



# A new approach to reduce infant mortality and achieve equity

---

Policy recommendations to improve  
housing, transportation, education  
and employment



Prepared by the Health Policy Institute of Ohio  
for the Ohio Legislative Service Commission

Dec. 1, 2017



# Acknowledgments

---

Section 5 of Sub. SB 332 of the 131<sup>st</sup> General Assembly required the Ohio Legislative Service Commission (LSC) to contract with a nonprofit organization to convene and lead a stakeholder group and produce a report with the group's findings and policy recommendations by Dec. 1, 2017. Following a competitive procurement process, LSC selected the Health Policy Institute of Ohio (HPIO) for the project. HPIO subcontracted with the Ohio University Voinovich School of Leadership and Public Affairs for data analysis.

## Health Policy Institute of Ohio

### **Project lead and co-author**

Amy Bush Stevens, MSW, MPH

### **Co-authors**

Hailey Akah, JD, MA; Reem Aly, JD, MHA; Becky Carroll, MPA; Zach Reat, MPA;  
Amy Rohling McGee, MSW

### **Graphic design and layout lead**

Nick Wiselogel, MA

### **Contributors**

Sarah Perry, MPH candidate; Dan Purkepile, MPA candidate

### **Additional support**

Alana Clark-Kirk; Neva Hornbeck

## Ohio University Voinovich School of Leadership and Public Affairs

### **Data Analysis**

Anirudh Ruhil, PhD; Francesca Gordon, PhD

### **Other stakeholders**

Over 100 stakeholders from public and private organizations across the state participated in the Steering Committee, Advisory Group and Housing Subcommittee for this project. See Appendix C for a complete list of participants and other subject matter experts who contributed to this report.

# Contents

---

<b>Acknowledgments</b>	<b>1</b>
<b>Snapshot</b>	<b>3</b>
<b>1. Background and purpose</b>	<b>5</b>
<b>2. Infant mortality overview</b>	<b>10</b>
<b>3. Social determinants of health and health equity overview</b>	<b>15</b>
<b>4. Housing</b>	<b>22</b>
<b>5. Transportation</b>	<b>50</b>
<b>6. Education</b>	<b>70</b>
<b>7. Employment</b>	<b>98</b>
<b>8. State-level regression analysis</b>	<b>122</b>
<b>9. Lessons learned from other states</b>	<b>124</b>
<b>10. Discussion and conclusion</b>	<b>172</b>
<b>11. Appendix</b>	<b>178</b>
Appendix A. Complete list of policy recommendations	<b>178</b>
Appendix B. Evidence inventories	<b>190</b>
Appendix C. Stakeholder engagement	<b>206</b>
Appendix D. Methodology	<b>212</b>
Appendix E. State data tables	<b>221</b>



## A new approach to reduce infant mortality and achieve equity

Policy recommendations to improve housing, transportation, education and employment

### Snapshot

#### What is the problem?

**Ohio's infant mortality rate increased in 2015 and again in 2016, and remains higher than most other states.**

In the early 1990s, Ohio's overall infant mortality rate was slightly lower than the U.S. rate. Since then, however, improvements at the national level have outpaced improvements in Ohio.

**Ohio has troubling infant mortality disparities by race and geography.**

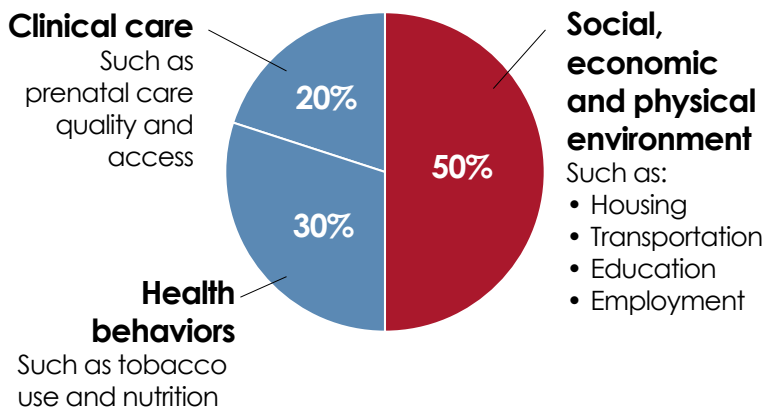
- In 2016, Ohio's non-Hispanic black infant mortality rate (15.2 per 1,000 live births) was almost three times as high as the white rate (5.8).
- There were only three states with higher non-Hispanic black infant mortality rates than Ohio, based on most-recent U.S. comparison data.<sup>1</sup>
- Infant mortality rates are highest in Ohio's largest metropolitan areas and in some rural counties, particularly in Appalachian parts of the state.

#### Why is this happening?

**Access to health care is necessary, but not sufficient. Improvements to factors beyond medical care are needed to achieve infant mortality reduction goals.**

- Researchers estimate that of the modifiable factors that impact overall health, 20 percent are attributed to clinical care (e.g., healthcare access and quality) and 30 percent to health-related behaviors. The remaining 50 percent are attributed to the types of community conditions highlighted in the pie chart below.
- Over the past few decades, Ohio's efforts to reduce infant mortality have focused primarily on medical care and interventions for pregnant women. These strategies focus on some—but not all—of the underlying causes of infant death, and may not be enough to improve maternal and child health in a widespread way.

#### Modifiable factors that influence health<sup>2</sup>



#### Community conditions for low-income, African-American and rural families in Ohio are particularly challenging.

As an indicator of the overall health and wellbeing of a state, infant mortality rates reveal the cumulative impact of poverty, discrimination, racism and inequities in the social, economic and physical environment. For example:

- Median income for Ohioans has lagged behind the U.S. over the last 12 years, and many of Ohio's fastest-growing occupations pay wages below \$12 per hour.
- A national ranking of child wellbeing found that Ohio was the second worst state in the country for African-American children.
- Rural communities and small cities in Ohio have experienced more population decline, industry loss and worsening economic indicators than urban centers.

**Underlying drivers of inequity:** Poverty, racism, discrimination, trauma, violence and toxic stress

## What can we do about it?

**State and local policymakers have many options to address the community conditions and inequities that contribute to infant mortality.**

- Improvement is possible. Other states have made faster progress than Ohio in reducing infant deaths, including black infant deaths.
- This report highlights lessons learned from other states, including examples of approaches to improving social and economic conditions.
- This report offers a total of 127 specific policy recommendations based upon stakeholder input and a review of the research evidence for what works to improve housing, transportation, education, employment and cross-cutting factors.

Going forward, Ohio's new approach to reducing infant mortality by improving community conditions should:

- **Prioritize housing and employment.** Housing and income are foundational, basic human needs.
- **Connect the disconnected.** Better connect low-income families to jobs, transportation, post-secondary education and social support.
- **Ensure all children have the opportunity to thrive.** Extend the reach of early childhood programs, decrease education disparities, prevent violence and support marriage.
- **Acknowledge and address the roles of racism, discrimination, violence and toxic stress.** Provide all Ohioans with the opportunity to be healthy by eliminating discriminatory policies and practices and helping families be resilient in the face of trauma and toxic stress.
- **Innovate, leverage public-private partnerships and join forces across sectors.** Innovative financing and collaboration between new partners are critical for long-term impact.
- **Coordinate, collaborate, monitor and evaluate.** Policymakers and state agencies have an important role to work together to develop, document, assess and continually improve infant mortality efforts.
- **Balance short-term fixes with longer-term change.** Address immediate needs, such as homelessness, but also pursue fundamental changes to the housing, transportation, education and employment sectors that ensure that all Ohio families can participate in the economy, build positive social relationships and attain optimal health.

## Priority populations

This report focuses on babies born to the following groups of Ohioans most at risk for infant mortality:

- African-American/black Ohioans
- People with low levels of educational attainment
- People with low incomes
- Residents of infant mortality "hot spot" communities (mostly urban neighborhoods and rural counties with higher rates of infant death)

It is important to note that racism and inequities in the social, economic and physical environment drive the increased risk of infant mortality for African Americans.

## About this study

Prepared by HPIO for the Legislative Service Commission, this report was a requirement of Senate Bill 332 and drew upon the following sources of information:

- Guidance from over 100 state and local-level Ohio stakeholders
- Existing quantitative data and research literature
- New state-level analysis of social, economic and physical environment metrics conducted by Ohio University researchers
- 23 key informant interviews with stakeholders from eight case study states

## Notes

1. Pooled years 2012-2014. Linked birth/infant death records via CDC WONDER for the 34 states and Washington D.C. for which non-Hispanic black infant mortality rate data is available.
  2. Booske, Bridget C. et. al. County Health Rankings Working Paper: Different Perspectives for Assigning Weights to Determinants of Health. University of Wisconsin Public Health Institute, 2010.
- All other sources are cited in the full report.

For a 16-page executive summary and other project material, visit

<http://bit.ly/SDOIM>

## Senate Bill 332

In March 2016, the Ohio Commission on Infant Mortality issued a **report** to the Governor and leaders of the General Assembly.<sup>1</sup> The report included several specific recommendations for state agencies and the legislature designed to reduce infant mortality, and acknowledged the critical importance of reducing racial disparities and addressing contributing factors inside and outside the healthcare system.

Most of the recommendations from the Commission's report were enacted in 2017 through Senate Bill 332 (SB 332), co-sponsored by Senators Shannon Jones and Charleta B. Tavares. SB 332 required the Legislative Service Commission (LSC) to contract with a nonprofit organization to convene a stakeholder group and issue a report regarding the social drivers of infant mortality.

Specifically, SB 332 called for this study to:

- Review state policies and programs that impact the social determinants of health for infants and for women of child-bearing age, particularly programs intended to improve educational attainment, public transportation options, housing, and access to employment (addressed in parts four through seven of this report)
- Identify opportunities to improve those programs and policies (parts four through seven)
- Study the impact of using a state-funded rental assistance program targeted at infant mortality reduction (part four)
- Evaluate best practices other states have implemented to improve the social determinants of health for infants and women of child-bearing age (part nine)

LSC issued a competitive Request for Proposals in March 2017 and selected the Health Policy Institute of Ohio (HPIO) to lead the study. The project began in May 2017 and concludes with submission of this report to LSC, the Governor and the General Assembly on Dec. 1, 2017.

## Purpose and scope of this report

Given the vision of the Ohio Commission on Infant Mortality and the requirements of SB 332, the purposes of this report are to:

- Describe the many ways that factors beyond medical care affect the health of infants and their families, focusing on housing, transportation, education and employment
- Assess the extent to which current housing, transportation, education and employment policies and programs in Ohio meet the needs of Ohioans most at risk for infant mortality
- Identify lessons learned from other states that have successfully reduced overall and black infant mortality rates, including innovative ideas to address the social determinants of health
- Offer specific, actionable and evidence-informed policy options that state- and local-level policymakers can employ to address unmet needs and inequities

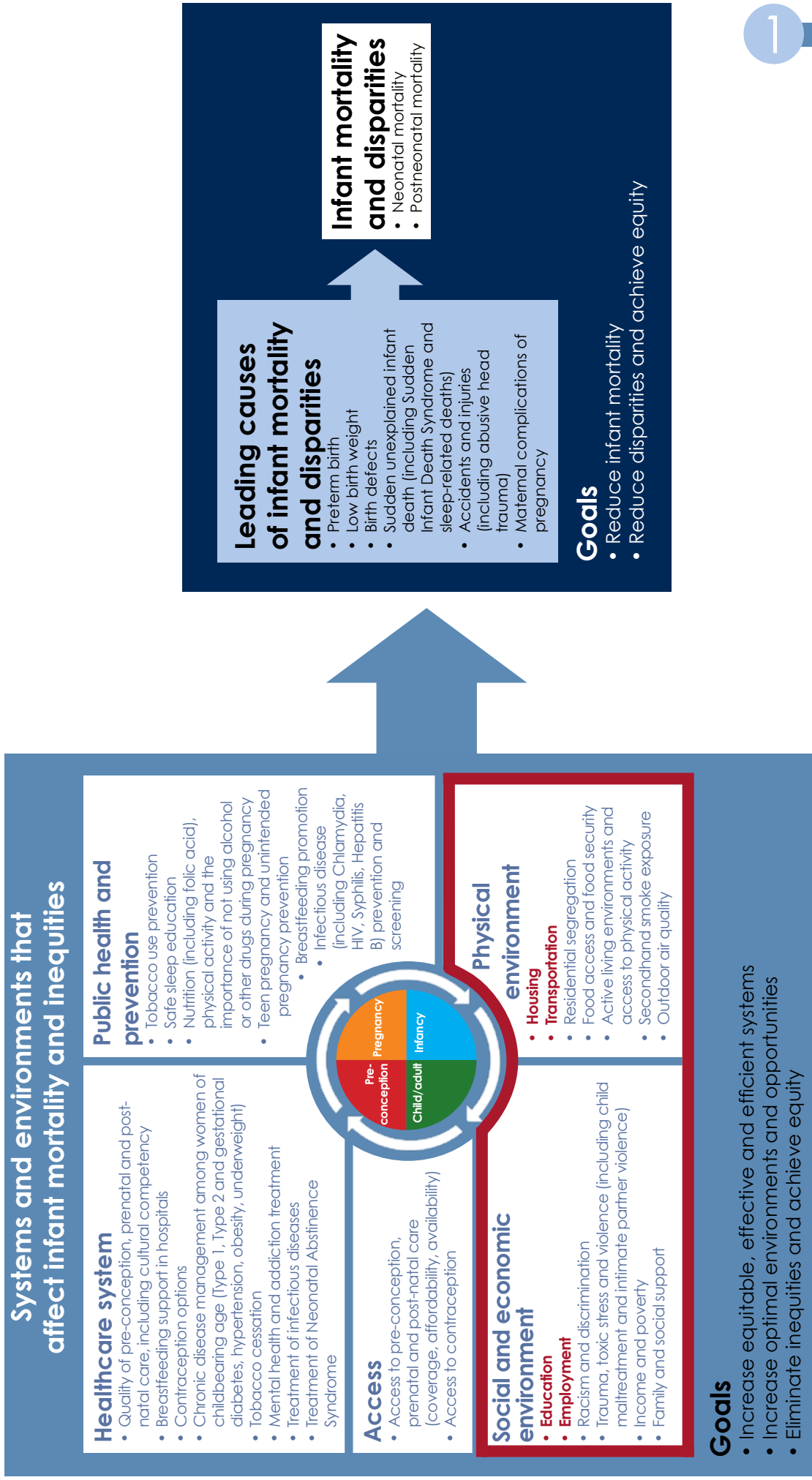
This study addresses a wide range of topics and complex policy challenges. In order to identify a strategic set of recommendations likely to reduce infant mortality, three concepts described below guide the scope of this report: social determinants of health, priority populations and policy relevance.

## Social determinants of health

This report looks beyond medical care to explore factors in the social, economic and physical environment that affect infant mortality. These factors—such as educational attainment, food access and air quality—are commonly referred to as the “social determinants of health” and are outlined in red in figure 1.1.

Research estimates that of the modifiable factors that impact overall health, only 20 percent are attributed to clinical factors (i.e. access to high quality medical care).<sup>2</sup> The remaining 80 percent are attributed to non-clinical factors, including an individual's social and economic environment (40 percent), health-related behaviors (30 percent) and

Figure 1.1. Conceptual framework for infant mortality reduction



**SB 332 specified housing, transportation, education and employment as the focus for this study.**

physical environment (10 percent).<sup>3</sup> Efforts to reduce infant mortality, therefore, are not likely to be successful unless they address social determinants.

This report does not focus on clinical healthcare services or health behaviors. Access to prenatal care, contraception and progesterone treatment, Centering Pregnancy group prenatal care, breastfeeding education, drug treatment for pregnant women and safe sleep campaigns are examples of critical interventions that are addressed by many existing initiatives in Ohio and have been described in other reports.

### Tobacco Use

This report does not focus specifically on tobacco use. Smoking is, however, one of the most common preventable risk factors for infant mortality and should continue to be a priority in infant mortality reduction efforts in Ohio.<sup>4</sup> A recent Center for Community Solutions analysis of Ohio birth outcomes data found that, maternal smoking during pregnancy was one of the strongest predictors of low birth weight and prematurity, controlling for other factors.<sup>5</sup> Notably, the Ohio Commission on Infant Mortality's March 2016 recommendations regarding tobacco use were not included in SB 332 due to concerns about political feasibility. This issue warrants ongoing attention from researchers and policymakers. See HPIO's [tobacco prevention and cessation publications](#) for evidence-based strategies to reduce smoking and secondhand smoke exposure.

### Priority populations

As described in part two of this report, infant mortality rates vary widely by race, ethnicity, education level, geography and other factors. In order to target resources to the areas of greatest need, this study focuses on babies born to the following groups of Ohioans most at risk for infant mortality and related risk factors:

- African American/black Ohioans
- People with low levels of educational attainment
- People with low income
- Residents of infant mortality hot spot communities

It is important to note that racism and inequities in the social, economic and physical environment drive the increased risk of infant mortality for African Americans.<sup>6</sup>

Pregnant women and parents of infants are particularly at risk, although the needs of people of childbearing age in general are relevant given the importance of the life-course perspective and the social-ecological model described in part three.

Disparities experienced by these populations are key drivers of Ohio's poor overall maternal and infant health. Consequently, addressing health disparities and eliminating health inequities, focusing on these priority populations, is critical to reducing infant mortality and achieving equitable birth outcomes for all Ohioans.

### Policy relevance

State policymakers are the primary audience for this report. The policy goals and recommendations are designed to provide state agency leaders and legislators with specific and actionable steps to improve conditions in the social, economic and physical environment that contribute to infant mortality and related inequities.

In cases where local-level decision making, funding or planning is particularly relevant, this report also offers policy options for local policymakers and infant mortality reduction partners. The policy recommendations include opportunities for many sectors and partners to come together to improve community conditions, including public health, health care, housing, regional planning, public transportation, education and workforce development organizations.



## Stakeholder engagement

Over 100 stakeholders from public and private organizations around the state contributed to this study. Appendix C provides a detailed description of the stakeholder engagement process and lists of participants in the Steering Committee, Advisory Group and Housing Subcommittee.

## Data sources and research methodology

### Existing data and research

This report relies on existing quantitative data to describe infant mortality-related trends and disparities, and the prevalence of housing, transportation, education and employment challenges and inequities. Sources include vital statistics from the Ohio Department of Health and Centers for Disease Control and Prevention (CDC); demographic data from the U.S. Census Bureau; economic data from the Bureau of Labor Statistics; administrative data from federal and state housing, transportation, education and workforce/labor agencies; and other sources.

The report also summarizes and synthesizes existing research on the relationships between social determinants and infant mortality, as well as effective strategies to address social determinants. Sources include:

- Peer-reviewed journal articles, including systematic reviews and meta-analyses when available
- Reports from expert panels, government agencies and policy organizations
- Evidence registries (clearinghouses that rate the evidence of effectiveness of specific programs and policies)

### New analysis and research

HPIO contracted with researchers at the Ohio University Voinovich School of Leadership and Public Affairs to conduct new analysis of state-level trend data (metrics from the Social and Economic Environment and Physical Environment domains of the HPIO [Health Value Dashboard](#)). These findings, summarized in parts eight and nine of this report, indicate drivers of infant mortality and context for changes in other states.

The Ohio University research team also analyzed state trend data from the Linked Birth/Infant Death records through CDC WONDER and Ohio data from the CDC Pregnancy Risk Assessment Monitoring System (PRAMS), disaggregated by race, ethnicity, education level, income level and marital status.

In addition, HPIO conducted 23 key informant interviews with contacts from eight other states, and gathered evaluation reports from those states, when available, in order to identify policies and programs Ohio may want to scale up or replicate.

Appendix D provides additional detail about research methodology.

### Geography matters: The importance of local data

Infant mortality rates and social, economic and physical environments vary widely by geography. When available, this report includes city, county or metropolitan area data, in addition to state-level data. For local decision makers, it is important to analyze data at the neighborhood, zip code or census tract level. It is beyond the scope of this project to present neighborhood-level data. However, links to several local data sources are highlighted throughout this report and the following sources from The Ohio State University Kirwan Institute for the Study of Race and Ethnicity provide useful census-tract-level information for local decision makers:

- **Child Opportunity Maps:** Maps that visualize the geographic distribution of neighborhood-based opportunity for children in metropolitan areas
- **Urban Suburban Rural Opportunity Index:** Interactive tool that displays opportunity areas for all of Ohio (developed for the Ohio Housing Finance Agency)

## Limitations

First, it is difficult to identify which of the four topics (housing, transportation, education or employment) is most important to address in order to reduce infant mortality. Furthermore, available research is not able to clearly recommend which combinations of policies and programs are most likely to be effective.

Second, many of the connections between the social determinants of health and health outcomes, such as infant mortality, are indirect and complex. There are very few housing, transportation, education or employment policies and programs for which rigorous research has demonstrated a direct, causal impact on infant mortality.

While there are significant gaps in the research literature directly tying social and economic interventions to the distal outcome of infant mortality, there is a wealth of literature describing the intermediate steps and proximal relationships between non-medical factors and the leading causes of infant mortality, such as preterm birth or sleep-related death. For example, lack of safe, affordable housing leads to living in poor-quality housing<sup>7</sup>, which leads to overcrowding and unsafe sleep conditions, which are risk factors for sleep-related death.<sup>8</sup>

This study, therefore, uses the best-available research evidence, coupled with input from subject matter experts and local infant mortality reduction groups, to identify the most important factors that contribute indirectly or directly to infant health.<sup>9</sup>

Additional limitations are described in Appendix D.

## Connections to other studies and initiatives

This report builds upon and complements other infant mortality reduction studies, plans, recommendations and data reports that have been released in Ohio over the past few years, including:

- **2016 Ohio infant mortality data: General findings**, Ohio Department of Health, 2017
- **Infant Mortality Research Partnership: Reducing infant mortality in Ohio: Individuals, communities, systems and interventions**, Ohio Colleges of Medicine Government Resource Center, 2017
- **Birth equity: A pathway forward**, Children's Defense Fund-Ohio, 2017
- **Low birth weight and prematurity in Ohio: A multivariate analysis**, The Center for Community Solutions, 2017
- **Ohio 2017-2019 State Health Improvement Plan** (includes maternal and infant health), Ohio Department of Health and Governor's Office of Health Transformation
- **Ohio Medicaid update on infant mortality initiatives SFY 2016-2017**, Ohio Department of Medicaid, 2017
- **Report on pregnant women, infants and children**, Ohio Department of Medicaid, 2017
- **Ohio infant mortality reduction plan 2015-2020**, Ohio Collaborative to Prevent Infant Mortality, 2015

## Notes

1. *Committee Report, Recommendations and Data Inventory*. Ohio Commission on Infant Mortality, March 2016. <http://cim.legislature.ohio.gov/Assets/Files/march-2016-final-report.pdf>
2. Booske, Bridget C. et al. *Different Perspectives for Assigning Weights to Determinants of Health*. County Health Rankings, University of Wisconsin Public Health Institute, 2010. <https://uwphi.pophealth.wisc.edu/publications/other/different-perspectives-for-assigning-weights-to-determinants-of-health.pdf> Ibid.
3. *New Strategies to Address Infant Mortality in Ohio (2017-2018)*. Ohio Department of Health, 2017. [https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI-](https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI-New-Strategies-Addressing-Infant-Mortality-in-Ohio-2017-18-FINAL.pdf?la=en)
4. *New Strategies to Address Infant Mortality in Ohio (2017-2018)*. Ohio Department of Health, 2017. [https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI-](https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI-New-Strategies-Addressing-Infant-Mortality-in-Ohio-2017-18-FINAL.pdf?la=en)
5. Ahern, Joseph. *Low Birth Weight and Prematurity in Ohio: A Multivariate Analysis*. The Center for Community Solutions, July 2017. [http://www.communitysolutions.com/assets/docs/Major\\_Reports/Other\\_Publications/issue%20brief\\_lbvw%20and%20pre-maturity%20in%20ohio\\_jahern\\_070717b.pdf](http://www.communitysolutions.com/assets/docs/Major_Reports/Other_Publications/issue%20brief_lbvw%20and%20pre-maturity%20in%20ohio_jahern_070717b.pdf)
6. Mendez, Dara D., Vijaya K. Hogan, and Jennifer F. Culhane. "Institutional racism, neighborhood factors, stress, and preterm birth." *Ethnicity & health* 19, no. 5 (2014): 479-499.
7. Desmond, Matthew. "Unaffordable America: Poverty, Housing, and Eviction." *Fast Focus*, no. 22 (2015): 1-6. <https://www.irp.wisc.edu/publications/fastfocus/pdfs/FF22-2015.pdf>
8. Chu, Tracy, Martine Hackett and Navpreet Kaur. "Housing Influences among Sleep-Related Infant Injury Deaths in the USA." *Health Promotion International* 31, no. 2 (2016): 396-404. doi: 10.1093/heapro/dav12
9. For a discussion of the challenges of making recommendations to address the social determinants of health, see Braveman, Paula A., Susan A. Egerter, Steven H. Woolf and James S. Marks. "When Do We Know Enough to Recommend Action on the Social Determinants of Health?" *American Journal of Preventive Medicine* 40, no. 1 (2011): S58-S66. doi: 10.1016/j.amepre.2010.09.02

# 2

## Infant mortality overview

Infant mortality refers to the death of a live-born baby before his or her first birthday, and is typically measured as a rate (number of infant deaths per 1,000 live births in a population).

Infant mortality is an internationally recognized indicator of the overall health and wellbeing of a community, state or country. Ohio's rate is higher than most other states<sup>1</sup>, signaling that Ohio has significant room for improvement in population health. Even more concerning, the number of Ohio infants who died before their first birthdays increased from 955 in 2014 to 1,024 in 2016.<sup>2</sup>

### Scope of the problem in Ohio: Disparities and trends

During most of the last two decades, Ohio's overall, white and black infant mortality rates have ranked amongst the highest in the nation. Especially problematic, racial and ethnic

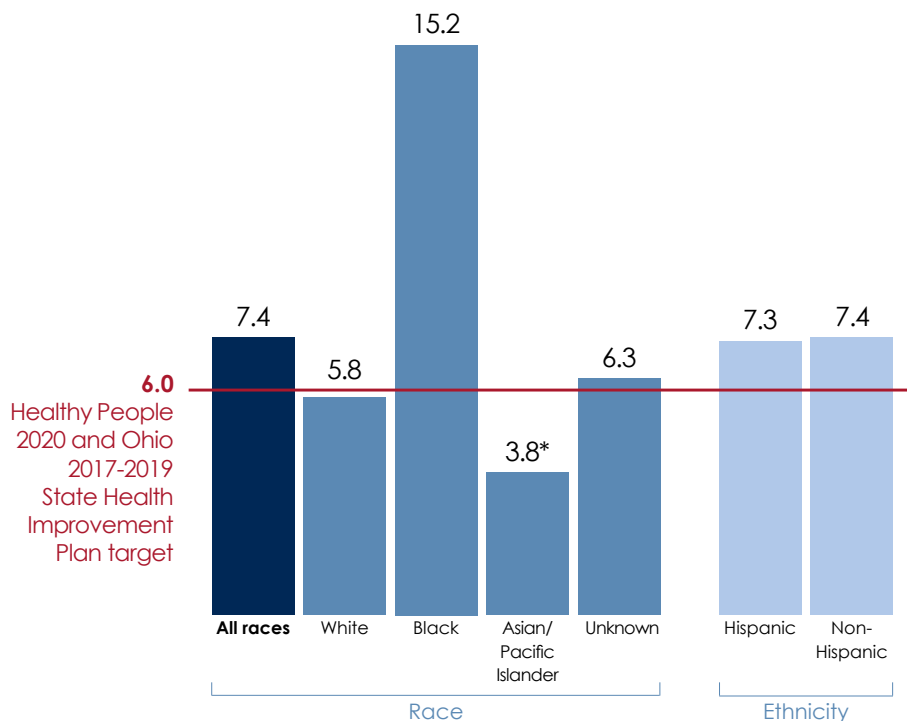
disparities in infant mortality stand out as major challenges for Ohio. In 2016, the black infant mortality rate was almost three times as high as the white rate (see figure 2.1). In 2016, all races and ethnicities other than whites and Asians/Pacific Islanders had rates above the target of 6.0 per 1,000 live births set by Healthy People 2020<sup>3</sup> and the [Ohio 2017-2019 State Health Improvement Plan](#).<sup>4</sup>

After gradual improvement from 1990 to 2014 and reaching record lows for the state, Ohio's overall, black and white infant mortality rates increased slightly in 2015 and again in 2016 (see figure 2.2).

Infant mortality rates vary widely by geography. Families in the following geographic areas are priority populations because of elevated risk:

- Nine Ohio Equity Institute (OEI) metropolitan communities, in which 59 percent of all infant

Figure 2.1. **Ohio infant mortality rate, by race and ethnicity (2016)** Number of infant deaths, per 1,000 live births



\* Rate based on fewer than 20 infant deaths and should be interpreted with caution-  
**Source:** 2016 Ohio Infant Mortality Data: General Findings, Ohio Department of Health

deaths and 86 percent of black infant deaths occurred in 2016<sup>5</sup> (see figure 2.3), and infant mortality hot spot neighborhoods within the OEI metropolitan areas.<sup>6</sup>

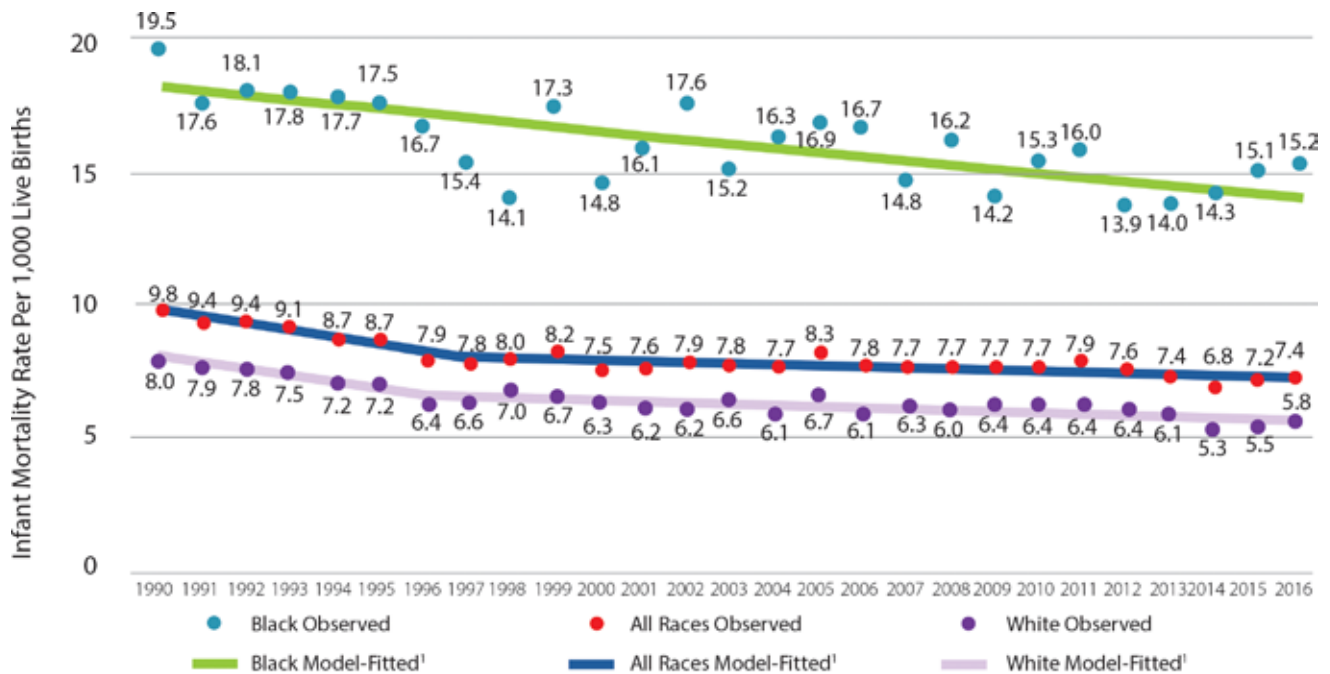
- Rural areas, particularly in Appalachian counties, with elevated rates of preterm and/or low birth weight births. For example, recent geospatial analysis identified Ross, Perry, Morgan, Muskingum and Marion counties as having clusters of risk for preterm birth.<sup>7</sup> In addition, as shown in figure 2.3, Madison, Jefferson, Highland, Pike and Adams Counties have the highest infant mortality rates in the state.

**Leading direct causes of infant mortality**

Figure 2.4 shows the leading direct causes of infant deaths in Ohio in 2016, as identified in death certificates:

- Prematurity-related (e.g., related to birth before 37 weeks, low birth weight, respiratory distress, and neo-natal hemorrhage)
- Congenital anomalies/birth defects
- Sudden Infant Death Syndrome (SIDS)
- Maternal conditions (e.g. premature rupture of membranes, placental separation)
- Lack of oxygen to the fetus/infant during delivery
- Maternal/infant infections
- Other infections
- Accident/injury
- Other causes<sup>8</sup>

Figure 2.2. Trends in Ohio infant mortality rates, by race (1990-2016)



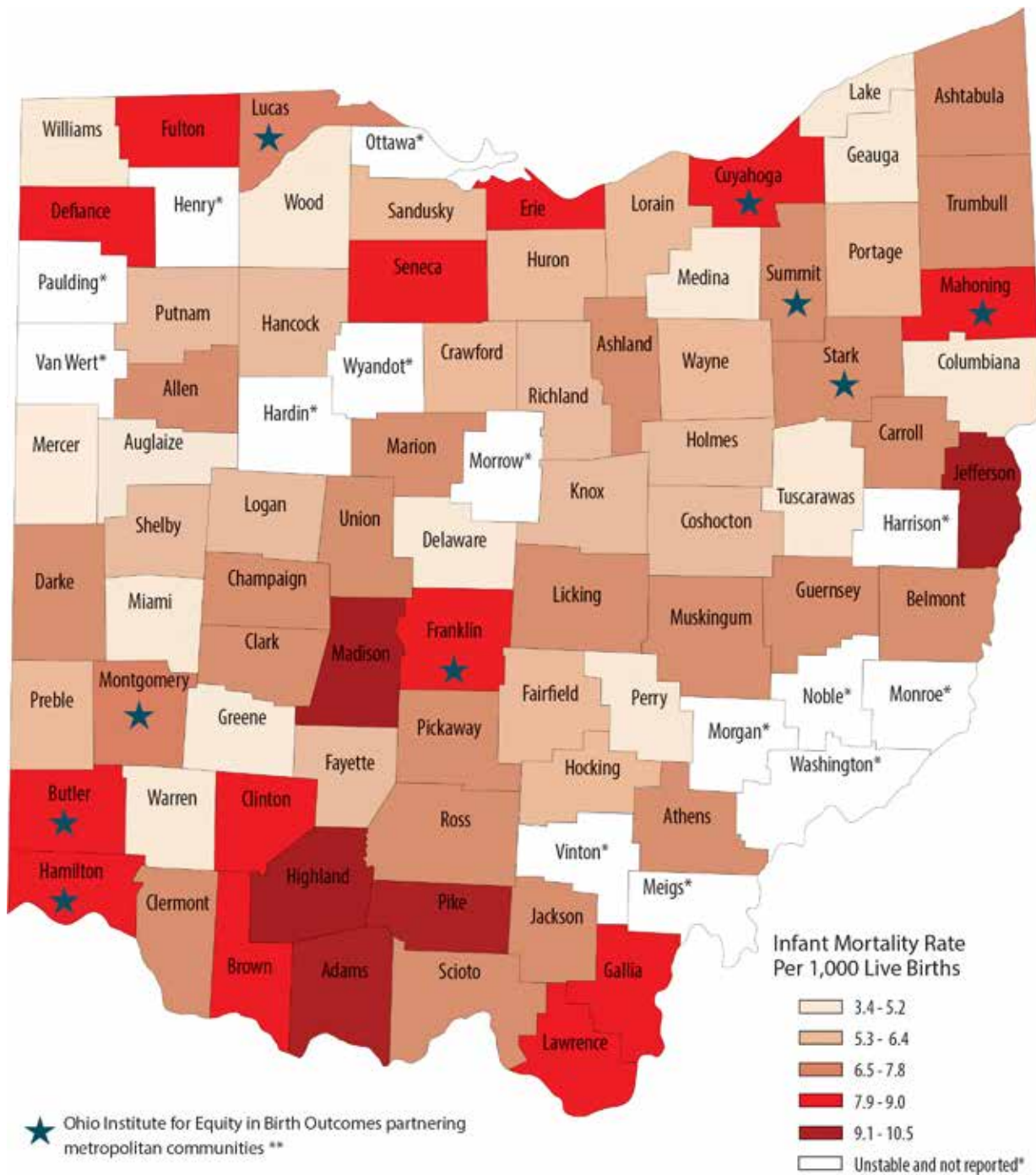
<sup>1</sup> "Model-Fitted" Definition – Joinpoint software models were used to test the statistical significance of changes in trends. For each group the best fitting trend lines are presented. A change in trend was observed for all races infant mortality in 1996 and for white mortality in 1997. No change in trend was detected for black infant mortality.

Source: 2016 Ohio Infant Mortality Data: General Findings, Ohio Department of Health

**Ohio vs. U.S. data**

Ohio infant mortality data is available from the Ohio Department of Health (ODH) through 2016. Data for other states, reported in part nine of this report, is available from the Centers for Disease Control and Prevention (CDC) through 2014. ODH and CDC numbers may vary slightly due to different calculation methodologies.

Figure 2.3. Ohio infant mortality average five-year rate, by county (2012-2016)



Infant mortality rate county groupings were determined by Jenks Natural Breaks. This method finds the best way to split up the ranges by minimizing the variation within each group, so the areas within each color are as close as possible in value to each other.

\* Rates based on fewer than 10 infant deaths are unstable and not reported.

\*\* Ohio Institute for Equity in Birth Outcomes partnering communities seek to improve overall birth outcomes and reduce racial and ethnic disparities in infant mortality. These metropolitan areas accounted for 59 percent of all infant deaths, and 86 percent of black infant deaths, in Ohio in 2016.

Source: 2016 Ohio Infant Mortality Data: General Findings, Ohio Department of Health

Sleep-related deaths are included in either the SIDS or the accident/injury category depending on the exact cause of death.

Previous Ohio Department of Health reports on the leading causes of infant mortality relied on Child Fatality Review data.<sup>9</sup> However, beginning with the 2016 report, death certificate data is used. Analysis of death certificate data uses the Dolfus system which focuses on the origin or etiology of death and collapses leading causes of infant mortality data into more meaningful categories for establishing public health priorities. Unlike with Child Fatality Review data, cause of death is reported for all infant deaths using death certificate data making it more complete.

For additional information about infant mortality rates, disparities and causes of infant deaths, see:

- **2016 Ohio infant mortality data: General findings**, Ohio Department of Health, 2017
- **Low birth weight and prematurity in Ohio: A multivariate analysis**, The Center for Community Solutions, 2017
- **Ohio infant mortality reduction plan 2015-2020**, Ohio Collaborative to Prevent Infant Mortality, 2015

**Key infant mortality terms**

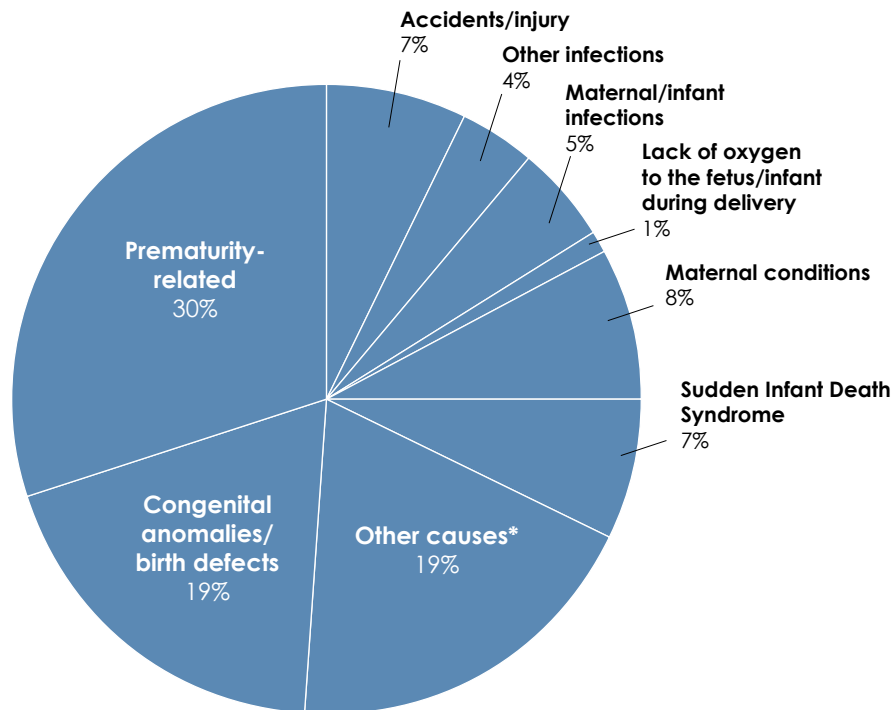
*Preterm birth* – infants born before 37 weeks of pregnancy have been completed

*Low birth weight birth* – infants born weighing less than 2,500 grams/5lb. 8 oz.

*Neonatal infant death* – occurring within the first 27 days of life

*Postneonatal infant death* – occurring between 28 and 364 days after birth

Figure 2.4. **Leading causes of infant mortality in Ohio (2016)**



\*Other causes include neoplasms, anemias, infectious colitis, enteritis, gastroenteritis and other conditions not specified.

Source: 2016 Infant Mortality Data: General Findings, Ohio Department of Health, Bureau of Vital Statistics

## Notes

1. Health Policy Institute of Ohio. 2017 Health Value Dashboard. March 2017.
2. 2014 and 2016 *Ohio Infant Mortality Data: General Findings*. Ohio Department of Health, 2015 and 2017. <https://www.odh.ohio.gov/odhprograms/cfhs/octpim/atestoind.aspx>
3. "Healthy People 2020 objective MICH-1.3." U.S. Department of Health and Human Services. Accessed November 9, 2017. <https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives>
4. 2017-2019 *State Health Improvement Plan*. Governor's Office of Health Transformation and Ohio Department of Health, February 2017. <https://www.odh.ohio.gov/en/odhprograms/chss/Health-Policy/ship/State-Health-Improvement-Plan>
5. 2016 *Ohio Infant Mortality Data: General Findings*. Ohio Department of Health, 2017. <https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI/2016-Ohio-Infant-Mortality-Report-FINAL.pdf?la=en>
6. For infant mortality hot spot maps prepared by the Kirwan Institute for the Study of Race and Ethnicity at The Ohio University, see *Committee Report, Recommendations and Data Inventory*. Ohio Commission on Infant Mortality, March 2016. <http://cim.legislature.ohio.gov/Assets/Files/march-2016-final-report.pdf>
7. *Reducing Infant Mortality in Ohio: Individuals, Communities, Systems and Interventions*. Infant Mortality Research Partnership: Ohio Colleges of Medicine Government Resource Center, 2017.
8. 2016 *Ohio Infant Mortality Data: General Findings*. The Ohio Department of Health, 2017. <https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI/2016-Ohio-Infant-Mortality-Report-FINAL.pdf?la=en>
9. Ohio law requires every county to review the deaths of children. This data is the outcome of thoughtful inquiry and discussion by a multi-disciplinary group of local experts who consider all circumstances surrounding the death of each child. Notably, cause is not always attributed to every infant death and cause of death identified through this process may not match the death certificate.

# 3

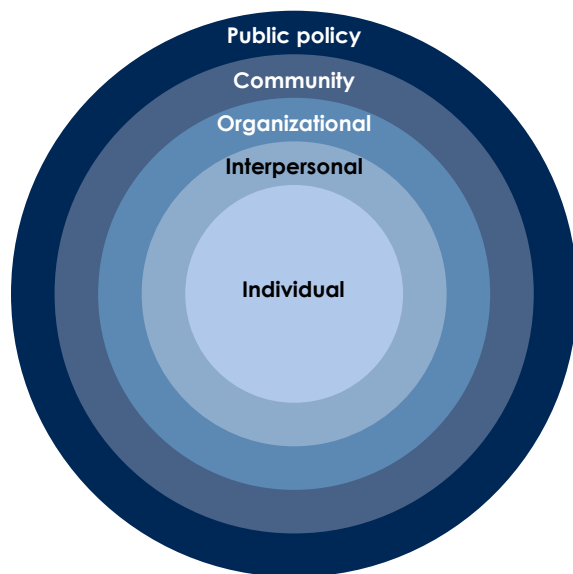
## Social determinants of health and health equity overview

### Key concepts

This section begins with a description of four key concepts that help to explain why it is important to address social determinants of health comprehensively, strategically allocate resources toward priority populations and implement policy change in order to reduce infant mortality and achieve equity:

- Social-ecological framework
- Life-course perspective
- Health inequities, disparities and equity
- Toxic and persistent stress, trauma and violence

Figure 3.1. **Social-ecological model**



### Social-ecological framework

The social-ecological framework recognizes that health is not only influenced by individual characteristics and behavior (such as maternal age and nutrition), but also by interpersonal relationships with family and peers and the broader community environment, including neighborhood conditions, social norms and economic trends (see figure 3.1).<sup>1</sup> Public policy also influences health, often by changing conditions in other levels of the framework.

Within the context of infant mortality reduction, this framework calls for a comprehensive approach that includes fathers, grandparents

and other family members and addresses structural issues such as access to health care, healthy food, transportation and housing.

### Life-course perspective

The life-course perspective asserts that pregnancy is not the only period of time that matters for infant health. A woman's health before pregnancy can have a much larger impact on outcomes and disparities than do the nine months of gestation.<sup>2</sup> Therefore, interventions such as prenatal care, case management and care coordination that may only reach women in their second or third trimester, are largely "too little, too late."

The life-course framework emphasizes that:

- Risk and protective factors experienced early in life, particularly during sensitive developmental periods in early childhood, influence physical and mental health later in adulthood
- The cumulative "wear and tear" of persistent stress over a person's life time can negatively affect health outcomes<sup>3</sup> (described below)

Health promotion and prevention in childhood and adolescence therefore support optimal health over the life span.<sup>4</sup> In the context of infant mortality reduction, policies and programs that improve the preconception health of girls and women of childbearing age have the "win-win" effect of supporting health and wellbeing for two generations. For example, girls who are more physically active and eat healthy food are less likely to develop Type 2 diabetes in adulthood, which is a risk factor for poor birth outcomes.<sup>5</sup>

### Health disparities, inequities and equity

Health disparities and health inequities are two closely related yet separate and distinct terms. Health disparities are adverse differences in health status across population groups, which include differences in maternal and infant health outcomes. Inequities are largely viewed as the underlying drivers of health disparities and are attributed to differences in key determinants of health, such as income or wealth, education level, neighborhood characteristics and health behaviors.<sup>6</sup> Health



inequities are often rooted in systemic, historic, unjust or racist structures, policies and norms within society. In order to achieve health equity, health disparities and inequities must be eliminated.

Health equity means that “everyone has a fair and just opportunity to be as healthy as possible.”<sup>7</sup> This requires the removal of barriers to health that drive inequities, including poverty, racism and discrimination and exposure to toxic and persistent stress, trauma and violence.

As previously discussed, for both Ohio and the U.S., black infants have significantly worse infant mortality rates and related birth outcomes than other racial and ethnic groups.<sup>8</sup> Disparities in maternal and infant health outcomes can also be seen among people with low levels of educational attainment, low incomes and residents of infant mortality hot spot communities. Disparities experienced by these populations are key drivers of Ohio's poor overall maternal and infant health. Consequently, addressing health disparities and eliminating health inequities, particularly for these priority populations, is critical to reducing infant mortality and achieving equitable birth outcomes for all Ohioans.

### Toxic and persistent stress

Toxic stress is different from normal stress because it results in the ongoing activation of the body's “fight or flight” stress response from which the body does not fully recover.<sup>9</sup> Also referred to as chronic or persistent stress, toxic stress causes changes to the neurologic, endocrine and immune systems that can result in physical and mental health problems throughout the life course.<sup>10</sup> Sources of toxic stress include racism, extreme poverty and interpersonal and community violence.<sup>11</sup>

Exposure to toxic stress early in life is particularly harmful. The Adverse Childhood Experiences (ACEs) study, for example, found a direct relationship between the number of ACEs experienced in childhood (such as witnessing domestic violence or having an incarcerated parent) and health problems experienced later in adulthood, including heart disease, cancer and addiction.<sup>12</sup>

Numerous studies have found that maternal stress contributes to poor birth outcomes.<sup>13</sup> Toxic stress experienced over the life course prior to conception, as well as acute stressors such as illness, divorce or the death of a family member during pregnancy, contribute to poor outcomes such as preterm birth.<sup>14</sup>

### Trauma and violence

Trauma is a concept related to toxic stress. Trauma results from “an event, series of events or set of circumstances that is experienced by an individual as physically or emotionally harmful or life-threatening and that has lasting adverse effects on the individual's functioning and mental, physical, social, emotional or spiritual wellbeing.”<sup>15</sup> Traumatic events include being a victim or witness of intimate partner violence (domestic violence) or community violence<sup>16</sup>, as well as being subjected to implicit or explicit racism.<sup>17</sup>

A 2016 systematic review of 19 research studies found that intimate partner violence is associated with low birth weight and preterm birth.<sup>18</sup> Ohio data shows that African American women are more likely than women of other racial or ethnic groups to report that their husband or partner physically hurt them in any way during their most recent pregnancy.<sup>19</sup>

Research has also found that community violence is associated with fetal death and preterm birth<sup>20</sup>, and a recent Ohio study concluded that “living in an area with a high homicide rate increases the risk of infant mortality as well as preterm birth.”<sup>21</sup>

In addition, studies find that maternal exposure to racial discrimination is associated with poor birth outcomes.<sup>22</sup>

### Relationship between social determinants and infant mortality

Birth and death records compiled by public health agencies (vital statistics) are the most readily available source of individual-level information on birth outcomes and infant mortality. This data includes maternal age, race, ethnicity, education level, marital status, geography and smoking, as well as birth weight and weeks of gestation. For this reason, there is a large volume of research that

identifies risk factors from this data for infant mortality and poor birth outcomes, including studies conducted in Ohio. Ohio women with the following racial and social determinant-related characteristics are at greatest risk for poor outcomes:

- African American
- Lower educational attainment (did not finish high school)
- Unmarried<sup>23</sup>

It is important to note that racism and inequities in the social, economic and physical environment drive the increased risk of infant mortality for African Americans.<sup>24</sup> In addition, residents of the geographic areas described in part two are at higher risk for infant mortality and poor birth outcomes, including the nine Ohio Equity Institute (OEI) metropolitan communities (see figure 2.3).

Looking beyond these factors, there is a small but growing body of research literature on social determinants of health that contribute directly to infant mortality, and a more substantial body of research describing risk and protective factors for the leading causes

of infant mortality, particularly poor birth outcomes. Risk factors are characteristics at the individual or community level that precede and are associated with a higher likelihood of negative outcomes. Protective factors are characteristics associated with a lower likelihood of negative outcomes or that reduce a risk factor's impact.<sup>25</sup> Protective factors have a buffering effect that helps individuals to be resilient.

It is difficult to directly connect the dots between conditions in the social, economic and physical environment and infant mortality. However, research does identify social and economic conditions that contribute to, or harm, maternal and child health more broadly, including the leading causes of infant mortality. The literature review below summarizes these findings.

### Social determinants of health risk and protective factors for infant mortality

Two systematic reviews provide useful summaries of what is currently known in the research literature about direct links

Figure 3.2. Risk and protective factors for infant mortality

Social-ecological level	Risk factors	Protective factors
Public policy	<ul style="list-style-type: none"> <li>• Economic contraction (increased unemployment)</li> <li>• Imprisonment rate</li> <li>• Air and water pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Social policies (maternal leave policies, government spending on non-health factors)</li> <li>• Presence of an Office of Minority Health</li> <li>• Public health expenditures</li> <li>• Women's status (reproductive rights, employment and earnings)</li> </ul>
Community	<ul style="list-style-type: none"> <li>• Income inequality</li> <li>• Neighborhood socioeconomic deprivation (area-level income, poverty, education, employment, housing, etc.) and concentrated poverty</li> </ul>	Availability of medical providers
Interpersonal	Intimate partner violence	<ul style="list-style-type: none"> <li>• Paternal involvement</li> <li>• Marriage</li> </ul>
Individual	<ul style="list-style-type: none"> <li>• Methamphetamine use</li> <li>• Chronic health problems (such as Type 2 diabetes and hypertension)</li> <li>• Short inter-pregnancy interval (birth spacing)</li> <li>• Younger and older maternal age</li> <li>• Maternal smoking</li> <li>• Poverty</li> <li>• Unsafe sleep practices</li> </ul>	<ul style="list-style-type: none"> <li>• Breastfeeding</li> <li>• Educational attainment</li> <li>• Employment</li> <li>• Prenatal care utilization</li> </ul>

Source: Adapted from Kim and Saada, 2013 and Reno and Hyder, 2017.

between social determinants and infant mortality. The first review covered articles published between 1966 and 2011<sup>26</sup>, and the second—conducted in 2017 by researchers from Ohio State University—included studies published between 2006 and 2016.<sup>27</sup> Figure 3.2 summarizes relevant risk and protective factors for infant mortality identified by these systematic reviews.<sup>28</sup>

The 2017 review concluded that there were an inadequate number of studies that grapple with the complexity of the social determinants of health, connections between social-ecological levels and the accumulation of risk for women who have experienced multiple risk factors.<sup>29</sup>

### Social determinants of health risk and protective factors for poor birth outcomes

There is a strong body of research demonstrating the relationship between lower socioeconomic status (income, education and class) and poor birth outcomes (low birth weight and preterm birth).<sup>30</sup> In addition, the following modifiable factors are associated with low birth weight and/or preterm birth:<sup>31</sup>

- Maternal health conditions, including Type 1, Type 2 and gestational diabetes; hypertension; depression; sexually transmitted infections and being overweight or underweight
- Maternal behaviors, such as poor nutrition, smoking and alcohol or other drug use
- Inadequate access to prenatal care
- Maternal stress
- Inadequate birth spacing
- Domestic violence
- Strenuous working conditions
- Exposure to secondhand smoke or other harmful chemicals

### Causes of disparities and inequities

The underlying causes of racial disparities in birth outcomes are multifaceted and not fully understood in the literature.<sup>32</sup> However, researchers acknowledge that exposure to various protective and risk factors during a mother's life shapes birth outcomes and can lead to health disparities.<sup>33</sup>

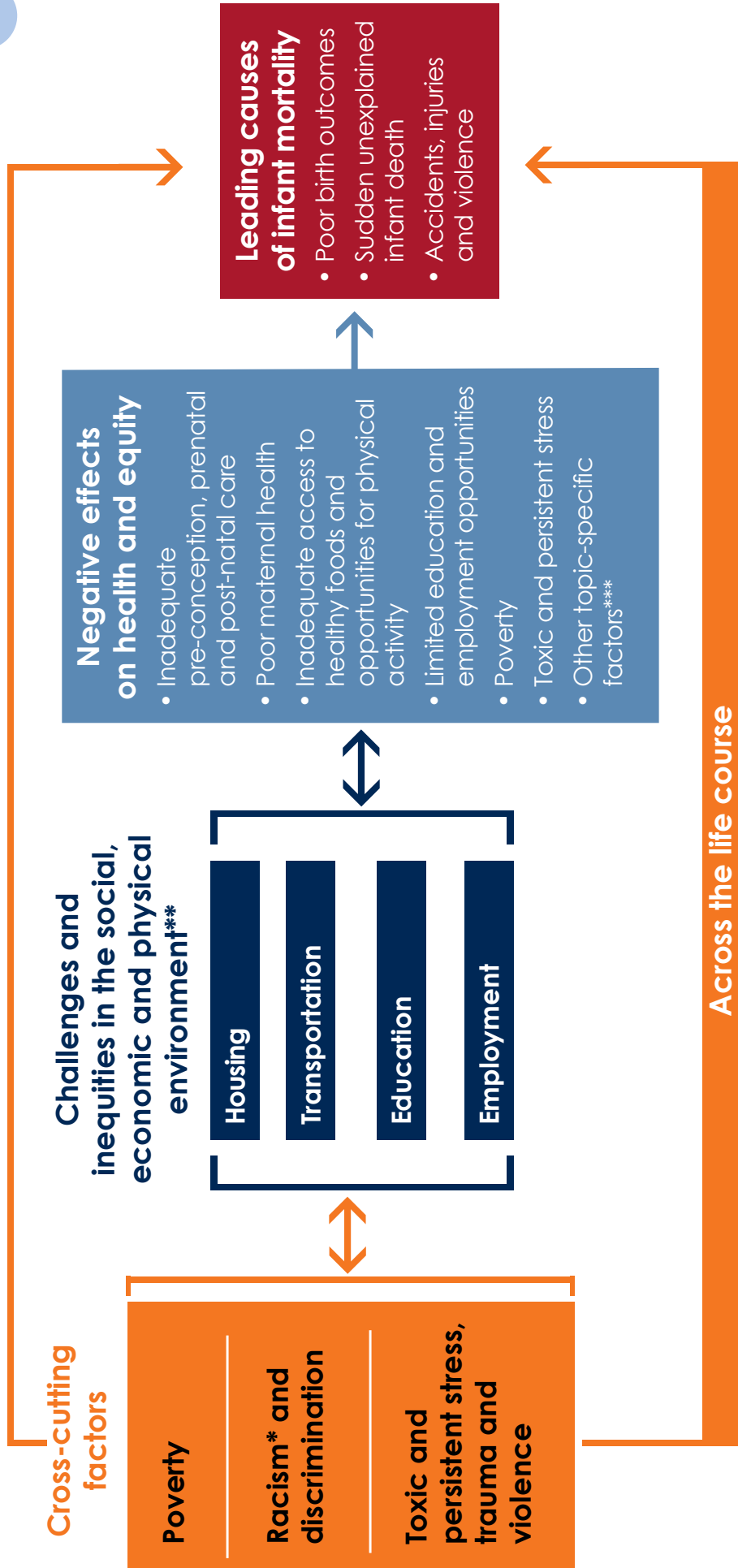
Disparities in birth outcomes can also be attributed to the complex interactions across the social determinants of health that drive inequities and accumulate over the life of the mother.<sup>34</sup> This suggests that disparities are attributed not only to issues related to healthcare delivery and access, but also to the impact of environmental and psychosocial stressors such as racism<sup>35</sup>, discrimination and living in economically-disadvantaged or under-resourced communities.<sup>36</sup>

African Americans in the U.S. are more likely to be exposed to unhealthy environments that result in poorer health outcomes.<sup>37</sup> For example, African Americans are more likely to live in neighborhoods with poor quality housing and limited access to resources, including employment and opportunities for high-quality education.<sup>38</sup> However, even after accounting for these environmental and other socio-economic risk factors, racial disparities in birth outcomes persist among African-American women.<sup>39</sup>

The presence of disparities, even after accounting for known risk factors, has led to greater research emphasis on the impact of racism and discrimination as unique psychosocial stressors among African-American women.<sup>40</sup> Researchers also discuss the contribution of historical obstacles to social advancement experienced by African Americans across generations, leading to lower levels of education, earnings and accumulated wealth than whites.<sup>41</sup> These historical obstacles are rooted in slavery, Jim Crow and a long legacy of policies and programs that support segregation and institutional racism such as mass incarceration, residential redlining, racially restrictive covenants and discriminatory mortgage lending.

These underlying structural drivers of inequities related to housing, transportation, education and employment are described in more detail in parts four through seven of this report.

Figure 3.3. Summary of relationships between social determinants of health and infant mortality



\* Structural, institutional, interpersonal and internalized racism

\*\* Topics specified for study by SB 332

\*\*\* See figures 4.1, 5.1, 6.1 and 7.1 for details

## Summary: How do social determinants contribute to infant mortality and disparities?

Infant mortality is the result of complex interactions between biological, behavioral, social, political and environmental factors. In some cases, research has identified direct causal links between social determinants of health and infant mortality. In other cases, the relationships are indirect or not well understood.

Infant mortality reduction requires a comprehensive approach that touches on many different public policy challenges. The research summarized above suggests that in order to make meaningful progress in reducing infant mortality and disparities, strategies should:

- Reach priority populations across the life course, with a focus on early childhood and “two generation” approaches that promote optimal health for children and their parents
- Prevent trauma and violence, build stress reduction and coping skills among vulnerable families and include trauma-informed services
- Specifically address the underlying causes of inequities, including poverty and racism

As specified in SB 332, this study focuses on four specific aspects of this complex picture: housing, transportation, education and employment. Figure 3.3 describes poverty, racism, stress and violence as underlying drivers of challenges and inequities related to these four topics. This diagram provides a high-level summary of the relationships between housing, transportation, education and employment. Similar “pathway diagrams” in parts four through seven of this report provide additional detail.

### Strategies to address poverty, racism, toxic and persistent stress, trauma and violence

This report includes specific policy recommendations to increase income, reverse discriminatory policies and practices and reduce sources of persistent stress in the lives of families most at risk for infant mortality. It is beyond the scope of this report, however, to

provide a set of recommendations that comprehensively address the cross-cutting factors shown in Figure 3.3. The following resources provide information that may be useful to infant mortality reduction partners that seek to directly address the cross-cutting factors:

- **Poverty: Opportunity, responsibility and security: A consensus plan for reducing poverty and restoring the American dream**, American Enterprise Institute and the Brookings Institution
- **Racism and discrimination: Truth, Racial Healing and Transformation**, W.K. Kellogg Foundation
- **Intimate partner violence: Preventing intimate partner violence across the lifespan: A technical package of programs, policies and practices**, Centers for Disease Control and Prevention (CDC)
- **Sexual violence: Stop SV: A technical package to prevent sexual violence**, CDC
- **Youth violence: A comprehensive technical package for the prevention of youth violence and associated risk behaviors**, CDC
- **Trauma: Birth equity: A pathway forward**, Children's Defense Fund-Ohio

## Conclusion

Because infant mortality is a measure of the overall health and wellbeing of a state, Ohio's sharp disparities in infant mortality indicate that some groups of Ohioans are being left behind. Infant mortality rates reveal the cumulative impact of poverty, discrimination, racism and inequities in the social, economic and physical environment. As summarized by health researcher Nancy Krieger, “Social inequality kills. It deprives individuals and communities of a healthy start in life, increases their burden of disability and disease, and brings early death. Poverty and discrimination, inadequate medical care, and the violation of human rights all act as powerful social determinants of who lives and who dies, at what age, and with what degree of suffering.”<sup>42</sup>

## Notes

- Health Policy Institute of Ohio. "Ohio Prevention Basics." June 2014.
- Lu, Michael C. and Neal Halfon. "Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective." *Maternal and Child Health Journal* 7, no. 1 (2003): 13-30. doi: 10.1023/A:1022537516969
- Ibid.
- Halfon, Neil. "Life Course Health Development: A New Approach for Addressing Upstream Determinants of Health and Spending. Expert Voices: National Institute for Health Care Management, February 2009. [https://www.nihcm.org/pdf/ExpertVoices\\_Halfon\\_FINAL.pdf](https://www.nihcm.org/pdf/ExpertVoices_Halfon_FINAL.pdf)
- Preterm Labor and Premature Birth: Are You at Risk? March of Dimes, accessed November 9, 2017. <https://www.marchofdimes.org/complications/preterm-labor-and-premature-birth-are-you-at-risk.aspx>
- Woolf, Steven H. and Paula Braveman. "Where Health Disparities Begin: The Role of Social and Economic Determinants—And Why Current Policies May Make Matters Worse." *Health Affairs* 30, no. 10 (2011): 1852-1859.
- Braveman, Paula et al. *What Is Health Equity? And What Difference Does a Definition Make?* Princeton, NJ: Robert Wood Johnson Foundation, 2017. <https://www.rwjf.org/en/library/research/2017/05/what-is-health-equity-.html>
- Lu, Michael C. and Neal Halfon. "Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective." *Maternal and Child Health Journal* 7, no. 1 (2003): 13-30. doi: 10.1023/A:1022537516969
- Franke, Hillary A. "Toxic stress: Effects, Prevention and Treatment." *Children* 1, no. 3 (2014): 390-402. doi: 10.3390/children1030390
- Ibid. See also, Shern, David L., Andrea K. Blanch and Sarah M. Steverman. *The Impact of Toxic Stress on Individuals and Communities: A Review of the Literature*. Mental Health America, 2014.
- Shern, David L., Andrea K. Blanch and Sarah M. Steverman. *The Impact of Toxic Stress on Individuals and Communities: A Review of the Literature*. Mental Health America, 2014.
- Gilliam, Walter S. "Testimony before U.S. House Committee on Appropriations Subcommittee on Labor, Health & Human Services." Education and Related Services Budget Hearing – Early Education Panel. April 14, 2015. <http://docs.house.gov/meetings/AP/AP07/20150414/103296/HHRG-114-AP07-Wstate-GilliamW-20150414.pdf>
- Research literature reviewed and summarized in Lu, Michael C. and Neal Halfon. "Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective." *Maternal and Child Health Journal* 7, no. 1 (2003): 13-30. doi: 10.1023/A:1022537516969
- See also Kramer, Michael R. and Carol R. Hogue. "What Causes Racial Disparities in Very Preterm Birth? A Biosocial Perspective." *Epidemiologic Reviews* 31, no. 1 (2009): 84-98. doi: 10.1093/ajerev/mxp003
- Trauma and Violence, The Substance Abuse and Mental Health Services Administration, accessed November 9, 2017. <https://www.samhsa.gov/trauma-violence>
- Types of Trauma and Violence, The Substance Abuse and Mental Health Services Administration, accessed November 9, 2017. <https://www.samhsa.gov/trauma-violence/types>
- For a definition of implicit bias and a review of research on this topic, see Staats, Cheryl, Kelly Capatosto, Lena Tenney, Sarah Mamo. "State of the science: Implicit bias review 2017." *Kirwan Institute for the Study of Race and Ethnicity*. Columbus, OH (2017).
- Hill, Amber, Christina Pallitto, Jennifer McCleary-Sills and Claudia Garcia-Moreno. "A Systematic Review and Meta-Analysis of Intimate Partner Violence during Pregnancy and Selected Birth Outcomes." *International Journal of Gynecology and Obstetrics* 133, no. 3 (2016): 269-76. doi: 10.1016/j.ijgo.2015.10.023
- Ohio University analysis of 2010 Pregnancy Risk Assessment Monitoring System (PRAMS) data.
- Okah, Felix A., Adebayo Oshodi, Yifei Liu and Jinwen Cai. "Community Violence and Pregnancy Health Behaviors and Outcomes." *Southern Medical Journal*, 107, no. 8 (2010): 513-17. doi: 10.14423/SMJ.0000000000000143
- Reducing Infant Mortality in Ohio: Individuals, Communities, Systems and Interventions. Infant Mortality Research Partnership: Ohio Colleges of Medicine Government Resource Center, 2017.
- Collins, JW Jr., et al. "Very low birthweight in African American infants: The role of maternal exposure to interpersonal racial discrimination." *American Journal of Public Health*, 2004 Dec;94(12):2132-8.
- Ahern, Joseph. *Low Birth Weight and Prematurity in Ohio: A Multivariate Analysis*. The Center for Community Solutions, July 2017.
- Mendez, Dara D., Vijaya K. Hogan, and Jennifer F. Culhane. "Institutional racism, neighborhood factors, stress, and preterm birth." *Ethnicity & Health* 19, no. 5 (2014): 479-499.
- Risk and Protective Factors, The Substance Abuse and Mental Health Services Administration, accessed November 9, 2017. <https://www.samhsa.gov/capt/practicing-effective-prevention/prevention-behavioral-health/risk-protective-factors>
- Kim, Daniel and Adrianna Saada. "The Social Determinants of Infant Mortality and Birth Outcomes in Western Developed Nations: A Cross-Country Systematic Review." *Environmental Research and Public Health* 10, no. 6 (2013):2296-2335. doi:10.3390/ijerph10062296
- Reno, Rebecca and Ayaz Hyder. "The Evidence Base for Social Determinants of Health as Risk Factors for Infant Mortality: A Systematic Scoping Review." Unpublished manuscript (under review) provided by The Ohio State University College of Public Health, 2017.
- Studies conducted in the U.S. with credible positive findings for outcomes relevant to housing, transportation, education, employment, poverty, racism and toxic and persistent stress.
- Reno, Rebecca and Ayaz Hyder. "The Evidence Base for Social Determinants of Health as Risk Factors for Infant Mortality: A Systematic Scoping Review." Unpublished manuscript (under review) provided by The Ohio State University College of Public Health, 2017.
- Blumenshine, Phillip, et al. "Socioeconomic Disparities in Adverse Birth Outcomes: A Systematic Review." *American Journal of Preventive Medicine* 39, no. 3 (2011): 263-72. doi: 10.1016/j.amepre.2010.05.012
- Preterm Labor and Premature Birth: Are You at Risk? March of Dimes, accessed November 9, 2017. <https://www.marchofdimes.org/complications/preterm-labor-and-premature-birth-are-you-at-risk.aspx>
- Alexander, Greg R., Martha S. Wingate, Deren Bader and Michael D. Kogan. "The Increasing Racial Disparity in Infant Mortality Rates: Composition and Contributors to Recent U.S. Trends." *American Journal of Obstetrics and Gynecology* 198, no. 1 (2008): 51e1-e9. doi: 10.1016/j.ajog.2007.06.006
- Li, Qing and Louis G. Keith. "The Differential Association Between Education and Infant Mortality by Nativity Status of Chinese American Mothers: A Life-Course Perspective." *American Journal of Public Health* 101, no. 5 (2011) 899-908. doi: 10.2105/AJPH.2009.186916; See also Lu, Michael C. and Neal Halfon. "Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective." *Maternal and Child Health Journal* 7, no. 1 (2003): 13-30. doi: 10.1023/A:1022537516969
- Lu, Michael C. and Neal Halfon. "Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective." *Maternal and Child Health Journal* 7, no. 1 (2003): 13-30. doi: 10.1023/A:1022537516969; See also Halfon, Neal and Miles Hochstein. "Life Course Health Development: An Integrated Framework for Developing Health, Policy and Research." *Milbank Quarterly* 80, no. 3 (2002): 433-79. doi: 10.1111/1468-0009.00019
- For a description of levels of racism, see: Jones, Camara Phyllis. "Levels of racism: A theoretical framework and a gardener's tale." *American Journal of Public Health*. 2000;90:1212-1215.
- Alexander, Greg R., Martha S. Wingate, Deren Bader and Michael D. Kogan. "The Increasing Racial Disparity in Infant Mortality Rates: Composition and Contributors to Recent U.S. Trends." *American Journal of Obstetrics and Gynecology* 198, no. 1 (2008): 51e1-e9. doi: 10.1016/j.ajog.2007.06.006; See also Kramer, Michael R. and Carol R. Hogue. "What Causes Racial Disparities in Very Preterm Birth? A Biosocial Perspective." *Epidemiologic Reviews* 31, no. 1 (2009): 84-98. doi: 10.1093/ajerev/mxp003; See also Mutambudzı, Miriam, John D. Meyer, Susan Reisine and Nicholas Warren. "A Review of Recent Literature on Materialist and Psychosocial Models for Racial and Ethnic Disparities in Birth Outcomes in the U.S., 2000–2014." *Ethnicity & Health* 22, no. 3 (2017): 311-332. doi: 10.1080/13557858.2016.1247150
- Dominguez, Tyan Parker. "Adverse Birth Outcomes in African American Women: The Social Context of Persistent Reproductive Disadvantage." *Social Work in Public Health* 26, no. 1 (2011): 3-16. doi: 10.1080/10911350902986880
- Mendez, Dara D., Vijaya K. Hogan and Jennifer F. Culhane. "Institutional Racism, Neighborhood Factors, Stress and Preterm Birth." *Ethnicity & Health* 19, no. 5 (2014): 479-99. doi: 10.1080/13557858.2013.846300
- Farmer, Melissa M. and Kenneth F. Ferraro. "Are Racial Disparities in Health Conditional on Socioeconomic Status?" *Social Science & Medicine* 60, no. 1 (2005): 191-204. doi: 10.1016/j.socscimed.2004.04.026; See also Mutambudzı, Miriam, John D. Meyer, Susan Reisine and Nicholas Warren. "A Review of Recent Literature on Materialist and Psychosocial Models for Racial and Ethnic Disparities in Birth Outcomes in the U.S., 2000–2014." *Ethnicity & Health* 22, no. 3 (2017): 311-332. doi: 10.1080/13557858.2016.1247150
- Mutambudzı, Miriam, John D. Meyer, Susan Reisine and Nicholas Warren. "A Review of Recent Literature on Materialist and Psychosocial Models for Racial and Ethnic Disparities in Birth Outcomes in the U.S., 2000–2014." *Ethnicity & Health* 22, no. 3 (2017): 311-332. doi: 10.1080/13557858.2016.1247150
- Dominguez, Tyan Parker. "Adverse Birth Outcomes in African American Women: The Social Context of Persistent Reproductive Disadvantage." *Social Work in Public Health* 26, no. 1 (2011): 3-16. doi: 10.1080/10911350902986880
- Krieger, Nancy. *Health Disparities and the Body Politic*. Boston: Harvard School of Public Health (2005): 5-9.

### Housing overview

This section begins with a brief summary of the ways that housing affects health overall and then describes more specific ways that housing challenges contribute to infant mortality and related risk factors based upon a review of the research literature. This section also describes:

- Scope of housing problems in Ohio
- Housing policy landscape in Ohio (types of services, major policy levers, funding sources and planning and implementation entities)
- Housing policy goals and recommendations

Equity is addressed throughout this section by:

- Describing differences by race, ethnicity, sex, income level or other factors when data is available
- Discussing structural drivers of inequities

### How housing affects infant mortality: Literature review

Housing affects *overall health and wellbeing* in several ways:<sup>1</sup>

- **Affordability:** High housing costs make it more difficult for families with low incomes to pay for other necessities such as food, medical care and prescription drugs that can have a direct and negative impact on health. Predatory landlords, eviction, involuntary moves and difficulty paying for housing can lead to toxic and persistent stress that contributes to poor mental and physical health.
- **Residential segregation:** Deteriorating conditions in segregated communities expose residents to poor housing conditions, high poverty and crime. Segregation also isolates some minority communities from mainstream resources, including quality healthcare services and educational and employment opportunities.
- **Stability:** Housing instability is associated with poor health and disrupted access to health care and other social services. Families with low incomes may experience housing instability in the form of difficulty staying current on rent, forced and frequent moves and, in the most severe cases, homelessness.
- **Neighborhood conditions:** Neighborhoods with inadequate access to healthy foods, safe places to exercise, a sufficient number of good

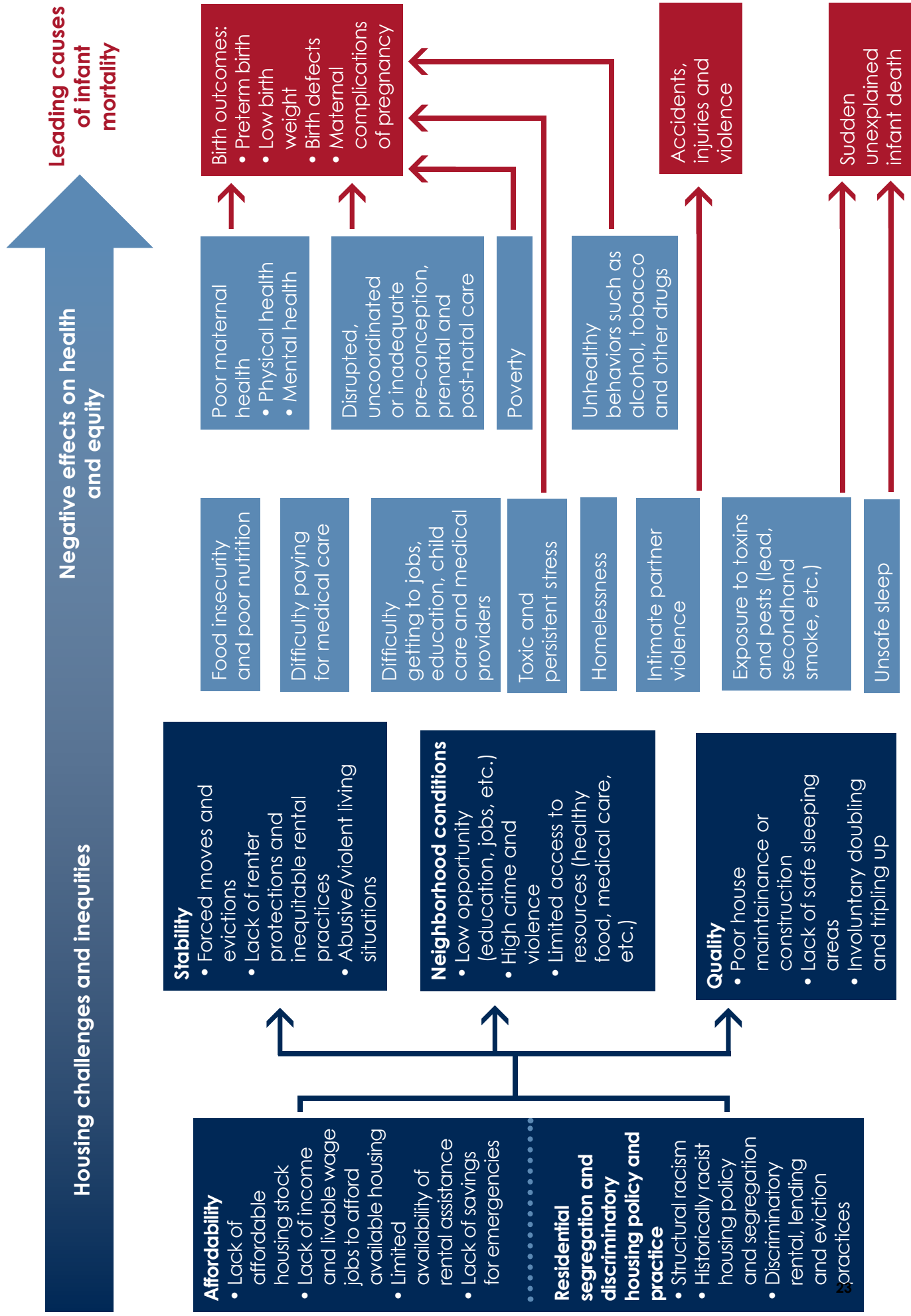
jobs and strong social capital contribute to poor mental and physical health through poor nutrition, lack of physical activity and increased stress. Poor neighborhood conditions may expose residents to violence and other sources of toxic and persistent stress which can be damaging to mental and physical health.

- **Quality:** Housing that is unsafe, infested with rodents or other pests, not well maintained and/or overcrowded contributes to physical and mental health problems from accidents or injuries, exposure to harmful contaminants (such as lead, mold and secondhand smoke) and toxic and persistent stress.

Housing that is high-quality, affordable and located in safe, resource-rich neighborhoods supports good health. A lack of affordable housing stock in most communities, historical policies of segregation and discriminatory housing practices make it difficult for people in groups at the greatest risk of poor birth outcomes to find housing that meets this description. In order to “get by” some have to live in housing that has negative effects on health and can increase the likelihood of poor birth outcomes and infant mortality.

Figure 4.1 applies the relationships between housing and health to the main causes of infant mortality as outlined in the research literature.

Figure 4.1. Relationship between housing and infant mortality







## Housing affordability

Households are considered to be affordably housed when they spend 30 percent or less of total household income on housing costs, including rent or mortgage, regular maintenance, repairs and utilities. Households that spend more than one-half of their income on housing costs are considered severely cost-burdened. Spending too much on housing contributes to infant mortality through two primary pathways:

- Cost-burdened households have difficulty paying for other necessities such as food, transportation, medical care and prescription drugs which can lead to conditions that are associated with poor birth outcomes, including poor nutrition<sup>2</sup> and disrupted access to prenatal care.<sup>3</sup>
- Inability to pay for housing and other necessities is a source of stress and anxiety for cost-burdened households.<sup>4</sup> Research shows that pregnant women who experience anxiety are more likely to have a preterm birth, particularly when the anxiety is related to external factors such as finances or the pregnancy itself.<sup>5</sup>

## Residential segregation

A significant body of research identifies and untangles the complex relationship between segregation and birth outcomes.<sup>6</sup> Research shows that isolation resulting from residential segregation<sup>7</sup> and racial discrimination<sup>8</sup> increases risk for poor birth outcomes and infant mortality. Residents of segregated communities are often isolated from mainstream resources such as good jobs, high-quality education and capital investment.<sup>9</sup> This happens as businesses, lenders and other entities that are crucial to supporting growing and thriving communities divest from segregated communities. The isolation from opportunity and concentration into extremely under-resourced neighborhoods disproportionately impacts African-American and low-income communities, a result of a legacy of policies and programs that support segregation and institutional racism.

In Ohio, people living in neighborhoods with a high concentration of non-Hispanic black residents are more likely to experience infant mortality than people living in neighborhoods with a lower concentration of non-Hispanic black people.<sup>10</sup> A recent study from the Joint Center for Political and Economic Studies found that if racial segregation were eliminated, the black infant mortality rate would decrease by two

per 1,000 live births and the Hispanic rate would be lower than the white rate.<sup>11</sup> This evidence and similar research on the multi-dimensional impacts of residential segregation<sup>12</sup> suggests that segregation is an important risk factor for infant mortality, but that solutions for this problem are complex.

## Housing stability

Housing instability is a term used to describe households that are severely cost burdened, often have trouble paying rent, move frequently and/or live in overcrowded conditions, sometimes with friends or relatives.<sup>13</sup> Research has established connections between housing instability and negative physical and mental health outcomes, including frequent mental distress<sup>14</sup>, depression<sup>15</sup>, fair or poor overall health and delayed medical care.<sup>16</sup> Based on these associations, pregnant women who experience housing instability may be at increased risk for infant mortality due to poor physical and mental health and delayed or disrupted prenatal care.

Research has also established associations between aspects of housing instability like frequent moves or living in crowded and/or “doubled up” and other potentially harmful conditions that can negatively impact birth outcomes, including food insecurity and living with abusive partners. Research from Boston, Massachusetts found that households that moved two or more times during the previous year were more than twice as likely to be food insecure compared to households that had not moved.<sup>17</sup> Studies about the effectiveness of rental assistance programs — which address housing instability by helping to pay rent — found that rental subsidies decreased the incidence of intimate partner violence and enabled people to live separate from abusive partners.<sup>18</sup>

Homelessness is the most extreme form of housing instability and is associated with several infant mortality risk factors, including low birth weight<sup>19</sup> and preterm birth.<sup>20</sup> An analysis of data from the Pregnancy Risk Assessment Monitoring System (PRAMS) found that 4 percent of U.S. women were homeless in the year before they became pregnant.<sup>21</sup> The study also found that infants born to women that experienced perinatal homelessness were more likely to have low birth weight and require additional services in the hospital.<sup>22</sup>



## Neighborhood conditions

In general, residents of neighborhoods with low socioeconomic status experience poorer health outcomes.<sup>23</sup> Several studies examine the connections between neighborhood conditions and infant mortality.<sup>24</sup> For example, one study found that women from areas with a high neighborhood deprivation index (social and environmental factors including income and housing) experienced higher rates of infant mortality.<sup>25</sup>

Neighborhood conditions and housing quality are closely linked. Rental housing that is safe, well-maintained and in close proximity to resources and opportunities for advancement demands higher market rents. Housing stock in neighborhoods marked by high poverty rates, high crime, poor health outcomes and low-performing schools<sup>26</sup> is often poorly-maintained, deteriorating or near vacant homes and abandoned buildings<sup>27</sup> and demands lower rents. Over time, low property values and low rents cause investments in communities to decrease, which accelerates declines in housing cost and quality.<sup>28</sup>

Neighborhood blight — a result of decreased investment in neighborhoods — is associated with poor health outcomes. A report from the Urban Institute connects conditions of neighborhood blight, including substandard housing, rodent and pest infestations, lead exposure and concentrations of vacant and abandoned buildings with negative health outcomes.<sup>29</sup>

## Housing quality

Housing quality problems, such as property damage and structural deterioration, are associated with negative birth outcomes and may lead to poor mental health.<sup>30</sup> Other environmental factors, such as overcrowding, lack of safe sleeping surfaces, difficulty regulating temperatures in sleeping rooms and the presence of pests or rodents in the home, are risk factors found in some cases of sleep-related infant deaths.<sup>31</sup>

The physical environment of a family's home, including exposure to structural problems (such as problems with foundations, steps and exterior surfaces<sup>32</sup>) and toxins (such as lead<sup>33</sup> and secondhand smoke<sup>34</sup>) are associated with poor

birth outcomes. Exposure to secondhand smoke is also associated with an increased risk for Sudden Infant Death Syndrome (SIDS).<sup>35</sup> According to data from 2011, Ohio children from households with incomes below 100 percent of the Federal Poverty Level (FPL) are almost 25 times more likely to be exposed to secondhand smoke than children in households with incomes above 400 percent FPL.<sup>36</sup> Regulations are in place in Ohio to protect people from exposure to secondhand smoke in workplaces, but children and pregnant women in non-smoking households may be exposed to secondhand smoke in multifamily housing units.<sup>37</sup>



### Scope of housing problems in Ohio

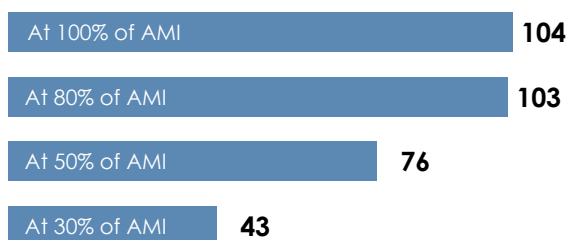
This section describes the current status of housing-related challenges in Ohio that are particularly relevant to infant mortality—access to affordable housing and rental assistance, housing instability and homelessness, neighborhood conditions and housing quality. This section ends with a description of three underlying structural drivers of inequities that contribute to housing-related challenges.

It is important to note that housing needs vary greatly by housing market. For example, some growing metropolitan areas are experiencing rising housing costs and gentrification, while other housing markets are declining as a result of divestment and population decline in rural areas. Interventions should be tailored to address affordable housing challenges in each housing market. This report focuses on housing challenges at the state level that are relevant to the priority population, which includes people living in infant mortality hot spot areas.

### Access to affordable housing and rental assistance

Lack of affordable housing for people with low incomes is a problem throughout most of the U.S., particularly for people with Extremely and Very Low Incomes (see Area Median Income text box for definitions).<sup>38</sup> The National Low Income Housing Coalition (NLIHC) estimates that, in 2015, there were only 43 affordable and available rental units in Ohio for every 100 Extremely Low Income renter households (see figure 4.2). For these households, finding and securing safe,

Figure 4.2. **Affordable and available units per 100 renter households in Ohio by income level (2015)**



**Note:** AMI=Area median income  
**Source:** National Low Income Housing Coalition, 2017 *State Housing Profile*

### Data on households facing severe housing cost burden

A NLIHC analysis of 2015 data from the U.S. Census found that 68 percent of renters with Extremely Low Incomes are severely cost burdened — spend more than 50 percent of income on housing costs — in Ohio compared to 18 percent of renters with Very Low Incomes.<sup>39</sup> Data on rates of severe cost burden for renters is not readily accessible from the U.S. Census Bureau for most local areas. However, national organizations have created tools for state and local stakeholders to understand the scope of housing affordability problems in communities, including the [Joint Center for Housing Studies of Harvard University](#)<sup>40</sup> and [NLIHC](#).<sup>41</sup>

stable and affordable housing is extremely difficult without financial assistance. According to Housing Subcommittee members, this is because it is very difficult to build, maintain and financially sustain safe, quality rental housing that is affordable for households with Extremely Low Incomes due to resource constraints for capital development, operating support and rental assistance.

Figure 4.3 shows the percent of renters in selected counties that spend more than 30 percent of their household income on rent only.

Figure 4.3. **Percent of renters spending more than 30 percent of household income on rent only, Ohio Equity Institute counties (2016)**

County	Percent
Stark County	39.4
Butler County	40.7
Mahoning County	41.2
Franklin County	42.4
Hamilton County	42.5
Summit County	43.6
Cuyahoga County	45.7
Lucas County	46.3
Montgomery County	46.8

**Source:** U.S. Census Bureau



## Area Median Income (AMI)

Incomes and fair market rents vary by geography. To help account for geographic differences, housing programs use AMI to measure household income. AMI is determined annually for each metropolitan statistical area using data collected by the U.S. Census Bureau, American Community Survey. U.S. Department of Housing and Urban Development (HUD)

income eligibility standards for housing subsidies are set as a percentage of AMI. For targeting HUD subsidies and measuring available housing stock, the population is stratified into three groups: Extremely Low Income (0-30 percent AMI), Very Low Income (31-50 percent AMI) and Low Income (51-80 percent AMI).

County	AMI	Extremely Low Income limit*	Very Low Income limit**	Low Income limit**
Butler	\$74,700	\$24,600	\$37,350	\$59,750
Cuyahoga	\$67,900	\$24,600	\$33,950	\$54,300
Franklin	\$74,500	\$24,600	\$37,200	\$59,500
Hamilton	\$74,700	\$24,600	\$37,350	\$59,750
Lucas	\$61,500	\$24,600	\$30,750	\$49,200
Mahoning	\$54,600	\$24,600	\$28,800	\$46,100
Montgomery	\$63,600	\$24,600	\$31,800	\$50,900
Stark	\$60,800	\$24,600	\$30,400	\$48,650
Summit	\$65,700	\$24,600	\$32,850	\$52,550

\*The Extremely Low Income limit is set at 60 percent of the Very Low Income limit or the federal poverty level, whichever is greater.

\*\*Very Low Income and Low Income limits are adjusted in low-cost and high-cost areas.

Source: U.S. Department of Housing and Urban Development, FY 2017 Income Limits Documentation System

In addition to a shortage of affordable rental housing units, Ohio households with low incomes also face a shortage of rental assistance programs. The federal government provides funding for the majority of rental assistance programs available to Ohioans. Between 2004 and 2014, the number of families with children that received federal rental assistance across the U.S. decreased by 13 percent to 1.7 million households.<sup>42</sup> Households that do not receive rental assistance are at the highest risk of experiencing housing-related challenges such as difficulty paying for other necessities, eviction or feeling forced to live in a dangerous environment (see figure 4.4).<sup>43</sup>

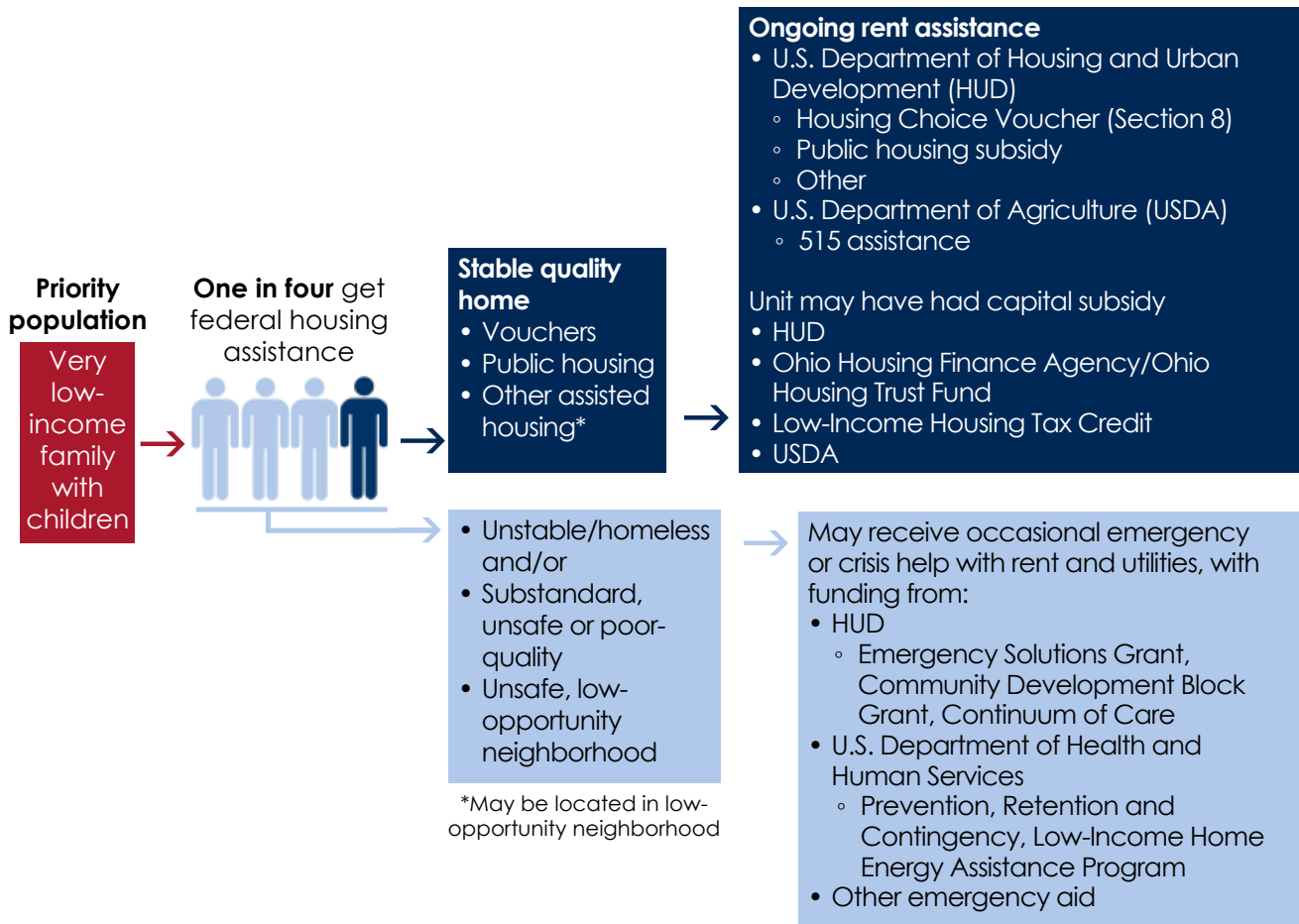
Accessing federal rental assistance involves applying through a local public housing authority (PHA). Because the demand for rental assistance is greater than the supply of federal subsidies, PHAs typically maintain waitlists that can be very long and, in some cases, are closed for periods of time. Figure 4.5 shows the average number of months households that received assistance waited before receiving a Housing Choice Voucher in selected communities.

## Housing instability

Policymakers and housing practitioners have been working to develop a uniform measure for housing instability in recent years.<sup>44</sup> The lack of a definition and measure, and the transient nature of the problem, make it difficult to accurately estimate the number of people experiencing housing instability. A recent report from HUD included data about housing instability for a subset of renters in the U.S. (see figure 4.6).<sup>45</sup>

PRAMS collects state-level, population-based data on maternal attitudes and experiences before, during, and shortly after pregnancy, including data related to housing stability. In 2010, the PRAMS survey asked respondents if they moved to a new address in the 12 months before their baby was born. A single move is not necessarily indicative of housing instability, but this data is consistent with other research regarding the prevalence of housing instability among black and low-income populations.<sup>46</sup> In 2010, 18 percent of Ohioans with incomes above \$50,000 per year moved before having a baby, compared to almost half of people with incomes below \$10,000 (see figure 4.7). During the same year, 44 percent of black Ohioans moved before having a baby, compared to 31 percent of white Ohioans.

Figure 4.4. Affordable housing options for households with low incomes



### Homelessness

Homelessness is more clearly defined and measured than housing instability at the federal, state and local levels. HUD releases the Annual Homeless Assessment Report (AHAR) which uses multiple data sources to estimate the number of people who are homeless nationally and in each state. The 2016 point-in-time homeless count identified over 10,000 Ohioans who were homeless on a single night in January (see figure 4.8).

Comprehensive local-level data on the number of people who are pregnant while experiencing homelessness is not available because pregnancy status is not included in the 2017 HUD Homeless Management Information System Data Standards for HUD-funded projects.<sup>47</sup> In Cuyahoga County, the Continuum of Care (CoC) has elected to determine pregnancy status for households based on the age of children when they enter the emergency shelter system.<sup>48</sup> In state fiscal year (SFY) 2017, 9 percent of children entering the shelter system in Cuyahoga County were infants, suggesting that the household may have been experiencing housing instability or homelessness during pregnancy.<sup>49</sup>

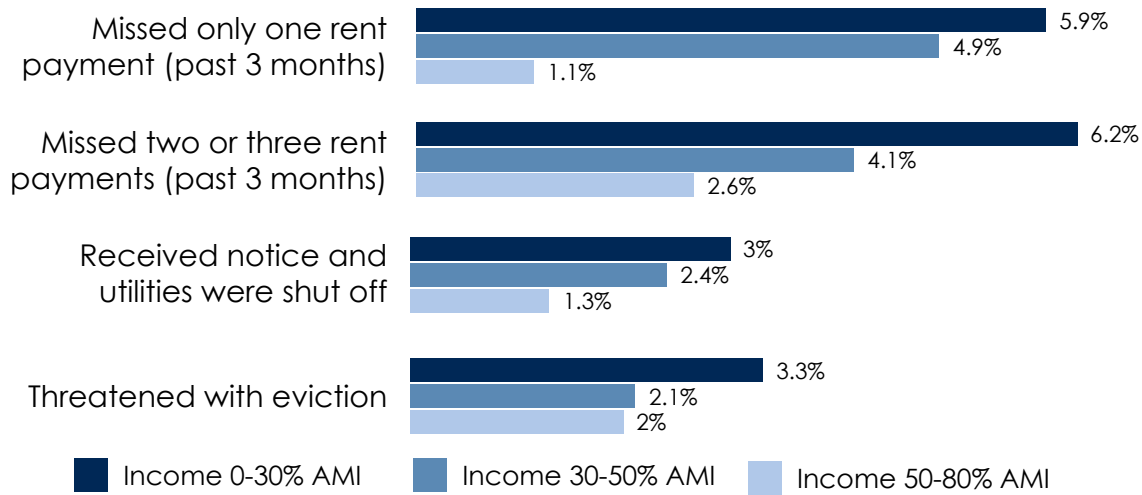
Figure 4.5. Average months on public housing authority waiting list before receiving a Housing Choice Voucher, Ohio Equity Institute counties (2016)

Metropolitan housing authority	Avg. months waiting for Housing Choice Voucher (rental assistance)
Columbus Metropolitan Housing Authority	17
Stark Metropolitan Housing Authority	17
Dayton Metropolitan Housing Authority	20
Cuyahoga Metropolitan Housing Authority	25
Cincinnati Metropolitan Housing Authority	27
Youngstown Metropolitan Housing Authority	28
Lucas Metropolitan Housing Authority	33
Akron Metropolitan Housing Authority	35
Butler Metropolitan Housing Authority	53

Source: U.S. Department of Housing and Urban Development, Picture of Subsidized Households: 2016.



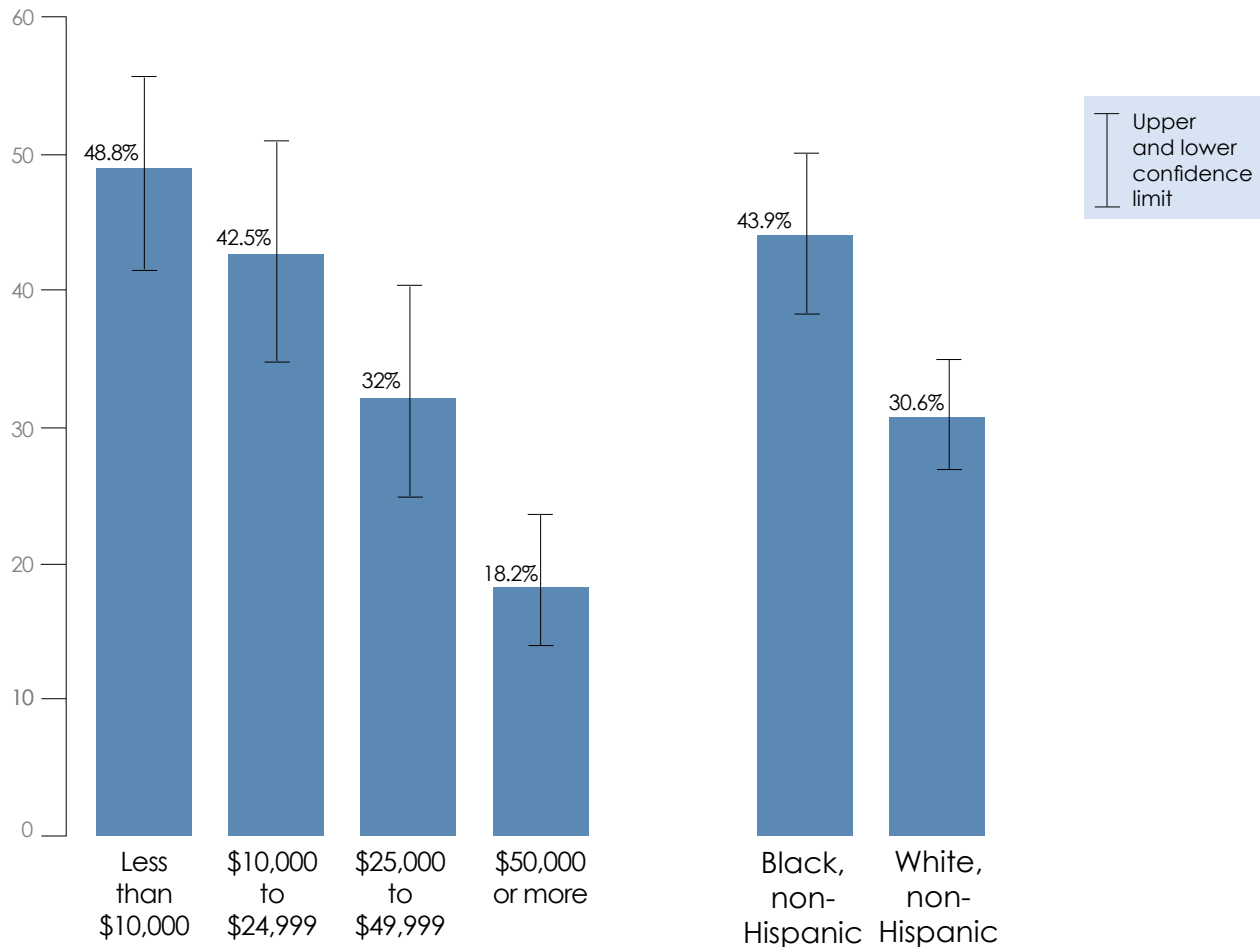
**Figure 4.6. Percent of unassisted renter households with severe housing problems, U.S. (2013)**



**Note:** AMI=Area median income

**Source:** U.S. Department of Housing and Urban Development, 2013 American Housing Survey data as published in the 2015 Annual Homeless Assessment Report

**Figure 4.7. Percent of women who moved to a new address in the 12 months before their baby was born, by income and race and ethnicity, Ohio (2010)**



**Source:** Ohio University analysis of 2010 Pregnancy Risk Assessment Monitoring System (PRAMS) data

Figure 4.8. **Point-in-time homeless counts by Ohio Continuums of Care (CoCs) (2016)**

Continuum of Care (CoC) Name	Total number of homeless people
Youngstown/Mahoning County CoC	346
Canton/Massillon/Alliance/Stark County CoC	460
Toledo/Lucas County CoC	599
Akron/Barberton/Summit County CoC	679
Dayton/Kettering/Montgomery County CoC	751
Cincinnati/Hamilton County CoC	1,116
Cleveland/Cuyahoga County CoC	1,697
Columbus/Franklin County CoC	1,724
Ohio Balance of State CoC* (includes all areas in Ohio not listed above)	3,032

\*All communities that are not represented by a local Continuum of Care are included in the Balance of State point-in-time estimates

**Source:** U.S. Department of Housing and Urban Development, Annual Homeless Assessment Report, 2016

### Advisory Group insights: Experiences of women who are homeless

Housing Subcommittee and Advisory Group members emphasized the importance of addressing homelessness in order to improve outcomes related to infant mortality. They explained that homelessness is prevalent among women at high risk of infant mortality and that women who are homeless face unique barriers to having a healthy pregnancy. For example, the director of Moms2B – a program that provides support for high-risk mothers during pregnancy and the first year of a baby’s life – estimates that approximately 25 percent of the women enrolled in the program are housing insecure and that many live in homeless shelters while taking part in the program.<sup>50</sup> Examples of unique barriers faced by women who are homeless that the Advisory Group mentioned include:

- Stress associated with living in group settings, not having control over many aspects of life and pressure related to time limits on shelter stays
- Restrictions on bringing food and drinks into shelters
- Limitations on storing food, drinks and medications that require refrigeration
- Limitations on accessing and storing equipment to care for infants (i.e., diapers, pack and play, medications and breastfeeding equipment)
- Limited access to safe and private locations for breastfeeding
- Requirements to leave shelters during daytime hours
  - Difficulty getting around with baby and all possessions
  - Lack of places for new mothers and infants to pass time
- Women who are pregnant and/or have young children have a harder time finding permanent housing than households without young children



### Residential segregation, neighborhood conditions and housing quality

Neighborhood conditions and housing quality are often interrelated, particularly in segregated communities with a high proportion of people of color. In general, these neighborhoods have worse neighborhood conditions and poorer housing quality than neighborhoods with higher proportions of white residents. For example, rates of lead poisoning among children in Toledo between 2010 and 2014 were significantly higher in segregated parts of the city.<sup>51</sup> Most of the housing in these areas is older, which is a risk factor for lead exposure.<sup>52</sup> In addition, a large-scale analysis of U.S. cities found that rates of violent crime are higher in cities with greater degrees of residential segregation.<sup>53</sup>

The connections between residential segregation, housing quality and neighborhood conditions are particularly important in states, like Ohio, where the degree of segregation is very high. One common measure of residential segregation is the dissimilarity index. The index measures how the racial composition of an area is similar or dissimilar to the surrounding area. A dissimilarity index greater than 60 is considered to be highly segregated. Figure 4.9 displays the black-white dissimilarity index for Ohio's largest metropolitan areas. The largest metros in the eight case study states discussed in part nine of this report are also included for reference.

### Underlying structural drivers of inequities in housing

Today's housing inequities are largely the result of policy decisions made in the 20th century.<sup>54</sup> The three issues discussed below have historical roots and can be traced back to specific policies and practices. In many cases, these policies and practices have

Figure 4.9. **Black-white dissimilarity index for selected Metropolitan Statistical Areas (2010)**

Metropolitan Statistical Area	Black-white dissimilarity index
Las Vegas-Henderson-Paradise, NV	35.9
Greenville-Anderson-Mauldin, SC	42.7
Columbia, SC	48.3
Nashville-Davidson-Murfreesboro-Franklin, TN	55.0
Denver-Aurora-Lakewood, CO	59.4
<b>Columbus, OH</b>	<b>60.0</b>
Washington-Arlington-Alexandria, D.C.	61.0
Boston-Cambridge-Newton, MA	61.5
<b>Cincinnati, OH</b>	<b>66.9</b>
<b>Cleveland-Elyria, OH</b>	<b>72.6</b>
Detroit-Warren-Dearborn, MI	74.0
New York-Newark-Jersey City, NY	76.9

**Source:** Data from the American Community Survey, as compiled by the American Communities Project

been addressed by more recent policy changes, but the inequities they created are still experienced by Ohioans at greatest risk of infant mortality, particularly African Americans.

### Low income relative to housing cost

Underlying most inequities in housing is the fundamental disconnect between the incomes of

### Advisory Group and Housing Subcommittee insights: Discrimination and inequitable rental practices

The Advisory Group identified discrimination and inequitable rental practices as underlying factors that are particularly relevant to populations at the greatest risk for infant mortality. Research from Milwaukee, Wisconsin finds that black women with low incomes are the group most likely to be evicted.<sup>55</sup>

Other discriminatory and/or inequitable rental practices that contribute to housing inequities mentioned by the Advisory Group include:

- Restrictions against renting to people with criminal convictions and/or arrest records
- Refusing to accept certain forms of payment, including rental assistance vouchers, Supplemental Security Income (SSI) and Temporary Assistance for Needy Families (TANF)
- Requiring long-term leases for renters in high-poverty neighborhoods
- "Rent-to-own" arrangements
- Informal lease agreements

(Some of these practices may be illegal under current law)





residents and the cost of housing. This problem is particularly important to consider when addressing infant mortality because families at the greatest risk for infant mortality are often also members of groups that are more likely to have low incomes.

Changes in rental markets contribute to structural inequities in access to affordable housing. Across the country, the price of renting has gone up since the early 2000s.<sup>56</sup> During the same period, income growth for the lowest income renter households has lagged behind increases in housing costs. The consequence is a rapidly growing number of families confronted with paying a higher share of their incomes for housing. As the housing cost burden facing renter households grows, government-funded rental assistance is not expanding to meet the need. Today, only one in four potentially eligible households receives federal rental assistance (see figure 4.4).<sup>57</sup>

### **Residential segregation**

Policies and practices that lead to segregated communities contribute to structural inequities in

housing. One such policy frequently associated with residential segregation in the U.S. is redlining — the practice by which banks limited access to mortgages and other capital investment in areas with high percentages of black households. Other practices and policies, such as those related to education funding, transportation planning and zoning or land use decisions contribute to residential segregation and inequities.<sup>58</sup> Communities with good schools, growing economies and quality access to transportation support vibrant economies that provide opportunities to all residents.

### **Discriminatory and inequitable rental practices**

Discriminatory and inequitable rental practices also contribute to inequities in housing conditions. Evictions contribute to housing inequities by restricting future housing options which can force households into substandard housing in high-poverty neighborhoods.<sup>59</sup> Displacement related to a forced move can also lead to job loss, poor credit and homelessness.<sup>60</sup>

### **Ohio story**

#### **Have you experienced housing discrimination?**

*In August 2008, Celeste Barker found a townhouse advertised in a local Ohio newspaper. When she stopped by the rental office, the property manager told her the office was closed and the townhouse was no longer available, according to HUD. Barker, who is black, suspected discrimination and filed a complaint with a fair housing group. The group had a white tester call to inquire about the rental. The property manager made an appointment to show the tester the apartment the next day. When a black tester called, he once again claimed he had nothing to rent.*



— ProPublica, Oct. 28, 2012 (excerpt)



## Housing policy landscape in Ohio

This section focuses on current programs and policies in Ohio that impact renters with Extremely and Very Low Incomes and people who experience homelessness. These are the groups most at-risk for infant mortality.

The largest rental assistance programs — Housing Choice Vouchers (Section 8) and public housing — are federally-funded by the U.S. Department of Housing and Urban Development (HUD) and locally administered by public housing authorities (PHAs). State government agencies prepare and submit plans to federal agencies that outline how federal funding for affordable housing and homeless services will be used. The Ohio Development Services Agency (ODSA) and the Ohio Housing Finance Agency (OHFA) are the state agencies with primary responsibility for affordable housing, rental assistance and services for people who experience homelessness.

### Existing programs and services most relevant to infant mortality

Women who are most at-risk for infant mortality are likely to be renters with Extremely or Very Low Incomes. Figure 4.10 provides examples of rental assistance programs and services for people with low incomes who may be experiencing housing instability or homelessness.

Based on the findings of the literature review above, and feedback from the Advisory Group, policies and programs related to the following categories are most relevant to infant mortality high-risk populations:

- Rental assistance
- Services for people who experience homelessness
- Affordable housing preservation and development

### Rental assistance and services for people who experience homelessness

These two categories are grouped together in this report because, in Ohio, most federal funding for rental assistance and services for people who experience homelessness comes from HUD directly to local administering agencies or is passed through ODSA.

Rental assistance programs mitigate many of the potentially harmful effects of unaffordable,

substandard and/or unstable housing. Rental subsidies are typically tied to income, meaning that a household pays a portion of total income toward rent and utilities. When household income fluctuates, the rent payment can usually be adjusted. To ensure that rental subsidy recipients live in quality housing, regulations set standards for the health and safety of subsidized units, and PHAs enforce these regulations through inspections.

Services for people who experience homelessness encompass a continuum of services that ranges from emergency shelter and transitional housing to rapid rehousing programs and permanent supportive housing for formerly homeless individuals.

### Funding

Federal funding for rental assistance and services for people who experience homelessness comes mostly from HUD. Funds for the largest federal rental assistance programs — Housing Choice Vouchers (Section 8) and public housing<sup>61</sup> — are appropriated by Congress and allocated directly to public housing authorities.<sup>62</sup> Other HUD funds that can be used to provide rental assistance and/or services for people who are homeless come from these programs:

- Community Development Block Grants
- HOME Investment Partnerships
- Emergency Solutions Grants
- Housing Opportunities for Persons with AIDS
- Continuums of Care
- National Housing Trust Fund

Funding from these federal programs is distributed through programs developed by the Office of Community Development at ODSA and OHFA.<sup>63</sup>

State funding for rental assistance and services for people who experience homelessness comes from the OHTF<sup>64</sup>, which was established more than 25 years ago to “provide housing and housing assistance for specifically targeted low- and moderate-income families and individuals.”<sup>65</sup>

Fees from county recorders fund the OHTF. Funds are distributed based on guidelines in the Ohio Revised Code and recommendations from an advisory committee comprised of members appointed by the Governor. In 2016, the OHTF allocated \$42 million to numerous programs and providers.<sup>66</sup>

Figure 4.10. **Selected examples of rental and homeless assistance programs for people with low incomes and people experiencing homelessness in Ohio\***

Type of service or program	Program description	Eligibility and priority populations
<b>Voucher rental assistance</b>	<ul style="list-style-type: none"> <li>Provides rental assistance voucher to eligible households</li> <li>Rent typically based on income</li> <li>Voucher may be used for any unit that meets agency (usually HUD) standards with agreement from the landlord</li> <li>Administered by local public housing authorities (PHAs) or other designated agency</li> </ul>	<ul style="list-style-type: none"> <li>Usually income below 50% AMI, additional consideration below 30% AMI</li> <li>Agencies may establish preferences for specific populations</li> </ul>
<b>Public housing</b>	<ul style="list-style-type: none"> <li>Provides subsidized rent to people living in PHA-owned and operated units</li> <li>Rent typically based on income, but may require a minimum rent contribution</li> <li>Administered by local PHAs</li> </ul>	<ul style="list-style-type: none"> <li>Income below 80% AMI, additional consideration below 50% AMI</li> <li>PHAs may establish preferences for specific populations</li> </ul>
<b>Rental assistance and support services</b>	Provides subsidized rental assistance and supportive services to eligible tenants	<ul style="list-style-type: none"> <li>Low income</li> <li>Projects typically serve a target population(s) such as families, people with disabilities or mental illness and seniors</li> </ul>
<b>Transitional housing</b>	<ul style="list-style-type: none"> <li>Provides funding to rapidly transition people from homelessness to housing</li> <li>Administered by local agencies</li> </ul>	<ul style="list-style-type: none"> <li>Homeless and low income</li> <li>Some programs require proof of ability to maintain housing after assistance ends</li> </ul>
<b>Rapid Rehousing</b>	<ul style="list-style-type: none"> <li>Provides assistance through housing identification, limited financial assistance for rent and case management</li> <li>Administered by County Department of Job and Family Services (CDJFS) agencies</li> </ul>	<ul style="list-style-type: none"> <li>Eligibility may vary, but typically low income with dependent children</li> <li>Must demonstrate capacity to maintain stability after receiving assistance, typically through employment</li> </ul>
<b>Prevention, Retention and Contingency (PRC)</b>	<ul style="list-style-type: none"> <li>Provides one-time assistance to households to prevent eviction, job loss or to provide other temporary support that may prevent reliance on public assistance</li> <li>Administered by CDJFS agencies</li> </ul>	<ul style="list-style-type: none"> <li>Eligibility may vary, but typically low income with dependent children</li> <li>Must demonstrate capacity to maintain stability after receiving assistance, typically through employment</li> </ul>
<b>Emergency shelter</b>	<ul style="list-style-type: none"> <li>Provides a temporary place to stay for people without other housing options</li> <li>Administered by local agencies</li> </ul>	May require access through a coordinated point of entry

\*Programs will be described in more detail later in this section



OHFA recently made new funding available for a rental assistance pilot program targeted at reducing infant mortality. On July 31, 2017, OHFA released a Notice of Funding Availability for \$1 million dollars seeking proposals to establish a rental assistance pilot program. The goal of the pilot program is to assess the potential impact of a rental subsidy to reduce the risk factors for infant mortality and increase housing stability of low-income households with children. The pilot program must include rental assistance, access to maternal and child healthcare services, social service supports and activities to foster long-term housing stability.

### **Planning and implementation**

ODSA prepares the **Ohio Consolidated Plan**<sup>67</sup>, which outlines how federal funding for homeless services will be used. It also outlines which state agency will administer the funds, organizations eligible to receive funding and sources of matching funds. The Consolidated Plan for program year 2017 covers \$70 million in federal funding. Counties and city governments that receive HUD funding are also required to prepare consolidated plans.

### **The Ohio Housing and Homelessness**

**Collaborative** (OHHC) is an inter-agency collaborative that works to align resources and create new, comprehensive approaches to address housing and homelessness by utilizing public and private resources at both the state and federal levels. Members coordinate funding priorities and strategies as well as engage local housing and homelessness interest groups. The OHHC is creating a statewide plan to end homelessness which is slated to be published by the end of 2017.

At the local level, Continuums of Care (CoCs) play an important role in planning and implementing services for people who are homeless. The CoC program is a HUD program that provides funding, as well as a framework for communities to coordinate housing and homeless services. Communities apply for funding through a single, lead agency known as the “collaborative applicant.” This lead agency develops the application through a collaborative process. Metropolitan areas typically convene a community-wide CoC, and non-metropolitan counties are convened in a “balance-of-state

CoC” led by the Coalition on Homelessness and Housing in Ohio. Some communities, including Columbus and Cincinnati, apply for CoC funding through a Unified Funding Agency designated by HUD. Local CoCs may receive funding from ODSA and/or the OHTF as well as other local and state entities.

Rental assistance programs administered by public housing authorities operate independently of Ohio’s Consolidated Plan and local CoCs. In some cases, a public housing authority will work with local and state agencies to address community issues related to housing.<sup>68</sup>

### **Affordable housing preservation and development**

New development increases the supply of units available to households with low incomes. Preserving existing affordable housing ensures that residents with low incomes are not displaced by increasing housing costs. Both are critical components to closing the affordable housing gap. New developments in low-poverty, high-opportunity neighborhoods are supportive of good health for residents.

### **Funding**

HUD funding from several of the programs discussed above may also be used for affordable housing development, including Community Development Block Grants, HOME Investment Partnerships and the National Housing Trust Fund. This funding is managed at the state level by ODSA, which allocates funding to local entities.

Ohio also receives significant investment for affordable housing development through the federal Low Income Housing Tax Credit Program. The program is administered by OHFA based on guidelines set by the Internal Revenue Service. Housing developers receive a tax benefit for projects that are selected to receive credits in exchange for providing an agreed-upon number of units that are affordable for people with specified incomes. In July 2017, OHFA announced that it awarded more than \$27 million dollars in tax credits to 34 affordable housing development projects. Additional funding for affordable housing development comes from local governments and private investors.



### Planning and implementation

OHFA conducts an **annual housing needs assessment**<sup>69</sup> and develops an **annual plan**<sup>70</sup> that outlines how the agency will distribute funding for development of affordable housing. The 2018 annual housing needs assessment includes information about infant mortality, including maps that overlay OHFA project sites with infant mortality census tracts. In response to SB 332, OHFA's **2018 Annual Plan**<sup>71</sup> included infant mortality reduction as strategic priority 2.4:

*Join efforts to reduce Ohio's infant mortality rate by making strategic housing investments that address the needs of vulnerable families.*

*In 2015, the Ohio Department of Health reported that 7.2 in every 1,000 infants died before their first birthday, a rate well above the national average. OHFA will contribute to efforts to improve low birth weight and infant mortality rates in Ohio through strategic partnerships with established organizations and partners.*

In addition to the annual plan, OHFA develops a Qualified Allocation Plan (QAP) that outlines how projects will be selected for Low Income Housing Tax Credits. OHFA released a draft of the **2018 QAP**<sup>72</sup> in September 2017. The plan outlines how developers can integrate services for people at risk of experiencing infant mortality to receive points in the project consideration process.

Evidence from the Moving to Opportunity study suggests that when people use rental assistance vouchers to move away from high-poverty, low-opportunity areas, they experience better outcomes than people who stay in those areas.<sup>73</sup> OHFA worked with the Kirwan Institute for the Study of Race and Ethnicity at The Ohio State University to develop the **Urban Suburban Rural Opportunity Index**, a tool to help with the placement of low-income housing in 2018 and 2019.

### Advisory Group and Housing Subcommittee insights: Barriers to affordable housing

The Advisory Group and Housing Subcommittee highlighted barriers to new affordable housing development in low-poverty, high-opportunity areas:

- Lack of appropriately zoned land for rental housing development and exclusionary land use policies
- "NIMBY-ism," or Not In My Backyard, which is a collective attitude that affordable housing should not be built in affluent areas
- Development costs, including land, and

regulatory barriers to developing affordable housing in low-poverty and high-opportunity areas

Housing Subcommittee members also discussed barriers that federal rental assistance voucher recipients encounter when locating rental housing in low-poverty, high-opportunity areas, including:

- Restrictions against renting to people with criminal records
- Limitations on renting to people with poor credit and/or a history of previous evictions
- Restrictions against renting to voucher holders



## Housing policy recommendations

HPIO drew upon the following sources of information to identify policy goals and recommendations to improve housing in Ohio:

- Literature review, scope of problem and policy landscape (part four of this report)
- Evidence inventories (see Appendix B)
- Suggestions and feedback from the Advisory Group and Housing Subcommittee, including prioritization of goals and recommendations
- Input from additional subject matter experts on technical and political feasibility

See Appendix D for a detailed description of the policy recommendation development process.

The following policy goals address the most critical housing challenges and inequities facing Ohio families at risk for infant mortality. Research indicates that achievement of these goals would likely contribute to improved birth outcomes, healthier infants and health equity.

### Housing policy goals

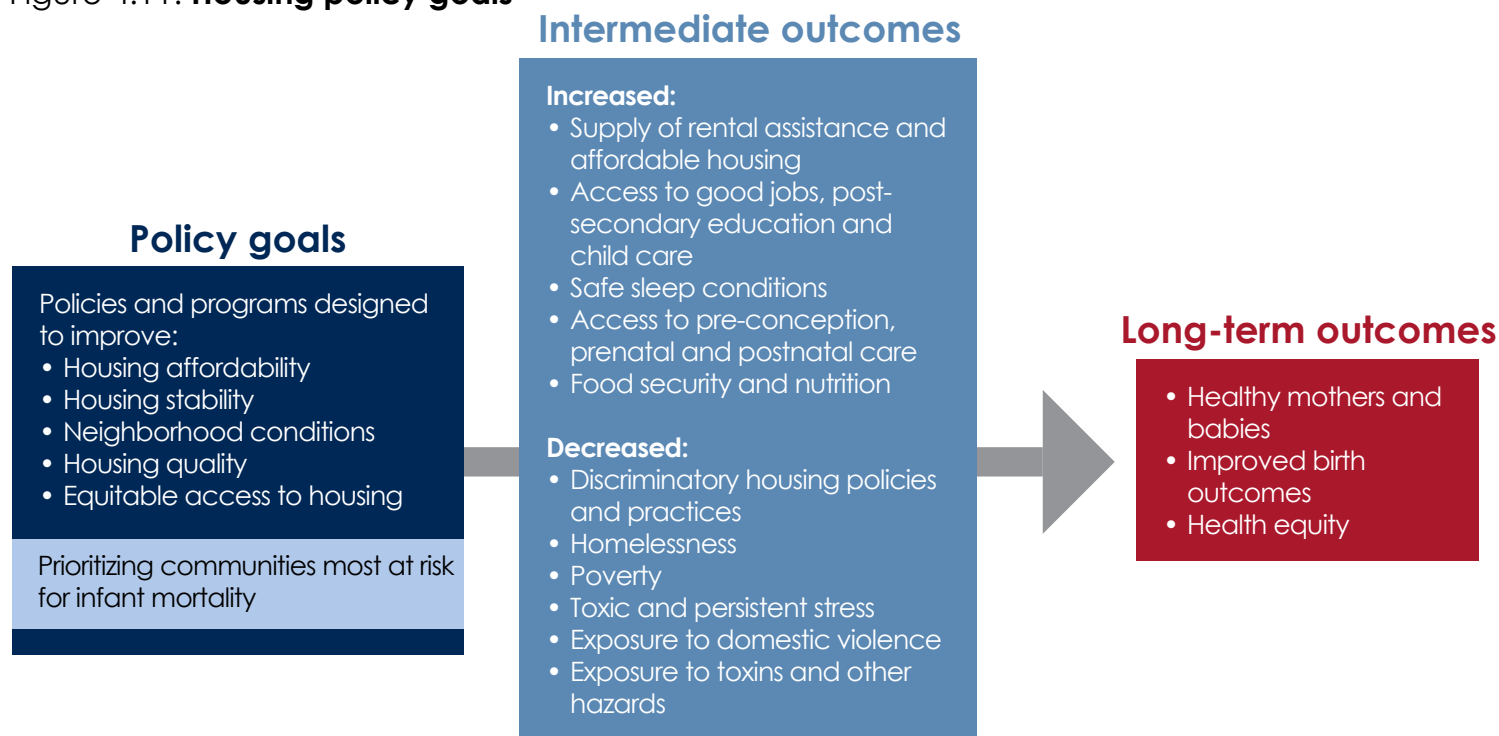
#### Top-priority goals

1. Increase the availability of rental assistance programs for renters with Extremely Low Incomes
2. Reduce structural barriers to accessing affordable housing for the highest-risk renters (structural barriers include level of income, source of income, criminal record, etc.)
3. Increase the supply of affordable rental housing for Extremely Low Income and Very Low Income households in high-opportunity and low-poverty areas
4. Improve coordination of services for low-income families by convening cross-sector partnerships

#### Additional goals

5. Increase the supply of affordable housing for renters with Extremely Low Incomes
6. Reduce the number of evictions and forced moves experienced by low-income families most at risk of infant mortality, including African Americans and pregnant women
7. Improve the quality of affordable housing stock

Figure 4.11. Housing policy goals





In order to reach these long-term policy goals, this report identifies specific and actionable recommendations for state and local policymakers. The top-priority recommendations are listed below and additional policy options are listed in Appendix A.

### **Housing policy goal 1.** Increase the availability of rental assistance programs for renters with Extremely Low Incomes

- 1.1 State policymakers can provide funding from the General Revenue Fund for the Ohio Housing Finance Agency (OHFA) to establish a new state-funded rental assistance program targeted to reducing infant mortality among populations most at-risk for infant mortality, including people with low incomes and low levels of educational attainment, African Americans and residents of infant mortality hot spot zip code areas or neighborhoods.
- 1.2 State policymakers can direct state agencies to increase funding from new and existing sources for rapid re-housing programs and rental assistance programs for pregnant women and families with very young children. Potential sources of new and existing funding include:
  - a. Increased revenue to the Ohio Housing Trust Fund through increased county recordation fees
  - b. Increased funding for these programs from the Ohio Development Services Agency
  - c. Amending the state TANF spending plan to allow funds to be dedicated to these programs
- 1.3 State policymakers can use recommendations from the OHFA evaluation of the Housing Assistance to Reduce Infant Mortality pilot project to plan future state-funded rental assistance programs targeted to reduce infant mortality.

### **Housing policy goal 2.** Reduce structural barriers to accessing affordable housing for the highest-risk renters (structural barriers include level of income, source of income, criminal record, etc.)

- 2.1 State legislators can pass legislation to reduce or eliminate barriers to obtaining affordable housing. Barriers that could be reduced or eliminated include:
  - a. Landlord discrimination based on the source of income potential tenants will

use to pay rent (such as Housing Choice Vouchers, Supplemental Security Income and Temporary Assistance for Needy Families)

- b. "Banning the box" or delaying the use of criminal background checks in the tenant screening process until after a conditional housing offer is made
- c. Restrictions on not renting to people with criminal records

### **Housing policy goal 3.** Increase the supply of affordable rental housing for Extremely Low Income and Very Low Income households in high opportunity and low poverty areas

- 3.1 State policymakers can provide incentives, such as increased funding for services or preference for state grant programs, to municipalities that encourage and support the development of affordable housing in high opportunity areas within their communities.
- 3.2 Local policymakers can require or incentivize that new housing developments implement inclusionary policies such as reserving a certain percentage of new units to be affordable as a condition of obtaining a zoning variance. Local policymakers can also require that housing developers work with local public housing authorities to ensure that new housing developments will be eligible to accept rental assistance.

### **Housing policy goal 4.** Improve coordination of services for low-income families by convening cross-sector partnerships

- 4.1 Convene the Ohio Department of Medicaid, Ohio Housing Finance Agency, Ohio Development Services Agency, Ohio Capital Corporation for Housing, Ohio Department of Mental Health and Addiction Services, Ohio Department of Health and Ohio's Medicaid managed care plans with Ohio Equity Institute partners and Continuums of Care to discuss ways that Medicaid managed care plans can support housing stability among Medicaid enrollees most at-risk for infant mortality, including people with low incomes and low levels of educational attainment, African Americans and residents of infant mortality hot spot zip code areas or neighborhoods.



- 4.2 State policymakers can require service systems, such as Medicaid, Temporary Assistance for Needy Families (TANF) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), to collect information about the housing status of households during the application and re-certification process. This data could be collected consistently across systems and used to:
- Provide a standardized means for identifying and connecting people experiencing a housing crisis to appropriate and timely interventions
  - Inform the allocation of resources to affordable housing programs
  - Direct resources to areas with the greatest need
  - Inform the development of cross-sector partnerships with the potential to improve housing outcomes for Ohioans
- 4.3 The Ohio Department of Health and the Ohio Housing Financial Agency can collaborate to create additional guidance for directing hospital community benefit spending to affordable housing strategies related to the State Health Improvement Plan.

### **Housing policy goal 5. Increase the supply of affordable housing for renters with Extremely Low Incomes**

- 5.1 State agencies can promote strategies that can be implemented at the local level to reduce financial and regulatory barriers to increasing the supply of affordable housing. Examples of strategies that could be promoted include:
- Adopting clearer and shorter permitting requirements for affordable housing development
  - Revising zoning ordinances to reduce the need for variances and/or expedite the process for obtaining a variance for affordable housing development
  - Allowing developers to purchase or use housing plans that are examples of good design that have been pre-approved by the city for conformance with building codes and/or other standards
  - Allowing or encouraging the use of innovative housing design and construction techniques to reduce

the cost of developing and operating affordable housing by investing in micro-housing, green affordable housing development and/or non-conventional building technology, such as modular, prefabricated or shipping container units

### **Housing policy goal 6. Reduce the number of evictions and forced moves experienced by low-income families most at risk of infant mortality, including African Americans and pregnant women**

- 6.1 State and local policymakers can increase rapid access to legal representation, landlord-tenant mediation and other supportive services, including emergency financial assistance, to prevent formal evictions experienced by low-income families most at risk of infant mortality, including African Americans and pregnant women.
- 6.2 State policymakers and the Ohio Supreme Court can commission research to determine how inequitable rental practices and discrimination based on race, gender and pregnancy status impact housing stability for low-income families most at risk of infant mortality, including African Americans and pregnant women, and provide recommendations for local executives and courts to address these issues.

### **Housing policy goal 7: Improve the quality of affordable housing stock**

- 7.1 State policymakers can increase funding to the Ohio Department of Health, local health departments and other local entities that screen for and remediate housing quality issues with potential impacts on health such as lead, mold and pests. Additional incentives could be developed for entities that give preference to women who are pregnant and families with infants.





## Connections to other outcomes

Although developed to reduce infant mortality, the housing policy goals and recommendations also support many other state priorities for improving population health outcomes, controlling healthcare spending and increasing economic opportunity and vitality. Housing stability, for example, is important to children's social-emotional functioning at school<sup>74</sup> and supports the policy goals in part six of this report. Improving data collection on the housing status of Ohioans accessing work support programs would provide important information that could help to improve outcomes across systems.

Housing policy goals 1, 2 and 5 directly align with affordable, quality housing strategies in the **2017-2019 State Health Improvement Plan**<sup>75</sup> (SHIP). The SHIP is being implemented by state agencies and by local health departments and hospitals through their community health improvement initiatives.



## Impact study: Rental assistance program targeted to reducing infant mortality

### Background

Senate Bill 332 states that OHFA “may establish a housing assistance pilot program” targeted to reducing infant mortality and lays out broad criteria for the program.<sup>76</sup> This recommendation was based on the accepted view that safe, quality and stable housing is a critical component for helping women and infants maintain good health before, during and after pregnancy.<sup>77</sup>

Understanding the potential impact of a proposed intervention provides policymakers with information to determine how to effectively allocate resources and implement programs to achieve desired outcomes. This impact study is required by SB 332.<sup>78</sup>

Federal, state and local government entities provide rental assistance.<sup>79</sup> However, available assistance does not meet the needs of the entire population with incomes that are too low to afford fair market rental housing. Recent estimates indicate that, nationally, only one in four potentially eligible households receive federal rental housing assistance.<sup>80</sup>

State-funded rental assistance programs targeted to reducing infant mortality are not common among other states. Healthy Start in Housing in Boston, Massachusetts is the only program specifically targeted to reducing infant mortality with published information about program outcomes that was identified while preparing this impact study.<sup>81</sup> In July 2017, OHFA released a Notice of Funding Availability (NOFA) requesting proposals to implement a similar pilot program. The NOFA requires applicants to evaluate outcomes related to infant mortality. Both programs are described below.

### Ohio Housing Finance Agency pilot program

OHFA released the “Housing Assistance to Reduce Infant Mortality” NOFA on July 31, 2017. The purpose of the funding is to “establish a time-limited housing assistance pilot program to expand housing opportunities and demonstrate the effectiveness of a time-limited rental subsidy targeted to households that include pregnant women, new mothers or infants within the first year of life.”<sup>82</sup> The NOFA requires applicants to ensure that program participants receive supportive

services, including maternal and child healthcare services. Preference will be given to proposals that target Extremely Low-Income households with incomes below 30 percent AMI. Evaluation of program outcomes is required “to assess the potential impact of a rental subsidy to reduce the risk factors for infant mortality and increase housing stability of low-income households with children.”<sup>83</sup> A proposal will likely be selected in December 2017.

### Healthy Start in Housing

**Healthy Start in Housing** (HSiH) is a partnership between the Boston Public Health Commission (BPHC) and the Boston Housing Authority (BHA) that began in 2011.<sup>84</sup> HSiH gives priority housing placement for 75 units of public-housing set aside for pregnant women who:

- Reside in BHA’s service area,
- Are experiencing homelessness or housing instability and
- Are at medical risk of poor birth outcomes or have previously experienced a poor birth outcome<sup>85</sup>

The HSiH pilot program was designed to support a quasi-experimental research design “to assess the effects of program participation on maternal mental health and social functioning.”<sup>86</sup>

The program has received much attention and is often highlighted as a promising intervention to reduce infant mortality and disparities.<sup>87</sup> As of November 2017, a final outcomes evaluation of the program has not been published, but an analysis of preliminary data found improvement in mental health and social and mental functioning.<sup>88</sup> These preliminary results are not sufficient to determine the potential impact of the HSiH program on poor birth outcomes or infant mortality, but they do suggest that interventions designed to provide housing stability for pregnant women at risk of infant mortality can improve mental health.

Research findings based on preliminary data from the HSiH program are consistent with other research. Moving to Opportunity, a pilot program with an experimental research component, found that Section 8 rental assistance voucher recipients experienced statistically significant improvements in mental health outcomes compared to a control group.<sup>89</sup>



## Potential impact of a state-funded rental assistance program targeted to reduce infant mortality

Additional research is needed to predict the impact of rental assistance programs on reducing infant mortality and poor birth outcomes. To address this gap in research, HPIO turned to three sources of information to complete this impact study:

1. Expertise from the Housing Subcommittee (Ohio housing experts)
2. General literature review on the impact of housing affordability interventions on health and related outcomes
3. What Works for Health review of evidence of effectiveness of relevant housing programs

The Housing Subcommittee assembled by HPIO included members of the Advisory Group who have specific housing expertise (see Appendix C for list of members). HPIO tasked this group with developing a logic model that lays out the short- and intermediate-term outcomes that could be expected from a state-funded rental assistance program targeted to reducing infant mortality (see figure 4.12).

Housing Subcommittee members said they needed more details about the potential rental assistance program than were provided by SB 332 to anticipate short and intermediate outcomes. For example, more information about the priority population, referral sources and barriers to program participation (i.e., landlord limitations on people with criminal records, poor credit scores and/or previous evictions) is needed to anticipate the percent of the priority population that would enroll. Additional information about the structure of the subsidy, including whether the subsidy will be tenant-based or project-based, the amount of rent assistance provided and the time limit on rental assistance is needed to anticipate outcomes related to housing stability for program participants. Figure 4.12 includes potential attributes and partnerships of a rental assistance program targeted to reduce infant mortality that were highlighted by Housing Subcommittee members.

To ensure that the policy recommendations included in this report are evidence-informed, HPIO staff identified three programs rated by [What Works for Health](#) that exhibit some of the attributes identified by subcommittee members. What Works for Health is an

evidence registry produced by the University of Wisconsin Population Health Institute that rates the effectiveness of interventions to improve health and other outcomes on a six-level scale: evidence of ineffectiveness, mixed evidence, insufficient evidence, expert opinion, some evidence and scientifically supported.<sup>90</sup> What Works for Health reviewed three housing affordability programs that align with subcommittee recommendations:

- [Housing Choice Voucher Program \(Section 8\)](#)
- [Service-enriched housing](#)
- [Rapid re-housing](#)

All three are rated as “some evidence” of effectiveness, the second highest rating of effectiveness assigned to programs. Figure 4.13 provides a brief description of the interventions and illustrates connections between the policies or programs and their expected beneficial outcomes, as well as other potential beneficial outcomes.

## Connections between expected beneficial outcomes and infant mortality

This section describes how the expected beneficial outcomes of the housing affordability programs reviewed in figure 4.13 are relevant to the leading causes of infant mortality.

### Increased housing stability

- There is limited research on the connections between housing instability and birth outcomes. However, one study of pregnant women aged 14-21 conducted in New York City found that housing instability (as defined by moving two or more times in the past year) is a predictor of lower birth weight.<sup>91</sup>
- Housing instability is associated with factors that are related to poor birth outcomes, including frequent mental distress<sup>92</sup>, depression<sup>93</sup>, fair or poor overall health and delayed medical care.<sup>94</sup>
- Interventions to increase housing stability among the priority population could reduce poor mental health among mothers and children.<sup>95</sup>

### Reduced homelessness

- Homelessness is the most severe and visible form of housing instability.
- Homelessness is associated with several leading causes of infant mortality, including low birth weight<sup>96</sup> and preterm birth.<sup>97</sup>



Figure 4.12. Logic model for a state-funded rental assistance program targeted to reduce infant mortality

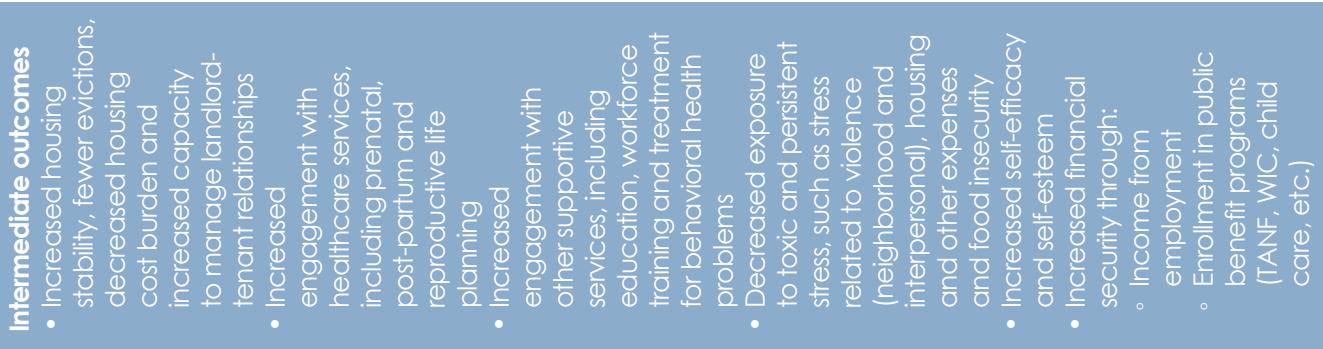
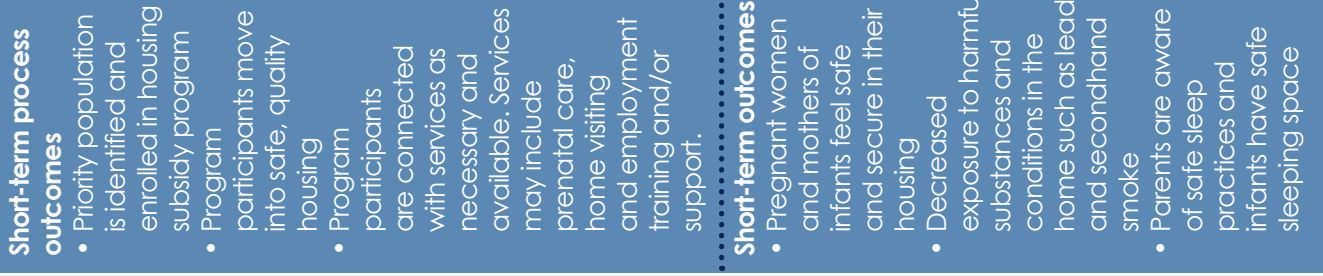




Figure 4.13. Housing affordability programs evidence summary

Program as listed in What Works for Health evidence registry

**Housing Choice Voucher Program (Section 8)**

- Federally-funded (U.S. Department of Housing and Urban Development), locally-administered (public housing authorities) rental assistance program
- Provides a voucher to eligible households:
  - 50 percent area median income (AMI) or lower
  - 75 percent of vouchers must go to people with income below 30 percent AMI
- Recipients may use vouchers to rent any privately-owned apartment that:
  - Is owned by a landlord that participates in the Section 8 program
  - Meets certain quality standards
  - Is priced at or near fair market rent

**Rapid re-housing**

- Provides support services and time-limited rental assistance to people experiencing homelessness, often families and/or priority populations such as military veterans
- Support services may include assistance with locating housing, landlord negotiations and other housing stabilization assistance

**Service-enriched housing**

- Housing with supportive services that are co-located or provided through a referral partnership for residents
- May be funded and operated by private, nonprofit and/or government agencies
- One model of service-enriched housing is permanent supportive housing

**Expected beneficial outcomes** rated as “some evidence of effectiveness” by What Works for Health

- Increased neighborhood choice
- Increased neighborhood socio-economic diversity
- Reduced exposure to crime
- Improved access to social services
- Reduced homelessness
- Increased housing stability
- Reduced hospital utilization

**Other potential beneficial outcomes**, evidence not rated by What Works for Health

- Reduced homelessness
- Reduced poverty
- Improved housing stability
- Increased food security
- Improved health outcomes
- Improved mental health
- Increased income



- The system of services available to families experiencing homelessness has created opportunities to measure the impact of rental assistance interventions on health outcomes.
  - The Family Options Study<sup>98</sup> interim evaluation found statistically significant improvements in rates of psychological distress among permanent subsidy recipients.

### **Increased neighborhood choice**

- Factors that limit neighborhood choice, such as residential segregation<sup>99</sup> and racial discrimination<sup>100</sup>, increase risk for poor birth outcomes and infant mortality.
- The Moving to Opportunity final impacts evaluation<sup>101</sup> found that, compared to residents of public housing, Section 8 voucher recipients lived in neighborhoods with lower poverty and higher-quality homes, felt safer in their neighborhoods, were slightly less racially segregated and developed social connections with more affluent people.
- Three studies<sup>102</sup> that used data from the Effects of Housing Vouchers on Welfare Families study found a limited long-term impact on neighborhood quality for voucher recipients. The studies also identified improvements in other metrics associated with poor birth outcomes, including homelessness and crowding.<sup>103</sup>

### **Increased neighborhood socio-economic diversity**

- Research indicates that birth outcomes are worse in neighborhoods where residents have lower socio-economic status.<sup>104</sup>
- Research on income inequality — an indicator of socio-economic diversity — has found states with higher levels of income inequality also have worse birth outcomes.<sup>105</sup>

### **Improved access to social services**

- Research shows that receipt of assistance from the food stamp program<sup>106</sup> and other food assistance programs such as the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is associated with improved birth outcomes.
- Experimental studies of rental assistance programs find increased receipt of Temporary Assistance for Needy Families (TANF) and food stamp programs:
  - The Effects of Housing Vouchers on Welfare Families study found that voucher recipients

saw an increase in their total combined TANF and food stamps receipts compared to the control group.<sup>108</sup>

- The Moving to Opportunity study found somewhat higher food stamp use for voucher recipients with location restrictions and less food insufficiency for all voucher recipients.<sup>109</sup>

### **Reduced exposure to crime**

- Exposure to crime is a source of toxic and persistent stress and, in some cases, a direct cause of infant mortality (homicide). Recent research from Ohio found that people living in areas with high homicide rates are at greater risk of infant mortality.<sup>110</sup>
- Research has identified connections between intimate partner violence and adverse birth outcomes.<sup>111</sup> One study found that women who were threatened with harm, but not physically abused during pregnancy, were significantly more likely to deliver low birth weight babies.<sup>112</sup> The connection was explained in part by risky health behaviors that are also associated with emotional and verbal abuse, including smoking, alcohol and drug use.<sup>113</sup> Being threatened during pregnancy is also associated with increased stress, anxiety and depression.<sup>114</sup>
- Rental subsidy recipients that participated in the Family Options Study reported fewer experiences of intimate partner violence in the past six months, although the results were only statistically significant for permanent subsidy recipients.<sup>115</sup>
- Qualitative information collected during the Effects of Housing Vouchers on Welfare Families study suggests that the vouchers enabled some participants to live separately from abusive partners.<sup>116</sup>



## Conclusion

One housing assistance program in the U.S. is using housing assistance as a strategy to reduce infant mortality and conducting research on the effectiveness of the intervention; OHFA will fund the second beginning in 2018. Conclusive research about the direct impact of using rental assistance to reduce infant mortality is not available, but there is a significant body of research about the impacts of rental assistance programs on a variety of health, healthcare and social determinant of health outcomes. This

research suggests that rental assistance programs produce outcomes — such as increased housing stability, improved neighborhood conditions and decreased exposure to crime — that are associated with the leading causes of infant mortality. Therefore, a rental assistance program based on the evidence-based programs discussed in this section and tailored to address the needs of women at the greatest risk of infant mortality could potentially improve birth outcomes among program participants.

## Experimental studies about rental assistance programs

### The Family Options Study

The Family Options Study<sup>117</sup> used an experimental research design to assess the effectiveness of four types of rental assistance interventions for families experiencing homelessness: permanent rental subsidy, rapid re-housing with a temporary subsidy, project-based transitional housing with a temporary subsidy and usual emergency shelter care with no subsidy.

### Moving to Opportunity for Fair Housing Demonstration Program

The Moving to Opportunity for Fair Housing Demonstration Program<sup>118</sup> (MTO) evaluated the impact of providing a voucher with location restrictions to rental subsidy-eligible families. The location restrictions were imposed to study the impact of moving to neighborhoods with lower poverty rates on several outcomes, including physical and mental health, economic self-sufficiency, behaviors and educational attainment. The study used an experimental design to determine if such a subsidy would produce better outcomes when compared to public housing and typical Section 8 voucher programs.

### Effects of Housing Vouchers on Welfare Families

This study was conducted to evaluate the Welfare to Work Voucher program, a federally-funded program that gave 50,000 families tenant-based vouchers to help move from welfare to work. The Welfare to Work Voucher program began in 1999 and was created to help families comply with requirements of welfare reform, including time limits on cash benefits and work requirements. The six-site experimental design study evaluated participants' progress on several metrics including housing mobility, neighborhood characteristics, household composition, employment, education, receipt of public assistance, hardships and child wellbeing.



## Notes

- Adapted from *Links between Housing and Health*. The Pew Charitable Trusts; Maqbool, Nabihah, Janet Viveiros, and Mindy Ault. "The Impacts of Affordable Housing on Health: A Research Summary." Center for Housing Policy. Washington, DC: 2015.
- The Role of Nutrition in Infant Mortality*. Johnstown, PA: Association of State Public Health Nutritionists, 2013.
- Partridge, Sarah, et al. "Inadequate Prenatal Care Utilization and Risks of Infant Mortality and Poor Birth Outcome: A Retrospective Analysis of 28,729,765 U.S. Deliveries over 8 Years." *American Journal of Perinatology*, 29, no. 10 (2012): 787-794. doi: 10.1055/s-0032-1316439
- Maqbool, Nabihah, Janet Viveiros, and Mindy Ault. "The Impacts of Affordable Housing on Health: A Research Summary." Center for Housing Policy. Washington, DC: 2015.
- Rose, M. Sarah, Gianella Pana and Shahirose Premji. "Prenatal Maternal Anxiety as a Risk Factor for Preterm Birth and the Effects of Heterogeneity on This Relationship: A systematic review and Meta-analysis." *BioMed Research International* (2016). doi: 10.1155/2016/8312158
- Kramer, Michael R. and Carol R. Hogue. "Is Segregation Bad for Your Health?" *Epidemiologic Reviews*, 31 (2009): 178-194. doi: 10.1093/epirev/mxp001; see also McFarland, Michael and Cheryl A. Smith. "Segregation, Race, and Infant Well-Being." *Population Research and Policy Review*, 30, no. 3 (2011): 467-493.
- Grady, Sue C. "Racial disparities in low birthweight and the contribution of residential segregation: A multilevel analysis." *Social Science and Medicine*, 63 (2006): 3013-3029 doi: 10.1016/j.socscimed.2006.08.017; Bell, Janice F et al. "Birth outcomes among urban African-American women: A multilevel analysis of the role of racial residential segregation." *Social Science and Medicine*, 63, no 12 (2006): 3030-3045; Britton, Marcus L. and Heeju Shin. "Metropolitan residential segregation and very preterm birth among African American and Mexican-origin women." *Social Science and Medicine*, 98 (2013): 37-45. doi: 10.1016/j.socscimed.2013.08.039
- Alhusen, Jeanne L. et al. "Racial Discrimination and Adverse Birth Outcomes: An Integrative Review." *Journal of Midwifery & Women's Health* 61, no. 6 (2016): 707-720. doi: 10.1037/0033-2909.131.5.662; Giurgescu, C. et al. "Racial Discrimination and the black-white gap in adverse birth outcomes: a review." *Journal of Midwifery and Women's Health* 56, no. 4 (2011): 362-370. doi: 10.1111/j.1542-2011.2011.00034.x.
- Wenger, Mike. *Place Matter: Ensuring Opportunities for Good Health for All: A summary of Place Matters' Community Health Equity Reports*. Joint Center for Political and Economic Studies, September 2012; see also Kramer, Michael R. and Carol R. Hogue. "Is Segregation Bad for Your Health?" *Epidemiologic Reviews*, 31 (2009): 178-194. doi: 10.1093/epirev/mxp001
- Infant Mortality Research Partnership *Reducing Infant Mortality in Ohio: Individuals, Communities, Systems, and Interventions*. Ohio Colleges of Medicine Government Research Center, June 2017.
- LaViest, Thomas A., Darel J. Gaskin, Antonio J. Trujillo. *Segregated Spaces, Risky Place: The Effects of Segregation on Racial and Ethnic Health*. Joint Center for Political and Economic Studies, September 7, 2011.
- McFarland, Michael and Cheryl A. Smith. "Segregation, Race, and Infant Well-Being." *Population Research and Policy Review*, 30, no. 3 (2011): 467-493
- Kushel, Margot B, Reena Gupta, Lauren Gee and Jennifer S. Haas. "Housing Instability and Food Insecurity as Barriers to Health Care Among Low-Income Americans." *Journal of Internal Medicine*, 21, no. 1 (2006): 71-77.
- Liu, Y., et al. "Relationships between housing and food insecurity, frequent mental distress, and insufficient sleep among adults in 12 US States, 2009." *Preventing Chronic Disease* 11, (2014):E37. doi: 10.5888/pcd11.130334
- Suglia, Shkira Franco, Christina S. Duarte and Megan T. Sandel. "Housing Quality, Housing Instability, and Maternal Mental Health." *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 88, no. 6 (2011): 1105-1115. doi: 10.1007/s11524-011-9587-0
- Stahre, Mandy et al. "Housing Insecurity and the Association with Health Outcomes and Unhealthy Behavior, Washington State, 2011." *Preventing Chronic Disease*, 12 (2015): E109. doi: 10.5888/pcd12.140511
- Binging Children in from the Cold: Solutions for Boston's Hidden Homeless*. The Children's Sentinel Nutritional Assessment Program and Medical-Legal Partnership for Children at Boston Medical Center, October 2008.
- Sanbonmatsu, Lisa et al. *Moving to Opportunity for Fair Housing Demonstration Program Final Outcomes Evaluation*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, November 2011.; Abt Associates Inc., et al. *Effects of Housing Vouchers on Welfare Families*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, September 2006.
- Cutts, DB, et al. "Homelessness during pregnancy: a unique, time-dependent risk factor of birth outcomes." *Journal of Maternal and Child Health* 19, no. 6 (2015): 1276-1283. doi: 10.1007/s10995-014-1633-6; Little, Merry et al. "Adverse perinatal outcomes associated with homelessness and substance abuse during pregnancy." *Canadian Medical Association Journal* 173, no. 6 (2005): 615-618. doi: 10.1503/cmaj.050406.; Stein, JA, MC Lu, and L Gelberg. "Severity of homelessness and adverse birth outcomes." *Health Psychology* 19, no. 6 (2000): 524-534. doi: 10.1037/0278-6133.19.6.524
- Little, Merry et al. "Adverse perinatal outcomes associated with homelessness and substance abuse during pregnancy." *Canadian Medical Association Journal* 173, no. 6 (2005): 615-618. doi: 10.1503/cmaj.050406.; Stein, JA, MC Lu, and L Gelberg. "Severity of homelessness and adverse birth outcomes." *Health Psychology* 19, no. 6 (2000): 524-534. doi: 10.1037/0278-6133.19.6.524
- Richards, Rickelle, Ray M. Merrill, and Laurie Baksh. "Health Behaviors and Infant Health Outcomes in Homeless Pregnant Women in the United States." *Pediatrics* 128, no. 3 (2011): 438-446. doi: 10.1542/peds.2010-3491
22. Ibid.
23. Ibid.
24. Blumenshine, P. et al. "Socioeconomic disparities in adverse birth outcomes: a systematic review." *American Journal of Preventive Medicine* 39, no. 3: 263-272. doi: 10.1016/j.amepre.2010.05.012.; Grintsova, O, W Maier and A Mielck. "Inequalities in health care among patients with type 2 diabetes by individual socio-economic status (SES) and regional deprivation: a systematic literature review." *International Journal for Equity in Health*. 13 (2014). doi: 10.1186/1475-2875-13-43
- O'Campo, Patricia et al. "Neighborhood Deprivation and Preterm Birth among Non-Hispanic Black and White Women in Eight Geographic Areas in the United States." *American Journal of Epidemiology* 167, no. 2: 155-163. doi: 10.1093/aje/kwm277
- Kneebone, Elizabeth and Natalie Holmes. *U.S. concentrated poverty in the wake of the Great Recession*. The Brookings Institution, 2016.
- Drew, Rachel B. "The Truth about Concentrated Poverty." *Shelterforce Online*. 147 (2006). <http://nhi.org/online/issues/147/concentratedpoverty.html>
28. Ibid.
29. Leon, Erwin and Joseph Schilling. *Urban Blight and Public Health: Addressing the impact of substandard housing, abandoned buildings, and vacant lots*. Washington, D.C.: Urban Institute, 2017.
- Nowak, AL and C. Giurgescu. "The built environment and birth outcomes: A systematic review." *The American Journal of Maternal Child Nursing* 42, no. 1 (2017):14-20. doi: 10.1097/NMNC.0000000000000299
- Chu, Tracy et al., "Housing influences among sleep-related infant injury deaths in the USA." *Health Promotion International* 31, no. 2 (2016): 396-404. doi: 10.1093/heapro/dav12
- Nowak, AL and C. Giurgescu. "The built environment and birth outcomes: A systematic review." *The American Journal of Maternal Child Nursing* 42, no. 1 (2017):14-20. doi: 10.1097/NMNC.0000000000000299; for a study about the impact of structural deterioration see Kruger, Daniel J., Melissa A. Munsell and Tonya French-Turner. "Using a Life History Framework to Understand the Relationship between Neighborhood Structural Deterioration and Adverse Birth Outcomes." *Journal of Social, Evolutionary, and Cultural Psychology*, 5, no. 4 (2011): 260-274.
- Taylor, CM, J Goulding and AM Emron. "Adverse effects of maternal lead levels on birth outcomes in the ALSPAC study: a prospective birth cohort study." *BJOG: An International Journal of Obstetrics and Gynaecology* 122, no. 3 (2015): 322-328. doi: 10.1111/1471-0528.12756
- Salmasi, G. et al. "Environment tobacco smoke exposure and perinatal outcomes: a systematic review and meta-analyses." *Acta obstetrica et gynecologica Scandinavica*, 89, no. 4 (2010): 423-441. doi: 10.3109/00016340903505748
- McMartin, Kristen I. et al. "Lung tissue concentrations of nicotine in sudden infant death syndrome (SIDS)." *The Journal of Pediatrics* 140, no. 2 (2002): 205-209. doi: 10.1016/j.ped.2002.12.1937; Anderson, Mark E, and Gregory M. Bogdan. "Environments, Indoor Air Quality, and Children" *Pediatric Clinics of North America* 54 (2007): 295-307. doi: 10.1016/j.pcl.2007.01.003
- 2017 Health Value Dashboard. Health Policy Institute of Ohio, March 2017.
- Bartholomew, Karla S. "Policy Options to Promote Smokefree Environments for Children and Adolescents." *Current Problems in Pediatric and Adolescent Health Care* 45, no. 6 (2015): 146-181.
- Leopold, Josh et al. *The Housing Affordability Gap for Extremely Low-Incomes Renters in 2014*. Washington, D.C.: Urban Institute, 2015.
- 2017 State Housing Profile. Washington, DC: National Low Income Housing Coalition, 2017.
- Joint Center for Housing Studies of Harvard University. "Low-Income Households Face Severe Housing Cost Burdens." Accessed on November 16, 2017. <http://harvard-cga.maps.arcgis.com/apps/MapSeries/index.html?appid=9a24bdf3ae8c4272a58b0309890d5835>
- National Low Income Housing Coalition. "Ohio." Accessed on November 16, 2017. <http://nlihc.org/involvement/local/state/OH>
- Mazzara, Alicia, Barbara Sard and Douglas Rice. *Rental Assistance to Families with Children at Lowest Point in Decade*. Washington, D.C.: Center of Budget and Policy Priorities, October 18, 2016. [https://www.cbpp.org/research/housing/rental-assistance-to-families-with-children-at-lowest-point-in-decade#\\_fn3](https://www.cbpp.org/research/housing/rental-assistance-to-families-with-children-at-lowest-point-in-decade#_fn3)
- Steffen, Barry L. et al. *Worst Case Housing Needs: 2015 Report to Congress*. U. S. Department of Housing and Urban Development, Office of Policy Development and Research, April 2015.
- Cox, Robynn, et al. "Roadmap to a Unified Measure of Housing Insecurity." *CESR-Schaeffer Working Paper Series* (2016) Paper No: 2016-013. [https://cesr.usc.edu/documents/WP\\_2016\\_013.pdf](https://cesr.usc.edu/documents/WP_2016_013.pdf)
- Annual Homeless Assessment Report. Washington D.C.: U.S. Department of Housing and Urban Development, 2015.
- Cunningham, Mary, Robin Harwood and Sam Hall. *Residential Instability and the McKinney-Vento Homeless Children and Education Program: What we know, plus gaps in research*. Washington, D.C.: The Urban Institute, Metropolitan Housing and Communities. <https://www.urban.org/sites/default/files/publication/28736/412115-Residential-Instability-and-the-McKinney-Vento-Homeless-Children-and-Education-Program.PDF>; see also Desmond, Matthew. "Unaffordable America: Poverty, housing, and eviction." *Fast Focus*, No. 22-2015 (2015); University of Wisconsin-Madison, Institute for Research on Poverty. <https://www.ip.wisc.edu/publications/fastfocus/pdfs/FF22-2015.pdf>
- Information provided by the Cleveland/Cuyahoga Office of Homeless Services. Personal communication. Provided November 15, 2017.
28. Ibid.
29. Ibid.: The Homeless Management Information System (HMS) is the sole source for this data summary and includes client counts entered by only HMS participating, emergency shelter and overflow projects serving homeless families in Cuyahoga County.
- Information provided by Dr. Pat Gabbe, Moms2B. Personal communication. Provided November 2, 2017.
- Norris, David and Robert Cole. *The Effects of Lead Poisoning on African-American and Low-Income Families in Toledo, OH*. Prepared on behalf of the Toledo Lead Poisoning Prevention Coalition, March 2016. <http://kiwanisstitute.osu.edu/wp-content/uploads/2017/05/2016-04-04-TLPPC-Lead-Report.pdf>
25. Ibid.
- Kuhl, Danielle Corinne, Lauren J. Krivo and Ruth D Peterson. "Segregation, Racial Structure, and Neighborhood Violent Crime." *Sociology Faculty Publications, Paper 8* (2009). [http://scholarworks.bgsu.edu/cgi/viewcontent.cgi?article=1005&context=ssoc\\_pub](http://scholarworks.bgsu.edu/cgi/viewcontent.cgi?article=1005&context=ssoc_pub)
- Rothstein, Richard. *The Color of Law: A forgotten history of how our government segregated America*. New York: Liveright Publishing Corporation, 2017.
25. *The State of the Nation's Housing 2017*. Cambridge, MA: Joint Center for Housing Studies of Harvard University, 2017.
26. Ibid.
- Davis et al. *Countering the Production of Health Inequities: A Framework of Emerging Systems to Achieve and Equitable Culture of Health, Extended Summary*. Prevention and Equity Institute at the Center of Community Well-being, Dec. 2016.
- Desmond, Matthew. "Unaffordable America: Poverty, housing, and eviction." *Fast Focus*, No. 22-2015 (2015); University of Wisconsin-Madison, Institute for Research on Poverty. <https://www.ip.wisc.edu/publications/fastfocus/pdfs/FF22-2015.pdf>
29. Ibid.
30. Ibid.
61. *Affordable Rental Housing: Assistance in provided by federal, state and local programs, but there is incomplete information on collective performance*. Washington, D.C.:United States Government Accountability Office, September 2015.
- "Notice PIH 2016-04: Implementation of the Federal Fiscal Year (FFY) 2016 Funding Provisions for the Housing Choice Voucher Program." Memorandum. U.S. Department of Housing and Urban Development, March 10, 2016. <https://www.hud.gov/sites/documents/PIH-2016-04.PDF>
- Program Year 2017 Ohio Consolidated Plan Annual Action Plan*. Columbus, OH: Ohio Development Services Agency, Community Services Division, Office of Community Development, July 2017.
- Some state agencies, including the Ohio Department of Rehabilitation and Corrections, Ohio Department of Developmental Disabilities and Ohio Department of Mental Health and Addiction Services provide housing to constituents that are enrolled in specific programs, but those programs are not discussed in this report.
- Ohio Revised Code § 174.03
- Ohio Housing Trust Fund: *State Fiscal Year 2016 Annual Report*. Columbus, OH: Ohio Development Services



- Agency, Community Services Division, Office of Community Development, 2016.
67. *Program Year 2017 Ohio Consolidated Plan Annual Action Plan*. Columbus, OH: Ohio Development Services Agency, Community Services Division, Office of Community Development, July 2017.
  68. *The City of Columbus Annual Action Plan, Program Year 2016*. Columbus, OH: The City of Columbus, 2016.
  69. *Ohio Housing Needs Assessment: Technical Supplement to the Fiscal Year 2018 Annual Plan*. Columbus, OH: Ohio Housing Finance Agency, Office of Affordable Housing Research and Strategic Planning, July 1, 2017 – June 30, 2018.
  70. *2018 Annual Plan*. Columbus, OH: Ohio Housing Finance Agency, July 1, 2017 – June 30, 2018. <http://ohiohome.org/news/documents/2018-AnnualPlan.pdf>
  71. *Ibid.*
  72. *DRAFT 2018-2019 Qualified Allocation Plan*. Columbus, OH: Ohio Housing Finance Agency, Office of Planning, Preservation and Development, September 13, 2017. <http://ohiohome.org/ppd/documents/2018-19-QAP-FinalDraft.pdf>
  73. Sanbonmatsu, Lisa et al. *Moving to Opportunity for Fair Housing Demonstration Program Final Outcomes Evaluation*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, November 2011.
  74. Coley, Rebekah Levine and Melissa Kull. *Is Moving During Childhood Harmful? Multiple residential moves take a toll on children, but effects may fade with time*. Chicago, IL: MacArthur Foundation, 2016.
  75. Ohio Department of Health. "State Health Improvement Plan (SHIP)." Last updated April, 21, 2017. <https://www.odh.ohio.gov/en/odhprograms/chss/HealthPolicy/ship/State-Health-Improvement-Plan>
  76. The Ohio General Assembly. "Senate Bill 332." Accessed November 9, 2017. <https://www.legislature.ohio.gov/legislation/legislation-documents?id=GA131-SB-332>
  77. Sandel, Megan. "The Housing Vaccine: Why a Stable, Decent Affordable Home Keeps Kids Healthy." Presentation for the Ohio Commission on Infant Mortality, Columbus, OH, December 17, 2015. <http://cim.legislature.ohio.gov/documents>
  78. Musielewicz, Lisa. Final Analysis: Sub. S.B. 332, 131st General Assembly (As Passed by the General Assembly). Columbus, OH: Ohio Legislative Services Commission, 2017.
  79. *Affordable Rental Housing: Assistance in provided by federal, state and local programs, but there is incomplete information on collective performance*. Washington, D.C.: United States Government Accountability Office, September 2015.
  80. *The State of the Nation's Housing 2017*. Cambridge, MA: Joint Center for Housing Studies of Harvard University, 2017.
  81. Local governments, infant mortality collaborative groups, anchor institutions and other stakeholders are developing models to provide stable housing to women during and after pregnancy. For example, the City of Columbus partnered with the Community Shelter Board, YMCA, and Salvation Army to implement a Housing First/Rapid Re-housing program. The pilot provides up to 15 women who are homeless and pregnant up to twelve months of rental assistance and supportive services. The program began in March 2017. Another pilot program in Columbus, CareHome, is a partnership between the CareSource Foundation, Nationwide Children's Hospital, Community Development for All People and Moms2B. The program will provide 10 pregnant women and families an average of 15 months of rental subsidy. The project began in November 2016.
  82. *Notice of Funding Availability (NOFA) Housing Assistance to Reduce Infant Mortality*. Columbus, OH: Ohio Housing Finance Agency, 2017.
  83. *Ibid.*
  84. Feinberg, Emily, Bricia Trejo, Brianna Sullivan and Zhandra Ferreira-Cesar Suarez. "Healthy Start in Housing: A Case Study of a Public Health and Housing Partnership to Improve Birth Outcomes." *Cityscape: A Journal of Policy Development and Research*, 16, no. 1 (2014): 141-164.
  85. *Ibid.*
  86. Vieira, Charlotte et al. "Effects of Healthy Start in Housing on maternal mental health among high-risk pregnant women experiencing homelessness." (Abstract from the on-line program for the American Public Health Association 2015 annual meeting). <https://apha.confex.com/apha/143am/webprogram/Paper318073.html>
  87. See "Boston Uses Public Housing to Promote Healthy Birth Outcomes." [HealthEquityGuide.org](http://HealthEquityGuide.org), n.d. <https://healthequityguide.org/case-studies/boston-uses-public-housing-to-promote-healthy-birth-outcomes/>
  88. Vieira, Charlotte et al. "Effects of Healthy Start in Housing on maternal mental health among high-risk pregnant women experiencing homelessness." (Abstract from the on-line program for the American Public Health Association 2015 annual meeting).
  89. Sanbonmatsu, Lisa et al. *Moving to Opportunity for Fair Housing Demonstration Program: Final Impacts Evaluation*. Washington, D.C.: Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, November 2011.
  90. For more information about What Works for Health ratings see <http://www.countyhealthrankings.org/roadmaps/what-works-for-health>
  91. Canion, Bianca V et al. "Housing Instability and Birth Weight among Young Urban Mothers." *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 92, 1 (2014): 1-9. doi: 10.1007/s11524-014-9913-4
  92. Liu, Y., et al. "Relationships between housing and food insecurity, frequent mental distress, and insufficient sleep among adults in 12 US States, 2009." *Preventing Chronic Disease* 11, (2014):E37. doi: 10.5888/pcd11.1.30334
  93. Suglia, Shakira Franco, Christina S. Duarte and Megan T. Sandel. "Housing Quality, Housing Instability, and Maternal Mental Health." *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 88, no. 6 (2011): 1105-1115. doi: 10.1007/s11524-011-9587-0
  94. Stahre, Mandy et al. "Housing Insecurity and the Association with Health Outcomes and Unhealthy Behavior, Washington State, 2011." *Preventing Chronic Disease* 12 (2015): E109. doi: 10.5888/pcd12.140511
  95. Suglia, Shakira Franco, Christina S. Duarte and Megan T. Sandel. "Housing Quality, Housing Instability, and Maternal Mental Health." *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 88, no. 6 (2011): 1105-1115. doi: 10.1007/s11524-011-9587-0
  96. Cutts, DB, et al. "Homelessness during pregnancy: a unique, time-dependent risk factor of birth outcomes." *Journal of Maternal and Child Health* 19, no. 6 (2015): 1276-1283. doi: 10.1007/s10995-014-1633-6; Little, Merry et al. "Adverse perinatal outcomes associated with homelessness and substance abuse during pregnancy." *Canadian Medical Association Journal* 173, no. 6 (2005): 615-618. doi: 10.1503/cmaj.050406; Stein, JA, MC Lu, and L Gelberg. "Severity of homelessness and adverse birth outcomes." *Health Psychology* 19, no. 6 (2000): 524-534. doi: 10.1037/0278-6133.19.6.524
  97. Little, Merry et al. "Adverse perinatal outcomes associated with homelessness and substance abuse during pregnancy." *Canadian Medical Association Journal* 173, no. 6 (2005): 615-618. doi: 10.1503/cmaj.050406; Stein, JA, MC Lu, and L Gelberg. "Severity of homelessness and adverse birth outcomes." *Health Psychology* 19, no. 6 (2000): 524-534. doi: 10.1037/0278-6133.19.6.524
  98. Gubits et al. *Family Options Study: Short-Term Impacts of Housing and Services Interventions for Homeless Families*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research., July 2015.
  99. Grady, Sue C. "Racial disparities in low birthweight and the contribution of residential segregation: A multilevel analysis." *Social Science and Medicine*, 63 (2006): 3013-3029 doi: 10.1016/j.socscimed.2006.08.017; Bell, Janice F et al. "Birth outcomes among urban African-American women: A multilevel analysis of the role of racial residential segregation." *Social Science and Medicine*, 63, no 12 (2006): 3030-3045; Britton, Marcus L. and Heeju Shin. "Metropolitan residential segregation and very preterm birth among African American and Mexican-origin women." *Social Science and Medicine*, 98 (2013): 37-45. doi: 10.1016/j.socscimed.2013.08.039
  100. Alhusen, Jeanne L. et al. "Racial Discrimination and Adverse Birth Outcomes: An Integrative Review." *Journal of Midwifery & Women's Health* 61, no. 6 (2016): 707-720. doi: 10.1037/0033-2909.131.5.662; Giurgescu, C. et al. "Racial Discrimination and the black-white gap in adverse birth outcomes: a review." *Journal of Midwifery and Women's Health* 56, no. 4 (2011): 362-370. doi: 10.1111/j.1542-2011.2011.00034.x
  101. Sanbonmatsu, Lisa et al. *Moving to Opportunity for Fair Housing Demonstration Program Final Outcomes Evaluation*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, November 2011.
  102. Eriksen, Michael D. and Amanda Ross. "The Impact of Housing Vouchers on Mobility and Neighborhood Attributes." *Real Estate Economics*, 41, 2 (2013): 255-277. doi: 10.1111/j.1540-6229.2012.00342.x; Carlson, Deven et al. "Long-term effects of public low-income housing vouchers on neighborhood quality and household composition." *Journal of Housing Economics*, 21 (2012): 101-120. doi: 10.1016/j.jhe.2012.04.004; Wood, Michelle, Jennifer Turnham and Gregory Mills. "Housing Affordability and Family Well-Being: Results from the Housing Voucher Evaluation." *Housing Policy Debate*, 19, no.2 (2008): 367-412. doi: 10.1080/10511482.2008.9521639
  103. Wood, Michelle, Jennifer Turnham and Gregory Mills. "Housing Affordability and Family Well-Being: Results from the Housing Voucher Evaluation." *Housing Policy Debate*, 19, no.2 (2008): 367-412. doi: 10.1080/10511482.2008.9521639
  104. O'Campo, Patricia et al. "Neighborhood Deprivation and Preterm Birth among Non-Hispanic Black and White Women in Eight Geographic Areas in the United States." *American Journal of Epidemiology*, 167, no. 2 (2007): 155-163. doi: 10.1093/aje/kwm277
  105. Wallace, Maeve et al. "Preterm birth in the context of increasing income inequality." *Maternal and Child Health Journal*, 20, no. 1 (2016): 164-171. doi: 10.1007/s10995-015-1816-9; Olson, Maren E. et al. "Impact of income and income inequality on infant health outcomes in the United States." *American Academy of Pediatrics*, 126, no. 6 (2010): 1165-1173. doi: 10.1542/peds.2009-3378
  106. Almond, Douglas, Hilary W. Hoynes and Diane Whitmore Schanzenbach. *Inside the War on Poverty: The Impact of Food Stamps on Birth Outcomes*. NBER Working Paper No. 14306. Cambridge, MA: National Bureau of Economic Research, September, 2008.
  107. Carlson, Steven and Zoe Neuberger. *WIC Works: Addressing the Nutrition and Health Needs of Low-Income Families for 40 Years*. Washington, D.C.: Center on Budget and Policy Priorities, March 29, 2017.
  108. Abt Associates Inc., et al. *Effects of Housing Vouchers on Welfare Families*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, September 2006.
  109. Sanbonmatsu, Lisa et al. *Moving to Opportunity for Fair Housing Demonstration Program Final Outcomes Evaluation*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, November 2011.
  110. *Infant Mortality Research Partnership Reducing Infant Mortality in Ohio: Individuals, Communities, Systems, and Interventions*. Ohio Colleges of Medicine Government Resource Center, June 2017.
  111. Alhusen, Jeanne L., Linda Bullock, Phyllis Sharps, Donna Schminkey, Emily Comstock, Jacquelyn Campbell. "Intimate Partner Violence During Pregnancy and Adverse Neonatal Outcomes in Low-Income Women." *Journal of Women's Health*, 23, no. 11 (2014): 920-926. doi: 10.1089/jwh.2014.4862; Pavey, Ashleigh R et al. "Intimate Partner Violence Increases Adverse Outcomes at Birth and in Early Infancy." *The Journal of Pediatrics*, 165, no. 5 (2014): 1034-1039. doi: 10.1016/j.jpeds.2014.06.060
  112. Gentry, Jacqueline and Beth A. Bailey. "Psychological Intimate Partner Violence During Pregnancy and Birth Outcomes: Threat of Violence Versus Other Verbal and Emotional Abuse." *Violence and Victims*, 29, no. 3 (2014): 383-392. doi: 10.1891/0886-6708.VV-D-13-00020



113. Ibid.
114. Ibid.
115. Gubits et al. *Family Options Study: Short-Term Impacts of Housing and Services Interventions for Homeless Families*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research., July 2015.
116. Abt Associates Inc., et al. *Effects of Housing Vouchers on Welfare Families*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, September 2006.
117. Gubits et al. *Family Options Study: Short-Term Impacts of Housing and Services Interventions for Homeless Families*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research., July 2015.
118. Sanbonmatsu, Lisa et al. *Moving to Opportunity for Fair Housing Demonstration Program Final Outcomes Evaluation*. Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, November 2011.



### Transportation overview

This section begins with a brief summary of the ways that transportation affects health overall and then describes more specific ways that transportation infrastructure challenges contribute to infant mortality and related risk factors based upon a review of the research literature. This section also describes:

- Scope of transportation problems in Ohio
- Transportation policy landscape in Ohio (types of services, major policy levers, funding sources, and planning and implementation entities)
- Transportation policy goals and recommendations

Equity is addressed throughout this section by:

- Describing differences by race, ethnicity, sex, income level or other factors, when data is available
- Discussing structural drivers of inequities

### How transportation affects infant mortality: Literature review

Transportation affects *overall health and wellbeing* in several ways:<sup>1</sup>

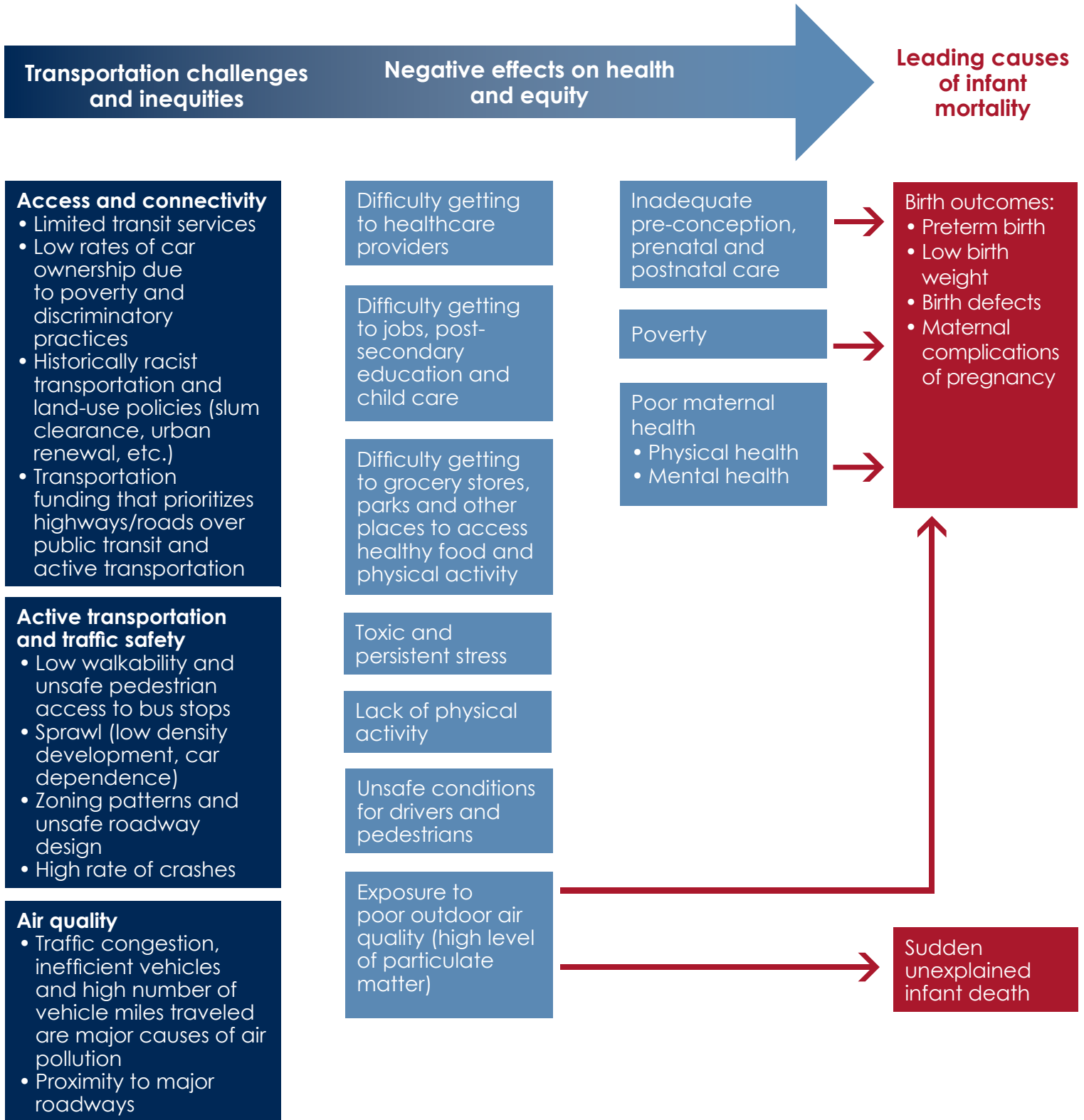
- **Access and connectivity:** The ability to get to health care, jobs, school, child care, social services, grocery stores, parks, libraries and other destinations impacts health behaviors, access to care and health outcomes.
- **Active transportation and traffic safety:** Walking, biking and public transit are transportation modes that increase physical activity. Active transportation infrastructure includes features such as sidewalks, curb ramps, crosswalks and multi-use trails that are designed to enable safe access for all users, including pedestrians and people with strollers or wheel chairs. More walkable communities with parks and playgrounds promote social connectedness. Land use and zoning patterns affect pedestrian safety, motor vehicle crashes and active transportation.

- **Air quality:** Air pollution has been linked to a number of negative health outcomes including asthma, heart disease and lung cancer.<sup>2</sup> Vehicle emissions are a major source of air pollution. Increasing public transit usage, improving transportation system efficiency and supporting cleaner vehicles and fuels can improve air quality.

Figure 5.1 applies these relationships between transportation and health specifically to the main causes of infant mortality. The research literature on the impact of transportation on infant mortality is less extensive than the literature on housing reviewed in the previous section. Some studies do, however, indicate indirect associations, and, in the case of air quality, direct links to the leading causes of infant deaths.



Figure 5.1. Relationship between transportation and infant mortality





### **Access and connectivity**

The most obvious connection between transportation access and infant mortality is that lack of transportation can make it difficult for women to get to healthcare services, including prenatal care. Taking a broader life-course perspective, however, there are many other ways that the quality and equity of the transportation infrastructure affects the wellbeing of children and adults, which can in turn affect birth outcomes and other factors (see figure 5.1).<sup>3</sup> For example, difficulty traveling from inner-city neighborhoods to jobs in suburban areas may contribute to poverty, a risk factor for infant mortality. Poverty, in turn, can restrict funds for car ownership, maintenance, insurance and fees.

Not having a car is a challenge in urban, suburban and rural communities. Although public transportation may be available in an urban or suburban area, bus trips can often involve transfers to two or more bus routes which can result in a two-hour bus ride to travel what would have taken 20 minutes by car. Needing to get to multiple destinations, such as child care, work or a doctor's appointment adds logistical challenges with getting around by bus. Rural communities have their own unique transportation challenges because public transportation is either very limited or not available at all.

### **Active transportation and traffic safety**

Low-density development, known as "urban sprawl," is an underlying structural factor that decreases active transportation and traffic safety, as well as transit access and air quality. In lower-density metropolitan areas, employment, stores, homes and other destinations are spread out, making it difficult to get to them without a car. Urban sprawl reduces walkability and increases the likelihood of pedestrian fatalities.<sup>4</sup> For these reasons, low-income families that do not own a car may be particularly disadvantaged in low-density environments and experience challenges getting to health care, jobs and other critical destinations.

Although motor vehicle crashes are not a major direct cause of infant mortality<sup>5</sup>, unsafe conditions for pedestrians are indirectly linked to poor birth outcomes because they reduce active transportation and access to public transportation. Overall, women living in areas without sidewalks, crosswalks or parks are less likely

to be physically active, which is a risk factor for hypertension, obesity and Type 2 diabetes<sup>6</sup>—all causes of maternal complications in pregnancy.<sup>7</sup> Concerns about crime and neighborhood safety can also deter physical activity.

### **Air quality**

There is a growing body of research on the relationship between outdoor air quality and the leading causes of infant mortality, including preterm birth, low birth weight and Sudden Infant Death Syndrome (SIDS). Systematic reviews in 2012 and 2015 concluded that air pollution exposure contributes to preterm birth and low birth weight.<sup>8,9</sup> A 2016 study estimated that 5.44 percent of preterm births in Ohio could be attributed to exposure to PM 2.5 (particulate matter less than 2.5 micrometers in diameter); this was the highest percent among all states.<sup>10</sup>

Laboratory research identifies several mechanisms through which air pollution may affect birth outcomes, including inflammation and inadequate blood flow to the placenta.<sup>11</sup> In addition to harmful effects on birth outcomes, researchers have found that air pollution exposure in early infancy increases the risk of post-neonatal infant mortality, including SIDS<sup>12</sup>, although more research is needed in this area. African American, Hispanic and Asian/Pacific Islander mothers are more likely to live in areas with higher levels of air pollution than white mothers<sup>13</sup>, indicating that poor outdoor air quality could be a contributor to racial/ethnic disparities in infant mortality.



## Scope of transportation problems in Ohio

This section describes the current status of transportation-related challenges in Ohio that are particularly relevant to infant mortality—personal vehicles, transit access, active transportation/pedestrian safety and air pollution.

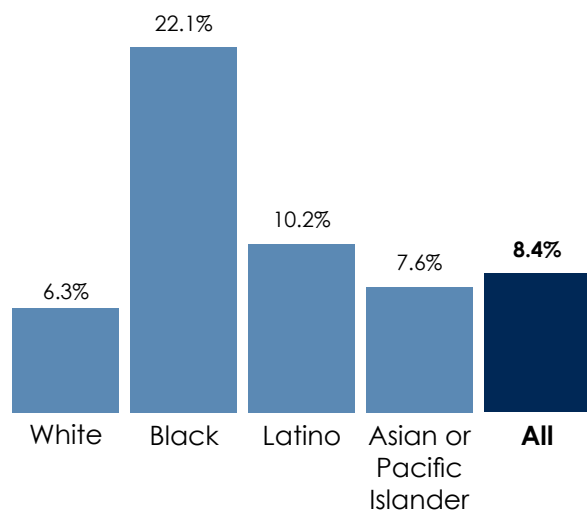
### Personal vehicles

In 2014, an estimated eight percent of Ohio households did not have a vehicle<sup>14</sup>, known as “zero-vehicle” households. Households that are low-income and urban are more likely than other households to not have a vehicle.<sup>15</sup> In addition, people who are African American or Latino/Hispanic are more likely than other racial/ethnic groups to live in a zero-vehicle household and to not have a driver’s license (see figures 5.2 and 5.3).<sup>16</sup> African-American women, a group at higher risk for infant mortality, are less likely than white women or men of any other racial or ethnic group to have a driver’s license (see figure 5.3).

For zero-vehicle household data for Ohio metropolitan areas, disaggregated by race and ethnicity, see the [National Equity Atlas](#).<sup>17</sup>

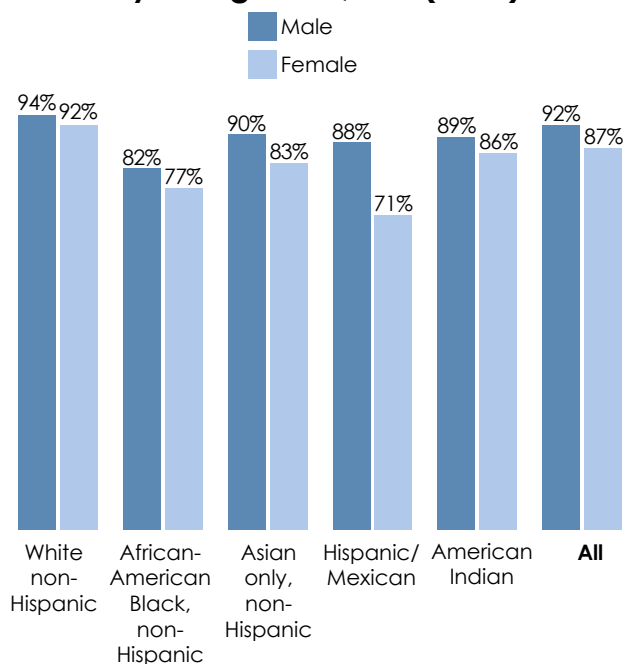
Driver’s license suspensions are widespread in Ohio and are one barrier to driving a personal vehicle that may disproportionately affect low-income communities. A 2017 analysis of Ohio Bureau of Motor Vehicles data found that

**Figure 5.2. Percent of households with zero vehicles, by race and ethnicity, Ohio (2014)**



Source: National Equity Atlas

**Figure 5.3. Percent of population age 16+ with a driver’s license, by race/ethnicity and gender, U.S. (2009)**



Source: 2009 National Household Travel Survey, as reported by American Association of State Highway and Transportation Officials, 2013

low-income zip codes had much higher rates of driver’s license suspensions than higher-income zip codes.<sup>18</sup>

The Ohio Bureau of Motor Vehicles reports that a total of 1,083,734 drivers had an active license suspension, as of Jan. 1, 2017.<sup>19</sup> Three of the four most common reasons for suspensions involved inability to afford car insurance or pay fees or fines, rather than direct traffic violations (see figure 5.4). Legal aid advocates report that these suspensions are a barrier to employment for low-income clients, which leads to reduced income and inability to pay future fines—an ongoing cycle that is difficult to break.<sup>20</sup>

Families without vehicles or driver’s licenses in rural areas face unique transportation challenges because robust public transit systems are not available or logistically feasible. Some rural counties do have transit agencies that provide demand-response or dial-a-ride services, but service times are limited.

### Transit access

Figure 5.5 describes the extent to which not having a car is a challenge for residents in Ohio’s largest



Figure 5.4. **Most common types of driver’s license suspensions in Ohio (active statewide active suspensions, as of Jan. 1, 2017)**

Type	Description	Total
<b>Noncompliance suspension (NC)</b>	A non-compliance suspension can be imposed when the Ohio Bureau of Motor Vehicles (BMV) is notified that a <b>driver failed to show proof of insurance</b> at a traffic stop or at an accident. The penalty for a second non-compliance offense in a five-year period is a one-year suspension. The penalty for a third non-compliance offense in a five-year period is a two-year suspension.	1,248,947
<b>License forfeiture (LF)</b>	A license forfeiture suspension can be imposed when an individual is charged with a first, second, third or fourth degree misdemeanor and either <b>fails to appear in court or fails to pay a court fine.</b>	484,072
<b>Court suspension/OVI (D1)</b>	A court may impose a suspension for traffic violations; the length of the suspension is determined by the court.	328,493
<b>Child support suspension (KS)</b>	A child support enforcement agency can order a license suspension because of <b>failure to pay on a child support order</b> or failure to answer to a warrant or subpoena for child support issues. This suspension is indefinite and will stand until all requirements are met.	232,403

Source: State of Ohio Bureau of Motor Vehicles (information provided directly to HPIO)<sup>21</sup>

metropolitan areas based upon overall access to public transit and the percent of jobs that are accessible via transit. Residents in Akron and Cleveland had the most overall access to public transit in 2010, while Youngstown residents had the least. Job access via transit was best in Columbus, Dayton and Toledo, although even in those cities, fewer than half of jobs were accessible within at least 90 minutes via bus. The "rank among U.S. metros" column in figure 5.5 shows that Ohio cities generally rank in the bottom half of U.S. cities on transit coverage. This means that Ohioans who

rely on the bus to get to work often face very long commute times, which is particularly challenging for parents with young children.

**Transit Score**<sup>22</sup> is another methodology for calculating the robustness of a city’s transit system. A higher score indicates a more useful transit system with more routes and more frequent service. All three of Ohio’s largest cities score relatively low on this measure, indicating that in Cleveland, Columbus and Cincinnati most errands require a car.<sup>23</sup> Transit Score is also

Figure 5.5. **Transit coverage and job access in Ohio cities (2010)**

Metropolitan area	Transit coverage rate (percent of households served by transit)		Job access rate (percent of jobs accessible in at least 90 minutes via transit)	
	Percent	Rank among U.S. metros*	Percent	Rank among U.S. metros*
<b>Akron</b>	88.9%	35	31.3%	70
<b>Cleveland-Elyria-Mentor</b>	87.7%	41	37.6%	48
<b>Dayton</b>	84.5%	54	42.1%	29
<b>Toledo</b>	81.4%	59	40.5%	37
<b>Cincinnati-Middletown (OH, KY, IN)</b>	78.7%	66	33.9%	61
<b>Columbus</b>	78.3%	70	41.2%	34
<b>Youngstown-Warren-Boardman (OH, PA)</b>	55.6%	95	15.7%	96

\*1= best rank, 100=worst

Source: Transit Access and Zero-Vehicle Households. Brookings, 2011.



### Advisory Group insights: Bus system challenges for pregnant women and families with young children

Even when public transit is available, members of the Advisory Group reported that pregnant women and families with young children struggle with riding the bus for the following reasons:

- Difficulty walking long distances to bus stops (“first mile/last mile” challenges getting to and from the bus), especially while pregnant or with infants or toddlers
- Lack of sidewalks along route to bus stops and concerns about pedestrian safety, particularly in winter weather

- Lack of benches and bus shelters
- Lack of lighting and concerns about safety while walking and waiting for the bus
- Challenging logistics of getting to child care, work, appointments and errands with long waits and limited bus routes
- Bus riding policies that are not family friendly (e.g., some transit systems do not allow children to stay in strollers or limit the number of bags you can bring with you on the bus)
- Inability to afford bus fare

available at the neighborhood level for these three cities, which may be a useful source of information for local infant mortality reduction collaboratives.

### Active transportation and pedestrian safety

Calculated based on the walking distance to amenities, **Walk Score**<sup>24</sup> is a useful indicator of neighborhood connectivity, access to active transportation and pedestrian safety. As shown in figure 5.6, Ohio's largest cities are less walkable than many other U.S. cities, and Cincinnati and Cleveland are better environments for pedestrians than are Columbus and Toledo.

**Walk Score** is also available at the neighborhood level for these four cities, which may be a useful source of information for local infant mortality reduction collaboratives.

Urban sprawl is another indicator of the extent to which a geographic area is amenable to public transportation and pedestrian safety. The sprawl scores and ranks displayed in figure 5.7 take into consideration four factors:<sup>25</sup>

- **Development density:** Measures the extent to which people live and work in high-density areas
- **Land use mix:** Balance of jobs to total population, mix of job types and Walk Score
- **Activity centering:** Proportion of people and businesses located near each other
- **Street accessibility:** Block size and density of intersections

Low-income families without a vehicle may find it particularly challenging to get to health care, employment, child care and other destinations

in metropolitan areas with more sprawl, or in rural areas. Most Ohio metropolitan areas rank in the bottom half of U.S. metros, indicating more sprawl.

In 2015, there were 1.0 pedestrian fatalities due to vehicle crashes per 100,000 population in Ohio, slightly below the overall U.S. rate of 1.67.<sup>26</sup> Pedestrian fatality rates are disproportionately high for racial and ethnic minorities; in Ohio in 2005-2013, 24 percent of pedestrian fatalities were among people of color or Hispanic/Latino ethnicity, although these groups only made up 19 percent of the population.<sup>27</sup> Pedestrian fatalities are relevant to infant mortality because they deter active transportation.

Figure 5.6. **Walk Score for Ohio's largest cities\* (2017)**

City	Walk Score	Description	Rank among large U.S. cities (1=most walkable)
Cleveland	59.5	50-69=	27
Cincinnati	50.4	Somewhat walkable (some errands can be accomplished on foot)	35
Toledo	45.9	25-49=	45
Columbus	40.7	Car-dependent (most errands require a car)	66

\*Only available for four Ohio cities. Rank is among U.S. cities with population 200,000 and larger.

Source: Walk Score: <https://www.walkscore.com/cities-and-neighborhoods/>





## Ohio stories

### Who wins when a city gets smart?

Katrina Lewis could feel impatience radiating off the bus as she struggled to collapse the stroller. That was the rule on Columbus transit, the driver said, even with small children in tow.

That meant extracting her newborn and two-year-old from the big doublewide baby carrier as the four-year-old stood next to her. All the passengers seemed to stare as Lewis bent over the bulky stroller, baby gripped in one arm, crying. Her bad hip ached under the strain. She thought she heard someone on the back of the bus shout her name: Come on, Katrina!

That's it, Lewis thought. "I could not handle it that day," says the 37-year-old. She picked up the stroller, backed off the bus, and hauled her family, on foot, nearly a mile to the primary care center where the children had doctor's appointments that day. They were nearly half an hour late. "I should tell y'all to go home," Lewis remembers the receptionist telling her. Hours later, after they'd walked back home, she collapsed on the couch from the exhaustion.

— CityLab, Nov. 1, 2017 (excerpt)

### Stranded in central Ohio

Anita Rosvanis walks to her COTA stop weekday mornings around 10 a.m. The single mother of three starts her journey by checking the bus schedule with an app on her smartphone.

"I hate this because I could be at home spending time with my daughter, but the bus wants to come later and later and later," Rosvanis says. "'Cause at the house it said, what, 10:07, and now it's saying 10:13. And I don't like missing this bus because then I'll miss the second bus and have to wait longer."

The bus arrives at 10:14.

Rosvanis rides the first bus for about 7 minutes, gets off at Cleveland and Innis, then waits about 10 minutes before the second bus picks her up.

A 30-minute ride takes Rosvanis to the Easton Transit Center off Morse Road near I-270, where she waits several minutes for a third bus. This bus takes her to her last stop north of Morse on Hamilton Road.

By the time Rosvanis arrives in Gahanna, she has traveled on three buses. But her trip is not over. She still has to walk about half a mile on Morse Road to the apartment complex where she works.

There is no sidewalk.

"Now I just have to walk on one side of the street, because on the other side it's a real narrow path and when cars come you get sideswiped," Rosvanis says.

Rosvanis' one-way trip takes her 1.5 hours. At work, she makes \$9 an hour.

"Majority of my money goes toward child care and a bus pass, and the rest will go on utilities, or food, or whatever I need for the house or for my kids," Rosvanis says.

— WOSU Public Media, Oct. 27, 2017 (excerpt)



Figure 5.7. **Sprawl index score for Ohio metropolitan areas (2014)**

Metropolitan Statistical Area	Sprawl composite score (higher number indicates less sprawl)	Rank among 221 U.S. metros (1=least sprawl)
Canton-Massillon	106.99	93
Akron	103.15	111
Dayton	101.48	116
Toledo	100.90	117
Columbus	93.00	138
Cleveland-Elyria-Mentor	85.62	153
Cincinnati-Middletown (OH-KY-IN)	80.75	166
Youngstown-Warren-Boardman (OH-PA)	78.08	175

Source: Measuring Sprawl 2014, Smart Growth America, 2014.

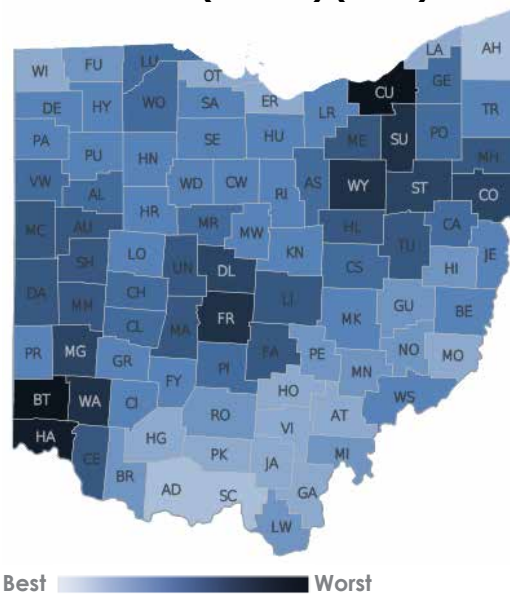
### Air pollution

Air pollution is a significant challenge for Ohio. Our state ranked 45th in outdoor air quality (particulate matter pollution less than 2.5 micrometers, PM 2.5) for 2012-2014<sup>28</sup>, meaning that Ohioans breathe more polluted air than people in most other states.

Air quality varies widely by geography, with urban areas generally having higher rates of particulate matter pollution (see figure 5.8). Regions that do not meet clean air standards established by the U.S. Environmental Protection Agency (EPA) are referred to as “non-attainment/maintenance” areas. Twenty-one Ohio counties are currently designated as non-attainment/maintenance for air quality.<sup>29</sup> Six of these are infant mortality hot spot communities (Ohio Equity Institute counties).

For air pollution exposure data for Ohio metropolitan areas, disaggregated by race and ethnicity, see the [National Equity Atlas](#).

Figures 5.8. **Air pollution- particulate matter: Average daily density of fine particulate matter in micrograms per cubic meter (PM 2.5) (2012)**



Source: County Health Rankings and Roadmaps



## Underlying structural drivers of inequities

Using a personal vehicle for transportation requires having a car, car insurance and a driver's license. Minority and low-income Ohioans are less likely to have each of these resources, largely due to underlying structural factors.

First, as shown in figure 5.2, African-American households are less likely than any other racial or ethnic group to have a vehicle. Given lower levels of income and wealth among black families, many African Americans lack financial reserves to purchase and maintain a car<sup>30</sup> and may be more vulnerable to discriminatory practices in auto lending.<sup>31</sup> There is also some evidence that car insurance premiums are higher in minority neighborhoods than in majority-white neighborhoods, regardless of insurance risk levels.<sup>32</sup> Insurance premium costs may therefore be an important barrier to car ownership for African American and other minority Ohioans.

Second, as discussed above, low-income communities have higher rates of driver's license suspensions than other communities. Similarly, research in three U.S. cities found that African Americans are more likely than whites to have unpaid fees and fines (including parking tickets and license plate renewal fees) that lead to aggressive debt collection.<sup>33</sup> Relatively small fines related to car ownership (or other factors) can therefore lead to escalating amounts of debt, exposure to predatory lending and wage garnishment.

Given these challenges to driving a personal vehicle, public transportation is particularly important for low-income and minority communities. Historically, transportation policies in the U.S. have favored highway development over public transportation. Furthermore, transportation planning lacked meaningful involvement from the low-income and minority communities that were often negatively affected by transportation and land use policies such as "slum clearance" and "urban renewal." Beginning with the Transportation Equity Act for the 21st Century (TEA-21) in 1998, state and regional entities are now required to increase public involvement in transportation planning.<sup>34</sup>

As highlighted by Rosa Parks and the Montgomery bus boycott of 1955-56, equitable transit access has been a key civil rights issue in the U.S. The Kirwan Institute for the Study of Race and Ethnicity at The Ohio State University recently released a documentary, [Free to Ride](#)<sup>35</sup>, about a 2011 lawsuit that arose when the city of Beavercreek, a predominantly white Dayton suburb, blocked the Greater Dayton Regional Transit Authority from placing three bus stops in their community. This film provides a case study for the ways that access to public transportation continues to be a civil rights issue in Ohio.

Going forward, strategies to address transportation inequities need to include short-term approaches to connect disconnected Ohioans to jobs and critical resources, as well as longer-term policy changes that fundamentally change the transportation landscape in ways that provide all Ohioans with the opportunity to get where they need to go.



## Transportation policy landscape in Ohio

### Existing policies and programs most relevant to infant mortality

Many low-income families rely on transit systems and turn to transportation assistance programs because they do not have a personal vehicle and/or driver's license. In addition to fixed route transit via buses, there is a complex array of transportation services in Ohio with varying eligibility requirements. Figure 5.9 provides an overview of transit services in Ohio. Many of the existing services are designed for people with disabilities and older adults, making them unavailable to those at highest risk for infant mortality.

Based upon the findings of the literature review above, and feedback from the Advisory Group, the following transportation policies and

programs are most relevant to infant mortality high-risk populations:

- Medicaid non-emergency medical transportation (NEMT)
- Public transportation (urban fixed route bus systems)
- Active transportation infrastructure (pedestrian safety and pedestrian access to bus stops)

### Medicaid non-emergency medical transportation (NEMT)

Because many low-income and African American women have limited access to personal vehicles, and public transportation systems are inadequate in many Ohio communities (particularly rural areas), NEMT is a critical service for getting to healthcare appointments, including prenatal care. It is important to note, however, that NEMT cannot be used to get to child care, employment,

Figure 5.9. Examples of transit services in Ohio\*

Type of service	Examples	Eligibility and priority populations
<b>Fixed route transit, mostly buses</b>	<ul style="list-style-type: none"> <li>• COTA buses in Franklin County</li> <li>• BCRTA buses in Butler County</li> <li>• TARTA buses in Lucas County</li> </ul>	Some discounts available for older adults, students and people with disabilities (varies by region)
<b>Non-emergency medical transportation</b>	Medicaid non-emergency transportation, arranged through Medicaid managed care plans and provided by taxi or bus	Medicaid enrollees traveling to Medicaid activities without own transportation (all counties)
	Pregnancy-Related Services (case management and transportation), arranged by county Job and Family Services (CDJFS) office. Can include rides to medical appointments provided by taxi or bus.	Medicaid-eligible pregnant women (up to 60 days after delivery) (all counties)
<b>Paratransit, deviated fixed route, dial-a-ride or demand-response (usually vans or small buses)</b>	Mainstream-COTA demand-response service for people with disabilities (central Ohio)	Eligibility guidelines based on the Americans with Disabilities Act <sup>36</sup>
<b>Human services transportation</b>	Transportation for older adults provided by senior centers or Area Agencies on Aging	<ul style="list-style-type: none"> <li>• Older adults (such as age 60+)</li> <li>• Some services may have additional eligibility requirements related to veteran status, Medicaid eligibility or disability status (varies by county)</li> </ul>

\* Relevant services will be described in more detail later in this section.

Source: Transit service hierarchy in the Ohio Statewide Needs Study: Final Report, 2015.



the grocery store or other destinations. NEMT is a stop-gap solution to problems in the overall transportation infrastructure.

Medicaid is the most common form of health insurance for low-income pregnant women, and most are enrolled in Medicaid managed care plans.<sup>37</sup> Medicaid is a federal-state partnership program in which the federal government and states share the cost of providing coverage to enrollees for a defined set of medical services. The federal government requires Medicaid to provide transportation to medically-necessary appointments, a service known as NEMT.<sup>38</sup> In addition to Medicaid-funded NEMT administered through CDJFS offices, managed care plans provide an “additional transportation benefit” for appointments closer than 30 miles, with some limitations.

NEMT can be delivered by taxi or para-transit vans, or through a bus pass or mileage reimbursement provided to the enrollee. Women who are enrolled in a Medicaid managed care plan have two ways they can access NEMT:

- **Managed care plan:** A woman can call her managed care plan's transportation vendor to arrange NEMT, typically via taxi. The plans require the NEMT request to be made at least 48 hours (or two business days) before the medical appointment and the service is limited to 15 round trips (30 one-way trips) per year. Currently, all plans allow for NEMT to be used for other services in addition to medical appointments, including trips for WIC services and CDJFS redetermination appointments.
- **CDJFS office:** A woman can also contact her CDJFS office to arrange NEMT. There are no limits on the number of medically-necessary trips per year. Currently, each county has its own Medicaid NEMT plan, and service restrictions, advance-notice timeframes and transportation modes (taxi, bus, etc.) vary by county.

Medicaid managed care plan agreements with the state include very specific requirements for NEMT, including a provision that the plan must ensure that enrollees are picked up not more than 15 minutes before or after their scheduled pick-up time, and that pick-up following an appointment must be within 30 minutes after the request.<sup>39</sup> An enrollee can call her plan to report a complaint, such as being picked up several hours after an appointment is over. The

Ohio Department of Medicaid (ODM) recently made data system changes that allow it to better monitor these grievance reports. Transportation grievances account for about 6 percent of the total number of grievances received. For example, ODM received 718 transportation grievances out of 11,883 total grievances in September 2017.<sup>40</sup>

Because the current CDJFS-administered NEMT program is administered by 88 different CDJFS offices, CDJFS NEMT varies widely across the state and standardized performance and grievance data is not available.<sup>41</sup> The 2018-2019 state budget called for a change in how these services are organized and financed with the goal of increasing the efficiency, transparency and consistency of transportation services. Starting in July 2018, a state-based brokerage model is slated to be implemented, in which Ohio Medicaid will contract with a third party transportation broker to manage NEMT services currently arranged by CDJFS, using existing transportation resources. This policy change will shift responsibility for funding and managing NEMT from the Ohio Department of Job and Family Services (ODJFS) to the ODM. ODM will receive partial reimbursement for these services from the federal government at the Federal Medical Assistance Percentage (FMAP) rate.<sup>42</sup> (It is important to note that this statewide brokerage model will not replace NEMT provided through managed care plans. Both systems will continue to exist.)

### Public transportation (fixed route bus systems)

Public transportation is operated by local transit agencies and funded by federal, state and local governments. Ohio has 27 urban transit agencies, 34 rural transit agencies and 26 counties that do not have a transit agency. In general, urban transit agencies operate fixed route bus service, while rural agencies operate dial-a-ride or demand-response service. Less populous areas, such as small-city and rural counties, have lower population density and fewer people likely to use buses, making it more difficult to sustain a bus system.<sup>43</sup> Given the relevance to infant mortality and number of Ohioans affected, this section focuses primarily on fixed route bus systems in urban counties.



## Advisory Group insights: Challenges with Medicaid NEMT

Advisory Group members reported widespread problems with Medicaid NEMT through managed care plans and CDJFS for pregnant women and parents of young children, such as:

- Drivers being late for pick up from home, or late for return trip from healthcare provider
- Patients having difficulty planning 48 hours ahead to set up rides
- Lack of car seats in taxis
- Poor customer service from taxi drivers and dispatchers
- Inability to bring additional passengers, such as other children or family members
- Limit of 15 round trips per year is not enough for women with higher-risk pregnancies who require additional prenatal care visits

### Transit funding

Bus systems are funded largely by federal and local governments, with a relatively small investment from the state. In 2012, 56 percent of urban transit agency funding was from local sources and 25 percent was from federal sources, while only two percent was from the state (see figure 5.10).

The Federal Transit Administration (FTA) is the primary source of federal funds. FTA funding is accessed directly by most large urban systems and administered through the Ohio Department of Transportation for rural and small urban transit systems.<sup>44</sup>

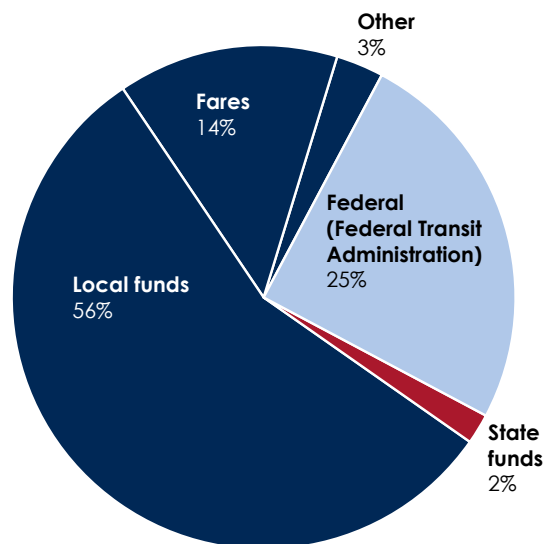
State General Revenue Fund (GRF) spending on transit has declined in recent years, and Ohio relies more heavily on local funding for transit compared to many other states. In 2012, Ohio's \$0.63 per capita transit spending ranked among the lowest in the U.S. (38 out of 51).<sup>45</sup> Some states, such as Indiana and New York<sup>46</sup>, allocate a portion of state gas tax revenue toward public transportation. Ohio, however, does not (per ORC 5501).

At the local level, the primary sources of revenue for transit systems are:

- Passenger fares
- Sales and property taxes
- Earnings taxes
- Contract revenues
- Local government contributions from the general revenue fund
- Other miscellaneous sources, such as advertisement revenues<sup>47</sup>

The state of Ohio permits local jurisdictions to support transit agencies through dedicated sales

Figures 5.10. Sources of funding for Ohio's urban transit agencies (2012)



Source: Ohio Statewide Transit Needs Study, Final Report, Ohio Department of Transportation, 2015

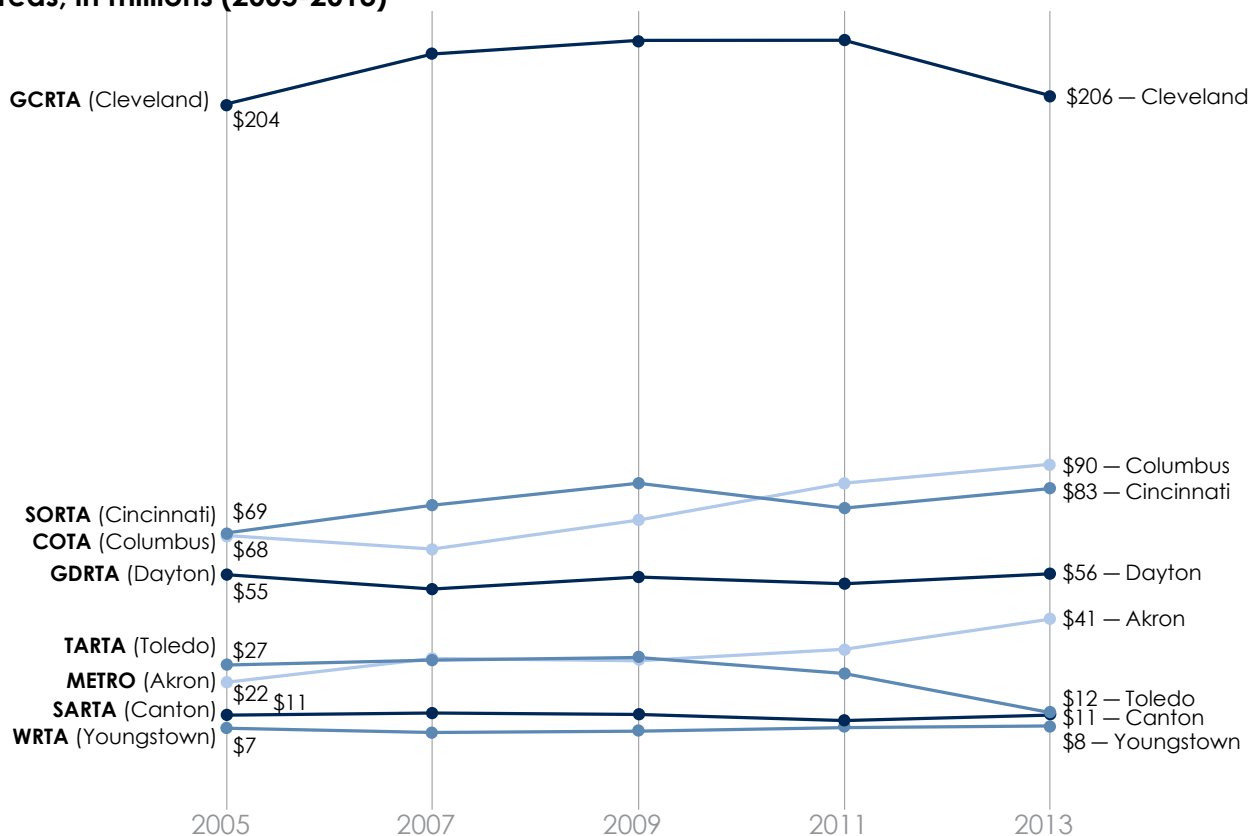
taxes and/or property taxes. Most urban transit systems are supported by dedicated local sales taxes. Lucas County, however, relies on a local property tax, and the Southwest Ohio Regional Transit Authority (SORTA, also known as "Metro"), which serves Cincinnati, is funded by a local earnings tax.<sup>48</sup>

From 2005 to 2013, transit system spending increased in most Ohio metropolitan areas, except for Toledo and Cleveland, where it declined after 2011 (see figure 5.11).

Transit systems that rely upon sales tax are slated to lose revenue from a Medicaid managed care plan tax, in place since 2009, that the federal government is requiring Ohio to repeal. The



Figures 5.11. Total system cost (fixed route only) of transit systems in Ohio metropolitan areas, in millions (2005-2013)



Source: Status of Public Transit in Ohio, ODOT, July 2006, October 2008, July 2010, July 2012, October 2014

2018-2019 state budget included a lump sum replacement plan to defray some of the impact in the first year. Beyond 2018, several transit systems will have reduced revenue because of this policy change.

For additional information about transit funding in Ohio, see the [Ohio Statewide Transit Needs Study](#).<sup>49</sup>

#### Transit policy, planning and implementation

The following entities are involved in transit regulation, planning and decision making:

- **Federal Transit Administration (FTA):** An agency within the U.S. Department of Transportation that regulates and helps fund public transportation, including capital and operating costs.
- **Ohio Department of Transportation (ODOT):** State agency responsible for developing and maintaining all state and federal roadways in the state of Ohio, with the exception of the Ohio Turnpike.

- **Metropolitan Planning Organizations (MPO):**

Local entities designated by law with lead responsibility for developing transportation plans and programs for urbanized areas of 50,000 or more in population. MPOs set coordination standards and managed processes for selecting projects to be funded through federal transportation programs. Ohio has 17 MPOs (see figure 5.12). MPOs work closely with local transit agencies to coordinate transit services with other regional planning activities.

- **Transit agencies:** Local entities that operate bus systems and other transit services. A "transit authority" is a specific type of transit agency that can request levies for funding, such as the Central Ohio Transit Authority (COTA).
- **Local municipalities (counties, cities, villages, townships):** Local government entities that make decisions about land use, zoning and transportation infrastructure.

ODOT, MPOs and local transit agencies must follow regulations and planning requirements that



have been specified through a series of major federal civil rights and transportation acts and subsequent federal guidance and law, including:

- **Civil Rights Act of 1964:** Title VI of this landmark civil rights legislation prohibits recipients of federal funding (including Federal Highway Administration transit funding) from excluding persons from participation in programs or denying persons the benefit of programs on the basis of race.
- **Intermodal Surface Transportation Efficiency Act (ISTEA) (1991):** Requires each state to develop a Statewide Transportation Improvement Program, which includes a transit component.
- **Transportation Equity Act for the 21st Century (TEA21) (1998) and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (2005):** Additional definition of Statewide Transportation Improvement Program requirements, including for community engagement in decision making.
- **Moving Ahead for Progress in the 21st Century Act (MAP-21) (2012) and Fixing America's Surface Transportation Act (FAST) (2015):** Added a performance management approach to transportation planning.<sup>50</sup>

ODOT released the **2018-2020 Statewide Transportation Improvement Program**<sup>51</sup>, effective July 2017, which includes the following sections relevant to infant mortality reduction:

- **Environmental justice:** In order to address the needs of low-income and racial/ethnic minority Ohioans, the plan identifies target populations, describes the public involvement process in transportation planning and analyzes adverse impacts and benefits for target populations of transportation policies and programs.
- **Title VI/Nondiscrimination program:** Describes how ODOT complies with Title VI of the Civil Rights Act. (Additional information about ODOT compliance with federal civil rights laws and regulations is posted [here](#).<sup>52</sup>)
- **Transit:** Describes public transportation programs coordinated by ODOT, including:
  - **Ohio Coordination Program:** Federal funding for local and regional mobility managers who work to improve transportation options at the community and personal level. These mobility managers are potential partners for local infant mortality reduction collaboratives.
  - **Specialized Transportation (FTA Section 5310):** Federal funds to support transportation infrastructure and services for seniors and people with disabilities. Requires a 20 percent

non-federal transportation funds match. It can be matched with federal health or HUD funds.

- **Air quality conformity:** Identifies Ohio regions that do not currently meet clean air standards established by the U.S. EPA, and describes strategies to improve air quality in those areas.

At the local/regional level, MPOs are responsible for creating a Locally-developed, Coordinated Public Transit-Human Services Transportation Plan, referred to as a “coordinated plan.” These plans identify transportation resources, gaps, unmet needs and strategies for improvement. Federal law requires public participation in the planning process. Local infant mortality reduction collaboratives can participate as stakeholders.

ODOT provides **guidance**<sup>53</sup> on coordinated plans, and the local/regional plans for Ohio communities are posted [here](#).<sup>54</sup>

### Active transportation infrastructure and policy

Active transportation infrastructure refers to built environment features that support walking and biking, such as sidewalks, curb ramps, crosswalks, pedestrian-friendly intersections, bike lanes and multi-use trails. Given the needs of the infant mortality priority populations, this report focuses on pedestrian safety and pedestrian access to bus stops, particularly in infant mortality hot spot neighborhoods.

### Active transportation infrastructure funding

Active transportation infrastructure projects are implemented at the local level, but can be funded by federal, state and local sources. In FY 2012-2014, Ohio obligated 2.3 percent of federal transportation funds toward active transportation projects, totaling \$91,141,185 of federal dollars for bike and pedestrian projects. This investment is similar to the overall U.S. rate of 2.0 percent.<sup>55</sup>

### Active transportation policy, planning and implementation

ODOT, in partnership with the Ohio Department of Health, developed an **Active Transportation Plan** for Ohio<sup>56</sup>, as well as an **Active Transportation Guide** for local communities.<sup>57</sup>

Many local communities also have Active Transportation Plans, sometimes known as Complete Streets Plans. **Complete Streets policies** are designed to enable safe access for all users, including pedestrians, people with strollers or





wheel chairs, bicyclists, motorists and transit riders.<sup>58</sup> Planning and implementation of local or regional Active Transportation or Complete Streets plans typically involve collaboration between MPOs, local governments, local health departments and other partners. For example, central Ohio's MPO (MORPC) has adopted a **Complete Streets Policy**<sup>59</sup> and developed a **Complete Streets Toolkit**<sup>60</sup> (including model policies for municipalities). MORPC also developed the **2016-2040 Columbus Area Active Transportation Plan**<sup>61</sup>, with stakeholder input from a wide variety of local public and private partners. Examples of Complete Streets policies from other Ohio communities are posted [here](#).<sup>62</sup>

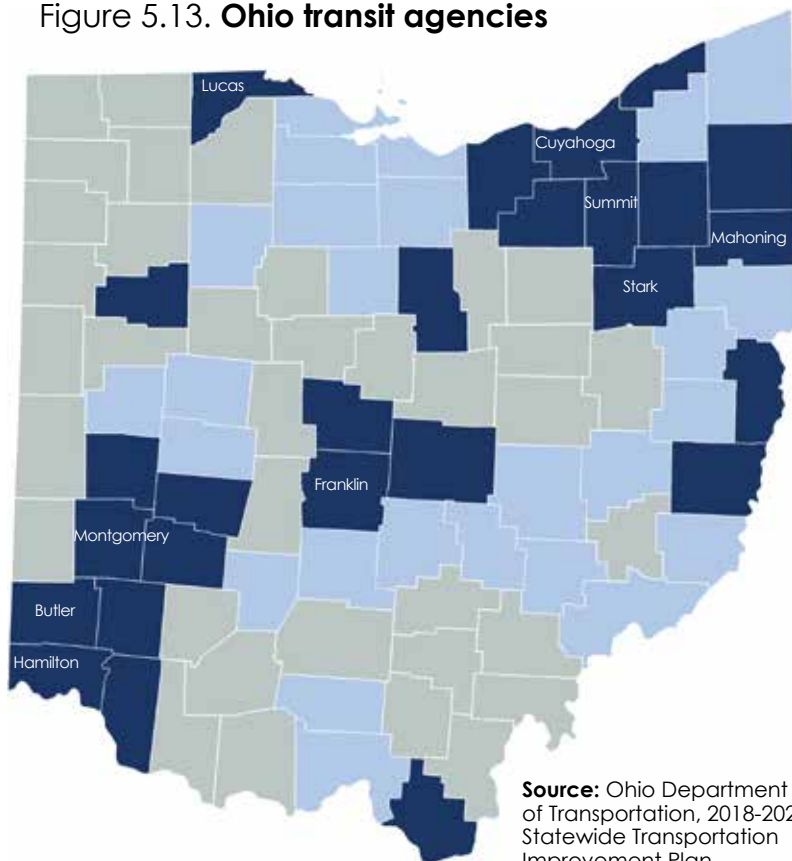
Columbus Public Health and CelebrateOne (infant mortality reduction collaborative) partner with MORPC to improve transit access and pedestrian safety in infant mortality hot spot neighborhoods. For example, the City of Columbus recently added sidewalks near bus stops in the North Linden neighborhood based upon information gathered by CelebrateOne. This is part of a broader Sidewalk Prioritization Model that identifies sidewalk gaps and prioritizes investments in infant mortality hot spot areas in order to improve access to bus stops, parks, schools, libraries and healthcare providers.

Figure 5.12. Ohio Metropolitan Planning Organizations (MPOs)



Source: Ohio Department of Transportation

Figure 5.13. Ohio transit agencies



Source: Ohio Department of Transportation, 2018-2021 Statewide Transportation Improvement Plan

Legend:  
■ Rural  
■ Urban  
 County Urban Ohio Equity Institute (OEI) hot spot county

Ohio Equity Institute (OEI) counties	Transit system
Butler	Butler County Regional Transit Authority
Cuyahoga	Greater Cleveland Regional Transit Authority
Franklin	Central Ohio Transit Authority
Hamilton	Southwest Ohio Regional Transit Authority
Lucas	Toledo Area Regional Transit Authority
Mahoning	Western Reserve Transit Authority
Montgomery	Greater Dayton Regional Transit Authority
Stark	Stark Area Regional Transit Authority
Summit	METRO Regional Transit Authority



## Transportation policy recommendations

HPIO drew upon the following sources of information to identify policy goals and recommendations to improve transportation in Ohio:

- Literature review, scope of problem and policy landscape (part five of this report)
- Evidence inventories (see Appendix B)
- Suggestions and feedback from the Advisory Group, including prioritization of goals and recommendations
- Input from additional subject matter experts on technical and political feasibility

See Appendix D for a detailed description of the policy recommendation development process.

The following policy goals address the most critical transportation challenges and inequities facing Ohio families at risk for infant mortality. Research indicates that achievement of these goals would likely contribute to improved birth outcomes, healthier infants and health equity.

### Transportation policy goals

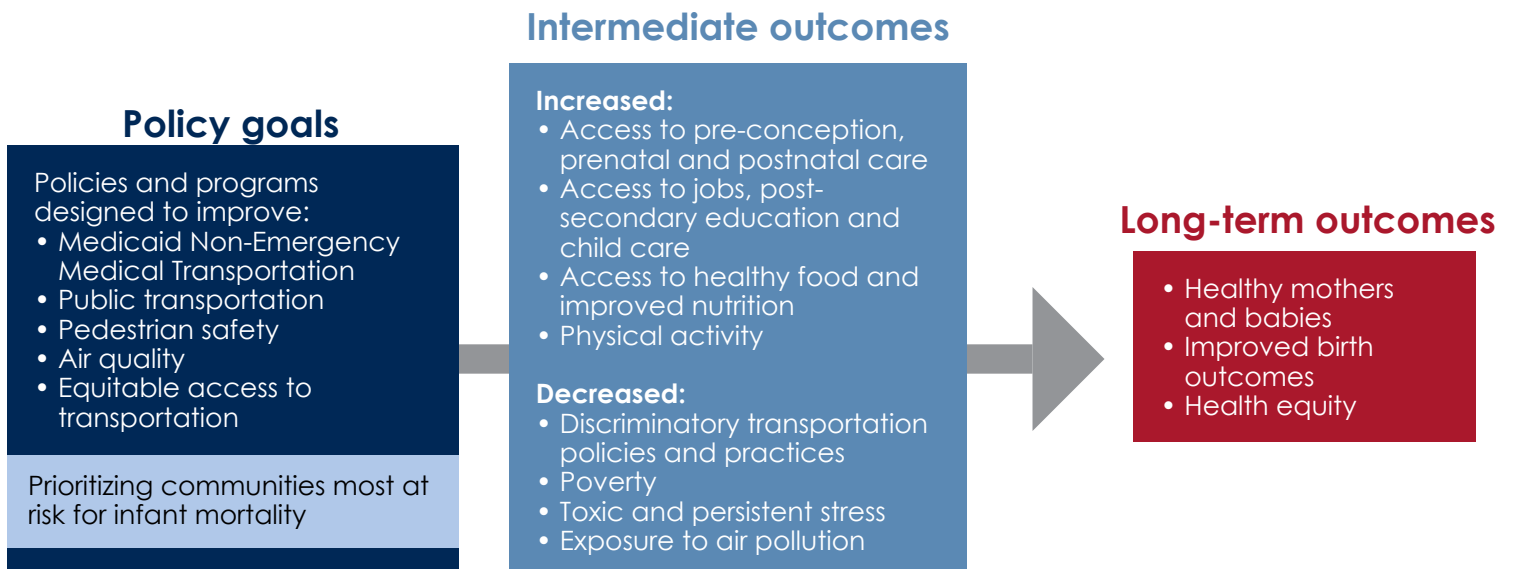
#### Top-priority goals

1. Increase access to health care, particularly for pregnant women and parents of young children, by evaluating and continuously improving Medicaid Non-Emergency Medical Transportation provided through managed care plans
2. Increase access to health care, particularly for pregnant women and parents of young children, by evaluating and continuously improving Medicaid Non-Emergency Medical Transportation to be provided through the new state-based brokerage model starting in 2018
3. Strengthen access to public transportation by improving and expanding local bus systems
4. Improve pedestrian safety and active transportation through infrastructure design and investment

#### Additional goals

5. Decrease barriers to maintaining a driver's license
6. Improve air quality through reduced vehicle emissions

Figure 5.14. Transportation policy goals





In order to reach these long-term policy goals, this report identifies specific and actionable recommendations for state and local policymakers. The top-priority recommendations are listed below and additional policy options are listed in Appendix A.

**Transportation policy goal 1.** Increase access to health care, particularly for pregnant women and parents of young children, by evaluating and continuously improving Medicaid Non-Emergency Medical Transportation provided through managed care plans

- 1.1 Medicaid managed care plans can monitor NEMT grievances from members and promptly make changes to improve the timeliness and quality of NEMT, prioritizing infant mortality hot spot areas.
- 1.2 Medicaid managed care plans can improve the timeliness, responsiveness and customer service of NEMT provided by vendors (including reduced wait times and improved scheduling process), and increase the overall accountability and transparency of the Medicaid NEMT system.
- 1.3 Medicaid managed care plans can explore the use of Lyft, Uber or other ride-sharing services and innovative technologies (such as apps) for NEMT.
- 1.4 The Ohio Department of Medicaid can carefully monitor and enforce managed care plan compliance with NEMT requirements in their contracts.

**Transportation policy goal 2.** Increase access to health care, particularly for pregnant women and parents of young children, by evaluating and continuously improving Medicaid Non-Emergency Medical Transportation to be provided through the new state-based brokerage model starting in 2018

- 2.1 The Department of Medicaid can develop performance metrics and a data tracking system to monitor the effectiveness of the new brokerage model. Metrics to monitor include:
  - a. Passenger information (type of visit, number of passengers, etc., while protecting patient privacy)
  - b. Ride information (on-time rates, no-show rates for drivers and passengers, wait times, etc.)

- c. Quality of service information (complaints, driver reviews, call volume and responsiveness, etc.)

The Department can use this information to monitor performance of vendors, identify trends, increase transparency and accountability, and improve service, particularly in infant mortality hot spot areas.

- 2.2 The Department of Medicaid can use the results of the performance measurement described above to improve the timeliness, responsiveness and customer service of NEMT provided by vendors (including reduced wait times and improved scheduling process) and increase the overall accountability and transparency of the Medicaid NEMT system.
- 2.3 The Department of Medicaid can explore the use of Lyft, Uber or other ride sharing services and innovative technologies (apps) for NEMT.

**Transportation policy goal 3.** Strengthen access to public transportation by improving and expanding local bus systems

- 3.1 State policymakers can support bus systems by replacing lost revenue from the cut to transit authorities that resulted from the repeal of the Medicaid managed care organizations sales tax required by the federal government.
- 3.2 State legislators can increase funding available to local bus systems from existing revenue by allowing gas tax and vehicle-related fee revenue to be used for transit systems through revision of ORC 5501.05. (ORC 5501.05 currently prohibits use of fuel or vehicle-related fees or taxes for non-highway purposes.)
- 3.3 Local transit agencies, metropolitan planning organizations and other transportation partners can actively engage groups at high risk for infant mortality—particularly African-American and low-income families with young children—in decisions about transit services and improvements to the built environment.
- 3.4 Local transit agencies can improve local bus systems and prioritize the needs of pregnant women, families and people of childbearing age in transit system improvements:
  - a. Add or expand routes that better connect low-income communities to jobs, health care providers, grocery stores and other critical resources
  - b. Provide more frequent and consistent service seven days a week



- c. Implement family-friendly policies that allow parents to bring strollers and other baby equipment onto buses (including priority seating for pregnant women and families with young children and eliminating bag limits)
  - d. Increase the number of bus shelters and benches
  - e. Provide discounted bus passes for low-income parents and pregnant women
  - f. Coordinate with municipalities and developers to install sidewalks, crosswalks, lighting and other pedestrian safety features near bus stops
- 3.5 Local municipalities can require real estate developers to include safe pedestrian access to bus stops in all new developments, where applicable.

#### **Transportation policy goal 4.** Improve pedestrian safety and active transportation through infrastructure design and investment

- 4.1 The Ohio Department of Transportation can encourage local municipalities to adopt complete streets policies by providing model policies and increased technical assistance and support.
- 4.2 The Ohio Department of Transportation and local municipalities can prioritize funding for active transportation improvements, such as sidewalks and crosswalks, in infant mortality hot spot neighborhoods.
- 4.3 The Ohio Department of Transportation and local municipalities can integrate health equity considerations into zoning and development decision making by assigning additional points to projects that address inequities (for example, awarding extra points to projects that improve pedestrian safety near bus stops in infant mortality hot spot zip code areas).
- 4.4 Local municipalities can require real estate developers to include safe pedestrian access to bus stops in all new developments, where applicable.

#### **Transportation policy goal 5.** Decrease barriers to maintaining a driver's license

- 5.1 State legislators can pass legislation authorizing courts to allow completion of a community service program in lieu of payment of a driver's license reinstatement fee when the court determines the offender cannot reasonably pay for those fees. (See SB 160

- introduced in 132nd General Assembly.)
- 5.2 State legislators can pass legislation authorizing courts to allow people with suspended licenses to continue driving to work and to healthcare appointments (for those suspended for non-driving-related offenses, e.g. inability to pay fees or fines).

#### **Transportation policy goal 6.** Improve air quality through reduced vehicle emissions

- 6.1 State policymakers can incentivize state agencies, local transit agencies, school districts and local municipalities to transition vehicle fleets to clean diesel technology.
- 6.2 Local transit agencies and school districts can implement vehicle anti-idling policies (education and signage to minimize time that drivers idle engines).
- 6.3 Municipalities can prohibit idling for their own vehicle fleets.

#### **Connections to other outcomes**

Although developed to reduce infant mortality, the transportation policy goals and recommendations also support many other state priorities for improving population health outcomes, controlling healthcare spending and increasing economic opportunity and vitality. Transit system quality, for example, is a consideration for employer site selection<sup>63</sup> and supports the policy goals in the employment section of this report. As another example, improvements to Medicaid NEMT would increase adequate and timely prenatal care, which has been linked to healthcare savings related to low birth weight and preterm birth<sup>64</sup> — major cost drivers for Medicaid.

Transportation policy goal 4 directly aligns with local/regional built environment change strategies in the **2017-2019 State Health Improvement Plan (SHIP)**.<sup>65</sup> Goals 1, 2, 3, 4 and 6 also support the SHIP objective to reduce child asthma morbidity. The SHIP is being implemented by state agencies and by local health departments and hospitals through their community health improvement initiatives.



## Notes

- Adapted from the U.S. Department of Transportation. "Transportation and Health Tool." Accessed May 1, 2017: <https://www.transportation.gov/transportation-health-tool>
- American Lung Association. "Health Effects of Ozone and Particulate Pollution." Accessed May 23, 2017. <http://www.lung.org/our-initiatives/healthy-air/sota/health-risks/>
- Lu, Michael C., et al. "Closing the black-white gap in birth outcomes: A life-course approach." *Ethnicity and Disease*, 20, (2010): S2-62-76
- Ewing, Reid, et al. "Urban sprawl as a risk factor in motor vehicle occupant and pedestrian fatalities." *American Journal of Public Health*, 93, no. 9 (2003): 1541-1545.
- Data provided by the Ohio Department of Health, Ohio Public Health Data Warehouse. Vital Statistics. Provided May 10, 2017.
- U.S. Department of Health and Human Services, The Community Guide. "Combined built environment features help communities get active." Accessed May, 2017: <https://www.thecommunityguide.org/content/combined-built-environment-features-help-communities-get-active>
- U.S. Centers for Disease Control and Prevention. "Pregnancy complications." Accessed November 3, 2017: <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregcomplications.htm>
- Stieb, David M., et al. "Ambient air pollution, birth weight and preterm birth: A systematic review and meta-analysis." *Environmental Research*, 117 (2012): 100-111. doi: 10.1016/j.envres.2012.05.007
- Shah, Prakesh S., Taiba Balkhair, and Knowledge Synthesis Group on Determinants of Preterm/LBW births. "Air pollution and birth outcomes: a systematic review." *Environment International*, 37, no. 2 (2011): 498-516. doi: 10.1016/j.envint.2010.10.009
- Trasande, Leonardo, Patrick Malecha and Teresa M. Affina. "Particulate matter exposure and preterm birth: Estimates of U.S. attributable burden and economic cost." *Environmental Health Perspectives*, 124, no. 12 (2016): 1913-1918. doi: 10.1289/ehp.1510810
- Ferguson, Kelly K., and Helen B. Chin. "Environmental Chemicals and Preterm Birth: Biological Mechanisms and the State of the Science." *Current Epidemiology Reports*, 4, no. 1 (2017): 56-71. doi: 10.1007/s40471-017-0099-7
- Son, Ji-Young, et al. "Pregnancy and Lifetime Exposure to Fine Particulate Matter and Infant Mortality in Massachusetts, 2001–2007." *American Journal of Epidemiology* (2017): 1-9.
- Bell, Michelle L., and Keita Ebisu. "Environmental inequality in exposures to airborne particulate matter components in the United States." *Environmental Health Perspectives* 120, no. 12 (2012): 1699-1704.
- Data from the U.S. Census Bureau, American Community Survey as compiled by the American FactFinder. Accessed May, 2017: <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkrmk>
- U.S. Department of Transportation, Bureau of Transportation Statistics. "Percent and characteristics of zero-vehicle households." Accessed May 2017: [https://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/highlights\\_of\\_the\\_2001\\_national\\_household\\_travel\\_survey/html/table\\_a04.html](https://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/highlights_of_the_2001_national_household_travel_survey/html/table_a04.html)
- Weinberger, Penelope et al. *Commuting in America 2013: Brief 7, Vehicle and Transit Availability*. American Association of State Highway and Transportation Officials, 2013. [http://traveltrends.transportation.org/Documents/B7\\_Vehicle%20and%20Transit%20Availability\\_CA07-4\\_web.pdf](http://traveltrends.transportation.org/Documents/B7_Vehicle%20and%20Transit%20Availability_CA07-4_web.pdf)
- National Equity Atlas. "Indicators." Accessed on November 8, 2017: <http://nationalequityatlas.org/indicators>
- Dorn, Sara. "License suspensions disproportionately imposed on poor Ohioans, trapping them in debt." *Cleveland.com*, March 31, 2017: [http://www.cleveland.com/metro/index.ssf/2017/03/license\\_suspensions\\_dispropor\\_1.html](http://www.cleveland.com/metro/index.ssf/2017/03/license_suspensions_dispropor_1.html)
- Data provided by the Ohio Bureau of Motor Vehicles to HPIO in response to a data request.
- Feedback from Advisory Group and subject matter experts.
- This should not be construed as legal advice.
- Transit Score is posted on the Walk Score website. Accessed on November 6, 2017: <https://www.walkscore.com/cities-and-neighborhoods/>
- Ibid.
- Walk Score. Accessed on November 1, 2017: <https://www.walkscore.com/cities-and-neighborhoods/>
- Ewing, Reid et al. *Measuring Sprawl 2014*. Smart Growth America, 2014. <https://smartgrowthamerica.org/app/uploads/2016/08/measuring-sprawl-2014.pdf>
- Traffic Safety Facts: 2015 data*. Washington, D.C.: National Highway Traffic Safety Administration, National Center for Statistics and Analysis, 2017. <https://crashstats.nhtsa.dot.gov/#/DocumentTypeList/11>
- Bicycling and walking in the United States 2016: Benchmarking report*. Washington, D.C.: Alliance for Biking and Walking, 2016. <https://www.aarp.org/content/dam/aarp/livable-communities/documents-2016/2016-WalkingBicyclingBenchmarkingReport.pdf>
- Health Policy Institute of Ohio. 2017 Health Value Dashboard. March 2017.
- Statewide Transportation Improvement Program, State Fiscal Years 2016-2019*. Ohio Department of Transportation, May 2015. [https://www.dot.state.oh.us/Divisions/Planning/STIP/20162019%20STIP%20Original/2016-2019%20STIP\\_Final\\_Compressed\\_Rev%20IOC.pdf](https://www.dot.state.oh.us/Divisions/Planning/STIP/20162019%20STIP%20Original/2016-2019%20STIP_Final_Compressed_Rev%20IOC.pdf)
- Keil, Paul. "Debt and the racial wealth gap." *The New York Times*. Dec. 31, 2015. <https://www.nytimes.com/2016/01/03/opinion/debt-and-the-racial-wealth-gap.html>
- Such as through greater use of finance companies rather than traditional banking institutions. See Charles, Kerwin K., Erik Hurst and Melvin Stephens. "Rates for vehicle loans: Race and loan source." *American Economic Review*, 98, no. 2 (2008): 315-320. doi: 10.1257/aer.98.2.315
- Julia Angwin et al. "Minority neighborhoods pay higher car insurance premiums than white areas with the same risk." *ProPublica* and *Consumer Reports*, April 5, 2017. <https://www.propublica.org/article/minority-neighborhoods-higher-car-insurance-premiums-white-areas-same-risk>
- Keil, Paul and Annie Waldman. "The color of debt: How collection suits squeeze black neighborhoods." *ProPublica*, Oct. 8, 2015. <https://www.propublica.org/article/debt-collection-lawsuits-squeeze-black-neighborhoods>
- Sánchez, Thomas W., Rich Stolz and Jacinta S. Ma. *Moving to Equity: Addressing Inequitable Effects of Transportation Policies on Minorities*. Cambridge, MA: The Civil Rights Project at Harvard University, 2003.
- Marlin, Matthew et al. *Free to Ride*. Documentary. Directed by Jamaal Bell. 2014. Columbus, OH: The Ohio State University Kirwan Institute for the Study of Race and Ethnicity. <http://kirwaninstitute.osu.edu/freetoride/>
- Franklin County Coordinated Plan*. Columbus OH: Central Ohio Transit Authority and Mid-Ohio Regional Planning Commission, 2012. [http://www.morpc.org/trans/FCCP\\_Final\\_072012.pdf](http://www.morpc.org/trans/FCCP_Final_072012.pdf)
- Health Policy Institute of Ohio. "Ohio Medicaid Basics 2017." April 2017.
- Musumeci, MaryBeth and Robin Rudowitz. *Medicaid Non-Emergency Medical Transportation: Overview and Key Issues in Medicaid Expansion Waivers*. Kaiser Family Foundation, 2016. <https://www.kff.org/medicaid/issue-brief/medicaid-non-emergency-medical-transportation-overview-and-key-issues-in-medicaid-expansion-waivers/>
- Document provided by the Ohio Department of Medicaid. "The Ohio Department of Medicaid Ohio Medical Assistance Provider Agreement for Managed Care Plan. Provided May 2017.
- Information provided by the Ohio Department of Medicaid, 2017.
- Information provided by the Ohio Department of Medicaid, 2017.
- Improve Program Performance*. Columbus, OH: Office of Health Transformation, Jan. 30, 2017. <http://healthtransformation.ohio.gov/Portals/0/18-19%2007%20Improve%20Program%20Performance.pdf?ver=2017-01-30-115225-683>
- Ohio Statewide Transit Needs Study: Final Report*. Columbus, OH: Ohio Department of Transportation, 2015. <http://www.dot.state.oh.us/Divisions/Planning/Transit/TransitNeedsStudy/Documents/OHIOStatewideTransitNeedsStudyFinalReport.pdf>
- Ibid.
- Survey of Public Transportation Funding: Public Transportation Final Report 2016-FY 2014 Data*. Washington D.C.: American Association of State Highway and Transportation Officials, 2016.
- Workman, Simon and Jaime Rall. "Motor fuel sales taxes and other taxes on fuel distributors or suppliers." *National Conference of State Legislatures*, updated June 2012. <http://www.ncsl.org/research/transportation/fuel-sales-taxes-and-other-related-taxes.aspx>
- Ohio Statewide Transit Needs Study: Final Report*. Columbus, OH: Ohio Department of Transportation, 2015.
- Ibid.
- Ibid.
- Statewide Transportation Improvement Program, State Fiscal Years 2018-2012*. Columbus, OH: Ohio Department of Transportation, 2017. <https://www.dot.state.oh.us/Divisions/Planning/STIP/Pages/default.aspx>
- Ibid.
- Ohio Department of Transportation. "Civil Rights." Accessed May 2017. <http://www.dot.state.oh.us/Divisions/Planning/Transit/Pages/CivilRights.aspx>
- Ohio Department of Transportation. "Locally Developed, Coordinated Public Transit-Human Services Transportation Plans." Accessed May 2017. <http://www.dot.state.oh.us/Divisions/Planning/Transit/Pages/LocallyDevelopedCoordinatedPlans.aspx>
- Ohio Department of Transportation. "Coordinated transportation plans in Ohio." Accessed May 2017. <http://www.dot.state.oh.us/Divisions/Planning/Transit/Pages/CoordinatedPlansList.aspx>
- Bicycling and walking in the United States 2016: Benchmarking report*. Washington, D.C.: Alliance for Biking and Walking, 2016. <https://www.aarp.org/content/dam/aarp/livable-communities/documents-2016/2016-WalkingBicyclingBenchmarkingReport.pdf>
- Active Transportation Plan for Ohio's Strategic Highway Safety Plan*. Columbus, OH: Ohio Department of Transportation. Accessed May 2017. [https://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/ActiveTransportation/Documents/ActiveTrans\\_ActionPlan\\_Reformatted.pdf](https://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/ActiveTransportation/Documents/ActiveTrans_ActionPlan_Reformatted.pdf)
- ODOT Active Transportation Guide: A reference for communities*. Columbus, OH: Ohio Department of Transportation, 2014. <https://www.dot.state.oh.us/Divisions/Planning/SPR/bicycle/Documents/Final%20ODOT%20Active%20Transportation%20Plan%20Guide%2011-24-14.pdf>
- Smart Growth America. "National Complete Streets Coalition." Accessed May 2017. <https://smartgrowthamerica.org/program/national-complete-streets-coalition/>
- MORPC Complete Streets Policy. Columbus, OH: Mid-Ohio Regional Planning Commission, 2010. Accessed May 2017. [http://www.morpc.org/trans/CompleteStreets\\_MORPC\\_CS\\_PolicyFINAL2010-03-31.pdf](http://www.morpc.org/trans/CompleteStreets_MORPC_CS_PolicyFINAL2010-03-31.pdf)
- Mid-Ohio Regional Planning Commission. "Complete Streets Toolkit." Accessed May 2017. <http://www.morpc.org/transportation/complete-streets/toolkit/index>
- Mid-Ohio Regional Planning Commission. "2016-2040 Columbus Area Active Transportation Plan." Accessed May 2017. <http://www.morpc.org/transportation/bicycle-pedestrian/active-transportation-plan/index>
- Mid-Ohio Regional Planning Commission. "Complete Streets Local Policies." Accessed November 15, 2017. <http://www.morpc.org/transportation/complete-streets/local-policies/index>
- For example, Amazon HQ2 site requirements include "access to mass transit." In addition, HQ2 proposals must describe "transit options, including bike lanes and pedestrian access to the site(s). Also, list the ranking of traffic congestion for your community and/or region during peak commuting times." *Amazon HQ2 RFP*. Seattle, WA: Amazon, n.d. Accessed Oct. 29, 2017: [https://images-na.ssl-images-amazon.com/images/G/01/Anything/test/images/usa/RFP\\_3\\_V516043504.pdf](https://images-na.ssl-images-amazon.com/images/G/01/Anything/test/images/usa/RFP_3_V516043504.pdf)
- Cost-benefit Analysis of Providing Non-Emergency Medical Transportation*. The National Academies of Science, Engineering and Medicine, 2005. <https://www.nap.edu/catalog/22055/cost-benefit-analysis-of-providing-non-emergency-medical-transportation>
- Ohio 2017-2019 State Health Improvement Plan*. Columbus, OH: Governor's Office of Health Transformation and Ohio Department of Health, 2017.





## Education overview

This section begins with a brief summary of the ways that education affects health overall and then describes more specific ways that low educational attainment contributes to infant mortality and related risk factors based upon a review of the research literature. This section also describes:

- Scope of educational challenges in Ohio
- Education policy landscape in Ohio (types of programs, major policy levers, funding sources, planning and implementation entities)
- Education policy goals and recommendations

Equity is addressed throughout this section by:

- Describing differences by race, ethnicity, sex, income level or other factors, when data is available
- Discussing structural drivers of inequities

## How education affects infant mortality: Literature review

Educational attainment affects overall *health and wellbeing* in several ways:

- **Income and employment:** Lacking a sufficient education generally makes it more difficult to find employment that pays enough to support basic needs such as healthy food, medical care and stable housing in a safe neighborhood. Low-paying jobs may also involve working conditions that are dangerous or otherwise harmful to one's health.
- **Literacy and health literacy:** People with more education generally have higher literacy levels, allowing more effective comprehension of

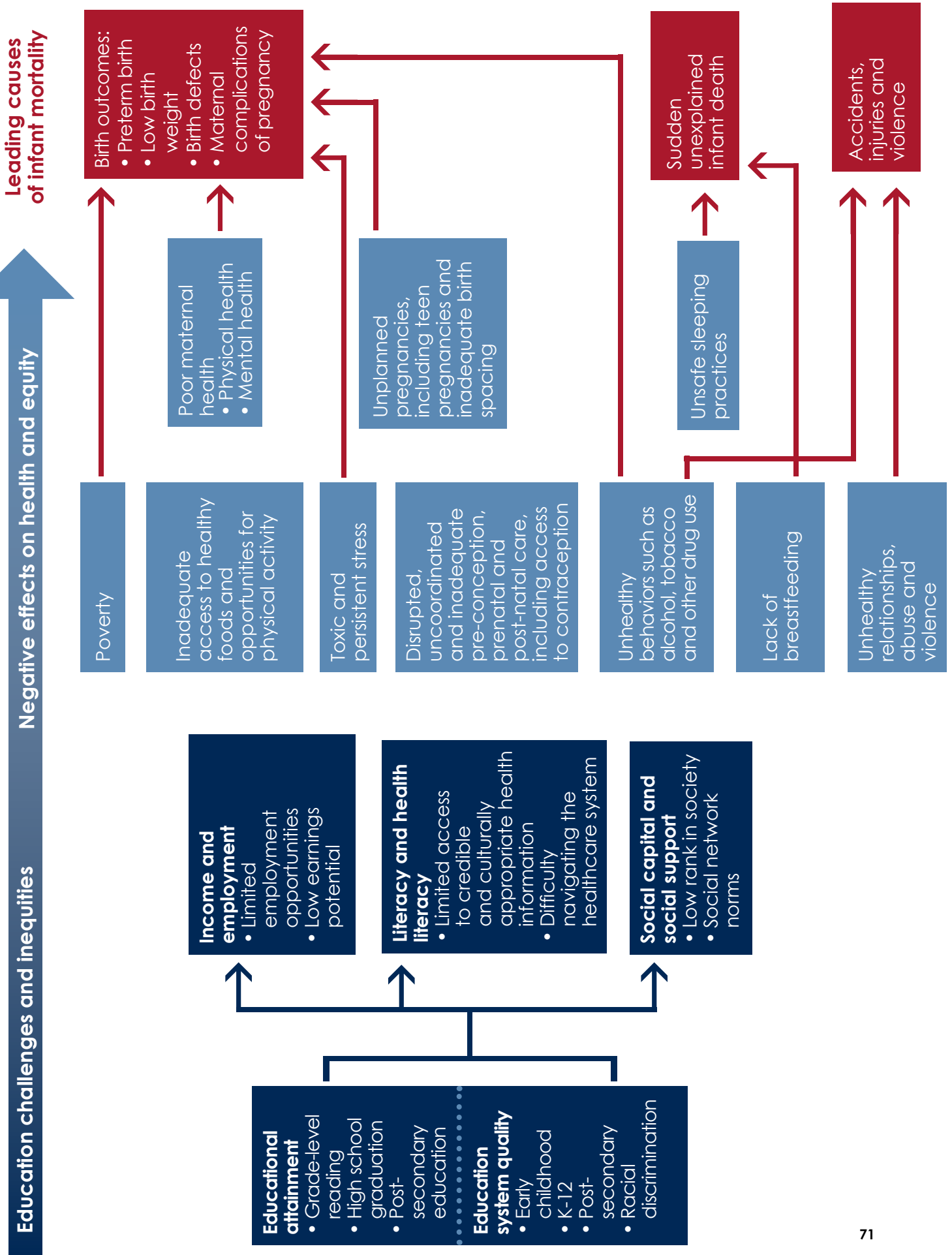
written health materials. Skills and knowledge gained through school enable a better understanding of how to be healthy and effectively navigate the healthcare system.

- **Social capital and social support:** Stronger social connections and more social capital, meaning the degree to which a person is socially-integrated within a community or society, are more common among people with higher educational attainment and are typically associated with greater levels of social support and other protective health factors.

Figure 6.1 applies these relationships between education and health specifically to the main causes of infant mortality.



Figure 6.1. Relationship between education and infant mortality







## Educational attainment

Research literature consistently shows an association between higher levels of maternal educational attainment and lower rates of both neonatal and postneonatal infant mortality, although postneonatal disparities are larger.<sup>1</sup> In general, the risk of infant mortality decreases as maternal education increases. However, several studies have found the risk to increase again slightly at high levels of education – specifically for women with more than 16 years of education.<sup>2</sup> This may be partially due to increased job stress.

Furthermore, even though higher educational attainment is associated with lower rates of infant mortality for both white and black women, racial disparities persist even for highly-educated African-American women.<sup>3</sup> The relative risk for infant mortality among African Americans compared to whites actually increases as maternal educational achievement rises.<sup>4</sup> Finally, research also finds that greater paternal education reduces the risk of preterm birth.<sup>5</sup>

An analysis of 2010-2015 Ohio birth data found that mothers without a high school education were over 50 percent more likely than those who had completed high school to have a baby with low birth weight, with rates of 9.7 percent and 6.2 percent respectively. Rates of prematurity were also considerably higher, with 9.8 percent among high school graduates compared to 13.9 percent among those who did not graduate.<sup>6</sup>

A study comparing birth outcomes among infants born to college-educated white and black parents found that the disparity in infant mortality at this level of education was due to higher rates of low birth weight among the black infants. Infants born with normal birth weight had an equal chance of surviving to age 1 and equal rates of Sudden Infant Death Syndrome (SIDS) and preventable mortality regardless of race.<sup>7</sup> Some potential reasons for these disparities in death rates due to low birth weight include racial differences in maternal physical and mental health status, stress levels and access to and quality of health care.<sup>8</sup>

Infant mortality disparities are described further in the next section.

## Income and employment

Low educational attainment is associated with a lower likelihood of employment and a higher likelihood of employment in jobs with unfavorable working conditions that pay lower salaries and offer fewer benefits, such as comprehensive health insurance and paid leave.<sup>9</sup>

People with less education have lower earning potential. This may lead to housing instability or unhealthy and/or unsafe housing and neighborhood conditions, with limited access to nutritious foods and opportunities for physical activity. Women with low educational attainment and low incomes also commonly experience more barriers to accessing healthcare services, including prenatal care. All of these factors can be detrimental to maternal health and increase stress, resulting in increased risk of poor birth outcomes.<sup>10</sup>

The conditions in which a woman works can be harmful to her pregnancy. For example, research has identified physical demands (e.g., prolonged standing, heavy lifting<sup>11</sup>), harmful conditions (e.g., exposure to toxins<sup>12</sup>) and low job status and recognition as factors associated with preterm birth and low birth weight.<sup>13</sup>

## Literacy and health literacy

Low educational attainment is related to lower literacy levels and may result in difficulty understanding information about health and health care – often referred to as low “health literacy.” The knowledge and skills gained through education often lead to a better ability to understand health needs, navigate the complex healthcare system, access credible and reliable health information, effectively communicate with providers and follow complex medical advice and instructions.

Research has found that educational materials and instructions provided to pregnant women and women with young children are often written at a reading level that is too high for some to comprehend.<sup>14</sup> To be effective, health-related materials need to be easy to read, written at an appropriate literacy level and culturally-sensitive.



People with low health literacy are also often less likely to practice health-promoting behaviors or may not have the means to do so. Behaviors such as eating nutritious food, engaging in regular physical activity and refraining from smoking and using other drugs all lead to a healthier pregnancy. In addition, inadequate birth spacing, not beginning prenatal care early in pregnancy, not breastfeeding and not practicing safe sleeping habits with infants are more common among parents with low educational attainment.<sup>15</sup> Prior to pregnancy, women with low literacy and health literacy tend to have less knowledge of contraceptives and how to use them effectively, which leads to more unplanned pregnancies.<sup>16</sup>

Finally, people with less education and lower health literacy tend to have more difficulty successfully managing chronic health conditions. This can be problematic for pregnant women with pre-existing conditions, such as Type 2 diabetes or hypertension, which can cause maternal complications in pregnancy.<sup>17</sup>

### **Social capital and social support**

People with lower educational attainment tend to have less social and cultural capital. Social capital refers to the degree to which a person is socially-integrated within a community or society.<sup>18</sup> It is characterized by strong social networks, civic engagement, social norms, a sense of trust and solidarity with others in the community and a willingness to help and support one another.<sup>19</sup> Research has identified education as one of the most consistent predictors of social capital.<sup>20</sup> People with more education also tend to have more cultural capital, which refers to having a position of privilege and higher rank in society.<sup>21</sup> Social and cultural capital are protective factors for health, buffering against the negative effects of stress and increasing access to resources through social connections and relationships.<sup>22</sup>

Compared to those with low levels of education, women with higher educational attainment are more likely to be married.<sup>23</sup> Not only is marriage associated with better birth outcomes, but highly-educated women are more likely to marry a person with a

comparable level of education and cultural capital.<sup>24</sup> With more education and higher incomes, these couples generally experience less stress and have stronger social networks with more positive and healthy social norms. Conversely, unmarried women with low educational attainment often have lower levels of social and emotional support, which can lead to more psychosocial pressures and result in poor birth outcomes.<sup>25</sup>

In terms of health care, women with less education and lower levels of social and cultural capital may experience more barriers to accessing high-quality care, be treated with less respect and have less of a say in decision-making.<sup>26</sup>



### Scope of education problems in Ohio

This section describes the current status of education-related challenges and inequities in Ohio that are particularly relevant to infant mortality – educational attainment, literacy, health literacy and social capital.

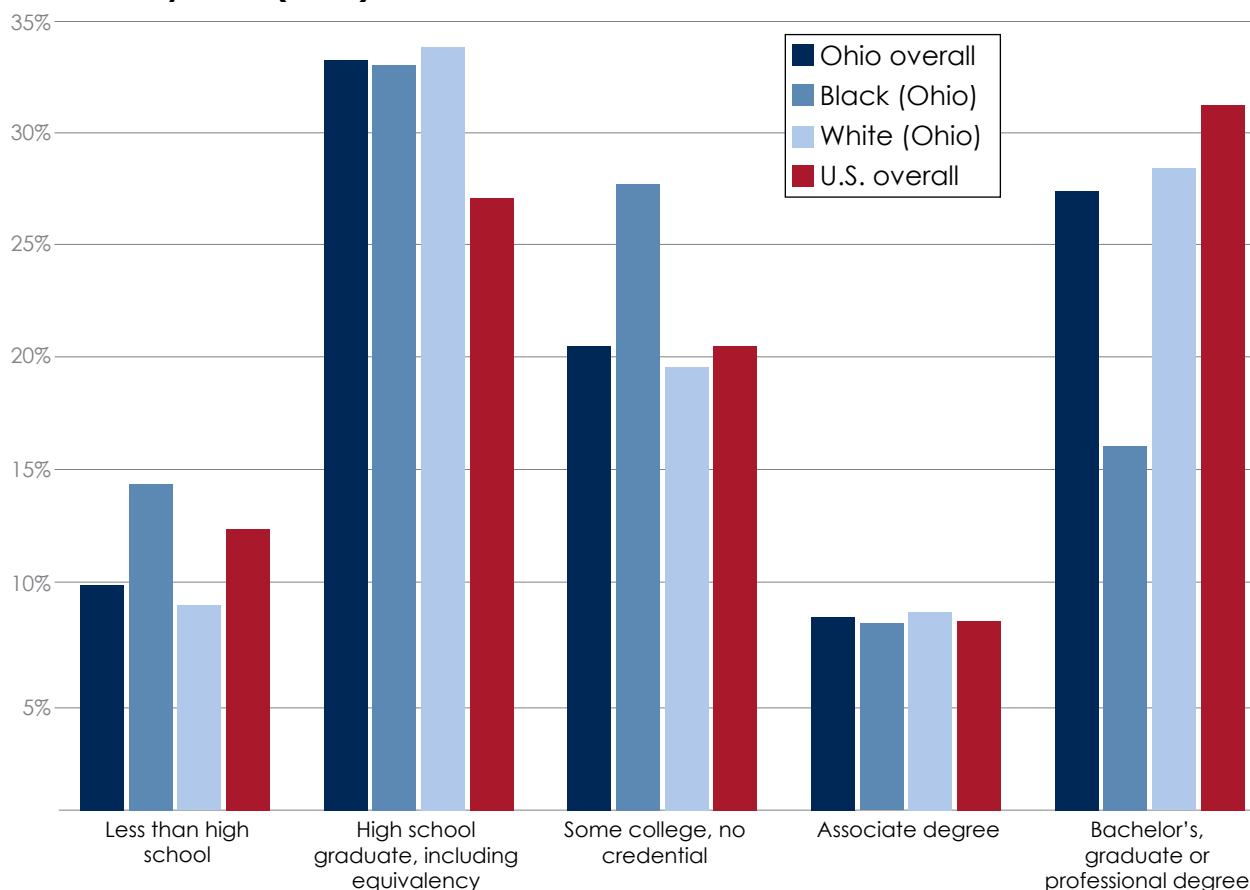
#### Educational attainment

Figure 6.2 shows the educational attainment of Ohio adults ages 25 and above. In 2016, 10 percent of Ohio adults had not earned a high school diploma (or equivalent). The percentage was slightly lower for white Ohio adults (9.1 percent) and higher for black adults (14.5 percent). Black adults were also less likely to have earned an Associate, Bachelor's, graduate or professional degree. Local-level educational attainment data is available from the [U.S. Census Bureau](#) at the county, city, census tract and block level.

Educational success early in life is a predictor of later success. Similarly, achievement gaps based on factors such as race and income appear early and continue throughout schooling.

Participation in high-quality early childhood education, such as preschool, prepares children for success in kindergarten and has a number of other benefits, especially for children in low-income families. However, only 45 percent of all 3 and 4 year-old children in Ohio were enrolled in a publicly- or privately-funded, formal early childhood education program in 2013-2015. Only 39 percent of 3 and 4 year-old children in families living below 200 percent of the Federal Poverty Level (FPL) were enrolled (see figure 6.3).<sup>27</sup>

Figure 6.2. Highest level of educational attainment of adults (ages 25+) in Ohio and the U.S., by race (2016)



Source: U.S. Census Bureau America Community Survey 2016



**Figure 6.3. Percent of Ohio and U.S. 3 and 4 year-old children enrolled in a formal early childhood education program, by income (2011-2015)**

	Ohio	U.S.
All	45%	47%
Below 200% FPL	39%	40%
At or above 200% FPL	52%	55%

**Note:** Percentages for all children are from 2013-2015. Percentages for children below and at or above 200% FPL are from 2011-2015.  
**Source:** Population Reference Bureau analysis of data from the U.S. Census Bureau, pooled 2013-15 one-year American Community Survey, as reported by Kids Count Data Center

Figure 6.4 shows the results of Ohio's Kindergarten Readiness Assessment for the 2015-2016 school year. These results indicate that black students and students who are economically disadvantaged lag behind other groups. Only 24 percent of black and 26 percent of economically-disadvantaged students entered

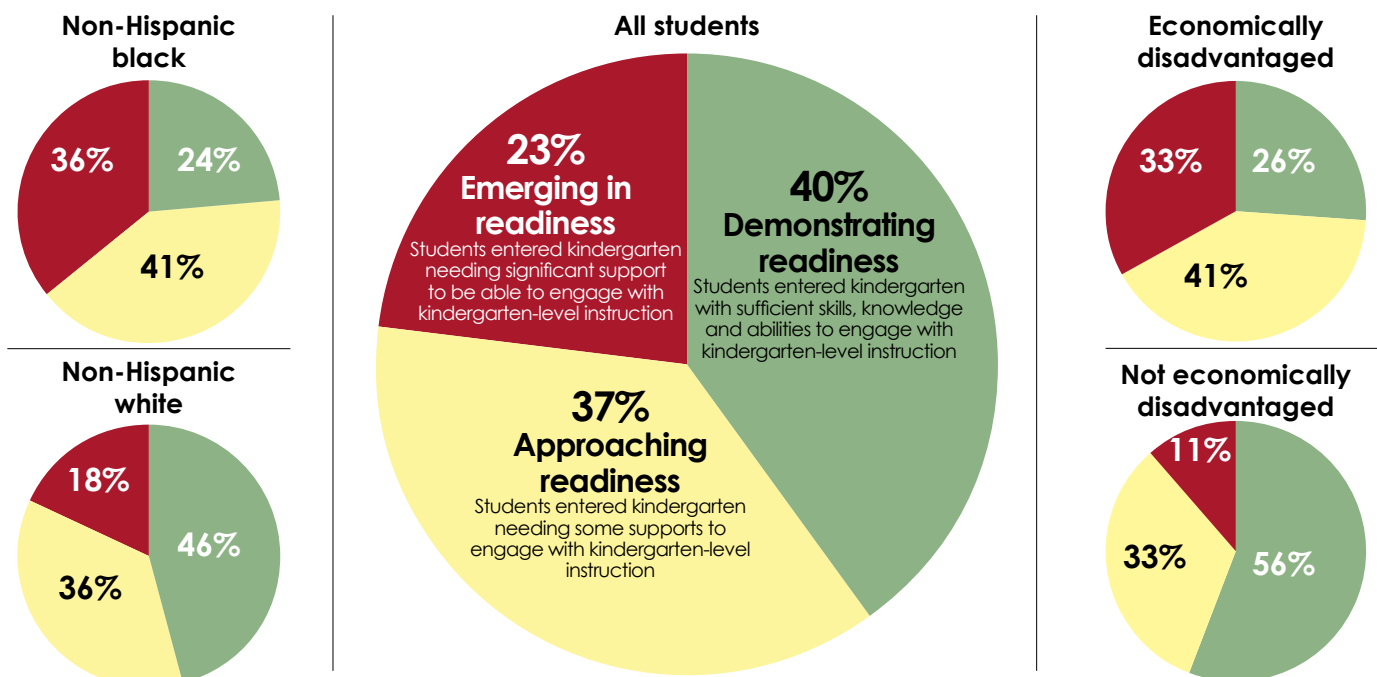
kindergarten demonstrating readiness, meaning that they had sufficient skills, knowledge and abilities to engage with kindergarten-level instruction.

Kindergarten readiness correlates with third-grade reading proficiency.<sup>28</sup> Figure 6.5 presents third-grade reading data for all Ohio students and separately by race and economic disadvantage.

Since the 2013-2014 school year, Ohio has had a **Third Grade Reading Guarantee** that requires students (with a few exceptions) to be held back if they do not earn a passing score (set by the Ohio Department of Education) on the third-grade reading test. Research shows that third-graders who read on grade level are four times more likely to go on to graduate from high school.<sup>29</sup> In the 2014-2015 school year, the high school graduation rates among black and economically-disadvantaged students were 59.7 and 68.7 percent respectively, compared to a rate of 83 percent for Ohio overall (see figure 6.6).

These numbers vary considerably by school district in Ohio. Third-grade reading proficiency

**Figure 6.4. Ohio Kindergarten Readiness Assessment results (2015-2016)**



**Note:** A student is considered to be economically disadvantaged if he/she meets any of the following conditions: eligible for free or reduced-price lunches or resides in a household in which someone is eligible; receives public assistance or has a guardian receiving public assistance; or meets the income guidelines for Title I and the parent or guardian has completed a Title I student income form.  
**Source:** Ohio Department of Education. Kindergarten Readiness Assessment Annual Report 2015-2016



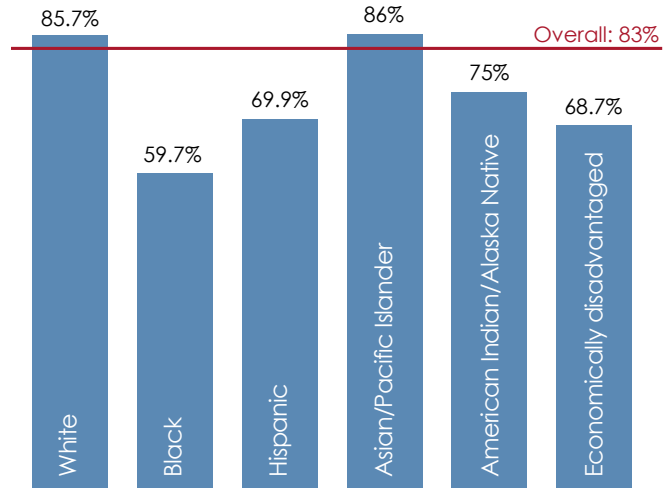
and high school graduation rates are available for each public school district and school building in the annual **Ohio School Report Cards** developed by the Ohio Department of Education (ODE). Data for Ohio's eight largest urban school districts is presented in figure 6.9.

Finally, figure 6.7 shows that in 2015, 43.6 percent of Ohio adults ages 25-64 had a postsecondary certificate or Associate, Bachelor's, graduate or professional degree. Ohio is slightly lower than the national average (45.8 percent) on this metric.

### Literacy and health literacy

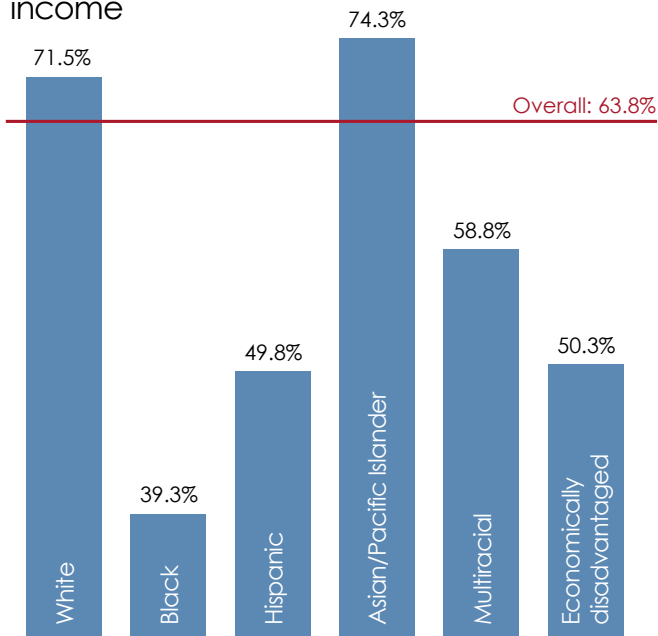
As described in the previous section, low literacy and health literacy levels can be risk factors for poor birth outcomes and infant mortality. In 2003, 9 percent of Ohioans ages 16 and above lacked basic prose literacy skills, which ranges from not being able to read and understand any written information to being able to only locate easily

Figure 6.6. **High school graduation rates in Ohio (2014-2015).** Ohio's public high school 4-year adjusted cohort graduation rate, by race, ethnicity and income



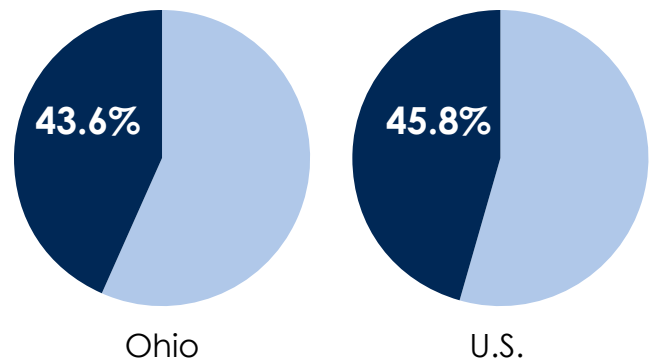
Source: National Center for Education Statistics

Figure 6.5. **Third-grade reading proficiency in Ohio (2016-2017).** Percent of Ohio third-graders proficient in reading by a state assessment, by race, ethnicity and income



Source: Ohio Department of Education. Ohio School Report Cards.

Figure 6.7. **Percent of adults with postsecondary credentials, Ohio and the U.S. (2015).** Percent of adults ages 25-64 with a postsecondary certificate, Associate degree, Bachelor's degree or graduate or professional degree



Source: Data from the U.S. Census Bureau American Community Survey, 2015, as reported by the Lumina Foundation. A Stronger Nation 2017.



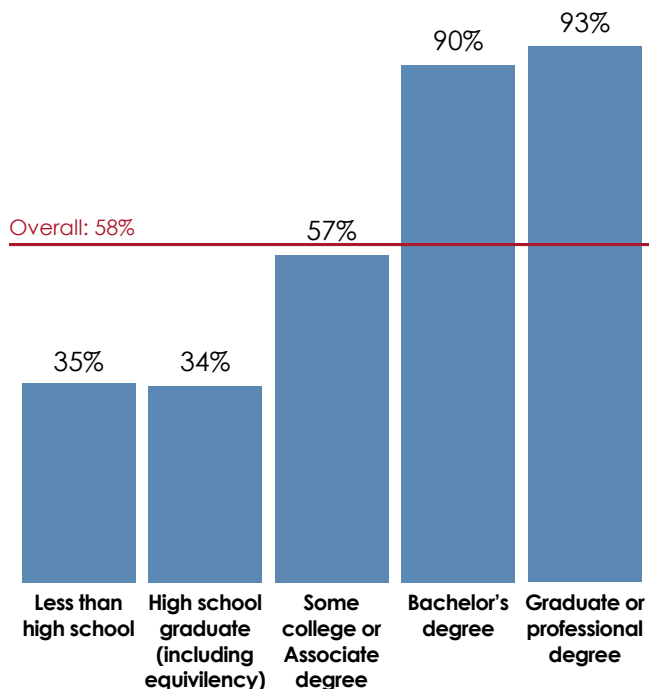
identifiable information in short, commonplace English text. This is the lowest level of English literacy.<sup>30</sup> Additionally, 14 percent of Ohio adults ages 16 and above had below basic health literacy in 2003.<sup>31</sup> Ohio literacy and health literacy data by race, ethnicity and income is not available.

### Social capital and marriage

Additional education is associated with more social capital, which is a protective factor for health. The National Health Security Preparedness Index gave Ohio a score of 4.5 (on a scale of one to 10) on a composite measure of social capital and cohesion that includes connections with neighbors, supportive neighborhoods, voter turnout and volunteerism.<sup>32</sup>

Marriage is more likely among people with more education and is another protective factor against infant mortality.<sup>33</sup> In 2016, 58 percent of Ohio women who had given birth in the past 12 months reported being married (including separation and spouse absent<sup>34</sup>). Figure 6.8 shows marriage

Figure 6.8. Percent of Ohio women that had given birth in the past 12 months who were married, by education level (2016)



Note: Includes separation and spouse absent  
 Source: U.S. Census Bureau American Community Survey, 2016

percentages for women with different levels of educational attainment who had given birth in the past year.

### Underlying structural drivers of inequities

Not all Ohioans have an equal opportunity to receive a high-quality education. As shown in the data presented above, people with low incomes and racial minorities tend to have lower levels of educational attainment. Segregation, while improved by policies and court decisions in the 1960s-1990s, now mirrors residential segregation (see figure 6.9).

School funding in Ohio depends largely on local property taxes. Therefore, public schools in low-income districts often have fewer resources, which can impact the quality of education provided. Black families tend to make up a larger proportion of the populations in lower-income areas, such as inner cities. Without sufficient funding, schools struggle to attract highly-trained teachers and obtain the most up-to-date textbooks, technology and other necessary educational materials.<sup>35</sup> Therefore, there tend to be considerable differences in performance among higher- and lower-income areas (see figures 6.9 and 6.10). Despite being ruled unconstitutional by the Ohio Supreme Court in 1997 and revisited by the Court several times since then, Ohio's school funding formula has not substantially changed.

Figures 6.9 and 6.10 show some of these disparities among school districts in Ohio. Data is included for Ohio's eight largest urban school districts, which are all located in areas with high rates of poverty and infant mortality. For comparison, data is also provided for three of the state's wealthiest districts. Large differences in third-grade reading proficiency exist, with only 32.5 percent proficient in Canton City Schools, compared to at least 87 percent in the wealthier districts. Figure 6.10 shows the grades received by each district in the six areas evaluated by ODE. Districts are given an A-F grade in each area.

Another notable disparity in education involves disciplinary rates – specifically, in the numbers of suspensions and expulsions among different groups of students. These disparities start at very young ages. For example, there were over 17,000 suspensions and expulsions in the 2015-2016 academic year among Ohio students in pre-K through third grade for disobedient or disruptive



Figure 6.9. Demographic and performance data for select Ohio school districts (2016-2017)

School district	Percent of third-graders proficient in reading	Four-year high school graduation rate	Percent of students classified as economically disadvantaged*	Percent of students who are black	Chronic absenteeism rate
<b>Large urban districts</b>					
Cincinnati City	60.7%	72.8%	79.9%	62.9%	13%
Akron City	45.9%	74.3%	100%*	46.1%	22.4%
Toledo City	40.1%	72.1%	86.1%	43.2%	8.4%
Columbus City	39.8%	74.1%	99.4%	54.7%	37.8%
Youngstown City	35.9%	73.8%	100%*	61.5%	34.3%
Cleveland Municipal	35.6%	72.1%	100%*	64.5%	30.2%
Dayton City	34.8%	72.6%	100%*	66.1%	30.7%
Canton City	32.5%	76.2%	100%*	36.8%	22.8%
<b>Wealthy districts (for comparison)</b>					
Ottawa Hills Local (Lucas County)	94.8%	100%	Not calculated (Fewer than 10 students)	1.3%	2%
Upper Arlington City (Franklin County)	89.9%	97.5%	0.9%	0.9%	6.2%
Revere Local (Summit County)	87.1%	96.5%	5%	1.9%	5.6%

\* Schools and districts in high-poverty areas can apply for "Community Eligibility" through ODE, which allows them to serve free lunches and breakfasts to all their students. At least 40 percent of enrolled students must meet identified criteria explained in [ODE's fact sheet](#).<sup>36</sup> Since students who are eligible for free or reduced price lunches are considered economically disadvantaged, a school with community eligibility may report 100 percent of its students as economically disadvantaged.

Source: Ohio School Report Cards, 2016-2017. Ohio Department of Education.

behavior.<sup>37</sup> Rates of suspensions and expulsions are higher among black, male and economically disadvantaged students. For example, during the 2015-2016 school year, a black student was 6.4 times more likely to receive an out-of-school suspension than a white student, and an economically-disadvantaged student was 5.7 times more likely to be suspended than a more financially-stable student.<sup>38</sup> Figure 6.11 shows rates

of out-of-school suspensions for black and white students in Ohio's eight largest urban districts.

A student who is suspended or expelled is less likely to graduate from high school. These students are also more likely to become involved in the criminal justice system.<sup>39</sup> This phenomenon is often called the "school-to-prison pipeline."



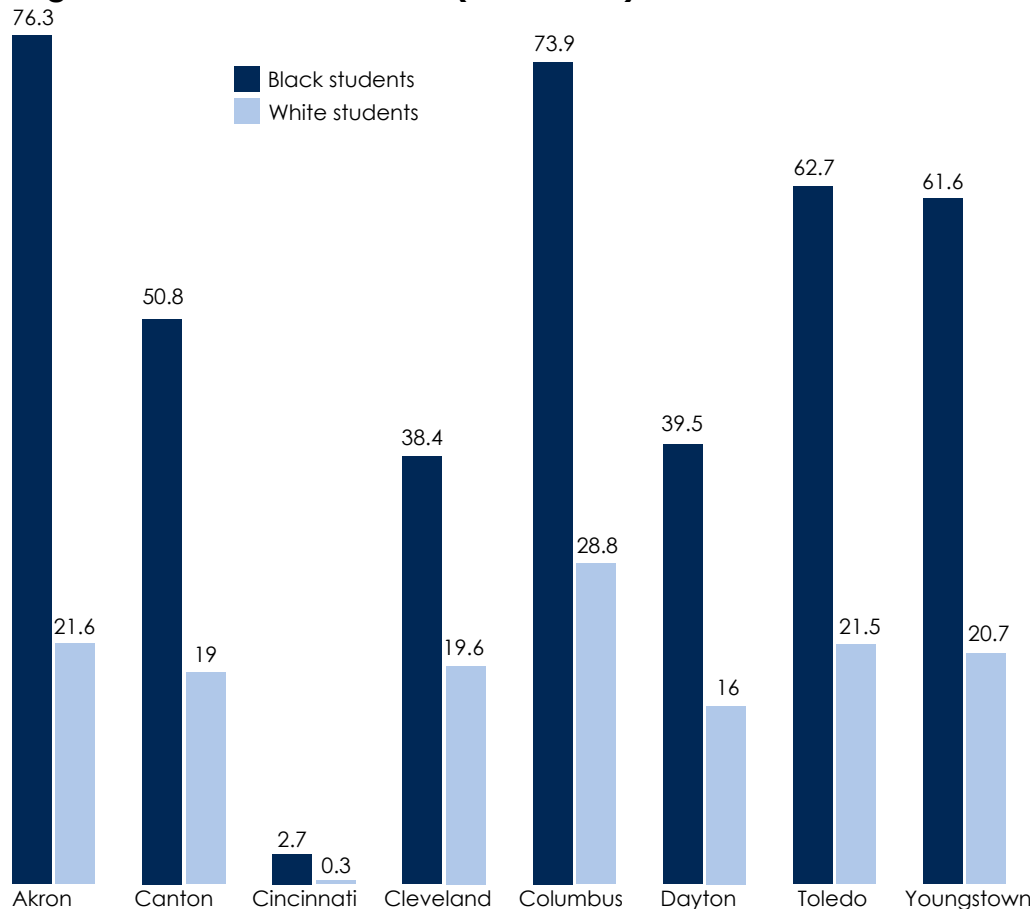
Figure 6.10. School district report card grades for six categories of performance for select Ohio school districts (2016-2017)

School district	Achievement	Gap closing	K-3 literacy	Progress	Graduation rate	Prepared for success
<b>Large urban districts</b>						
Cincinnati City	D	F	C	F	F	D
Akron City	D	F	C	F	F	F
Toledo City	F	F	D	D	F	F
Columbus City	F	F	D	F	F	F
Youngstown City	F	F	B	D	F	F
Cleveland Municipal	F	F	C	F	F	F
Dayton City	F	F	D	D	F	F
Canton City	F	F	D	D	F	F
<b>Wealthy districts (for comparison)</b>						
Ottawa Hills Local (Lucas County)	A	A	Not rated	A	A	A
Upper Arlington City (Franklin County)	B	C	Not rated	C	A	A
Revere Local (Summit County)	B	B	Not rated	B	A	B

**Note:** Any district with fewer than 5% of its kindergartners reading below grade level at the beginning of the school year is not rated in K-3 literacy.

**Source:** Ohio School Report Cards, 2016-2017. Ohio Department of Education

Figure 6.11. Out-of-school suspensions per 100 students\* in Ohio's eight largest urban school districts (2015-2016)



\*Rates are calculated by dividing the total number of out-of-school suspensions received by students of a certain race by the total number of students of that race enrolled in the district. This number is then multiplied by 100. This can include multiple suspensions for a single student.

**Note:** Cincinnati Public Schools have adopted policies to minimize out-of-school suspensions, including the [Alternative to Suspension program](#).

**Source:** Ohio Department of Education, Report Card Data (iLRC) (2015-2016).





## Education policy landscape in Ohio

### Existing policies and programs most relevant to infant mortality

As described earlier, lower levels of educational attainment are associated with a higher risk of poor birth outcomes and infant mortality. Therefore, policies and programs to increase educational attainment are likely to decrease these risks.

There are many initiatives in Ohio aimed at increasing student success and educational attainment. A few examples of these programs are shown in figure 6.12.

It is beyond the scope of this report to address the complete cradle to career continuum. Based on the literature review above and feedback from the Advisory Group, the following educational policies and programs are most relevant to infant mortality high-risk populations and are therefore the focus of this policy landscape:

- Early childhood care, education and family support programs
- High school graduation and equivalency
- Career-technical education
- Postsecondary education

Figure 6.12. **Examples of education programs in Ohio (for at-risk students and adults)\***

Type of program	Examples	Eligibility and priority populations
<b>Early childhood education</b>		
<b>Home visiting programs</b>	<ul style="list-style-type: none"> <li>• Help Me Grow</li> <li>• Early Head Start</li> </ul>	<ul style="list-style-type: none"> <li>• Help Me Grow: Primarily pregnant women and women with young children, income below 200% FPL</li> <li>• Early Head Start: Pregnant women and infants and toddlers until age 3, income below 100% FPL</li> </ul>
<b>Programs to increase access to early childhood care and education</b>	<ul style="list-style-type: none"> <li>• State-funded preschool</li> <li>• State-funded special education preschool</li> <li>• Publicly-Funded Child Care</li> <li>• Head Start</li> </ul>	<ul style="list-style-type: none"> <li>• State-funded preschool: Children of age 4, income at or below 200% FPL</li> <li>• State-funded special education preschool: Children ages 3-5 with a disability</li> <li>• Publicly-Funded Child Care: Children ages 0-12 with parents who are working or in school, income at or below 130% FPL</li> <li>• Head Start: Children ages 3-5, income below 100% FPL</li> </ul>
<b>High school graduation and postsecondary education programs</b>		
<b>Programs to increase high school graduation rates among at-risk students</b>	<ul style="list-style-type: none"> <li>• Dropout prevention and recovery programs</li> <li>• Career-Based Intervention</li> </ul>	<ul style="list-style-type: none"> <li>• Dropout prevention and recovery programs: Students ages 16-21 who are at least one grade level behind and/or have experienced crises that significantly interfere with academic progress and have prevented them from continuing in their traditional programs (at the time of initial enrollment)</li> <li>• Career-Based Intervention: Students in grades 7-12 (ages 12-21) identified as disadvantaged (academically, economically or both) and as having barriers to achieving academic and career success<sup>40</sup></li> </ul>
<b>Programs to increase high school completion/equivalency among Ohio adults without a diploma</b>	<ul style="list-style-type: none"> <li>• Aspire (formerly ABLE)</li> <li>• GED/high school equivalency tests</li> <li>• Adult Diploma Program</li> <li>• 22+ Adult High School Diploma Program</li> </ul>	<ul style="list-style-type: none"> <li>• Aspire: Ohioans ages 18 and above with less than a 12th-grade education or the equivalent</li> <li>• Ohio high school equivalency tests: Ohioans ages 18 and above without a high school diploma; Ohioans of ages 16 and 17 are also eligible under certain circumstances<sup>41</sup></li> <li>• Adult Diploma Program and 22+ Adult High School Diploma Program: Ohioans ages 22 and above without a high school diploma or equivalency</li> </ul>
<b>Programs to increase postsecondary education among at-risk high-school students</b>	<ul style="list-style-type: none"> <li>• College Credit Plus</li> <li>• Secondary career-technical education</li> </ul>	<ul style="list-style-type: none"> <li>• College Credit Plus: Students who are Ohio residents, in grades 7-12 and gain admission to an Ohio public or participating private college or university</li> <li>• Career-technical education: Available to all Ohio students in grades 7-12 (most wait until high school to enroll)</li> </ul>
<b>Programs to increase rates of postsecondary education among high-risk populations</b>	Ohio College Opportunity Grant	Ohio College Opportunity Grant: Ohio residents in an Associate degree, first Bachelor's degree or nurse diploma program at an eligible Ohio or Pennsylvania institution who demonstrate financial need as determined through completion of the Free Application for Federal Student Aid (FAFSA)

\* Programs will be described in more detail later in this section.



## Early childhood care, education and family support programs

A strong body of research confirms the importance of a child's first five years of life. Early childhood lays the groundwork for physical, emotional, social and intellectual development later in life. Interventions supporting healthy development in early childhood have been shown to benefit children in various ways throughout life. This is especially true for children in families with low incomes. Giving children a healthy foundation is likely to increase educational attainment and may prevent poor birth outcomes and other negative events later in life.<sup>42</sup>

The federal, state and local levels of government all recognize the importance of these interventions, but local investments are not standard or consistent across Ohio. Publicly-funded early childhood interventions are primarily funded through federal and state sources but are administered at the local level. At the federal level, the Department of Health and Human Services (HHS) is the primary entity funding and administering programs.

Authority for state-level early childhood policies and programs in Ohio is shared among multiple entities – the State Board of Education and the Ohio Departments of Education, Job and Family Services, Health, Mental Health and Addiction Services and Developmental Disabilities. Ohio also has an **Early Childhood Advisory Council** which counsels the governor on matters involving early childhood.

Three types of early childhood programs are particularly relevant to infant mortality – home visiting, child care and early childhood education (e.g., preschool).

### Home visiting

Home visiting programs are an example of a two-generation strategy, helping children by also helping and supporting their parents. Trained professionals visit expectant mothers and families with infants and young children, providing one-on-one support for healthy parent and child development, early education and family needs. Participation is typically voluntary.

Help Me Grow is Ohio's largest home visiting program. Services are available in

all 88 counties and are provided by locally-administered programs. Ohio requires all Help Me Grow sites to use evidence-based home visiting program models.

Help Me Grow is administered by the Ohio Department of Health (ODH). It is funded by the Ohio General Revenue Fund (GRF) and, in some communities, supplemented by local sources such as tax levies or private foundations. Funding from the federal Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program allows Help Me Grow to reach more families in 27 counties.<sup>43</sup> In State Fiscal Year (SFY) 2016, 10,586 families received services funded by Help Me Grow and MIECHV. At most, this represents 4.7 percent of Ohio children under age 6 living below 100 percent FPL.<sup>44</sup>

**Early Head Start**, a federally-funded program that serves children ages 0-2, is administered through the Administration for Children and Families (ACF) within HHS,<sup>45</sup> but services are provided by local programs. Early Head Start programs in Ohio served over 5,000 pregnant women and children in 2014-2015.<sup>46</sup>

### Early childhood care and education

Publicly-funded child care and early childhood education programs (e.g., preschool) are available to low-income families but do not reach all eligible children. There are various federal, state and local programs that fund early childhood care and education in Ohio.

First, child care subsidies are primarily federally funded through the Child Care and Development Block Grant Act of 2014. The Ohio Department of Job and Family Services (ODJFS) is responsible for administering these Publically Funded Child Care (PFCC) subsidies in Ohio. PFCC can be used on child care for young children, preschool services for children of appropriate ages (normally 3 and 4 years old) and after-school programs for children in school.

At the state level, the Ohio Department of Education (ODE) funds preschool for eligible 4 year-old children and children with special needs. Federal funding is also provided for preschool for children with disabilities through the Individuals with Disabilities in Education Act (IDEA).



**Head Start**, which is almost completely funded by the federal government, is another early childhood education program for children through age 5. Like Early Head Start, Head Start programs are locally-administered. In addition to early childhood education, Head Start programs provide additional services such as healthcare services and parent education.

In order for early childhood care and education to impact children positively, it must be high quality.<sup>47</sup> **Step Up To Quality** (SUTQ) is Ohio's five-star quality rating and improvement system for early care and education programs, which is jointly administered by ODE and ODJFS. All programs funded by ODE must participate in SUTQ and receive a high-quality rating (three, four or five stars). Programs funded by ODJFS will also be required to participate by 2020 and receive a high-quality rating by 2025. As of September 2017, only 27 percent of these ODJFS programs were participating, and only 19 percent were rated as high-quality.<sup>48</sup>

There are also a number of local initiatives to expand access to high-quality early childhood education in Ohio; some local governments provide funding for these programs. A few examples include Cuyahoga County, Dayton, Columbus and Cincinnati. More details about these programs, as well as additional information about early childhood care, education and family support programs can be found in HPIO's policy brief **Connections between Education and Health #3: The importance of early learning**.

## High school graduation and equivalency

On-time high school graduation from a high-quality school district is ideal, but some students need additional support or alternative pathway options to reach this level of educational attainment. Programs and policies to increase rates of high school graduation and completion among high-risk infant mortality populations are valuable.

### Kindergarten – grade 12 (K-12) education

All three levels of government have roles in K-12 education policy and funding. The U.S.

Constitution gives the responsibility of public education to the states. Therefore, the federal government's role in K-12 education policy is minimal. Authority in K-12 education rests largely at the state and local levels. Further, Ohio is a local control state, which means local boards of education, rather than ODE, have decision-making authority in many areas of education policy, such as:

- Student codes of conduct or rules for expected behavior
- Academic curricula
- Grades and student retention/promotion
- Discipline, including suspensions and expulsions
- Open enrollment policies
- School safety<sup>49</sup>

### K-12 education funding

K-12 education is funded by federal, state and local sources. Federal funding makes up the smallest percentage, representing 8 percent of funding to Ohio school districts in 2014.<sup>50</sup> Federal funding largely provides additional support for students with low incomes through Title I of the Elementary and Secondary Education Act, currently authorized as the Every Student Succeeds Act, and students with disabilities through IDEA. Local funding (mainly through property taxes and sometimes income taxes) and state support (primarily through the GRF and lottery profits) make up the rest of the funding.

The percentages of state and local funding vary by district, and this ratio is determined by a state share index (SSI) formula which is based on a district's wealth (property values and resident incomes). Wealthier districts have a lower SSI, which means that they receive lower state aid and rely more heavily on local funding. In SFY 2017, the average state share of funding for Ohio K-12 schools was 48.1 percent.<sup>51</sup> By law, the state cannot contribute less than 5 percent or more than 90 percent. Also, there is no maximum limit on the amount of local funding a district can raise, which often leads to large variances in school funding levels between districts.

Funding is generally determined on a per-student basis. The per-student amount starts with a base amount, which is legislatively determined as the amount needed to



educate a student who requires no special services. In SFY 2017, the base amount was \$6,000.<sup>52</sup> It increased to \$6,010 in SFY 2018 and will increase to \$6,020 in SFY 2019.<sup>53</sup>

The state also distributes additional funding to districts for specific purposes or categories of students. Additional funding is provided based on:

- District characteristics, such as low wealth and high transportation costs
- Student characteristics, such as students in grades K-3, low-income students, English language learners and students with disabilities
- Specialized instruction programs, including career-technical education and instruction for gifted students
- Student performance based on graduation rates and third-grade reading proficiency

After accounting for these adjustments, state funding to high-poverty districts was 9 percent higher than state funding to low-poverty districts in 2015.<sup>54</sup>

It is important to note that funding for some districts is capped, meaning that it cannot go above a certain amount. Other districts are guaranteed a certain amount, meaning that their funding cannot go below that amount.

Funding for community schools (i.e., charter schools) works differently. Charter schools do not have local taxing authority, so their funding comes entirely from the state. This tends to result in lower funding levels when compared to traditional schools. More details about Ohio school funding can be found in [this report](#),<sup>55</sup> and funding levels for local districts can be found on [ODE's website](#).

### **K-12 education policy, planning and implementation**

The following entities and individuals are involved in K-12 education planning and decision-making:

- **U.S. Department of Education (ED):** The central entity involved in K-12 education at the federal level. The Department's primary functions are to "establish policy for, administer and coordinate most federal assistance to education," collect data on U.S. schools and to enforce federal

education laws regarding privacy and civil rights.<sup>56</sup>

- **Ohio Department of Education (ODE):** The agency which oversees Ohio's public education system (612 public school districts, 49 joint vocational school districts and 362 charter schools) and monitors early learning programs and private schools. Some of ODE's responsibilities include administering the school funding system, collecting school data, developing academic content standards and model curricula, issuing district and school report cards and licensing teachers, administrators, superintendents and other education personnel.
- **Ohio State Board of Education:** Composed of 19 members (11 elected and eight appointed by the Governor) who engage in state education policymaking, focusing on the long-term vision for public education. The State Board of Education governs ODE and selects the superintendent of public instruction, who leads ODE.
- **Local boards of education:** School district policymaking bodies composed of elected members who reside within the school district limits. There are normally five members, but this number can vary based on a city's population. School boards are charged with providing "the best educational opportunities possible for the youth of Ohio and managing and controlling the political subdivision of the school district."<sup>57</sup>
- **School district superintendent:** The person who serves as the top executive in a school district, similar to a CEO, and makes day-to-day decisions regarding educational programs, spending, staff and facilities. The superintendent is chosen by the local school board.
- **School building principal:** The person who manages the day-to-day operations of an individual school building, oversees faculty and staff and make decisions that impact educational success in the school.

ODE and local school boards must follow regulations and planning requirements specified in major federal legislation:

- **Civil Rights Act of 1964:** Title VI of this landmark civil rights legislation prohibits recipients of federal funding (included funding from ED) from excluding persons from participation in programs or denying persons the benefit of programs on the basis of race.



- **Every Student Succeeds Act (ESSA):** The latest reauthorization of the Elementary and Secondary Education Act of 1965. It gives states additional flexibility and encourages innovation, while holding them accountable for the results. Topics addressed in the law include standards, testing, accountability, teacher and leader quality and school improvement. States are required to develop an ESSA consolidated plan with input from a variety of stakeholders and submit it to the federal government. More information can be found [here](#).<sup>58</sup>
- **Individuals with Disabilities Act (IDEA):** Law that requires eligible children with disabilities to receive a “free appropriate public education” and ensures those children receive special education and other necessary services.<sup>59</sup>
- **Family Educational Rights and Privacy Act (FERPA):** Law which protects the privacy of student educational records and applies to all schools that receive ED funding.

States must submit an ESSA consolidated state plan to the U.S. Department of Education. It must address standards, assessments, school and district accountability and special help for struggling schools.<sup>60</sup> The plan that Ohio submitted in September 2017 is posted on [ODE’s website](#). It is pending approval from ED.

Further, there are several categories of low-performing schools in Ohio – called **priority**, **focus** and **watch schools** – that are required to develop school improvement plans, although all schools are free to do so. Ohio also requires certain districts to develop improvement plans.<sup>61</sup> ESSA requires states to identify their low-performing schools which are required to develop improvement plans at least every three years, but Ohio has not yet finalized its decision on whether this will be done more frequently.

ESSA created more opportunities for additional stakeholders, including teachers, parents, families and community organizations and leaders, to participate in school improvement plan development and implementation efforts. Schools must conduct a needs assessment and use the data to inform plan development.

### Health education in Ohio

Ohio law requires school districts to teach health education and outlines various topics that must be covered. Some examples include:

- The nutritive value of foods
- The relation of nutrition to health
- The harmful effects of using drugs, alcoholic beverages and tobacco
- Dating violence prevention
- Prescription opioid abuse prevention

The Ohio Revised Code ([ORC 3313.603](#)) only requires students to have one-half unit of health education to graduate from high school. More information about health education requirements in Ohio can be found on [ODE’s Health Education webpage](#).

Current Ohio law ([ORC 3301.0718](#)) does not permit the State Board of Education to adopt health education standards. Ohio is the only state without health education standards. Standards outline what a student should know and be able to do at each grade level. Standards are different than a curriculum, which refers to the detailed plan for day-to-day teaching. A curriculum outlines what will be taught and how it will be taught, with the goal of students mastering the standards. Standards are often used by districts to guide curriculum development.

Plans must include evidence-based interventions and identify resource inequities. The **Ohio Improvement Process**, a continuous improvement cycle, is a framework used to guide this work. ODE coordinates 16 regional **state support teams** to assist with school and district improvement efforts.

There are a number of other plans that school districts are required to develop and submit to the state. One relevant example is the **Career Advising Policy and Student Success Plan**, which school districts must submit every two years. It outlines how the district will approach career advising with students in grades 6-12. The plan must include a specific emphasis on students at risk of dropping out of school. Research has shown that academic and career counseling is provided less often to students with low incomes.<sup>62</sup>



Ohio also has several programs, described below, to help at-risk students earn a high school diploma or equivalency (i.e., Ohio Certificate of High School Equivalence).

**Dropout prevention and recovery programs**

Community schools (i.e., charter schools) can receive a formal dropout prevention and recovery program designation if the majority of students they serve are between the ages of 16 and 22 and are at-risk of dropping out or have already dropped out of high school. Dropout prevention and recovery schools are defined in **Ohio Administrative Code 3301-102-10**. Schools with this designation are evaluated differently than traditional schools and receive an alternate report card – Ohio’s Dropout Prevention and Recovery (DOPR) Report Card.

There are 82 designated dropout prevention and recovery programs around Ohio<sup>63</sup>, in which total enrollment was 14,402 students in October 2016.<sup>64</sup> These schools are overseen by ODE, and funding is generally determined the same way as for other community schools in Ohio.

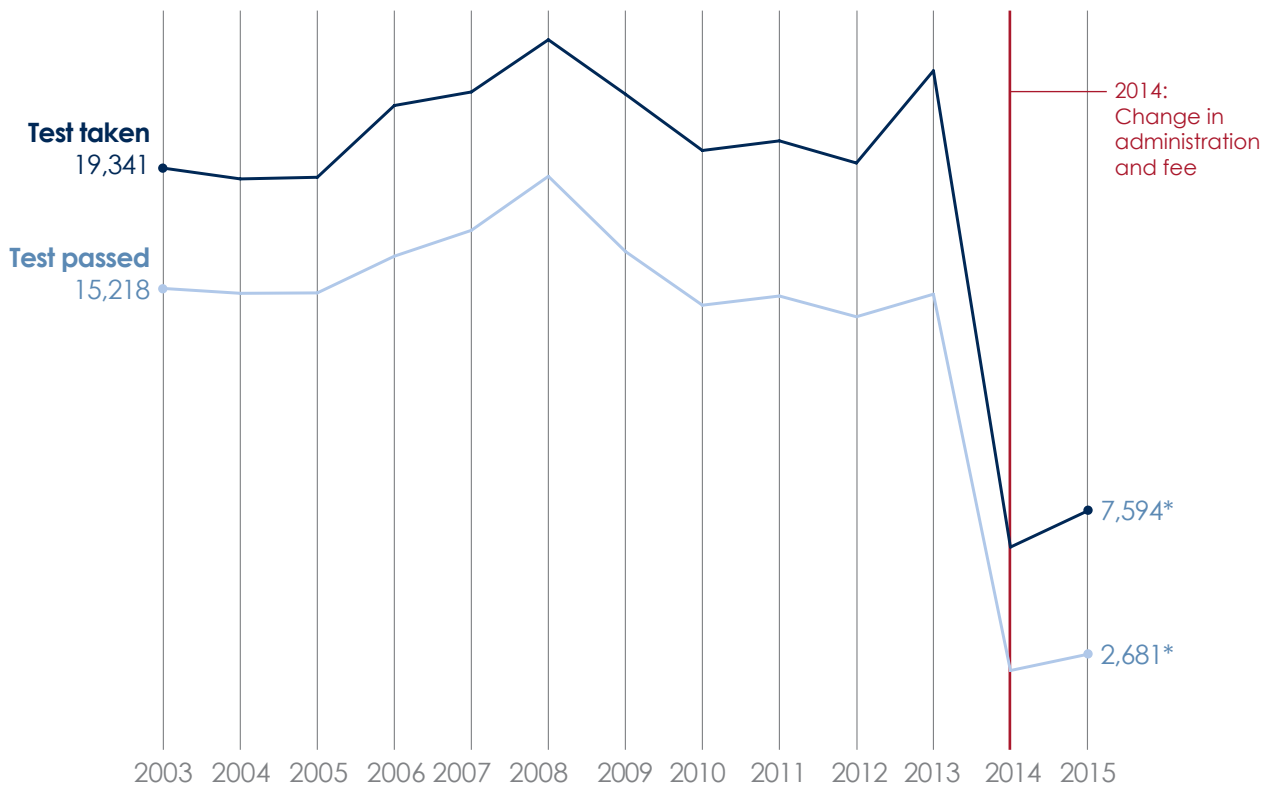
**High school equivalency**

Ohio has three programs to assist adults wanting to earn a high school diploma or equivalency, all of which fall under the purview of ODE.

The most well-known high school equivalency option is the GED (General Educational Development) Test. Upon passing the GED, the person receives an Ohio Certificate of High School Equivalence. The GED underwent some considerable changes several years ago. In 2014, a new company, PearsonVUE, took over administration of the GED, increased the price, changed the content to align with Common Core standards and eliminated the option to take the test on paper, rather than electronically.

The number of people taking and passing the GED dropped considerably (see figure 6.13). However, after the GED cost increase, the state of Ohio began providing financial vouchers to GED test-takers through career centers. The vouchers are provided for first-time computer-

Figure 6.13. Number of Ohioans taking and passing the GED (2003-2015)



\* As of Sept. 9, 2015

Source: Policy Matters Ohio analysis of data provided by the Ohio Department of Education



based test-takers and they reduce the individual cost of the test from \$120 to \$40.

Some states have started to offer alternative high school equivalency test options in addition to or in place of the GED. For 2018, ODE approved two nationally recognized high school equivalency tests (the HiSET and TASC) in addition to the GED. The costs of the tests vary, but the vouchers issued by the state of Ohio will result in the cost being \$40 for each.<sup>65</sup> The HiSET will offer a non-electronic testing option.

Ohio began offering two other adult high school diploma programs several years ago, both at no cost to the student:

- **Adult Diploma Program:** Offers Ohio adults an opportunity to simultaneously earn a state-issued high school diploma and industry credentials in one of Ohio's in-demand job fields. Programs are offered locally at **40 locations** around the state.
- **22+ Adult High School Diploma Program:** Enables an adult to earn a high school diploma from the local school district he or she had attended. The adult learner must complete all graduation requirements that were in place when he or she enrolled in ninth grade, including all applicable testing requirements. Programs are offered by nearly **20 providers** around the state. Districts are required to award a diploma to students fulfilling the necessary requirements.

A representative from ODE estimated that approximately 1,000 Ohio adults have earned a high school diploma through one of these two programs since they began.<sup>66</sup>

Ohio's **54 locally-administered Aspire programs** offer free high school equivalency exam preparation services. Aspire is the new name of the program that was formerly known as ABLE (Adult Basic and Literacy Education). It is largely funded by the federal Workforce Innovation and Opportunity Act (WIOA) and the state GRF. See part seven of this report for more information.

## Career-technical education

Career-technical education (CTE) offers opportunities to earn valuable certificates or credentials in a relatively short amount of time.

CTE programs can also be part of a pathway toward an Associate or Bachelor's degree.

Ohio offers both secondary (high-school students) and postsecondary (adult) CTE opportunities. Secondary CTE is overseen by ODE, and postsecondary CTE is under the purview of the Ohio Department of Higher Education (ODHE).

First, public school districts are required by Ohio law to provide students in grades 7-12 access to career-technical education, although most wait until high school to enroll.<sup>67</sup> In addition to the standard academic requirements, students take specific classes in their chosen field, such as health sciences, information technology or hospitality and tourism. Ohio offers 16 program options in secondary CTE. Finding and recruiting instructors for secondary CTE can be a challenge for programs, because licensure requirements are stricter than those for adult CTE instructors.<sup>68</sup>

Depending on where a student lives, CTE is either delivered in the local high school or through a career center, both of which are part of a career-technical planning district (CTPD). There are **91 CTPDs** in the state.

Under the umbrella of Ohio's secondary CTE is Career-Based Intervention (CBI), which is a long-standing program to serve students at risk of academic failure. CBI consists of work-based learning and academic interventions and aims to keep students engaged and prevent them from dropping out.<sup>69</sup>

Since CTE infrastructure already exists, many CTPDs offer programs to adults in evening hours or expand to serve adults. At the postsecondary level, CTE services are delivered by **Ohio Technical Centers** and Aspire sites, but also by colleges and universities. Adults can earn certificates and credentials through short- or longer-term training programs. Short-term programs normally last 10 weeks or less. Welding is one example of a short-term program. Comparatively, longer-term programs can require the student to complete 30 credit hours or more.



There are some CTE programs available to adults that are not available to high school students. This may be because some programs are too long or are not appropriate for high school students, such as programs involving heavy equipment operations. Paramedic programs are another example. Accreditation requirements and licensure standards prohibit secondary students from being eligible for this program.<sup>70</sup>

In the past three years, a total of 206,865 Ohioans (112,888 through secondary CTE and 93,977 adults through postsecondary CTE) enrolled in career-technical programs.<sup>71</sup> Demand for some programs exceeds capacity, in which cases students are either turned away or added to a waiting list.<sup>72</sup>

### **Career-technical education funding**

CTE in Ohio is funded by a grant from the federal Carl D. Perkins Career and Technical Education Act of 2006 and state CTE funding. In FY 2015, 88 percent of the Perkins funding went to secondary education, and only 12 percent went to postsecondary education. However, ODE estimates that Perkins funding only represents between 3 and 8 percent of a CTPD's budget.<sup>73</sup> See part seven of this report for more information on Perkins funding.

For secondary students, Ohio uses a per-student funding model, and amounts differ based on the program in which a student enrolls. There are five categories of CTE funding, which added between \$1,308 and \$5,192 to the per-student base amount (\$6,000) in SFY 2017.<sup>74</sup>

Postsecondary funding works differently and depends on the entity providing the CTE. See the postsecondary education funding section for more information.

Funding from the Perkins Act to Ohio has remained fairly steady in recent years, while state funding for CTE has generally trended upward.<sup>75</sup>

### **Postsecondary education**

Postsecondary education is very important and becoming more critical as more employers are demanding more highly-

educated employees. Ohio offers a range of postsecondary education options. In addition to the 54 Ohio Technical Centers in the state, there are 14 public universities, 24 public regional campuses, 23 community colleges and **52 private colleges and universities**. (This [map from ODHE](#) shows all public institutions in Ohio.)

Spearheaded by ODE, ODHE, the Governor's Office of Workforce Transformation and a group of stakeholders, the state of Ohio has formally adopted and endorsed a statewide attainment goal: 65 percent of Ohioans, ages 25-64, will have a degree, certificate or other postsecondary workforce credential of value in the workplace by 2025. In 2015, the percentage was 43.6 percent.<sup>76</sup> There are challenges to attaining this goal, one of which is the cost of postsecondary education. Tuition costs of Ohio public higher education institutions are higher than the national average, and Ohio's need-based financial aid is lower than the national average.<sup>77</sup> Several programs to help with postsecondary accessibility are explained below.

### **College Credit Plus**

College Credit Plus (CCP) allows high school students to take college-level courses and simultaneously earn college and high school credit. There are a number of delivery models. For example, students can attend classes on the institution's campus, the higher education institution can offer classes at high schools or classes can be offered online. The cost to the student for taking courses through CCP is normally minimal.

The program served more than 68,000 Ohio students in 2016-2017.<sup>78</sup> However, participation in CCP is much lower among minority students, students with low incomes and students living in rural and urban areas. This may be due, in part, to transportation barriers.

### **Postsecondary education funding**

In addition to the revenue collected through student tuition and fees, Ohio public institutions of higher education receive funding from the federal and state governments. In recent years, state shares of higher education funding have decreased and the federal share has increased.<sup>79</sup> Relative to K-12 education, a





larger portion of postsecondary funding comes from the federal government. Federal student aid programs, including the need-based Pell Grant program and federal loans, are authorized under Title IV of the Higher Education Act.<sup>80</sup> Pell grants make up a considerable share of government aid to institutions of higher education. Other federal grants are also allocated. For example, universities can receive considerable amounts of funding through federal research grants.

Government funding for public postsecondary institutions helps keep tuition costs down for students. Figure 6.14 shows Ohio's state-source expenditures for higher education in SFY 2008-2017 and appropriations for SFY 2018-2019. Funding dropped considerably in SFY 2010 and remains below pre-2010 levels.

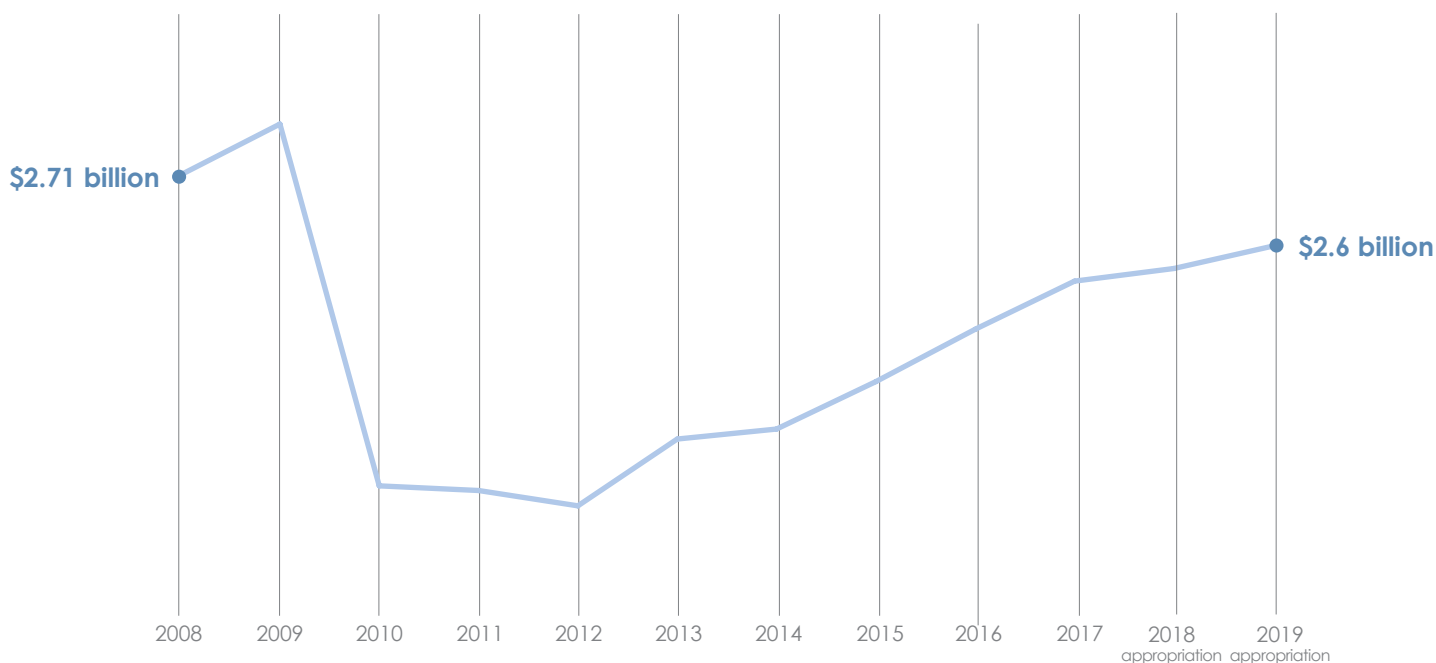
State funding is largely determined by the state share of instruction (SSI) funding formulas. In recent years, Ohio has transitioned to a more performance-based funding system that incentivizes student course and degree completion, among other things. The formula for university main and regional campuses is slightly different than the formula for community and technical colleges.

SSI is student-based, but goes directly to the institutions. Higher funding weights are applied to certain groups of students based on age, race, income and academic preparation. Public universities receive the highest percentage of the state's total SSI funding.<sup>81</sup> More information on SSI can be found [here](#).<sup>82</sup>

State funding for Ohio Technical Centers (OTCs) is also determined by a performance-based formula. However, state funding covers a much lower percentage of OTCs' costs than it does for community colleges and universities, despite the fact that these entities offer some of the same technical programs. OTC completion rates are very high – approximately 75 percent.<sup>83</sup>

In an effort to decrease tuition costs and accumulated student debt, Governor Kasich created the Ohio Task Force on Affordability and Efficiency in Higher Education in 2015. The task force was charged with making recommendations for how state public higher education institutions could be more efficient, while keeping quality high. The recommendations report is available [here](#).

Figure 6.14. Ohio state-source expenditures for higher education (SFY 2008-2017)



**Note:** Includes state sources credited to the General Revenue Fund (GRF), the Local Government Fund (LGF), the Public Library Fund (PLF) and the Lottery Profits Education Fund (LPEF).

**Source:** Ohio Legislative Service Commission. Historical Revenues and Expenditures. Table 2- State-Source GRF, LPEF and LGF Expenditure History



**State need-based financial aid**

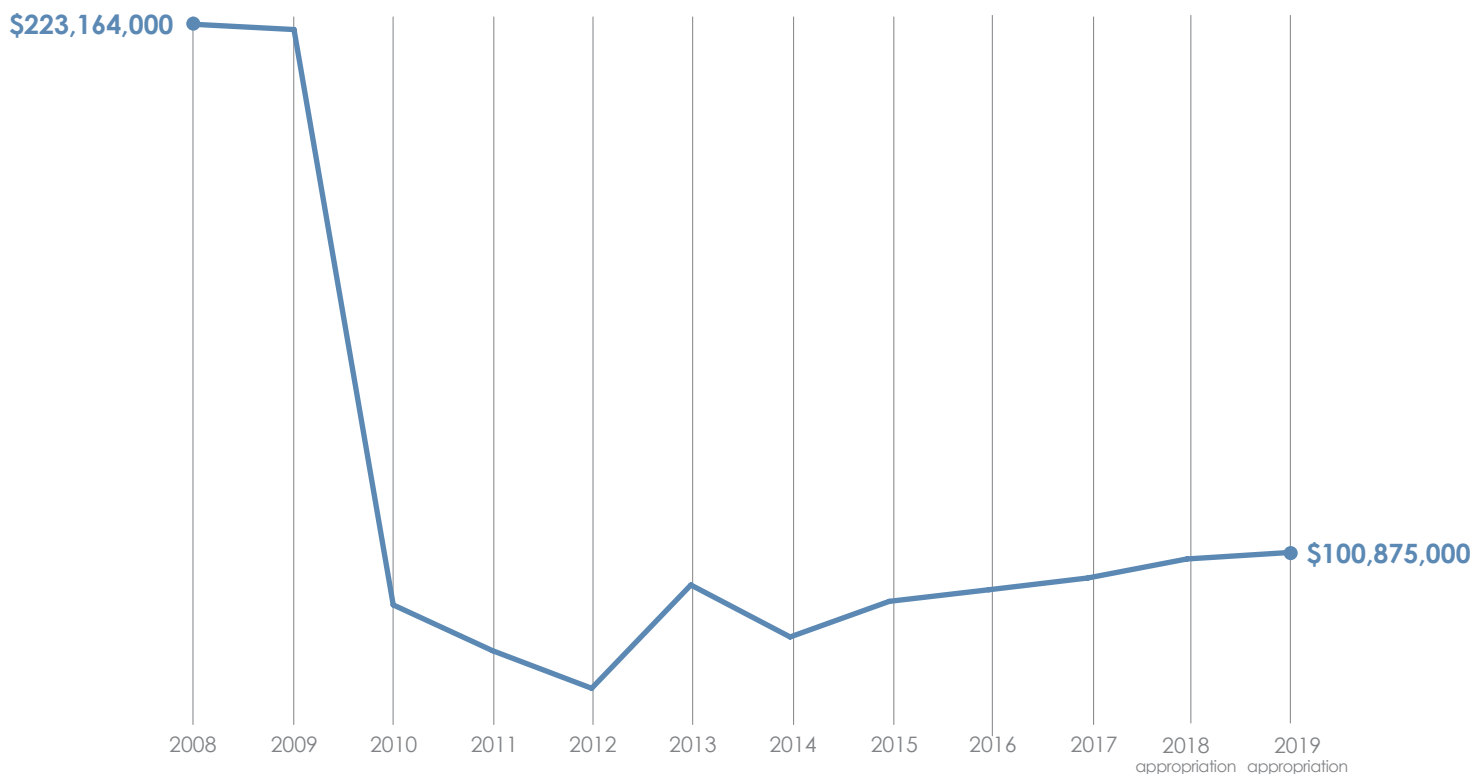
The state of Ohio offers need-based financial aid, primarily through the Ohio College Opportunity Grant (OCOG) program. However, there are some barriers associated with accessing this funding. First, to apply for OCOG funding, applicants must fill out the Free Application for Federal Student Aid (FAFSA), which is a very complicated process that is challenging for many students – especially first-generation college students. Not filing a FAFSA has been found to be a significant barrier to college enrollment.<sup>84</sup> In 2016, the FAFSA completion rate among Ohio high school seniors was only 44.2 percent as of April 15, 2016.<sup>85</sup>

State-level funding for need-based financial aid dropped significantly in SFY 2010 during the economic recession and still remains

considerably lower than pre-2010 levels (see figure 6.15). Also in 2009, Ohio adopted a Pell-first policy, which requires students to use Pell grant funding before being able to use funding from OCOG. In most cases, OCOG funding can only be used on tuition and fees and not on other expenses such as textbooks and room and board. Since tuition costs are lower at community colleges, regional campuses and OTCs, Pell grant funding is normally sufficient to cover the cost. Therefore, students at these institutions are very rarely able to benefit from OCOG funding.

Ohio has other financial aid and scholarship programs. However, they are primarily targeted toward specific groups of students, such as children of police officers or firefighters killed in the line of duty.

Figure 6.15. **Total need-based, higher education financial aid provided in Ohio (SFY 2008-2017)**



**Note:** All years include spending amounts for the Ohio College Opportunity Grant line item. For 2008 and 2009, the Ohio Instructional Grant line item is included, and the Part-Time Student Instructional Grant line item is also included for 2008. An OCOG-Proprietary line item is included for 2012 and 2013.

**Source:** Ohio Legislative Service Commission Main Operating Budget Greenbooks 128th-132nd General Assemblies



### **Short-term training programs**

There is no financial aid available for short-term training programs, except for loans through **Ohio's Workforce Development Revolving Loan Fund** program, which is administered through postsecondary institutions. Students must be enrolled in an approved workforce training program at a participating institution. The bipartisan JOBS Act, introduced in January 2017 by U.S. Senators Rob Portman (R-OH) and Tim Kaine (D-VA), would allow Pell grants to be used for these programs. As of early November 2017, the legislation had not yet been voted out of the Senate.<sup>86</sup>

In the SFY 2018-2019 Ohio budget, \$5 million was allocated for the second year of the biennium to reduce the cost of short-term certificate programs for in-demand jobs at community colleges and universities. However, ODHE has not yet determined how that funding will be utilized.

### **Postsecondary education policy, planning and implementation**

The following entities and individuals are involved in higher education planning and decision-making:

- **U.S. Department of Education (ED):** The central entity involved in higher education at the federal level.
- **The Ohio Department of Higher Education (ODHE):** Formerly called the Ohio Board of Regents, ODHE is the state agency overseeing higher education. Some of its primary responsibilities include developing higher education policy, authorizing and approving new degree programs and managing state financial aid programs.
- **College/university boards of trustees:** Governing bodies for institutions of higher learning. University boards are composed of 9-15 members appointed by the governor. Community college board members are also normally appointed by the governor, but some are appointed by local officials.<sup>87</sup> These bodies make many important decisions including selecting the college/university president, setting operating budgets and approving rules, regulations and curriculum changes.
- **College/university president:** The person who serves as the top executive for a college/university, similar to a CEO, and is responsible

for the operations of the institution. Specific responsibilities of the president vary by institution.

- **College/university provost:** The person who serves as the Chief Academic Officer for a college/university. Normally, the provost oversees curricular, instructional and research affairs, but the specific responsibilities for this role also vary by institution.

In addition to the Civil Rights Act, FERPA and the Perkins Act, the most important piece of legislation impacting postsecondary education is the Higher Education Act, which is currently authorized as the Higher Education Opportunity Act. In 1965, the Higher Education Act first authorized assistance for postsecondary education, and a reauthorization in 1972 created the Pell grant.<sup>88</sup> Today, this piece of legislation is the vehicle for a considerable amount of federal higher education policy.



## Education policy recommendations

HPIO drew upon the following sources of information to identify policy goals and recommendations to improve educational attainment in Ohio:

- Literature review, scope of problem and policy landscape (part six of this report)
- Evidence inventories (see Appendix B)
- Suggestions and feedback from the Advisory Group, including prioritization of goals and recommendations
- Input from additional subject matter experts on technical and political feasibility

See Appendix D for a detailed description of the policy recommendation development process.

The following policy goals address critical education challenges and inequities facing Ohio families at risk for infant mortality. Research indicates that achievement of these goals would likely contribute to improved birth outcomes, healthier infants and health equity.

### Education policy goals

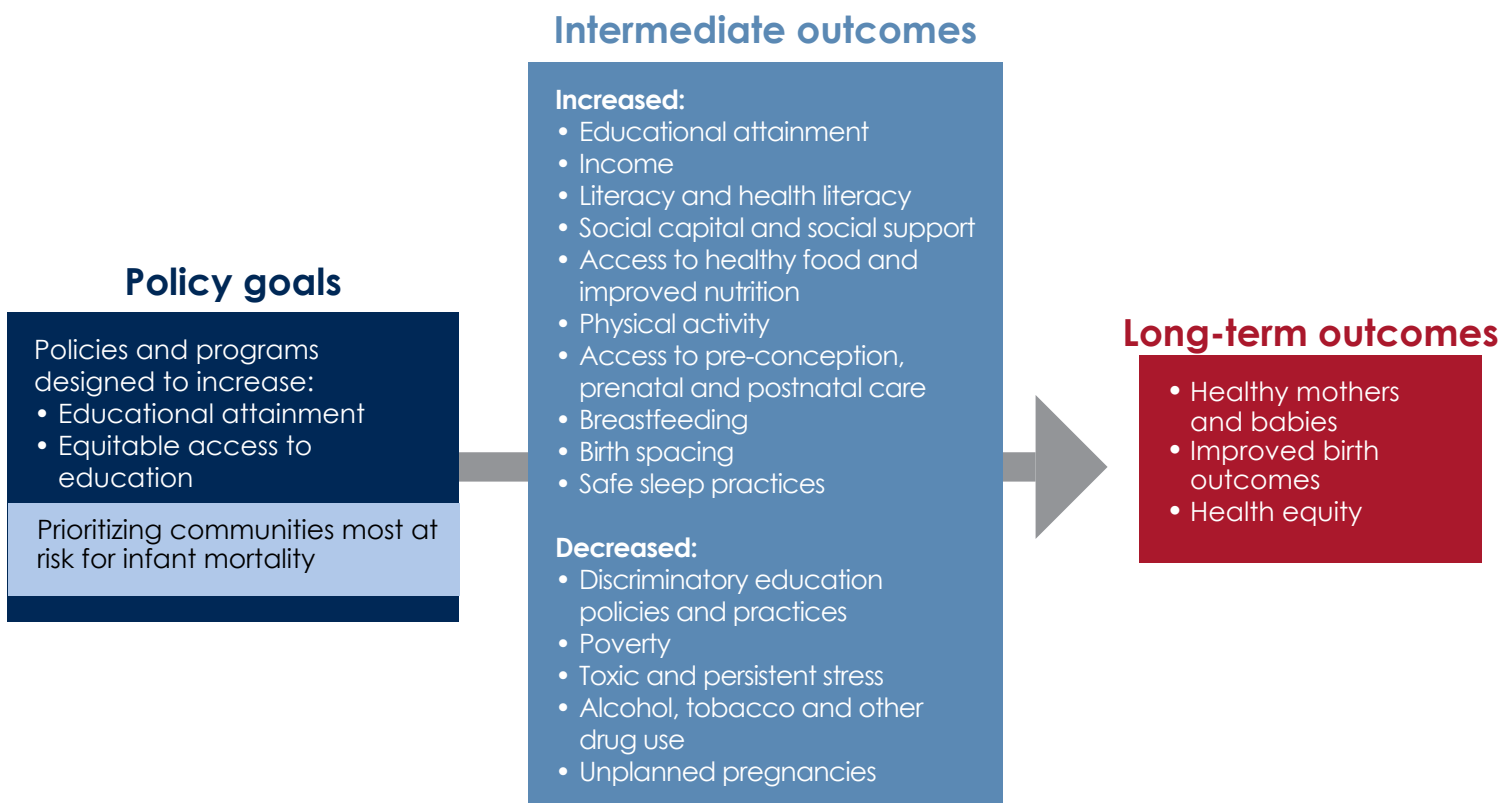
#### Top-priority goals

1. Strengthen early childhood education and family support programs
2. Increase high school graduation rates through high-quality programs geared toward the highest risk students
3. Strengthen career-technical education programs
4. Reduce financial barriers to postsecondary education

#### Additional goals

5. Increase the number of Ohio adults who take and pass high school equivalency exams or pursue other paths to earn a high school diploma
6. Improve college preparation and college entry programs and services for low-income Ohioans
7. Reduce other barriers to high school completion programs and postsecondary education for students

Figure 6.16. Education policy goals





In order to reach these long-term policy goals, this report identifies specific and actionable recommendations for state and local policymakers. The top-priority recommendations are listed below and additional policy options are listed in Appendix A.

### **Education policy goal 1.** Strengthen early childhood education and family support programs

- 1.1 State and local policymakers can increase the provision of evidence-based parenting education and support interventions, such as home visiting.
- 1.2 State and local policymakers can increase the number of Ohio children served by high-quality child care, preschool and pre-K by increasing public funding for early learning programs to provide access for more 3 and 4 year-old children and/or exploring the possibility of more innovative funding mechanisms such as pay-for-success financing.
- 1.3 State policymakers can create incentives to encourage early childhood care and education programs to participate in Step Up To Quality and achieve high-quality ratings.

### **Education policy goal 2.** Increase high school graduation rates through high-quality programs geared toward the highest risk students

- 2.1 The Ohio Department of Education, State Board of Education, Ohio Department of Higher Education, Governor's Office of Workforce Transformation, local school districts and/or local philanthropic organizations can strengthen and expand use of the following evidence-based strategies:
  - a. Career academies
  - b. Talent search programs (programs to help low-income and first-generation college students complete high school and gain access to college)
  - c. **Community schools** (Note: Charter schools in Ohio are referred to as "community schools" under Ohio law, ORC 3314.01, but this is different from the community schools model referenced here)
  - d. School-based health centers
  - e. Mentoring and/or case management programs, specifically for pregnant and parenting teens

- 2.2 School districts can support students' high school graduation by:
  - a. Establishing community partnerships to facilitate provision of more support services (e.g., mental health services and supports, mentoring, child care, health care, including prenatal care) for struggling students, especially pregnant and parenting teens
  - b. Providing early educational intervention services to at-risk students to keep them on a path toward academic success, high school graduation and career readiness
  - c. Implementing career academies and identifying other ways to increase school engagement
  - d. Recognizing early warning signs of dropout (e.g., chronic absenteeism, students falling far behind academically, suspensions/expulsions, etc.) and taking appropriate preventive action early (Districts can utilize the Student Success Dashboard offered by ODE)
  - e. Implementing trauma-informed policies and practices in schools
- 2.3 State and local policymakers can encourage and support partnerships between schools and community health and social service providers to increase services offered to students and strengthen coordination of services.
- 2.4 The Ohio General Assembly can require the Ohio Department of Education to establish health education standards.

### **Education policy goal 3.** Strengthen career-technical education programs

- 3.1 State policymakers can explore ways to increase capacity for secondary and postsecondary career-technical education (vocational training) programs by:
  - a. Incentivizing businesses to partner with and provide support to career-technical education programs
  - b. Working with schools and career-technical planning districts to re-evaluate and streamline teacher credentialing requirements
  - c. Providing additional incentive-based resources for under-subscribed career-technical education programs, especially those in high-need career areas, in hopes of increasing enrollment in those programs



- 3.2 State policymakers can identify ways to increase participation of high-school students in career-technical education (vocational training) programs such as:
- Increasing opportunities for work-based learning
  - Further leveraging credit flexibility
  - Allowing students to attend Ohio Technical Centers through College Credit Plus
  - Encouraging schools to implement career academies

#### **Education policy goal 4.** Reduce financial barriers to postsecondary education

- 4.1 The Ohio Department of Higher Education can further tailor financial aid and scholarship eligibility criteria to students who would likely not be able to attend without this financial support.
- 4.2 State policymakers can increase opportunities for Ohioans to obtain quality postsecondary credentials by raising appropriations for the Ohio College Opportunity Grant (OCOG) and requiring the Ohio Department of Higher Education to either reverse the Pell-first policy or otherwise reform OCOG so community college and OTC students can use financial aid to cover the total cost of attendance (not only tuition and fees, but other expenses such as textbooks and room and board as well). However, this will require policymakers to be mindful of not reducing allocations for currently-eligible recipients.

#### **Education policy goal 5.** Increase the number of Ohio adults who take and pass high school equivalency exams or pursue other paths to earn a high school diploma

- 5.1 State policymakers can explore ways to improve the quality and effectiveness of the Adult Diploma Program, the 22+ Adult High School Diploma Program and preparation services for high school equivalency tests provided by Aspire (formerly ABLE) programs, especially in infant mortality hot spot areas.

#### **Education policy goal 6.** Improve college preparation and college entry programs and services for low-income Ohioans

- 6.1 Local school districts can:
- Provide more assistance to students and families applying for financial aid and completing college applications
  - Offer ACT/SAT preparation services, especially for low-income students
  - Deliver more college and career advising services, beginning at younger ages, which include information about career-technical education programs, community colleges and other educational options outside of four-year college degrees
- 6.2 State policymakers can identify ways to expand the reach of College Credit Plus, especially in low-income and rural areas, such as through:
- Expanding financial support or incentives for teachers to obtain the necessary credentials to become College Credit Plus instructors in their own schools
  - Identifying new or innovative pathways to expand opportunities for students to pursue technical certificates or credentials through College Credit Plus

#### **Education policy goal 7.** Reduce other barriers to high school completion programs and postsecondary education for students

- 7.1 Institutions of higher education can implement retention programs and interventions, such as first year experience programs, co-requisite remediation models and guided pathways, especially for first-generation college students.



## Connections to other outcomes

Although developed to reduce infant mortality, these education policy goals and recommendations also support many other state priorities for improving population health outcomes, controlling healthcare spending and increasing economic opportunity and vitality. For example, increased educational attainment among Ohioans would increase individual earnings, reduce reliance on public benefits and attract employers, which support the policy goals of part seven of this report.

The importance of educational attainment and student success is also emphasized in the **2017-2019 State Health Improvement Plan (SHIP)**. For example, specific strategies in the areas of school-based health (mentioned in goal 2) and early childhood supports (goal 1) are listed in the SHIP as cross-cutting strategies to support all 10 SHIP priority outcomes. The SHIP is being implemented by state agencies and by local health departments and hospitals through their community health improvement initiatives.



## Notes

- "Infant mortality." Child Health USA 2014. Rockville, Maryland: U.S. Department of Health and Human Services, 2014. Accessed July 13, 2017. <https://mchb.hrsa.gov/chusa14/health-status-behaviors/infants/infant-mortality.html>
- Gage, Timothy B., Fu Fang, Erin O'Neill and Greg DiRienzo. "Maternal education, birth weight and infant mortality in the United States." *Demography* 50, No. 2 (2013): 615-635. doi: 10.1007/s13524-012-0148-2
- Din-Dzietham, Rebecca and Iva Hertz-Picciotto. "Infant mortality differences between Whites and African Americans: The effect of maternal education." *American Journal of Public Health* 88, No. 4 (1998): 651-656
- Gage, Timothy B., Fu Fang, Erin O'Neill and Greg DiRienzo. "Maternal education, birth weight and infant mortality in the United States." *Demography* 50, No. 2 (2013): 615-635. doi: 10.1007/s13524-012-0148-2
- Blumenshire, Philip M., Susan A. Egerter, Moreen L. Libet and Paula A. Braveman. "Father's Education: An independent marker of risk for preterm birth." *Journal of Maternal and Child Health* 15 (2011): 60-67. doi: 10.1007/s10995-009-0559-x
- Ahem, Joseph. *Low Birth Weight and Prematurity in Ohio: A multivariate analysis*. The Center for Community Solutions, July 2017.
- Schoendorf, Kenneth K., Carol J.R. Hogue, Joel C. Kleinman and Diane Rowley. "Mortality among infants of black as compared with white college-educated parents." *The New England Journal of Medicine* 326, No. 23 (1992): 1522-1526
- Ibid.
- Health Policy Institute of Ohio. "Connections between education and health." January 2017.
- Lu, Michael C., et al. Closing the Black-White gap in birth outcomes: A life-course approach (Author manuscript). *Ethnicity and Disease* 20 (2010): S2-62-76
- Bell, Janice F., Frederick J. Zimmerman and Paula K. Diehr. "Maternal work and birth outcome disparities. *Maternal and Child Health Journal* 12 (2008):415-426. doi:10.1007/s10995-007-0264-6
- Mahmoodi, Z. et al. "Association of maternal working condition on low birth weight: The social determinants of health approach." *Annals of Medical and Health Sciences Research* 5, No. 6 (2015): 385-391. doi:10.4103/2141-9248.177982
- Bell, Janice F., Frederick J. Zimmerman and Paula K. Diehr. "Maternal work and birth outcome disparities. *Maternal and Child Health Journal* 12 (2008):415-426. doi:10.1007/s10995-007-0264-6
- Levandowski, Brooke A. et al. "Parental literacy and infant health: An evidence-based Healthy Start intervention." *Health Promotion Practice* 7, No. 1 (2006): 95-102.
- Kateja, Alpana. "Role of female literacy in maternal and infant mortality decline." *Social Change* 37, No. 2 (2007): 29-39. See also W Xie, Yipiong, Emily Wheeler Harville and Aubrey Spriggs Madkour. "Academic performance, educational aspiration and birth outcomes among adolescent mothers: A national longitudinal study." *BMC Pregnancy and Childbirth* 14, No. 3 (2014). doi:10.1186/1471-2393-14-3; Kumar, Disha, et. al. "Parental understanding of infant health information: Health literacy, numeracy and the Parent Health Literacy Activities Test (PHLAT)." *Academic Pediatrics* 10, No. 5 (2010): 309-316. doi:10.1016/j.acop.2010.06.007
- Levandowski, Brooke A. et al. "Parental literacy and infant health: An evidence-based Healthy Start intervention." *Health Promotion Practice* 7, No. 1 (2006): 95-102.
- James-Todd, Tamara, Teresa Janevic, Florence M. Brown and David A. Savitz. "Race/ethnicity, educational attainment and pregnancy complications in New York City women with pre-existing diabetes." *Pediatric and Perinatal Epidemiology* (2013): 157-164
- Social capital, human capital and health: What is the evidence? OECD Center for Educational Research and Innovation, 2010. <https://www.oecd.org/edu/research/45760738.pdf>
- Lu, Michael C., et al. Closing the Black-White gap in birth outcomes: A life-course approach (Author manuscript). *Ethnicity and Disease* 20 (2010): S2-62-76
- Social capital, human capital and health: What is the evidence? OECD Center for Educational Research and Innovation, 2010. <https://www.oecd.org/edu/research/45760738.pdf>
- Vikram, Kriti, Sonalde Desai and Reeve Vanneman. "Maternal education and child mortality: exploring the pathways of influence." College Park, MD: University of Maryland, 2010. <http://ppaa2011.princeton.edu/papers/111195>
- Lu, Michael C., et al. Closing the Black-White gap in birth outcomes: A life-course approach (Author manuscript). *Ethnicity and Disease* 20 (2010): S2-62-76
- Currie, Janet and Enrico Moretti. "Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings." *The Quarterly Journal of Economics* 118, No. 4 (2003): 1495-1532.
- Ibid.
- Life course indicator: Mother's education level at birth. Washington, DC: Association of Maternal and Child Health Programs, Winter 2013-2014.
- Kateja, Alpana. "Role of female literacy in maternal and infant mortality decline." *Social Change* 37, No. 2 (2007): 29-39. See also Vikram, Kriti, Sonalde Desai and Reeve Vanneman. "Maternal education and child mortality: exploring the pathways of influence." College Park, MD: University of Maryland, 2010. <http://ppaa2011.princeton.edu/papers/111195>
- Data from Population Reference Bureau analysis of data from the U.S. Census Bureau, American Community Survey as reported by Kids Count Data Center. Accessed Oct. 17, 2017. <http://datacenter.kidscount.org/data#OH/2/0/char/0>.
- Logan, Jessica, Laura Justice and Jill Pentimonti. *Ready to Read and School Success: Kindergarten Readiness and the Third Grade Reading Guarantee*. Columbus, OH: Crane Center for Early Childhood Research and Policy, 2014.
- Hernandez, D. J. *Double Jeopardy: How Third-Grade Reading Skills and Poverty Influence High School Graduation*. Baltimore, MD: Annie E. Casey Foundation, 2011.
- Data from the 2003 National Assessment of Adult Literacy as reported by the National Center for Education Statistics. "State and county estimates of low literacy." Institute of Education Sciences. Accessed Oct. 13, 2017. <https://nces.ed.gov/naal/estimates/StateEstimates.aspx>
- Kulner, Mark, et. al. *The Health Literacy of America's Adults: Results from the 2003 National Assessment of Adult Literacy*. Washington, DC: National Center for Education Statistics, Sept. 2006.
- Data from the National Health Security Preparedness Index. "Ohio." Accessed Oct. 27, 2017. <https://nhspi.org/states/ohio/>
- Currie, Janet and Enrico Moretti. "Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings." *The Quarterly Journal of Economics* 118, No. 4 (2003): 1495-1532.
- Data from the American Community Survey 1-year estimates 2016. U.S. Census Bureau. Accessed Nov. 7, 2017. <https://www.census.gov/programs-surveys/acs/>
- Lu, Michael C., et al. Closing the Black-White gap in birth outcomes: A life-course approach (Author manuscript). *Ethnicity and Disease* 20 (2010): S2-62-76
- "Community Eligibility Provision Fact Sheet." Ohio Department of Education. Apr. 2017. Accessed Nov. 7, 2017. [http://education.ohio.gov/getattachment/Topics/Other-Resources/Food-and-Nutrition/Resources-and-Tools-for-Food-and-Nutrition/Community-Eligibility-Option/CEP\\_Fact\\_Sheet\\_2017\\_2018.pdf.aspx](http://education.ohio.gov/getattachment/Topics/Other-Resources/Food-and-Nutrition/Resources-and-Tools-for-Food-and-Nutrition/Community-Eligibility-Option/CEP_Fact_Sheet_2017_2018.pdf.aspx)
- Balmert, Jessica and Hannah Sparling. "How young is too young? 36,000 elementary school suspensions." *Cincinnati.com* Feb. 13, 2017. <https://www.cincinnati.com/story/news/politics/2017/02/13/ohio-schools-could-banned-suspending-expelling-young-students/97406154/>
- School discipline policies and cradle to prison pipeline. Children's Defense Fund-Ohio. May 2017. <http://www.cdfohio.org/research-library/2017/school-discipline-policies.pdf>
- Ibid.
- "Career-Based Intervention." Ohio Department of Education. Accessed Oct. 18, 2017. <http://education.ohio.gov/Topics/Career-Tech/Career-based-Intervention-CBI>
- "GED Credentialing FAQs." Ohio Department of Education. Accessed Oct. 18, 2017. <http://education.ohio.gov/Topics/Testing/Ohio-Options-for-Adult-Diploma/GED/GED-FAQs>
- Health Policy Institute of Ohio. "Connections between education and health #3: The importance of early learning." October 2017.
- "Home Visiting Program State Fact Sheets: Ohio." Health Resources and Services Administration. <https://mchb.hrsa.gov/sites/default/files/mchb/MaternalChildHealthInitiatives/HomeVisiting/pdf/oh.pdf>
- Analysis of data from the Ohio Department of Health and U.S. Census Bureau as reported by Ackerman, Susan and Lauren Manowar-Jones. "How is Ohio investing in children?" Testimony before the Senate Education and Health and Human Services Committees, Oct. 17, 2016.
- "History of Head Start." Office of Head Start: An Office of the Administration for Children and Families. <https://www.acf.hhs.gov/ohs/about/history-of-head-start>
- Ohio Head Start & Early Head Start 2014-2015 Overview. National Institute for Early Education Research. [http://nieer.org/wp-content/uploads/2016/12/HS\\_Ohio\\_Profile.pdf](http://nieer.org/wp-content/uploads/2016/12/HS_Ohio_Profile.pdf)
- Health Policy Institute of Ohio. "Connections between education and health #3: The importance of early learning." October 2017.
- Data provided by Groundwork Ohio via email. Oct. 23, 2017.
- "Having a problem with your school or district?" Ohio Department of Education. <http://education.ohio.gov/Parents/Having-a-problem-with-your-school-or-district>
- O'Neal Schiess, Jennifer, Max Marchitello and Juliet Squire. *A Formula That Works: Five ways to strengthen school funding in Ohio*. Bellwether Education Partners and Thomas B. Fordham Institute, March 2017.
- Siegel, Jim. "Answers to 20 Ohio school-funding questions you didn't know you had." *Columbus Dispatch*. Feb. 17, 2017. <http://www.dispatch.com/news/20170217/answers-to-20-ohio-school-funding-questions-you-didnt-know-you-had>
- O'Neal Schiess, Jennifer, Max Marchitello and Juliet Squire. *A Formula That Works: Five ways to strengthen school funding in Ohio*. Bellwether Education Partners and Thomas B. Fordham Institute, March 2017.
- Budget in Brief: House Bill 49 – As Enacted. Ohio Legislative Service Commission. July 11, 2017. <https://www.lsc.ohio.gov/documents/budget/132/mainoperating/EN/budgetinbrief-hb49-en.pdf>
- Ibid.
- Ibid.
- Overview of the U.S. Department of Education. Washington, DC: U.S. Department of Education, 2010. <https://www2.ed.gov/about/overview/focus/what.pdf>
- "Running for a school board." Ohio School Boards Association. Accessed Oct. 31, 2017. <https://www.ohioschoolboards.org/running-school-board>
- "Every Student Succeeds Act (ESSA)." U.S. Department of Education. Accessed Oct. 30, 2017. <https://www.ed.gov/essa?src=policy>
- "About IDEA." U.S. Department of Education. Accessed Oct. 29, 2017. <https://sites.ed.gov/idea/about-idea/>
- Driving Education Excellence: Securing the Future for All Ohio Students: A draft of Ohio's state plan for the Every Student Succeeds Act. Ohio Department of Education. [https://education.ohio.gov/getattachment/Topics/Every-Student-Succeeds-Act-ESSA/ESSA\\_Framework\\_Report.pdf.aspx](https://education.ohio.gov/getattachment/Topics/Every-Student-Succeeds-Act-ESSA/ESSA_Framework_Report.pdf.aspx)
- Information provided by the Ohio Department of Education via telephone conversation. Nov. 1, 2017.
- Opportunity, responsibility and security: A consensus plan for reducing poverty and restoring the American dream. AEI/Brookings Working Group on Poverty and Opportunity. American Enterprise Institute for Public Policy Research and the Brookings Institution, 2015.
- Data from "Dropout Prevention and Recovery." Ohio Department of Education. Dropout Prevention and Recovery Schools spreadsheet. Accessed Nov. 10, 2017. <http://education.ohio.gov/Topics/Community-Schools/Drop-Out-Prevention-and-Recovery>
- Data from "Enrollment Data." Ohio Department of Education. Fall Enrollment (Headcount) – October 2016 Public Districts and Buildings spreadsheet. Accessed Nov. 10, 2017. <http://education.ohio.gov/Topics/Data/Frequently-Requested-Data/Enrollment-Data>





65. Information provided by Rhonda Phillips and Amy Leedy via email. November 17, 2017.
66. Information provided by the Ohio Department of Education via telephone conversation. October 30, 2017.
67. Poiner, Jessica and Jeff Murray. "Career and technical education in Ohio: An overview." Thomas B. Fordam Institute Ohio Gadfly Daily. June 26, 2015. <https://edexcellence.net/articles/career-and-technical-education-in-ohio-an-overview>
68. Information provided by Rhonda Phillips via telephone discussion. October 13, 2017.
69. Ohio Career-Based Intervention: The Model. Ohio Department of Education. [http://education.ohio.gov/getattachment/Topics/Career-Tech/Career-based-Intervention-CBI/CBI\\_The-Model-Fact-Sheet.pdf.aspx](http://education.ohio.gov/getattachment/Topics/Career-Tech/Career-based-Intervention-CBI/CBI_The-Model-Fact-Sheet.pdf.aspx)
70. Information provided by Rhonda Phillips and Amy Leedy via email. November 17, 2017.
71. "State profile - Ohio." Perkins Collaborative Resource Network. Accessed Oct. 18, 2017. <http://cte.ed.gov/profiles/ohio>
72. Information provided by Christine Garder via telephone discussion. October 10, 2017.
73. Information provided by the Ohio Department of Education via telephone discussion. October 30, 2017.
74. O'Neal Schiess, Jennifer, Max Marchitello and Juliet Squire. A Formula That Works: Five ways to strengthen school funding in Ohio. Bellwether Education Partners and Thomas B. Fordham Institute, March 2017.
75. Information provided by the Ohio Department of Education via telephone discussion. Oct. 30, 2017.
76. A stronger nation: Ohio's report 2017. The Lumina Foundation. <http://strongernation.luminafoundation.org/report/2017/#page/downloads>
77. Information provided by the Ohio Department of Higher Education via telephone discussion on Oct. 11, 2017
78. Ibid.
79. Federal and State Funding of Higher Education: A changing landscape. The PEW Charitable Trusts, June 2015.
80. "What are Title IV programs?" Ohio Department of Education. Accessed Oct. 18, 2017. [http://federalstudentaid.ed.gov/site/front2back/programs/programs/fb\\_03\\_01\\_0030.htm](http://federalstudentaid.ed.gov/site/front2back/programs/programs/fb_03_01_0030.htm)
81. Information provided by the Ohio Department of Higher Education via telephone conversation. Oct. 11, 2017.
82. "Budget and Financial." Ohio Department of Higher Education. Accessed Nov. 1, 2017. <https://www.ohiohighered.org/financial>
83. Information provided by the Ohio Department of Higher Education via telephone discussion. Oct. 23, 2017.
84. Roderick, Melissa, et. al. From High School to the Future: Potholes on the Road to College (Executive Summary). Chicago, IL: Consortium on Chicago School Research at the University of Chicago, 2008.
85. Analysis of data from the U.S. Department of Education. Aldeman, Chad. "2016 FAFSA Completion Rates by State." Bellwether Education Partners. Accessed Nov. 1, 2017. <https://aheadoftheheard.org/2016-fafsa-completion-rates-by-state/>
86. "Portman, Kaine Introduce Bipartisan JOBS Act to Help Workers Access Training for In-Demand Career Fields." Jan. 25, 2017. <https://www.portman.senate.gov/public/index.cfm/2017/1/portman-kaine-introduce-bipartisan-jobs-act-to-help-workers-access-training-for-in-demand-career-fields>
87. "Public Trustees." Ohio Department of Higher Education. Accessed Nov. 1, 2017. <https://www.ohiohighered.org/trustees>
88. "Pell Grants." The Pell Institute for the Study of Opportunity in Higher Education. [http://www.pellinstitute.org/pell\\_grants.shtml](http://www.pellinstitute.org/pell_grants.shtml)



### Employment overview

This section begins with a brief summary of the ways that employment affects health overall and then describes more specific ways that employment challenges contribute to infant mortality and related risk factors based upon a review of the research literature. This section also describes:

- Scope of employment problems in Ohio
- Employment policy landscape in Ohio (types of services, major policy levers, funding sources and planning and implementation entities)
- Employment policy goals and recommendations

Equity is addressed throughout this section by:

- Describing differences by race, ethnicity, sex, income level or other factors, when data is available
- Discussing structural drivers of inequities

### How employment affects infant mortality: Literature review

Employment affects *overall health and wellbeing* in several ways:<sup>1</sup>

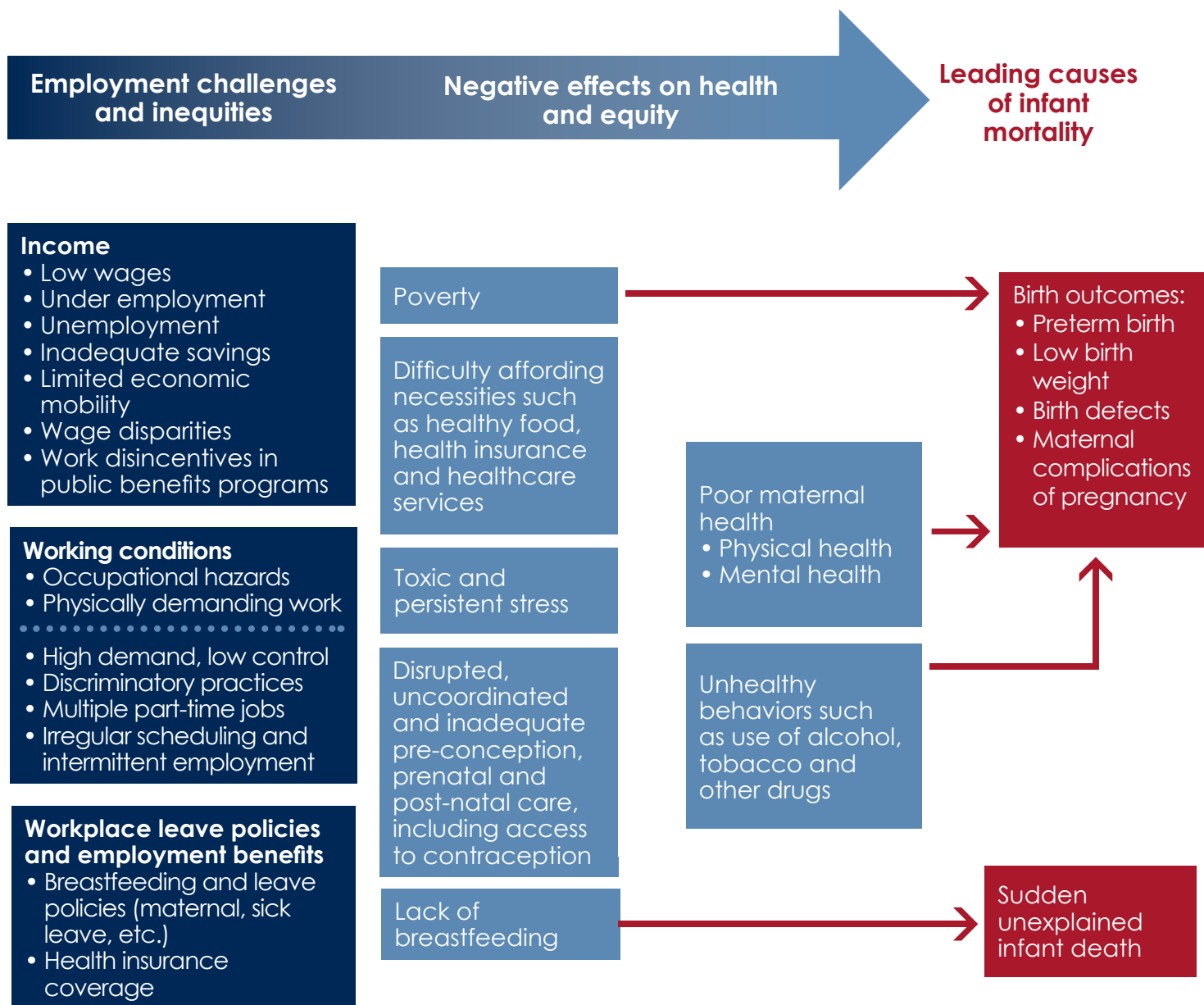
- **Income:** Income generated from employment affects access to healthy food, safe housing, quality education, healthcare services and other resources that promote health. People with low incomes are more likely to experience poor health outcomes related to stress. Higher income is associated with better mental health, including positive perceptions of self-worth.
- **Working conditions:** Working conditions refer to physical environments in the workplace, the type of work performed and the level of flexibility and control employees have to complete their work. The research literature points to these specific aspects of working conditions that influence overall health:
  - **Work-related stress:** Research shows that exposure to unmanaged, persistent stress is associated with a number of negative physical and mental health outcomes. Research on work-related stress distinguishes between stress that is experienced by people with high and low occupational status. People with low occupational status typically face high demands at work, but are granted low flexibility and control to complete the work. Discrimination in the workplace is also an important source of persistent work-related stress for minority populations.

- **Physical demands of work:** Work that is physically strenuous may improve health through increased physical activity, but can also put workers at increased risk of illness, injury and/or disability, particularly for people with other medical conditions.
- **Workplace policies and employment benefits:** Workplace policies and protocols, including paid time off, predictable scheduling and breastfeeding support, can influence the health of employees and their family members. Employment benefits, such as health insurance coverage, can improve access to healthcare services for employees and families.

Jobs that pay a livable wage, provide health insurance coverage and paid leave benefits and help employees manage stress promote good health. Many women who are most at risk of infant mortality are unemployed, under employed and/or work in jobs that do not offer these positive health benefits. Figure 7.1 applies the relationships between employment and health to the main causes of infant mortality as outlined in the research literature.



Figure 7.1. Relationship between employment and infant mortality



## Income

About 70 percent of women who are pregnant work at some point during their pregnancy.<sup>2</sup> Without well-paying jobs, families are more likely to experience poor health outcomes. Babies born to mothers with low incomes are more likely to be low birth weight<sup>3</sup>, and research has also linked low income and low educational attainment with increased infant mortality rates.<sup>4</sup> Unemployment among pregnant women is also associated with lower birth weights and higher rates of infant mortality.<sup>5</sup>

Women with low incomes have difficulty paying for basic necessities, such as food and medical care. This is important because food insecurity is associated with increased risk for maternal complications of pregnancy.<sup>6</sup> In addition, women with low incomes are less likely to receive adequate prenatal care, which increases risk of preterm birth and low birth weight.<sup>7</sup> Inadequate access to food and medical care can also be a source of stress for women who are pregnant and increase risk of poor birth outcomes.<sup>8</sup>

Economic mobility is another determinant of birth outcomes. Research has found a connection between upward economic mobility among African-American mothers and decreased risk of preterm birth.<sup>9</sup> A 2011 study found that women who were lifelong residents of impoverished neighborhoods had significantly higher rates of preterm birth than women who had lived in poverty early in life but had experienced upward mobility.<sup>10</sup>

Research supports the potential positive health impacts of several income enhancement programs, including employment and workforce development, tax credits and subsidies for child care.<sup>11</sup> Workforce development and training programs designed to build skills, provide work opportunities and improve access to the labor market are shown to increase employment and earnings<sup>12</sup>, both of which are associated with improved birth outcomes.

## Working conditions

### Work-related stress

In order to measure work-related stress, researchers compare the demands of a job, such as performance measures or output, to the skills, resources, flexibility and/or control that employees have in order to meet the demands.<sup>13</sup> In general, people who experience high demands, but have

## Impact of EITC on birth outcomes

The Earned Income Tax Credit (EITC), described later in this section, stands out in the research literature because it is an employment-related policy that has been specifically evaluated for its effect on birth outcomes:

- Increases in the federal EITC are associated with significant reductions in low birth weight.<sup>14</sup>
- An analysis of birth certificate data in states that enacted additional state EITCs between 1980 and 2002 found increases in birth weights and reductions in maternal smoking among single mothers with a high school degree or less, a priority population for infant mortality reduction.<sup>15</sup>

little control over their work, are more likely to experience work-related stress.<sup>16</sup>

A review of studies about occupational stress and birth outcomes found mixed evidence of increased risk of preterm delivery and low birth weight among women that experience high job strain, defined as a job with high demands and low control for employees.<sup>17</sup> Recent research found that people who are black tend to experience more job strain and worse health effects from job strain than people who are white.<sup>18</sup>

Implicit bias and discrimination in the workplace are sources of toxic and persistent stress that may contribute to racial disparities in infant mortality. African Americans are more likely to report low job control as a result of exposure to discrimination in the workplace.<sup>19</sup> For example, African Americans and other minorities may experience barriers to employment and advancement during the hiring process, in performance evaluations and when being considered for leadership positions.<sup>20</sup>

### Physical demands of work

Literature reviews have identified weak associations between physically strenuous work and poor birth outcomes.<sup>21</sup> One review suggests that weak associations do not rule out physically strenuous work as a risk factor, but that existing studies may not have been designed to detect the mechanisms through which physically-demanding work impacts birth outcomes.<sup>22</sup>

**Workplace policies and employment benefits**

Workplace policies affect the health of pregnant women, new mothers and newborns by either allowing women to or restricting women from taking time off work for recovery during the postpartum period and breastfeeding initiation and maintenance. Research on the connection between paid parental leave and birth outcomes has identified positive effects of paid leave on birth weight, infant deaths and rates of breastfeeding.<sup>23</sup> Much of the research on paid maternal leave comes from other countries, in part, because the U.S. and most states do not have policies that guarantee women and young mothers paid leave. Policies that support breastfeeding, including maternal leave, can extend the duration of breastfeeding<sup>24</sup>, which is a protective factor against infant mortality. Many women who are most at-risk of experiencing poor birth outcomes work low-wage or part-time jobs<sup>25</sup> and therefore are less likely to have access to supportive workplace policies and employment benefits.

Another workplace policy relevant to infant mortality is the availability of health insurance coverage. Health insurance coverage is important for pregnant women and women of childbearing age because people with coverage are more likely to access needed care.<sup>26</sup> Employer-sponsored health insurance is the primary source of coverage for most working-age households.<sup>27</sup> Because women who are most at risk for poor birth outcomes tend to work low-wage or part-time jobs, they are less likely to be offered employer-sponsored health insurance at work.<sup>28</sup> Ohio's Medicaid program allows pregnant women with incomes up to 200 percent of the Federal Poverty Level (FPL) to enroll, which means that most women with low incomes can access public health insurance coverage. Ohio Medicaid coverage terminates for women after 60 days postpartum unless they are eligible under criteria for adults (income up to 138 percent FPL).

## Scope of employment problems in Ohio

This section describes the current status of employment-related challenges in Ohio that are particularly relevant to infant mortality—unemployment and labor force participation, income and working conditions for low-wage workers.

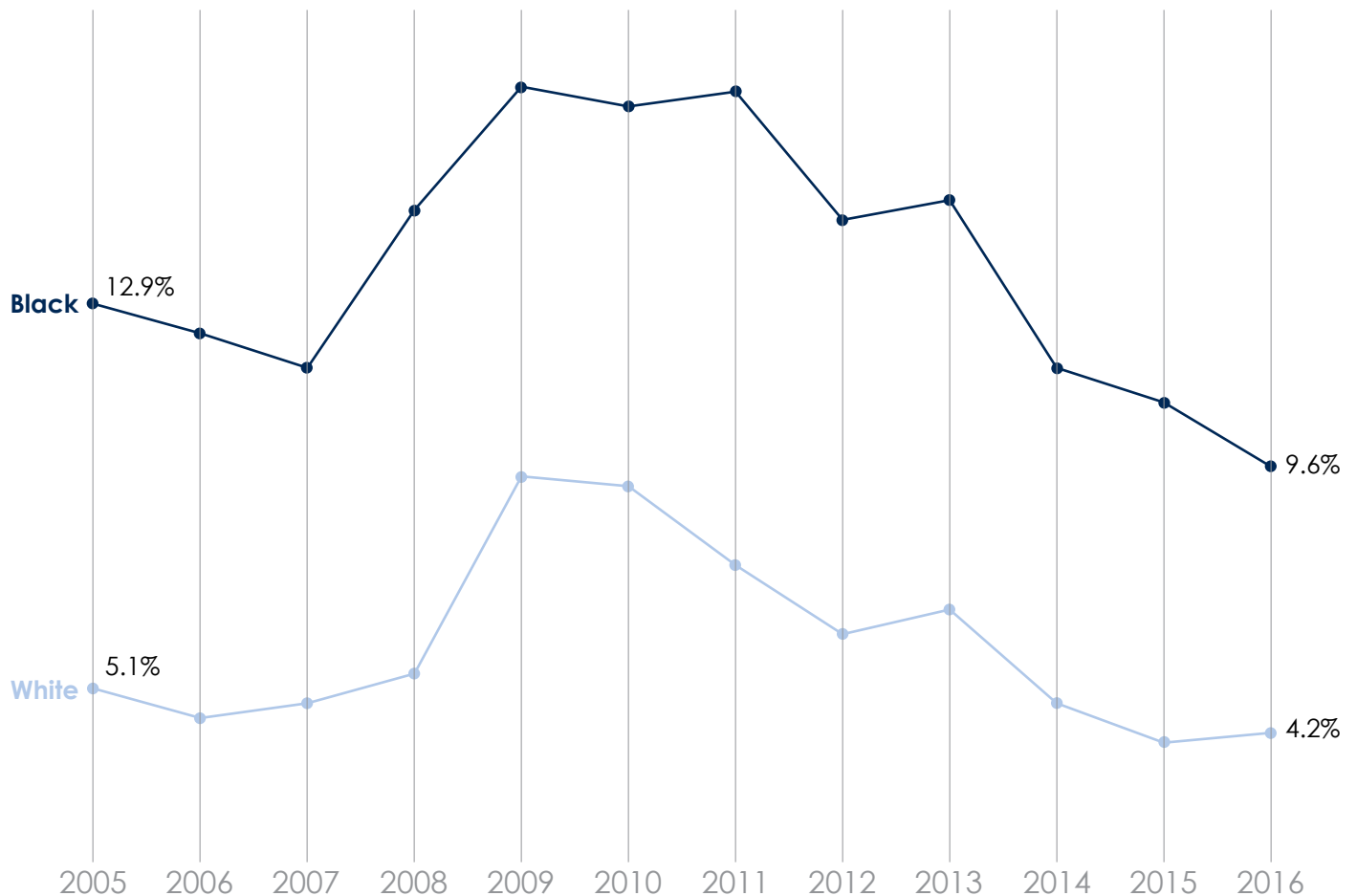
### Unemployment and labor force participation

In addition to income, employment provides families with access to a social network, which can be important for families and young children. Social connectedness is critical to positive health outcomes, and meaningful employment reduces the risk of social isolation.<sup>29</sup>

Unemployment in Ohio is near the lowest level in the past decade<sup>30</sup>, and participation in the labor force has begun to increase in recent years.<sup>31</sup> However, as of September 2017, Ohio's unemployment rate was 5.3 percent compared to the U.S. rate of 4.2 percent.<sup>32</sup> Additionally, disparities in unemployment rates between black and white Ohioans have long persisted (see figure 7.2). In 2016, black Ohioans were more than twice as likely to be unemployed compared to white Ohioans.

Unemployment disparities also persist for people with low incomes. The Pregnancy Risk Assessment Monitoring System (PRAMS) collects state-level, population-based data on maternal attitudes and experiences before, during and shortly after pregnancy, including data related to unemployment. In 2010, the PRAMS survey asked respondents if they had

Figure 7.2. Unemployment rate by race, Ohio (2005-2016)



Source: Bureau of Labor Statistics. Local Area Unemployment Statistics: Expanded State Employment Status Demographic Data.

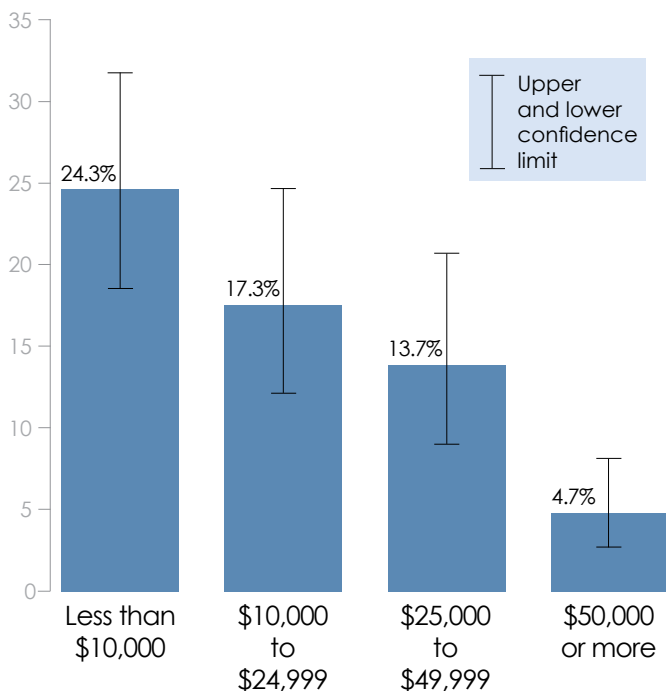


lost their job even though they wanted to go on working in the 12 months before their baby was born. Of women with incomes below \$10,000 per year, 24 percent lost their jobs under these circumstances, compared to less than 5 percent of women with incomes above \$50,000 (see figure 7.3).

The PRAMS survey also asked women if their husband or partner had lost their job in the 12 months before their baby was born. In 2010, nearly 30 percent of Ohioans with incomes below \$10,000 per year had a spouse or partner lose their job in the year before birth, compared to only 7 percent of people with incomes above \$50,000 (see figure 7.4).

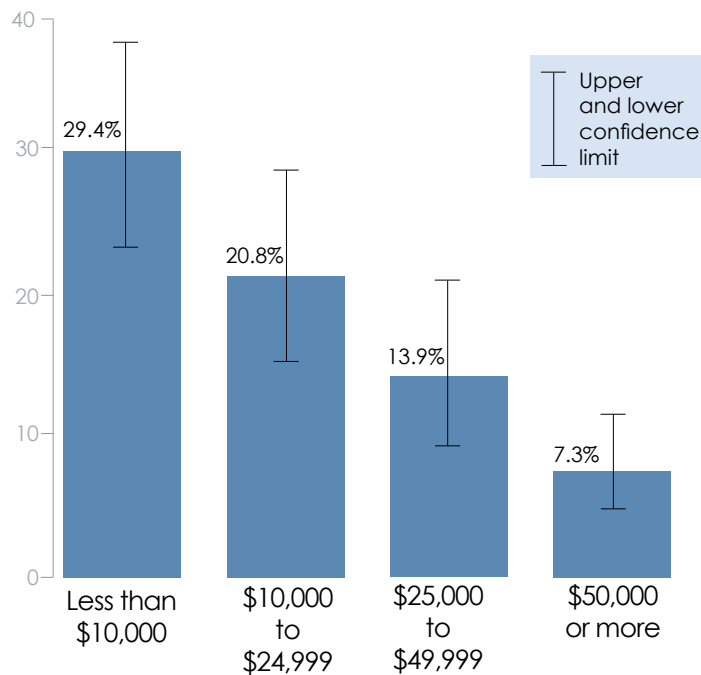
A consistent racial disparity also exists in labor force participation. In both 2005 and 2015, the labor force participation rate for black Ohioans was about 5 percentage points lower than the labor force participation rate for white Ohioans (see figure 7.5).

**Figure 7.3. Percent of women who lost their job even though they wanted to go on working in the 12 months before their baby was born, by income level, Ohio (2010)**



Source: Ohio University analysis of 2010 Pregnancy Risk Assessment Monitoring System (PRAMS) data.

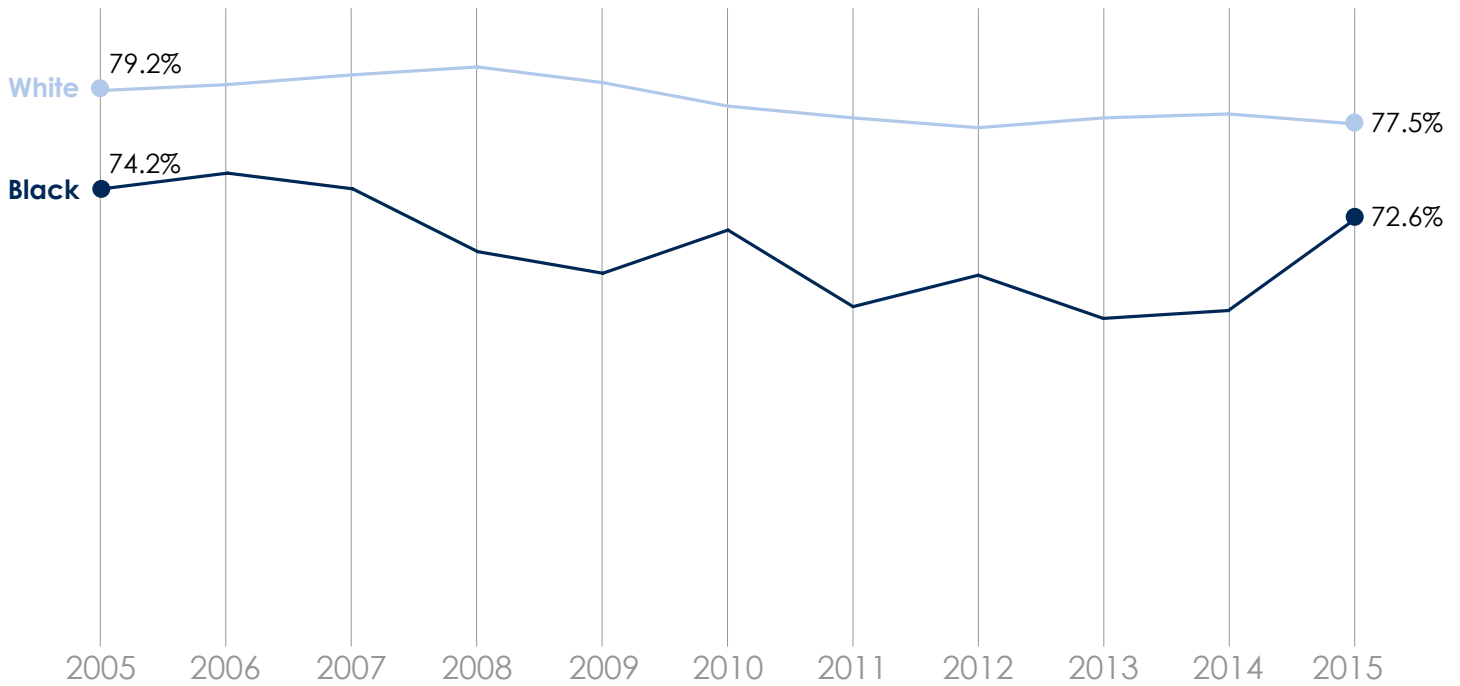
**Figure 7.4. Percent of women whose husband or partner lost their job in the 12 months before their baby was born, by income level, Ohio (2010)**



Source: Ohio University analysis of 2010 Pregnancy Risk Assessment Monitoring System (PRAMS) data.



Figure 7.5. Labor force participation for ages 20-64, by race, Ohio (2005-2015)



Source: Bureau of Labor Statistics. Local Area Unemployment Statistics: Expanded State Employment Status Demographic Data.

**Income**

Median income for Ohioans has lagged behind the U.S. over the last twelve years. However, median income has started to increase in recent years in Ohio (see figure 7.6).<sup>33</sup>

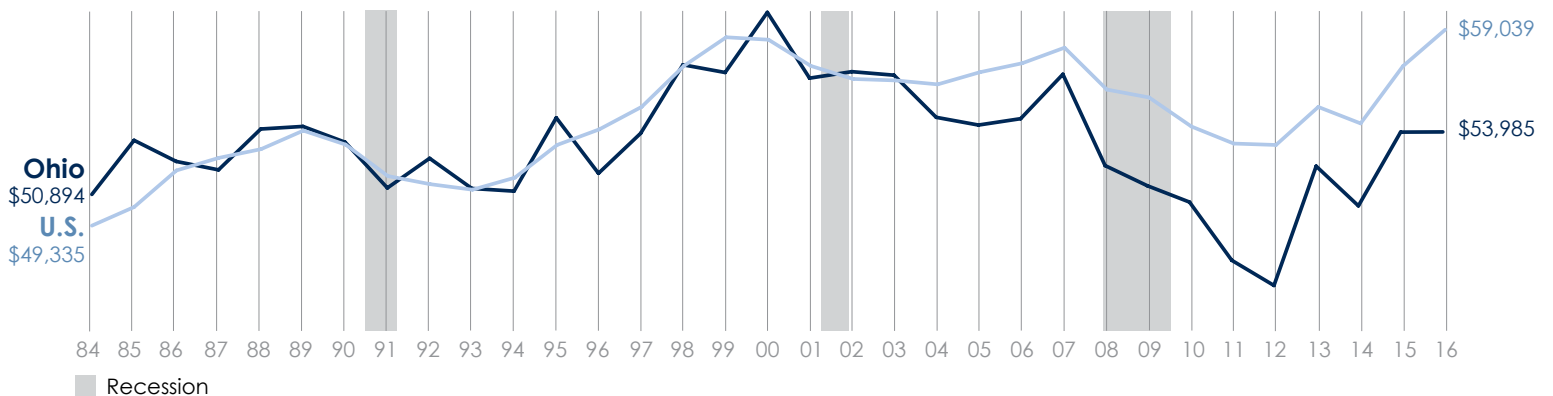
Income levels vary across racial and ethnic groups (see figure 7.7). In 2016, 48 percent of black Ohioans had incomes below 200 percent FPL, compared to 27 percent of white Ohioans.

Incomes also vary by geography. Some counties experience much higher rates of poverty than

other counties, particularly in southeastern Ohio (see figure 7.8).

Additionally, within counties, incomes vary greatly by neighborhood. Often, neighborhoods with lower incomes and high poverty rates also have higher rates of infant mortality. For local decision makers, it is important to analyze data at the neighborhood, zip code or census tract level. It is beyond the scope of this project to present neighborhood-level data, but there are several resources for finding local level information on poverty, income and employment including

Figure 7.6. Median household income, Ohio and U.S. (1984-2015)



Source: U.S. Census Bureau data compiled by the Federal Reserve Bank of St. Louis



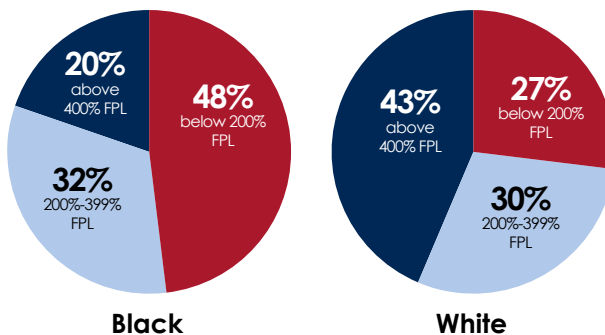
the National Equity Atlas and the U.S. Census Bureau's American FactFinder.

Low-wage jobs are one factor that accounts for low household incomes. In Ohio, five out of the top ten occupations that are projected to have the most annual job openings pay median wages below \$10 per hour (see figure 7.9).

### Working conditions

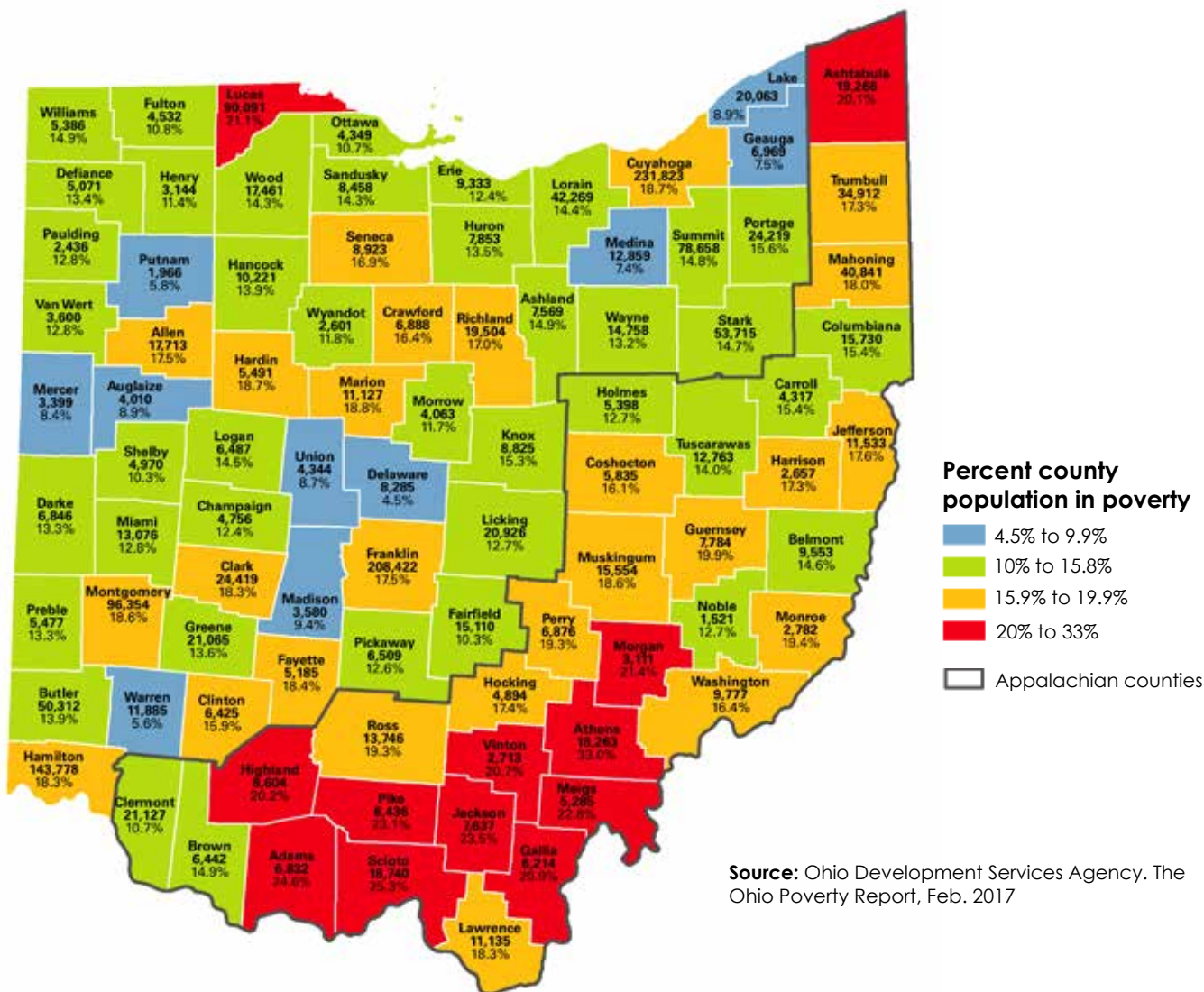
Comprehensive data about working conditions beyond wages and access to certain employment benefits is not readily available for the U.S. Even less data is available at the state level.<sup>34</sup> However, evidence about the connections between working conditions and birth outcomes suggest that

Figure 7.7. Distribution of household incomes by race, Ohio (2016)



Source: U.S. Census Bureau, Community Population Survey, Annual Social and Economic Supplement, 2017

Figure 7.8. Geographic distribution of poverty in Ohio by county (2011-2015)



Source: Ohio Development Services Agency. The Ohio Poverty Report, Feb. 2017

Figure 7.9. Top ten occupations with the largest number of projected job openings, Ohio (2014-2024)

	Annual openings	Median wage	Typical education needed for entry
Combined food preparation and serving workers, including fast food	6,920	\$8.94	No formal educational credential
Retail salespersons	6,002	\$9.92	No formal educational credential
Cashiers	4,960	\$9.13	No formal educational credential
Registered nurses	4,833	\$29.46	Bachelor's degree
Home health aides	4,476	\$9.83	No formal educational credential
Waiters and waitresses	4,267	\$8.97	No formal educational credential
Laborers/freight/stock/material movers	3,613	\$11.72	No formal educational credential
Nursing assistants	2,711	\$11.61	Postsecondary non-degree award
Stock clerks and order fillers	2,616	\$11.25	No formal educational credential
Office clerks, general	2,495	\$13.75	High school diploma or equivalent

Source: Ohio Department of Job and Family Services, Bureau of Labor Market Information, December 2016.

working conditions should be considered when developing strategies to reduce infant mortality. Better data about working conditions at the state level would inform this work.

**Work-related stress**

Work-related stress is higher for people who face high demands but have little control over their work.<sup>35</sup> Some stress at work is unavoidable and can actually improve performance, but stress that is chronic and unmanageable can have negative impacts on health. Data on the prevalence of work-related stress among Ohioans is not available, but the American Psychological Association reports that, in 2012, 65 percent of Americans cited work as their top source of stress. About one third of workers said they experience chronic work stress.<sup>36</sup>

One source of chronic and unmanageable work-related stress is unpredictable and/or irregular work schedules. In the U.S. in

2015, nearly 10 percent of workers had unpredictable or irregular schedules, and the rate was slightly higher for women.<sup>37</sup>

Discrimination can also be a source of chronic stress at work. Quantifying discrimination is difficult, and data on the prevalence of discrimination is limited. However, the U.S. Equal Employment Opportunity Commission (EEOC) publishes data about charges filed to the Commission. Of the 2,673 charges filed in 2016, 35 percent were filed on the base of race and 28 percent were filed on the base of sex.<sup>38</sup>

**Workplace policies and employment benefits**

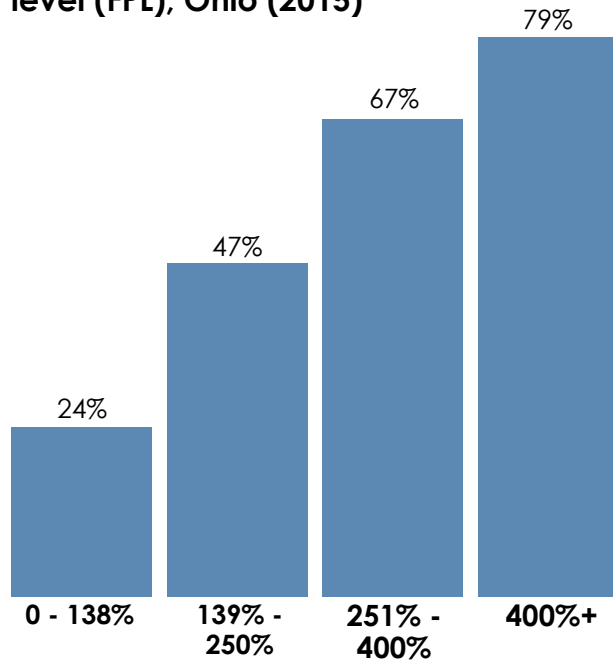
In Ohio, employees that earn higher incomes are more likely to be offered health insurance as an employee benefit. In 2015, nearly 80 percent of Ohioans with incomes above 400 percent FPL had access to employer-sponsored health insurance, while only 24



percent of people with incomes at 138 percent FPL and below had similar access (see figure 7.10). Across all income brackets, 50 percent of full-time employees were offered health insurance benefits, while only 19 percent of part-time employees were offered health insurance (see figure 7.11).

Data on access to other employment benefits such as paid leave is not available at the state level. However, analysis of data at the national level shows that part-time workers and workers with low incomes have less access to paid leave compared to higher income earners and full-time workers.<sup>39</sup>

**Figure 7.10. Employer-sponsored health insurance coverage by federal poverty level (FPL), Ohio (2015)**

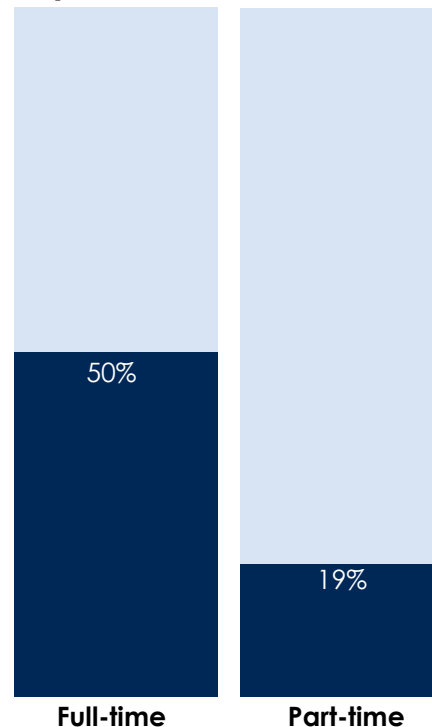


Source: SHADAC analysis of the American Community Survey (ACS) Public Use Microdata Sample (PUMS) files.

### Underlying structural drivers of inequities

Historically, people seeking employment have faced discrimination on the basis of race and ethnicity. As a result, African Americans are twice as likely to be unemployed as white Americans<sup>40</sup>, and black and Hispanic women with a bachelor's degree have lower median earnings than Asian and white women with the same level of education.<sup>41</sup> Research analyzing hiring decisions found that employers are

**Figure 7.11. Employer-sponsored health insurance coverage by work status, Ohio (2015)**



Source: SHADAC analysis of the American Community Survey (ACS) Public Use Microdata Sample (PUMS) files.

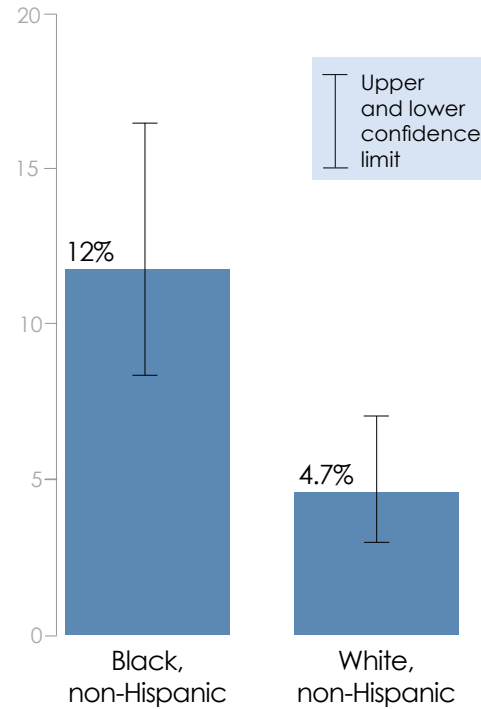
much more likely to extend a call-back to an applicant with a name that is associated more highly with white applicants versus black applicants, even when the applicants are equally qualified.<sup>42</sup> The research on discrimination against African Americans finds disparities in access to employment as well as wage discrimination.<sup>43</sup>

Several underlying structural factors likely contribute to inequities in unemployment and compensation. For instance, barriers to employment based on criminal history disproportionately affect African Americans. Due to a variety of structural factors, African Americans are incarcerated in state prisons at more than five times the rate of white Americans.<sup>44</sup> In Ohio, non-Hispanic black women report that they or their husband or partner went to jail in the 12 months before their baby was born at more than twice the rate of non-Hispanic white women (see figure 7.12). Implicit bias and institutional racism are key drivers of this disparity. For instance, African Americans and white Americans use drugs

at similar rates, but the incarceration rate of African Americans for drug-related offenses is nearly six times higher than that of white Americans.<sup>45</sup> Many employers ask potential employees about their criminal history in the interview process. High incarceration rates, and unwillingness to hire individuals with a criminal history, perpetuate inequities in income and unemployment between black and white Americans.

Inequities are also perpetuated on a geographic basis. Rural communities and small cities have experienced more population decline, industry loss and decline in economic indicators than urban centers in Ohio. For instance, small cities like Mansfield, Portsmouth and Marion have labor participation rates 20 percentage points lower than Columbus.<sup>46</sup> People in rural areas are much more likely than urban residents to express concerns about lack of jobs in their communities, and nearly 60 percent of rural residents would encourage young people in their communities to leave for more opportunity elsewhere.<sup>47</sup> The remaining residents of rural communities tend to be older, sicker and less likely to be employed. Urban minority communities also experience concentrated poverty as a result of lack of investment. For example, highways connecting suburban areas and urban centers have separated urban neighborhoods from employment opportunities, restricting access to resources for some communities.<sup>48</sup>

**Figure 7.12 Percent of women who went to jail or whose husband or partner went to jail in the 12 months before their baby was born, by race and ethnicity, Ohio (2010)**



**Source:** Ohio University analysis of 2010 Pregnancy Risk Assessment Monitoring System (PRAMS) data.



## Employment policy landscape in Ohio

### Existing policies and programs most relevant to infant mortality

Many women who are most at-risk of experiencing poor birth outcomes and infant mortality are unemployed or employed in low-wage jobs. There are policies and programs in place in Ohio to provide assistance in overcoming barriers to obtaining and maintaining employment (see figure 7.13). This section will provide examples of policies and programs that are most relevant to infant mortality, major policy levers at the federal and state levels and entities responsible for planning and implementation.

Based upon the findings of the literature review and feedback from the Advisory Group, the

following employment policies and programs are most relevant to infant mortality high-risk populations:

- Policies to increase income
- Work support programs
- Leave policies and employment benefits
- Policies to reduce structural barriers to employment, including anti-discrimination enforcement in employment settings

### Policies to increase income

Various public policies assist individuals with increasing earned income. This section describes the following federal and state policies:

- Earned Income Tax Credit
- Wage growth policies
- Policies to address the benefits cliff

Figure 7.13. Examples of employment policies and programs in Ohio\*

Type of service, program or policy	Examples	Eligibility and priority populations
<b>Tax credits</b>	Earned Income Tax Credit (EITC)	Earned income in taxable year, below a certain benchmark based on family size; must file a tax return
<b>Programs to help individuals build skills and find employment</b>	<ul style="list-style-type: none"> <li>• OhioMeansJobs centers</li> <li>• Aspire program</li> <li>• Secondary career-technical education (CTE)</li> </ul>	<ul style="list-style-type: none"> <li>• OhioMeansJobs: ages 18 and above, U.S. citizen or eligible to register, preference for low income, people with disabilities and veterans</li> <li>• Aspire: Ohioans ages 18 and above with less than a 12th-grade education or the equivalent</li> <li>• Career-technical education: All Ohio students in grades 7-12 (most wait until high school to enroll)</li> </ul>
<b>Coordinated case management to obtain employment</b>	Comprehensive Case Management and Employment Program (CCMEP)	16-24 years of age, eligible for Temporary Assistance for Needy Families (TANF) and the Workforce Innovation and Opportunity Act (WIOA) youth program
<b>Subsidized child care</b>	Child Care and Development Fund (CCDF)	Employed, in school or participating to meet the requirements of Ohio Works First (OWF) or the Supplemental Nutrition Assistance Program (SNAP)
<b>Workplace anti-discrimination policies</b>	<ul style="list-style-type: none"> <li>• State anti-discrimination law</li> <li>• “Ban the box” legislation</li> </ul>	<ul style="list-style-type: none"> <li>• Anti-discrimination law: public and private employers in Ohio</li> <li>• “Ban-the-box”: All public sector employers in Ohio at the state and local level</li> </ul>
<b>Free legal assistance (i.e., sealing criminal records; anti-discrimination suits)</b>	Legal Aid Clinics	Varies by location; typically low income and qualifying legal issue

\* Policies and programs will be described in more detail later in this section.

**Tax credits**

The Earned Income Tax Credit (EITC) is a federal tax credit for people with low and moderate incomes who are employed. Some states, including Ohio, and local governments also offer EITCs. In order to qualify for the federal EITC, individuals must have earned income and file a tax return. The earned income must be below a certain benchmark based on family size. The federal EITC is refundable, which means that filers with zero federal income tax liability can file a tax return and receive a refund. The size of the credit received is equal to a percentage of income up to a maximum credit. Both the percentage of income and maximum credit vary by family size.

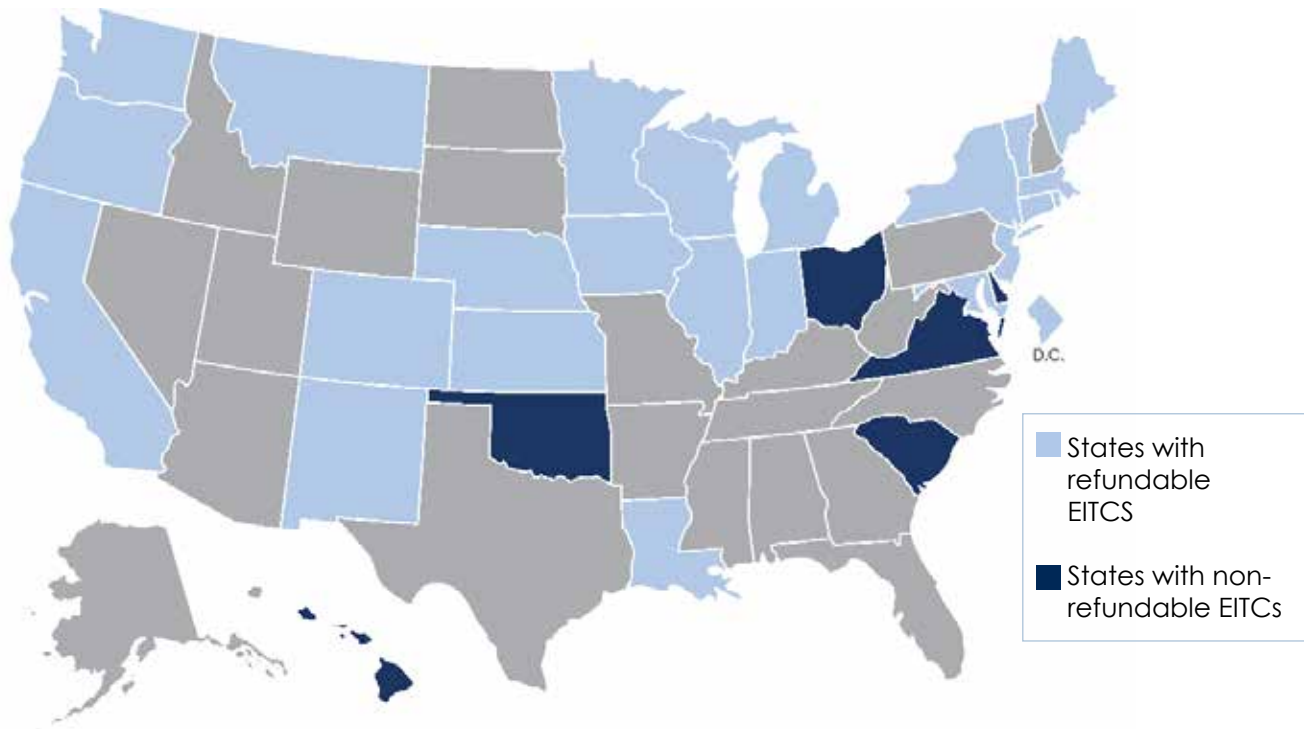
The federal EITC provides significant support to low- and moderate-income working parents, but less support for workers without children. In 2017, the maximum credit for a worker with one child is \$3,400 and the maximum credit for a worker with three or more children is \$6,318.<sup>49</sup> In contrast, the maximum credit for a childless worker is \$510. Childless workers must also be

between 25 and 64 years old in order to qualify for the EITC. There is no such age requirement for workers with children; however, working parents must meet other EITC requirements as listed on the [Internal Revenue Service website](#).<sup>50</sup> Ninety-seven percent of federal EITC credits go to families with children.<sup>51</sup>

The State of Ohio also offers an earned income tax credit (Ohio EITC). Ohioans are eligible for the Ohio EITC if they qualify for the federal EITC. The Ohio EITC is equal to 10 percent of the federal EITC for the same filer.<sup>52</sup> Unlike the federal EITC, the Ohio EITC is nonrefundable. This means that the maximum EITC a filer may claim is capped at the worker's state income tax liability. For example, if an Ohio tax filer owes \$25 in state taxes and is eligible for a \$100 state EITC, that filer could only claim \$25 of the EITC. Twenty-four states have refundable EITCs and six states, including Ohio, have nonrefundable EITCs (see figure 7.14).

Other tax credits offered by the federal government and some state governments include the Child Tax Credit and the Child

**Figure 7.14. Type of Earned Income Tax Credit (EITC) by state (2017)**



Source: "Policy Basics: State Earned Income Tax Credits," Center on Budget and Policy Priorities, 2017.



and Dependent Care Credit. These credits are intended to offset the expenses of child care and encourage parents to find work. For more information about the federal tax credits, see the Internal Revenue Service web pages on the [Child Tax Credit](#)<sup>53</sup> and the [Child and Dependent Care Credit](#).<sup>54</sup> Ohio offers a nonrefundable [Child Care and Dependent Care Credit](#).

### **Wage growth**

State and local governments across the country have considered policies related to wage growth, including the minimum wage, living wage and wage theft protections. For examples, see local ordinances in [San Francisco, California](#)<sup>55</sup> and [Tacoma, Washington](#).<sup>56</sup> Local governments and advocates in Ohio have attempted to implement similar policies, such as the “Fight for \$15” initiative in [Cleveland](#).<sup>57</sup> However, the 131st Ohio General Assembly passed Senate Bill 331 (SB 331), effective March 2017, which prohibits many facets of employment law from being decided on the local level.

For instance, SB 331 prohibits a political subdivision from establishing a minimum wage that is different from the wage rate required under Ohio’s Minimum Fair Wage Standards Law and the Minimum Wage Amendment to Ohio’s Constitution.<sup>58</sup> The current minimum wage for the state of Ohio is \$8.15 per hour for non-tipped employees, which is higher than the federal minimum wage, \$7.25.

SB 331 has been challenged by local governments in several courts across the state on the grounds that the bill violates the “single subject” provision of the Ohio Constitution (“No bill shall contain more than one subject”).<sup>59</sup> The Franklin County and Hamilton County Courts of Common Pleas have both found that the bill is in violation of the Ohio Constitution and that certain provisions, including those related to employment policy, cannot be enforced in the Ohio cities and villages that were party to the lawsuit. The Summit County Court of Common Pleas, however, found in favor of the state<sup>60</sup>, and several of these decisions are being appealed to higher courts. Due to these pending legal challenges, the future impact of SB 331 is uncertain.

Other local governments have implemented wage theft ordinances, which increase monitoring and enforcement of wage and hour laws to ensure that all local government employees and contractors are paid the legal or contractual wage for all hours worked. In 2016, the City of Cincinnati passed a wage theft ordinance that applies to the local government as an employer, as well as external contractors with the local government. For more information, see [Cincinnati’s wage theft ordinance](#).<sup>61</sup>

### **Benefits cliff**

People with lower incomes may face a “benefits cliff” as wages and/or hours increase. A benefits cliff occurs when benefits from a public program, such as medical, food or child care assistance, reduce rapidly as a result of increased income, but income has not increased enough for the household to become self-sufficient. This can create an economic disincentive to accepting a small raise or working more hours because the increase in earned income is at least partially offset by a decrease in benefits.

### **Work support programs**

A number of policies and programs impact people with low-incomes in seeking and maintaining employment and earning additional income. Work support programs facilitate access to employment, increase worker earnings and can reduce disparities and inequities. This section describes the following work support policies and programs:

- Workforce development, including career-technical education
- Comprehensive Case Management and Employment Program
- Subsidized child care

Most workforce support programs begin with funding from the federal level, which is granted to a state agency. The state agency then releases funding to local entities, such as OhioMeansJobs centers, career-technical education campuses and day care centers, for program implementation.

### **Workforce development and career-technical education**

The Workforce Innovation and Opportunity Act (WIOA), a federal law that went into effect in



2014, authorizes programs and funding related to job training, education and other services for people who are unemployed or under employed. WIOA also increases coordination for other major workforce development programs.

WIOA funds a national system of one-stop centers that are called OhioMeansJobs centers in Ohio. These centers provide a unified location for individuals seeking employment and training services. WIOA requires certain programs to collaborate with one-stop centers, including the **Temporary Assistance for Needy Families (TANF)** program, a federal block grant program used by states to support low-income families in a variety of ways, and the **Wagner-Peyser Employment Services** program, a nationwide system of public employment offices.

At the state level, there are 77 workforce training programs administered by 13 agencies, including the Departments of Job and Family Services, Education, Higher Education, Aging and the Development Services Agency.<sup>62</sup> In addition, the Governor's Executive Workforce Board provides state-level oversight of programs funded by WIOA. Many of Ohio's workforce programs are coordinated under Ohio's Combined State Plan, the four-year workforce development strategy required under WIOA. To learn more about the Combined State Plan, [see the Governor's Office of Workforce Transformation website](#).<sup>63</sup>

Locally, WIOA funding is managed by Ohio's system of workforce development boards. These boards conduct local oversight of WIOA programs, identify local in-demand jobs and available supportive services and procure program providers in the local area by awarding grants and contracts on a competitive basis. The state is split into 20 regions for the purpose of workforce development. Each region is served by a workforce development board and an OhioMeansJobs center. For the distribution of workforce development regions, [see the Ohio Department of Job and Family Services \(ODJFS\) website](#).<sup>64</sup>

Some of the funding sources coordinated by the Combined State Plan are related to career-technical education (CTE), an evidence-based work support that is known to increase

both income and employment<sup>65</sup>, and other educational attainment programs. Two key federal funding sources are:

- **WIOA funding for the Aspire program:** WIOA funding supports the Aspire program, which provides free services to adults who need assistance building skills in order to gain employment or pursue higher education. Aspire enrollees have less than a 12th grade education and are older than age 18. The Ohio Department of Higher Education (ODHE) manages Aspire, and approximately 30,000 Ohioans are enrolled annually. Some state funding also supports the Aspire program. [Learn more on the ODHE website](#).<sup>66</sup>
- **Carl D. Perkins Career and Technical Education Act of 2006 (the Perkins Act):** The State of Ohio receives \$40-50 million through the Perkins Act annually,<sup>67</sup> with 12 percent allocated to postsecondary CTE and the remainder allocated to secondary CTE.<sup>68</sup> The Perkins Act grant is monitored by the Ohio Departments of Education and Higher Education, and the funds are allocated to participating career technical planning districts (CTPDs) throughout the state. The state is required to measure grantee performance, and if a participating CTPD achieves less than 90 percent of each performance target, it is required to complete a Performance Improvement Plan (PIP). For more information on performance measures and the PIP requirement, [see the ODHE website](#).<sup>69</sup>

For more information on CTE, see part six of this report.

### **Ohio Comprehensive Case Management and Employment Program (CCMEP)**

CCMEP, created in 2016, serves youth and young adults with low incomes. CCMEP incorporates funding for both TANF and the **WIOA Youth program**,<sup>70</sup> a coordinated system of education and employment services for in-school and out-of-school youth, to provide employment and training services for Ohioans ages 16 to 24. Individuals are enrolled in CCMEP after a comprehensive assessment. Participants are then provided case managers and individual opportunity plans based on key goals, such as preparation to receive a high school diploma, job training, adult mentoring and/or job placement. Other supportive services are also available to CCMEP participants, including



child care, transportation and access to addiction counseling.<sup>71</sup>

Every individual who participates in CCMEP must be eligible for both the WIOA Youth program and TANF. WIOA Youth program participants who have a barrier to employment are required to participate in CCMEP, as are work-eligible participants in the **Ohio Works First (OWF) program**,<sup>72</sup> the financial assistance portion of the state's TANF program. Ohioans involved with the **Prevention, Retention and Contingency (PRC) program**,<sup>73</sup> another TANF program that provides work supports and other services to help low-income parents overcome immediate barriers to employment, and OWF participants who are not work eligible may also participate in CCMEP.<sup>74</sup>

Members of the Advisory Group report that CCMEP has had limited reach in its first year, but the participation rate has not yet been publically released. Additionally, CCMEP has not yet been evaluated. Lead agencies in each county will be evaluated on implementation of the program in July 2018.<sup>75</sup> For more information on CCMEP, see the **CCMEP webpage on the ODJFS website**.<sup>76</sup>

### **Subsidized child care**

Child care subsidies are important work supports that strengthen families' economic security by enabling parents, especially women, to work. They provide financial assistance to parents who work or attend school in order to cover the costs of certified in-home or center-based child care.

The federal government provides funding for public and subsidized child care through the Child Care and Development Block Grant, which contributes dollars to the Child Care and Development Fund (CCDF). The federal Office of Child Care, an office of the Administration for Children and Families, administers the CCDF. For more information on the federal administration of the CCDF, including planning documents, see the **Office of Child Care website**.<sup>77</sup>

CCDF and some TANF funds are granted to states to help low- and middle-income families obtain child care so that they can

work or receive job training or education. In Ohio, CCDF is administered by ODJFS. States have wide discretion in defining which employment, training and education opportunities apply, as well as setting income eligibility levels, family co-pay levels and other program requirements. CCDF funding is then granted to qualifying families and is accepted by participating local child care centers. Ohio families are eligible for a childcare subsidy if they meet the income threshold of 130 percent FPL. This threshold has been reduced from 200 percent FPL, which was the benchmark in 2010.

For more information about subsidized child care, see part six of this report.

### **Leave policies and employment benefits**

Employer policies that extend employer-sponsored health insurance, paid family and/or medical leave and health promotion supports, such as breastfeeding, support positive birth outcomes. There are federal and state policies requiring and encouraging these employer policies.

#### **Family and sick leave policies**

The federal Family and Medical Leave Act (FMLA)<sup>78</sup> enables the employees of covered employers to take unpaid leave for certain family and medical reasons. An employer must offer unpaid leave under FMLA if it employs 50 or more people, is a public agency or is a private elementary or secondary school. Employees of covered employers may take FMLA leave if they have worked for the employer for at least 12 months and 1,250 hours. Employees are guaranteed access to their employer-sponsored health insurance while they are on leave.

Eligible employees may take 12 work weeks of leave in a 12-month period. This leave can be used for medical and/or family leave, including:<sup>79</sup>

- The birth of a child and to care for a newborn within one year of birth
- To care for the employee's spouse, child or parent who has a serious health condition
- A serious health condition that makes the employee unable to perform the essential functions of his or her job

The state of Ohio has not implemented any mandatory paid leave policies. Four other states have passed paid family leave laws<sup>80</sup>, and all are funded by employee-paid payroll taxes.

In Ohio, there is uncertainty about whether local governments can set leave policy. SB 331 prohibits local governments from requiring an employer to provide “fringe benefits” to employees or mandating the amount of those benefits.<sup>81</sup> A “fringe benefit” under the law is any benefit that would be an added cost to the employer, including health and retirement benefits, leaves of absence or “vacation, separation, sick or holiday pay.”<sup>82</sup>

SB 331 requires these policies to be set at the federal or state level, or by individual employers. However, as stated above, legal challenges to SB 331 make the future of this provision unclear.

### **Schedule predictability**

Unpredictable or irregular work schedules create barriers for parents who must both earn an income and care for their families. Some state and local governments have addressed work schedule predictability in legislation, such as Oregon in June 2017.<sup>83</sup> Local governments in Ohio have attempted to implement similar policies, such as the “Part-Time Bill of Rights” proposal in [Youngstown](#).<sup>84</sup>

SB 331 states that local governments cannot set schedule predictability requirements, such as the “amount of notification an employee receives of work schedule assignments or changes” or the “fluctuations in the number of hours an employee is scheduled.”<sup>85</sup> However, it is unclear whether this provision will survive the series of legal challenges facing the bill.

### **Breastfeeding supports**

The Fair Labor Standards Act (FLSA), a foundational piece of federal labor standards policy, established the minimum wage, overtime pay, youth employment standards and other employment standards for both private and public sector employment. The FLSA also includes a provision related to break time for nursing mothers.<sup>86</sup> This requires employers to provide both reasonable time and private space for nursing women to express milk at work. Employers with less

than 50 employees are exempt from the requirement if it would impose an undue hardship on the employer.<sup>87</sup> The federal law does not preempt more protective state law, but the Ohio legislature has not passed legislation for additional work supports for women who are nursing.

## **Policies to reduce structural barriers to employment, including anti-discrimination enforcement in employment settings**

There are federal- and state-level policies aimed at reducing barriers to employment, including barriers related to occupational licensing, prior criminal convictions and discrimination in the workplace.

### **Occupational licensing reform**

Occupational licensing creates barriers to employment by increasing the amount of time and cost required in order to work in certain occupations. Licensure regulates professions and acts as an important protection for occupations that can negatively affect consumers (e.g., poor medical or legal services). The licensure requirements in Ohio are more costly overall than the U.S. average.<sup>88</sup>

Ohio has a variety of licensure boards, including the State of Ohio Board of Nursing, the Counselor, Social Worker and Marriage & Family Therapist Board, Ohio State Board of Cosmetology and the Casino Control Commission. State licensure boards have the authority to license, discipline and regulate members of a profession, which gives licensure boards the ability to adjust licensure requirements. However, the Ohio General Assembly can also pass legislation to make changes to occupational licensing.

The General Assembly has passed legislation that reduces the licensure requirements for a cosmetology license in Ohio (Senate Bill 213 in the 131st GA) and is considering another bill that would continue this trend in cosmetology (Senate Bill 129).<sup>89</sup> Senate Bill 129 and similar legislation would reduce barriers to employment by reducing the prerequisites to employment, and may reduce the wage and unemployment gap between unlicensed and licensed workers.<sup>90</sup>



### **Anti-discrimination enforcement and “ban the box” legislation**

In addition to occupational licensing reforms, there are federal and state efforts to reduce employment barriers based on discrimination, including discrimination related to past criminal convictions. On the federal level, the Equal Employment Opportunities Commission (EEOC) is the agency that enforces anti-discrimination laws. Most employers with at least 15 employees must abide by federal anti-discrimination law and can be monitored by the EEOC. The EEOC has field offices throughout the United States, including offices in both Cleveland and Cincinnati.

The EEOC provided employers with guidance for the consideration of arrest and conviction records in employment decisions.<sup>91</sup> The guidance prohibits employers from discriminating against job applicants and employees who have criminal records based on race or other protected characteristics. Employers are also prohibited from excluding applicants or employees as a result of a criminal record that disparately impacts people of a particular race or national origin.<sup>92</sup>

On the state level, the Ohio Civil Rights Commission (OCRC) investigates charges of discrimination in employment settings. The investigations cover all aspects of employment, including the hiring process, terms and conditions of work, harassment, discipline and termination. Ohio anti-discrimination law applies to public and private employers with four or more employees, excluding religious organizations.

Ohio law prohibits public and private employers from engaging in discrimination, which is to “discharge without just cause, to refuse to hire, or otherwise to discriminate against,” based on the “race, color, religion, sex, military status, national origin, disability, age, or ancestry of any person.”<sup>93</sup> Additionally, by executive order, public employers cannot discriminate on the basis of sexual orientation or gender identity.<sup>94</sup>

The Ohio Fair Hiring Act<sup>95</sup>, which became effective in March 2016, prohibits public employers in Ohio from including any questions about the criminal background

of an applicant on a job application.<sup>96</sup> This type of state-level policy is often referred to as “ban the box” legislation. According to the law, “public employers” include all state agencies, as well as “any political subdivision of the state<sup>97</sup>,” meaning all public sector employers at the local level. The Ohio Fair Hiring Act does not prohibit employers from subjecting job applicants to a background check, and employers can note on the job application if certain criminal convictions disqualify an applicant from gaining employment in a particular position. This law is enforced by OCRC, however members of the Advisory Group note that OCRC has insufficient resources, including personnel, to systematically enforce Ohio’s anti-discrimination laws.

Legal aid is a service available to low-income Ohioans who face employment discrimination. Ohio Legal Aid provides legal services at no cost to the client, and there are nine legal aid organizations serving Ohio’s 88 counties. Legal aid organizations can represent clients in anti-discrimination lawsuits and can assist justice-involved clients with employment concerns, such as sealing criminal records and obtaining certificates of qualification for employment.<sup>98</sup> Ohio Legal Aid is funded through a mix of federal funding, foundation support and private donations and grants. For more information about legal aid, including a list of state and local legal aid services, see the [Ohio Legal Aid website](#).<sup>99</sup>

## Employment policy recommendations

HPIO drew upon the following sources of information to identify policy goals and recommendations to improve employment in Ohio:

- Literature review, scope of problem and policy landscape (part seven of this report)
- Evidence inventories (see Appendix B)
- Suggestions and feedback from the Advisory Group, including prioritization of goals and recommendations
- Input from additional subject matter experts on technical and political feasibility

See Appendix D for a detailed description of the policy recommendation development process.

The following policy goals address the most critical employment challenges and inequities facing Ohio families at risk for infant mortality. Research indicates that achievement of these goals would likely contribute to improved birth outcomes, healthier infants and health equity.

### Employment policy goals

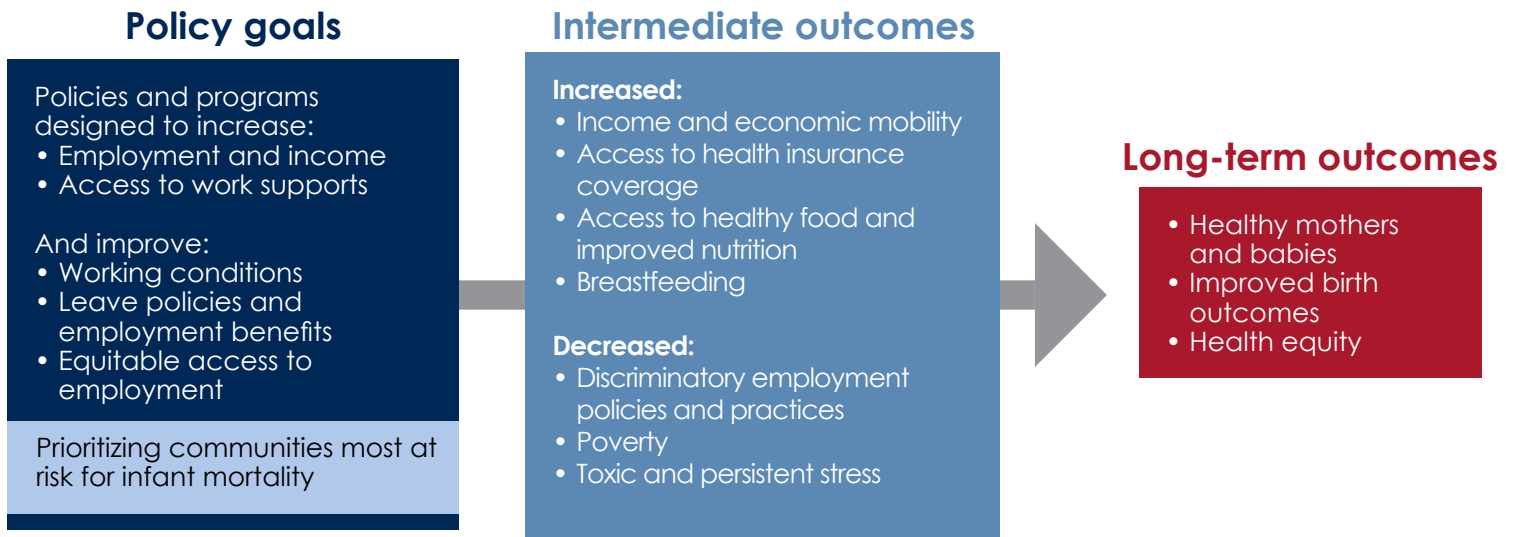
#### Top-priority goals

1. Increase incomes for pregnant women and parents of young children
2. Reduce unemployment and under employment
3. Increase access to work supports
4. Adopt more robust leave policies and employment benefits

#### Additional goals

5. Reduce exposure to toxic and persistent stress in employment settings

Figure 7.15. Employment policy goals





In order to reach these long-term policy goals, this report identifies specific and actionable recommendations for state and local policymakers. The top-priority recommendations are listed below, and additional policy options are listed in Appendix A.

### **Employment policy goal 1.** Increase incomes for pregnant women and parents of young children

- 1.1 State policymakers can expand the state Earned Income Tax Credit (EITC), lift the existing cap on the credit, make it refundable and/or expand the credit to non-custodial parents.
- 1.2 State policymakers can prioritize funds for career-technical education (vocational training) to:
  - a. Jobs and/or employers that pay a living wage
  - b. Jobs and/or employers that are offering a lower wage, but in a job with an articulated and stepped career pathway to higher wages and benefits
  - c. Employers that do not have a history of wage and hour violations
  - d. Employers that have relatively low turnover
  - e. Jobs that are in-demand or on the 21st Century Jobs list

These programs could also include job search assistance and comprehensive support services (including child care) during training.
- 1.3 Local policymakers, infant mortality collaboratives and other partners can encourage employers to voluntarily adopt living wage policies.

### **Employment policy goal 2.** Reduce unemployment and under employment

- 2.1 State policymakers can reform occupational licensing to reduce barriers to employment, such as through reductions in license requirements for some occupations, including cosmetology. (See SB 129 for an example of proposed legislation to reduce the required number of training hours for a cosmetology license in Ohio.)

- 2.2 State policymakers can reduce barriers to employment related to criminal convictions by increasing monitoring and enforcement of the Ohio Fair Hiring Act, which prohibits public employers from asking any questions on a job application about conviction history or previous salary ("ban the box"), as well as extending this same prohibition to any employer with a state contract over \$50,000.
- 2.3 State policymakers can reduce barriers to employment related to criminal convictions by offering tax benefits to employers who hire people with criminal records. Tax benefits can be paired with legislation reducing civil liability for employers who hire people with criminal records.

### **Employment policy goal 3.** Increase access to work supports

- 3.1 State policymakers can increase funding for child care subsidies so that eligibility limits can be restored to 200 percent FPL and more families can access child care. Access can also be expanded by increasing the reimbursement rate paid to child care centers to the 75th percentile, making 75 percent of the state's child care centers affordable to voucher families.
- 3.2 State policymakers can incentivize employers to provide child care subsidies to their employees in order to remove barriers to employment for parents, particularly those with part-time and/or low-wage jobs.
- 3.3 The Ohio Department of Job and Family Services can analyze and evaluate the effectiveness of the Comprehensive Case Management and Employment Program (CCMEP). If the evaluation is favorable, policymakers can increase funding for CCMEP to connect more youth and young adults with low incomes to skilled employment in Ohio.
- 3.4 State policymakers can review eligibility levels for government programs that serve individuals with low incomes in order to remove disincentives for job attainment or wage increases ("benefit cliffs"). Eligibility levels for programs such as medical, food and child assistance should be aligned with the self-sufficiency of the program recipients.

#### **Employment policy goal 4. Adopt more robust leave policies and employment benefits**

- 4.1 State policymakers can offer low-cost incentives to employers, primarily those with part-time and/or low-wage workers, who choose to offer employment benefits, such as paid family leave, sick leave and work schedule predictability. An example of a low-cost incentive may be awarding employers additional points in a state contracting process.
- 4.2 State policymakers can prohibit employers, primarily those offering part-time, classified and/or low-wage work, from discriminating against employees who breastfeed.
- 4.3 The Ohio Department of Job and Family Services can provide, on its website, information and links to other websites where employers can access information regarding methods to accommodate nursing mothers in the workplace.
- 4.4 Local municipalities and local infant mortality partners can monitor the legal challenges to Senate Bill 331 to determine the extent to which local governments can establish employment policies, such as minimum wage, leave policies and schedule predictability.

#### **Employment policy goal 5. Reduce exposure to toxic and persistent stress in employment settings**

- 5.1 State policymakers can increase enforcement efforts related to discriminatory workplace practices through the Ohio Civil Rights Commission (OCRC) by increasing the staff at OCRC to implement enforcement.
- 5.2 State policymakers can consider an employer's record with the OCRC when determining tax incentives, and assess a fee on employers with regular complaints to the OCRC. Revenue gained from these fees can be dedicated to fund education programs on eliminating discrimination in the workplace.

#### **Connections to other outcomes**

Although developed to reduce infant mortality, the employment policy goals and recommendations also support many other state priorities for improving population health outcomes, controlling healthcare spending and increasing economic opportunity and vitality. Career-technical education, for example, supports educational outcomes as well as serving as a work support program. Additionally, child care subsidies advance early childhood educational outcomes as well as support work for parents. These recommendations support policy goals in part six of this report.

Employment policy goal 1 directly aligns with employment and income strategies in the **2017-2019 State Health Improvement Plan (SHIP)**. The SHIP is being implemented by state agencies and by local health departments and hospitals through their community health improvement initiatives.



## Notes

1. *How Does Employment – or Unemployment – Affect Health?* Robert Wood Johnson Foundation, March 2013. [http://www.rwjf.org/content/dam/farm/reports/issue\\_briefs/2013/rwjf403360](http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2013/rwjf403360)
2. Bell, Janice F., Frederick J. Zimmerman and Paula K. Diehr. "Maternal Work and Birth Outcome Disparities." *Maternal Child Health Journal*, 12, no. 4 (2008): 415-426.
3. Woolf, Steven H. et al. *How are Income and Wealth Linked to Health and Longevity*. Urban Institute and the Center on Society and Health at the Virginia Commonwealth University, 2015.
4. Ibid.
5. Scharber, Helen. "Does Out of Work Get into the Womb? Exploring the Relationship between Unemployment and Adverse Birth Outcomes?" *Journal of Health and Social Behavior*, 55, no. 3 (2014): 266-282. doi: 10.1177/0022146514543799
6. Larcia, Barbara A., Anna Maria Siega-Riz and Craig Gundersen. "Household food insecurity is associated with self-reported pregravid weight status, gestational weight gain and pregnancy complications." *Journal of the Academy of Nutrition and Dietetics*, 110, no. 5 (2010): 692-701. doi: 10.1016/j.jada.2010.02.014
7. Mikhail, Blanche. "Prenatal Care Utilization among Low-Income African American Women." *Journal of Community Health Nursing*, 17, no. 4 (2000): 235-246.
8. Research literature reviewed and summarized in Lu, Michael C. and Neal Halfon. "Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective." *Maternal and Child Health Journal*, 7, no. 1 (2003): 13-30. doi: 10.1023/A:1022537516969
9. Collins, James W., Kristin M. Rankin and Richard J. David. "African American Women's Lifetime Upward Economic Mobility and Preterm Birth: The Effect of Fetal Programming." *American Journal of Public Health*, 101, no. 4 (2011): 714-719. doi: 10.2105/AJPH.2010.195024
10. Ibid.
11. What Works for Health. County Health Rankings & Roadmaps. Accessed Nov. 8, 2017. <http://www.countyhealthrankings.org/roadmaps/what-works-for-health>
12. Ibid.
13. Mutambudzi, Miriam et al. "Effects of Psychosocial Characteristics of Work on Pregnancy Outcomes: A Critical Review." *Women and Health*, 51, no. 3 (2011): 279-297. doi: 10.1080/03630242.2011.560242
14. Hoynes, Hillary W., Douglas L. Miller and David Simon. *Income, the Earned Income Tax Credit, and Infant Health*. NBER Working Paper Series, Working Paper 18206 (2012).
15. Strully, Kate W., David H. Rehkopf and Ziming Xuan. "Effects of Prenatal Poverty on Infant Health: State Earned Income Tax Credits and Birth Weight." *American Sociological Review*, 75, no. 4 (2010): 534-562. doi:10.1177/0003122410374086
16. Carayon, Pascale and Fred Zijlstra. "Relationship between job control, work pressure and strain: studies in the USA and The Netherlands." *Work and Stress*, 13, no. 1 (1999): 32-48.
17. Mutambudzi, Miriam et al. "Effects of Psychosocial Characteristics of Work on Pregnancy Outcomes: A Critical Review." *Women and Health*, 51, no. 3 (2011): 279-297. doi: 10.1080/03630242.2011.560242
18. Meyer, John D. "Race-Based Job Discrimination, Disparities in Job Control, and Their Joint Effects on Health." *American Journal of Industrial Medicine*, 57, (2014): 587-595. doi: 10.1002/ajim.22255
19. *State of the Science: Implicit Bias Review 2015*. Kirwan Institute for the Study of Race and Ethnicity. <http://kirwaninstitute.osu.edu/wp-content/uploads/2015/05/2015-kirwan-implicit-bias.pdf>
20. Ibid.
21. Domingues, Marlos Rodrigues, Alicia Matijasevich, and Aluisio J. D. Barros. "Physical Activity and Preterm Birth: A Literature Review." *Sports Medicine (Auckland, N.Z.)* 39, no. 11 (2009): 961-75. doi:10.2165/11317900-000000000-00000; and Savitz, David A., and Pamela Mumane. "Behavioral Influences on Preterm Birth: A Review." *Epidemiology (Cambridge, Mass.)* 21, no. 3 (May 2010): 291-99. doi:10.1097/EDE.0b013e3181d3ca63
22. Domingues, Marlos Rodrigues, Alicia Matijasevich, and Aluisio J. D. Barros. "Physical Activity and Preterm Birth: A Literature Review." *Sports Medicine (Auckland, N.Z.)* 39, no. 11 (2009): 961-75.
23. Burtle, Adam and Stephen Bezuchka. "Population Health and Paid Parental Leave: What the United States Can Learn from Two Decades of Research." *Healthcare*, 30, no. 4 (2016). doi: 10.3390/healthcare4020030
24. Abdulwadud, Omar A. and Mary Elizabeth Snow. "Interventions in the Workplace to Support Breastfeeding for Women in Employment." *The Cochrane Database of Systematic Reviews* 10 (2012): CD006177. doi: 10.1002/14651858.CD006177.pub3
25. Data visualization: How do U.S. Workplace Benefits Differ? The Pew Charitable Trusts, 2016. <http://www.pewtrusts.org/en/multimedia/data-visualizations/2016/how-do-us-workplace-benefits-differ>
26. *Key Facts about the Uninsured Population*. Henry J. Kaiser Family Foundation, October 2015. <http://kff.org/uninsured/fact-sheet/key-facts-about-the-uninsured-population/>
27. Health Policy Institute of Ohio. "Private Health Insurance Basics Fact Sheet 5: Employer-Sponsored Health Insurance (ESI)." October 2016.
28. Ibid.
29. Umberson, Debra and Jennifer Karas Montez. "Social Relationships and Health: A Flashpoint for Health Policy." *Journal of Health and Social Behavior* 51: no. 1 (2010): 54-66. doi: 10.1177/0022146510383501
30. Data from Local Area Unemployment Statistics. "Databases, Tables & Calculators by Subject." United States Department of Labor, Bureau of Labor Statistics. Accessed July 26, 2017. [https://data.bls.gov/timeseries/LASST3900000000000003&amp%253bdata\\_tool=XGtable&output\\_view=data&include\\_graphs=true](https://data.bls.gov/timeseries/LASST3900000000000003&amp%253bdata_tool=XGtable&output_view=data&include_graphs=true)
31. Ibid.
32. Data from the Local Area Unemployment Statistics as compiled by the Ohio Department of Job and Family Services. Accessed November 16, 2017. <http://ohiolmi.com/>
33. U.S. Census Bureau data compiled by the Federal Reserve Bank of St. Louis
34. Maestas, Nicole et al. *Working Conditions in the United States: Results of the 2015 American Working Conditions Survey*. Santa Monica, CA: RAND Corporation, 2017.
35. Carayon, Pascale and Fred Zijlstra. "Relationship between job control, work pressure and strain: studies in the USA and The Netherlands." *Work and Stress*, 13, no. 1 (1999): 32-48.
36. "Coping with Stress at Work," American Psychological Association, accessed November 22, 2017, <http://www.apa.org/helpcenter/work-stress.aspx>
37. The Rand Corporation. *Working Conditions in the United States: Results of the 2015 American Working Conditions Survey*. Ohio data not available.
38. Data from the U.S. Equal Employment Opportunity Commission, "FY 2009 – 2016 EEOC Charge Receipts for Ohio." [https://www1.eeoc.gov/eeoc/statistics/enforcement/charges\\_by\\_state.cfm](https://www1.eeoc.gov/eeoc/statistics/enforcement/charges_by_state.cfm)
39. Data visualization: How do U.S. Workplace Benefits Differ? The Pew Charitable Trusts, 2016. <http://www.pewtrusts.org/en/multimedia/data-visualizations/2016/how-do-us-workplace-benefits-differ>
40. "Unemployment in Black and White." *New York Times*, August 28, 2017. <https://www.nytimes.com/2017/08/28/opinion/unemployment-in-black-and-white.html>
41. *Women's Earnings and the Wage Gap*. U.S. Department of Labor Women's Bureau, 2017. [https://www.dol.gov/wb/resources/Womens\\_Earnings\\_and\\_the\\_Wage\\_Gap\\_17.pdf](https://www.dol.gov/wb/resources/Womens_Earnings_and_the_Wage_Gap_17.pdf)
42. Bertrand, Marianne and Sendhil Mullainathan. Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *The American Economic Review*, 94, no. 4: 991-1013, 2004.
43. Pager, Devah and Hana Shepherd. *The Sociology of Discrimination: Racial Discrimination in Employment, Housing, Credit, and Consumer Markets*. *Annu Rev Sociol*, 34 (2008): 181-209.
44. *The Color of Justice: Racial and Ethnic Disparity in State Prisons*. The Sentencing Project. July 14, 2016. <http://www.sentencingproject.org/publications/color-of-justice-racial-and-ethnic-disparity-in-state-prisons/>
45. "Criminal Justice Fact Sheet" National Association for the Advancement of Colored People (NAACP), accessed Nov. 17, 2017. <http://www.naacp.org/criminal-justice-fact-sheet/>
46. From Akron to Zanesville: How are Ohio's Small and Mid-Sized Cities Faring? *Greater Ohio Policy Center*. June 2016. <https://static1.squarespace.com/static/59396fee59cc6877bacc5ab5/1/595f9ed9bf629a49f1e1d35b/1499438840836/FromAkronToZanesville.pdf>
47. "Washington Post-Kaiser Family Foundation rural and small-town America poll." *The Washington Post*. June 2017. <http://apps.washingtonpost.com/g/page/national/washington-post-kaiser-family-foundation-rural-and-small-town-america-poll/2217/>
48. Davis et al. "Countering the Production of Health Inequities: A Framework of Emerging Systems to Achieve and Equitable Culture of Health, Extended Summary." *Prevention and Equity Institute at the Center of Community Well-being*, Dec. 2016.
49. "2017 EITC Income Limits, Maximum Credit Amounts and Tax Law Updates." *Internal Revenue Service*. Accessed October 24, 2017. <https://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/eitc-income-limits-maximum-credit-amounts-next-year>
50. "Do I Qualify for EITC?" *Internal Revenue Service*. Accessed Nov. 7, 2017. <https://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/do-i-qualify-for-earned-income-tax-credit-eitc>
51. Tax Policy Center. "What is the earned income tax credit (EITC)?" Accessed October 24, 2017. <http://www.taxpolicycenter.org/briefing-book/what-earned-income-tax-credit-eitc>
52. FAQs – Individual Income Tax. Ohio Department of Taxation. Accessed October 24, 2017. [http://www.tax.ohio.gov/ohio\\_individual\\_individual/faqs/individual/tafid/2766/Default.aspx?QuestionID=3797&AFMID=9539](http://www.tax.ohio.gov/ohio_individual_individual/faqs/individual/tafid/2766/Default.aspx?QuestionID=3797&AFMID=9539)
53. "Ten Facts about the Child Tax Credit" *Internal Revenue Service*. Feb. 10, 2011. <https://www.irs.gov/newsroom/ten-facts-about-the-child-tax-credit>
54. "Topic Number: 602 - Child and Dependent Care Credit" *Internal Revenue Service*. Sept. 21, 2017. <https://www.irs.gov/taxtopics/tc600/tc602>
55. "Minimum Wage Ordinance (MWO)." City and County of San Francisco: Office of Labor Standards Enforcement. Accessed Nov. 7, 2017. <http://sfgov.org/olse/minimum-wage-ordinance-mwo>
56. "Minimum Wage." City of Tacoma Washington. Accessed Nov. 7, 2017. <https://www.cityoftacomwa.org/cms/one.aspx?objectid=89891>
57. Fight for \$15. Accessed Nov. 7, 2017. <https://fightfor15.org/s-petition/cleveland-15-petition-oh/>
58. ORC § 4111.02
59. Zachariah, Holly. "Franklin County judge rules for local governments in micro-wireless equipment dispute." *The Columbus Dispatch*. June 2, 2017. <http://www.dispatch.com/news/20170602/franklin-county-judge-rules-for-local-governments-in-micro-wireless-equipment-dispute>
60. Hewell, E. Nicki. "Summit and Franklin County judges split on 'Single Subject Rule' Violation in Sub. S.B. 331 Litigation." *Bricker & Eckler Insights & Resources*, September 2017. <http://www.bricker.com/insights-resources/publications/summit-and-franklin-county-judges-split-on-%E2%80%9Csingle-subject-rule%E2%80%9D-violation-in-sub-sb-331-litigation>
61. "Wage Enforcement (CMC Chapter 326): Rules and Regulations." City of Cincinnati. Accessed Sept. 7, 2017. <http://cincinnati-oh.gov/inclusion/assets/File/Wage%20Enforcement%20Regs.pdf>
62. WIOA State Plan for the State of Ohio. Accessed October 30, 2017. <https://www2.ed.gov/about/offices/list/oesers/rsa/wioa/state-plans/oh.pdf>
63. "Ohio's Combined State Plan: Better Coordination, Improved Delivery of Service, Superior Results." Governor's Office of Workforce Transformation. Accessed Nov. 7, 2017. <http://workforce.ohio.gov/Initiatives/CombinedStatePlan.aspx>
64. OhioMeansJobs Centers. Ohio Department of Job and Family Services: Office of Workforce Development. Accessed Nov. 7, 2017. <http://jfs.ohio.gov/owd/wioa/map.shtm>



65. "Adult Vocational Training." What Works for Health. County Health Rankings & Roadmaps. Accessed Nov. 13, 2017. <http://www.countyhealthrankings.org/policies/adult-vocational-training>
66. "Aspire: Learn More, Earn More." Ohio Department of Higher Education. Accessed Nov. 7, 2017. <https://www.ohiohighered.org/aspire>
67. Perkins: Financial Requirements. Ohio Department of High Education. Accessed November 3, 2017. <https://www.ohiohighered.org/node/319>
68. Advance CTE: State Leaders Connecting Learning to Work. "Ohio." Accessed November 3, 2017. <https://careertech.org/ohio>
69. "Perkins: Performance." Ohio Department of Higher Education. Accessed Nov. 7, 2017. <https://www.ohiohighered.org/perkins/performance>
70. *The Workforce Innovation and Opportunity Act: Fact Sheet: Youth Program*. U.S. Department of Labor: Employment and Training Administration. Accessed Nov. 7, 2017. [https://www.doleta.gov/wioa/Docs/WIOA\\_YouthProgram\\_FactSheet.pdf](https://www.doleta.gov/wioa/Docs/WIOA_YouthProgram_FactSheet.pdf)
71. *Comprehensive Case Management and Employment Program Factsheet*. Ohio Department of Job and Family Services. Access October 26, 2017. <http://jfs.ohio.gov/owd/CCMEP/CCMEP-Fact-Sheet.stm>
72. *Fact Sheet: Ohio Works First*. Ohio Department of Job and Family Services. March 2017. <https://jfs.ohio.gov/factsheets/owf.pdf>
73. *Fact Sheet: Prevention, Retention and Contingency*. Ohio Department of Job and Family Services. August 2017. <http://jfs.ohio.gov/factsheets/PRC.pdf>
74. *Ibid.*
75. *Comprehensive Case Management and Employment Program Procedure Letter No. 2*. Ohio Department of Job and Family Services. Sept. 22, 2016. <http://emanuals.jfs.ohio.gov/Workforce/CCMEP/CCMEPPL/CCMEPPL-2.stm>
76. *Comprehensive Case Management and Employment Program (CCMEP)*. Ohio Department of Job and Family Services. Accessed Nov. 7, 2017. <http://jfs.ohio.gov/owd/CCMEP/index.stm>
77. "Child Care and Development Fund Program Plans." Office of Child Care. Accessed Nov. 7, 2017. <https://www.acf.hhs.gov/occ/plans>
78. 29 U.S.C. 28
79. "Family and Medical Leave Act." United States Department of Labor: Wage and Hour Division. Accessed October 24, 2017. <https://www.dol.gov/whd/fmla/>
80. "State Family and Medical Leave Laws." National Conference of State Legislatures. July 19, 2016. <http://www.ncsl.org/research/labor-and-employment/state-family-and-medical-leave-laws.aspx>
81. ORC § 4113.85(B)
82. ORC § 4113.85(A)(1)(c)
83. Borund, Hillary. "Oregon Senate passes bill to mandate work schedule predictability." *The Oregonian*. June 23, 2017. [http://www.oregonlive.com/politics/index.ssf/2017/06/oregon\\_senate\\_passes\\_bill\\_to\\_m.html](http://www.oregonlive.com/politics/index.ssf/2017/06/oregon_senate_passes_bill_to_m.html)
84. Jodka, Sara H. and William V. Voyrs. "Ohio Adopts Preemption Legislation, Blocking Local Minimum Wage Hikes and Other Local Employer Restriction Proposals." *The National Law Review*, December 22, 2016. <https://www.natlawreview.com/article/ohio-adopts-preemption-legislation-blocking-local-minimum-wage-hikes-and-other-local>
85. ORC § 4113.85(B)
86. 29 U.S.C. 207(r)(1)
87. 29 U.S.C. 207(r)(3)
88. *Ibid.*
89. Senate Bill 129. Ohio Legislature: 132nd General Assembly. <https://www.legislature.ohio.gov/legislation/legislation-summary?id=GA132-SB-129>
90. Nunn, Ryan. *Occupational licensing and American workers*. The Brookings Institution. June 21, 2016. <https://www.brookings.edu/research/occupational-licensing-and-the-american-worker/>
91. *Consideration of Arrest and Conviction Records in Employment Decisions Under Title VII of the Civil Rights Act of 1964*. U.S. Equal Employment Opportunity Commission. April 25, 2012. [https://www.eeoc.gov/laws/guidance/arrest\\_conviction.cfm](https://www.eeoc.gov/laws/guidance/arrest_conviction.cfm)
92. "What You Should Know About the EEOC and Arrest and Conviction Records." Equal Employment Opportunity Commission. Accessed Nov. 1, 2017. [https://www.eeoc.gov/eeoc/newsroom/wysk/arrest\\_conviction\\_records.cfm](https://www.eeoc.gov/eeoc/newsroom/wysk/arrest_conviction_records.cfm)
93. ORC § 4112.02(A)
94. Executive Order 2007—10S. <http://epa.ohio.gov/Portals/36/documents/Executive%20Order%202007-10S.pdf>
95. The Ohio Fair Hiring Act amended sections 124.11, 124.34, 329.021, 2953.36, 4121.121, 5120.38, 5120.381, 5120.382, 5123.08 and 5139.02 and enacted sections 9.73 and 5164.44 of the Ohio Revised Code.
96. ORC § 9.73(B)
97. ORC § 9.73(A)(3)
98. ORC § 2953.25
99. "Ohio Legal Aids." Ohio Legal Aid. Accessed Nov. 7, 2017. <https://www.ohiolegalaid.org/ohio-legal-aids/>
100. "State Health Improvement Plan." Ohio Department of Health. May 2017. <https://www.odh.ohio.gov/en/odhprograms/chss/HealthPolicy/ship/State-Health-Improvement-Plan>



# 8

# State-level regression analysis

The purpose of this analysis is to identify state-level social determinants of health that correlate with better and worse performance on infant mortality and low birth weight rates from 2005 through 2014 for each state and Washington D.C. The analysis builds upon state trend data from the HPIO [2017 Health Value Dashboard](#).<sup>1</sup>

This section provides a brief summary of the results of regression analysis conducted by Ohio University researchers. Regression analysis is a way to identify which factors matter the most when there are many potential reasons for an outcome, and whether these factors worsen or improve the outcome, and by how much. In this case, the regression analysis sorts out which measurable characteristics in the social, economic and physical environment (independent variables) had the biggest impact on state-level infant mortality and low birth weight rates (dependent variables). A complete description of the methodology and results is included in Appendix D.

## Independent variables

The independent variables in this analysis were selected from a list of 21 metrics from the social and economic and physical environment domains of the HPIO *2017 Health Value Dashboard*. Guided by the scope of this study and the results of the literature reviews described in parts three through seven of this report, seven metrics were ultimately selected to include in the regression analysis:

- **Households with high monthly housing costs:** Percent of households where monthly housing costs, including utilities, exceed 30 percent of household income
- **Children without a vehicle at home:** Percent of children living in zero-vehicle households
- **Preschool enrollment:** Percent of 3 and 4 year-olds enrolled in preschool
- **Some college:** Percent of the population ages 25-44 with some post-secondary education; includes individuals who pursued education following high school but did not receive a degree
- **Labor force participation:** Annual average civilian labor force participation rate, ages 16 and older

Figure 8.1. **Fixed-effects regression estimates (robust standard errors)**

Independent variable	Infant mortality rate	Low birth weight birth rate
<b>Some college</b>	<b>-0.1171****</b> (0.0335)	<b>-0.3410***</b> (0.1198)
Labor force participation rate	-0.0069 (0.0622)	-0.1416 (0.1985)
Child poverty	0.0039 (0.0196)	0.0879 (0.1237)
<b>Violent crime</b>	<b>0.0043****</b> (0.0010)	<b>0.0142****</b> (0.0040)
Preschool enrollment	-0.0330 (0.0173)	0.0171 (0.0404)
<b>Children without a vehicle at home</b>	0.0617* (0.0326)	<b>0.4753**</b> (0.1860)
Percent of households with high monthly housing costs	-0.0162 (0.0170)	0.0842 (0.0853)
F Statistic (df = 7; 452)	51.7169***	21.1324***
Adjusted R-Squared	0.3747	0.1515
N	510	510

\*\*\*\*Significant at the 0.1 percent level

\*\*\*Significant at the 1 percent level

\*\*Significant at the 5 percent level

**Note:** Bold font = significant result

**Source:** See Appendix E for variable data sources

- **Child poverty:** Percent of persons under age 18 who live in households at or below the poverty threshold (<100 percent federal poverty level)
- **Violent crime:** Violent crime rate per 100,000 inhabitants (murders, rapes, robberies and aggravated assaults)

See Appendix D for a description of why other Dashboard metrics were removed from the analysis.

## Regression model estimates

Figure 8.1 displays the results of the analysis, referred to as a fixed-effects regression model. (See Appendix D for a detailed description of the methodology.)

These regression results indicate that infant mortality rates:

- Decline with an increase in the percent of the population ages 25-44 with some post-secondary education
- Rise with an increase in the violent crime rate per 100,000 inhabitants

They also indicate that low birth weight rates:

- Decline with an increase in the percent of the population ages 25-44 with some post-secondary education
- Rise with an increase in the violent crime rate per 100,000 inhabitants
- Rise with an increase in the percent of children living in zero-vehicle households

The regression model for infant mortality has an adjusted R-squared of 0.3747, indicating that about 37 percent of the variation in the states' infant mortality rates can be explained by this regression analysis, and the remaining 63 percent is explained by other variables not included in this analysis (e.g., other characteristics of the social environment that could not be measured, health behaviors, healthcare system quality, etc.). The model for low birth weight rates, on the other hand, can

only explain about 15 percent of the variation in states' low birth weight rates.

The regression results should be treated with caution because they are based on aggregate state-level data. Rates, changes in rates and the factors that may be responsible for these changes differ for by race, ethnicity, income, sub-state geography and other factors.

## Discussion and conclusions

The analysis finds that educational attainment and violent crime rise to the top as important factors predicting state-level infant mortality and low birth weight rates. This is consistent with research literature that identifies educational attainment is a protective factor and exposure to violence is risk factor (see literature review summarized in parts three, four and six of this report). Partnerships with the education sector, law enforcement and violence prevention organizations are therefore particularly important for infant mortality reduction stakeholders.

The finding that low birth weight rates rise with an increase in the percent of children living in zero-vehicle households is consistent with Advisory Group discussions about challenges faced by low-income families without cars. Pregnant women in zero-vehicle households may particularly struggle with accessing prenatal care and healthy food—two resources directly related to low birth weight.

Due to data limitations, this analysis was not able to include the independent variables disaggregated by race, ethnicity or sub-state geography. Additional analysis is needed to explore which social, economic and physical environment characteristics are most predictive of infant mortality for specific racial, ethnic and geographic groups.

## Note

1. HPIO 2017 Health Value Dashboard. 2017.

HPIO developed brief case studies of seven states and Washington D.C. that had impressive reductions in overall infant mortality, black infant mortality and/or a narrowing of the black-white disparity gap from 2005-2007 to 2012-2014. The purpose of the case studies is to identify:

- Factors that may have contributed to success in these states
- Examples of ways that other states are addressing the social determinants of health
- Lessons learned that may help Ohio to improve or expand existing strategies

Rather than only exploring states that have always had low rates of infant mortality, these case studies focus on improvement. Most of the case study states performed similarly to or worse than Ohio in the past, but now perform

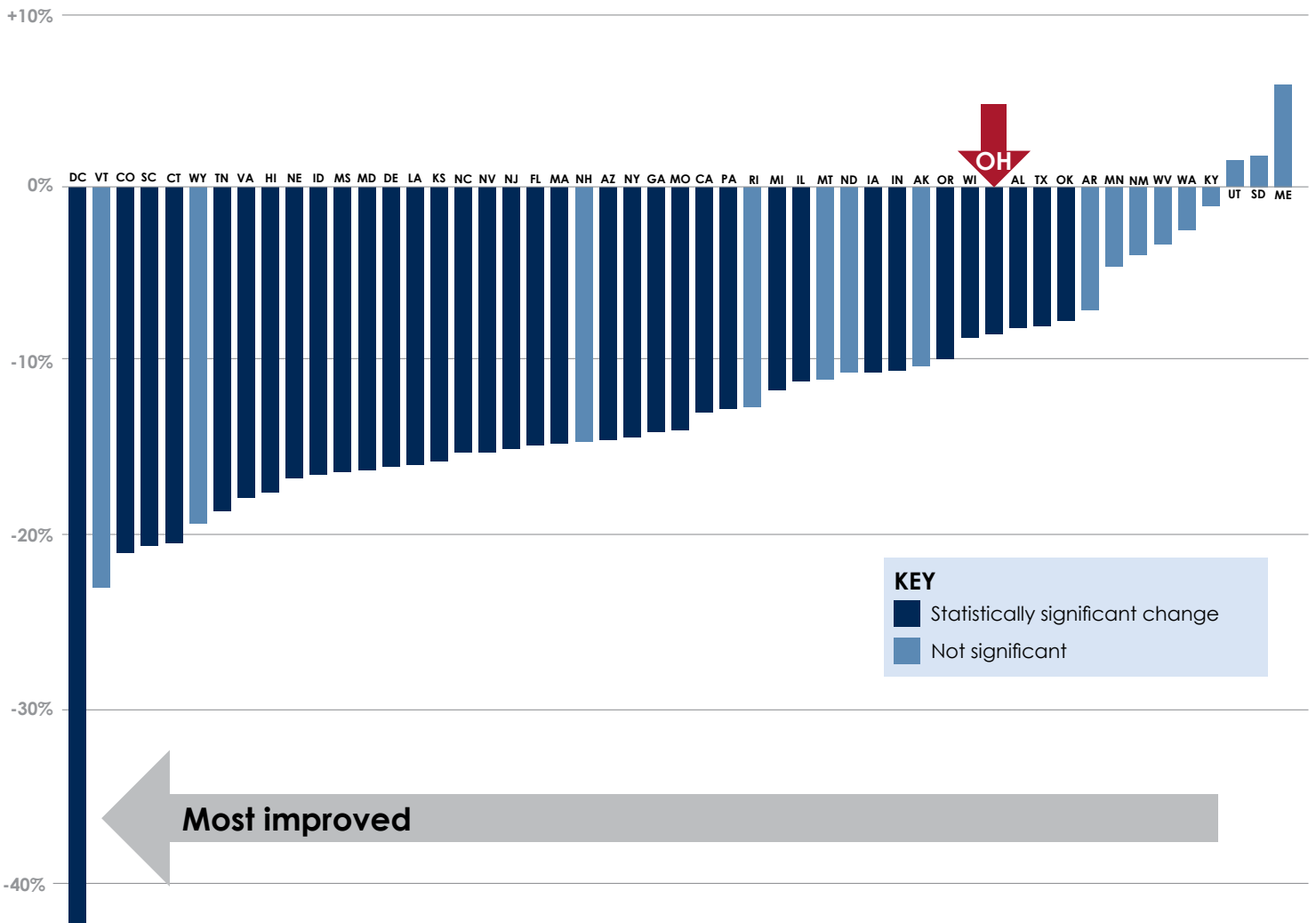
better. These case studies were designed to find out why and how progress was made.

### State-level infant mortality trends

In the early 1990s, Ohio's overall infant mortality rate was slightly lower than the U.S. rate. Since then, however, improvements at the national level have outpaced improvements in Ohio.<sup>1</sup> By 2012-2014, there were only seven states with higher overall infant mortality rates than Ohio and only three states with higher non-Hispanic black infant mortality rates.<sup>2</sup>

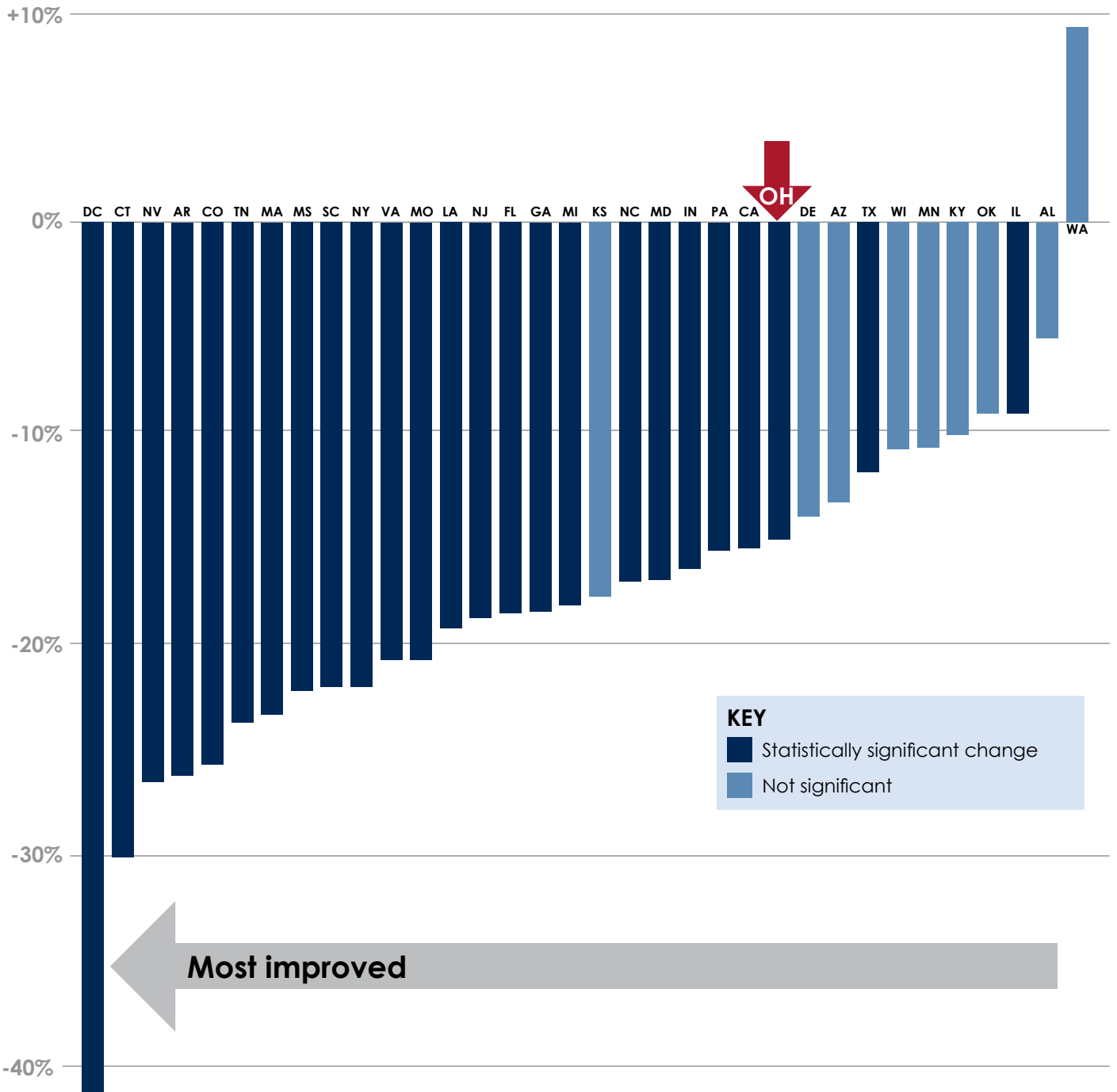
A recent report from the National Center for Health Statistics found that the U.S. infant mortality rate declined 15 percent from 6.86 infant deaths per 1,000 live births in 2005—a rate peak—to 5.82 in 2014.<sup>3</sup> Given that 2014 is the

Figure 9.1. Change in infant mortality rate, 2005-2007 to 2012-2014, by state



Source: Analysis of Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

Figure 9.2. **Change in non-Hispanic black infant mortality rate, 2005-2007 to 2012-2014, by state**



Source: Analysis of Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

most recently available year of data for the U.S. and other states, this study used the same time period (pooled years 2005-2007 to 2012-2014) to identify states with the largest reductions in infant mortality.

Figures 9.1 and 9.2 display state-level change in overall infant mortality and non-Hispanic black infant mortality rates from 2005-2007 to 2012-2014.<sup>4</sup> Each bar represents a state; dark blue bars indicate states with statistically significant change.<sup>5</sup> Bars toward the left side had the

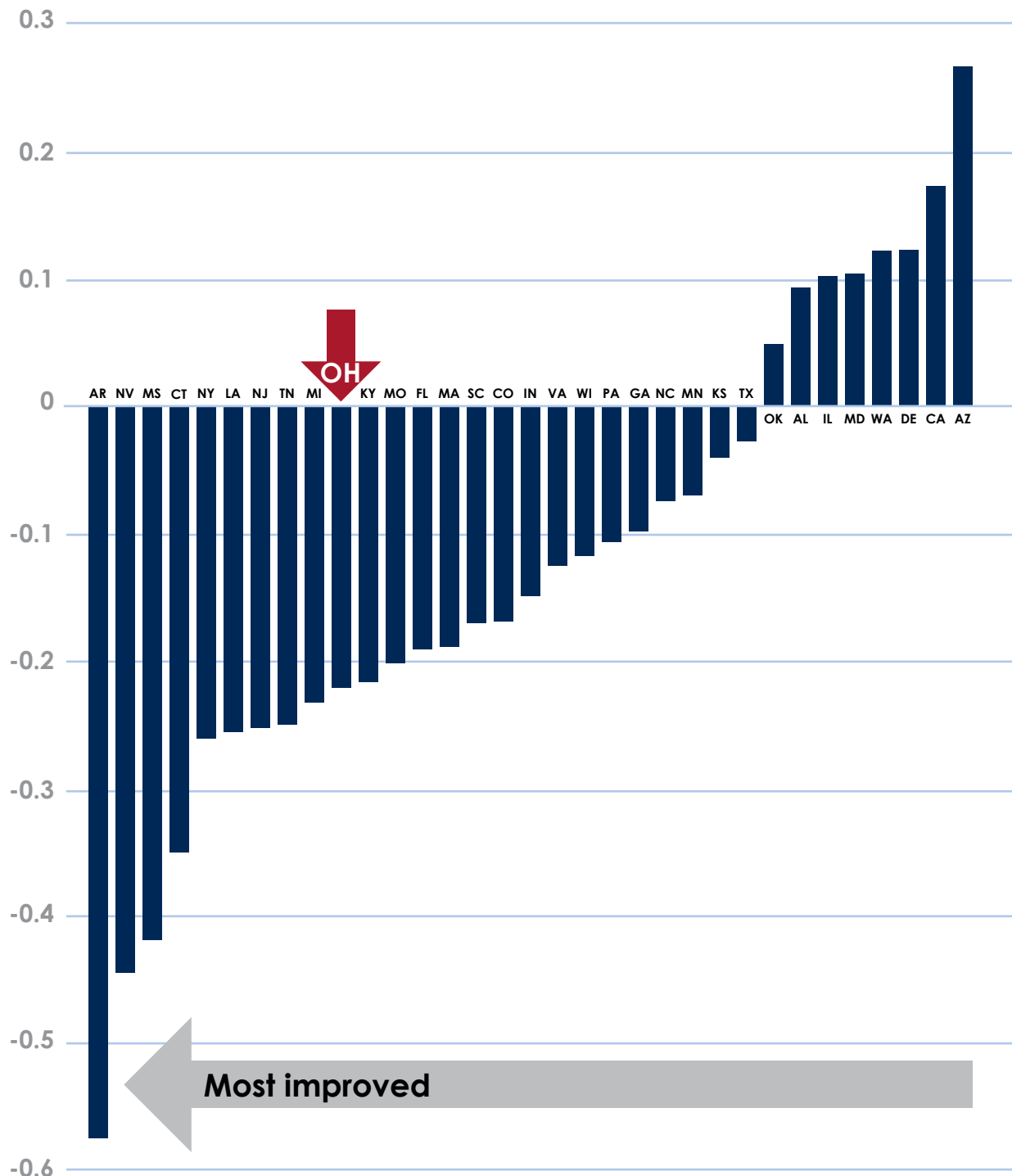
largest improvements, meaning the biggest reductions in the infant mortality rate. Note that figure 9.2 includes a smaller number of states because data on non-Hispanic black rates is not available for some states due to small population size.<sup>6</sup>

During this time period, Ohio had statistically significant reductions, although most other states had even larger improvements.

Figure 9.3 displays change in the black-white disparity gap, with the disparity between non-Hispanic black and non-Hispanic white infant mortality rates for each state expressed as an odds ratio. This is the odds of a non-Hispanic black baby not living to his or her first birthday relative to that of a non-Hispanic white baby.

The change in this odds ratio from 2005-2007 to 2012-2014 was then calculated, along with the 95 percent confidence intervals for the 2005-2007 and 2012-2014 odds-ratios, respectively. Ohio had the tenth largest decrease in the disparity odds ratio, meaning that there was some progress in narrowing the disparity gap.<sup>7</sup>

**Figure 9.3. Change in black-white disparity odds ratio for infant mortality, 2005-2007 to 2012-2014, by state**



Source: Analysis of Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

## Process for identifying case study states

In order to select states for the case studies, HPIO first identified states for which black infant mortality data is available. The Centers for Disease Control and Prevention (CDC) report that black infant mortality rate data is unreliable or suppressed for 17 states due to small numbers. These states have relatively small African-American populations compared to other states<sup>8</sup> and were consequently not selected for case study.

HPIO then used the following criteria to narrow down the list of remaining states:

- Top 10 states for:
  - Statistically significant reduction in **overall infant mortality** from 2005-2007 to 2012-2014 (figure 9.1)
  - Statistically significant reduction in **non-Hispanic black infant mortality** from 2005-2007 to 2012-2014 (figure 9.2)
  - Reduction in the **black-white disparity ratio**

from 2005-2007 to 2012-2014 (among states with significant reductions for all groups) (figure 9.3)

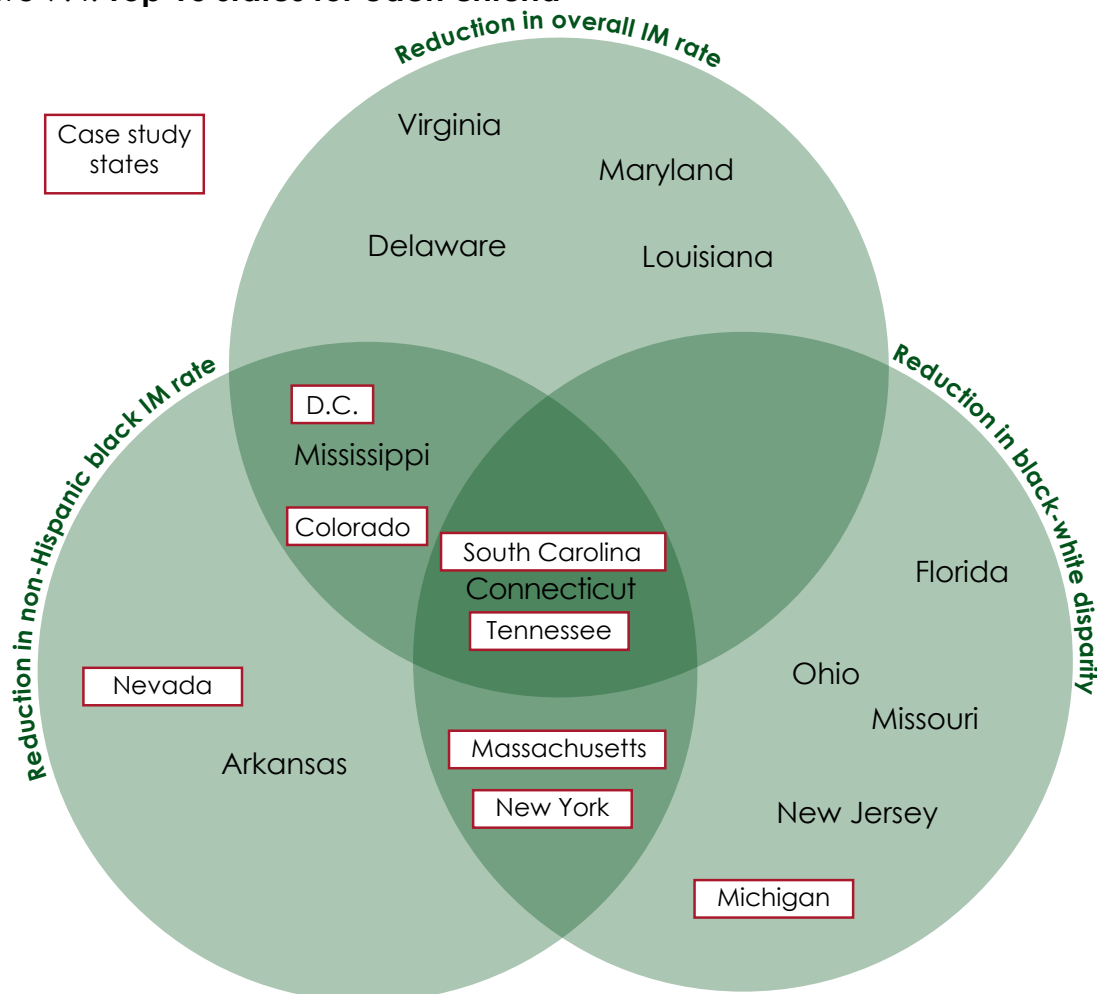
- Indication of some role of social determinants based on initial outreach to key stakeholders in the states and review of social, economic and physical environment data (see Appendix E)
- Geographic balance

The following states were selected based on the criteria above:

- Colorado
- Massachusetts
- Michigan<sup>9</sup>
- Nevada
- New York
- South Carolina
- Tennessee
- Washington D.C.

Figure 9.4 displays these states/D.C. by the relevant criteria.

Figure 9.4. Top 10 states for each criteria





## Population size, geography and political landscape of case study states

Information about the population size, geography and political landscape of the case study states is provided in the state profiles in this section and is compiled in data tables in Appendix E.

The case study states vary in population size from a low of 2.8 million in Nevada to a high of 19.7 million in New York. With the exception of Michigan, all of the states have had stronger population growth than Ohio over the past 10 years. Three states (South Carolina, Tennessee and Michigan) have a larger proportion of the population living in rural areas than Ohio, while the other states are more urban than Ohio.

Residential segregation, as measured by the black-white dissimilarity index, is less pronounced in metropolitan areas in some western and southern states (Nevada, South Carolina and Tennessee). States in the Midwest (including Ohio) and Northeast, on the other hand, generally have more highly segregated metropolitan areas.

The case study states represent a balanced range of Republican, Democratic and mixed party control. South Carolina had a Republican Governor and Republican control of the legislature during the entire study period (2005 to 2014), while D.C. had complete Democratic control of leadership. All of the other states had mixed party control over this time period.

## Social, economic and physical environments of case study states

Data on several social, economic and physical environment metrics for the case study states is provided in Appendix E.

A review of how Ohio performs relative to the case study states on these metrics highlights several challenges for Ohio. For example, most case study states have:

- Higher rates of preschool enrollment
- Higher rates of educational attainment (at least some college)
- Lower child poverty rates
- Better outdoor air quality (less exposure to particulate matter)

In addition, this data demonstrates that social and economic conditions are particularly challenging for African Americans in Ohio, compared to African Americans in other states. For example, most case study states have:

- Lower black unemployment rates

- Higher black labor force participation rates
- Lower black child and adult poverty rates

Similarly, the Annie E. Casey Foundation Race for Results index finds that Ohio is the second worst state for black child wellbeing and opportunity. Most states that perform poorly in this ranking are clustered in the Midwest and South.<sup>10</sup>

## Key informant interview methodology

HPIO conducted a total of 23 key informant interviews from August through November 2017. All interviews were conducted by phone, with one or more people from the same organization, using a semi-structured interview script. Each interview was approximately one hour.

HPIO conducted the first wave of interviews with key informants from the following organizations:

- State health department maternal and child health director, or other relevant staff
- March of Dimes (state affiliate) maternal and child health director, or other relevant staff
- Other public health or research organization, such as representatives from statewide infant mortality reduction collaboratives, universities or health systems

The second wave of interviews focused on specific social determinant of health issues. Respondents included representatives from community-based organizations, statewide initiatives, universities and health and social service policy institutes. HPIO relied upon suggestions from the first wave of interviews to identify these contacts. (See Appendix D for a list of the organizations that participated and the total number of completed interviews for each state.)

In addition to the interviews, HPIO reviewed documents and online material for each state, including evaluation reports and descriptions of specific policy changes.

## Limitations

This study does not assess the causal relationships between programs and policies implemented in these states and the reductions in infant mortality they experienced. HPIO requested evaluation reports from key informants, although few were provided. In many cases, evaluation results were either not available or were only available for specific services or interventions (such as pilot projects with small numbers of participants) rather than for comprehensive initiatives to reduce infant mortality.

Key informants from state health departments and March of Dimes state affiliates generally struggled

to identify factors from the social, economic and physical environment that may have contributed to reductions in infant mortality. Although key informants acknowledged the importance of social determinants and were sometimes able to identify these factors once prompted, they were most familiar with health care and public health strategies.

### Summary of major drivers of improvement

Interviewers asked key informants what they believed were the major drivers of improvement in their state (i.e., reductions in overall infant mortality, non-Hispanic black infant mortality and/or black-white disparity ratio). Figure 9.5 summarizes these results.

Overall, the most frequently mentioned policies and programs were:

- Home visiting (Nurse-Family Partnership or other models)
- Safe sleep campaigns and programs
- Centering Pregnancy (or other group prenatal care model)
- Medicaid policy changes (including coverage expansions in 2014 or earlier and reimbursement changes)
- Policies and education to reduce early elective deliveries/non-medically necessary inductions and C-sections
- Tobacco prevention policies and/or smoking cessation programs
- Collaboration at the state and local level

Notably, Ohio is currently implementing all of the activities listed above.

Figure 9.5. “What do you believe are the major drivers of improvement in overall infant mortality/black infant mortality from 2005-2014 in your state?”\*

Policies and programs mentioned by key informants	CO	DC	MA	MI	NV	NY	SC	TN	Total number of states that cited this as major driver
<b>Healthcare system and access to care (clinical care)</b>									
Centering Pregnancy (or other group prenatal care model)		X	X	X	X		X	X	6
Medicaid policy changes (including coverage expansions in 2014 or earlier and reimbursement changes)	X		X	X		X	X	X	6
Policies and education to reduce early elective deliveries/non-medically necessary inductions and C-sections	X		X	X		X	X	X	6
Progesterone access (17P)			X	X			X	X	4
Substance abuse screening and/or treatment (including SBIRT)					X		X		2
Access to contraception, including long-term reversible contraception (LARC)	X		X				X	X	4
Perinatal Quality Improvement Collaborative			X	X		X		X	4
Sexually transmitted infection screening and treatment		X					X		2
Preconception health	X			X					2
Access to care programs, such as mobile clinics		X					X		2
Mental health and depression screening and/or treatment	X		X						2
Care coordination/case management				X					1
Birthing centers						X			1

Policies and programs mentioned by key informants	CO	DC	MA	MI	NV	NY	SC	TN	Total number of states that cited this as major driver
<b>Public health campaigns and policies</b>									
Safe sleep campaigns and programs	X	X		X	X	X	X	X	7
Tobacco prevention policies and/or smoking cessation programs	X	X		X	X	X		X	6
Educational campaigns and resources			X		X	X		X	4
Breastfeeding promotion				X		X	X	X	4
Text 4 Baby					X				1
Shaken Baby Syndrome education campaign and other injury prevention programs/policies					X				1
Immunizations					X				1
<b>Social, economic or physical environment</b>									
Transportation assistance, including vouchers			X		X				2
Housing programs	**		X						2
Family-friendly workplace policies	**								1
<b>Cross-cutting</b>									
Collaboration	X	X	X	X	X	X	X	X	8
Home visiting (Nurse-Family Partnership or other model)	X	X	X	X	X	X	X		7
Community engagement	X				X			X	3
Community Health Workers				X	X	X			3
Health equity focus			X	X		X			3
Fetal and Infant Mortality Review (FIMR) teams			**	X				X	3
Healthy Start program	X								1

\*Based on interviews with 21 key informants (one to five interviews per state/D.C.) who were specifically asked about major drivers of improvement

\*\* New policies/future policies implemented after 2014

**Note:** This information is based on interviewee responses regarding the major drivers of improvement and may not comprehensively reflect all activities implemented in the state.

### Social determinants of health

Most of the strategies cited by key informants as major drivers of improvement were healthcare services, public health programs or other interventions delivered directly to individual pregnant women, rather than policies designed to improve the social, economic or physical environment challenges and inequities that contribute to infant mortality. When specifically asked about social determinants, some key informants were able to identify policies and programs enacted in their state that may have improved conditions for families most at risk for infant mortality.

Notably, several states emphasized the importance of home visiting as a way to address

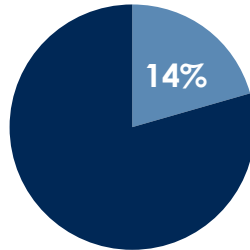
social factors. Because home visitors meet with families outside the clinical setting, they are able to assess and address issues such as domestic violence, healthy food access and housing conditions that affect safe sleep practices. While home visiting does not actually change the causes of inequities, it does connect families with services that can help them to overcome challenges in the social, economic and physical environment.

In order to identify innovative ideas for addressing social determinants, each state case study includes a “spotlight on social determinants of health” section that describes an upstream strategy mentioned by interviewees and/ or a positive trend in the social or economic environment that may have contributed to a state’s improvement.

## Population size and geography

**Population (2015):**  
5,278,906  
**Population trend:** 16.4%  
increase from 2005-2015

### Population living in rural area



### Largest metropolitan areas

- Denver-Aurora-Lakewood: 2,703,972 (48.8% of state population)
- Colorado Springs: 678,364 (12.2%)
- Boulder: 310,032(5.6%)

## Political landscape 2005-2014

	Governor	Party control of legislature
2005	Bill Owens	Democratic
2006	Bill Owens	Democratic
2007	Bill Ritter	Democratic
2008	Bill Ritter	Democratic
2009	Bill Ritter	Democratic
2010	Bill Ritter	Democratic
2011	John Hickenlooper	Democratic
2012	John Hickenlooper	Split
2013	John Hickenlooper	Democratic
2014	John Hickenlooper	Democratic

**Women as percent of legislature (2005-2014): 37%**  
**African Americans as percent of legislature (2009): 2%**  
(4% of population is African American)

## 2017 HPIO Health Value Dashboard

Rank among 50 states and D.C.

	CO	OH
<b>Health value</b>	7	46
<b>Population health</b>	7	43
<b>Healthcare spending</b>	22	31
<b>Access to care</b>	30	17
<b>Healthcare system</b>	6	37
<b>Public health and prevention</b>	34	50
<b>Social and economic environment</b>	12	29
<b>Physical environment</b>	7	35

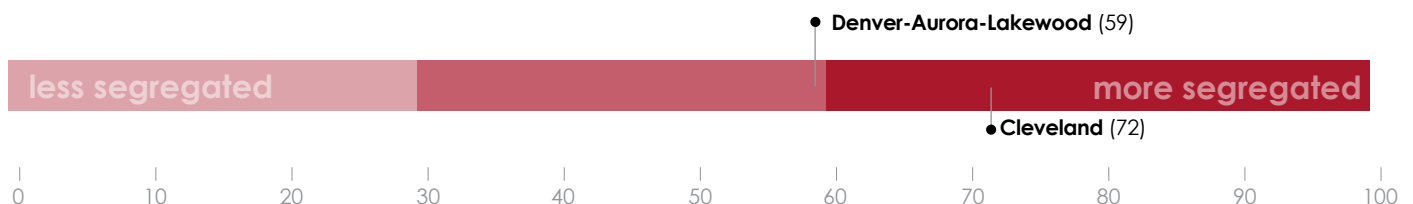
## Annie E. Casey Foundation Race for Results index rank

Index of child wellbeing and opportunity

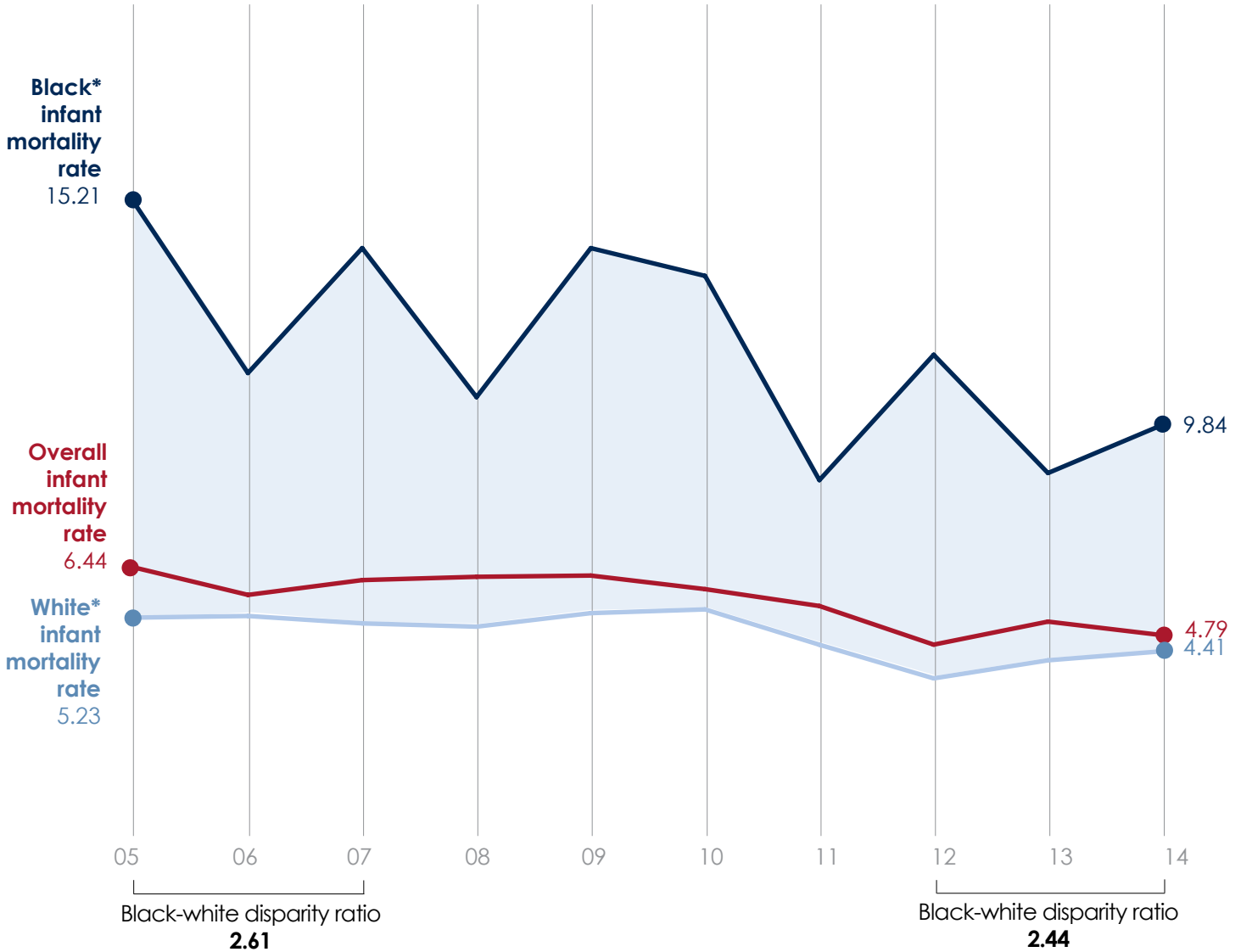
	CO	OH
<b>African-American children</b> (out of 44)	7	42
<b>Latino children</b> (out of 49)	24	23
<b>White children</b> (out of 50)	13	31

## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below is the black-white dissimilarity index for the largest metropolitan area in Colorado. Cleveland, Ohio's most segregated metropolitan area, is displayed for reference.



### Colorado infant mortality trend (2005-2014)



\* Non-Hispanic

Source: Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

#### Notable areas of improvement from 2005-2007 to 2012-2014

- 21.1% decrease in overall infant mortality
- 25.8% decrease in non-Hispanic black infant mortality

## Colorado case study

### Highlights: Family planning and family-friendly employment policies

- Stakeholders in Colorado emphasized the role of long-acting reversible contraception (LARC) in reducing infant mortality rates (see box).
- In addition to increasing access to LARC, the Colorado Department of Public Health and Environment (CDPHE) has led a variety of healthcare and public health programs that have impacted birth outcomes in the state.
- Going forward, Colorado's infant mortality reduction partners are pursuing innovative approaches to address infant mortality through state and local implementation of family-friendly employment policies.

### Major drivers of improvement

When asked to identify the major drivers of improvement in overall and black infant mortality in Colorado from 2005 to 2014, interviewees discussed the following activities:

- Access to LARC, which is available at low- or no-cost to low-income women statewide (see box)
- Policies and education to reduce early elective deliveries, including policy change across Colorado hospitals to reduce births before 39 weeks
- Medicaid policy changes, including coverage expansions in 2014 and reimbursement changes. For instance, public health agencies in Colorado can bill Medicaid for LARC reimbursement
- Tobacco prevention policies and smoking cessation programs, such as the 2004 increase in the tobacco excise tax and the 2006 Clean Indoor Air Act
- Safe sleep campaigns and programs, such as the Community Action Network, a collective impact project to increase safe sleep in at-risk neighborhoods
- Collaboration between public health and Medicaid
- Preconception health
- Depression screening and treatment
- Nurse-Family Partnership home visiting
- Healthy Start program
- Housing programs, implemented after 2014
- Family-friendly workplace policies, implemented after 2014

### Long-acting reversible contraception (LARC)

Colorado has placed significant emphasis on LARC as a method for reducing unintended pregnancy. In 2008, CDPHE launched the Colorado Family Planning Initiative (CFPI), which provides low- or no-cost LARC to low-income women statewide, as well as training and education for providers.

The CFPI was originally funded through a private donor, and the initiative has since been supported by philanthropic foundations. In 2016, the Colorado legislature also allocated funds to CFPI through the state budget. CFPI makes LARC available to all women in Colorado based on a sliding scale fee. The lowest income women receive LARC at no cost, while women with higher incomes may pay up to full price.

By 2015, CFPI had distributed LARC to more than 36,000 women. Between 2009 and 2014, birth and abortion rates declined by nearly 50 percent among teens aged 15-19 and by 20 percent among young women aged 20-24. CDPHE calculates that the reduction in public spending associated with births among women aged 15-24 has been between \$54.6 and \$60.6 million across four entitlement programs.

For more information, see the 2017 CFPI report [“Taking the Unintended Out of Pregnancy: Colorado’s Success with Long-Acting Reversible Contraception.”](#)

## Spotlight on social determinants of health: Family-friendly employment policies

Family-friendly employment policies, such as paid family leave and breastfeeding supports, encourage work and support positive health outcomes. In addition to strong evidence that paid family leave policies increase labor force participation rates among women<sup>11</sup>, research suggests that paid leave policies improve birth outcomes and reduce infant mortality rates.<sup>12</sup>

Colorado's **FY 2016-2020 Maternal and Child Health (MCH) State Action Plan** has several strategies to reduce infant mortality rates and disparities, including steps to "promote and measure the adoption of family-friendly employer policies in jurisdictions with elevated rates of infant mortality."<sup>13</sup> CDPHE has formed MCH Implementation Teams (MITs) around each of the MCH State Action Plan priorities. The MITs are developing state and local logic models and action plans for each priority area.<sup>14</sup>

Interviewees noted that local health departments and other local partners have also begun implementing family-friendly employment policies in their agencies and jurisdictions. For instance, Boulder County recently implemented a paid family leave

policy. Starting January 2017, county employees can take one to four weeks of paid leave for the birth or adoption of a child. This change in employment policy was guided by the advice of public health and early childhood advocates in Boulder County.<sup>15</sup>

The Colorado state legislature has also considered bills that would increase access to family-friendly employment policy. In 2017, the Colorado House of Representatives passed the "**FAMLI Act**,"<sup>16</sup> which would create the Family and Medical Leave Insurance (FAMLI) program to "provide partial wage-replacement benefits to an eligible individual who takes leave from work to care for a new child or a family member with a serious health condition or who is unable to work due to the individual's own serious health condition."<sup>17</sup> The FAMLI project would be funded by premiums paid by each employee in the state. Although the FAMLI Act passed in the Colorado House, it did not pass in the Senate. Interviewees note that considerable advocacy efforts for a statewide paid family leave policy in Colorado are ongoing.

Colorado's approach to funding paid family leave is a one example of implementing Employment Policy Recommendation 4.1 (see part seven).



# State profile Massachusetts

## Population size and geography

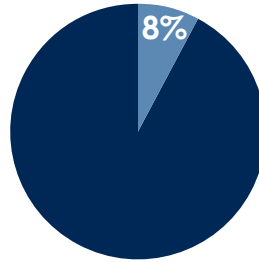
**Population (2015):**

6,705,586

**Population trend:** 9.9%

increase from 2005-2015

**Population living in rural area**



**Largest metropolitan areas**

- Boston-Cambridge-Newton: 4,270,286 (64% of state population)
- Worcester: 810,935 (12%)
- Springfield: 628,800 (9.4%)

## Political landscape 2005-2014

	Governor	Party control of legislature
2005	Mitt Romney	Democratic
2006	Mitt Romney	Democratic
2007	Deval Patrick	Democratic
2008	Deval Patrick	Democratic
2009	Deval Patrick	Democratic
2010	Deval Patrick	Democratic
2011	Deval Patrick	Democratic
2012	Deval Patrick	Democratic
2013	Deval Patrick	Democratic
2014	Deval Patrick	Democratic

**Women as percent of legislature (2005-2014): 25%**

**African Americans as percent of legislature (2009): 5%**

(7% of population is African American)

## 2017 HPIO Health Value Dashboard

Rank among 50 states and D.C.

	MA	OH
<b>Health value</b>	27	46
<b>Population health</b>	11	43
<b>Healthcare spending</b>	43	31
<b>Access to care</b>	2	17
<b>Healthcare system</b>	12	37
<b>Public health and prevention</b>	18	50
<b>Social and economic environment</b>	15	29
<b>Physical environment</b>	5	35

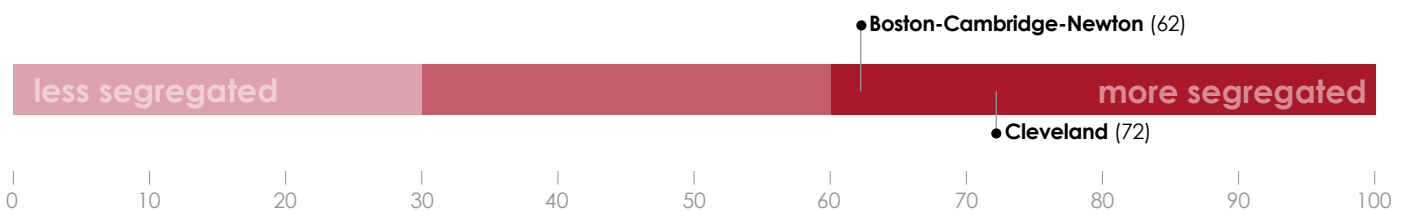
## Annie E. Casey Foundation Race for Results rank

Index of child wellbeing and opportunity

	MA	OH
<b>African-American children</b> (out of 44)	5	42
<b>Latino children</b> (out of 49)	29	23
<b>White children</b> (out of 50)	2	31

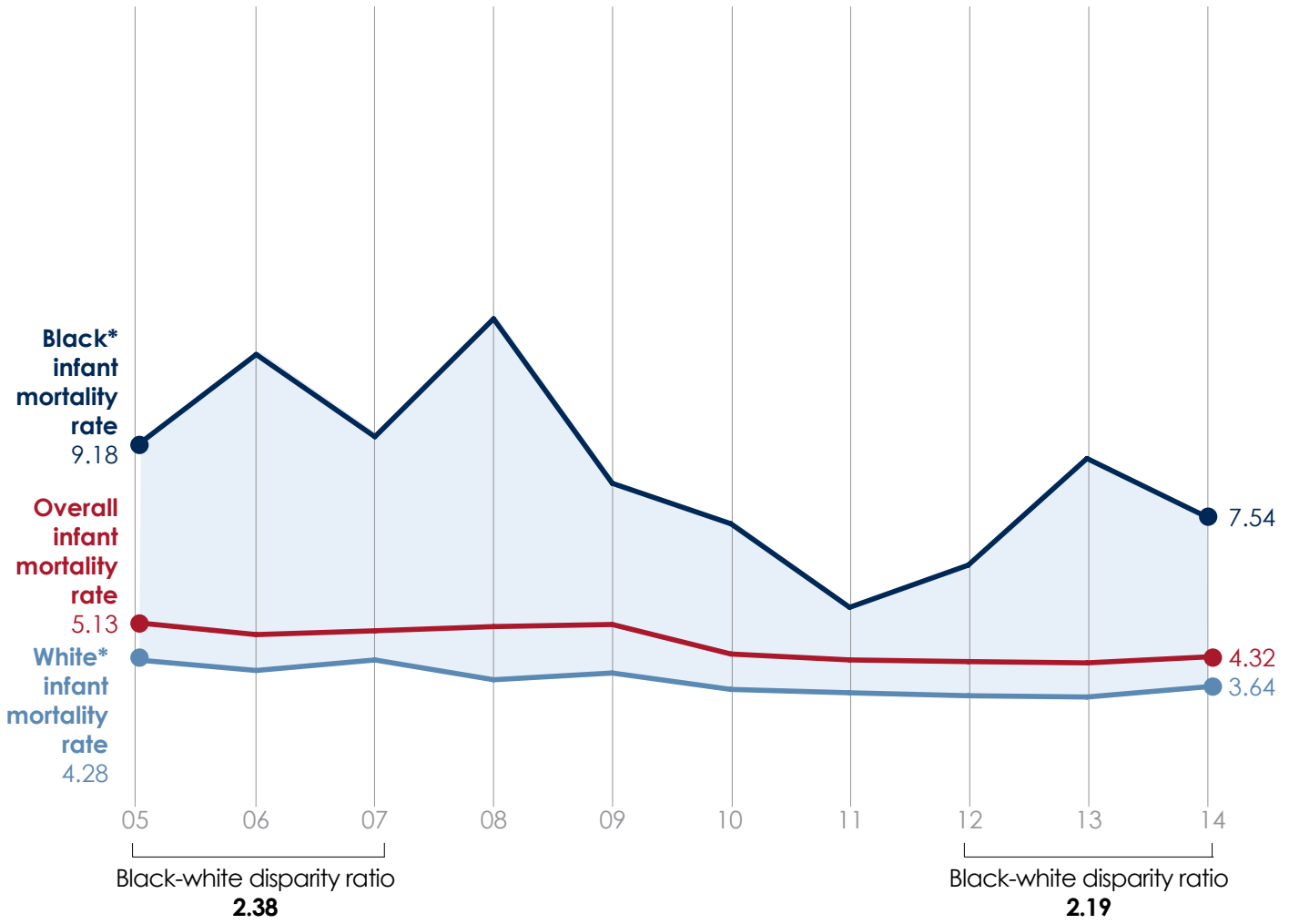
## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below is the black-white dissimilarity index for the largest metropolitan area in Massachusetts. Cleveland, Ohio's most segregated metropolitan area, is displayed for reference.





### Massachusetts infant mortality trend (2005-2014)



\* Non-Hispanic  
 Source: Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

#### Notable areas of improvement from 2005-2007 to 2012-2014

- **23.4% decrease** in non-Hispanic black infant mortality
- **0.19 decrease** in black-white disparity odds ratio

## Massachusetts case study

### Highlights: Data-driven approaches to improve birth outcomes and achieve health equity

- Massachusetts stakeholders largely attribute reductions in black infant mortality to healthcare quality improvements and the translation of data into information that can be used by local initiatives to improve birth outcomes. Work at the local level involves collaborating with sectors beyond health care, such as housing providers and employers.
- Coordination between the Massachusetts Department of Health (DOH), birthing hospitals and prenatal care providers ensures appropriate levels of care for mothers. These providers are increasingly working with community partners to address social determinants of health.
- Housing policies and programs, including Massachusetts' status as a "right to shelter" state, help to ensure stability for families, providing an important platform for addressing other social determinants of health.

### Major drivers of improvement

When asked to identify the major drivers of improvement in black infant mortality in Massachusetts from 2005 to 2014, interviewees mentioned the following activities:

- Focus on data and surveillance: Massachusetts DOH identifies higher rates of infant mortality among specific populations and makes specific recommendations<sup>18</sup> that the local initiatives use to develop coordinated community responses.
- Centering Pregnancy and Centering Parenting programs: In Boston, liaisons from the Healthy Baby Healthy Child program of the Boston Public Health Commission (BPHC) are paired with Centering Pregnancy groups. Liaisons complete a screening to identify issues at intake, including depression and social determinants of health.
- Programs and initiatives to address social determinants, including housing (see spotlight section), education (Kids First Initiative), transportation, integrating trauma-informed care, inequities in the justice system and home visiting (state and local); increasingly services are available to undocumented residents.

- Access to Long-Acting Reversible Contraception (LARC): The Massachusetts' Medicaid program (MassHealth) began reimbursing for LARC immediately postpartum in inpatient and outpatient settings in Oct. 2014.<sup>19</sup>
- Legislatively mandated **Perinatal Advisory Committee** (PAC) and coordinated levels of care: In 2006, the Massachusetts DOH updated regulations to ensure that birthing hospitals provide appropriate care, improve data collection and increase breastfeeding support in hospitals.<sup>20</sup>
- Health insurance reforms in 2006 similar to the federal Affordable Care Act coverage provisions that greatly reduced the uninsured rate.
- Educational campaigns and resources
- Preterm birth prevention: Massachusetts Perinatal Quality Collaborative led initiatives to increase progesterone use and implement a hard stop policy for early elective deliveries in hospitals.
- **Child Behavioral Health Initiative** (CBHI): Medicaid implemented a policy change to provide improved access to mental and behavioral healthcare for children.
- Earned Income Tax Credit: Massachusetts increased the value of the state credit from 10 to 15 percent of the federal credit in 2000.<sup>21</sup>

## Spotlight on social determinants of health: Housing interventions to stabilize families

Unlike Ohio and most other states, Massachusetts is a “right to shelter” state, which means that families and pregnant women who meet eligibility criteria are guaranteed access to Emergency Assistance administered by the Massachusetts Department of Housing and Community Development.<sup>22</sup> Below are selected examples of housing stabilization programs for families in Massachusetts:

- The **Emergency Assistance** program provides access to emergency shelter for eligible families in a group setting, apartments rented for the purpose of providing shelter and, in some cases, hotels and motels.<sup>23</sup>
- The **Residential Assistance for Families in Transition** program is a homelessness prevention program that provides up to \$4,000 in a twelve-month period to help families move, pay rent or utility arrearages and/or purchase furniture for new housing. Families must meet eligibility criteria, including income below 50 percent area median income and be prioritized for assistance based on an assessment. Families must also demonstrate that they have enough income to remain stably housed after assistance ends.<sup>24</sup>

- **HomeBASE** is a state-funded rental assistance program that provides funds to help pay housing costs for up to one year and provides case management to families.<sup>25</sup>

In addition to state-funded and administered programs, local collaborations provide housing support to residents. In Boston, the **Healthy Start in Housing** (HSiH) program provides public housing and supportive services for up to 75 women at high risk for infant mortality (see part four of this report for more information). HSiH was initiated as a partnership between BPHC and the Boston Housing Authority (BHA) in 2011. The program was designed to answer research questions about the effectiveness of housing as an intervention to improve mental health outcomes for at-risk mothers. An analysis of preliminary data from the program found improvement in mental health and social and mental functioning among participants.<sup>26</sup> The Ohio Housing Finance Agency issued a notice of funding availability to support a similar pilot program beginning in 2018.

Massachusetts' approach to providing rental assistance for families at high risk for infant mortality is one example of implementing Housing Policy Recommendation 1.1 (see part four).

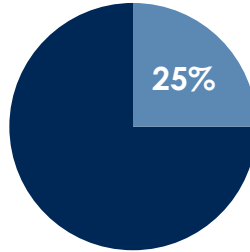


# State profile Michigan

## Population size and geography

**Population (2015):**  
9,900,571  
**Population trend:** 0.6%  
increase from 2005-2015

### Population living in rural area



### Largest metropolitan areas

- Detroit-Warren-Dearborn: 4,296,416 (43.5% of state population)
- Grand Rapids-Wyoming: 1,017,877 (10.3%)
- Lansing-East Lansing: 468,737 (4.7%)

## Political landscape 2005-2014

	Governor	Party control of legislature
2005	Jennifer Granholm	Republican
2006	Jennifer Granholm	Split
2007	Jennifer Granholm	Split
2008	Jennifer Granholm	Split
2009	Jennifer Granholm	Split
2010	Jennifer Granholm	Split
2011	Rick Snyder	Split
2012	Rick Snyder	Republican
2013	Rick Snyder	Republican
2014	Rick Snyder	Republican

**Women as percent of legislature (2005-2014): 21%**  
**African Americans as percent of legislature (2009): 15%**  
(14% of population is African American)

## 2017 HPIO Health Value Dashboard

Rank among 50 states and D.C.

	MI	OH
<b>Health value</b>	42	46
<b>Population health</b>	38	43
<b>Healthcare spending</b>	37	31
<b>Access to care</b>	10	17
<b>Healthcare system</b>	33	37
<b>Public health and prevention</b>	42	50
<b>Social and economic environment</b>	37	29
<b>Physical environment</b>	23	35

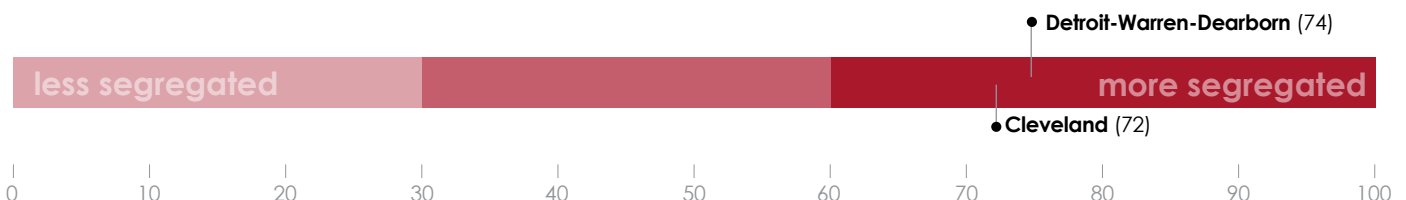
## Annie E. Casey Foundation Race for Results rank

Index of child wellbeing and opportunity

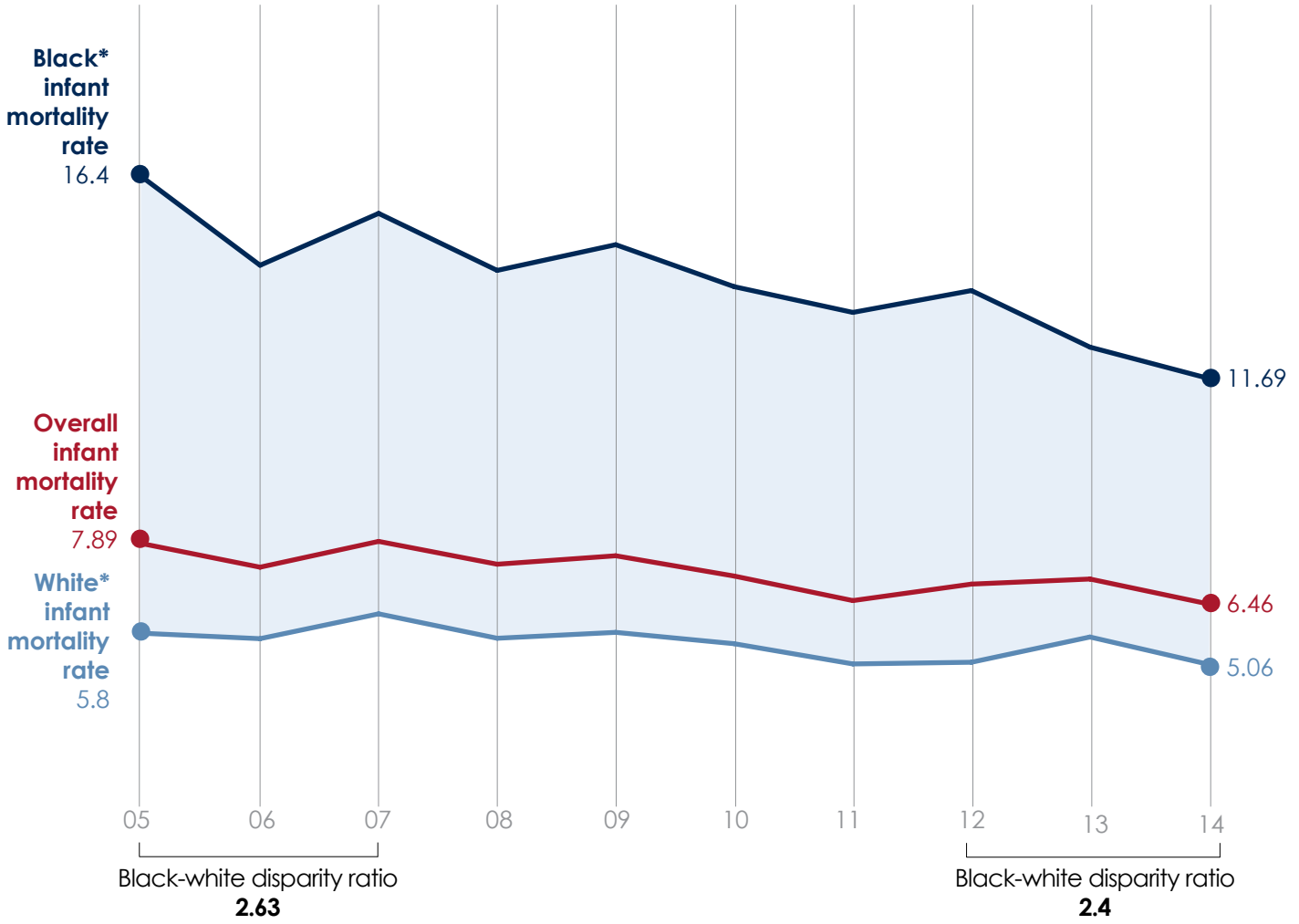
	MI	OH
<b>African-American children</b> (out of 44)	44	42
<b>Latino children</b> (out of 49)	19	23
<b>White children</b> (out of 50)	36	31

## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below is the black-white dissimilarity index for the largest metropolitan area in Michigan. Cleveland, Ohio's most segregated metropolitan area, is displayed for reference.



### Michigan infant mortality trend (2005-2014)



\* Non-Hispanic  
 Source: Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

**Notable area of improvement** from 2005-2007 to 2012-2014  
 0.23 decrease in black-white disparity odds ratio

## Michigan case study

### Highlights: Medicaid managed care, home visiting and health equity

- Michigan interviewees largely attribute the improvement in the black-white infant mortality disparity gap to expanded access to care and improved care coordination for pregnant women and children within the Medicaid program.
- Michigan interviewees identified the state's robust home visiting initiatives as contributing to the state's progress in improving birth outcomes. In 2012, Michigan enacted legislation<sup>27</sup> mandating home visiting programs address one or more of a number of drivers of infant mortality including preterm births, child maltreatment and injury, family self-sufficiency and school readiness.<sup>28</sup> Maternal, Infant and Early Childhood Home Visiting (MIECHV) federal funding supports the implementation of evidence-based home visiting programs in the state's highest-need communities.
- Strong state leadership and a more intense focus on health equity and reducing health disparities through education and training at both the state and local levels have also been driving forces behind the reduction in the black-white infant mortality disparity gap.

### Major drivers of improvement

When asked to identify the major drivers of Michigan's improvement in the black-white infant mortality disparity gap from 2005 to 2014, interviewees discussed the following activities:

- Medicaid coverage expansion and improved care coordination through Medicaid managed care for pregnant women and children including: MOMS program (provides immediate health coverage to pregnant women while their Medicaid application is pending); automatic enrollment of infants onto their mother's Medicaid managed care plan after birth; moving children's special healthcare services into Medicaid managed care
- Policies and education to reduce early elective deliveries, including adoption of the March of Dimes "Healthy Babies are Worth the Wait" campaign in 2012

- Expansion of access to care through school-based health centers (interviewees noted that this contributed to a reduction in teen pregnancy) and federally qualified health centers
- Statewide coordination and collaboration across sectors and systems: Michigan's **Infant Mortality Advisory Council** supports the development and implementation of Michigan's Infant Mortality Reduction Plan
- Regional perinatal quality improvement collaboratives
- Expansion of evidence-based home visiting models, including **Michigan's Home Visiting Initiative** and **Maternal Infant Health Program**, and increased use of community health workers
- Programs and policies that increase access to progesterone including programs like **Make Your Date™ Detroit**
- Evidence-based tobacco cessation programs
- Breastfeeding promotion policies and programs
- Safe sleep promotion policies and programs
- Local public-private partnerships to reduce infant mortality, such as the **Women-Inspired Neighborhood** (WIN) network and the **Detroit Institute for Equity in Birth Outcomes**
- Strong state leadership and attention to achieving health equity and reducing health disparities, including inclusion of infant mortality as a metric on Governor Rick Snyder's Open Performance Michigan Dashboard

## Spotlight on social determinants of health: Practices to Reduce Infant Mortality through Equity (PRIME)

Health equity means that “everyone has a fair and just opportunity to be as healthy as possible.”<sup>29</sup> This requires the removal of barriers to health that drive inequities and result in health disparities, including poverty, exposure to toxic and persistent stress, trauma, violence, as well as racism and discrimination.

In 2010, Michigan implemented the **PRIME initiative**, with the goal of developing a comprehensive strategy to reduce racial disparities in the state. PRIME specifically focuses on reductions in the infant mortality rates between whites and blacks as well as whites and American Indians. The Michigan Department of Community Health (MDCH), Bureau of Family and Maternal Child Health, received approximately \$1.94 million from the W.K. Kellogg Foundation to fund the initiative over the past seven years.

PRIME is based on partnerships between various state agencies, local health departments, academic universities and public health institutes and organizations. The initiative focuses on providing trainings and workshops to build the capacity of state health department staff to address health disparities and raise awareness of racism and discrimination. Part of the trainings and workshops include educating staff on understanding, identifying and eliminating policies and practices that support

institutional racism and discrimination. PRIME also supports the development of approaches to incorporate the social determinants of health into public health practice.

As part of PRIME, Local Learning Collaboratives (LLCs) were established that include representatives from local health departments, Healthy Start projects and other community organizations. LLCs provide an opportunity for local stakeholders to share and disseminate information to increase their effectiveness in reducing infant mortality and eliminating racism at the local level and throughout the state.

It is important to note that the underlying causes of racial disparities in birth outcomes are multifaceted and not fully understood in the literature.<sup>30</sup> However, the persistence of racial disparities, even after accounting for other known risk factors, has led to greater emphasis on the impact of racism and discrimination as unique psychosocial stressors for African-American women.<sup>31</sup> While there are no studies demonstrating a causal link between PRIME and reductions in the black-white infant mortality disparity gap in Michigan, the initiative provides a useful example of how to increase education and awareness of health equity and racism among state- and local-level partners.

Michigan’s approach to address equity and eliminate racism is one example of implementing Cross-Cutting Policy Recommendations 2 and 3 (see part ten).

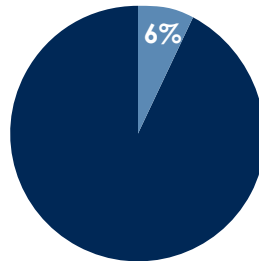


# State profile Nevada

## Population size and geography

**Population (2015):**  
2,798,636  
**Population trend:** 21.4%  
increase from 2005-2015

Population living in rural area



### Largest metropolitan areas

- Las Vegas-Henderson-Paradise: 2,035,572 (72.7% of state population)
- Reno-Sparks: 438,948 (15.7%)

## Political landscape 2005-2014

	Governor	Party control of legislature
2005	Kenny Guinn	Split
2006	Kenny Guinn	Split
2007	Jim Gibbons	Democratic
2008	Jim Gibbons	Democratic
2009	Jim Gibbons	Democratic
2010	Jim Gibbons	Democratic
2011	Brian Sandoval	Democratic
2012	Brian Sandoval	Democratic
2013	Brian Sandoval	Split
2014	Brian Sandoval	Split

**Women as percent of legislature (2005-2014): 30%**  
**African Americans as percent of legislature (2009): 11%**  
(8% of population is African American)

## 2017 HPIO Health Value Dashboard

Rank among 50 states and D.C.

	NV	OH
Health value	8	46
Population health	28	43
Healthcare spending	8	31
Access to care	49	17
Healthcare system	48	37
Public health and prevention	46	50
Social and economic environment	46	29
Physical environment	28	35

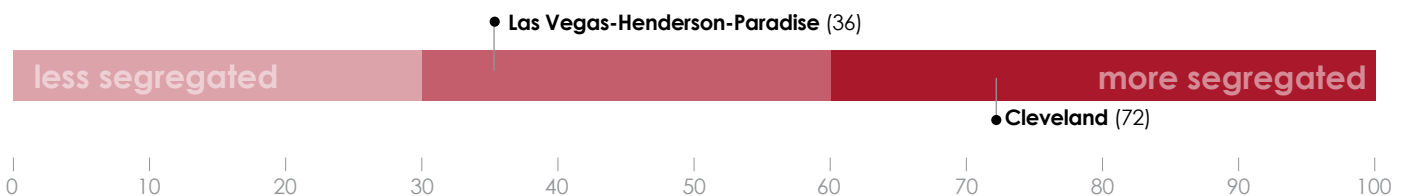
## Annie E. Casey Foundation Race for Results rank

Index of child wellbeing and opportunity

	NV	OH
African-American children (out of 44)	40	42
Latino children (out of 49)	46	23
White children (out of 50)	40	31

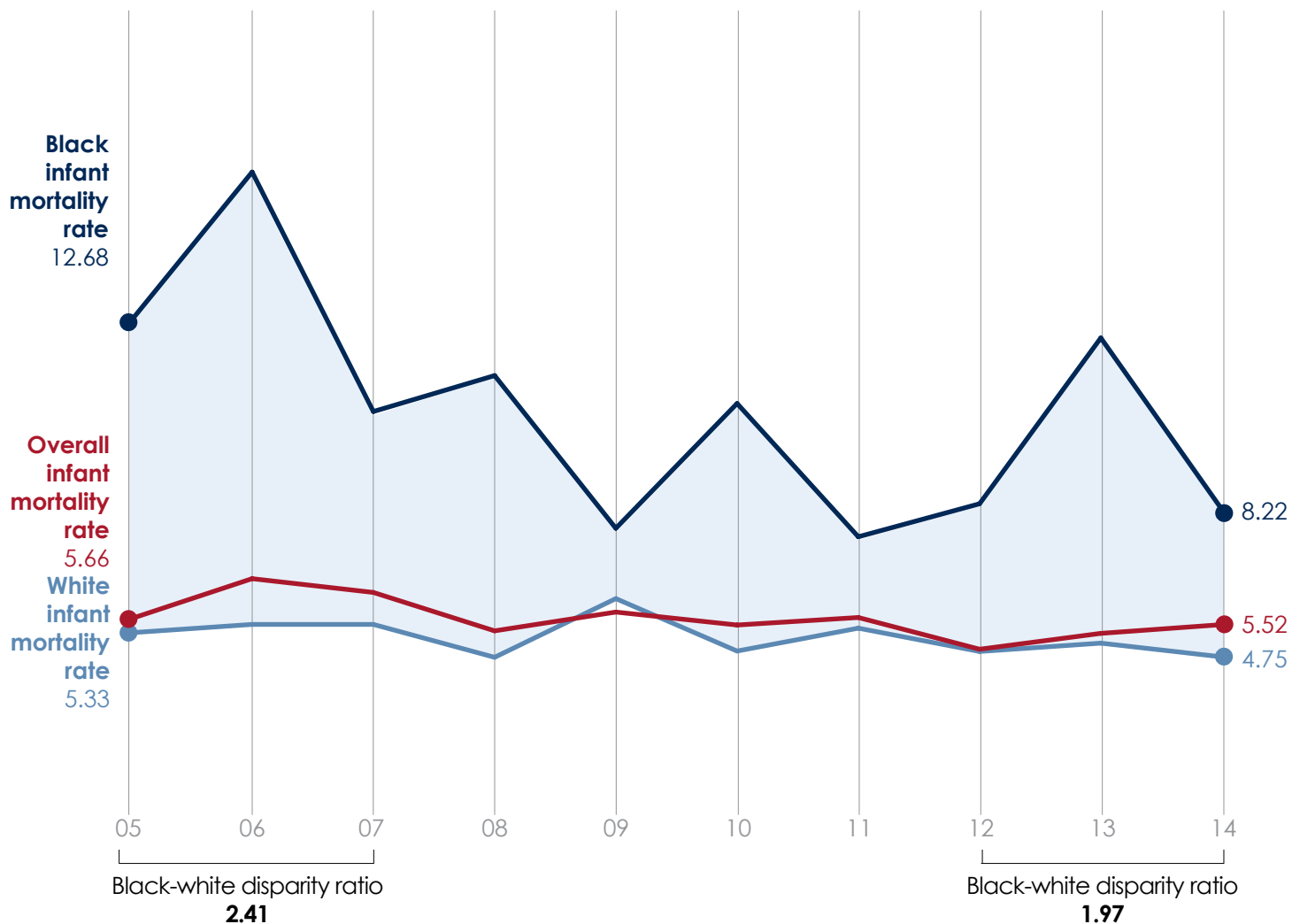
## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below is the black-white dissimilarity index for the largest metropolitan area in Nevada. Cleveland, Ohio's most segregated metropolitan area, is displayed for reference.





### Nevada infant mortality trend (2005-2014)



\* Non-Hispanic

Source: Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

**Notable area of improvement** from 2005-2007 to 2012-2014  
**26.6% decrease** in non-Hispanic black infant mortality

## Nevada case study

### Highlights: Economic growth and educational attainment

- Nevada interviewees attributed the state's progress in reducing infant mortality to group prenatal care, educational campaigns and community-based programs.
- In addition, Nevada has experienced improvements in employment and education—two key social determinants of health.

### Major drivers of improvement

When asked to identify the major drivers of improvement in overall and black infant mortality in Nevada from 2005 to 2014, interviewees discussed the following activities:

- Centering Pregnancy and other group prenatal programs held in at-risk neighborhoods: Group prenatal programs were often run by Community Health Works, child care and transportation vouchers were provided and participating women were offered a small stipend for participating
- Prenatal substance abuse screenings for pregnant women and referrals to treatment services
- Safe sleep campaigns and programs, including safe sleep bundles provided to new mothers
- Text4baby, a smartphone app for pregnant women to access health information, prenatal appointment reminders and other web content
- Shaken Baby Syndrome education campaign
- Tobacco prevention policies and smoking cessation
- Efforts to increase immunizations
- Collaboration and community engagement, such as state partnerships with local health departments and other organizations focused on reducing infant mortality
- Home visiting (funded through Maternal, Infant, and Early Childhood Home Visiting)

### Nevada's Reemployment and Eligibility Assessment (REA) Program

Nevada established the REA program, funded by the U.S. Department of Labor, in order to increase rapid reemployment of Unemployment Insurance (UI) claimants. UI provides compensation for eligible unemployed individuals currently searching for work. The REA program requires UI claimants to participate if they have received one week of UI benefits under a new claim, have no work return date, are not active in other training programs and are not attached to a union hiring hall.

Through the REA program, One-Stop Career Center staff work with claimants to develop individual reemployment plans and provide referrals to reemployment services such as job search workshops, resume assistance and job placement services. This program also includes a review of UI eligibility and provides labor market information to identify high-growth employment opportunities.

A randomized control trial to evaluate the effects of this program showed that, among those who participated in REA, there was a 4 percent increase in the employment rate and an 18 percent increase in wage earnings during an 18-36 month period. In the same trial, the net savings to the UI system was \$715 per claimant in the 20-26 months following the program, offsetting the program cost of \$218 per claimant.

The Coalition for Evidence-Based Policy's Top Tier Evidence Initiative identified the Nevada REA Program as "Near Top Tier." For more information, see the Coalition's report "[Nevada's Reemployment and Eligibility Assessment Program.](#)"

## Spotlight on social determinants of health: Nevada's employment and education landscape

Jobs that pay a decent wage and offer benefits promote good health outcomes for parents and children. Nevada has a unique employment landscape that has seen significant growth in the last decade. Although some industries took a significant hit during the Great Recession in 2007, job growth has bounced back, and Nevada has seen several positive economic indicators in recent years. For example:

- The unemployment rate has decreased steadily over the last seven years, from 13.7 in 2010 to 4.9 in 2017.<sup>32</sup>
- Many Nevada workers without bachelors' degrees have access to well-paying jobs. Good blue collar jobs have increased by 50 percent, and good skilled service jobs have increased by 101 percent from 1991-2005.<sup>33</sup> ("Good jobs" for workers without a bachelor's degree are defined by a 2017 JPMorgan Chase report as jobs that pay at least \$35,000 per year for those under age 45 and \$45,000 per year for workers age 45 and older.<sup>34</sup>)
- Nevada is projected to add jobs at a 2.6 percent annual growth rate through 2020, which is the highest rate in the nation.<sup>35</sup> Much of this job growth will be in hospitality, construction and real estate.
- Nevada has the smallest gender wage gap in the nation<sup>36</sup>, and income mobility for women is better in Clark County than in 71 percent of counties nationwide.<sup>37</sup> Las Vegas is in Clark County.

- Industry in Nevada is expanding. Large corporations, such as Apple and Tesla, have brought factories and business hubs to the state. The state's current governor, Brian Sandoval, and the Governor's Office of Economic Development have provided tax incentives in an effort to attract new industries to Nevada.<sup>38</sup>
- Nevada has a strong entrepreneurial atmosphere with the highest rate of startup companies in the nation—107 startups per 1,000 employer businesses in 2016.<sup>39</sup>

Women with higher levels of educational attainment give birth to healthier babies. Governor Sandoval has emphasized educational attainment as a path forward for Nevada. During the 2015-2017 biennium, he proposed **a series of initiatives** to advance the state's education system, and many of these proposals were passed by the Nevada legislature.<sup>40</sup> These initiatives include:

- Expanding full day kindergarten
- Increasing preschool funding through federal grant programs and social impact bonds (i.e., pay-for-success financing)
- Funding programs to increase academic achievement in reading from kindergarten to third grade

Nevada's approach to early childhood education is one example of implementing Education Policy Goal 1 (see part six).

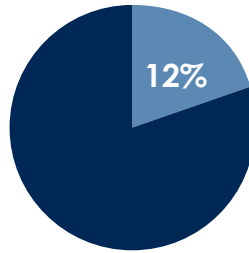


# State profile New York

## Population size and geography

**Population (2015):**  
19,673,174  
**Population trend:** 6.1%  
increase from 2005-2015

Population living in rural area



### Largest metropolitan areas

- New York-Newark-Jersey City: 13,342,531 (67.8% of state population)
- Buffalo-Cheektowaga-Niagara Falls: 1,135,734 (5.8%)
- Rochester: 1,083,156 (5.5%)

## Political landscape 2005-2014

	Governor	Party control of legislature
2005	George E. Pataki	Split
2006	George E. Pataki	Split
2007	Eliot Spitzer	Split
2008	Eliot Spitzer/David Patterson	Democratic
2009	David Patterson	Democratic
2010	David Patterson	Democratic
2011	Andrew Cuomo	Split
2012	Andrew Cuomo	Split
2013	Andrew Cuomo	Democratic
2014	Andrew Cuomo	Democratic

## 2017 HPIO Health Value Dashboard

Rank among 50 states and D.C.

	NY	OH
<b>Health value</b>	25	46
<b>Population health</b>	8	43
<b>Healthcare spending</b>	42	31
<b>Access to care</b>	24	17
<b>Healthcare system</b>	41	37
<b>Public health and prevention</b>	7	50
<b>Social and economic environment</b>	30	29
<b>Physical environment</b>	27	35

## Annie E. Casey Foundation Race for Results index rank

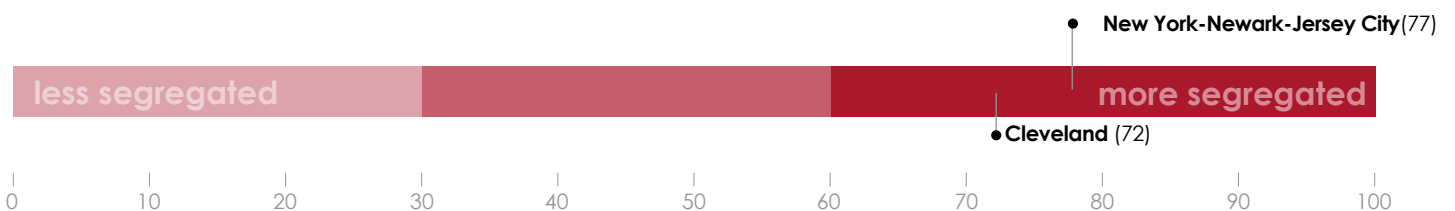
Index of child wellbeing and opportunity

	NY	OH
<b>African-American children</b> (out of 44)	20	42
<b>Latino children</b> (out of 49)	32	23
<b>White children</b> (out of 50)	6	31

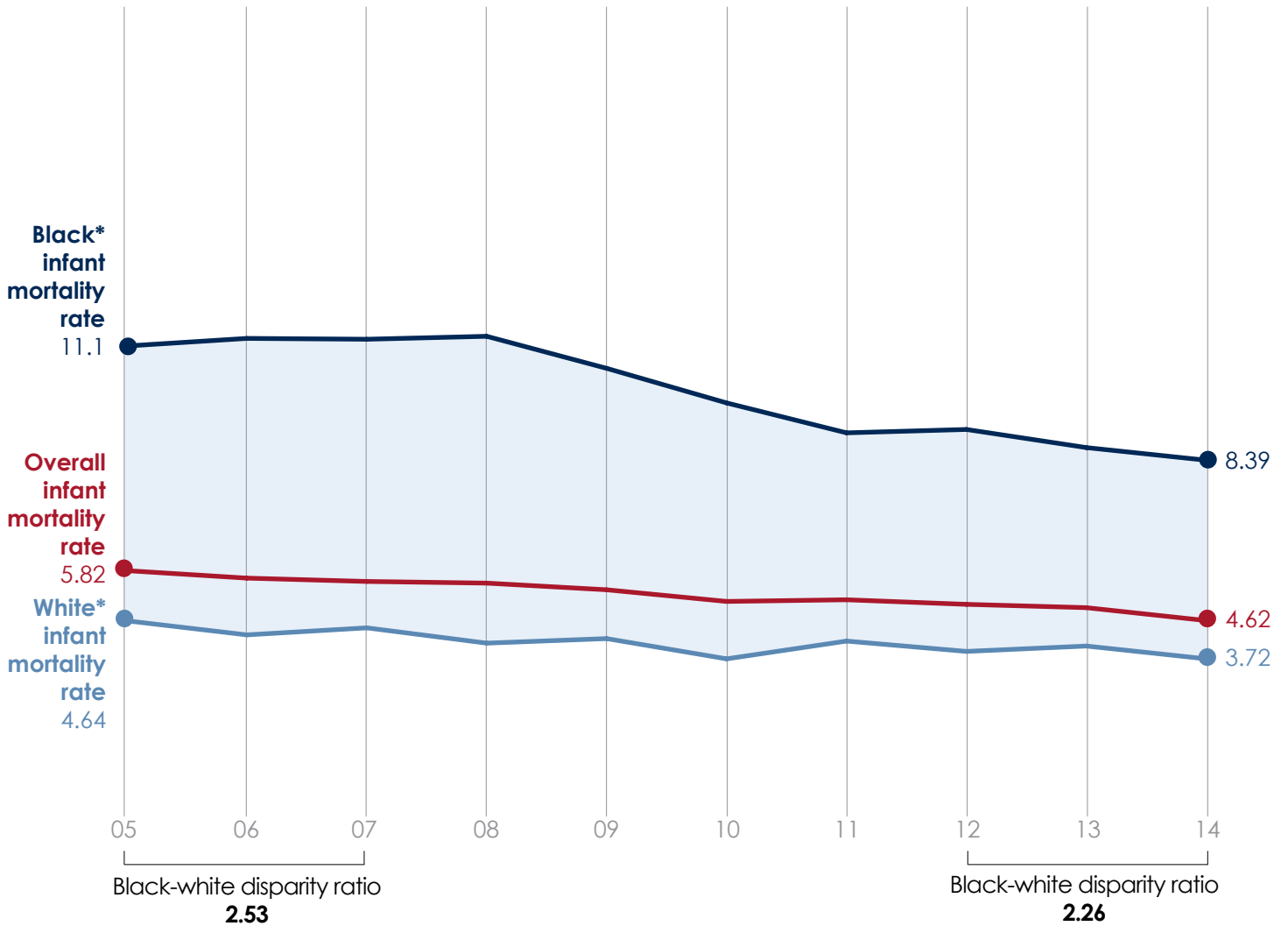
**Women as percent of legislature (2005-2014): 23%**  
**African Americans as percent of legislature (2009): 16%**  
(16% of population is African American)

## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below is the black-white dissimilarity index for the largest metropolitan area in New York. Cleveland, Ohio's most segregated metropolitan area, is displayed for reference.



### New York infant mortality trend (2005-2014)



\* Non-Hispanic  
 Source: Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

#### Notable areas of improvement from 2005-2007 to 2012-2014

- **22.1% decrease** in non-Hispanic black infant mortality
- **0.26 decrease** in black-white disparity odds ratio

## New York case study

### Highlights: A comprehensive approach to reducing preterm birth

- New York stakeholders attribute the reductions in the non-Hispanic black infant mortality rate and the black-white disparity to reductions in preterm births, largely driven by healthcare system improvements and educational campaigns implemented by state and local entities.
- Stakeholders also acknowledged the role of policy to improve maternal and child health. For example, stakeholders commented on the cohesiveness of policies to reduce tobacco use. In addition, New York has used tax policy to support family incomes.

### Major drivers of improvement

When asked to identify the major drivers of improvement in black infant mortality in New York from 2005 to 2014, interviewees mentioned the following activities:

- New York State Perinatal Quality Collaborative (NYSPQC): In 2010, the New

York State Department of Health (NYSDOH) started an initiative to improve hospital services for very preterm births, reduce sleep-related deaths and improve nutrition for babies born prematurely

- Regional Perinatal Centers and levels of care for perinatal centers: NYSDOH designates perinatal care centers based on their ability to provide appropriate care for deliveries with varying levels of risk and triages high-risk births to facilities that can provide an appropriate level of care
- Efforts to reduce early elective deliveries: March of Dimes and local partners, including Maternal and Infant Community Health Collaboratives, participated in an evidence-based campaign to reduce elective deliveries (Healthy Babies are Worth the Wait)
- Expanded eligibility for health insurance coverage: Medicaid expansion, enacting pregnancy as a qualifying life event for coverage from New York's Affordable Care Act marketplace, family planning benefit program

Figure 9.6. Selected examples of New York State tax credits for families

Tax credit	Eligibility	Amount (percent of federal credit)	Refundable? <sup>41</sup>
<b>Earned Income Tax Credit (EITC)</b> <sup>42</sup>	All New York taxpayers who qualify for the federal EITC	30%, reduced by the amount of any household credit (New York City taxpayers can claim an additional 5% local EITC)	Fully refundable for full-year residents, non-refundable for non-residents and partially refundable for part-year residents
<b>Child Tax Credit (known as Empire State Child Credit)</b> <sup>43</sup>	Full-year residents with a qualifying child that receive a federal credit or have income below: \$110,000 per year for married filing jointly filers; \$75,000 for single, head of household or qualifying widow(er); \$55,000 for married filing separately filers	\$100 per qualifying child or 33% of federal credit, whichever is greater	Refundable
<b>Child and Dependent Care Tax Credit (CDTC)</b> <sup>44</sup>	All New York taxpayers who are qualified to claim the federal credit	Up to 110% of federal credit for taxpayers with incomes below \$25,000, phasing down to 20% for taxpayers with incomes above \$65,000 <sup>45</sup>	Fully refundable for full-year resident, non-refundable for non-residents and partially refundable for part-year residents

- Tax policies to reduce smoking
- Tax credits to increase household incomes
- Healthy Families New York (Head Start home visiting)
- Family Planning Benefit Program (public health insurance program for family planning services)
- Long-standing community health worker model
- Safe sleep collaborative, began in 2015
- Health equity and health disparities focus
- Teen birth rate at an all-time low

### Spotlight on social determinants of health: Tax credits to support family incomes

The federal Earned Income Tax Credit (EITC) is a well-researched tax credit program that is associated with improved birth outcomes and maternal health, as well as increased income, increased employment and economic activity.<sup>46</sup> Other federal tax credits including the Child Tax Credit (CTC) and the Child and Dependent Care Tax Credit (CDCTC) also provide tax relief and potentially increase income. New York is one of only three states that offer a version of all three of these credits at the state level.<sup>47</sup> Ohio has a non-refundable EITC worth up to 10 percent of the federal credit and also a CDCTC for filers with incomes up to \$40,000 per year.<sup>48</sup>

Figure 9.6 displays information about selected New York State tax credits for families.

The New York EITC was established in 1994 with a value of 7.5 percent of the federal credit and gradually increased to 30 percent in 2000.<sup>49</sup> New York's EITC is larger than most other states; only Vermont and Washington D.C. offer taxpayers a larger tax credit.<sup>50</sup> To further supplement the incomes of residents, New York City implemented a local EITC in 2004 equal to five percent of the federal credit.<sup>51</sup> Both the state and local EITC remained at

these levels throughout the entire study period for this report (2005 – 2014). The New York legislature recently considered proposals to further increase the credit, but those proposals have not passed out of committee.<sup>52</sup>

Part seven of this report highlighted research about the connections between the federal and state EITCs and improved birth outcomes and reduced infant mortality. One study examined the impact of legislative changes to state and local EITC policies on birth outcomes in New York City at the neighborhood level.<sup>53</sup> The study found that a 15 percentage point increase in EITC benefit rates was associated with a significant reduction in low birth weight rates in New York City's low-income neighborhoods.<sup>54,55</sup> It is important to note that this study did not establish a causal link between EITC policy change and reductions in New York's non-Hispanic black infant mortality rate and the black-white disparity from 2005-2007 to 2012-2014. However, the findings of this study are consistent with other research about the connections between increased income and birth outcomes.

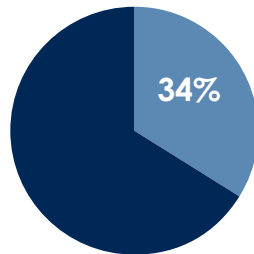
New York's approach to implementing EITC is one example of implementing Employment Policy Recommendation 1.1 (see part seven).



## Population size and geography

**Population (2015):** 4,777,576  
**Population trend:** 19% increase from 2005-2015

**Population living in rural area**



**Largest metropolitan areas**

- Greenville-Anderson-Mauldin: 852,631 (17.8% of state population)
- Columbia: 792,530 (16.6%)
- Charleston-North Charleston: 712,232 (14.9%)

## Political landscape 2005-2014

	Governor	Party control of legislature
2005	Mark Sanford	Republican
2006	Mark Sanford	Republican
2007	Mark Sanford	Republican
2008	Mark Sanford	Republican
2009	Mark Sanford	Republican
2010	Mark Sanford	Republican
2011	Nikki Haley	Republican
2012	Nikki Haley	Republican
2013	Nikki Haley	Republican
2014	Nikki Haley	Republican

**Women as percent of legislature (2005-2014):** 10%  
**African Americans as percent of legislature (2009):** 22%  
 (28% of population is African American)

## 2017 HPIO Health Value Dashboard

Rank among 50 states and D.C.

	SC	OH
<b>Health value</b>	14	46
<b>Population health</b>	40	43
<b>Healthcare spending</b>	5	31
<b>Access to care</b>	35	17
<b>Healthcare system</b>	32	37
<b>Public health and prevention</b>	38	50
<b>Social and economic environment</b>	41	29
<b>Physical environment</b>	33	35

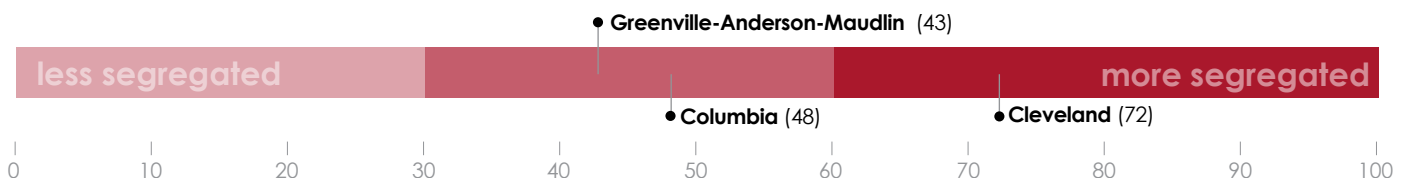
## Annie E. Casey Foundation Race for Results rank

Index of child wellbeing and opportunity

	SC	OH
<b>African-American children</b> (out of 44)	33	42
<b>Latino children</b> (out of 49)	31	23
<b>White children</b> (out of 50)	39	31

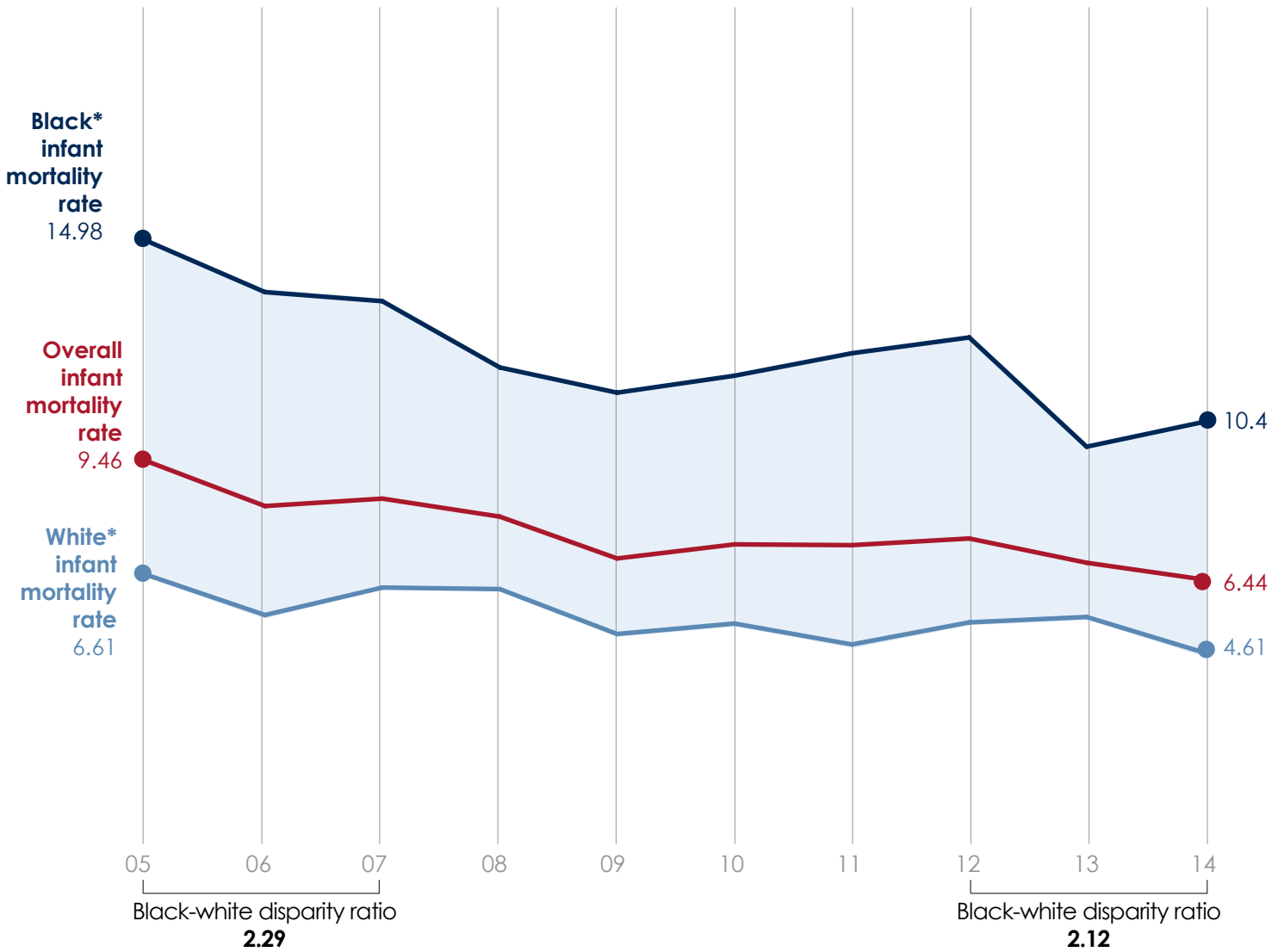
## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below are the black-white dissimilarity indexes for the largest metropolitan areas in South Carolina. Cleveland, Ohio's most segregated metropolitan area, is displayed for reference.





### South Carolina infant mortality trend (2005-2014)



\* Non-Hispanic

Source: Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

#### Notable areas of improvement from 2005-2007 to 2012-2014

- **20.7% decrease** in overall infant mortality
- **22.1% decrease** in non-Hispanic black infant mortality
- **0.17 decrease** in black-white disparity odds ratio

## South Carolina case study

### Highlights: Public-private partnership and Medicaid innovation

- South Carolina stakeholders largely attribute their sizable reductions in overall and black infant mortality from 2005-2007 to 2012-2014 to healthcare quality improvements (listed below).
- South Carolina has also leveraged strong public-private partnerships and Medicaid reforms to launch an innovative Pay-for-Success financing model to extend the reach of the Nurse-Family Partnership (NFP), an evidence-based home visiting program that addresses the social determinants of health for vulnerable families.

- Centering Pregnancy (group prenatal care)
- Breastfeeding promotion, including “**Baby Friendly**” **hospital designation** for hospitals with monetary incentive and mother’s milk bank was established for low birth weight babies
- Progesterone access (17P)
- Medicaid reimbursement for Screening, Brief Intervention and Referral to Treatment (SBIRT) (substance abuse screening)
- Safe sleep campaign
- **Nurse-Family Partnership** home visiting program (described in the social determinants of health spotlight)
- Strong collaborations with stakeholders statewide
- Data-informed decision making

### Major drivers of improvement

The South Carolina Birth Outcomes Initiative (BOI), launched in 2011, has been a driving force behind improved birth outcomes in the state. BOI brings together leadership from the state’s Medicaid program (Department of Health and Human Services), hospital association, Department of Health and Environmental Control, BlueCross BlueShield of South Carolina and other partners.

When asked to identify the major drivers of improvement in overall and black infant mortality in South Carolina from 2005 to 2014, BOI and other interviewees mentioned the following activities:

- Provider reimbursement policy changes and education to reduce early elective deliveries and C-sections: In January 2013, South Carolina was the first state to have its Medicaid program and the largest local commercial insurer stop reimbursing providers for early elective deliveries. As a result, early elective inductions were reduced by 50 percent<sup>56</sup>, and Medicaid is estimated to save \$11.25 million through 2018.<sup>57</sup> (Ohio implemented this change in 2015.<sup>58</sup>)
- Access to Long-Acting Reversible Contraception (LARC): In 2012, South Carolina’s Medicaid program was the first in the nation to cover inpatient insertion of LARC immediately after delivery (with payment outside Diagnosis-Related Group, or DRG). (Ohio implemented this change in 2017.<sup>59</sup>)

## Spotlight on social determinants of health: Home visiting

NFP is a rigorously-evaluated home visiting program with strong evidence of effectiveness for improving birth outcomes and child health, as well as some evidence for improving family economic self-sufficiency (e.g., reduced reliance on cash welfare and food stamps), employment among mothers and father involvement.<sup>60</sup>

Nurses visit with first-time, low-income mothers about twice a month from pregnancy through a child's second birthday. Through the visits, mothers learn how to have a healthy pregnancy, support healthy child development and plan for future pregnancies, education or employment.

Using funds from private and corporate philanthropy and the federal Maternal, Infant and Early Childhood Home Visiting (MIECHV) program, South Carolina began implementing NFP in 2009. There were 1,335 families participating in NFP in South Carolina as of September 2017.<sup>61</sup> (By comparison, there were 350 families served by ODH-funded NFP programs in SFY 2016.<sup>62</sup>) South Carolina interviewees reported that they are currently only reaching about 10-12 percent of families in need (first-time Medicaid births) and are working to steadily increase the reach of NFP, with a focus on enrolling women who live in low-income zip codes.

In April 2016, South Carolina launched an innovative financing model called Pay-for-Success (PFS) that will extend the program to an additional 3,200 first-time, low-income mothers over the next four years.<sup>63</sup>

PFS projects, also known as a Social Impact Bonds, draw upon private financing

for upfront capital to pay for services. Government then pays for all or part of the program only if an independent evaluator finds that it was effective in achieving specific outcomes. In this case, the South Carolina PFS initiative has mobilized a total of \$30 million:

- \$17 million from philanthropy (The Duke Endowment, BlueCross BlueShield of South Carolina Foundation, The Boeing Company and private foundations)
- \$13 million from Medicaid (via a 1915(b) waiver)<sup>64</sup>

With support from former Governor Nikki Haley, South Carolina hosted a Harvard Social Impact Bond Lab fellow (now Government Performance Lab) to develop this PFS project in 2013-2015.<sup>65</sup> Haley's administration also provided leadership to apply for a **1915(b) waiver**<sup>66</sup> from the federal government to allow the South Carolina Medicaid program to provide reimbursement for NFP for home visiting services. Evaluation results for this PFS project will be available starting in 2020.

It is important to note that there are no studies demonstrating a causal link between NFP and reductions in infant mortality in South Carolina from 2005 to 2014. However, NFP does have a strong track record of improving birth outcomes based on randomized control trials conducted in other states. Therefore, the South Carolina PFS NFP model provides a useful example of an innovative way to extend and sustain an evidence-based program that will likely contribute to maternal and child health improvements in a more widespread way going forward.

South Carolina's approach to home visiting supports Education Policy Recommendation 1.1 (see part six).



# State profile Tennessee

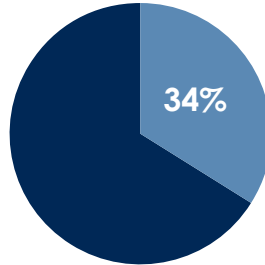
## Population size and geography

**Population (2015):**

6,499,615

**Population trend:** 13.6% increase from 2005-2015

**Population living in rural area**



**Largest metropolitan areas**

- Nashville-Davidson-Murfreesboro-Franklin: 1,761,848 (27.1% of state population)
- Memphis: 1,038,238 (16%)
- Knoxville: 852,159 (13%)

## Political landscape 2005-2014

	Governor	Party control of legislature
2005	Phil Bredesen	Split
2006	Phil Bredesen	Split
2007	Phil Bredesen	Split
2008	Phil Bredesen	Republican
2009	Phil Bredesen	Republican
2010	Phil Bredesen	Republican
2011	Bill Haslam	Republican
2012	Bill Haslam	Republican
2013	Bill Haslam	Republican
2014	Bill Haslam	Republican

**Women as percent of legislature (2005-2014): 18%**

**African Americans as percent of legislature (2009): 14%**  
(17% of population is African American)

## 2017 HPIO Health Value Dashboard

Rank among 50 states and D.C.

	TN	OH
<b>Health value</b>	31	46
<b>Population health</b>	45	43
<b>Healthcare spending</b>	9	31
<b>Access to care</b>	36	17
<b>Healthcare system</b>	35	37
<b>Public health and prevention</b>	48	50
<b>Social and economic environment</b>	42	29
<b>Physical environment</b>	38	35

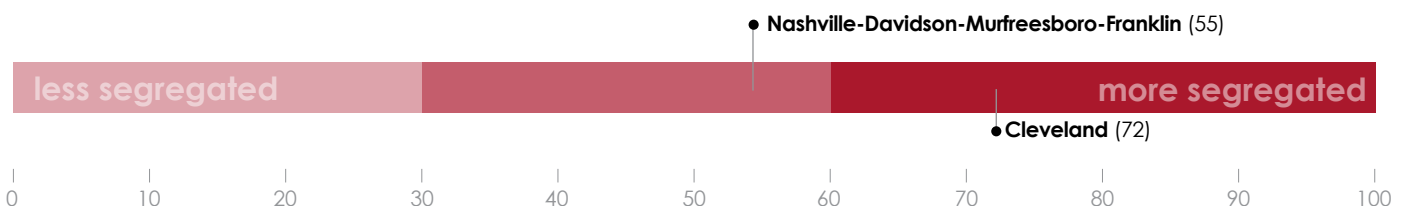
## Annie E. Casey Foundation Race for Results rank

Index of child wellbeing and opportunity

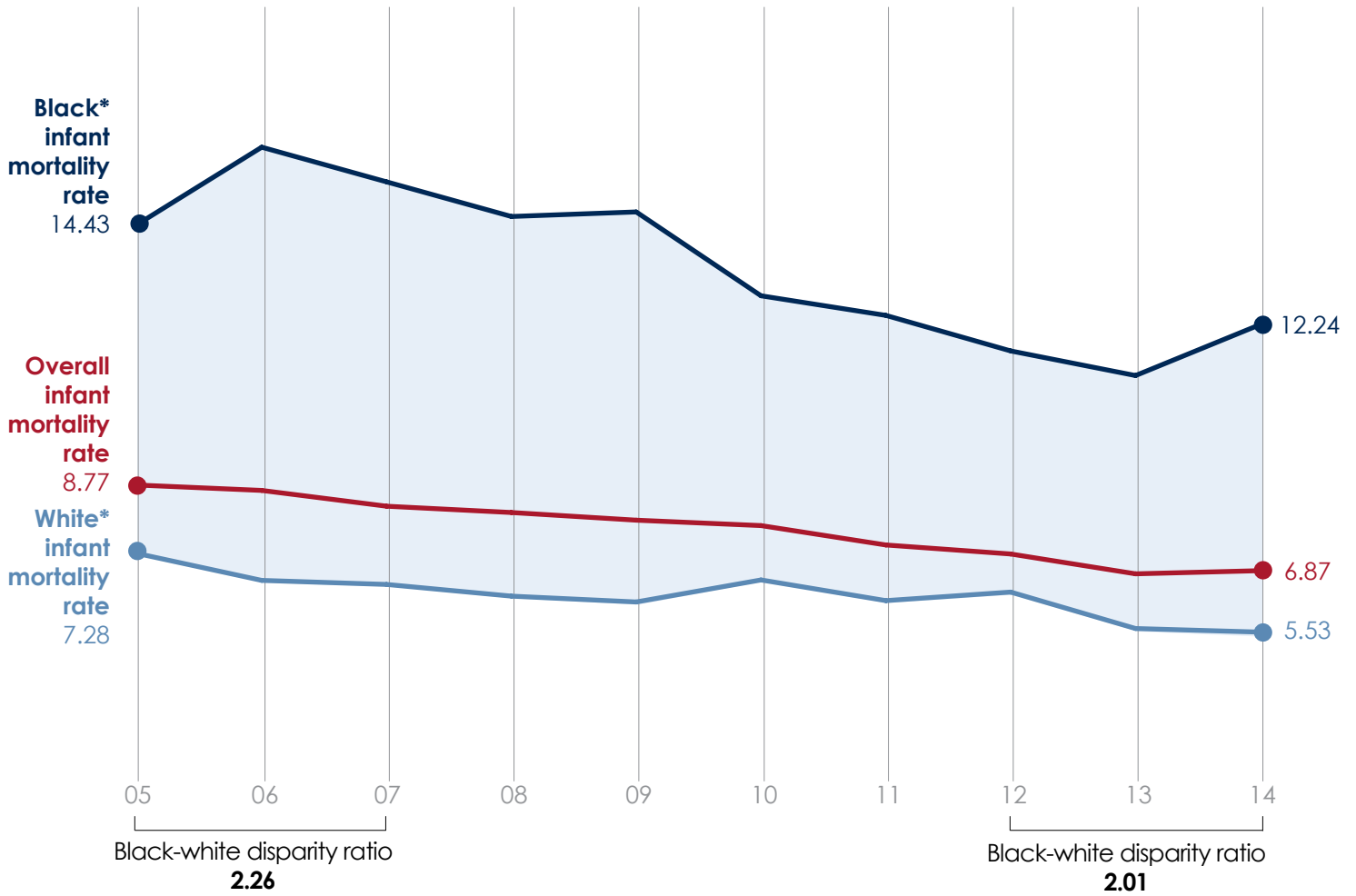
	TN	OH
<b>African-American children</b> (out of 44)	31	42
<b>Latino children</b> (out of 49)	39	23
<b>White children</b> (out of 50)	43	31

## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below is the black-white dissimilarity index for the largest metropolitan area in Tennessee. Cleveland, Ohio's most segregated metropolitan area, is displayed for reference.



### Tennessee infant mortality trend (2005-2014)



\* Non-Hispanic  
 Source: Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

#### Notable areas of improvement from 2005-2007 to 2012-2014

- **18.7% decrease** in overall infant mortality
- **23.8% decrease** in non-Hispanic black infant mortality
- **0.25 decrease** in black-white disparity odds ratio

## Tennessee case study

### Highlights: Gubernatorial leadership and community-based interventions

- Tennessee stakeholders attributed the state's progress in reducing infant mortality to several healthcare initiatives and community-based programs, listed below.
- In addition, Tennessee stakeholders mentioned the strong role two governors have played in coordinating infant mortality reduction efforts and improving education – a key social determinant of health.

### Major drivers of improvement

When asked to identify the major drivers of improvements in overall and non-Hispanic black infant mortality and the black-white disparity ratio in Tennessee from 2005 to 2014, interviewees mentioned the following activities:

#### Healthcare interventions

- Infant mortality reduction programs funded by the Governor's Office of Children's Care Coordination, which was created in 2004<sup>67</sup> by Tennessee's previous governor, Phil Bredesen. He identified infant mortality as a statewide priority in 2006.
- Group prenatal care using Centering

Pregnancy and a new model called the Supportive Pregnancy Care program, that is less expensive and more flexible but maintains the quality of Centering Pregnancy

- Policy change and education efforts to reduce early elective deliveries

#### Local community-based programs and statewide prevention efforts

- The BLUES Project: Community outreach program providing education, counseling, social support and community resource referrals to participants during pregnancy and until the child's second birthday, started in Memphis in 2005, and then expanded to other cities
- Community Voice Program: Aims to deepen understanding of pre-conception health and prenatal care among high-risk populations, launched in 2008
- **A Step Ahead Foundation:** Community organization aiming to prevent unintended pregnancies in the Memphis area through provision of Long-Acting Reversible Contraception (LARC) and other services to improve educational, economic and health outcomes for women and children

Figure 9.7. Tennessee policies and programs to increase educational attainment

<b>Drive to 55</b>	<ul style="list-style-type: none"> <li>• Launched by Gov. Haslam in 2013</li> <li>• Aims to increase the number of Tennessee adults with a postsecondary degree or credential to 55% by the year 2025</li> <li>• Ohio has a similar state-level postsecondary goal, but the target is set at 65% for 2025</li> </ul>
<b>Tennessee Promise</b>	<ul style="list-style-type: none"> <li>• Launched in 2014</li> <li>• Provides two years of community or technical college free of tuition or fees to recent high school graduates who meet certain requirements</li> <li>• Funded by the state lottery fund</li> </ul>
<b>Tennessee Reconnect</b>	<ul style="list-style-type: none"> <li>• Extends the Tennessee Promise to adults without an Associate or Bachelor's degree</li> </ul>
<b>FAFSA Frenzy campaign</b>	<ul style="list-style-type: none"> <li>• Program encouraging students to complete the Free Application for Federal Student Aid (FAFSA), which is required to be eligible for state financial aid programs</li> </ul>
<b>HOPE Scholarship</b>	<ul style="list-style-type: none"> <li>• Signed into law by Gov. Bredesen in 2003</li> <li>• Merit-based scholarship available to all Tennessee students enrolling in a public college or university or private college and meeting certain academic requirements</li> <li>• The Aspire Award is a need-based supplemental award for HOPE scholarship recipients with incomes of \$36,000 or less</li> </ul>

- Office of Minority Health and Disparities Elimination, established in 2004
- Statewide infant mortality public awareness campaign, launched in 2006
- Efforts to reduce tobacco use in Tennessee including:
  - The Nonsmokers Protection Act, which banned indoor smoking in 2007
  - The Tennessee Intervention for Pregnant Smokers, started in 2007
  - Baby and Me Tobacco Free - smoking cessation program for pregnant women, started in 2014
- Fetal and Infant Mortality Reviews (FIMR), which began in 2009
- **Safe sleep mass media campaign**, launched in 2012
- Widespread stakeholder collaboration on infant mortality efforts

### Spotlight on social determinants of health: Policies to increase educational attainment

Women with higher educational attainment have better birth outcomes and lower rates of infant mortality. Results of the regression analysis described in part eight found that increases in “some college” education were associated with decreases in infant mortality and low birth weight. Tennessee had a considerable increase (13.6 percent) in the percent of its population with at least some college education from 2005-2007 to 2012-2014.<sup>68</sup>

Tennessee’s improved high school graduation rate is also notable. From the 2002-2003 to 2013-2014 school year, the overall rate increased from 63.5 percent to 87.2 percent.<sup>69</sup> In 2013-2014, the black graduation rate was 78.6 percent, compared to 62.7 percent in Ohio.<sup>70</sup> Tennessee saw its highest graduation rate ever in the 2016-2017 school year (89.1 percent).<sup>71</sup>

Bill Haslam, the current governor of Tennessee, has made educational attainment a key priority. Figure 9.7 summarizes examples of education policies and programs which may have contributed to improvements in maternal and infant health outcomes in Tennessee.

Since Tennessee Promise began, more than 33,000 students have enrolled<sup>72</sup>, and first-time freshman enrollment in public higher education has increased 13 percent.<sup>73</sup> Also, Tennessee has had the highest FAFSA completion rate of any state for the past two years. In 2016, 70.3 percent of Tennessee high school seniors completed the FAFSA.<sup>74</sup>

Tennessee’s approach to increasing educational attainment is one example of implementing Education Policy Goals four and six (see part six).

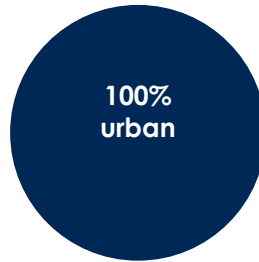


# State profile Washington D.C.

## Population size and geography

**Population** (2015): 647,484  
**Population trend:** 30.5% increase from 2005-2015

**Population living in rural area**



## Political landscape 2005-2014

	Mayor	Party control of city council
2005	Anthony Williams	Democratic
2006	Anthony Williams	Democratic
2007	Adrian Fenty	Democratic
2008	Adrian Fenty	Democratic
2009	Adrian Fenty	Democratic
2010	Adrian Fenty	Democratic
2011	Vincent Gray	Democratic
2012	Vincent Gray	Democratic
2013	Vincent Gray	Democratic
2014	Vincent Gray	Democratic

**Women as percent of city council** (2005-2014): **29%**  
**African Americans as percent of city council** (2009): **54%**  
 (49% of population is African American)

## 2017 HPIO Health Value Dashboard

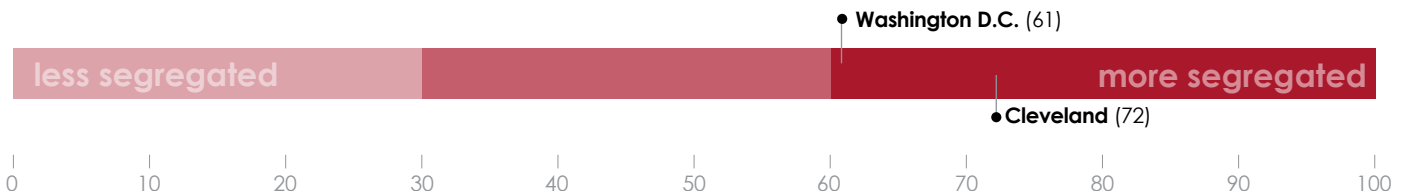
Rank among 50 states and D.C.

	DC	OH
<b>Health value</b>	13	46
<b>Population health</b>	26	43
<b>Healthcare spending</b>	16	31
<b>Access to care</b>	21	17
<b>Healthcare system</b>	49	37
<b>Public health and prevention</b>	15	50
<b>Social and economic environment</b>	34	29
<b>Physical environment</b>	21	35

**Note:** Race for Results index is not available for Washington D.C.

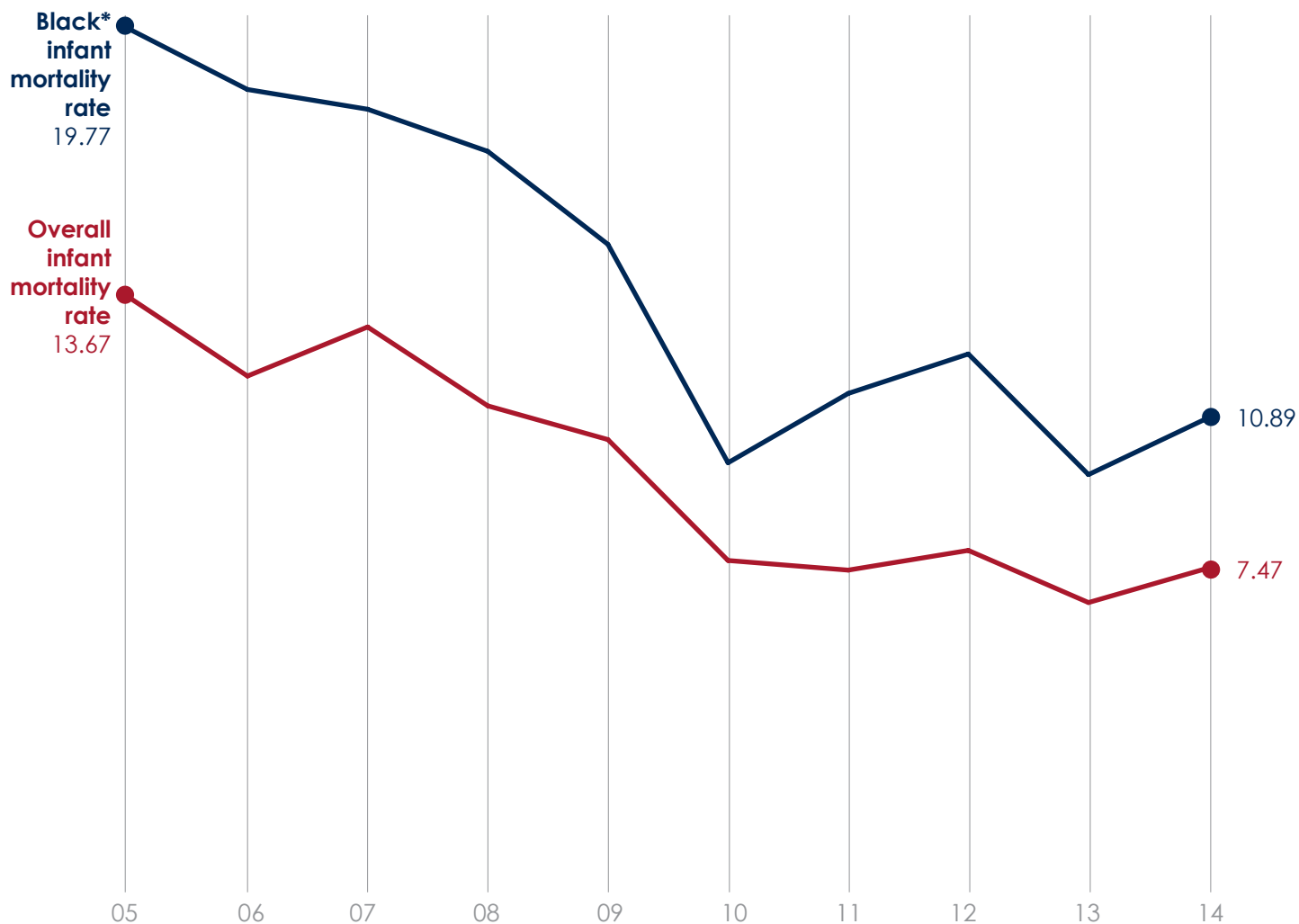
## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below is the black-white dissimilarity index for Washington D.C. Cleveland, Ohio's most segregated metropolitan area, is displayed for reference.





## Washington D.C. infant mortality trend (2005-2014)



\* Non-Hispanic

**Note:** White infant mortality rate data not available

**Source:** Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

### Notable areas of improvement from 2005-2007 to 2012-2014

- **42.7% decrease** in overall infant mortality
- **41.4% decrease** in non-Hispanic black infant mortality

## Washington D.C. case study

### Highlights

- Washington D.C. interviewees attributed the District's progress in reducing infant mortality to prenatal care access and community-based prevention programs.
- In addition, D.C. has experienced significant reductions in violent crime, a risk factor for infant mortality, over the past two decades.

### Major drivers of improvement

When asked to identify the major drivers of improvements in overall and black infant mortality in D.C. from 2005 to 2014, interviewees discussed the following activities:

- The Stork's Nest program, which offers incentives for low-income pregnant women to access prenatal care and education (see box)
- The Mama and Baby Bus mobile clinic, which provided prenatal education and care, as well as screenings for sexually transmitted infections, smoking cessation counseling, preconception health information and connections to community resources for follow-up services
- Centering Pregnancy group prenatal care program
- Tobacco prevention policies and smoking cessation
- Collaboration and community engagement
- Safe sleep programs
- Home visiting

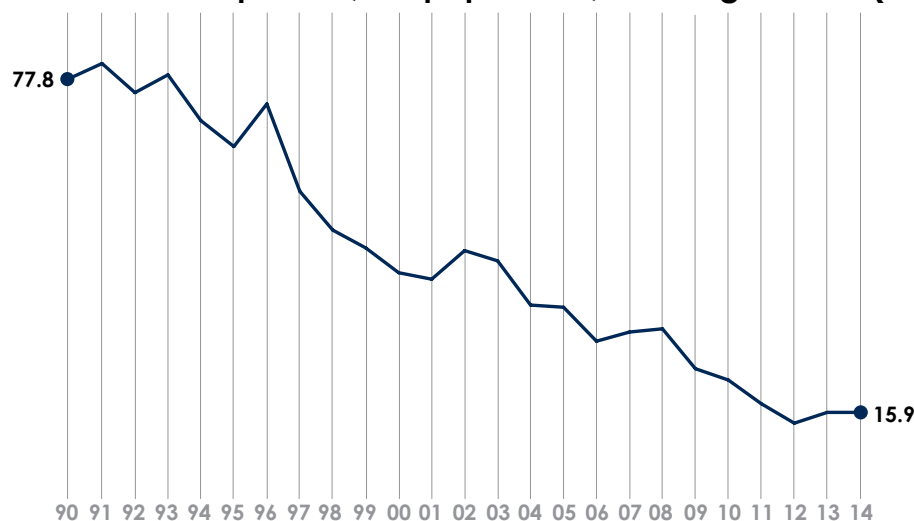
### The Stork's Nest program

The Stork's Nest is an incentive-based, prenatal health promotion program for low-income pregnant women. A cooperative project of Zeta Phi Beta Sorority, Inc. and the March of Dimes, Stork's Nest encourages women to utilize prenatal care and education classes in an effort to prevent cases of low birth weight, premature births and infant deaths.

Stork's Nest clients earn points toward incentives, such as maternity or baby care items, by engaging in health promotion activities, including attending prenatal visits, participating in prenatal education classes and eliminating negative health behaviors such as tobacco and alcohol use.

As of 2014, Stork's Nest programs were implemented in 125 sites across the country, including communities in Ohio. For more information, see Stork's Nest webpages from [Zeta Phi Beta sorority](#) and [March of Dimes](#).

Figure 9.8. **Homicide rate per 100,000 population, Washington D.C. (1990-2014)**



**Note:** Homicide is defined as murder and nonnegligent manslaughter

**Source:** Uniform Crime Reporting Statistics, U.S. Department of Justice

## Spotlight on social determinants of health: Reductions in violent crime

Experiencing trauma, such as being a victim or witness of violence, increases toxic stress and other risk factors for infant mortality. Research has found that intimate partner violence is associated with low birth weight and preterm birth.<sup>75</sup> Additional studies find that community violence is associated with fetal death and preterm birth<sup>76</sup> and that living in a community with a high homicide rate increases the risk of infant mortality and preterm birth.<sup>77</sup>

D.C. has seen a significant reduction in violent crime over the last several decades. The homicide rate, for instance, decreased from 77.8 per 100,000 people in 1990 to 15.9 per 100,000 people in 2014 (see figure 9.8). There are many factors that may have contributed to violent crime reduction in the District, including evidence-based policies such as **community policing** and **firearm licensing laws**.

Policymakers in D.C. have continued to focus on violent crime prevention in the District in recent years. In March 2016, the Council of the District of Columbia passed the **Neighborhood Engagement Achieves Results (NEAR) Act**, which aims to reduce violence in D.C. through a community-based public health approach that identifies and addresses the root causes of crime.<sup>78</sup> Funding for the legislation was included in the D.C. Mayor's proposed FY 2018 budget.

The NEAR Act created two new government offices, the Office of Violence Prevention and Health Equity (OVPHE) and the Office of Neighborhood Safety and Engagement (ONSE). The OVPHE will implement a violence interruption model that places nonprofit staff at hospital emergency rooms in order to connect the victims of violent crimes and their families with support services. The program will be implemented in four D.C. hospitals by fiscal year 2019.<sup>79</sup> In addition, ONSE will engage in primary prevention with individuals most likely to perpetrate gun violence.

The NEAR Act also includes training for officers of the Metropolitan Police Department on community policing, bias-free policing and cultural competency. The NEAR Act has not yet been implemented in D.C., and there are no causal connections between these programs and D.C.'s infant mortality reductions from 2005-2014. However, given the relationships between violence and poor birth outcomes, these strategies hold promise in improving maternal and infant health if they are successful in reducing violence.

D.C.'s approach to violence prevention and intervention is one example of addressing toxic and persistent stress, trauma and violence as cross-cutting factors that impact housing, transportation, education and employment (see part three).

## Population size and geography

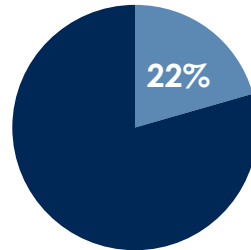
**Population** (2015):

11,575,977

**Population trend:** 4.1%

increase from 2005-2015

**Population living in rural area**



**Largest metropolitan areas**

- Cleveland-Elyria: 2,046,483 (17.7% of state population)
- Columbus: 1,972,375 (17%)
- Cincinnati: 1,641,180 (14.2%)

## Political landscape 2005-2014

	Governor	Party control of legislature
2005	Bob Taft	Republican
2006	Bob Taft	Republican
2007	Ted Strickland	Republican
2008	Ted Strickland	Split
2009	Ted Strickland	Split
2010	Ted Strickland	Split
2011	John Kasich	Republican
2012	John Kasich	Republican
2013	John Kasich	Republican
2014	John Kasich	Republican

**Women as percent of legislature** (2005-2014): **21%**

**African Americans as percent of legislature** (2009): **14%**  
(12% of population is African American)

## 2017 HPIO Health Value Dashboard

Rank among 50 states and D.C.

<b>Health value</b>	<b>46</b>
<b>Population health</b>	<b>43</b>
<b>Healthcare spending</b>	<b>31</b>
<b>Access to care</b>	<b>17</b>
<b>Healthcare system</b>	<b>37</b>
<b>Public health and prevention</b>	<b>50</b>
<b>Social and economic environment</b>	<b>29</b>
<b>Physical environment</b>	<b>35</b>

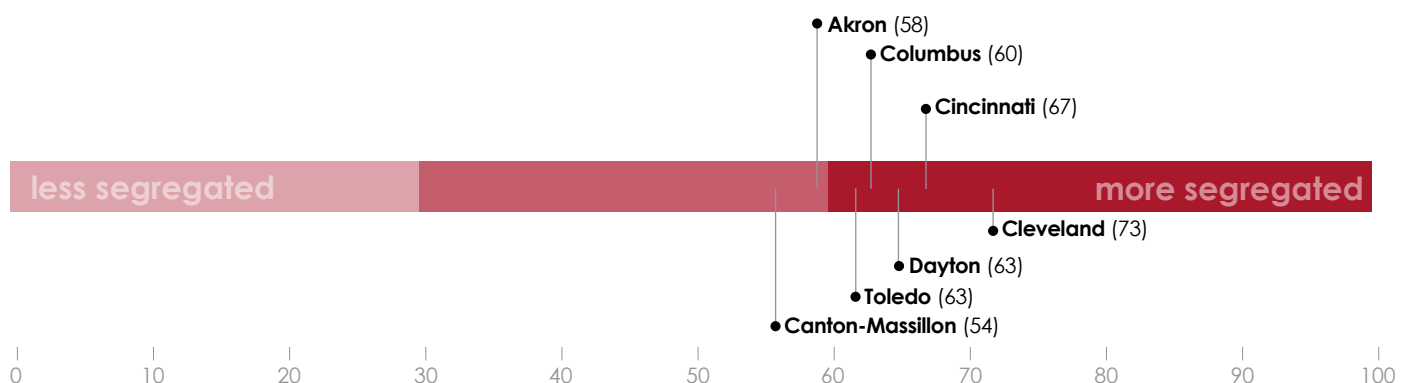
## Annie E. Casey Foundation Race for Results rank

Index of child wellbeing and opportunity

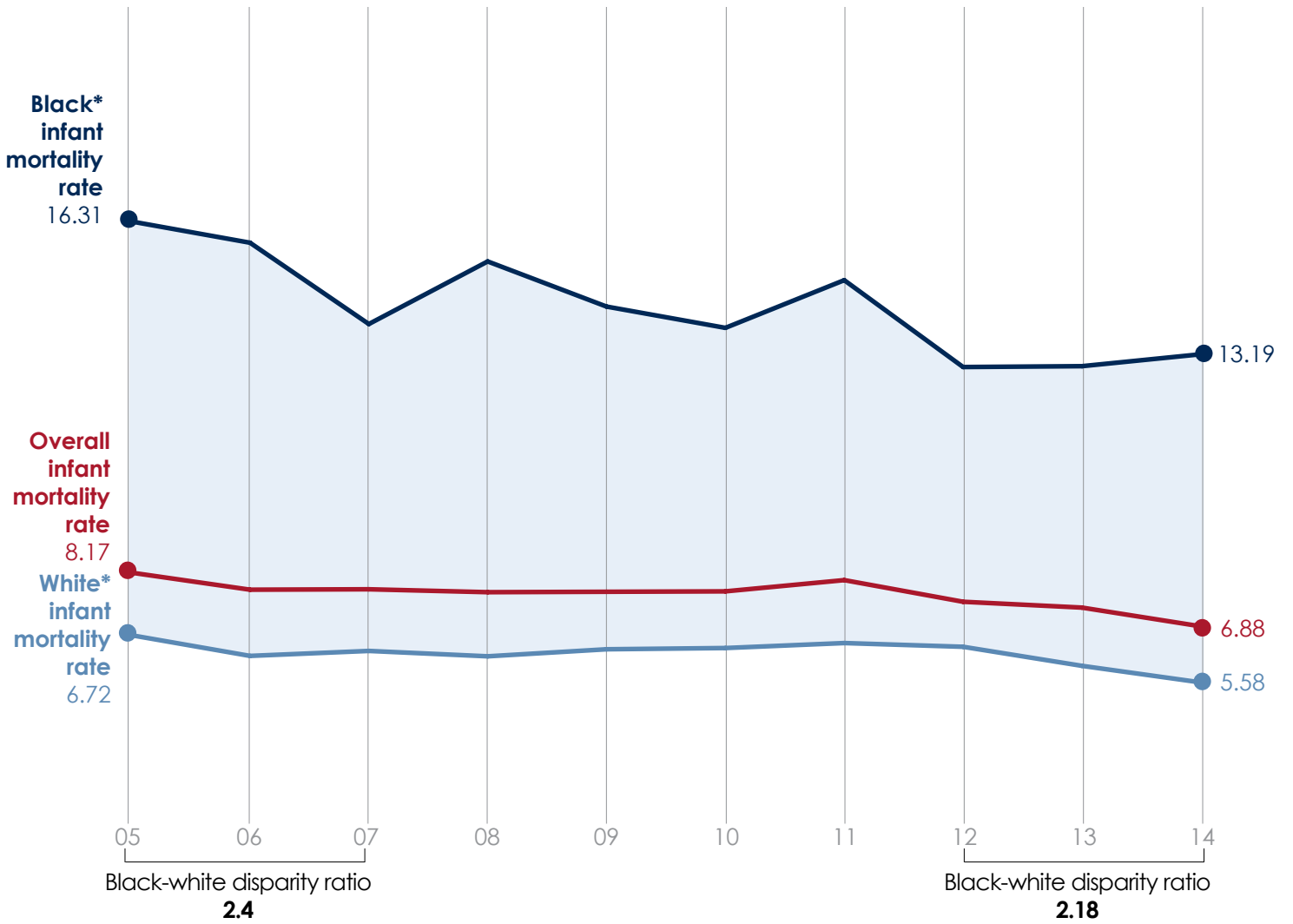
<b>African-American children</b> (out of 44)	<b>42</b>
<b>Latino children</b> (out of 49)	<b>23</b>
<b>White children</b> (out of 50)	<b>31</b>

## Residential segregation

The **black-white dissimilarity index** (Brown University, 2010) measures whether one particular group is distributed across census tracts in a metropolitan area in the same way as another group. Below are the black-white dissimilarity indexes for the largest metropolitan areas in Ohio.



### Ohio infant mortality trend (2005-2014)



\* Non-Hispanic  
 Source: Linked Birth/Infant Death Records 2005-2014 via CDC WONDER

**Notable area of improvement** from 2005-2007 to 2012-2014  
**0.22 decrease** in black-white disparity odds ratio

## Lessons learned

The following themes emerged across the key informant interviews as factors that contributed to success in reducing infant mortality:

- Collaboration, leadership and data
- The role of governors
- Specific focus on equity
- Community engagement
- Medicaid policy changes

### Collaboration, leadership and data

When asked to identify lessons learned from their infant mortality reduction initiatives, interviewees from all states and D.C. mentioned the importance of collaboration among a broad range of public and private organizations. In addition to state health departments and March of Dimes affiliates, the following types of organizations and sectors were frequently mentioned as key partners in this work: state Medicaid programs, hospital associations, health systems, managed care plans/insurance plans and state and local health departments. Colorado highlighted the strong partnership between Medicaid and the state health department, and other states mentioned similar bridging between health care and public health entities at the state and local levels.

Several interviewees mentioned strong leadership and effective use of data as key ingredients for successful collaboration. The South Carolina Birth Outcomes Initiative, for example, reported that they frequently share data and evaluation results with the collaborative group as a way to hold leaders and partners accountable. D.C. and Massachusetts stakeholders talked about the importance of sharing local-level and disparities data with community partners, and several states mentioned the use of “hot spotting” to prioritize geographic areas.

Examples of harnessing healthcare system data to guide infant mortality reduction activities include:

- The Women-Inspired Neighborhood (WIN) Network: Detroit is currently working on integrating social determinants of health screening questions into electronic health records
- Partners in Massachusetts use that state’s All Payer Claims Database (APCD) to identify trends in maternal and infant health

## The role of governors

Very few interviewees were able to recall specific legislators who have taken a leadership role in addressing infant mortality. Many, however, discussed the important role that governors have played in their states with championing maternal and infant health or leading initiatives that address education, a key social determinant. Examples include:

- **Former Massachusetts Gov. Mitt Romney:** Led healthcare system reforms similar to coverage expansions in the Affordable Care Act, resulting in a large reduction in the uninsured rate and increase in access to care.
- **Michigan Gov. Rick Snyder:** Launched the Michigan Dashboard, a high-visibility assessment of the state’s performance on economic, health, education and other metrics. The infant mortality rate is included in the Dashboard, and Governor Snyder frequently refers to it as a key indicator in need of improvement.
- **Nevada Gov. Brian Sandoval:** Championed early childhood education and full-day kindergarten.
- **New York Gov. Andrew Cuomo:** Led efforts to increase Medicaid enrollment and redesign the state’s Medicaid program, including a greater focus on prevention and wellness.
- **Former South Carolina Gov. Nikki Haley:** Launched a strategy to eliminate a budget shortfall by improving birth outcomes and reducing related Medicaid spending on NICU hospitalizations. She also embraced exploration of Pay-for-Success financing, which resulted in a sustainable funding stream for the Nurse-Family Partnership home visiting program.
- **Tennessee Gov. Bill Haslam:** Launched the Tennessee Promise scholarship program and Drive to 55 initiative to increase post-secondary educational attainment.

### Specific focus on equity

Massachusetts and Michigan interviewees strongly emphasized the importance of focusing on strategies to decrease disparities and achieve equity.

Although Massachusetts has consistently been among the states with the lowest black infant mortality rate, interviewees discussed a shared desire to continue working toward eliminating disparities. Stakeholders commented that the political and economic conditions

in Massachusetts have enabled the state to test strategies to address inequities and social determinants of health, including housing instability. One interviewee described willingness to engage in conversations about drivers of inequities, including racism, as a reason for the state's improvements. In addition, media attention to disparities has helped to build interest in the issue.

Michigan interviewees repeatedly emphasized the importance of strong state leadership focused on reducing health disparities as a driving force behind the reduction in the black-white infant mortality disparity gap in the state. Michigan implemented the PRIME initiative beginning in 2010, with the goal of developing a comprehensive strategy to reduce racial disparities in the state. The initiative focuses on providing trainings and workshops to build the capacity of state health department staff to address health disparities and raise awareness of racism and discrimination. Staff education includes understanding, identifying and eliminating policies and practices that support institutional racism and discrimination. Although PRIME was focused on state-level capacity building, interviewees acknowledged the influence of the initiative on local-level stakeholders as well.

### Community engagement

Community engagement at the local level was discussed as a way to gather and communicate information. A Nevada interviewee, for example, emphasized the importance of engaging community members in decision making through Community Advisory Boards and “town hall” meetings, and tapping local neighborhood leaders to disseminate culturally-appropriate information. Tennessee stakeholders mentioned that the African-American community in Memphis has used the Community Voice approach to foster discussions about causes of infant mortality in their community.

### Medicaid policy changes

Given that Medicaid pays for roughly half of all births in the case study states (as well as in the U.S. overall), Medicaid policies are an important lever for improving health care for families at risk of infant mortality. Interviewees from several states talked about Medicaid policy changes enacted

between 2005 and 2014 to accomplish the following goals:

- Increase birth spacing through improved reimbursement for LARC immediately after delivery
- Decrease early elective deliveries and C-sections through reimbursement changes
- Increase general access to care by extending Medicaid eligibility to more people, including Medicaid expansion in 2014
- Increase addiction screening through reimbursement for Screening, Brief Intervention and Referral to Treatment (SBIRT)
- Address social determinants of health by paying for home visiting and housing interventions

For additional examples of lessons learned from other states that have experienced reductions in infant mortality, see:

- [State population health strategies that make a difference: Reducing infant mortality in Georgia and Florida](#), Milbank Memorial Fund
- [B'More for Healthy Babies](#), Baltimore City Health Department

## State profile sources

State profile metric	Organization	Name of primary source	Year(s) of data
<b>Infant mortality</b>			
Infant mortality rate and trend	CDC WONDER	Linked birth/infant death records 2005-2014 from National Center for Health Statistics	2005-2014
<b>Population dynamics/geography</b>			
Total population size	U.S. Census Bureau	2015 American Community Survey 5-Year Population Estimate	2011-2015
Population trend	U.S. Census Bureau	2015 and 2005 American Community Survey 1-Year Estimates, Table B01003	2005, 2015
Percent of population: urban vs. rural	U.S. Census Bureau	2010 Census Summary File 1, Table SF1-P2	2010
Large metropolitan areas	U.S. Census Bureau	2011-2015 American Community Survey Selected Population Tables, Table B01003	2011-2015
<b>Political landscape</b>			
Governor name and party affiliation	National Governor's Association	NGA "Former Governors' Bios", NGA "Current Governors"	2005-2014
Party control of legislature	National Conference of State Legislatures	Partisan composition of State Legislatures 2002-2014	2005-2012
Party control of legislature	National Conference of State Legislatures	State Partisan Composition	2013, 2014
Percent of state legislators who are women	National Conference of State Legislatures	Women in State Legislatures Table: "Women Serving in the 50 states"	2009-2014
Percent of state legislators who are women	Rutgers Eagleton Institute of Politics Center for American Women and Politics	Fact Sheet on Women in State Legislatures Table: "Women in State Legislatures"	2005-2008
Percent of state legislators who are African American	National Conference of State Legislatures	African-American Legislators 2009	2009
Percent of overall state population that is African American	U.S. Census Bureau	2011-2015 American Community Survey 5-Year Estimates	2011-2015
<b>Additional metrics</b>			
Health Value Dashboard Ranks	Health Policy Institute of Ohio	2017 Health Value Dashboard Note: Rank of 1 is best	2016
Race for Results index scores	Annie E. Casey Foundation	Race for Results 2017 Policy Report Note: Rank of 1 is best	Based on 12 measures, ranges of dates/estimates differ for each measure



## State profile sources (cont.)

State profile metric	Organization	Name of primary source	Year(s) of data
Black-white dissimilarity index	Brown University	<p>Diversity and Disparities Project, Residential segregation by metropolitan statistical area.</p> <p>The dissimilarity index measures whether one particular group is distributed across census tracts in the metropolitan area in the same way as another group. A high value indicates that the two groups tend to live in different tracts. Values range from 0 to 100. A value of 60 (or above) is considered very high. It means that 60 percent (or more) of the members of one group would need to move to a different tract in order for the two groups to be equally distributed. Values of 40 or 50 are usually considered a moderate level of segregation, and values of 30 or below are considered to be fairly low.</p>	2010

## Notes

- Data from the CDC National Vital Statistics System, as compiled by America's Health Rankings. "Explore interactive tool." United Health Foundation. Accessed 11/7/17. <https://www.americashealthrankings.org/explore/2016-annual-report/measure/IMR/state/OH>
- Ohio University analysis of data from the Linked Birth/Infant Death Records 2005-2014, as compiled the Centers for Disease Control and Prevention (CDC). "CDC WONDER." CDC. Accessed June 21, 2017. <https://wonder.cdc.gov/>
- Mathews, T.J. and Anne K. Driscoll. Trends in Infant Mortality in the United States, 2005-2014. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, 2017. <https://www.cdc.gov/nchs/data/databriefs/db279.pdf>
- Years are pooled together to provide greater stability for the rates, which may vary widely from year to year in states with smaller population sizes.
- Ohio University analysis of statistical significance using Fisher's exact test. The level of significance was 0.05.
- Excluded states: AK, HI, ID, IA, ME, MT, NE, NH, NM, ND, OR, RI, SD, UT, VT, WV, WY
- One can claim a statistically significant difference if two confidence intervals do not overlap. However, if two confidence intervals overlap, this does not necessarily indicate no statistically significance. Consequently, in figure 9.3 where changes from 2005-2007 and 2012-2014 are plotted, we avoid using the phrase "statistically significant," and instead merely show the change as a simple difference in the odds-ratio between the two years.
- Excluded states: AK, HI, ID, IA, ME, MT, NE, NH, NM, ND, OR, RI, SD, UT, VT, WV, WY
- Michigan was primarily selected because it is a Midwestern state. In general, upper Midwest states have higher rates of infant mortality, Michigan did experience a reduction in the black-white disparity gap and its black infant mortality rate was lower than Ohio's in 2014.
- 2017 Race for Results: Building a path to opportunity for all children. Annie E. Casey Foundation, 2017.
- Community Health Rankings. What Works for Health. 2017. <http://www.countyhealthrankings.org/roadmaps/what-works-for-health> (accessed November 17, 2017).
- Ibid.
- Colorado Vital Statistics . Colorado Maternal and Child Health State Action Plan, 2017. [https://www.colorado.gov/pacific/sites/default/files/LPH\\_MCH-InfantMortality-AP.pdf](https://www.colorado.gov/pacific/sites/default/files/LPH_MCH-InfantMortality-AP.pdf)
- Colorado Department of Public Health & Environment. MCH priority implementation, 2017. <https://www.colorado.gov/pacific/cdphe/mch-priority-implementation>
- Boulder County. Boulder County Supports Families by Extending Paid Family Leave. January 2016. <https://www.bouldercounty.org/news/boulder-county-supports-families-by-extending-paid-family-leave/>
- Colorado General Assembly. HB 17-1307.
- Ibid.
- University of Massachusetts Medical School. "Worcester healthy Baby Collaborative: Social Determinants." Accessed on November 17, 2017. <https://libraryguides.umassmed.edu/c.php?g=499833&p=3422182>
- Wachino, Vikki. "State Medicaid Payment Approaches to Improve Access to Long-Acting Reversible Contraception." Memorandum. Baltimore, MD: U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, April 8, 2016. <https://www.medicare.gov/federal-policy-guidance/downloads/CIB040816.pdf>
- Dreyer, Paul. "Circular Letter DHQC: 06-6-461." Boston, MA: The Commonwealth of Massachusetts, Executive Office of Health and Human Services, Department of Public Health, Division of Health Care Quality, June 20, 2006. <http://www.mass.gov/eohhs/docs/dph/quality/hcq-circular-letters/hospital-general-066461.rtf>
- Mass.gov. "Department of Revenue – Prior Year Credits." Accessed November 19, 2017: <http://www.mass.gov/dor/individuals/filing-and-payment-information/guide-to-personal-income-tax/prior-law-and-massachusetts-differences/prior-year-credits.html#Earned>
- Ellis, Lucy. "Massachusetts Family Homelessness System | City of Ideas." The Boston Foundation, February 22, 2017. <https://www.tbf.org/blog/2017/february/massachusetts-family-homelessness-system>
- Ibid.
- Mass.gov. "Residential Assistance for Families in Transition (RAFT)." Accessed on November 17, 2017. <https://www.mass.gov/service-details/residential-assistance-for-families-in-transition-raft>
- Mass.gov. "HomeBASE." Accessed on November 17, 2017. <https://www.mass.gov/service-details/homebase>
- Vieira, Charlotte et al. "Effects of Healthy Start in Housing on maternal mental health among high-risk pregnant women experiencing homelessness." (Abstract from the on-line program for the American Public Health Association 2015 annual meeting).
- Michigan Public Act No. 291
- 2016 Michigan Infant Mortality Reduction Plan [https://www.michigan.gov/documents/infantmortality/Infant\\_Mortality\\_16\\_FINAL\\_515908\\_7.pdf](https://www.michigan.gov/documents/infantmortality/Infant_Mortality_16_FINAL_515908_7.pdf)
- Braveman, Paula et al. What Is Health Equity? And What Difference Does a Definition Make? Princeton, NJ: Robert Wood Johnson Foundation, 2017. <https://www.rwjf.org/en/library/research/2017/05/what-is-health-equity.html>
- Alexander, Greg R., Martha S. Wingate, Deren Bader and Michael D. Kogan. "The Increasing Racial Disparity in Infant Mortality Rates: Composition and Contributors to Recent U.S. Trends." *American Journal of Obstetrics and Gynecology* 198, no. 1 (2008): 51e1-e9. doi: 10.1016/j.ajog.2007.06.006
- Mutambudzi, Miriam, John D. Meyer, Susan Reisine and Nicholas Warren. "A Review of Recent Literature on Materialist and Psychosocial Models for Racial and Ethnic Disparities in Birth Outcomes in the U.S., 2000-2014." *Ethnicity & Health* 22, no. 3 (2017): 311-332. doi: 10.1080/13557858.2016.1247150
- Local Area Unemployment Statistics from the Bureau of Labor Statistics. Accessed November 17, 2017. <https://data.bls.gov/timeseries/LASST3200000000000003>
- Comevale, Anthony P., Jeff Strohl and Neil Ridley. Good Jobs That Pay without a BA: A State-by-State Analysis. JPMorgan Chase & Co. and the Georgetown University Center on Education and the Workforce, 2017.
- Ibid.
- Badenhausen, Kurt. "The 10 Best States for Future Job Growth." *Forbes*, November 2016. <https://www.forbes.com/sites/kurtbadenhausen/2016/11/16/the-10-best-states-for-future-job-growth/#acc063f6d209>
- Casserty, Meghan. "The Geography Of The Gender Pay Gap: Women's Earnings By State." *Forbes*, September 19, 2013. <https://www.forbes.com/sites/meghancasserty/2013/09/19/the-geography-of-the-gender-pay-gap-womens-earnings-by-state/#dc30d8f64730>
- Bronson, Brittany. "Why Las Vegas Is a Great Place for Working-Class Women." *New York Times*, August 2016. <https://www.nytimes.com/2016/08/17/opinion/how-unions-help-cocktail-servers.html>
- Meek, Glen A. "States of the State: How has Nevada performed under Gov. Brian Sandoval?" *Las Vegas Sun*, January 2017. <https://lasvegassun.com/news/2017/jan/23/states-of-the-state-how-has-nevada-performed-under/>
- Morelix, Arnobio, Robert W. Fairlie, E.J. Reedy and Joshua Russell. The Kauffman Index of Startup Activity. Ewing Marion Kauffman Foundation, 2016.
- Education Initiatives for the New Nevada: Governor Sandoval's Approved Budget: 2015-17 Biennium. Nevada Department of Education, 2015.
- Refundable credits may be claimed by tax filers that do not have a tax liability, thereby increasing annual income.
- New York State Department of Taxation and Finance. "Earned income credit (New York State)." Accessed on November 10, 2017. [https://www.tax.ny.gov/pit/credits/earned\\_income\\_credit.htm](https://www.tax.ny.gov/pit/credits/earned_income_credit.htm)
- New York State Department of Taxation and Finance. "Empire State child credit." Accessed on November 10, 2017.
- New York State Department of Taxation and Finance. "Child and dependent care credit (New York State)." Accessed on November 10, 2017. [https://www.tax.ny.gov/pit/credits/child\\_and\\_dependent\\_care\\_credit.htm](https://www.tax.ny.gov/pit/credits/child_and_dependent_care_credit.htm)
- New York City taxpayers with incomes below \$30,000 may claim a local CDCTC worth up to 75% of the New York state CDCTC.
- See independent evidence reviews in What Works for Health and Health Impact in Five Years (Hi-5).
- Tax Credits for Workers and Their Families. "State Tax Credits." Accessed on November 10, 2017. <http://www.taxcreditsforworkersandfamilies.org/state-tax-credits/>
- Tax Credits for Working Families. "Ohio." Accessed on November 22, 2017. <http://www.taxcreditsforworkersandfamilies.org/state-tax-credits/ohio/>
- Sykes, Russell. "Making Work Pay in New York." Empire Center, April 18, 2012. <https://www.empirecenter.org/publications/making-work-pay-in-new-york/>
- Internal Revenue Service. "States and Local Government with Earned Income Tax Credit." Accessed on November 10, 2017. <https://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/states-and-local-governments-with-earned-income-tax-credit>; Some states offer larger credits to certain individuals, particularly people with very low incomes.
- Ibid.
- Tax Credits for Workers and Their Families. "State Tax Credits: New York." Accessed on November 10, 2017. <http://www.taxcreditsforworkersandfamilies.org/state-tax-credits/new-york/>
- Wicks-Lim, Jeanette and Peter S Arno. "Improving population health by reducing poverty: New York's Earned Income Tax Credits." *SSM – Population Health*, 3 (2017): 373-381. doi: 10.1016/j.ssmph.2017.03.006
- In this study, "low income neighborhoods" were defined as neighborhoods where the per capita EITC benefit was at least \$300 throughout the entire study period (1997-2010).
- Wicks-Lim, Jeanette and Peter S Arno. "Improving population health by reducing poverty: New York's Earned Income Tax Credits." *SSM – Population Health*, 3 (2017): 373-381. doi: 10.1016/j.ssmph.2017.03.006
- Using education, collaboration, and payment reform to reduce early elective deliveries: A case study of South Carolina's Birth Outcomes initiative. Catalyst for Payment Reform, 2014.
- Information provided directly by the Birth Outcomes Initiative, November 2017.
- Ohio Department of Medicaid
- American Congress of Obstetricians and gynecologists. Medicaid reimbursement for postpartum LARC by state. Accessed 11/21/17: <https://www.acog.org/About-ACOG/ACOG-Departments/Long-Acting-Reversible-Contraception/Immediate-Postpartum-LARC-Medicaid-Reimbursement#Ohio>
- See independent evidence reviews from Top Tier Evidence (Coalition for Evidence-Based Policymaking): <http://topierevidence.org/programs-reviewed/interventions-for-children-age-0-6/nurse-family-partnership-and-What-Works-for-Health>: <http://www.countyhealthrankings.org/policies/nurse-family-partnership-nfp>; and summary of evaluation findings from Nurse-Family Partnership: <https://www.nursefamilypartnership.org/about/proven-results/>
- Nurse-Family Partnership Snapshot. Nurse-Family Partnership, 2017. Accessed 11/1/17: [https://www.nursefamilypartnership.org/wp-content/uploads/2017/11/NFP\\_Snapshot\\_Sept2017.pdf](https://www.nursefamilypartnership.org/wp-content/uploads/2017/11/NFP_Snapshot_Sept2017.pdf)
- Information provided directly by ODH, November, 2017.
- South Carolina Nurse-Family Partnership Pay for Success Project- February 2016, Nurse-Family Partnership fact sheet.
- South Carolina Nurse-Family Partnership Pay for Success Project- February 2016, Nurse-Family Partnership fact sheet.
- Ohio also hosted a SIB Lab fellow during this time period but chose not to pursue a PFS initiative.
- Section 1915(b) waiver. The enhanced prenatal and postpartum home visitation pilot project and managed care program. South Carolina Department of Health and Human Services, December 10, 2015.

67. The Governor's Office of Children's Care Coordination was discontinued in 2011, and its projects were transitioned to the state health department.
68. United States Census Bureau American Community Survey
69. Methodologies used to calculate the high school graduation rate changed within this timeframe. In 2002-03, the Adjusted Freshman Graduation Rate (AFGR) was used, and in 2013-14, the Adjusted Cohort Graduation Rate (ACGR) was used.
70. Institute of Education Sciences, National Center for Education Statistics
71. Tennessee High School Graduation Rate Reaches Highest Rate on Record. Tennessee Department of Education. Sept. 14, 2017. Accessed Nov. 14, 2017. <https://www.tn.gov/education/news/tennessee-high-school-graduation-rate-reaches-highest-rate-on-record>
72. Tennessee Promise Annual Report 2017. Tennessee Higher Education Commission and Tennessee Student Assistance Corporation. [https://www.tn.gov/assets/entities/thehc/attachments/2017\\_IN\\_Promise\\_Report.pdf](https://www.tn.gov/assets/entities/thehc/attachments/2017_IN_Promise_Report.pdf)
73. Ibid.
74. Ibid.
75. Hill, Amber, Christina Pallitto, Jennifer McCleary-Sills and Claudia Garcia-Moreno. "A Systematic Review and Meta-Analysis of Intimate Partner Violence during Pregnancy and Selected Birth Outcomes." *International Journal of Gynecology and Obstetrics* 133, no. 3 (2016): 269-76. doi: 10.1016/j.ijgo.2015.10.023
76. Okah, Felix A., Adebayo Oshodi, Yifei Liu and Jinwen Cai. "Community Violence and Pregnancy Health Behaviors and Outcomes." *Southern Medical Journal*, 107, no. 8 (2010): 513-17. doi: 10.14423/SMJ.0000000000000143
77. Reducing Infant Mortality in Ohio: Individuals, Communities, Systems and Interventions. Infant Mortality Research Partnership: Ohio Colleges of Medicine Government Resource Center, 2017.
78. Cohen, Brent J. Implement the ENAR Act to Reduce Violence in D.C. D.C. Policy Center, May 2017. <https://www.dcpolicycenter.org/publications/implementing-near-act-reduce-violence-d-c/>
79. Ibid.



Over the past few decades, Ohio's efforts to reduce infant mortality have focused primarily on medical care and interventions such as prenatal care, case management and care coordination that often do not reach women until their second or third trimester.<sup>1</sup> These strategies focus on some—but not all—of the underlying causes of infant death, and may be “too little, too late” to improve maternal and child health in a widespread way. This report takes a broader look at factors beyond medical care that affect health to examine the various ways that housing, transportation, education and employment contribute to infant mortality and its related risk factors. This section reviews key findings from other parts of this report and provides a summary of:

- How housing, transportation, education and employment affect the health of infants and their families
- The most notable housing, transportation, education and employment challenges related to infant mortality
- Lessons learned from case study states

In addition, this section provides a set of cross-cutting policy recommendations and key implications for moving toward reduced infant mortality and improved birth outcomes for all Ohioans.

### How do factors beyond medical care affect the health of infants and their families?

There is a small but growing body of research literature on social determinants of health that contribute directly to infant mortality, and a more substantial body of research describing risk and protective factors for the leading causes of infant mortality, particularly poor birth outcomes. Parts four through seven of this report review the research literature to identify how housing, transportation, education and employment affect the health of infants and their families. Examples of how these factors contribute to infant mortality and poor birth outcomes are outlined below.

#### Housing

- Housing that is too expensive makes it harder for a family to pay for other essentials like healthy

food, transportation and prescriptions, which are important for a healthy pregnancy.

- A woman who cannot afford quality housing in a good neighborhood may have to rent in a high-crime area, double up with friends or relatives or move in with an abusive partner to avoid homelessness. All of these options come with health risks for pregnant women and children.
- Housing that is old, poorly maintained and/or overcrowded can make it harder to use safe sleep practices, cause stress that is difficult to manage and expose pregnant women and infants to hazards, including lead and pests.
- Affordable housing stock in Ohio is often located in communities with poor schools, low-wage jobs and weak or unsupportive social connections between residents.

#### Transportation

- Lack of adequate transportation makes it difficult for a family to access healthcare services, including prenatal care.
- Long commutes on city busses to get from inner-city neighborhoods to jobs in suburban areas make it difficult for parents to get and maintain employment and earn a decent wage. Poverty is a risk factor for infant mortality.
- A rural family without a car may have a difficult time getting to the grocery store to access healthy food. Poor nutrition is a risk factor for low birth weight and preterm birth.
- Women living in areas without sidewalks and crosswalks are less likely to be physically active, which is a risk factor for hypertension, obesity and Type 2 diabetes—all causes of maternal complications in pregnancy.
- Air pollution from vehicle emissions and other sources is linked to preterm birth, low birth weight and Sudden Infant Death Syndrome.

#### Education

- Lower educational attainment often leads to lower-paying jobs and jobs that offer few benefits, such as paid leave. A lower income makes it more challenging to live in safe and healthy neighborhoods and access healthy foods, which may negatively impact a woman's health before and during pregnancy.
- The knowledge and skills gained through education lead to higher levels of literacy,

including health literacy, which can result in a better ability to navigate the healthcare system and access credible and reliable health information. All of these factors can improve birth outcomes and reduce infant mortality.

- People with higher educational attainment tend to belong to stronger, healthier social networks and receive more support from their relationships. Social support is a protective factor for pregnant women.

### Employment

- Low-income households have difficulty affording basic necessities, like healthy food. Poor nutrition is a risk factor for low birth weight and preterm birth.
- Women who work in low-wage jobs often have difficulty getting time off work to go to prenatal care appointments.
- Coping with many stressors, such as getting to appointments and affording food and medical care, can increase risk of poor birth outcomes.
- Low-wage and part-time jobs do not typically offer paid family or sick leave. Paid leave has a positive impact on birth weight and rates of breastfeeding.

## To what extent are housing, transportation, education and employment policies and programs in Ohio meeting the needs of Ohioans most at risk for infant mortality?

In reviewing Ohio's housing, transportation, education and employment policy and program landscape, it is clear that Ohioans most at risk for infant mortality face many unmet needs. The most notable challenges related to infant mortality discussed in this report are summarized below.

### Housing

Largely driven by discriminatory practices, divestment from low-income communities and under-funding of housing programs, Ohio faces a number of housing challenges. For example:

- There are only 43 available units that are affordable for every 100 renters with Extremely Low Incomes and there is only enough federal rental assistance to help about one-quarter of all households that are eligible.

- Ohio's cities are highly segregated and residential segregation is associated with increased risk of poor birth outcomes as well as neighborhood conditions that contribute to infant mortality, including crime and poor-quality housing.
- Historical policies and inequitable housing practices have concentrated populations at the greatest risk of infant mortality in under-resourced areas that offer residents fewer opportunities.
- Advisory Group members described how housing instability and homelessness makes it difficult to have and raise a healthy baby, including stress from being behind on rent, living in overcrowded situations and trouble holding onto baby items like strollers and pack-and-plays through multiple moves.

### Transportation

Because of inequities in transportation access and the transportation infrastructure, many Ohioans are disconnected from health care, employment and other resources and opportunities. For example:

- Twenty-two percent of black households in Ohio did not have a vehicle in 2014, compared to 8 percent overall.
- Advisory Group members reported widespread problems with transportation services funded through Medicaid, known as Medicaid Non-Emergency Medical Transportation (NEMT), such as mothers waiting several hours to be picked up from appointments.
- Compared to cities in other states, Ohio's metropolitan areas generally have less robust bus service and less walkable neighborhoods. In Toledo, for example, only an estimated 41 percent of jobs are accessible within 90 minutes via public transportation.
- In 2012, Ohio's \$0.63 per capita transit spending ranked among the lowest in the U.S. (38 out of 51).

### Education

In 2016, the highest level of educational attainment for 43.3 percent of Ohio adults was a high school diploma (including equivalency) or less, and educational attainment varies widely by race. Achievement gaps appear before children enter kindergarten and widen throughout schooling. For example:

- Only 24 percent of black and 26 percent of economically-disadvantaged students

entered kindergarten demonstrating readiness, meaning they had sufficient skills, knowledge and abilities to engage with kindergarten-level instruction.

- Considerable variations exist in third-grade reading proficiency based on the wealth of a school district. In Ohio's eight largest urban districts, only 30 to 60 percent of third-graders were reading proficiently in the 2016-2017 school year, compared to 87 percent or more in wealthier districts.
- Eighty-three percent of all Ohio high school seniors graduated in 2015. Rates among black and economically disadvantaged students were 59.7 and 68.7 percent respectively.
- In 2016, 14.5 percent of black Ohio adults had not earned a high school diploma or equivalency, compared to 9.1 percent among white Ohio adults and 10 percent of Ohio adults overall.

## Employment

Many Ohioans do not have access to medium- or high-wage jobs and employment benefits that promote health for babies and moms. For example:

- Wages are low in the fastest growing jobs in Ohio. Five of the ten occupations that are projected to have the most job openings in the next several years pay median wages below \$10 per hour.
- Black Ohioans are more than twice as likely to be unemployed than white Ohioans. Hiring discrimination plays a role in this disparity.
- In 2016, nearly half of black Ohioans had annual incomes below 200 percent of the Federal Poverty Level—\$23,540 for an individual and \$48,500 for a family of four.

## Lessons learned from other states

Analysis of the case study states indicates that improvement is possible. These states have made faster progress than Ohio in reducing infant deaths, including black infant deaths. Although the case study states are diverse in population size, geography and political landscape, a review of Ohio's performance relative to these states on key social, economic and physical environment metrics revealed that, as compared to Ohio, most case study states have:

- Higher rates of preschool enrollment and adult educational attainment (at least some college)
- Lower child poverty rates
- Better economic outcomes for African Americans (e.g., higher black labor force participation rates and lower black unemployment and poverty rates)
- Better outdoor air quality (less exposure to particulate matter)

The case study states also provide examples of policies and programs that address the social determinants of health and may improve conditions for families most at risk for infant mortality. For example:

- **Tennessee** Gov. Bill Haslam launched the Tennessee Promise scholarship program and other education reforms that have helped to improve education outcomes.
- **New York** implemented tax credits (state Earned Income Tax Credit, Child Tax Credit, and Child and Dependent Care Tax Credit) that support family incomes.
- **South Carolina** leveraged an innovative Pay for Success financing model to extend the reach of the Nurse-Family Partnership (NFP), an evidence-based home visiting program.
- **Michigan** implemented the Practices to Reduce Infant Mortality through Equity (PRIME) initiative which provided state health department staff with trainings and workshops on health disparities, and identification and elimination of policies and practices that support institutional racism and discrimination.
- **Nevada** Gov. Brian Sandoval has championed early childhood education and full-day kindergarten, and the state has experienced strong employment growth and an increase in well-paying jobs for workers with less than a bachelor's degree.

Although information gathered from the case study states does not assess the causal relationships between programs and policies implemented and reductions in infant mortality experienced, it does provide insight on what other states are doing to reduce infant mortality. Ohio policymakers and other stakeholders can use this information to strengthen and expand existing strategies in the state to address infant mortality.

## Short-term fixes vs. long-term change

The long period of time needed to make meaningful improvements in outcomes is a significant challenge for population health initiatives, including efforts to reduce infant mortality. The importance of pre-conception health and the indirect relationships between social determinants and infant mortality result in very long horizons from the time community conditions are improved to the time that the impact on infant mortality rates and disparities can be assessed. In addition, many of the structural drivers of inequities that contribute to poor maternal and child health—such as redlining and residential segregation—are rooted in decades of racist and discriminatory policies and practices that will take time and concerted effort to undo.

In order to effectively reduce infant mortality, fundamental changes to the housing, transportation, education and employment sectors are needed. It may take many years to dismantle the structural inequities that are driving infant mortality. While these long-term changes are being pursued, it is important to also make short-term fixes that address immediate unmet needs for Ohioans most at risk for infant mortality.

Medicaid NEMT, for example, is a stop-gap solution to problems in the overall transportation infrastructure. Medicaid NEMT relies on funding from the healthcare sector to fill in gaps in the transportation sector. In most cases, Medicaid NEMT would not be necessary within a high-performance transportation infrastructure with equitable access for all Ohioans.

Similarly, emergency rental assistance to prevent families from becoming homeless is critical for family wellbeing. However, demand for this emergency assistance will continue unless the underlying structural barriers to accessing decent, affordable housing are addressed.

## Cross-cutting policy recommendations

The housing, transportation, education and employment policy and program landscape is complex and harbors many challenges for Ohioans most at-risk for infant mortality. However, state and local policymakers have many options to address the community conditions and inequities within these environments that contribute to infant mortality and its related risk factors. This report offers a total of 121 specific policy recommendations

based upon stakeholder input and a review of the research evidence for what works to improve housing, transportation, education and employment.

In addition, outlined below is a set of six cross-cutting policy recommendations that can be implemented to further advance the policy goals and recommendations identified throughout this report:

### Cross-cutting policy recommendation 1

**Monitor and evaluate implementation of the recommendations in this report.** State legislators can request that the Commission on Infant Mortality monitor the extent to which the recommendations in this report are implemented and report findings to House and Senate leadership and all relevant committees on an annual basis.

### Cross-cutting policy recommendation 2

**Increase the effectiveness of policies and programs serving Ohioans most at-risk for infant mortality.** State agencies and local organizations can increase the effectiveness of policies and programs serving Ohioans most at risk for infant mortality by:

- a. Hosting cultural competence and implicit bias training for staff
- b. Implementing programs like Michigan's Practices to Reduce Infant Mortality through Equity (PRIME) initiative to address health disparities through the social determinants of health and the identification and elimination of policies and practices that support institutional racism and discrimination
- c. Increasing workforce diversity through recruitment of minority and rural/Appalachian students for health and human services higher-education programs
- d. Implementing evidence-based strategies to prevent violence and integrating trauma-informed care approaches into existing services and programs

### Cross-cutting policy recommendation 3

**Increase local-level leadership and advocacy to address the social determinants of health.** Local infant mortality reduction collaboratives and other local partners can:

- a. Identify which policy goals to focus on from this report that best address challenges, inequities and social drivers within their communities, guided by input from community residents and local/neighborhood-level data



- b. Implement specific local-level recommendations in this report that align with the selected policy goals
- c. Advocate for state-level recommendations that align with the selected policy goals and recommendations
- d. Gather and disseminate qualitative information and real-life stories from Ohio families that illustrate the housing, transportation, education and employment challenges and inequities described in this report

#### **Cross-cutting policy recommendation 4**

**Measure, report and act upon disparities and inequities data.** State agencies can collect and report data on infant mortality, birth outcomes and related inequities in the social, economic and physical environment disaggregated by race, ethnicity, income level, sex and geography. In addition, local partners can collect and use local-level data (e.g., by zip code or census tract) and advocate for improved data collection that allows for actionable analysis, transparency and accountability for differences in health and community conditions by race, ethnicity, income level, sex and geography.

#### **Cross-cutting policy recommendation 5**

**Coordinate, collaborate and evaluate.** State agencies and other state or local-level organizations can work together to coordinate, evaluate and continuously improve infant mortality reduction policies and programs.

#### **Cross-cutting policy recommendation 6**

**Expand upon case study findings.** State policymakers can commission a study to assess the extent to which Ohio is implementing the evidence-based strategies used in other states that have led to larger improvements in infant mortality. (Determine, for example, the number of families reached by Centering Pregnancy and Nurse-Family Partnership in Ohio compared to the case study states.)

## **Conclusions**

Legislators, community leaders, clinicians and other stakeholders are concerned about Ohio's infant mortality rate and are particularly troubled that some babies face worse odds than others at the beginning of life. While healthcare providers play a key role in improving infant outcomes, access to quality health care is necessary, but not sufficient. Improvements to factors beyond medical care are needed to achieve infant mortality reduction goals and to overcome the inequities and community conditions driving Ohio's worsening infant mortality rates and large disparities. Addressing the social drivers of poor health, such as housing, education, employment and transportation, holds promise for preventing infant mortality.

Going forward, Ohio's new approach to reducing infant mortality by improving community conditions should:

- **Prioritize housing and employment.** Ensure families have decent, stable housing and income. Housing and income are foundational, basic human needs.
- **Connect the disconnected.** Better connect low-income families to jobs, transportation, post-secondary education and social capital.
- **Ensure all children have the opportunity to thrive.** Extend the reach of early childhood programs, decrease education disparities, prevent violence and support marriage.
- **Acknowledge and address the roles of racism, discrimination, violence and toxic stress.** Provide all Ohioans with the opportunity to be healthy by eliminating discriminatory policies, programs and practices and helping families be resilient in the face of trauma and toxic stress.
- **Innovate, leverage public-private partnerships and join forces across sectors.** Innovative financing and collaboration between new partners are critical for long-term impact.
- **Coordinate, collaborate, monitor and evaluate.** Policymakers, state agencies and community leaders have an important role to work together to develop, document, assess and continually improve infant mortality efforts.
- **Balance short-term fixes with longer-term change.** Address immediate needs, such as homelessness, but also pursue fundamental changes to the housing, transportation, education and employment sectors that ensure that all Ohio families can participate in the economy, build positive social relationships and attain optimal health.

## **Note**

1. *Addressing Infant Mortality in Ohio (2011-2016)*. Ohio Department of Health, n.d. <https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI/Addressing-Infant-Mortality-in-Ohio-2011-16-FINAL.pdf?la=en>; *New Strategies to Address Infant Mortality in Ohio (2017-2018)*. Ohio Department of Health, n.d. [www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI/New-Strategies-Addressing-Infant-Mortality-in-Ohio-2017-18-FINAL.pdf?la=en](http://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI/New-Strategies-Addressing-Infant-Mortality-in-Ohio-2017-18-FINAL.pdf?la=en)



## Appendix A. Complete list of policy recommendations

### Housing policy goals and recommendations

		State	Local
<b>Goal 1</b>	<b>Increase the availability of rental assistance programs for renters with Extremely Low Incomes</b>		
1.1	State policymakers can provide funding from the General Revenue Fund for the Ohio Housing Finance Agency (OHFA) to establish a new state-funded rental assistance program targeted to reducing infant mortality among populations most at-risk for infant mortality, including people with low incomes and low levels of education attainment, African Americans and residents of infant mortality hot spot zip code areas or neighborhoods.	X	
1.2	State policymakers can direct state agencies to increase funding from new and existing sources for rapid re-housing programs and rental assistance programs for pregnant women and families with very young children. Potential sources of new and existing funding include: a. Increased revenue to the Ohio Housing Trust Fund through increased county recordation fees b. Increased funding for these programs from the Ohio Development Services Agency c. Amending the state TANF spending plan to allow funds to be dedicated to these programs	X	
1.3	State policymakers can use recommendations from the OHFA evaluation of the Housing Assistance to Reduce Infant Mortality pilot project to plan future state-funded rental assistance programs targeted to reduce infant mortality.	X	
1.4	State policymakers can instruct key state agencies to establish low-cost financial incentives that will help public housing authorities implement housing preferences for pregnant women who are homeless or experiencing housing insecurity.	X	
<b>Goal 2</b>	<b>Reduce structural barriers to accessing affordable housing for the highest-risk renters (structural barriers include level of income, source of income, criminal record, etc.)</b>		
2.1	State legislators can pass legislation to reduce or eliminate barriers to obtaining affordable housing. Barriers that could be reduced or eliminated include: a. Landlord discrimination based on the source of income potential tenants will use to pay rent (such as Housing Choice Vouchers, Supplemental Security Income and Temporary Assistance for Needy Families) b. "Banning the box" or delaying the use of criminal background checks in the tenant screening process until after a conditional housing offer is made c. Restrictions on not renting to people with criminal records	X	
2.2	Local policymakers can increase access to private rental market housing for tenants with Extremely Low Incomes by establishing incentives, such as a 'mitigation fund' that could be used to mitigate some of the perceived risks associated with renting to tenants with Extremely or Very Low Incomes and rental assistance recipients, including ability to pay rent, lease compliance and general maintenance.		X
<b>Goal 3</b>	<b>Increase the supply of affordable rental housing for Extremely Low Income and Very Low Income households in high opportunity and low poverty areas</b>		
3.1	State policymakers can provide incentives, such as increased funding for services or preference for state grant programs, to municipalities that encourage and support the development of affordable housing in high opportunity areas within their communities.	X	
3.2	Local policymakers can require or incentivize that new housing developments implement inclusionary policies such as reserving a certain percentage of new units to be affordable as a condition of obtaining a zoning variance. Local policymakers can also require that housing developers work with local public housing authorities to ensure that new housing development will be eligible to accept rental assistance.		X
<b>Goal 4</b>	<b>Improve coordination of services for low-income families by convening cross-sector partnerships</b>		
4.1	Convene the Ohio Department of Medicaid, Ohio Housing Finance Agency, Ohio Development Services Agency, Ohio Capital Corporation for Housing, Ohio Mental Health and Addiction Services, Ohio Department of Health and Ohio's Medicaid managed care plans with Ohio Equity Institute partners and Continuums of Care to discuss ways that Medicaid managed care plans can support housing stability among Medicaid enrollees most at-risk for infant mortality, including people with low incomes and low levels of education attainment, African Americans and residents of infant mortality hot spot zip code areas or neighborhoods.	X	X

**Bold** = High priority



## Housing policy goals and recommendations (cont.)

		State	Local
4.2	<p>State policymakers can require service systems, such as Medicaid, Temporary Assistance for Needy Families (TANF) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), to collect information about the housing status of households during the application and re-certification process. This data could be collected consistently across systems and used to:</p> <ul style="list-style-type: none"> <li>a. Provide a standardized means for identifying and connecting people experiencing a housing crisis to appropriate and timely interventions</li> <li>b. Inform the allocation of resources to affordable housing programs</li> <li>c. Direct resources to areas with the greatest need</li> <li>d. Inform the development of cross-sector partnerships with the potential to improve housing outcomes for Ohioans</li> </ul>	X	
4.3	The Ohio Department of Health and the Ohio Housing Financial Agency can collaborate to create additional guidance for directing hospital community benefit spending to affordable housing strategies related to the State Health Improvement Plan.	X	
4.4	<p>State policymakers can maximize the impact of supportive services that are already being paid for by the state by:</p> <ul style="list-style-type: none"> <li>a. Targeting public grants to affordable housing providers that provide co-located services or effectively partner with community service providers</li> <li>b. Providing rent assistance funds to supportive service providers that engage individuals and families experiencing housing insecurity</li> <li>c. Providing housing counseling and asset-building programs for recipients of housing assistance to enable them to move up the housing continuum</li> </ul>	X	
<b>Goal 5</b>	<b>Increase the supply of affordable housing renters with Extremely Low Incomes</b>		
5.1	<p>State agencies can promote strategies that can be implemented at the local level to reduce financial and regulatory barriers to increasing the supply of affordable housing. Examples of strategies that could be promoted include:</p> <ul style="list-style-type: none"> <li>a. Adopting clearer and shorter permitting requirements for affordable housing development</li> <li>b. Revising zoning ordinances to reduce the need for variances and/or expedite the process for obtaining a variance for affordable housing development</li> <li>c. Allowing developers to purchase or use housing plans that are examples of good design that have been pre-approved by the city for conformance with building codes and/or other standards</li> <li>d. Allowing or encouraging the use of innovative housing design and construction techniques to reduce the cost of developing and operating affordable housing by investing in micro-housing, green affordable housing development and/or non-conventional building technology, such as modular, prefabricated or shipping container units</li> </ul>	X	
<b>Goal 6</b>	<b>Reduce the number of evictions and forced moves experienced by low-income families most at risk of infant mortality, including African Americans and pregnant women</b>		
6.1	State and local policymakers can increase rapid access to legal representation, landlord-tenant mediation and other supportive services, including emergency financial assistance, to prevent formal evictions experienced by low-income families most at risk of infant mortality, including African Americans and pregnant women.	X	X
6.2	State policymakers and the Ohio Supreme Court can commission research to determine how inequitable rental practices and discrimination based on race, gender and pregnancy status impact housing stability for low-income families most at risk of infant mortality, including African Americans and pregnant women, and provide recommendations for local executives and courts to address these issues.	X	
6.3	The Supreme Court of Ohio Domestic Violence Program can provide educational materials, training curriculum and other technical assistance to organizations that regularly interact with landlords, such as public housing authorities and landlord membership organizations, for the purpose of educating landlords on protections for survivors of domestic violence related to housing and eviction.	X	

**Bold** = High priority



## Housing policy goals and recommendations (cont.)

		State	Local
6.4	State policymakers can provide financial assistance to pregnant women who do not have access to paid medical leave to cover housing costs during periods of pregnancy-related leave from work.	X	
<b>Goal 7</b>	<b>Improve the quality of affordable housing stock</b>		
<b>7.1</b>	<b>State policymakers can increase funding to the Ohio Department of Health, local health departments and other local entities that screen for and remediate housing quality issues with potential impacts on health such as lead, mold and pests. Additional incentives could be developed for entities that give preference to women who are pregnant and families with infants.</b>	X	X
7.2	State legislators can reduce the waiting period for tenants to begin paying rent into escrow in cases when landlords do not quickly fix problems in rental units that are harmful to health for pregnant women and/or young children. Current law requires that tenants wait 30 days after providing written notice of problems to landlords before depositing rent in escrow except emergency cases and makes no exceptions for people with health conditions that may be particularly vulnerable to the health effects of poor quality housing.	X	
7.3	Local policymakers can purchase or otherwise acquire vacant, abandoned and other blighted properties for redevelopment into affordable housing.		X
7.4	State policymakers can commission research to examine the relationships between building code enforcement, health and housing instability. The purpose of the study could be to develop recommendations for local governments to balance the need to enforce building codes that negatively impact health without increasing housing instability among pregnant women and families with young children.	X	

**Bold** = High priority



## Transportation policy goals and recommendations

		State	Local
<b>Goal 1</b>	<b>Increase access to health care, particularly for pregnant women and parents of young children, by evaluating and continuously improving Medicaid Non-Emergency Medical Transportation provided through managed care plans</b>		
1.1	Medicaid managed care plans can monitor NEMT grievances from members and promptly make changes to improve the timeliness and quality of NEMT, prioritizing infant mortality hot spot areas.		X
1.2	Medicaid managed care plans can improve the timeliness, responsiveness and customer service of NEMT provided by vendors (including reduced wait times and improved scheduling process), and increase the overall accountability and transparency of the Medicaid NEMT system.		X
1.3	Medicaid managed care plans can explore the use of Lyft, Uber or other ride-sharing services and innovative technologies (such as apps) for NEMT.		X
1.4	The Ohio Department of Medicaid can carefully monitor and enforce managed care plan compliance with NEMT requirements in their contracts.	X	
<b>Goal 2</b>	<b>Increase access to health care, particularly for pregnant women and parents of young children, by evaluating and continuously improving Medicaid Non-Emergency Medical Transportation to be provided through the new state-based brokerage model starting in 2018</b>		
2.1	The Department of Medicaid can develop performance metrics and a data tracking system to monitor the effectiveness of the new brokerage model. Metrics to monitor include: a. Passenger information (type of visit, number of passengers, etc., while protecting patient privacy) b. Ride information (on-time rates, no-show rates for drivers and passengers, wait times, etc.) c. Quality of service information (complaints, driver reviews, call volume and responsiveness, etc.) The Department can use this information to monitor performance of vendors, identify trends, increase transparency and accountability, and improve service, particularly in infant mortality hot spot areas.	X	
2.2	The Department of Medicaid can use the results of the performance measurement described above to improve the timeliness, responsiveness, and customer service of NEMT provided by vendors (including reduced wait times and improved scheduling process) and increase the overall accountability and transparency of the Medicaid NEMT system.	X	
2.3	The Department of Medicaid can explore the use of Lyft, Uber or other ride sharing services and innovative technologies (apps) for NEMT.	X	
2.4	The Department of Medicaid can actively engage Medicaid enrollees through a Stakeholder Advisory Group or other mechanism to inform design of the new NEMT brokerage system, and monitor ongoing quality improvement. Feedback from residents of infant mortality hot-spot areas and low-income rural areas, in particular, should be included to ensure access to care for those at highest risk for infant mortality and transportation challenges.	X	
2.5	The Department of Medicaid can require vendors (drivers) to provide child car seats.	X	
<b>Goal 3</b>	<b>Strengthen access to public transportation by improving and expanding local bus systems</b>		
3.1	State policymakers can support bus systems by replacing lost revenue from the cut to transit authorities that resulted from the repeal of the Medicaid managed care organizations sales tax required by the federal government.	X	
3.2	State legislators can increase funding available to local bus systems from existing revenue by allowing gas tax and vehicle-related fee revenue to be used for transit systems through revision of ORC 5501.05. (ORC 5501.05 currently prohibits use of fuel or vehicle-related fees or taxes for non-highway purposes.)	X	
3.3	Local transit agencies, metropolitan planning organizations and other transportation partners can actively engage groups at high risk for infant mortality—particularly African-American and low-income families with young children—in decisions about transit services and improvements to the built environment.		X

**Bold** = High priority



## Transportation policy goals and recommendations (cont.)

		State	Local
3.4	Local transit agencies can improve local bus systems and prioritize the needs of pregnant women, families and people of childbearing age in transit system improvements: <b>a. Add or expand routes that better connect low-income communities to jobs, health care providers, grocery stores and other critical resources</b> <b>b. Provide more frequent and consistent service seven days a week</b> <b>c. Implement family-friendly policies that allow parents to bring strollers and other baby equipment onto buses (including priority seating for pregnant women and families with young children and eliminating bag limits)</b> <b>d. Increase the number of bus shelters and benches</b> <b>e. Provide discounted bus passes for low-income parents and pregnant women</b> <b>f. Coordinate with municipalities and developers to install sidewalks, crosswalks, lighting and other pedestrian safety features near bus stops</b>		X
3.5	Local municipalities can require real estate developers to include safe pedestrian access to bus stops in all new developments, where applicable.		X
3.6	State policymakers can incentivize the development of affordable residential and mixed-use development within a half-mile of quality public transit that can connect workers to jobs by incentivizing local governments to: a. Adopt land use controls that permit and encourage affordable, transit-friendly development b. Establish property acquisition funds or provide publicly-acquired land to facilitate the acquisition of land near transit corridors c. Secure public and private sector financing for development of affordable housing near transit corridors d. Integrate affordable housing planning with transit improvement projects (example: CMAX Bus Rapid Transit Line and the Smart Columbus initiative)	X	X
3.7	Local public-private partnerships can provide incentives for employees to use public transportation, such as by replicating Columbus' Capital Crossroads Special Improvement District COTA bus pass incentive program for downtown employees. (Increased ridership can strengthen the overall transit system and reduce air pollution.)		X
3.8	Local transit agencies and other local partners can monitor municipalities' compliance with requirements of Title VI of the Civil Rights Act of 1964 when planning transit routes and bus stop placement to ensure that transit access is not denied to residents on the basis of race. In cases where municipalities are not in compliance with Title VI, local partners can file a complaint with the Federal Highway Administration Office of Civil Rights and monitor corrective actions. (example: civil rights complaint filed against city of Beavercreek regarding new Greater Dayton Regional Transit Authority bus stops)		X
3.9	Local policymakers and municipal authorities can identify new sources of revenue for Federal Transit Administration (FTA) Section 5310 municipal match funds for transit access improvements (bus shelters, sidewalks, extended bus routes), including public-private partnerships with healthcare providers (hospital community benefit community-building funds), foundations and employers.		X
3.10	Local policymakers can incentivize employers to locate job sites on existing transit routes or to work with the local transit authority to add/extend bus routes to access the job sites.		X
<b>Goal 4</b>	<b>Improve pedestrian safety and active transportation through infrastructure design and investment</b>		
4.1	<b>The Ohio Department of Transportation can encourage local municipalities to adopt complete streets policies by providing model policies and increased technical assistance and support.</b>	X	X
4.2	<b>The Ohio Department of Transportation and local municipalities can prioritize funding for active transportation improvements, such as sidewalks and crosswalks, in infant mortality hot spot neighborhoods.</b>	X	X
4.3	<b>The Ohio Department of Transportation and local municipalities can integrate health equity considerations into zoning and development decision making by assigning additional points to projects that address inequities (for example, awarding extra points to projects that improve pedestrian safety near bus stops in infant mortality hot spot zip code areas).</b>	X	X
4.4	<b>Local municipalities can require real estate developers to include safe pedestrian access to bus stops in all new developments, where applicable.</b>		X
4.5	The Ohio Department of Transportation can allocate a larger proportion of existing federal funding toward bike and pedestrian projects.	X	

**Bold** = High priority



## Transportation policy goals and recommendations (cont.)

		State	Local
4.6	Local municipalities (city and village councils and county commissioners) and metropolitan planning organizations can adopt, implement and monitor complete streets policies, including zoning regulations that support street connectivity, mixed-use development, transit access, sidewalk and trail infrastructure and proximity of residential areas to health care, stores, jobs, schools and recreation in existing and new developments.		X
4.7	The Ohio Department of Transportation, Ohio Department of Public Safety, metropolitan planning organizations and local municipalities can review crash data to identify areas that are unsafe for pedestrians and identify strategies to improve safety in those areas.	X	X
4.8	Metropolitan planning organizations and local municipalities can ensure that roundabouts have pedestrian cross-walks and can educate the public about proper use of roundabouts.		X
<b>Goal 5</b>	<b>Decrease barriers to maintaining a driver's license</b>		
<b>5.1</b>	<b>State legislators can pass legislation authorizing courts to allow completion of a community service program in lieu of payment of a driver's license reinstatement fee when the court determines the offender cannot reasonably pay for those fees. (See SB 160 introduced in 132nd General Assembly.)</b>	X	
<b>5.2</b>	<b>State legislators can pass legislation authorizing courts to allow people with suspended licenses to continue driving to work and to healthcare appointments (for those suspended for non-driving-related offenses, e.g. inability to pay fees or fines).</b>	X	
5.3	The Bureau of Motor Vehicles can identify alternatives to the Random Selection Program (insurance verification letters sent 5,400 randomly-selected drivers per week) to ensure that low-income drivers who move frequently are not disproportionately targeted for license suspensions.	X	
5.4	Municipal courts can reduce fees for reinstatement of a suspended license or grant driving privileges for trips to employment or health care for drivers with suspended licenses (tiered approach to suspensions).		X
<b>Goal 6</b>	<b>Improve air quality through reduced vehicle emissions</b>		
<b>6.1</b>	<b>State policymakers can incentivize state agencies, local transit agencies, school districts and local municipalities to transition vehicle fleets to clean diesel technology.</b>	X	X
<b>6.2</b>	<b>Local transit agencies and school districts can implement vehicle anti-idling policies (education and signage to minimize time that drivers idle engines).</b>		X
<b>6.3</b>	<b>Municipalities can prohibit idling for their own for vehicle fleets.</b>		X
6.4	The Ohio Department of Transportation and Ohio Department of Administrative Services can allow state agencies, local governments or other entities to procure electric vehicles (EV) or compressed natural gas (CNG) vehicles through state purchasing contracts. (This is option is not currently available.)	X	
6.5	Local municipalities can create or support clean fueling infrastructure such as electric vehicle charging stations and natural gas/hydrogen fueling stations.		X
6.6	School districts can modify transportation policies to reduce the number of children bussed and driven to school and/or the number of bus miles traveled, and can implement or expand Safe Routes to Schools and Walking School Bus programs.		X
6.7	Metropolitan planning organizations and local municipalities can install air quality monitors to assess and report air pollution levels in infant mortality hot spot neighborhoods compared to other areas. Local partners can then work together to develop a plan to improve air quality in the high-pollution areas with strategies such as clean diesel fleets, anti-idling policies and reductions in vehicle miles traveled.		X

**Bold** = High priority





## Education policy goals and recommendations

		State	Local
<b>Goal 1</b>	<b>Strengthen early childhood education and family support programs</b>		
1.1	State and local policymakers can increase the provision of evidence-based parenting education and support interventions, such as home visiting.	X	X
1.2	State and local policymakers can increase the number of Ohio children served by high-quality child care, preschool and pre-K by increasing public funding for early learning programs to provide access for more 3 and 4 year-old children and/or exploring the possibility of more innovative funding mechanisms such as pay-for-success financing.	X	X
1.3	State policymakers can create incentives to encourage early childhood care and education programs to participate in Step Up To Quality and achieve high-quality ratings.	X	
<b>Goal 2</b>	<b>Increase high school graduation rates through high-quality programs geared toward the highest risk students</b>		
2.1	The Ohio Department of Education, State Board of Education, Ohio Department of Higher Education, Governor's Office of Workforce Transformation, local school districts and/or local philanthropic organizations can strengthen and expand use of the following evidence-based strategies: a. Career academies b. Talent search programs (programs to help low-income and first-generation college students complete high school and gain access to college) c. <b>Community schools</b> (Note: Charter schools in Ohio are referred to as "community schools" under Ohio law, ORC 3314.01, but this is different from the community schools model referenced here) d. School-based health centers e. Mentoring and/or case management programs, specifically for pregnant and parenting teens	X	X
2.2	School districts can support students' high school graduation by: a. Establishing community partnerships to facilitate provision of more support services (e.g., mental health services and supports, mentoring, child care, health care, including prenatal care) for struggling students, especially pregnant and parenting teens b. Providing early educational intervention services to at-risk students to keep them on a path toward academic success, high school graduation and career readiness c. Implementing career academies and identifying other ways to increase school engagement d. Recognizing early warning signs of dropout (e.g., chronic absenteeism, students falling far behind academically, suspensions/expulsions, etc.) and taking appropriate preventive action early (Districts can utilize the Student Success Dashboard offered by ODE) e. Implementing trauma-informed policies and practices in schools		X
2.3	State and local policymakers can encourage and support partnerships between schools and community health and social service providers to increase services offered to students and strengthen coordination of services.	X	X
2.4	The Ohio General Assembly can require the Ohio Department of Education to establish health education standards.	X	
2.5	State policymakers can strengthen data-sharing among state agencies (specifically the Ohio Department of Education, Ohio Department of Higher Education, Ohio Department of Medicaid, Ohio Department of Mental Health and Addiction Services, Ohio Department of Job and Family Services, Ohio Department of Health and Ohio Department of Developmental Disabilities) to more effectively identify and serve at-risk students.	X	
2.6	The Ohio Department of Education can continue to encourage and support implementation of social-emotional learning programs throughout the state.	X	
2.7	To strengthen dropout prevention and recovery programs, state policymakers can build upon the <b>Superintendent's Workgroup on Dropout Prevention and Recovery Summary Report</b> (released in July 2017) by: a. Implementing the recommendations outlined in the report, some of which focus on eligibility ages, accountability metrics and ODE oversight and support services b. Continuing to evaluate additional aspects of accountability and alternative funding models, as recommended in the summary report	X	

**Bold** = High priority



## Education policy goals and recommendations (cont.)

		State	Local
2.8	Local and/or state policymakers can revise school hiring policies and practices to increase diversity among teachers and staff.	X	X
2.9	School districts can utilize community partnerships to enhance health education among students.		X
2.10	State policymakers can require schools to teach comprehensive sexual education to students.	X	
2.11	School districts can identify ways to increase parent engagement in students' education.		X
<b>Goal 3</b>	<b>Strengthen career-technical education programs</b>		
<b>3.1</b>	<b>State policymakers can explore ways to increase capacity for secondary and postsecondary career-technical education (vocational training) programs by:</b> <b>a. Incentivizing businesses to partner with and provide support to career-technical education programs</b> <b>b. Working with schools and career-technical planning districts to re-evaluate and streamline teacher credentialing requirements</b> <b>c. Providing additional incentive-based resources for under-subscribed career-technical education programs, especially those in high-need career areas, in hopes of increasing enrollment in those programs</b>	X	
<b>3.2</b>	<b>State policymakers can identify ways to increase participation of high-school students in career-technical education (vocational training) programs such as:</b> <b>a. Increasing opportunities for work-based learning</b> <b>b. Further leveraging credit flexibility</b> <b>c. Allowing students to attend Ohio Technical Centers through College Credit Plus</b> <b>d. Encouraging schools to implement career academies</b>	X	
3.3	State policymakers can develop financial incentives for businesses who offer apprenticeship programs for above normal-age graduates.	X	
3.4	State policymakers can strengthen accountability requirements for career-technical education programs.	X	
<b>Goal 4</b>	<b>Reduce financial barriers to postsecondary education</b>		
<b>4.1</b>	<b>The Ohio Department of Higher Education can further tailor financial aid and scholarship eligibility criteria to students who would likely not be able to attend without this financial support.</b>	X	
<b>4.2</b>	<b>State policymakers can increase opportunities for Ohioans to obtain quality postsecondary credentials by raising appropriations for the Ohio College Opportunity Grant (OCOG) and requiring the Ohio Department of Higher Education to either reverse the Pell-first policy or otherwise reform OCOG so community college and OTC students can use financial aid to cover the total cost of attendance (not only tuition and fees, but other expenses such as textbooks and room and board as well). However, this will require policymakers to be mindful of not reducing allocations for currently-eligible recipients.</b>	X	
4.3	The Ohio General Assembly and the Ohio Department of Higher Education can enhance access to state-funded, need-based financial aid and scholarships for postsecondary education such as the Ohio College Opportunity Grant by: a. Increasing funding for these programs b. Exploring ways to increase FAFSA completion rates c. Re-evaluating programs to ensure that older applicants returning to school have access equal to that of students just finishing high school	X	
4.4	State policymakers can increase state funding for community colleges and public universities to bring tuition costs down.	X	
<b>Goal 5</b>	<b>Increase the number of Ohio adults who take and pass high school equivalency exams or pursue other paths to earn a high school diploma</b>		
<b>5.1</b>	<b>State policymakers can explore ways to improve the quality and effectiveness of the Adult Diploma Program, the 22+ Adult High School Diploma Program and preparation services for high school equivalency tests provided by Aspire (formerly ABLE) programs, especially in infant mortality hot spot areas.</b>	X	

**Bold** = High priority



## Education policy goals and recommendations (cont.)

		State	Local
5.2	The Ohio Department of Education can identify ways to increase the number of people who take high school equivalency tests and participate in the adult diploma programs such as: a. Maintaining or increasing financial vouchers for test-takers b. Creating incentives for people to complete test preparation courses and take the equivalency tests or enroll in one of the adult diploma programs c. Increasing awareness of the adult diploma programs and encouraging more providers to offer programs	X	
<b>Goal 6</b>	<b>Improve college preparation and college entry programs and services for low-income Ohioans</b>		
<b>6.1</b>	<b>Local school districts can:</b> <b>a. Provide more assistance to students and families applying for financial aid and completing college applications</b> <b>b. Offer ACT/SAT preparation services, especially for low-income students</b> <b>c. Deliver more college and career advising services, beginning at younger ages, which include information about career-technical education programs, community colleges and other educational options outside of four-year college degrees</b>		X
<b>6.2</b>	<b>State policymakers can identify ways to expand the reach of College Credit Plus, especially in low-income and rural areas, such as through:</b> <b>a. Expanding financial support or incentives for teachers to obtain the necessary credentials to become College Credit Plus instructors in their own schools</b> <b>b. Identifying new or innovative pathways to expand opportunities for students to pursue technical certificates or credentials through College Credit Plus</b>	X	
6.3	State policymakers and local postsecondary education providers can explore ways to offer remedial education services for students wanting to attend college but lacking the proper academic preparation.	X	X
<b>Goal 7</b>	<b>Reduce other barriers to high school completion programs and postsecondary education for students</b>		
<b>7.1</b>	<b>Institutions of higher education can implement retention programs and interventions, such as first year experience programs, co-requisite remediation models and guided pathways, especially for first-generation college students.</b>		X
7.2	Local educational providers can offer more flexible class options for students who work during the day or have other timing restraints such as online programs and class offerings in convenient locations and at convenient times.		X
7.3	The Ohio General Assembly can increase funding for child care vouchers for parents from lower income families who are in school.	X	
7.4	State policymakers can require cultural competency training for educators.	X	

**Bold** = High priority



## Employment policy goals and recommendations

		State	Local
<b>Goal 1</b>	<b>Increase incomes for pregnant women and parents of young children</b>		
1.1	State policymakers can expand the state Earned Income Tax Credit (EITC), lift the existing cap on the credit, make it refundable and/or expand the credit to non-custodial parents.	X	
1.2	State policymakers can prioritize funds for career-technical education (vocational training) to: a. Jobs and/or employers that pay a living wage b. Jobs and/or employers that are offering a lower wage but in a job with an articulated and stepped career pathway to higher wages and benefits c. Employers that do not have a history of wage and hour violations d. Employers that have relatively low turnover e. Jobs that are in-demand or on the 21st Century Jobs list. These programs could also include job search assistance and comprehensive support services (including child care) during training.	X	
1.3	Local policymakers, infant mortality collaboratives and other partners can encourage employers to voluntarily adopt living wage policies.		X
1.4	State policymakers can create a refundable Child Tax Credit and/or a refundable Child and Dependent Care Credit for Ohio citizens.	X	
1.5	State policymakers can create a matched dollar incentive program for people with low incomes, incentivizing people to deposit some or all of their tax refund (including EITC) in a savings account. This program can either be administered by the state or by a contracted organization.	X	
1.6	State policymakers can increase investigation of state employment law violations by increasing designated funding to the wage and hour division of the Department of Commerce.	X	
1.7	State and local policymakers can convene employers of low-wage workers to discuss program and policy changes that will encourage upward mobility for employees and advancement within their companies.	X	X
1.8	Local policymakers can implement wage theft ordinances that apply to the local government as an employer, as well as external contractors with the local government. Wage theft ordinances increase monitoring and enforcement of wage and hour laws to ensure that all local government employees and contractors are paid the legal or contractual wage for all hours worked (see <a href="#">Cincinnati's wage theft ordinance</a> passed in 2016).		X
1.9	Local policymakers can increase transparency related to wages paid in the jurisdiction by compiling a list of employers that pay a living wage and posting it on a public website.		X
<b>Goal 2</b>	<b>Reduce unemployment and under employment</b>		
2.1	State policymakers can reform occupational licensing to reduce barriers to employment, such as through reductions in license requirements for some occupations, including cosmetology. (See SB 129 for an example of proposed legislation to reduce the required number of training hours for a cosmetology license in Ohio.)	X	
2.2	State policymakers can reduce barriers to employment related to criminal convictions by increasing monitoring and enforcement of the Ohio Fair Hiring Act, which prohibits public employers from asking any questions about conviction history on a job application or previous salary ("ban the box"), as well as extending this same prohibition to any employer with a state contract over \$50,000.	X	
2.3	State policymakers can reduce barriers to employment related to criminal convictions by offering tax benefits to employers who hire people with criminal records. Tax benefits can be paired with legislation reducing civil liability for employers who hire people with criminal records.	X	
<b>Goal 3</b>	<b>Increase access to work supports</b>		
3.1	State policymakers can increase funding for child care subsidies so that eligibility limits can be restored to 200 percent FPL and more families can access child care. Access can also be expanded by increasing the reimbursement rate paid to child care centers to the 75th percentile, making 75 percent of the state's child care centers affordable to voucher families.	X	

**Bold** = High priority

## Employment policy goals and recommendations (cont.)

		State	Local
3.2	State policymakers can incentivize employers to provide child care subsidies to their employees in order to remove barriers to employment for parents, particularly those with part-time and/or low-wage jobs.	X	
3.3	The Ohio Department of Job and Family Services can analyze and evaluate the effectiveness of the Comprehensive Case Management and Employment Program (CCMEP). If the evaluation is favorable, policymakers can increase funding for CCMEP to connect more youth and young adults with low incomes to skilled employment in Ohio.	X	
3.4	State policymakers can review eligibility levels for government programs that serve individuals with low incomes in order to remove disincentives for job attainment or wage increases ("benefit cliffs"). Eligibility levels for programs such as medical, food and child assistance should be aligned with the self-sufficiency of the program recipients.	X	
3.5	The Ohio Department of Job and Family Services can license day care centers that provide child care on a temporary, irregular basis to children with short-term illnesses (see HB 77, introduced in the 132 General Assembly).	X	
<b>Goal 4</b>	<b>Adopt more robust leave policies and employment benefits</b>		
4.1	State policymakers can offer low-cost incentives to employers, primarily those with part-time and/or low-wage workers, who choose to offer employment benefits, such as paid family leave, sick leave and work schedule predictability. An example of a low-cost incentive may be awarding employers additional points in a state contracting process.	X	
4.2	State policymakers can prohibit employers, primarily those offering part-time, classified and/or low-wage work, from discriminating against employees who breastfeed.	X	
4.3	The Ohio Department of Job and Family Services can provide, on its website, information and links to other websites where employers can access information regarding methods to accommodate nursing mothers in the workplace.	X	
4.4	Local municipalities and local infant mortality partners can monitor the legal challenges to Senate Bill 331 to determine the extent to which local governments can establish employment policies, such as minimum wage, leave policies and schedule predictability.		X
4.5	The Ohio Department of Job and Family Services can require employers who receive funding for supported work programs, training and other programs to offer employee benefits, such as paid parental leave, paid sick leave and nursing support. Additional funding may be required.	X	
4.6	State policymakers can require and subsidize more types of employers to offer employer sponsored health insurance to their employees, including those offering part-time or low wage work. This employer sponsored health insurance should cover services that will benefit pregnant women and/or women of childbearing age, including prenatal services, contraception and postnatal care.	X	
4.7	State policymakers can require employers to provide additional breastfeeding supports above the minimum requirements specified in the Fair Labor Standards Act (such as increasing time allowed for expressing milk at work, paying employees for that time, the availability of refrigeration, etc.).	X	
4.8	State policymakers can require or incentivize employers to increase breastfeeding supports in the employment setting, including providing education for pregnant and lactating women on the benefits of breast feeding, as well as offering support from supervisors and coworkers.	X	
4.9	State policymakers can encourage employers to provide health and wellness opportunities as employment benefits.	X	
4.10	State policymakers can create employment protections for victims of violent crimes, such as a set amount of unpaid time off so that victims can seek protection services.	X	
4.11	State policymakers can make unemployment compensation available to people who resign from their jobs for safety reasons, such as survivors of domestic violence.	X	
<b>Goal 5</b>	<b>Reduce exposure to toxic and persistent stress in employment settings</b>		
5.1	State policymakers can increase enforcement efforts related to discriminatory workplace practices through the Ohio Civil Rights Commission (OCRC) by increasing the staff at OCRC to implement enforcement.	X	
5.2	State policymakers can consider an employer's record with the OCRC when determining tax incentives, and assess a fee on employers with regular complaints to the OCRC. Revenue gained from these fees can be dedicated to fund education programs on eliminating discrimination in the workplace.	X	
5.3	The State of Ohio can increase work schedule predictability for state employees, particularly those who work part-time or are on-call, by adopting a policy to provide scheduling notice at least 7 days in advance.	X	

## Cross-cutting policy recommendations

		State	Local
1	<b>Monitor and evaluate implementation of the recommendations in this report.</b> State legislators can request that the Commission on Infant Mortality monitor the extent to which the recommendations in this report are implemented and report findings to House and Senate leadership and all relevant committees on an annual basis.	X	
2	<b>Increase the effectiveness of policies and programs serving Ohioans most at-risk for infant mortality.</b> State agencies and local organizations can increase the effectiveness of policies and programs serving Ohioans most at risk for infant mortality by: <ul style="list-style-type: none"> <li>a. Hosting cultural competence and implicit bias training for staff</li> <li>b. Implementing programs like Michigan's Practices to Reduce Infant Mortality through Equity (PRIME) initiative to address health disparities through the social determinants of health and the identification and elimination of policies and practices that support institutional racism and discrimination</li> <li>c. Increasing workforce diversity through recruitment of minority and rural/Appalachian students for health and human services higher-education programs</li> <li>d. Implementing evidence-based strategies to prevent violence and integrating trauma-informed care approaches into existing services and programs</li> </ul>	X	X
3	<b>Increase local-level leadership and advocacy to address the social determinants of health.</b> Local infant mortality reduction collaboratives and other local partners can: <ul style="list-style-type: none"> <li>a. Identify which policy goals to focus on from this report that best address challenges, inequities and social drivers within their communities, guided by input from community residents and local/neighborhood-level data</li> <li>b. Implement specific local-level recommendations in this report that align with the selected policy goals</li> <li>c. Advocate for state-level recommendations that align with the selected policy goals and recommendations</li> <li>d. Gather and disseminate qualitative information and real-life stories from Ohio families that illustrate the housing, transportation, education and employment challenges and inequities described in this report</li> </ul>		X
4	<b>Measure, report and act upon disparities and inequities data.</b> State agencies can collect and report data on infant mortality, birth outcomes and related inequities in the social, economic and physical environment disaggregated by race, ethnicity, income level, sex and geography. In addition, local partners can collect and use local-level data (e.g., by zip code or census tract) and advocate for improved data collection that allows for actionable analysis, transparency and accountability for differences in health and community conditions by race, ethnicity, income level, sex and geography.	X	X
5	<b>Coordinate, collaborate and evaluate.</b> State agencies and other state or local-level organizations can work together to coordinate, evaluate and continuously improve infant mortality reduction policies and programs.	X	X
6	<b>Expand upon case study findings.</b> State policymakers can commission a study to assess the extent to which Ohio is implementing the evidence-based strategies used in other states that have led to larger improvements in infant mortality. (Determine, for example, the number of families reached by Centering Pregnancy and Nurse-Family Partnership in Ohio compared to the case study states.)	X	

## Appendix B. Evidence inventories

### Housing evidence inventory

Effective policies and programs to address housing challenges and inequities relevant to infant mortality

#### Key

**SHIP** = 2017-2019 State Health Improvement Plan strategy

**Red** = Leading causes of infant mortality

*Italics* = Outcomes also relevant to transportation, education, employment, poverty, racism, stress or violence

#### Affordability

Relevant policy goals:

- Increase the availability of rental assistance programs for renters with Extremely Low Incomes
- Reduce structural barriers to accessing affordable housing for the highest-risk renters (structural barriers include level of income, source of income, criminal record, etc.)
- Increase the supply of affordable housing for renters with Extremely Low Incomes
- Improve coordination of services for low-income families by convening cross-sector partnerships

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
1. <b>Tenant-based rental assistance</b> <b>SHIP</b>	CG: Recommended: <ul style="list-style-type: none"> <li>• <i>Reduced exposure to crimes against person and property</i></li> <li>• Decreases in neighborhood social disorder</li> </ul> WWFH ( <b>Housing Choice Voucher Program (Section8)</b> ): Some evidence: <ul style="list-style-type: none"> <li>• Increased neighborhood choice</li> <li>• Increased neighborhood socio-economic diversity</li> <li>• <i>Reduced exposure to crime</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Reduced poverty</i></li> <li>• Reduced homelessness</li> <li>• <i>Increased food security</i></li> <li>• Increased housing stability</li> </ul>	WWFH: likely to decrease disparities
2. <b>Low-income housing tax credits</b> <b>SHIP</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• Increased access to affordable housing</li> <li>• Increased access to quality housing</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Reduced crime</i></li> <li>• Increased neighborhood socio-economic diversity</li> </ul>	WWFH: likely to decrease disparities
3. <b>Inclusionary zoning</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• Increased access to affordable housing</li> <li>• Increased access to quality housing</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Increased neighborhood socio-economic diversity</li> </ul>	WWFH: likely to decrease disparities
4. <b>Living wage laws</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• <i>Increased earnings</i></li> <li>• <i>Reduced poverty</i></li> </ul>		WWFH: likely to decrease disparities
5. <b>Earned Income Tax Credit</b> <b>SHIP</b>	WWFH: Scientifically supported <ul style="list-style-type: none"> <li>• <i>Increased income</i></li> <li>• <i>Increased employment</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Increased academic achievement</i></li> <li>• <i>Improved maternal health</i></li> <li>• <b>Improved birth outcomes</b></li> </ul>	WWFH: likely to decrease disparities
6. <b>Matched dollar incentives for saving tax refunds</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• <i>Increased asset accumulation</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Increased financial stability</i></li> </ul>	WWFH: likely to decrease disparities



## Neighborhood conditions

Relevant policy goals:

- Increase the supply of affordable rental housing for Extremely Low Income and Very Low Income households in high opportunity and low poverty areas
- Improve coordination of services for low-income families by convening cross-sector partnerships

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
7. <b>Green space and parks SHIP</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• <i>Increased physical activity</i></li> </ul> CG ( <b>Creating or Improving Places for Physical Activity</b> ): Recommended: <ul style="list-style-type: none"> <li>• <i>Increase physical activity</i></li> <li>• <i>Improved fitness</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Reduced obesity rates</i></li> <li>• <i>Improved mental health</i></li> <li>• <i>Reduced crime</i></li> <li>• <i>Reduced stress</i></li> <li>• <b>Improved birth outcomes</b></li> </ul>	WWFH: likely to decrease disparities
8. <b>Zoning regulations for land use policy</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <i>Increased physical activity</i></li> <li>• <i>Increased active transportation</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Reduced vehicle miles traveled</i></li> <li>• <i>Reduced crime</i></li> <li>• <i>Reduced stress</i></li> <li>• <i>Improved sense of community</i></li> </ul>	
9. <b>Land banking</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• <i>Reduced blight</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Improved neighborhood quality</i></li> <li>• <i>Increased neighborhood socio-economic diversity</i></li> <li>• <i>Increased access to affordable housing</i></li> <li>• <i>Improved sense of community</i></li> </ul>	WWFH: likely to decrease disparities
10. <b>Mixed-use development</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <i>Increased physical activity</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Increased active transportation</i></li> <li>• <i>Improved health outcomes</i></li> <li>• <i>Reduced vehicle miles traveled</i></li> </ul>	
11. <b>Community Development Block Grants (CDBGs)</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• <i>Improved housing conditions</i></li> <li>• <i>Increased housing stability</i></li> <li>• <i>Improved neighborhood quality</i></li> </ul>		WWFH: likely to decrease disparities
12. <b>Focused deterrence strategies</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <i>Reduced crime</i></li> </ul>		WWFH: likely to decrease disparities
13. <b>Neighborhood watch</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <i>Reduced crime</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Reduced vandalism</i></li> </ul>	
14. <b>Cognitive-behavioral therapy for offenders</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <i>Reduced crime</i></li> <li>• <i>Reduced recidivism</i></li> </ul>		
15. <b>Community policing</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <i>Increased satisfaction with law enforcement</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Improved neighborhood safety</i></li> <li>• <i>Reduced crime</i></li> <li>• <i>Increased problem solving skills</i></li> </ul>	
16. <b>Healthy food in convenience stores SHIP</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• <i>Increased access to healthy foods in food deserts</i></li> <li>• <i>Increased access to fruits and vegetables</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Increased healthy food purchases</i></li> </ul>	WWFH: likely to decrease disparities
17. <b>Farmers' markets/stands SHIP</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• <i>Increased access to fruits and vegetables</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Increased healthy foods in food deserts</i></li> <li>• <i>Increased fruit and vegetable consumption</i></li> <li>• <i>Strengthened local food systems</i></li> <li>• <i>Improved local economy</i></li> </ul>	





Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<b>18. Healthy food initiatives in food banks SHIP</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Increased healthy food consumption</li> <li>Increased food security</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Improved nutrition</li> <li>Improved weight status</li> </ul>	WWFH: likely to decrease disparities
<b>19. Community gardens SHIP</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Increased access to fruits and vegetables</li> <li>Increased fruit and vegetable consumption</li> <li>Increased physical activity</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased food security</li> <li>Increased healthy foods in food deserts</li> <li>Reduced obesity rates</li> <li>Improved mental health</li> <li>Improved sense of community</li> <li>Improved neighborhood safety</li> </ul>	

## Stability

Relevant policy goals:

- Increase the availability of rental assistance programs for renters with Extremely Low Incomes
- Reduce the number of evictions and forced moves experienced by low-income families most at risk of infant mortality, including African Americans and pregnant women
- Improve coordination of services for low-income families by convening cross-sector partnerships

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<b>20. Community land trusts</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Increased housing stability</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased access to affordable housing</li> <li>Improved neighborhood quality</li> </ul>	WWFH: likely to decrease disparities
<b>21. Service-enriched housing SHIP</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Reduced homelessness</li> <li>Increased housing stability</li> <li>Reduced hospital utilization</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Improved health outcomes</li> <li>Improved mental health</li> </ul>	WWFH: likely to decrease disparities
<b>22. Rapid re-housing programs</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Reduced homelessness</li> <li>Improved access to social services</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Improved housing stability</li> <li>Increased food security</li> <li>Improved health outcomes</li> <li>Improved mental health</li> <li>Increased income</li> </ul>	WWFH: likely to decrease disparities



## Quality

Relevant policy goals:

- Improve the quality of affordable housing stock
- Improve coordination of services for low-income families by convening cross-sector partnerships

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<b>23. Home rehabilitation loan and grant programs SHIP</b>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• <i>Improved health outcomes</i></li> <li>• <i>Improved mental health</i></li> </ul> <p>Hi-5: Recommended:</p> <ul style="list-style-type: none"> <li>• <i>Improvement in general health status</i></li> <li>• <i>Improvement in respiratory health</i></li> <li>• <i>Improvement in mental health</i></li> <li>• <i>Reduction in visits to general practitioners</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Increased energy efficiency</i></li> <li>• <i>Reduced hospital utilization</i></li> <li>• <i>Reduced absenteeism</i></li> <li>• <i>Improved neighborhood quality</i></li> </ul>	WWFH: likely to decrease disparities
<b>24. Integrated pest management for indoor use</b>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• <i>Reduced pesticide exposure</i></li> <li>• <i>Improved health outcomes</i></li> <li>• <i>Improved housing conditions</i></li> </ul>		WWFH: likely to decrease disparities
<b>25. Lead paint abatement programs</b>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• <i>Reduced lead exposure</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Reduced blood lead levels</i></li> <li>• <i>Improved health outcomes</i></li> <li>• <i>Improved child behavior</i></li> <li>• <i>Improved youth behavior</i></li> <li>• <i>Reduced healthcare costs</i></li> </ul>	
<b>26. Healthy home environment assessments SHIP</b>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• <i>Reduced exposure to allergens</i></li> <li>• <i>Reduced hospital utilization</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Improved asthma management</i></li> <li>• <i>Improved quality of life</i></li> <li>• <i>Improved indoor air quality</i></li> <li>• <i>Improved health outcomes</i></li> </ul>	WWFH: likely to decrease disparities

## Sources and acronyms

HPIO searched the following systematic reviews and evidence registries to develop this inventory. Search terms aligned with the pathway diagrams (dark blue boxes) and findings of the literature review.

Systematic review or evidence registry*	Recommendation level(s)/Evidence rating included in this inventory
<b>What Works for Health (WWFH):</b> Evidence registry from County Health Rankings and Roadmaps, a project of the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation	<ul style="list-style-type: none"> <li>• Scientifically supported</li> <li>• Some evidence</li> </ul>
<b>Hi-5 (Health Impact in 5 Years):</b> Recommendations from CDC	Recommended
<b>The Guide to Community Preventive Services (Community Guide, CG):</b> Systematic reviews from the U.S. Centers for Disease Control and Prevention (CDC)	Recommended

\* Also consulted What Works Clearinghouse and Top Tier Evidence, although no relevant reviews were found for housing.



## Transportation evidence inventory

Effective policies and programs to address transportation challenges and inequities relevant to infant mortality

### Key

**SHIP** = 2017-2019 State Health Improvement Plan strategy

**Red**= Leading causes of infant mortality

*Italics*= Outcomes also relevant to housing, education, employment, poverty, racism, stress or violence

### Access and connectivity

Relevant policy goals:

- Strengthen access to public transportation by improving and expanding local bus systems
- Improve Medicaid Non-Emergency Transportation (state-based brokerage model and managed care plans)

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
1. <b>Public transportation systems</b> (Introduction or expansion)	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• Increased access to public transit</li> <li>• Increased use of public transit</li> </ul> <b>Hi-5:</b> Recommended	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Increased physical activity</i></li> <li>• Reduced vehicle miles traveled</li> <li>• Reduced emissions</li> </ul>	WWFH- likely to decrease disparities
2. <b>Individual incentives for public transportation</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• Increased use of public transit</li> <li>• <i>Increased physical activity</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Increased active transportation</li> <li>• <i>Reduced obesity rates</i></li> <li>• Increased mobility</li> <li>• Reduced vehicle miles traveled</li> <li>• Reduced emissions</li> </ul>	
3. <b>Non-Emergency Medical Transportation</b>	NASEM: <ul style="list-style-type: none"> <li>• <i>Increased use of prenatal care</i></li> <li>• Decreased healthcare spending (non-emergency medical transportation on prenatal care is cost saving)</li> </ul>	NASEM: <ul style="list-style-type: none"> <li>• <b>Reduced premature birth</b></li> </ul>	

### Active transportation and traffic safety

Relevant policy goals:

- Improve pedestrian safety and active transportation through infrastructure design and investment
- Improve air quality through reduced vehicle emissions

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
4. <b>Zoning regulations for land use policy</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <i>Increased physical activity</i></li> <li>• Increased active transportation</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Reduced vehicle miles traveled</li> <li>• <i>Reduced crime</i></li> <li>• <i>Reduced stress</i></li> <li>• Improved sense of community</li> </ul>	
5. <b>Mixed use development</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <i>Increased physical activity</i></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Increased active transportation</li> <li>• <i>Improved health outcomes</i></li> <li>• Reduced vehicle miles traveled</li> </ul>	



Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
6. Built environment approaches combining transportation system interventions with land use and environmental design	CG: Recommended: <ul style="list-style-type: none"> <li>Increased physical activity</li> <li>Increased active transportation</li> </ul>		
7. Complete streets and streetscape design initiatives SHIP	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased physical activity</li> <li>Increased pedestrian and cyclist safety</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased active transportation</li> <li>Reduced obesity rates</li> <li>Improved sense of community</li> <li>Improved neighborhood safety</li> <li>Reduced stress</li> <li>Reduced vehicle miles traveled</li> </ul>	
8. Bike and pedestrian master plans SHIP	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Increased physical activity</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased active transportation</li> <li>Reduced injuries</li> <li>Reduced vehicle miles traveled</li> <li>Reduce emissions</li> </ul>	
9. Safe Routes to School SHIP	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased active transportation</li> </ul> Hi-5: Recommended	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased physical activity</li> <li>Improved health outcomes</li> <li>Increased pedestrian and cyclist safety</li> <li>Reduced emissions</li> <li>Reduced vehicle miles traveled</li> </ul>	
10. Walking school buses	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased active transportation</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased physical activity</li> <li>Improved health outcomes</li> <li>Improved sense of community</li> <li>Increased academic achievement</li> <li>Reduced vehicle miles traveled</li> <li>Reduced emissions</li> </ul>	

## Air quality

Relevant policy goal:

- Improve air quality through reduced vehicle emissions

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
11. Clean diesel technology fleet transition programs	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Reduced emissions</li> <li>Improved air quality</li> </ul> Hi-5: Recommended	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Improved health outcomes</li> </ul>	
12. Vehicle anti-idling initiatives	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Reduced vehicle idling</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Reduced emissions</li> <li>Improved air quality</li> <li>Improved health outcomes</li> </ul>	
13. Vehicle inspection and maintenance (I/M) programs	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Reduced emissions</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Improved air quality</li> </ul>	

**Sources and acronyms**

HPIO searched the following systematic reviews and evidence registries to develop this inventory. Search terms aligned with the pathway diagrams (dark blue boxes) and findings of the literature review.

Systematic review or evidence registry*	Recommendation level(s)/Evidence rating included in this inventory
<b>What Works for Health (WWFH):</b> Evidence registry from County Health Rankings and Roadmaps, a project of the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation	<ul style="list-style-type: none"> <li>• Scientifically supported</li> <li>• Some evidence</li> </ul>
<b>Hi-5 (Health Impact in 5 Years):</b> Recommendations from CDC	Recommended
<b>The Guide to Community Preventive Services (Community Guide, CG):</b> Systematic reviews from the U.S. Centers for Disease Control and Prevention (CDC)	Recommended
<b>National Academies of Sciences, Engineering and Medicine (NASEM)</b> Consensus Study Reports	N/A

\*Also consulted Washington State Institute for Public Policy Benefit-Cost Results, Campbell Library of Systematic Reviews, and Top Tier Evidence, although no relevant reviews were found for transportation.



## Education evidence inventory

Effective policies and programs to address education challenges and inequities relevant to infant mortality

### Key

**SHIP** = 2017-2019 State Health Improvement Plan strategy

**Red**= Leading causes of infant mortality

*Italics*= Outcomes also relevant to housing, transportation, employment, poverty, racism, stress or violence

### Educational attainment

Relevant policy goals:

- Strengthen early childhood education and family support programs
- Increase high school graduation rates through high-quality programs geared toward the highest risk students
- Strengthen career-technical education programs
- Reduce financial barriers to postsecondary education
- Increase the number of Ohio adults who take and pass high school equivalency exams or pursue other paths to earn a high school diploma
- Improve college preparation and college entry programs and services for low-income Ohioans
- Reduce other barriers to high school completion programs and postsecondary education for students

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<b>Early childhood strategies</b>			
1. <b>Early childhood home visiting programs SHIP</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• <b>Reduced child maltreatment</b></li> <li>• Reduced child injury</li> <li>• Improved cognitive skills</li> <li>• Improved social emotional skills</li> </ul> CG: Recommended <ul style="list-style-type: none"> <li>• <b>Reduced child maltreatment</b></li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Improved parenting</li> <li>• Improved prenatal care</li> <li>• <b>Improved birth outcomes</b></li> <li>• <i>Reduced rapid repeat pregnancies</i></li> <li>• <i>Increased use of contraception</i></li> </ul>	WWFH- likely to decrease disparities
2. <b>Early Head Start</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• Improved cognitive skills</li> <li>• Improved social emotional skills</li> <li>• Improved family functioning</li> </ul> WSIPP	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Reduced aggression</li> <li>• <i>Reduced stress</i></li> <li>• Improved parenting</li> <li>• Increased school readiness</li> <li>• <i>Increased family income</i></li> <li>• Reduced hospital utilization</li> </ul>	WWFH- likely to decrease disparities



Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<p>3. <b>Preschool education programs SHIP</b></p>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>Increased academic achievement</li> <li>Improved cognitive skills</li> <li>Improved social emotional skills</li> </ul> <p>CG: Recommended</p> <ul style="list-style-type: none"> <li>Improved educational outcomes</li> <li>Improved social and health outcomes</li> </ul> <p>Hi-5: Recommended</p> <ul style="list-style-type: none"> <li>Improved cognitive development</li> <li>Improved emotional development</li> <li>Improved self-regulation</li> <li>Improved academic achievement</li> <li>Reduced teen birth rates</li> <li>Reduced crime rates</li> </ul> <p>WSIPP</p>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>Increased high school graduation</li> <li>Reduced delinquent behavior</li> <li>Improved healthy behaviors</li> <li>Improved mental health</li> <li>Reduced obesity</li> </ul>	<p>WWFH- likely to decrease disparities</p> <p>CG - Health equity recommendation</p>
<p>4. <b>Preschool and child care Quality Rating and Improvement Systems (QRIS)</b></p>	<p>WWFH: Some evidence:</p> <ul style="list-style-type: none"> <li>Improved child care quality</li> <li>Improved preschool quality</li> </ul>		
<p>5. <b>Preschool programs with family support services</b></p>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>Increased academic achievement</li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>Improved cognitive skills</li> <li>Reduced delinquent behavior</li> <li>Reduced arrests</li> <li>Reduced obesity</li> <li>Improved healthy behaviors</li> <li>Improved mental health</li> </ul>	<p>WWFH- likely to decrease disparities</p>
<p>6. <b>Universal pre-kindergarten SHIP</b></p>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>Improved cognitive skills</li> <li>Improved social emotional skills</li> <li>Increased academic achievement</li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>Increased earnings</li> <li>Reduced child care costs</li> </ul>	<p>WWFH- likely to decrease disparities</p>
<p><b>Strategies to increase high school graduation and postsecondary education</b></p>			
<p>7. <b>Career academies</b></p>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>Increased high school graduation</li> <li>Increased academic achievement</li> <li>Improved student attendance</li> </ul> <p>Top Tier Evidence: Top Tier:</p> <ul style="list-style-type: none"> <li>Sustained increase in annual earnings for men</li> </ul> <p>WWC: Potentially positive effects:</p> <ul style="list-style-type: none"> <li>Completing school</li> <li>Staying in school</li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>Increased earnings</li> </ul>	<p>WWFH- likely to decrease disparities</p>



Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
8. <b>Career and technical education for high school graduation</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased high school graduation</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased employment</li> <li>Increased earnings</li> <li>Reduced arrests</li> <li>Reduced incarceration</li> </ul>	WWFH- likely to decrease disparities
9. <b>Dropout prevention programs</b>  (Also called <b>High school completion programs</b> )	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased high school graduation</li> </ul> CG: Recommended <ul style="list-style-type: none"> <li>Increased high school graduation</li> </ul> Campbell	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Reduced absenteeism</li> </ul>	WWFH- likely to decrease disparities  CG – Health equity recommendation
10. <b>Dropout prevention programs for teen mothers</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased high school graduation</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Reduced teen pregnancy</li> <li>Improved health outcomes</li> </ul>	WWFH- likely to decrease disparities
11. <b>Alternative high schools for at-risk students</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased high school graduation</li> </ul>		WWFH- likely to decrease disparities
12. <b>High school redirection</b>	WWC: Potentially positive effects: <ul style="list-style-type: none"> <li>Progressing in school</li> </ul>		
13. <b>College access programs</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased college enrollment</li> </ul>		WWFH- likely to decrease disparities
14. <b>H&amp;R Block college financial aid application assistance</b>	Top Tier Evidence: Top Tier: <ul style="list-style-type: none"> <li>Increased college attendance</li> <li>Increased likelihood of attending college for two consecutive years</li> <li>Higher likelihood of receiving a federal need-based grant (Pell grant)</li> </ul>		
15. <b>ACT/SAT preparation and coaching programs</b>	WWC: Positive effects: <ul style="list-style-type: none"> <li>General academic achievement – high school</li> </ul>		
16. <b>Talent search</b>	WWC: Potentially positive effects: <ul style="list-style-type: none"> <li>Completing school</li> </ul>		
17. <b>Dual enrollment programs</b>	WWC: Positive effects: <ul style="list-style-type: none"> <li>Access and enrollment</li> <li>Attainment</li> <li>Completing school</li> <li>Credit accumulation</li> <li>General academic achievement – high school</li> </ul> WWC: Potentially positive effects: <ul style="list-style-type: none"> <li>High school attendance</li> <li>College readiness</li> <li>Staying in school</li> </ul>		
18. <b>First year experience courses</b>	WWC: Potentially positive effects: <ul style="list-style-type: none"> <li>Academic achievement</li> <li>Attainment</li> <li>Credit accumulation and persistence</li> </ul>		





Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<p><b>19. GED certificate programs</b></p>	<p>WWFH: Some evidence:</p> <ul style="list-style-type: none"> <li>• <i>Increased earnings</i></li> <li>• <i>Reduced recidivism</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Increased GED certificate completion</i></li> </ul>	<p>WWFH- likely to decrease disparities</p>
<p><b>20. Health career recruitment for minority students SHIP</b></p>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• <i>Increased academic achievement</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Increased high school graduation</i></li> <li>• <i>Increased college enrollment</i></li> <li>• <i>Increased diversity of health care workforce</i></li> </ul>	<p>WWFH- likely to decrease disparities</p>
<p><b>21. Community schools</b>  <b>Note:</b> Charter schools in Ohio are referred to as "community schools" under Ohio law (see ORC 3314.01), but this is different from the community schools model referenced here.</p>	<p>WWFH: Some evidence:</p> <ul style="list-style-type: none"> <li>• <i>Increased academic achievement</i></li> <li>• <i>Improved student attendance</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Increased high school graduation</i></li> <li>• <i>Improved youth behaviors</i></li> <li>• <i>Increased access to services</i></li> <li>• <i>Increased social capital</i></li> <li>• <i>Increased parent engagement</i></li> <li>• <i>Increased community involvement</i></li> </ul>	<p>WWFH- likely to decrease disparities</p>
<p><b>22. School-based social and emotional instruction SHIP</b></p>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• <i>Increased academic achievement</i></li> <li>• <i>Increased high school graduation</i></li> <li>• <i>Improved social emotional skills</i></li> <li>• <i>Increased school engagement</i></li> <li>• <i>Increased self-confidence</i></li> <li>• <i>Improved mental health</i></li> <li>• <i>Improved youth behavior</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Reduced violence</i></li> <li>• <i>Reduced bullying</i></li> </ul>	
<p><b>23. School-based health centers SHIP</b></p>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• <i>Improved access to care</i></li> <li>• <i>Improved health outcomes</i></li> <li>• <i>Increased academic achievement</i></li> </ul> <p><b>CG:</b> Recommended: Improvements in:</p> <ul style="list-style-type: none"> <li>• <i>School performance</i></li> <li>• <i>Grade promotion</i></li> <li>• <i>High school completion</i></li> <li>• <i>Delivery of vaccinations and other recommended preventive services</i></li> <li>• <i>Asthma morbidity</i></li> <li>• <i>Emergency department and hospital admissions</i></li> <li>• <i>Contraceptive use among sexually active females</i></li> <li>• <i>Prenatal care and birth weight</i></li> <li>• <i>Other health risk behaviors</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Improved quality of care</i></li> <li>• <i>Reduced emergency room visits</i></li> <li>• <i>Reduced hospital utilization</i></li> <li>• <i>Increased vaccinations</i></li> <li>• <i>Reduced health care costs</i></li> </ul>	<p>WWFH- likely to decrease disparities</p> <p>CG – Health equity recommendation</p>
<p><b>24. School-based health clinics with reproductive health services</b></p>	<p>WWFH: Some evidence:</p> <ul style="list-style-type: none"> <li>• <b>Reduced low birth weight births</b></li> <li>• <i>Reduced teen births</i></li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• <i>Increased use of contraception</i></li> <li>• <i>Increased reproductive health care</i></li> <li>• <i>Reduced teen pregnancy</i></li> <li>• <i>Increased preventive care</i></li> <li>• <i>Improved student attendance</i></li> <li>• <i>Increased high school graduation</i></li> </ul>	<p>WWFH- likely to decrease disparities</p>



Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<b>25. Trauma-informed schools</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Increased understanding of trauma</li> <li>Increased use of trauma-informed practices</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased resilience</li> <li>Improved social emotional skills</li> <li>Improved student attendance</li> <li>Improved youth behavior</li> <li>Increased graduation rates</li> </ul>	
<b>26. Mentoring programs for high school graduation</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased high school graduation</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Improved academic outcomes</li> </ul>	WWFH- likely to decrease disparities
<b>27. Intensive case management for pregnant and parenting teens</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Reduced teenage pregnancy</li> <li>Reduced rapid repeat pregnancies</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased use of contraception</li> <li>Improved social networks</li> <li>Increased academic achievement</li> <li>Increased graduation rates</li> </ul>	WWFH- likely to decrease disparities
<b>28. Carrera Adolescent Pregnancy Prevention Partnership Program</b>	Top Tier Evidence: Top Tier: <ul style="list-style-type: none"> <li>Reduced likelihood of teen pregnancy</li> <li>Increased likelihood of having some work experience</li> <li>Improved educational outcomes (PSAT scores and college visits)</li> </ul>	Top Tier Evidence: May be valid but need additional confirmation: <ul style="list-style-type: none"> <li>Increased high school graduation or GED attainment</li> <li>Increased college enrollment</li> </ul>	

**Note:** Due to the extremely large number of evidence-based policies and programs related to education (relevant to the dark blue boxes on the education pathways diagram), HPIO chose to narrow the evidence inventory to only include strategies that increase educational attainment, with a specific focus on early childhood interventions, high school completion and post-high school educational programs.

### Sources and acronyms

HPIO searched the following systematic reviews and evidence registries to develop this inventory. Search terms aligned with the pathway diagrams (dark blue boxes) and findings of the literature review.

Systematic review or evidence registry	Recommendation level(s)/ Evidence rating included in this inventory
<b>What Works for Health (WWFH):</b> Evidence registry from County Health Rankings and Roadmaps, a project of the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation	<ul style="list-style-type: none"> <li>Scientifically supported</li> <li>Some evidence</li> </ul>
<b>The Guide to Community Preventive Services (Community Guide, CG):</b> Systematic reviews from the U.S. Centers for Disease Control and Prevention (CDC)	Recommended
<b>Top Tier Evidence:</b> Evidence registry maintained by the Laura and John Arnold Foundation	<ul style="list-style-type: none"> <li>Top tier</li> <li>Near top tier</li> </ul>
<b>Campbell Library of Systematic Reviews:</b> Systematic reviews from the Campbell Corporation	N/A
<b>What Works Clearinghouse (WWC):</b> Evidence registry from the U.S. Department of Education	<ul style="list-style-type: none"> <li>Positive effects</li> <li>Potentially positive effects</li> </ul>
<b>Hi-5 (Health Impact in 5 Years):</b> Recommendations from CDC	Recommended
<b>Washington State Institute for Public Policy (WSIPP):</b> Literature reviews and benefit-cost analyses of a wide variety of programs	N/A

## Employment evidence inventory

Effective policies and programs to address employment challenges and inequities relevant to infant mortality

### Key

**SHIP** = 2017-2019 State Health Improvement Plan strategy

**Red**= Leading causes of infant mortality

*Italics*= Outcomes also relevant to housing, transportation, education, poverty, racism, stress or violence

### Income

Relevant policy goals:

- Increase incomes for pregnant women and parents of young children
- Reduce unemployment and under employment
- Increase access to work supports

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
1. <b>Earned Income Tax Credit SHIP</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• Increased employment</li> <li>• Increased income</li> </ul> <b>Hi-5:</b> Recommended <ul style="list-style-type: none"> <li>• Reduced low birth weight</li> <li>• Improved health status among mothers</li> <li>• Increased economic activity</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <i>Increased academic achievement</i></li> <li>• <i>Improved maternal health</i></li> <li>• <b>Improved birth outcomes</b></li> </ul>	WWFH: likely to reduce disparities
2. <b>Matched dollar incentives for saving tax refunds</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• Increased asset accumulation</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Increased financial stability</li> </ul>	WWFH: likely to reduce disparities
3. <b>Child care subsidies SHIP</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• Increased employment</li> <li>• Increased earnings</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Increased access to child care</li> </ul>	WWFH: likely to reduce disparities
4. <b>Adult vocational training SHIP</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• Increased earnings</li> <li>• Increased employment</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Reduced recidivism</li> </ul>	WWFH: likely to reduce disparities
5. <b>Transitional jobs SHIP</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• Increased employment</li> <li>• Increased earnings</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Reduced recidivism</li> <li>• <i>Reduced poverty</i></li> </ul>	WWFH: likely to reduce disparities
6. <b>New Hope Project</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• Increased employment</li> <li>• Increased income</li> <li>• Increased earnings</li> <li>• <i>Increased academic achievement</i></li> </ul>		WWFH: likely to reduce disparities
7. <b>Living wage laws</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• Increased earnings</li> <li>• <i>Reduced poverty</i></li> </ul>		WWFH: likely to reduce disparities
8. <b>Full child support pass-through and disregard</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>• Increased child support receipt</li> <li>• Increased paternity establishment</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• <b>Reduced child maltreatment</b></li> </ul>	WWFH: likely to reduce disparities
9. <b>Summer work experience programs</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>• Increased employment</li> <li>• Increased earnings</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>• Improved student attendance</li> <li>• <i>Decreased violence</i></li> <li>• Increased job skills</li> </ul>	WWFH: likely to reduce disparities



Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<b>10. Health career recruitment for minority students SHIP</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased academic achievement</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased high school graduation</li> <li>Increased college enrollment</li> <li>Increased diversity of health care workforce</li> </ul>	WWFH: likely to reduce disparities
<b>11. Career and technical education for high school graduation</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased high school graduation</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased employment</li> <li>Increased earnings</li> <li>Reduced arrests</li> <li>Reduced incarceration</li> </ul>	WWFH: likely to reduce disparities
<b>12. Career Academies</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Increased high school graduation</li> <li>Increased academic achievement</li> <li>Improved student attendance</li> </ul> <p><b>Top Tier Evidence:</b> Top Tier:</p> <ul style="list-style-type: none"> <li>Sustained increase in annual earnings for men</li> </ul> <p><b>WWC:</b> Potentially positive effects:</p> <ul style="list-style-type: none"> <li>Completing school</li> <li>Staying in school</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased earnings</li> </ul>	WWFH: likely to reduce disparities
<b>13. Unemployment insurance (UI)</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Increased financial stability</li> <li>Improved wellbeing</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased food security</li> <li>Reduced poverty</li> </ul>	WWFH: likely to reduce disparities
<b>14. Nevada's Reemployment and Eligibility Assessment Program</b>	Top Tier Evidence: Near Top Tier: <ul style="list-style-type: none"> <li>Increase in earnings per claimant</li> <li>Increase in employment rate</li> <li>Net savings to the Unemployment Insurance system</li> </ul>		
<b>15. GED certificate programs</b>	WWFH: Some evidence: <ul style="list-style-type: none"> <li>Increased earnings</li> <li>Reduced recidivism</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Increased GED certificate completion</li> </ul>	WWFH: likely to reduce disparities

### Working conditions

Relevant policy goal:

- Reduce exposure to toxic and persistent stress in employment settings

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
<b>16. Flexible scheduling</b>	WWFH: Scientifically supported: <ul style="list-style-type: none"> <li>Improved health outcomes</li> <li>Increased job satisfaction</li> </ul>	WWFH: Other potential beneficial outcomes: <ul style="list-style-type: none"> <li>Improved mental health</li> <li>Improved work-life balance</li> <li>Reduced absenteeism</li> <li>Increased productivity</li> </ul>	

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
17. <b>Smoke-free policies for indoor areas SHIP</b>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• <i>Improved health outcomes</i></li> <li>• Reduced exposure to secondhand smoke</li> <li>• Reduced tobacco consumption</li> <li>• Reduced mortality</li> <li>• Reduced hospital utilization</li> </ul> <p><b>Hi-5:</b> Recommended:</p> <ul style="list-style-type: none"> <li>• Reducing exposure to secondhand smoke</li> <li>• Reducing the prevalence of tobacco use</li> <li>• Increasing the number of tobacco users who quit</li> <li>• Reducing the initiation of tobacco use among young</li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• Increased quit rates</li> <li>• Reduced youth smoking</li> <li>• Reduced health care costs</li> <li>• <b>Reduced preterm birth</b></li> <li>• <b>Reduced infant mortality</b></li> </ul>	

### Leave policies and employment benefits

Relevant policy goal:

- Adopt more robust leave policies and employment benefits

Policy or program	Evidence rating and direct outcomes documented in evidence review	Indirect/other potential outcomes in evidence review	Effectiveness to reduce inequities
18. <b>Health insurance enrollment outreach and support</b>	<p>WWFH: Some evidence:</p> <ul style="list-style-type: none"> <li>• Increased health insurance coverage</li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• Increased awareness of health insurance availability</li> </ul>	WWFH: likely to reduce disparities
19. <b>Paid family leave</b>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• Increased labor force participation</li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• Increased use of parental leave</li> <li>• <i>Improved health outcomes</i></li> <li>• <i>Improved mental health</i></li> <li>• Increased preventive care</li> <li>• Increased breastfeeding rates</li> <li>• <b>Improved birth outcomes</b></li> <li>• <b>Reduced infant mortality</b></li> <li>• Improved wellbeing</li> <li>• Improved economic security</li> </ul>	WWFH: likely to reduce disparities
20. <b>Paid sick leave laws</b>	<p>WWFH: Some evidence:</p> <ul style="list-style-type: none"> <li>• Increased access to paid leave</li> <li>• Increased access to health care</li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• Improved health outcomes</li> <li>• Increased job stability</li> <li>• Increased use of parental leave</li> </ul>	WWFH: likely to reduce disparities
21. <b>Breastfeeding promotion programs SHIP</b>	<p>WWFH: Scientifically supported:</p> <ul style="list-style-type: none"> <li>• Increased breastfeeding rates</li> </ul>	<p>WWFH: Other potential beneficial outcomes:</p> <ul style="list-style-type: none"> <li>• Improved health outcomes</li> </ul>	WWFH: likely to reduce disparities



### Sources and acronyms

HPIO searched the following systematic reviews and evidence registries to develop this inventory. Search terms aligned with the pathway diagrams (dark blue boxes) and findings of the literature review.

Systematic review or evidence registry*	Recommendation level(s)/Evidence rating included in this inventory
<b>What Works for Health (WWFH):</b> Evidence registry from County Health Rankings and Roadmaps, a project of the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation	<ul style="list-style-type: none"> <li>• Scientifically supported</li> <li>• Some evidence</li> </ul>
<b>Health Impact in 5 Years (Hi-5):</b> CDC ( <i>includes cost considerations</i> )	Recommended
<b>Top Tier Evidence:</b> Evidence registry maintained by the Laura and John Arnold Foundation	<ul style="list-style-type: none"> <li>• Top tier</li> <li>• Near top tier</li> </ul>
<b>What Works Clearinghouse (WWC):</b> Evidence registry from the U.S. Department of Education	<ul style="list-style-type: none"> <li>• Positive effects</li> <li>• Potentially positive effects</li> </ul>

\*Also consulted The Guide to Community Preventive Services, although no relevant reviews were found for employment

## Appendix C. Stakeholder engagement

HPIO engaged many stakeholders from a wide variety of sectors and from all regions of the state throughout this project. HPIO sent an invitation to participate in the Social Determinants of Infant Mortality (SDOIM) Advisory Group in mid-May 2017.

The Advisory Group included two representatives from a metropolitan housing authority that operates at least 1,000 units in Ohio, exceeding the requirement in SB 332 that at least one such expert be included. The Advisory Group also included representatives from the five key areas of social determinants of health identified by the U.S. Department of Health and Human Services Healthy People 2020 initiative: economic stability, education, social and community context, health and health care and neighborhood and built environment.

Over 100 people participated in at least one of four Advisory Group meetings from June-October 2017, with an average of 57 attendees at each meeting (see figure 11.c.1). All Advisory Group members are listed at the end of this section.

Members were asked to contribute content expertise, provide feedback on preliminary findings and make recommendations for policy changes to improve the social, economic and physical environments that impact maternal and infant health.

A smaller Steering Committee with 11 participants met three times (June 30, Aug. 9, Oct. 5) and provided guidance on agenda development and feedback on key deliverables. A Housing Subcommittee with 11 participants met twice (Aug. 23, Sept. 21). Lists of these participants are provided at the end of this section.

Meeting dates and materials were posted on [HPIO's website](#) and all meetings were open to anyone who wished to attend. HPIO consulted over 20 additional subject matter experts to provide information, feedback and/or review materials throughout the project.

There was considerable overlap between the Advisory Group and other state and local infant mortality initiatives (see figure 11.c.2). This was intentional because the project was the result of advocacy efforts of participants in these initiatives and because of the growing awareness of the many social drivers that impact infant mortality.

In addition to engaging numerous infant mortality experts, HPIO also reached out to many experts in housing, transportation, education and employment to invite participation in the Advisory Group (see figure 11.c.3).

Figure 11.c.1. **Advisory Group meetings**

Date	Location	Number of attendees
June 28, 2017	Webinar	60
August 17, 2017	Mid-Ohio Foodbank, Grove City	69
September 14, 2017	Webinar	55
October 17, 2017	Ohio Child Care Resource and Referral Association, Columbus	44

Figure 11.c.2. **Advisory Group participants involved with infant mortality reduction initiatives**

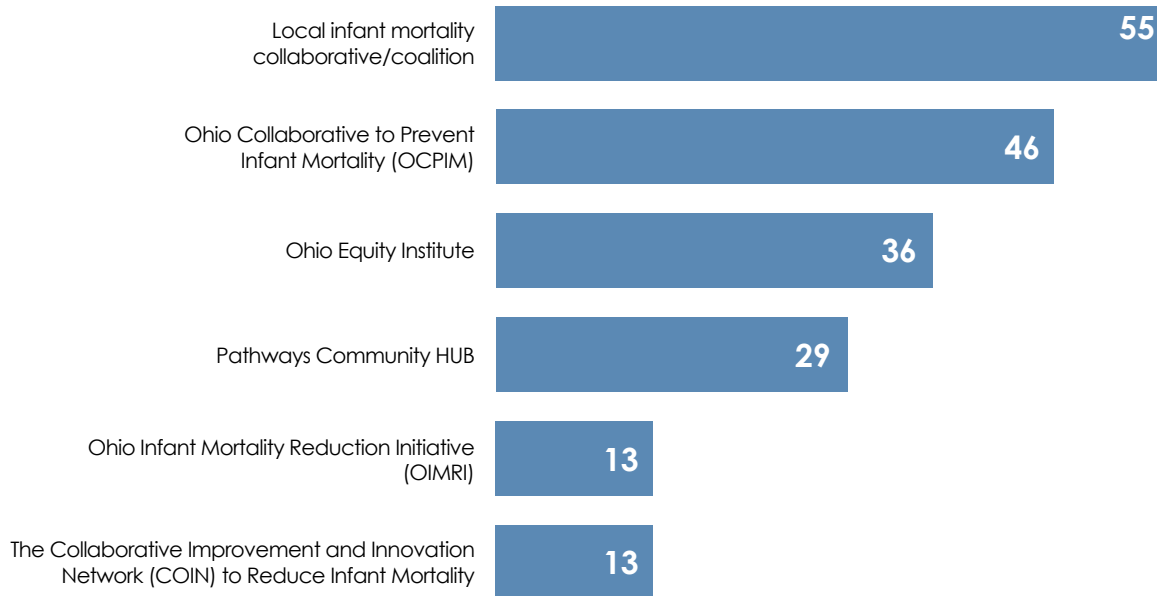


Figure 11.c.3. **Advisory Group sectors**

Advocacy	Local health department	State agency	Health plan/private insurer/managed care
Provider/clinician	Hospital/health system	Research/academic	Grassroots/consumer group
Community/economic development	Housing	Social service provider	Transportation/regional planning
Education/job training	Child care	Employment services/income	Business

Red indicates social determinant of health sector



**Advisory Group members**

Jim	Adams	Canton City Health Department
Ryan	Adcock	Cradle Cincinnati
Surendra Bir	Adhikari	Ohio Department of Mental Health and Addiction Services
Tom	Albanese	Community Shelter Board
Chip	Allen	Ohio Department of Health
Patrice	Allen-Brady	Columbus CelebrateOne
Valerie	Alloy	Ohio Department of Mental Health and Addiction Services
Lisa	Amlung Holloway	March of Dimes
Douglas	Argue	Coalition on Homelessness and Housing in Ohio
Kiera	Barnett	The Ohio State University Kirwan Institute for the Study of Race and Ethnicity
Todd	Barnhouse	Ohio Child Care Resource and Referral Association
Myia	Batie	Ohio Capital Corporation for Housing
Traci	Bell-Thomas	Ohio Department of Medicaid
Erin	Bishop	Youngstown City Health District
Bryan	Brown	Columbus Metropolitan Housing Authority
Amy	Burkett	American Congress of Obstetricians and Gynecologists
Mandy	Burkett	Ohio Department of Health
Deena	Chisolm	Nationwide Children's Hospital
Priyam	Chokshi	Columbus CelebrateOne
David	Cicccone	United Way of Central Ohio
Erika	Clark-Jones	Columbus CelebrateOne
Rebecca	Cline	Ohio Domestic Violence Network
Kay	Conley	Stark County Health Department
Kirstin	Craciun	The Center for Health Affairs
Jessie	Crews	Ohio Department of Health
Marie	Curry	Community Legal Aid Services, Inc.
Kimberly	Cutcher	Local Initiatives Support Corporation
Angela	Dawson	Ohio Commission on Minority Health
Aly	DeAngelo	Ohio Hospital Association
Chris	Demko	Hospital Council of Northwest Ohio
John	Edgar	United Methodist Church and Community Development for All People
Michelle	Edison	Mahoning County District Board of Health
Amy	Elbaor	Ohio Commission on Minority Health
Diego	Espino	Planned Parenthood
Ryan	Everett	Ohio Hospital Association
Christin	Farmer	Birthing Beautiful Communities
Melissa	Federman	The Center for Community Solutions
Elise	Fester	Columbus Public Health
Kjirsten	Frank Hoppe	Miami Valley Regional Planning commission
Mary Ann	Frantz	Mid-Ohio Regional Planning Commission
Patricia	Gabbe	Moms2B at The Ohio State University Wexner Medical Center
Roberta	Garber	Columbus Metropolitan Housing Authority
Francesca	Gordon	Ohio University
Angela	Hetrick	Barbara Poppe and Associates

**Advisory Group members (cont.)**

Carla	Hicks	Ohio Public Health Association
Kimberly	Hiltz	UnitedHealthcare Community Plan of Ohio, Inc.
Holly	Holtzen	Ohio Housing Finance Agency
Ben	Horne	Legal Aid Society of Columbus
Juana	Hostin	Ohio Department of Transportation
Ayaz	Hyder	College of Public Health, The Ohio State University
Arthur	James	The Ohio State University Kirwan Institute for the Study of Race and Ethnicity
Josh	Johnson	Coalition on Homelessness and Housing in Ohio
Shannon	Jones	Groundwork Ohio
Alexandria	Jones	Ohio Department of Health
Elizabeth	Kelly	Cradle Cincinnati
Bernadette	Kerrigan	Case Western Reserve University School of Medicine
Katie	Kitchin	Corporation for Supportive Housing
Grace	Kolliesuah	Ohio Department of Mental Health and Addiction Services
Mary Ellen	Kramer	Hamilton County Public Health
Brad	Lucas	Buckeye Health Plan
Kate	McGarvey	The Legal Aid Society of Columbus
Ashon	McKenzie	Children's Defense Fund-Ohio
John	Meier	ProMedica
Dawn	Miller	Canton City Health Department
Michelle	Missler	Healthcare Collaborative of Greater Columbus
Angela	Newman-White	Cuyahoga County Board of Health
Ryan	Noles	Northeast Ohio Areawide Coordinating Agency
David	Norris	The Ohio State University Kirwan Institute for the Study of Race and Ethnicity
Sandra	Oxley	Ohio Department of Health
Lisa	Patt-McDaniel	Workforce Development Board of Central Ohio
Barbara	Poppe	Barbara Poppe and Associates
Mark	Redding	Community Health Access Project HUB
Sarah	Redding	Pathways Community HUB Institute
Candy	Rinehart	The Ohio State University College of Nursing
Sabrina	Roberts	Cuyahoga County Department of Health and Human Services
Brandi	Robinson	Ohio Department of Health
Tamiyka	Rose	Mayor of Akron
Ellie	Roselle	Toledo-Lucas County Health Department
Anirudh	Ruhil	Ohio University
Jan	Ruma	Hospital Council of Northwest Ohio
Joanna	Saul	Planned Parenthood
Jessica	Saunders	Dayton Children's Hospital
Alex	Saver-Smith	Department of Development
Twinkle	Schoffke	Moms2B at The Ohio State University Wexner Medical Center
Jan	Schwarzkopf	Paramount Healthcare
Jo Ellen	Simonsen	Ohio Domestic Violence Network
Reina	Sims	Ohio Commission on Minority Health

**Advisory Group members (cont.)**

Celeste	Smith	Toledo Lucas County Health Department
Sherry	Smith	Stark County Health Department
Michelle	Smith-Wojnowski	Hospital Council of Northwest Ohio
Sanford	Starr	Ohio Department of Mental Health and Addiction Services
Patricia	Sweeney	Mahoning County District Board of Health
Robyn	Taylor	Ohio Department of Health
Corinn	Taylor	UnitedHealthcare
Teleange	Thomas	The Foundation Center
Autumn	Trombetta	Columbus Public Health
Scott	Ulrich	Columbus Public Health
Amanda	Waldrup	Health Resources and Services Administration
Judith	Warren	Health Care Access Now
Michael	Wellendorf	Akron Children's Hospital
Adam	White	Center for Community Solutions
Terra	Williams	Public Health-Dayton and Montgomery County
Sue	Wolfe	United Methodist Church and Community Development for All People
Gold-Marie	Wontumi	Butler County Health Department
Ted	Wymyslo	Ohio Association of Community Health Centers
Shannon	Yang	Columbus Public Health

**Housing Subcommittee**

Tom	Albanese	Community Shelter Board
Douglas	Argue	Coalition on Homelessness and Housing in Ohio
Myia	Batie	Ohio Capital Corporation for Housing
Bryan	Brown	Columbus Metropolitan Housing Authority
Kimberly	Cutcher	Local Initiatives Support Corporation
Robertta	Garber	Columbus Metropolitan Housing Authority
Holly	Holtzen	Ohio Housing Finance Agency
Ben	Home	Legal Aid Society of Columbus
Katie	Kitchin	Corporation for Supportive Housing
Dawn	Miller	Canton City Health Department
Barbara	Poppe	Barbara Poppe and Associates

**Steering Committee**

Lisa	Amlung Holloway	March of Dimes
Traci	Bell-Thomas	Ohio Department of Medicaid
Deena	Chisolm	Nationwide Children's Hospital
Angela	Dawson	Ohio Commission on Minority Health
Aly	DeAngelo	Ohio Hospital Association
Ayaz	Hyder	The Ohio State University College of Public Health
Arthur	James	The Ohio State University Kirwan Institute for the Study of Race and Ethnicity
Shannon	Jones	Groundwork Ohio
Sandra	Oxley	Ohio Department of Health
Reina	Sims	Ohio Commission on Minority Health
Ted	Wymyslo	Ohio Association of Community Health Centers

Additional subject matter experts		
Chad	Aldis	Thomas B. Fordham Institute
Shelia	Burton	Dayton Public Schools
Michael	Caniglia	Coalition on Homelessness and Housing in Ohio
Michael	Carter	Sinclair Community College
Stephen	Crouch	Coalition on Homelessness and Housing in Ohio
Christine	Gardner	Ohio Association for Career and Technical Education
Hannah	Halbert	Policy Matters Ohio
Cait	Harley	Ohio Department of Health
Kelly	Hogan	Columbus State Community College
Tom	Lasley	Learn to Earn Dayton
Brian	Perera	The Ohio State University
Rhonda	Philips	Miami Valley Career Technology Center
Jason	Reece	The Ohio State University Knowlton School of Architecture
Laura	Rittner	Ohio Association of Community Colleges
Michael	Shields	Policy Matters Ohio
Emily	Tully	Association of Independent Colleges and Universities in Ohio
Steve	Wagner	Universal Health Care Action Network
Tom	Walsh	Ohio Association of Community Colleges
Kelly	Weir	Columbus State Community College

## Appendix D. Methodology

This appendix describes the methodology for the following components of this report:

- Pathway diagrams and literature reviews
- Evidence inventories
- Case study key informant interviews
- Regression analysis

### Pathway diagrams and literature reviews for housing, transportation, education and employment

This section describes the methodology for development of figures 3.3, 4.1, 5.1, 6.1 and 7.1 and the literature reviews summarized in parts four through seven of this report.

#### Purpose

Pathway diagrams are commonly used in Health Impact Assessments to explore, describe and prioritize the direct and indirect ways that non-health factors affect health outcomes and equity. For this project, the purpose of these diagrams is to illustrate the complex connections between each social determinant of health topic (housing, transportation, education and employment) and the leading causes of infant mortality.

The dark blue boxes along the left side of each diagram provide general categories for the ways that housing characteristics, for example, affect health. The dark blue boxes generally align with the public policy and community levels of the social-ecological framework, including underlying factors that cause inequities, such as structural racism.

The light blue boxes represent intermediate outcomes that are risk factors for the leading causes of infant mortality, including access to care, health behaviors and exposure to toxins. These boxes generally align with the community, organizational, interpersonal and individual levels of the social-ecological framework. The relationships between these factors are complex and multi-directional; poverty and persistent stress are consistent elements across all four diagrams.

The red boxes represent the leading causes of infant mortality: poor birth outcomes, sudden unexplained infant death and accidents and injuries. The red arrows indicate that the literature review identified credible research connecting

an intermediate outcome to a leading cause of infant mortality.

#### Process

These diagrams were informed by literature reviews described in parts four through seven. The Housing and Transportation diagrams build upon previous work by HPIO sponsored by the Ohio Commission on Minority Health. The research citations are included in the literature review narratives.

HPIO staff consulted peer-reviewed studies (journal articles) and grey literature (e.g., reports from government agencies, policy organizations, etc.). Some articles and reports described results of quantitative research studies, while others described qualitative studies, practice-based research, theoretical models, conceptual frameworks or historical context of inequities. In addition to topic-specific search terms (such as "housing affordability"), HPIO used the following search terms: infant mortality, low birth weight, preterm/preterm birth, premature birth, birth outcomes, sudden infant death, sleep-related death, birth defects, SIDS and SUID. HPIO used PubMed to identify journal articles (search tool from the U.S. National Library of Medicine, National Institutes of Health).

In order to be eligible for inclusion in the review, HPIO prioritized the following types of literature:

- Systematic reviews and meta-analyses, when available
- Research done in the U.S. (although systematic reviews may include international studies) and articles published in English
- Literature published from 2010 to 2017, when possible
- Literature that addresses disparities or inequities, including findings specific to African American/black women or other women of color

#### Feedback from the Advisory Group

HPIO revised the four topic-specific pathway diagrams based on feedback from the Advisory Group at the Aug. 17 meeting, as well as created a summary pathway diagram that includes three cross-cutting factors that impact housing, transportation, education and employment (figure 3.3):

- Poverty
- Racism and discrimination
- Toxic and persistent stress, trauma and violence

**Evidence inventories**

The evidence inventories are in Appendix B.

**Purpose**

HPIO used the evidence inventories—along with feedback from Advisory Group members and other subject matter experts—to develop the policy goals and recommendations.

The evidence inventories compile credible research findings on the effectiveness of policies and programs that address relevant social determinants of health highlighted in the pathway diagrams and literature reviews. The inventories describe the strength of the evidence of effectiveness, as rated by an existing systematic review or evidence registry. They also

provide links to descriptions and evidence reviews for each policy and program.

**Process**

HPIO comprehensively searched the sources listed in figure 11.d.1 for relevant strategies using social determinant of health search terms identified through the literature reviews. Each of these sources uses specific criteria to assess the extent to which research has proven a strategy to be effective in meeting intended outcomes and how rigorously the strategy has been evaluated (e.g., number of experimental studies, strong research designs, etc.).

In addition, HPIO consulted Washington State Institute for Public Policy Benefit-Cost Results, Campbell Library of Systematic Reviews and National Academies of Sciences, Engineering and Medicine Consensus Study Reports, as needed.

Figure 11.d.1. **Evidence inventory sources**

Systematic review or evidence registry	Recommendation level(s)/Evidence ratings
<b>What Works for Health (WWFH):</b> Evidence registry from County Health Rankings and Roadmaps, a project of the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation	Inventories include policies/programs rated as: <ul style="list-style-type: none"> <li>• Scientifically supported</li> <li>• Some evidence</li> </ul> Not included in inventories: <ul style="list-style-type: none"> <li>• Expert opinion</li> <li>• Insufficient evidence</li> <li>• Mixed evidence</li> <li>• Evidence of ineffectiveness</li> </ul>
<b>The Guide to Community Preventive Services (Community Guide):</b> Systematic reviews from the U.S. Centers for Disease Control and Prevention (CDC)	Inventories include policies/programs rated as: <ul style="list-style-type: none"> <li>• Recommended</li> </ul> Not included in inventories: <ul style="list-style-type: none"> <li>• Recommend against</li> <li>• Insufficient evidence</li> </ul>
<b>Hi-5 (Health Impact in 5 Years):</b> Recommendations from CDC	Hi-5 only lists strategies that are recommended
<b>Top Tier Evidence:</b> Evidence review sponsored by the Coalition for Evidence-Based Policy and the Laura and John Arnold Foundation	Inventories include policies/programs rated as: <ul style="list-style-type: none"> <li>• Top tier</li> <li>• Near top tier</li> </ul>
<b>What Works Clearinghouse:</b> Evidence registry from the U.S. Department of Education	Inventories include policies/programs rated as: <ul style="list-style-type: none"> <li>• Positive</li> <li>• Potentially positive</li> </ul> Not included in inventories: <ul style="list-style-type: none"> <li>• Mixed evidence</li> <li>• No discernible effect</li> <li>• Potentially negative</li> <li>• Negative</li> </ul>

### **Effectiveness to reduce inequities**

The “effectiveness to reduce inequities” column indicates strategies that have been rated by What Works for Health as “likely to decrease disparities” and/or recommended by the Community Guide as effective strategies for achieving health equity. These sources consider potential impacts on disparities and inequities by racial/ethnic, socioeconomic, geographic or other characteristics. It is important to note that the evidence base on what works to decrease disparities and inequities is limited and evolving. Some programs not identified as “likely to decrease disparities” may in fact be effective if culturally adapted and tailored to meet the needs of priority populations.

### **Case study key informant interviews**

The case studies are included in part nine.

HPIO conducted a total of 23 key informant interviews from August through November 2017. All interviews were conducted by phone, with one or more people from the same organization, using a semi-structured interview script. Each interview was approximately one hour.

HPIO conducted the first wave of interviews with key informants from the following organizations:

- State health department maternal and child health director or other relevant staff
- March of Dimes (state affiliate) maternal and child health director or other relevant staff
- Other public health or research organization, such as representatives from statewide infant mortality reduction collaboratives, universities or health systems

The second wave of interviews focused on specific social determinant of health issues. Respondents included representatives from community-based

Organizations interviewed for the case studies are listed below.

#### **Colorado** (2 interviews)

- Colorado Department of Public Health and Environment
- March of Dimes

#### **Massachusetts** (4 interviews)

- Boston Medical Center
- Boston Public Health Commission
- March of Dimes
- Massachusetts Department of Public Health

#### **Michigan** (5 interviews)

- Carr Consulting LLC
- Henry Ford Health System
- March of Dimes
- Michigan Council for Maternal and Child Health
- Michigan Department of Health and Human Services
- VDAHealthConnect

#### **Nevada** (2 interviews)

- Nevada Department of Health and Human Services
- Nevada Department of Health and Human Services, Division of Public and Behavioral Health
- University of Nevada Las Vegas Medical Center

#### **New York** (4 interviews)

- March of Dimes
- New York State Department of Health, Division of Family Health
- New York State Department of Health, Office of Minority Health and Health Disparities Prevention
- The Schuyler Center for Analysis and Advocacy

#### **South Carolina** (3 interviews)

- Nurse-Family Partnership
- South Carolina Birth Outcomes Initiative
- South Carolina Department of Health and Environmental Control

#### **Tennessee** (2 interviews)

- March of Dimes
- Tennessee Department of Health
- Tennessee Office of Minority Health and Disparities Elimination

#### **Washington D.C.** (1 interview)

- District of Columbia Department of Health
- March of Dimes

organizations, statewide initiatives, universities and health and social service policy institutes. HPIO relied upon suggestions from the first wave of interviews to identify these contacts.

In addition to the interviews, HPIO reviewed documents and online material for each state, including evaluation reports and descriptions of specific policy changes.

**Policy recommendation development and prioritization**

The policy recommendations are listed in parts four through seven and part ten. Additional recommendations are included in Appendix A.

HPIO drew upon the following sources to develop the policy goals and recommendations:

- Evidence inventories (evidence-based policy/ program, plus specific policy lever needed to implement or expand the policy/program in Ohio)
- Suggestions from Advisory Group members shared at the Oct. 17 meeting
- Suggestions from Housing Subcommittee members shared via email
- Input from subject matter experts

These recommendations were designed to be:

1. Specific and actionable
2. Directed at the decision-making authority that can implement the change
  - a. Legislative, executive or judicial branch
  - b. Federal, state or local
  - c. Public or private
3. Evidence-informed
4. Realistic within the policy landscape

Following discussion and revision of draft policy goals and recommendations at the Oct. 17 Advisory Group meeting, HPIO invited all Advisory Group members to complete online surveys. The four topic-specific surveys listed the policy goals and recommendations and asked respondents to prioritize them based on the criteria listed in figure 11.d.2.

Advisory Group members could complete up to two topic surveys, depending on their expertise and interest. The following number of respondents completed each survey:

- Housing: 30 respondents
- Education: 22 respondents
- Transportation: 14 respondents
- Employment: 14 respondents

Figure 11.d.2. **Prioritization criteria**

<b>Strength of evidence of effectiveness</b>	<ul style="list-style-type: none"> <li>• Extent to which research has proven the recommended strategy to be effective in meeting the intended outcomes</li> <li>• How rigorously the strategy has been evaluated</li> </ul>
<b>Relevance to the priority populations for infant mortality</b>	<p>Relevance to the strengths and needs of groups of Ohioans most at risk for infant mortality and related risk factors:</p> <ul style="list-style-type: none"> <li>• African American/black Ohioans</li> <li>• People with low levels of educational attainment</li> <li>• People with low incomes</li> <li>• Residents of infant mortality hot spot communities</li> </ul> <p>Pregnant women and parents of infants are particularly at risk, although the needs of people of childbearing age in general are relevant given the importance of the life-course perspective and the social-ecological model.</p>
<b>Potential size of impact on overall infant mortality rate and risk factors</b>	Estimated magnitude of impact on factors that contribute to infant mortality
<b>Potential size of impact on inequities and disparities</b>	Estimated magnitude of impact on decreasing inequities and disparities, including estimated impact of reducing the black-white disparity gap in infant mortality
<b>Opportunities given current landscape and awareness of the problem in Ohio</b>	<p>Extent to which:</p> <ul style="list-style-type: none"> <li>• There are stakeholders in Ohio already working toward this goal</li> <li>• The recommendation addresses a widely-acknowledged unmet need in Ohio</li> </ul>
<b>Short-term political feasibility (2 years)</b>	Likelihood that the current state legislature, state agency leadership and other relevant decision makers would consider acting on the recommendation



HPIO used the results of these surveys and feedback from additional subject matter experts to identify top-priority goals and recommendations, which are listed in parts four through seven of this report. Additional recommendations are included in Appendix A.

## Regression analysis

A brief summary of the results of the regression analysis is presented in part eight. A more detailed description of the methodology and results, prepared by the Ohio University research team, is provided below.

### Purpose and background

The primary motivation for this task was to identify state-level social determinants of health that correlated with better/worse performance of a state vis-a-vis infant mortality and low birth weight rates. For each of these two outcomes, (a) the infant mortality rate, and (b) the low birth weight rate, annual data were gathered to span the 2005 through 2014 period for each state and Washington D.C. In addition to the data gathered for both outcomes of interest, we utilized data from the [2017 Health Value Dashboard](#) to select the independent variables used in the regression models.

### Visualizing trends

We started with a simple visualization of each outcome for all states and Washington D.C. (see figures 11.d.3 and 11.d.4). These visualizations are designed to emphasize trends in each of the two rates for each jurisdiction, allowing for a quick sense not only of whether the jurisdictions exhibit similar rates of change over time but also whether the jurisdictions reflect similar variability over time.

As is quite obvious from figures 11.d.3 and 11.d.4, both the trend and the variability differ across jurisdictions. For example, in figure 11.d.3, the trend-line for the infant mortality rate is the steepest for Washington D.C. and the shallowest for Texas and North Dakota. Looking at the movement over time also shows more variability in some jurisdictions (Washington D.C., for example) than in Texas and North Dakota. Similar differences – varying slopes of the trend-lines and different variability – are seen in the case of low birth weight rates as well (mapped in figure 11.d.4); Washington D.C. has the greatest volatility, while California has the least volatility.

Given that the jurisdictions appear to have their own unique patterns of infant mortality and low birth weight rates over time, this variability has to be controlled for in any analysis of the likely correlates/predictors of infant mortality or low birth weight rates. Failure to do so could yield unreliable statistical findings. Consequently, rather than fitting simple regression models, we employ fixed-effects regression models that control for the unique, unmeasured effect of each state and Washington D.C.

### Selecting the independent variables

The independent variables used in the models were drawn from two domains in the *2017 Health Value Dashboard* – the social and economic environment domain and the physical environment domain. These two domains combined to offer a set of 21 metrics (listed in figure 11.d.5). All metrics are annualized measures except for air quality; air quality has a measurement cycle of 2005-07, 2006-08, 2007-09, 2008-10, 2009-11, 2010-12, 2011-13, 2012-14. Irrespective of the measurement cycle, not all metrics are available for all jurisdictions for all periods. In particular:

- Adult Incarceration is unavailable for Washington D.C., so if this metric is used, the District drops out of the analysis.
- Income inequality is unavailable for 2005, so if this metric is used, the analysis will run for 2006 onward.
- High school graduation rate is missing for some states and years. Note also that this metric has to be used in a standardized form, because it spans two measures over time – AFGR and ACGR.<sup>1</sup>
- Lead poisoning is missing for several states and years, rendering it the most likely candidate to be dropped from the models.

However, not all of the metrics could be used in the regression analysis, either because of high levels of correlations between metrics or because the literature review highlighted a crucial role of particular metrics over others.<sup>2</sup> Consequently, the final set of metrics used in the regression models is as follows:

- Some college
- Child poverty
- Violent crime
- Labor force participation rate
- Preschool enrollment
- Children without a vehicle at home
- Percent of households with high monthly housing costs

Figure 11.d.3. **Infant mortality rate (2005-2014)**

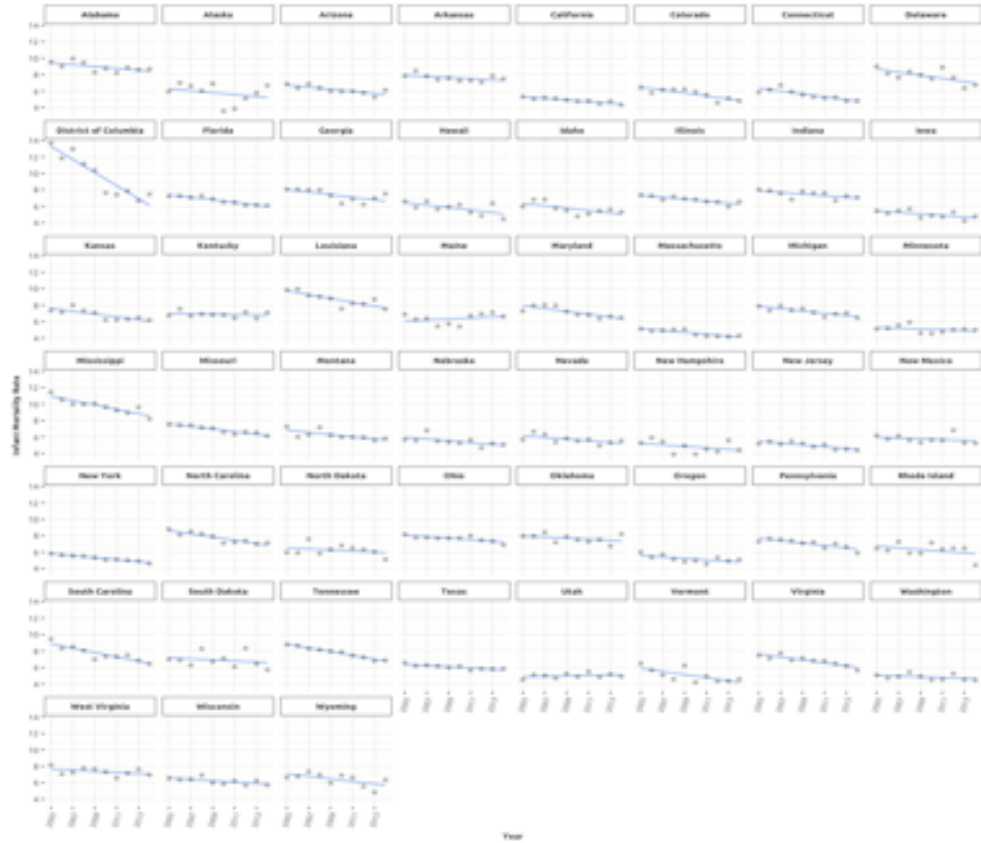
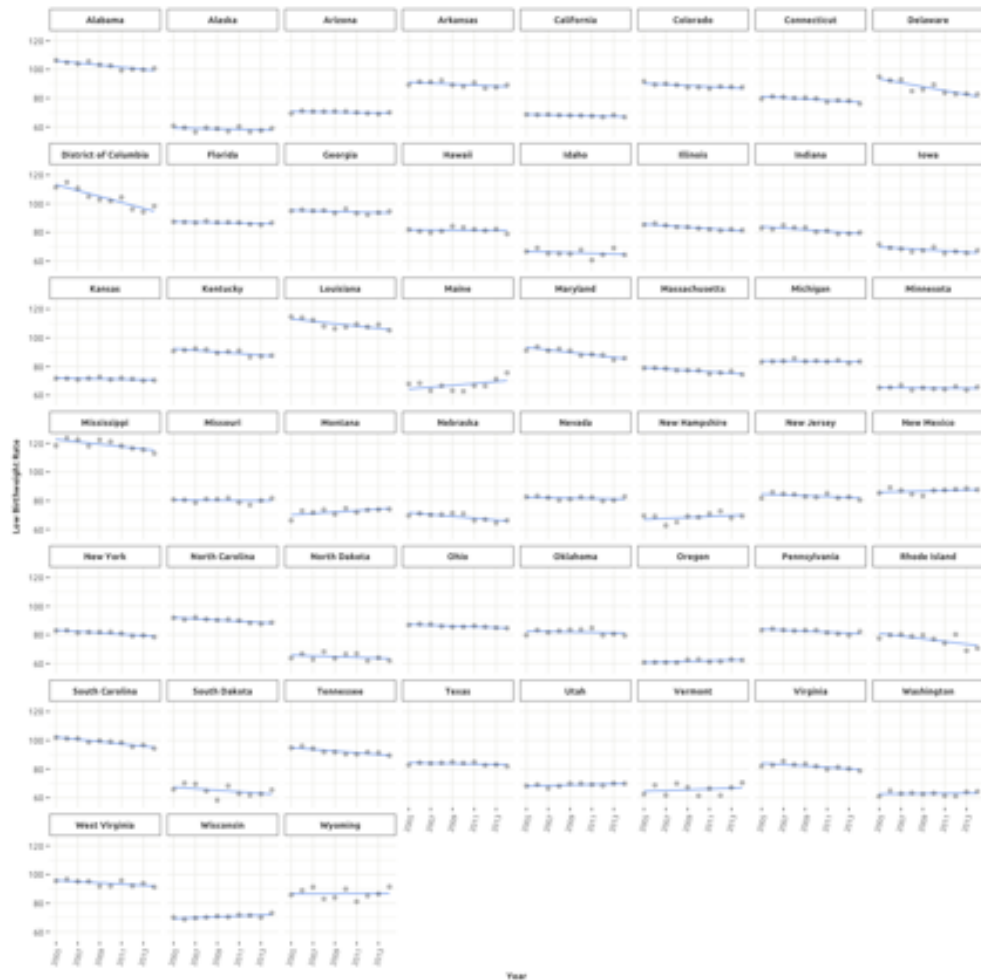


Figure 11.d.4. **Low birth weight rate (2005-2014)**



**Regression model estimates**

The statistical models we employ are a variant of the simple regression model, albeit designed to control, not only for each jurisdiction's unique pattern of a given outcome over time, but also other developments over time that are not captured by any of the metrics in use. In technical parlance, we employ a fixed-effects<sup>3</sup> regression model with standard errors adjusted for heteroscedasticity.<sup>4</sup>

These regression results indicate that:

- a. Infant mortality rates decline with an increase in the percentage of the population ages 25-44 with some post-secondary education and rise with an increase in the violent crime rate per 100,000 inhabitants.
- b. Low birth weight rates decline with an increase in the percentage of the population ages 25-44 with some post-secondary education and rise with an increase in the violent crime rate per 100,000 inhabitants and also rise with an increase in the percent of children living in zero-vehicle households.

The regression model for infant mortality has an adjusted R-squared of 0.3747, indicating that about 37 percent of the variation in jurisdictions' infant mortality rates can be explained by this regression analysis, with an average prediction error of 0.50. The model for low birth weight rates, on the other hand, can only explain about 15 percent of the variation in jurisdictions' low birth weight rates, and has an average prediction error of 1.99.

The regression results should, however, be treated with caution because they are based on aggregate data. Rates, changes in rates and the factors that may be responsible for these changes could and do differ for by race, ethnicity, income and other factors.

Figure 11.d.5. List of potential metrics available for regression modeling

Metric	Definition
Toxic pollutants	Total pounds of toxic chemicals released into the environment per capita (total on-site disposal or other releases for all industries and all chemicals). Numerator is total pounds of toxic chemicals released into the environment from the EPA's TRI Explorer. Denominator is the most recent vintage of the Population Estimates.
Lead poisoning	Percent of young children with blood lead levels above 10 ug/dL. Calculated by (Number of Children Tested/Total Confirmed BLL >10 µg/dL) * 100
Alternative commute modes	Percent of trips to work via bicycle, walking or mass transit (combined)
Children without a vehicle at home	Percent of children living in zero-vehicle households
Outdoor air quality	Average exposure of the general public to particulate matter of 2.5 microns or less in size (PM2.5)
Percent of households without kitchens	Percent of households that lack complete kitchen facilities
Percent of households without plumbing	Percent of households that lack complete plumbing facilities
Percent of severely overcrowded households	Percent of households where there are more than 1.51 occupants per room
Percent of households with high monthly housing costs	Percent of households where monthly housing costs, including utilities, exceed 30% of household income
Preschool enrollment	Percent of 3 and 4 year-olds enrolled in preschool
High school graduation	High school graduation
Some college	Percentage of the population ages 25-44 with some post-secondary education; includes individuals who pursued education following high school but did not receive a degree as defined in County Health Rankings, which is the data source for the Dashboard
Unemployment	Annual average unemployment rate, ages 16 and older
Labor force participation rate	Annual average civilian labor force participation rate, ages 16 and older
Child poverty	Percent of persons under age 18 who live in households at or below the poverty threshold (<100% FPL)
Adult poverty	Percent of persons age 18+ who live in households at or below the poverty threshold (<100% FPL)
Adult incarceration	Imprisonment rate of sentenced prisoners under the jurisdiction of state or federal correctional authorities, per 100,000 residents
Violent crime	Violent crime rate per 100,000 inhabitants (murders, rapes, robberies and aggravated assaults)
Income inequality	Income inequality as measured by the Gini coefficient. The Gini coefficient summarizes the dispersion of income across the entire income distribution for a given area. It ranges from 0, indicating perfect equality where everyone receives an equal share to 1, or perfect inequality where a single person or group receives all income
Children whose parent(s) are not in the workforce	Children living in a two parent family where neither parent is in the labor force, or children in a single parent family where the parent is not in the labor force

Figure 11.d.6. Fixed-effects regression estimates (robust standard errors)

Independent variable	Infant mortality rate	Low birth weight birth rate
Some college	-0.1171**** (0.0335)	-0.3410*** (0.1198)
Labor force participation rate	-0.0069 (0.0622)	-0.1416 (0.1985)
Child poverty	0.0039 (0.0196)	0.0879 (0.1237)
Violent crime	0.0043**** (0.0010)	0.0142**** (0.0040)
Preschool enrollment	-0.0330 (0.0173)	0.0171 (0.0404)
Children without a vehicle at home	0.0617 (0.0326)	0.4753** (0.1860)
Percent of households with high monthly housing costs	-0.0162 (0.0170)	0.0842 (0.0853)
F Statistic (df = 7; 452)	51.7169***	21.1324***
Adjusted R-Squared	0.3747	0.1515
N	510	510

\*\*\*\*Significant at the .1 percent level  
 \*\*\*Significant at the 1 percent level  
 \*\*Significant at the 5 percent level

## Notes

1. In particular, "NCES and the Department of Education release two widely-used annual measures of high school completion: the Adjusted Cohort Graduation Rate (ACGR) and the Averaged Freshman Graduation Rate (AFGR). Both measure the percent of public school students who attain a regular high school diploma within 4 years of starting 9th grade. However, they also differ in important ways. ... The ACGR was first collected for 2010-11 and is a relatively new graduation rate measure. The AFGR uses aggregate student enrollment data to estimate the size of an incoming freshman class, which is compared to the number of high school diplomas awarded 4 years later. The AFGR estimate

is less accurate than the ACGR, but it can be estimated as far back as the 1960s since it requires only aggregate annual counts of enrollment and graduate data."  
 2. Specifically, including highly correlated independent variables in a regression model is known to adversely impact the performance of the regression model.  
 3. We also carry out the usual tests for fixed-effects versus random-effects models but present only the fixed-effects results since the tests favor the fixed-effects specification.  
 4. Panel-data models are likely to exhibit substantial cross-sectional dependence in the errors because of the presence of common factors and/or unobserved

components absorbed by the error term, spatial dependence, or "idiosyncratic pairwise dependence in the disturbances with no particular pattern of common components or spatial dependence" (De Hoyos and Sarafidis 2006). If these unobserved common factors are uncorrelated with the independent variables, then fixed- and random-effects model-based estimates will be consistent but not efficient, and have biased standard errors. When we test for cross-sectional dependence via Pesaran's CD test (given that  $n > 1$ ) we do find evidence of cross-sectional dependence and hence adjust the standard errors.

## Appendix E. State data tables

Figure 11.e.1. **Infant mortality (IM) trends**

	OH	CO	DC	MA	MI	NV	NY	SC	TN
Overall IM rate 2012-2014	7.22	4.82	7.34	4.24	6.81	5.26	4.85	6.93	6.97
Overall IM rate change 2005-2007 to 2012-2014	-8.5%	-21.1%	-42.7%	-14.8%	-11.7%	-15.3%	-14.4%	-20.7%	-18.7%
Black IM rate 2012-2014	13.00	10.00	10.94	7.62	12.61	9.60	8.74	10.92	11.68
Black IM rate change 2005-2007 to 2012-2014	-15.1%	-25.8%	-41.4%	-23.4%	-18.2%	-26.6%	-22.1%	-22.1%	-23.8%
Black-white disparity odds ratio 2005-2007	2.40	2.61	No data	2.38	2.63	2.41	2.53	2.29	2.26
Black-white disparity odds ratio 2012-2014	2.18	2.44	No data	2.19	2.40	1.97	2.26	2.12	2.01
Change in odds ratio 2005-2007 to 2012-2014	-0.22	-0.17	No data	-0.19	-0.23	-0.45	-0.26	-0.17	-0.25

■ State's performance is better than Ohio

Figure 11.e.2. **Non-Hispanic black infant mortality rates for large cities (county rates) (pooled 2012-2014)**

State	Non-Hispanic black infant mortality rate per 1,000 live births
<b>Ohio</b>	
Cuyahoga County (Cleveland)	13.52
Franklin County (Columbus)	13.92
Hamilton County (Cincinnati)	13.84
<b>District of Columbia</b>	
District of Columbia	10.94
<b>Michigan</b>	
Wayne County (Detroit)	13.82
<b>Nevada</b>	
Clark County (Las Vegas)	9.16
<b>New York</b>	
New York City	8.1*
<b>South Carolina</b>	
Richland County (Columbia)	12.09
<b>Tennessee</b>	
Davidson County (Nashville)	10.73
Shelby County (Memphis)	12.3

 County's performance is better than Cuyahoga County, Ohio

\*New York City Department of Health and Mental Hygiene. Epiquery: NYC Interactive Health Data System – Infant Mortality Data 2000-2015. Accessed at <https://nyc.gov/health/epiquery>.

**Note:** Data for Denver County, CO; Suffolk County, MA; Kent County, MI; Erie County, NY; Monroe County, NY; Greenville County, SC and Charleston County, SC were unreliable due to small numbers

**Note:** Rates reported directly by counties may vary slightly from rates reported by the CDC due to different calculation methodologies

**Source:** Centers of Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Division of Vital Statistics (DVS). Linked Birth / Infant Death Records 2007-2015, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program, on CDC WONDER On-line Database. Accessed at <http://wonder.cdc.gov/lbd-current.html>

Figure 11.e.3. Population characteristics and policy landscape

	OH	CO	DC	MA	MI	NV	NY	SC	TN
Total population size 2011-2015	11,575,977	5,278,906	647,484	6,705,586	9,900,571	2,798,636	19,673,174	4,777,576	6,499,615
Population increase 2005-2015	4.1%	16.4%	30.5%	9.9%	0.6%	21.4%	6.1%	19.0%	13.6%
Population living in rural area	22.1%	13.8%	0.0%	8.0%	25.4%	5.8%	12.0%	33.7%	33.6%
Women as percent of legislature, average from 2005-2014	20.8%	37.3%	28.6%*	25.1%	21.0%	29.8%	22.7%	10.0%	17.7%
African Americans in legislature 2009	14%	2%	54%*	5%	15%	11%	16%	22%	14%
African Americans in overall state population 2015	12.2%	4.0%	48.9%	7.1%	14.2%	8.4%	15.6%	27.5%	16.8%
HPIO 2017 Health Value Dashboard rank	46	7	13	27	42	8	25	14	31
Percent of Medicaid population in managed care organization	88%	9%	76%	54%	75%	77%	77%	73%	100%

\*D.C. City Council statistics

 State's performance is better than Ohio



Figure 11.e.4. **Social determinants of health: Housing**

	OH	CO	DC	MA	MI	NV	NY	SC	TN
Overall children in households with high housing cost burden 2014	28.7%	32.8%	36.8%	36.0%	29.8%	35.4%	40.7%	29.8%	29.9%
Overall children in households with high housing cost burden change 2005-2007 to 2012-2014	-7.5%	-8.3%	-4.4%	-7.4%	-8.9%	-11.9%	1.2%	2.0%	2.5%
Black children in households with high housing cost burden 2014	51.0%	No data	No data	48.0%	51.0%	No data	53.0%	44.0%	52.0%
Black children in households with high housing cost burden change 2005-2007 to 2012-2014	-6.1%	No data	No data	-13.5%	-7.6%	No data	2.6%	5.7%	1.3%
Overall overcrowded households 2014	0.3%	0.7%	1.5%	0.8%	0.4%	1.0%	1.8%	0.4%	0.5%
Overall overcrowded households change 2005-2007 to 2012-2014	112.5%	49.4%	17.8%	149.8%	56.2%	46.8%	43.7%	83.3%	99.6%
Black overcrowded households 2014	1.9%	4.3%	2.9%	5.7%	2.4%	3.9%	6.1%	2.7%	2.6%
Black overcrowded households change 2005-2007 to 2012-2014	2.8%	54.4%	-20.2%	30.0%	-9.3%	48.9%	10.7%	2.6%	-13.1%

State's performance is better than Ohio

Figure 11.e.5. **Social determinants of health: Transportation**

	OH	CO	DC	MA	MI	NV	NY	SC	TN
Alternative commute modes 2014	4.2%	7.3%	53.1%	15.5%	4.1%	6.9%	35.2%	3.2%	2.5%
Alternative commute modes change 2005-2007 to 2012-2014	-2.3%	6.0%	8.5%	16.4%	13.9%	5.5%	6.9%	25.6%	4.5%
Children in zero vehicle households 2014	6.0%	3.0%	24.0%	7.0%	5.0%	6.0%	23.0%	6.0%	4.0%
Children in zero vehicle households change 2005-2007 to 2012-2014	0.0%	12.5%	-15.7%	15.8%	15.4%	6.7%	2.9%	-11.1%	-14.3%
Exposure to particulate matter, outdoor air quality 2012-2014	10.6	7.0	11.1	7.2	8.8	10.0	8.0	9.0	9.1
Exposure to particulate matter, outdoor air quality change 2005-2007 to 2012-2014	-23.7%	-10.3%	-5.1%	-29.4%	-32.3%	9.9%	-31.6%	-30.8%	-33.1%

Figure 11.e.6. **Social determinants of health: Education**

	OH	CO	DC	MA	MI	NV	NY	SC	TN
Preschool enrollment 2014	44.0%	53.5%	86.4%	58.7%	46.5%	34.0%	58.0%	46.0%	38.9%
Preschool enrollment change 2005-2007 to 2012-2014	5.0%	18.9%	33.3%	0.6%	1.9%	20.5%	3.1%	-6.3%	6.6%
Overall high school graduation rate 2014	81.8%	77.3%	61.4%	86.1%	78.6%	70.0%	77.8%	80.1%	87.2%
Black high school graduation rate 2014	62.7%	69.0%	59.7%	74.9%	64.5%	53.9%	64.5%	76.0%	78.6%
Overall some college rate 2014	64.3%	70.7%	80.7%	71.7%	67.3%	57.5%	67.0%	60.5%	58.7%
Overall some college change 2005-2007 to 2012-2014	11.7%	9.0%	14.2%	7.1%	8.4%	10.8%	7.9%	13.8%	13.6%
Black some college rate 2014	27.4%	29.7%	22.9%	22.7%	27.5%	30.9%	20.8%	21.1%	24.2%
Black some college rate change 2005-2007 to 2012-2014	24.1%	12.0%	14.5%	6.6%	15.1%	8.4%	16.3%	28.2%	13.2%

State's performance is better than Ohio

Figure 11.e.7. **Social determinants of health: Employment**

	OH	CO	DC	MA	MI	NV	NY	SC	TN
Overall unemployment rate change 2005-2007 to 2012-2014	22.5%	51.2%	43.1%	33.5%	21.1%	126.3%	60.1%	23.6%	44.0%
Black unemployment rate 2014	11.6%	10.8%	15.4%	10.8%	15.9%	15.4%	10.7%	9.9%	11.5%
Black unemployment rate change 2005-2007 to 2012-2014	11.3%	28.0%	60.9%	56.4%	24.4%	123.3%	54.2%	19.8%	32.3%
Overall labor force participation rate for ages 16 and older 2014	62.7%	67.8%	69.4%	65.2%	60.6%	63.3%	60.8%	59.2%	59.5%
Overall labor force participation rate change 2005-2007 to 2012-2014	-6.0%	-5.4%	2.5%	-2.6%	-7.4%	-6.1%	-2.6%	-6.6%	-5.3%
Black labor force participation rate for ages 16 and older 2014	58.2%	65.9%	56.4%	61.4%	57.6%	61.0%	60.3%	57.8%	63.0%
Black labor force participation rate change 2005-2007 to 2012-2014	-11.3%	-0.90%	-2.0%	-4.0%	-4.4%	-7.7%	-1.0%	-9.5%	-1.4%
Children with no parent in the labor force 2014	8.2%	6.1%	12.1%	6.4%	8.8%	8.4%	9.5%	9.4%	9.9%
Children with no parent in the labor force change 2005-2007 to 2012-2014	0.1%	-5.3%	-32.4%	-8.8%	6.3%	-0.1%	-9.4%	6.7%	-3.6%

■ State's performance is better than Ohio

Figure 11.e.8. **Social determinants of health: Cross-cutting factors (poverty and violence)**

	OH	CO	DC	MA	MI	NV	NY	SC	TN
Overall child poverty rate 2014	22.9%	15.4%	26.0%	15.2%	22.6%	22.0%	22.6%	27.1%	26.2%
Overall child poverty rate change 2005-2007 to 2012-2015	24.3%	9.8%	-8.9%	20.4%	26.7%	55.3%	15.8%	23.9%	16.9%
Black child poverty rate 2014	48.4%	30.7%	36.7%	30.6%	47.2%	37.9%	32.4%	43.1%	45.4%
Black child poverty rate change 2005-2007 to 2012-2015	13.0%	19.2%	-0.3%	7.0%	14.9%	33.5%	10.1%	12.0%	8.9%
Overall adult poverty rate 2014	13.7%	11.0%	15.9%	10.7%	14.3%	13.2%	14.1%	15.3%	16.0%
Overall adult poverty rate change 2005-2007 to 2012-2015	21.6%	11.6%	5.9%	17.1%	25.2%	46.4%	15.7%	17.3%	12.4%
Black adult poverty rate 2014	29.5%	18.8%	22.8%	18.8%	28.0%	21.2%	20.3%	23.9%	25.5%
Black adult poverty rate change 2005-2007 to 2012-2015	16.2%	18.0%	14.8%	3.9%	18.3%	57.0%	11.6%	4.7%	5.3%
Violent crime rate per 100,000 inhabitants 2014	284.9	309.1	1244.4	127.8	427.3	635.6	381.8	497.7	608.4
Violent crime rate change 2005-2007 to 2012-2014	-17.7%	-19.3%	-12.1%	10.2%	-19.2%	-12.6%	-8.7%	-32.6%	-19.4%

Figure 11.e.9. **Annie E. Casey Foundation Race for Results Rank: Index of child well-being and opportunity**

	OH	CO	DC	MA	MI	NV	NY	SC	TN
African-American children (out of 44)	42	7	No data	5	44	40	20	33	31
Latino children (out of 49)	23	24	No data	29	19	46	32	31	39
White children (out of 50)	31	13	No data	2	36	40	6	39	43

State's performance is better than Ohio

Figure 11.e.10. **Upward income mobility (Equality of Opportunity Project data)**

Geographic location	County rank	Percentage gain or loss in income at age 26 for children in low-income families (25 <sup>th</sup> percentile of income distribution)
Dupage County, IL (best)	1	15.1%
Baltimore city, MD (worst)	100	-17.3%
<b>Ohio</b>		
Cuyahoga County (Cleveland)	53	-2.9%
Franklin County (Columbus)	49	-2.1%
Hamilton County (Cincinnati)	55	-3.1%
<b>Case study states/D.C.</b>		
<b>District of Columbia</b>		
District of Columbia	37	0.5%
<b>Massachusetts</b>		
Suffolk County (Boston)	57	-3.2%
Worcester County (Worcester)	23	2.7%
<b>Michigan</b>		
Wayne County (Detroit)	94	-12.5%
Kent County (Grand Rapids)	65	-4.9%
<b>Nevada</b>		
Clark County (Las Vegas)	28	2.5%
<b>New York</b>		
New York	85	-10.9%
Erie County (Buffalo)	26	2.6%
Monroe County (Rochester)	81	-9.1%
<b>Tennessee</b>		
Davidson County (Nashville)	75	-7.8%
Shelby County (Memphis)	82	-9.6%


 County's performance is better than Franklin County, OH

Figure 11.e.11. **Tobacco use**

	OH	CO	DC	MA	MI	NV	NY	SC	TN
Women who smoked at any time during pregnancy — 2014	16.3%	6.7%	2.6%	6.2%	13.3%	5.1%	5.4%	11.2%	14.9%
Adults that currently smoke cigarettes — 2016	22.5%	15.6%	14.7%	13.6%	20.4%	16.5%	14.2%	20.0%	22.1%
Children exposed to secondhand smoke — 2016	21.6%	14.0%	12.5%	14.1%	18.6%	17.1%	14.5%	15.8%	24.8%

State's performance is better than Ohio

## Data sources

State summary table metric	Organization	Name of primary source	Year(s) of data
<b>Figure 11.e.1: Infant mortality (IM) trends</b>			
Infant mortality rate and trend	CDC Wonder	Linked birth/death infant records 2005-2014 from National Center for Health Statistics	2005-2014
<b>Figure 11.e.2: Non-Hispanic black infant mortality rates for large cities (county rates)</b>			
Non-Hispanic black IM rate per 1,000 live births (for all cities other than New York City)	CDC Wonder	Linked birth/infant death records 2007-2014 from National Center for Health Statistics	2012-2014
New York City black IM rate per 1,000 live births	New York City Department of Health and Mental Hygiene	Epiquery; NYC Interactive Health Data System – Infant Mortality Data 2000-2015	2012-2014
<b>Figure 11.e.3: Population characteristics and policy landscape</b>			
Total population size	U.S. Census Bureau	American Community Survey 5-Year Population Estimate	2011-2015
Population increase	U.S. Census Bureau	2015 and 2005 American Community Survey 1-Year Estimates, Table B01003	2005, 2015
Percent of population living in rural area	U.S. Census Bureau	2010 Census Summary File 1, Table SF1- P2	2010
Women as percent of legislature (2009-2014)	National Conference of State Legislatures	Women in State Legislatures Table: "Women Serving in the 50 states"	2009-2014
Women as percent of legislature (2005-2008)	Rutgers Eagleton Institute of Politics Center for American Women and Politics	Fact Sheet on Women in State Legislatures Table: "Women in State Legislatures"	2005-2008

## Data sources (cont.)

State summary table metric	Organization	Name of primary source	Year(s) of data
<b>African Americans in legislature</b>	National Conference of State Legislators	African-American Legislators 2009	2009
<b>African Americans in overall state population</b>	U.S. Census Bureau	2011-2015 American Community Survey 5-Year Estimates	2011-2015
<b>HPIO 2017 Health Value Dashboard Rank</b>	Health Policy Institute of Ohio	2017 Health Value Dashboard  Note: Rank of 1 is best	2016
<b>Percent of Medicaid population in managed care organization</b>	Kaiser Family Foundation, Kaiser Commission on Medicaid and the Uninsured, and the National Association of Medicaid Directors	Article: "Implementing Coverage and Payment Initiatives: Results from a 50-State Medicaid Budget Survey for State Fiscal Years 2016 and 2017"  Table 5: "Share the Medicaid Population Covered Under Different Delivery Systems in all 50 States and DC, as of July 1, 2016"  Prepared by: Vernon K. Smith, Kathleen Gifford, Eileen Ellis, Barbara Edwards, Robin Rudowitz, Elizabeth Hinton, Larisa Antonisse, and Allison Valentine  Published Oct 13, 2016	2016

**Figure 11.e.4: Social determinants of health: Housing**

<b>Overall children in households with high housing cost burden</b>	U.S. Census Bureau	American Community Survey 1-Year Estimates	2005-2014
<b>Black children in households with high housing cost burden</b>	U.S. Census Bureau	American Community Survey 1-Year Estimates	2005-2014

**Figure 11.e.5: Social determinants of health: Transportation**

<b>Alternative commute modes</b>	U.S. Census Bureau	American Community Survey 1-Year Estimates	2005-2014
<b>Children in zero vehicle households</b>	National Kids Count, Annie E. Casey Foundation	Kids Count Data Center	2005-2014
<b>Exposure to particulate matter, outdoor air quality</b>	U.S. Environmental Protection Agency	America's Health Rankings 2015 edition	2005-2014

**Figure 11.e.6: Social determinants of health: Education**

<b>Preschool enrollment</b>	National Kids Count, Annie E. Casey Foundation	U.S. Census Bureau, American Community Survey, as compiled by Kids Count Data Center	2005-2014
<b>Overall high school graduation rate</b>	Institute of Education Sciences	National Center for Education Statistics data tables	2014
<b>Black high school graduation rate</b>	Institute of Education Sciences	National Center for Education Statistics data tables	2014

## Data sources (cont.)

State summary table metric	Organization	Name of primary source	Year(s) of data
Overall some college rate	County Health Rankings	U.S. Census Bureau, American Community Survey, as compiled by County Health Rankings 2016 edition	2005-2014
Black some college rate	Institute of Education Sciences	National Center for Education Statistics data tables	2005-2014
<b>Figure 11.e.7: Social determinants of health: Employment</b>			
Overall unemployment rate	Bureau of Labor Statistics	Local Area Unemployment Statistics	2005-2014
Black unemployment rate	Bureau of Labor Statistics	Local Area Unemployment Statistics	2005-2014
Overall labor force participation rate for ages 16 and older	Bureau of Labor Statistics	Local Area Unemployment Statistics	2005-2014
Black labor force participation rate for ages 16 and older	Bureau of Labor Statistics	Local Area Unemployment Statistics	2005-2014
Children with no parent in the labor force	U.S. Census Bureau	American Community Survey 1-Year Estimates	2005-2014
<b>Figure 11.e.8: Social determinants of health: Cross-cutting factors (poverty and violence)</b>			
Overall child poverty rate	U.S. Census Bureau	American Community Survey 1-Year Estimates	2005-2014
Black child poverty rate	U.S. Census Bureau	American Community Survey 1-Year Estimates	2005-2014
Overall adult poverty rate	U.S. Census Bureau	American Community Survey 1-Year Estimates	2005-2014
Black adult poverty rate	U.S. Census Bureau	American Community Survey 1-Year Estimates	2005-2014
Violent crime rate per 100,000 inhabitants	America's Health Rankings	National Incident-Based Reporting System/Uniform Crime Reporting, Federal Bureau of Investigation as compiled by America's Health Rankings 2015 edition	2005-2014
<b>Figure 11.e.9: Annie E. Casey Foundation Race for Results Rank: Index of child wellbeing and opportunity</b>			
Race for Results index scores	Annie E. Casey Foundation	Race for Results 2017 Policy Report Note: Rank of 1 is best	Based on 12 measures, ranges of dates/estimates differ for each measure
<b>Figure 11.e.10: Upward income mobility (Equality of Opportunity Project data)</b>			
County rank	The Equality of Opportunity Project  Raj Chetty, Stanford University; John Friedman, Brown University; Nathaniel Hendren, Harvard University	Local Area Rankings: Causal Effects of the 100 Largest Counties on Household Income in Adulthood  Data from de-identified tax records on more than five million children whose families moved across counties between 1996 and 2012	1996-2012



## Data sources (cont.)

State summary table metric	Organization	Name of primary source	Year(s) of data
<b>Figure 11.e.11: Tobacco use</b>			
<b>Women who smoked at any time during pregnancy</b>	CDC National Vital Statistics Reports	Volume 65, No. 1; Smoking Prevalence and Cessation Before and During Pregnancy: Data From the Birth Certificate, 2014  Table 5. Prevalence of maternal smoking at any time during pregnancy using the item on smoking from the 1989 and 2003 U.S. Standard Certificates of Live Birth: 31 states, 2002–2014	2014
<b>Adults that currently smoke cigarettes</b>	CDC	BRFSS 2016 current smoking data, cigarette use (adults), State Tobacco Activities Tracking and Evaluation (STATE) System	2016
<b>Children exposed to secondhand smoke</b>	National Survey of Children's Health	Indicator 6.4: Someone living in the household uses cigarettes, cigars or pipe tobacco	2016