EXECUTIVE SUMMARY
Infant mortality is a key indicator for a community’s health. In Hamilton County, far too many babies have died for far too long.

As recently as 2011, we had the second worst infant mortality rate in the entire country. Thanks to hundreds of partners working under the guidance of a 5-year strategic plan, we’ve seen significant progress. However, the pace of change is too slow and the problem of infant death continues to plague our community. For that reason, more than 450 Hamilton County residents have participated in this new 5-year strategic plan for infant mortality reduction. It is our hope that we can continue recent progress while taking new ground for babies in our community.

The following pages summarize our 3 big goals, 23 strategies, and 6 core principles – all developed hand-in-hand with Cincinnati’s moms – to reduce infant death in Hamilton County.
GOAL 1: Reduce the number of babies born before the end of the second trimester by 33% by 2023, bringing us to the national average.

1A Replicate one neighborhood’s success at eliminating extreme preterm birth.
   - Spread the “Start Strong” project that brought extreme preterm birth down to 0 in Avondale to more neighborhoods, starting in Winton Hills and North College Hill. Strategies will need to be uniquely designed for each neighborhood.

1B Address implicit bias, starting in prenatal care settings.
   - Go on a community journey to better recognize and understand our unconscious bias.
   - Include equity initiatives in our efforts to improve prenatal care in Cincinnati.
   - Train our community in best-practice self-advocacy tools to empower us all in medical settings.

1C Mitigate stress during pregnancy through social support.
   - Expand the “Centering Pregnancy” model of care in Cincinnati.
   - Collaboratively improve the efficiency, timeliness, connectedness and capacity of Community Health Worker and Home Visitation programs.
   - Work with families to co-create “stress toolkits” and asset-based programs that help women cope with stress during pregnancy.
   - Build new partnerships with organizations that influence housing, education, transportation and jobs in Cincinnati and provide support in these areas for moms.

1D Increase the % of pregnancies that are expected and have healthy timing.
   - Work with teens to develop authentic and accurate sex education media designed to be shared widely via podcast, YouTube or other media.
   - Spread the use of reproductive life plans that help families set goals and decide how and when having children aligns with those goals.
   - Increase the availability, awareness and use of LARCs.
   - Develop a standardized transition appointment from pediatric care to gynecologic care for girls.

1E Decrease the % of women smoking during the second and third trimester of their pregnancies.
   - Incorporate use of “5As” interviewing in all prenatal care sites.
   - Support local and state “Tobacco 21” legislation.
   - Develop neighborhood-based campaigns that promote non-smoking while providing outlets to address stress.
   - Use technology-based solutions to help women quit.
GOAL 2: Eliminate sleep-related infant deaths in Hamilton County by 2023.

2A Increase awareness of the American Academy of Pediatrics safe sleep recommendations
   • Create marketing campaigns for dads, grandparents and other caregivers to complement those designed for moms.
   • Engage trusted and influential community members
   • Continually partner with health care providers on safe sleep.

2B Address barriers to safe sleep practices
   • Expand access to free and affordable cribs.
   • Address sleep deprivation as a barrier to safe sleep.
   • Debunk safe sleep myths and address cultural norms that promote unsafe sleep.

Goal 3: Promote what we know about reducing birth defects and lead the way on new scientific discovery to better understand congenital anomalies.
How we’ll get there. Our core principles for change.

Together. No single program or organization can solve a complex social problem like infant mortality by itself. Our only hope is through extensive partnership. Our society has a long history of developing isolated programmatic solutions for enormous problems like homelessness, poverty or infant mortality. Those programs are often necessary pieces of the puzzle, but aren’t enough to create change by themselves. To improve these important measures beyond what has been previously possible, we must embrace a model of “collective impact” that includes widespread and intentional collaboration with the community, a focused community-wide agenda and an obsession with data that informs every decision and allows us to measure our shared impact.

Equitably. We know that black mothers, regardless of socioeconomic status, are anywhere from 2-4 times more likely to experience infant loss. This is unacceptable. We are strongly compelled to focus our energy where there is the biggest opportunity for impact and have made reducing this racial inequity a primary goal. To that end, black women of child-bearing age are considered both the key audience and core partners for each element of this plan.

Co-creating solutions with families. This plan will only be a success if we can find ways to deeply involve members of affected communities in its implementation. Affected communities include families who have experienced infant loss or preterm birth, but also those who live, work and play in the neighborhoods that have the highest infant mortality rates. We want to become the best in the nation at co-creating solutions hand-in-hand with families.

Improving systems. Individual behavior change can be powerful. However, to see larger change in our community’s health, we must also improve the many stretched systems that prevent people from being as healthy as they can be. This includes continuing key partnerships to improve prenatal care and social service support during pregnancy. But, we must also forge new partnerships outside of healthcare and advocate for policy change that will lead to healthier pregnancies.

Constantly communicating. Infant mortality is complex. So are its solutions. To be successful, we must find simple ways to communicate so that ideas can spread and change can seem doable.

Growing our knowledge. We don’t yet know everything we need to know to save every life that is lost in Hamilton County. With more knowledge and a better understanding of the factors that influence infant death and those families most affected, we can create better and more targeted strategies and interventions to reduce infant mortality. We believe this knowledge will be most powerful when it is learned side-by-side with families.

Thank you to Luvenia, Wilma, Nikkea and Latria for their input and help developing these principles.
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INTRODUCTION

Infant Mortality
A community’s infant mortality rate is the rate at which live-born babies in that community die from any cause before their first birthday. It’s typically portrayed as deaths per one thousand live births. So, for example, the 2015 infant mortality rate in the US was 5.90. That means that for every 1,000 babies born alive in the US in 2015, 5.90 did not survive. Because its causes are so multi-faceted, infant mortality is frequently cited as one of the best measures of a community’s overall health.

In Hamilton County, 8.98 babies died for every 1,000 who were born from 2013-2017. That’s a dramatic improvement over where we have been in the past, but still puts us among the worst 10% in the country.

Hamilton County Infant Mortality Rate

<table>
<thead>
<tr>
<th>Period</th>
<th>Rate</th>
<th>Deaths</th>
<th>Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-2012</td>
<td>10.24</td>
<td>575</td>
<td>56,166</td>
</tr>
<tr>
<td>2013-2017</td>
<td>8.98</td>
<td>487</td>
<td>54,249</td>
</tr>
</tbody>
</table>

Why does this issue belong at the top of our community’s agenda?

Our Kids Are Dying
While largely a silent epidemic, around 100 babies in Hamilton County die each and every year. To put that in perspective, that’s more than our average annual number of adult homicide deaths. This profound grief is more frequent in our community than in almost any other part of the country.

Our Adults Aren’t Healthy
The overwhelming majority of our infant deaths have more to do with maternal health than infant health. Extreme preterm birth, or babies being born before the end of their mother’s second trimester, is the leading cause of infant death in our community. That means we must look to Mom’s health rather than Baby’s health for the solution. By addressing the root causes of infant mortality, we’ll make Hamilton County a healthier place for all of us.

The Grief is Not Evenly Distributed
Black babies are 2-4 times as likely to die as their white peers. The reasons for this are complex and not fully understood, but we do know that any plan to address inequities in our city requires us to prioritize a healthy start for all Cincinnatians.

The Cost is High
The human cost of this issue is what draws us to it. However, there are real and substantial financial costs as well. Preterm birth costs the community of Hamilton County $402 million each year. Even modest improvements in our outcomes will show an immediate return on investment in the form of substantially reduced costs to Ohio Medicaid as well as private insurance.
We Are Stronger Together

To address Hamilton County’s infant mortality rate, a broad and diverse collaborative of partners formed Cradle Cincinnati in 2013. The collaborative model we have used and continue to propose under this plan is called “collective impact.” Initially described in 2011 in the Stanford Social Innovation Review, collective impact has as its core premise that no single program or organization can solve complex social problems by itself. Our society’s history of developing programmatic solutions for enormous problems like homelessness, poverty or infant mortality is often necessary, but not sufficient. To improve these important measures beyond what has been previously possible, we must embrace a model that includes widespread and intentional collaboration with the community, a focused community-wide agenda and an obsession with data that informs every decision and allows us to measure our shared impact.

Like any framework, collective impact is not a perfect model. Specifically, the national community of practice has called out the need to better address racial equity and to be more inclusive of community members at every stage in the process. Cradle Cincinnati embraces the “Collective Impact Principles of Practice” that go beyond the initial literature in describing how to implement the model. These principles include:

- Design and implement the initiative with a priority placed on equity
- Include community members in the collaborative
- Recruit and co-create with cross-sector partners
- Use data to continuously learn, adapt and improve
- Customize for local context

We discuss, in detail, our proposals to address racial equity and community inclusion later in this document.
What’s Killing Our Babies?

EXTREME PRETERM BIRTH
Preterm birth that happens before the end of the second trimester is the leading cause of infant death in our community. We’ve seen a 17% decrease in extreme preterm birth in recent years (2008-2012 vs 2013-2017), but this continues to be an area of great concern for Hamilton County. Because nearly two out of every three infant deaths in Hamilton County is due to this cause, extreme preterm birth is a major focus of our strategic plan. For example, goals such as mitigating stress through social support, reducing unexpected pregnancy and decreasing the number of smoking pregnant women are all included because they are factors that impact when a baby is born. Extreme preterm birth is also the area where we see the greatest racial inequity between black and white babies; our efforts to reduce implicit bias are meant to close this gap. An in-depth literature review of the known drivers that influence extreme preterm birth was a central step in our planning process and is available at cradlecincinnati.org/planning.

SLEEP-RELATED DEATHS
Babies sleep safest alone, on their back and in an empty crib. Anything else puts them at higher risk for sleep-related death. The leading cause of local sleep-related deaths is babies sharing a bed with an adult. Thanks to hundreds of partners, we’ve seen an encouraging and sustained 25% decrease in sleep-related deaths in recent years (2008-2012 vs 2013-2017). In fact, Hamilton County has had its best 5 years ever for sleep-related deaths from 2013-2017. Our proposals here are focused primarily on sustaining and expanding efforts that work in order to drive that number even lower.

BIRTH DEFECTS
This is the only cause of death where Hamilton County does not have an elevated rate compared to the national average. Heart defects are the leading congenital anomaly causing infant deaths nationally and in our county. Because this is not a driver of our higher-than-normal rate of infant death, and because interventions are largely unknown, these deaths are not a central focus of our strategic plan. We do, however, seek to expand our learning in this area and promote known interventions.

OTHER DEATHS
Includes homicides, infections, accidents and other causes.
What’s Changed? And What Hasn’t?

WHERE WE’VE BEEN

115 per year

Preterm, 67

Sleep-related, 16

Birth defect, 18*

Other, 14*

WHERE WE ARE

97 per year

Preterm, 58

Sleep-related, 12

Birth defect, 19

Other, 8

WHERE WE COULD BE

64 per year

Preterm, 36

Sleep-related, 9

Birth defect, 18

Other, 1

Our collaborative has been in place for 5 years. So, what’s changed? In the chart above, we illustrate a reduction in every cause of death with one exception: birth defects, where we are already at the national average.

Notably, when we further subdivide preterm birth deaths, we also see no improvement in the very earliest cohort: those born prevailingly prior to 23 weeks. Broadly, our next 5 year plan focuses on sustaining and improving upon positive changes in preterm birth and sleep-related deaths while working to widen our interventions to better address these earliest births.

For this reason, we are particularly compelled by interventions that reach women very early in their pregnancy and/or those that address the health of women between pregnancies or even before they are pregnant at all. As our community works to address infant mortality, we all must get increasingly sophisticated at aligning the timeliness of our solutions with when they are needed to affect change.

One way to illustrate this important point is to consider the median age of death by cause:

- Extreme preterm birth: 2.5 hours
- Birth defects: 8 days
- Sleep-related deaths: 77 days

Early intervention is absolutely essential for success, and solutions that come postpartum are rarely sufficient to address infant death.
Of special note is the 18% of our deaths (2012-2016) that occurred when babies were born prior to 20 weeks gestation. With these babies in particular, there are likely to be differences in the ways that communities report these deaths. There is a certain degree of subjectivity involved in declaring whether these are miscarriages or live births. Technically, a live birth includes every baby who takes one breath or has one heartbeat or shows one voluntary movement of muscles. In practice, it is easy for this to be a grey area with the final category depending on many factors. One study suggests that the Midwest is more likely than other parts of the country to report these as live births rather than miscarriages. A local analysis of CDC data shows that babies in Hamilton County born at <20 weeks are more likely than those from all but two other counties in the country to be classified as live births. In fact, we are more than triple the national average in this category. Better consistency in reporting will be key to ensuring that accurate comparisons can be made.

Nationally and locally, African American babies have a 2-4X risk of death before their first birthday. This disparity has no known genetic or biological cause and a strong disparity remains even when adjusting for socio-economic status. A middle class African American mother with a graduate degree is still at increased risk when compared to a white woman living in poverty with no high school degree. This strongly suggests an interplay between racial experience and birth outcomes. We reviewed a breadth of literature in preparation for this plan and are convinced that bias, particularly that experienced in the health care system, and the increased stress that comes hand-in-hand with being black in America are impacting the preterm birth rates of African American women in Hamilton County.

For this reason, we suggest that African American women – regardless of socio-economic status – be considered the key audience and core partners for each element of this plan. While Hamilton County has slightly elevated infant mortality rates across other racial groups, we are strongly compelled to focus our energy where there is the biggest opportunity for impact and to make reducing racial inequity a primary goal for this plan.

In addition to African American women, we identified one additional audience who is at greatly increased risk for poor birth outcomes and who may require unique interventions: all women who have had previous preterm births.
OUR PLAN

Vision:
Every child in Hamilton County will live to see his or her first birthday.

Mission:
Cradle Cincinnati is a network of partners working across sectors to measurably improve preconception health, pregnancy health and infant health in order to reduce preterm birth and infant mortality in Hamilton County.

GOAL 1: Reduce the number of babies born before the end of the second trimester by 33% by 2023, bringing us to the national average.

GOAL 2: Eliminate sleep-related deaths by 2023.

GOAL 3: Promote what we know about reducing birth defects and lead the way on new scientific discovery to better understand congenital anomalies.
GOAL 1: Reduce the number of babies born before the end of the second trimester by 33% by 2023, bringing us to the national average.
Extreme preterm birth is the leading cause of infant death in Cincinnati, and for decades it was the leading cause of infant death in Avondale. Then, local moms, in partnership with bi3, Cincinnati Children’s Hospital Medical Center, UC Health, TriHealth and Every Child Succeeds, set out to change this through a partnership called “Start Strong”. The outcome is clear: 0 babies were born before the start of their mom’s third trimester in Avondale from 2015-2017. The success of this single community gives us hope. We plan to spread this model to additional neighborhoods with high rates of extreme preterm birth, starting with Winton Hills and North College Hill.

**Strategy 1A: Spread the “Start Strong” project that brought extreme preterm birth down to 0 in Avondale to more neighborhoods, starting in Winton Hills and North College Hill.**

We will use neighborhood-level extreme preterm birth data to identify additional zones to spread the “Start Strong” model, beginning with Winton Hills and North College Hill, the communities with the highest rates of extreme preterm birth in Hamilton County. Future phases could include launching work along the Beekman Street Corridor and in Forest Park.

**Before Start Strong (2009-2014):**

19 Extreme Preterm Births in Avondale

**Since Start Strong (2015-2017):**

0 Extreme Preterm Births in Avondale

The “Start Strong” model:

- Find and deliver measurable results for every woman in a geographic place.
- Build trust and empathy through consistency of care and sustained authentic connection.
- Work with Mom to solve her problems – say “yes” whenever possible and provide tangible resources to meet her needs.
- Reinforce stakeholders with place-based motivation and data about impact.
**GOAL 1A: Replicate one neighborhood’s success at eliminating extreme preterm birth**

**What is needed:**
- Improvements to medical care focused on consistency through a Community Health Worker and Case Manager Model.
- Neighborhood-specific, community-informed strategies to build trust and empathy.
- An infrastructure around data, community connections and quality improvement.

**Potential partners:** Neighborhood leaders, bi3, Ohio Department of Medicaid, Ohio Department of Health, prenatal care providers partnered with the Cradle Cincinnati Learning Collaborative, community health workers and nurse case managers.

**What it means for equity:** More than 90% of the births in Avondale are to African American moms. This project worked to empower and meet the needs of those women. In identifying areas for spread, we will prioritize neighborhoods with high numbers of African American births and high rates of extreme preterm birth.

**How we measure success:**
Measure 1A: Extreme preterm birth rate, by census tract, for neighborhoods where this work is spread. (Source: Ohio Vital Statistics; Baseline: Census tract 80 (Winton Hills, census tract 80): 0.36%, Census tract 218.01 (North College Hill, census tract 218.01): 1.28%)
GOAL 1B: Address implicit bias, starting in prenatal care settings

African American women, regardless of socioeconomic status, are 2-4 times more likely to experience infant loss. There are no known biological reasons for this difference. However, there is increasing evidence that the experience of racism plays a role in preterm birth and infant death. Attempts to measure the impact reveal an increased risk when someone reports experiencing prejudice during their pregnancy.

We know racial bias is not always intentional; Cradle Cincinnati is working to implement strategies to mitigate such bias. At the forefront of these strategies is bringing awareness to our own unconscious bias and strengthening patient-provider relationships when caring for pregnant women.

Implicit bias can impact interaction and communication between patients and staff, thereby affecting birth outcomes. Patients’ perceptions of care based on race can determine time of entry into care, returning for another visit, trust in provider’s instruction and more. We know, for example, that in Hamilton County, 62% of African American mothers enter prenatal care in the first trimester compared to 75% of white mothers. One possible explanation is a decreased value placed on the experience of care based on perceived or real experiences of bias.

**Strategy 1B.1: Go on a community journey to better recognize and understand our unconscious bias.**

Before doing anything else, we need to better understand the extent of bias in prenatal care and social service settings. Through patient interviews, ‘undercover boss’ type experiences and intimate one-on-one conversations, we will explore implicit and explicit biases that women face and create a plan of action accordingly. Experiences and research will be captured and shared with Cradle Cincinnati partners.

In addition, we will develop a series of empathy-building trainings designed to engage community members, executives, healthcare providers, medical residents, community health workers and others. These could include stereotype replacement, perspective-taking and partnership-building. Such exercises can help healthcare professionals and patients better understand one another outside of their traditional roles. This new dynamic can create advocates among doctors for system-level change to ensure high quality of care for all families, regardless of race, ethnicity, age or socioeconomic status.

**Strategy 1B.2: Include equity initiatives in our efforts to improve prenatal care in Cincinnati.**

Using quality improvement science, we will aim to see that the needs of all patients are met, including housing assistance, reliable transportation to and from medical appointments and food security. This work will grow out of the existing infrastructure of the Cradle Cincinnati Learning Collaborative, with the goal of prioritizing equitable prenatal care. To improve the health care experience, we need to recognize and address the needs of our high-risk patients as a part of every quality improvement effort.
**Strategy 1B.3: Train our community in best-practice self-advocacy tools to empower us all in medical settings.**

Everyone can be an advocate for moms and join the movement to stop bias. Borrowing the concept of “if you see something, say something” from the public safety world, we will empower individuals - through media, training and community projects - to say something when they see or experience bias in prenatal care settings. For example, tennis star Serena Williams, who had a history of blood clots, publicly shared her experience with advocacy. She urged her physician to check for blood clots when she noticed familiar symptoms and was able to get proper treatment. Without taking this initiative, her health may have suffered. Partnering with self-advocacy groups to offer trainings can empower patients and community members to advocate for themselves - and for others.

**Potential partners:** Patients/families, the Cradle Cincinnati Learning Collaborative, local Diversity and Inclusion Offices, Bridges Out of Poverty, managed care plans, Hamilton County Jobs and Family Services, Fetal and Infant Mortality Review.

**What it means for equity:** This work will be at the very center of our equity journey. When we asked Hamilton County residents why babies were dying in our community, the most common response was unequal treatment.

**How we measure success:**

Measure 1B.1: % of African American Hamilton County women that reported feeling emotionally upset (for example, angry, sad, or frustrated) as a result of how they were treated based on race during the 12 months before their baby was born (Source: OPAS; Baseline: 18%)

Measure 1B.2: # of Hamilton County prenatal care centers engaging in implicit bias initiatives (Source: Cradle Cincinnati Learning Collaborative; Baseline: 0)

Measure 1B.3: Interviews with Hamilton County moms who have experienced loss - % of non-white respondents who report mistrust with their physician (Source: FIMR; Baseline: TBD)

Measure 1B.4: Interviews with Hamilton County moms who have experienced loss - % of non-white respondents not satisfied with their hospital experience or would not return (Source: FIMR; Baseline: TBD)

Measure 1B.5: Interviews with Hamilton County moms who have experienced loss - % of non-white respondents not satisfied with their prenatal care (Source: FIMR; Baseline: TBD)

Measure 1B.6: New measures developed collaboratively to better measure bias.
GOAL 1C: Mitigate stress during pregnancy through social support

Stress during pregnancy is associated with adverse pregnancy outcomes, including preterm labor, low birthweight babies and pregnancy-induced hypertension. Evidence suggests women experiencing particularly high levels of stress during pregnancy are at a 25-60% greater risk for preterm birth as compared to women reporting low levels of stress. A variety of factors can cause stress during pregnancy, including anxiety, depression, perceived racism, health behaviors, trauma, a lack of coping resources, the community in which one lives and/or works, social expectations, socioeconomic level, level of education and quality of relationships.

This issue is inherently complex, and we do not expect to eliminate stressors for moms. However, we believe that increasing social support can buffer the effects of stress. That support can come from family, friends, healthcare providers, community health workers or anyone else within a pregnant woman’s social network. By increasing the amount of social support a pregnant woman has, we can reduce her risk of adverse pregnancy outcomes and improve her pregnancy experience.

**Strategy 1C.1: Expand the “Centering Pregnancy” model of care in Cincinnati.**
In Centering Pregnancy, 8 to 12 women who are at similar stages in their pregnancies are grouped together for prenatal care. This group care has been shown to improve birth outcomes, particularly in African American populations. In this setting, women are able to form important social connections with their peers. Centering Pregnancy is currently offered by TriHealth, Christ Hospital, WinMed Health Services and UC Health. We will expand efforts to increase the number of women participating in Centering Pregnancy in Hamilton County.

**Strategy 1C.2: Collaboratively improve the efficiency, timeliness, connectedness and capacity of Community Health Worker and Home Visitation programs.**
Community health workers and home visitors across multiple agencies serve and advocate for pregnant women and moms. They help with issues related to housing, transportation, food and employment that can be stressful for women to deal with during and after pregnancy. They also help with access to prenatal care and provide health education. Evidence suggests that when engaged early and often in pregnancy, these interventions can lower the risk of infant mortality.

Under our first strategic plan, we more than doubled the number of community health workers serving pregnant women in Hamilton County. And, we built a collaborative of provider agencies to improve this type of care. We will continue to collaborate with community health worker and home visitation agencies so that they can reach more women earlier in pregnancy in order to provide them with the support they need. Key challenges include:

- Improving the gestational age at which women enter into these programs. We can only impact preterm birth when we reach women early.
- Maximizing caseloads for all direct service providers.
- Creating a community of support for frontline staff.
- Centralizing data entry, improving data quality and decreasing time staff spends entering data.
GOAL 1C: Mitigate stress during pregnancy through social support

Strategy 1C.3: Work with families to co-create “stress toolkits” and asset-based programs that help women cope with stress during pregnancy.

Women don’t always need traditional “educational” programming – they have existing strengths and assets that they can share and build in their community. By empowering pregnant women and moms through interactive programs that they help design, they can join groups to learn or build on specific skills (i.e. storytelling, exercise, cooking, etc.) in order to build community and reduce stress. These asset-based programs can strengthen resilience to stress and improve the well-being of both mom and baby. They can also become spaces to share coping strategies and develop toolkits for managing stressful life events.

Strategy 1C.4: Build new partnerships with organizations that influence housing, education, transportation and jobs in Cincinnati and provide support in these areas to moms.

The conditions in the places where people live, learn, work and play can affect one’s health and well-being. Over the next five years, we will build partnerships with organizations and agencies that are leaders in these areas. This includes Cincinnati Public Schools, Cincinnati Metropolitan Housing Authority, Hamilton County Jobs and Family Services and the Southwest Ohio Transit Authority, as they have incredible influence over the lives of pregnant women in Hamilton County.

Potential partners: Moms, prenatal care providers including those already invested in Centering Pregnancy, community health workers and home visitation services, group facilitators, schools, Hamilton County Jobs and Family Services, workforce and housing organizations, Ohio Department of Health and Ohio Department of Medicaid.

What this means for equity: One possible explanation for the racial disparity in infant mortality is the disproportionate level of stress and lack of social support experienced by certain racial groups. On the 2016 Ohio Pregnancy Assessment Survey, 94.5% of white women who recently gave birth “had someone to talk with about [their] problems” during their most recent pregnancy; that percentage for African American women was 77.2%. Increasing social support to reduce the stress level of pregnant women can help reduce the racial disparity within infant mortality.

How we measure success:
Measure 1C.1: # of Hamilton County women participating in group prenatal care (Source: Cradle Cincinnati Learning Collaborative; Baseline: ~ 400 per year)

Measure 1C.2: % of Hamilton County women that reported suffering from anxiety during the 3 months before their most recent pregnancy (Source: OPAS; Baseline: 19%)

Measure 1C.3: % of Hamilton County women that reported suffering from anxiety during their most recent pregnancy (Source: OPAS; Baseline: 17%)

Measure 1C.4: % of Hamilton County women that reported having someone to talk to about problems during their most recent pregnancy (Source: OPAS; Baseline: 89%)
GOAL 1C: Mitigate stress during pregnancy through social support

Measure 1C.5: # of major stressors reported by Hamilton County African American women during pregnancy (Source: OPAS; Baseline: 2.4 stressors)

Measure 1C.6: % of Hamilton County moms enrolled in Medicaid who receive a community health worker or home visitor (Source: ODM Cradle Collaborative; Baseline: 21%)

Measure 1C.7: Average gestational age of entry in community health worker or home visitation programs (Source: ODM Cradle Collaborative; Baseline: 22 weeks)

Measure 1C.8: Average caseload per community health worker (Source: ODM Cradle Collaborative; Baseline: 18 clients)

Measure 1C.9: Average length of community health worker wait list (Source: ODM Cradle Collaborative; Baseline: 44 days)

Measure 1C.10: Average number of contact points with a community health worker or home visitor before delivery (Source: ODM Cradle Collaborative; Baseline: 15 contact points, with 6 being in-person)

Measure 1C.11: TBD measures of increased partnerships with housing, workforce and education organizations.
An unexpected pregnancy is a pregnancy that is reported by mom to have been either unwanted (that is, the pregnancy occurred when no children, or no more children, were desired) or mistimed (that is, the pregnancy occurred earlier than desired). In 2016, 40.7% of all pregnancies in Hamilton County were reported as unexpected. Even when adjusting for other risk factors, there is evidence these unexpected pregnancies are at increased risk for preterm birth. One study puts the increased risk at nearly 2 times.

Moving forward, we will expand our focus on reproductive health to include both unexpected pregnancies and birth spacing. Short spacing (less than 12 months) between the birth of one baby and conception of the next is strongly associated with premature birth.

Strategy 1D.1: Work with teens to develop authentic and accurate sex education media designed to be shared via podcast, YouTube or other media.
In 2017, the Ohio Equity Institute – Cincinnati team piloted Know Your Choices in 10 Cincinnati Public Schools. Know Your Choices is a reproductive health curriculum for students in grades 7-12 that covers healthy relationships, consent, birth control and more. Expanding upon their efforts, we will spark real dialogue about sex and relationships through teen-developed, highly shareable content via digital media platforms, such as podcasts, YouTube or Instagram. In doing so, we hope to create a safe space for teens to learn about and discuss topics that encourage positive health behaviors. Partnerships with schools, parents and medical experts will ensure that content is medically-accurate and age-appropriate.

Strategy 1D.2: Spread the use of reproductive life plans that help families set goals and decide how and when having children aligns with those goals.
Reproductive life plans help individuals set life goals and understand how and when having kids fits in. We will increase the number of people receiving a reproductive life plan by training healthcare and social service professionals to serve as reproductive life plan facilitators. As one point of focus, teens in the foster care system have been identified as a population with particularly high rates of unexpected pregnancy. In addition, we will evaluate reproductive life plans we use to ensure that they meet families’ needs in establishing and setting goals.

Strategy 1D.3: Increase the availability, awareness and use of LARCs.
Long Acting Reversible Contraceptives (LARCs) are the most effective and fool-proof method of birth control. Women who choose LARCs report lower levels of unexpected pregnancy than women who use other forms of birth control or no birth control at all. Several barriers stand in the way of LARC uptake, including cost, awareness and access. We will remove these barriers in Hamilton County while also increasing postpartum LARC insertion at willing partner institutions. Colorado and St. Louis successfully increased LARC usage and decreased unexpected pregnancies when addressing such barriers.
GOAL 1D: Increase the % of pregnancies that are expected and have healthy timing

Strategy 1D.4: Develop a standardized transition appointment from pediatric care to gynecologic care for girls.
A more integrated system between pediatrics and gynecology can increase the number of Hamilton County girls who receive reproductive health care. We’d like to bridge this gap by engaging pediatricians and their care teams to counsel and connect girls to OB/GYN resources at the appropriate age. This system change would normalize conversations about sex and increase preventative care, while cutting through myths and preparing parents for these crucial discussions.

An additional opportunity for medical system intervention is implementing “One Key Question” for moms at well-baby and primary care visits. The notion behind One Key Question is simple: It asks all health providers and champions who support women to routinely ask, “Would you like to become pregnant in the next year?” From there, the provider or champion takes the conversation in the direction the woman herself indicates is the right one, whether that is family planning, preconception health, prenatal care or other needs.

Potential partners: Moms, Cincinnati Health Department’s Body Shop, Cincinnati Public Schools, school administrators, students, the foster care system, local hospital systems, pediatricians, the Cradle Cincinnati Learning Collaborative, community health workers, Hamilton County Jobs and Family Services, March of Dimes, community leaders, churches, LARC Access Ohio.

What it means for equity: There is considerable disparity in reporting of unexpected pregnancy between white (32.3%) and black (76.3%) mothers. Also the < 6 months spacing of pregnancies is twice as high for black mothers at 9.0% compared to white mothers at 4.6%. Changing the conversation before pregnancy even begins can help improve outcomes later.

How we measure success:
Measure 1D.1: % <6 and <12 month birth spacing (Source: Ohio Vital Statistics; Baseline: 6.0%; 18.1%)

Measure 1D.2: % of Hamilton County women that reported their most recent pregnancy as unexpected (Source: OPAS; Baseline: 41%)

Measure 1D.3: Measure of LARC access (including availability, sites that offer, and proximity to neighborhoods and population) (Source: Cincinnati Health Department; Baseline: TBD)

Measure 1D.4: % of Hamilton County students receiving comprehensive sex education (Source: Cincinnati Health Department, school partners; Baseline: TBD)

Measure 1D.5: # of completed reproductive life plans (Source: ODM Cradle Collaborative, Cradle Cincinnati Connections; Baseline: 399)
A woman who smokes throughout her pregnancy is nearly 1.5 times more likely to suffer an infant death than a nonsmoker. In fact, smoking plays a contributing role in all three leading causes of infant death in Hamilton County: preterm birth, birth defects and sleep-related deaths. It is one of the most preventable influencers of infant death. Importantly, if mom can successfully quit by her 16th week of pregnancy, her increased risk is eliminated.

Self-reported data tells us that about 1 in 10 women in Hamilton County smoke during the second or third trimesters of their pregnancies. But, it is also well known that people underreport smoking status when asked to self-report. In 2016, Cradle Cincinnati conducted a study to measure cotinine levels (a marker of nicotine exposure) in the blood of local women at the time of birth. This study revealed that:

- 16.5% of women are using nicotine during the third trimester of their pregnancy.
- 21.1% of African American women.
- 15.7% of white women.
- An additional 7.5% are exposed to secondhand smoke.
- 14.8% of African American women.
- 5.8% of white women

This means that close to 1 in 4 women locally have nicotine exposure during the end of their pregnancy.

**Strategy 1E.1: Incorporate the use of “5As” interviewing in all prenatal care sites**

The 5As model is an evidence-based interviewing technique used by healthcare professionals that helps individuals quit smoking. Approximately 20% of women who smoke while pregnant quit with this intervention. We will train Cradle Cincinnati Learning Collaborative members on the 5As, so that all healthcare providers understand and can implement the technique confidently.

**Strategy 1E.2: Support local and state “Tobacco 21” legislation**

Tobacco 21 is a new policy campaign in cities around the country aimed at raising the minimum legal age for cigarette and tobacco sales from 18 to 21. Smokefree legislation is associated with reductions in preterm birth. If we can reduce access to high school seniors, we can reduce adolescent smoking overall and, therefore, decrease the number of people who start smoking. Columbus recently passed Tobacco 21 legislation while pointing to infant mortality reduction as a major reason for the change.

**Strategy 1E.3: Develop neighborhood-based campaigns that promote non-smoking while providing outlets to address stress**

In addition to medical interventions and policy initiatives, we need grassroots campaigns that support smokefree lifestyles. Efforts may be as diverse as smokefree pop-up public spaces, community get-togethers where neighbors provide quitting support for one another and neighborhood-made yard signs advocating for smokefree areas.

Many people smoke to reduce their stress. Part of this strategy should include a broad, community-based approach that addresses the underlying stress and mental wellness issues that contribute to smoking.
Strategy 1E.4: Use technology-based solutions to help women quit.
More and more tech companies are developing digital tools to help people quit smoking, such as phone apps and texting services. We will work with companies and institutions to develop new tools and spread existing ones. Examples include QuitNow! and EasyQuit.

Potential partners: Moms – particularly current and former smokers, neighborhood leaders, Cincinnati City Council, Interact for Health, the American Heart Association, the American Lung Association, the Cradle Cincinnati Learning Collaborative, tobacco treatment specialists.

What it means for equity: Our cotinine study revealed that 1 in 5 African American moms in Hamilton County are smoking during their third trimester of pregnancy and more than 1 in 3 is exposed to smoke. Changing this story will help improve birth equity.

How we measure success:
Measure 1E.1: % of Hamilton County women smoking at second or third trimester (Source: Ohio Vital Statistics; Baseline: 9.6%)

Measure 1E.2: # of Hamilton County individuals engaged in neighborhood-based activities that support smokefree communities and lifestyles (Source: Cradle Cincinnati; Baseline: TBD)

Measure 1E.3: % of eligible Hamilton County women receiving the Assist step of the 5As at their first prenatal appointment (Source: Cradle Cincinnati Learning Collaborative; Baseline: 46.0%)

Measure 1E.4: # of calls to 1-800-QUIT-NOW and texts to SmokeFreeMom by Hamilton County moms (Source: Ohio Tobacco QuitLine, CDC; Baseline: TBD)
GOAL 2: Eliminate sleep-related deaths in Hamilton County by 2023.
GOAL 2A: Increase awareness of the American Academy of Pediatrics safe sleep recommendations

Sleep-related deaths are the leading cause of mortality locally for infants between 1 month and 1 year of age. Since 2010, 114 babies have died due to unsafe sleep in Hamilton County. They are among our most preventable deaths.

Thanks to sizable and sustained efforts from dozens of partners, our average number of sleep-related deaths has dropped from 16 per year (2008-2012) to 12 (2013-2017). This means that 20 more babies celebrated their first birthday in the last five years. We believe that we can completely eliminate infant sleep-related deaths in Hamilton County, but can only do so with the help of our entire community.

Babies sleep safest alone, on their back, and in an empty crib, bassinet or pack n play. Our collaborative endorses and aligns with the American Academy of Pediatrics safe sleep recommendations.

Cincinnati is one of several communities that has demonstrated the effectiveness of safe sleep promotional campaigns. To broaden our impact, we must address additional concepts through new health messaging strategies.

Strategy 2A.1: Create marketing campaigns for dads, grandparents and other caregivers to complement those designed for moms.
It takes a village to raise a child, and yet safe sleep messaging is primarily directed at moms. In partnership with community members, we will create messaging campaigns that empower other infant caregivers to consistently advocate for and practice safe sleep.

Strategy 2A.2: Engage trusted and influential community members.
Caregivers place equal importance on information they receive from their doctor, their social circle (including family and friends) and the internet. We will continue to work with trusted individuals in our community to deliver consistent safe sleep messaging and education.

Strategy 2A.3: Continually partner with healthcare providers on safe sleep.
Healthcare providers are among our biggest safe sleep champions and at times serve as a family’s only source of safe sleep information. As such, we look forward to continued collaboration with doctors, nurses, community health workers and more to promote evidence-based and innovative safe sleep messaging. This includes using *Sleep Baby, Safe and Snug* in hospital and community settings; sharing family testimonials through video; and using caregiver-approved messaging as identified by the Ohio American Academy of Pediatrics.
Despite increases in safe sleep awareness, a gap remains between caregiver knowledge and practice. To bridge this, we will address the most frequently-cited barriers that caregivers face in practicing safe sleep.

**Strategy 2B.1: Expand access to free and affordable cribs.**
Working with the Cincinnati Health Department, we will create an infrastructure to expand crib distribution sites throughout Hamilton County. Partnering groups could include community health workers, parenting agencies and first responders.

**Strategy 2B.2: Address infant sleep efficacy and caregiver sleep deprivation.**
Sleep deprivation was cited in 45% of Ohio sleep-related deaths between 2012 and 2016, according to the 2017 Ohio Child Fatality Review Annual Report. Over the next five years, we will develop and implement initiatives focused on positioning safe sleep as a learnable skill. This could include the creation of a toolkit on how to soothe fussy babies; working with families to create individualized safe sleep action plans; and spreading awareness of the “Purple Crying” period, when babies seem like they will never sleep.

**Strategy 2B.3: Debunk safe sleep myths and address cultural norms that promote unsafe sleep.**
Caregiver concerns – rooted in misunderstandings of safe sleep and/or cultural norms that have been passed down through generations – can lead to unsafe sleep practice. Common concerns that we will address through education and messaging include baby’s comfort, his or her risk of choking, and baby’s safety sleeping alone.

**Potential partners:** Cincinnati Health Department, Hamilton County Public Health, the Ohio Department of Health, Charlie’s Kids Foundation, Baby 1st Network, Deskey, local birthing hospitals, Cincinnati Children’s Hospital Medical Center, the Cradle Cincinnati Learning Collaborative, community agencies and local community members and families. We will also continue to involve families that have experienced loss in this work.

**What it means for equity:**
Black families are disproportionately impacted by sleep-related death. According to local and state survey data, black families report less adherence to safe sleep recommendations than white families. This could be due to cultural or familial beliefs on infant sleep, availability of items that promote safe sleep (i.e. cribs, wearable blankets), or a lack of knowledge of he AAP recommendations. While many of our strategies above aim to reach all families regardless of race, location or socioeconomic background, we will work with families and partner agencies to create and implement initiatives that reach those families at greatest risk.

**How we measure success:**
Measure 2B.1: # of sleep-related infant deaths (Source: FIMR; Baseline: 13)
Measure 2B.2: Days between sleep-related deaths (Source: FIMR; Baseline: TBD)
Measure 2B.3: % of Hamilton County women who report laying their baby down to sleep on his or her back (Source: OPAS; Baseline: 86.6%)
GOAL 2B: Address barriers to safe sleep practice

Measure 2B.4: % of Hamilton County women who report that their baby sleeps alone in a crib (Source: OPAS; Baseline: 70.5%)

Measure 2B.5: % of Hamilton County women who report room-sharing with their baby (Source: OPAS; Baseline: 57.0%)

Measure 2B.6: % of Hamilton County women who report that their baby sleeps in an empty crib (without blankets, toys, cushions, pillows or crib bumpers) (Source: OPAS; Baseline: 54.0%)

Measure 2B.7: % of Hamilton County women who report receiving safe sleep information (on back to sleep and sleeping in a crib/bassinet/pack n play) from a health care provider (Source: OPAS; Baseline: 91.8%)

Measure 2B.8: % of Hamilton County residents who believe back sleeping is safest for babies (Source: UC Policy Center; Baseline: 75.4%)

Measure 2B.9: % of Hamilton County residents who believe sleeping alone in a crib is safest for babies (Source: UC Policy Center; Baseline: 95.0%)

Measure 2B.10: # of cribs distributed annually through Hamilton County Cribs for Kids and Cradle Cincinnati Connections (Source: Cincinnati Health Department, Cradle Cincinnati Connections; Baseline: 613)
GOAL 3: Promote what we know about reducing birth defects and lead the way on new scientific discovery to better understand congenital anomalies
Birth defects, or “congenital anomalies,” include a broad group of issues ranging from chromosomal abnormalities like, Down Syndrome, to single gene disorders, such as sickle cell anemia to malformations and deformations of many types. Most birth defects are not fatal, but we have about 18 each year of the most severe types that contribute to our infant mortality crisis in Hamilton County.

Most birth defects are currently considered unpreventable. However, we will promote the known ways to reduce risk including:

• Control diabetes: Poor control of diabetes during pregnancy increases the chance for birth defects and other problems during pregnancy.
• Maintain a healthy weight: A woman who is obese (a BMI of 30 or higher) before pregnancy is at a higher risk for complications during pregnancy. Obesity also increases a pregnant woman’s risk of several serious birth defects.
• Take prenatal vitamins with folic acid: If a woman has enough folic acid in her body at least one month before and during pregnancy, it can help prevent major birth defects of the developing brain and spine (anencephaly and spina bifida).
• Receive a rubella vaccination: Some vaccines protect women against infections that can cause birth defects. Having the right vaccinations at the right time can help keep a woman and her baby healthy.

Because there is so little known about this cause of death, our key approach will be to advocate for increased research - particularly that which can be led by Cincinnati’s world class research institutions.

**Potential partners:** Research partners including the March of Dimes, Cincinnati Children’s Hospital Medical Center and the University of Cincinnati.

**What it means for equity:**
This is the one cause of death in Hamilton County where there is no racial disparity.

**How we measure success**
Measure 3.1: # of congenital anomaly deaths per year (Source: FIMR; Baseline: 18)

Measure 3.2: % of births with congenital anomalies each year (Source: Ohio Vital Statistics; Baseline: 0.9%)
Ways We Get There Together:

- Improve Systems
- Listen to Communities
- Constantly Communicate
- Grow Our Knowledge
More than Just Healthcare
Infant mortality is more than just a medical problem. So, we need to engage systems outside of healthcare in order to make the change we want to see. Based on their influence and impact with women of childbearing age in Hamilton County, we plan to pursue new and deep partnerships with local organizations that impact health. This will include prioritizing new partnerships with at least four entities: Hamilton County Jobs and Family Services, Cincinnati Public Schools, Cincinnati Metropolitan Housing Authority and the Southwest Ohio Regional Transit Authority.

Improving Healthcare, Too
There is a traditional way of measuring the “adequacy” of prenatal care that looks at how early in pregnancy mom first accessed care and how often she received that care. It’s an imperfect, but useful measure. And, it’s one that is improving substantially in Hamilton County. From 2007-2009, 36% of all births had inadequate prenatal care and by 2015-2017, that number had been cut in half to 18%.

However, we propose that “adequate” care must be radically redefined in order for all babies to be healthy. At a minimum, prenatal care needs to have:

- A **seamless connection to an expanded social service network that can address complex social barriers to better health.** Every mom could use an advocate. In Hamilton County, advocates often take the form of a community health worker or a home visitor. Both models have shown promise in reducing preterm birth. In recent years, partners have worked to double local capacity for this kind of support. Now, we must get smarter about deploying these much needed resources. In the next 5 years, partners will work together to figure out how to get moms connected with the best service for them as soon as possible. Further, the work of the Accountable Health Communities grant led by the Greater Cincinnati Health Collaborative will better link data systems so that medical providers can directly refer to social service support.

- **Vastly improved support for mental health services.** Many local moms report high levels of stress during pregnancy. But some suffer from deeper mental health challenges including, but not limited to, depression. Local capacity to support these women is lacking. We will work to expand access to mental health services starting with expanding the evidence-based “Moving Beyond Depression” model run by Every Child Succeeds.

- **Same day access to care.** Given that most of our babies are dying at some point in their mother’s second trimester, we cannot continue to wait weeks to schedule that first appointment. Several health centers at the Cincinnati Health Department have successfully developed a model of “same day access to care” that allows for walk-in appointments. We hope to spread this model throughout the county.
• **Routine use of all evidence-based practices that can keep mom and baby healthy.** The Ohio Perinatal Quality Collaborative has successfully spread medical best practices across the state including the standardized use of progesterone. We plan to partner with this collaborative to increase their success in Hamilton County.

**Healthier Policies**
Good health requires more than just good genetics and healthy behaviors – our policy environment matters, too. We plan to develop and promote new laws and policies at the local, state and federal level that will help improve the health of moms and babies. By changing policies, we can impact every mom in Hamilton County by making the healthiest choice the easiest choice. For example, previous successful laws have made it easier for families to get cribs and car seats. Others have opened up new resources for social service agencies designed to serve moms.

Our approach, as always, will be collaborative. Cradle Cincinnati will develop a local infant health policy committee tasked with building upon the recent policy recommendations of the Health Policy Institute of Ohio in order to identify local priorities.
This plan will only be a success if we, as a community, can find ways to deeply involve members of affected communities in its implementation. Affected communities include families who have experienced infant loss or preterm birth, but also those who live, work and play in the neighborhoods that have the highest infant mortality rates. Families like these have helped us immeasurably to date and they should be considered our single greatest resource as we move forward. It’s why the very first step in developing this strategic plan was engaging more than 450 Hamilton County residents to get their advice on how to proceed.

There are various levels of intensity of community engagement. We use the spectrum of engagement below to measure our work in this area. No level is inherently best. We must, for example, simply inform the community on some issues. However, those strategies on the right of the spectrum are harder and rarer and we must be intentional about developing tactics here. True collaboration with affected communities and supporting their own leadership development will be central to success.

The Spectrum of Community Engagement

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<thead>
<tr>
<th>Informing</th>
<th>Consulting</th>
<th>Involving</th>
<th>Collaborating</th>
<th>Empowering</th>
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<td>Providing balanced and objective information about new programs or services, and about the reasons for choosing them. Providing updates during implementation.</td>
<td>Inviting feedback on alternatives, analyses and decisions related to new programs or services. Letting people know how their feedback has influenced program decisions.</td>
<td>Working with community members to ensure that their aspirations and concerns are considered at every stage of planning and decision-making. Letting people know how their involvement has influenced program decisions.</td>
<td>Enabling community members to participate in every aspect of planning and decision-making for new programs or services.</td>
<td>Giving community members sole decision-making authority over new programs or services, and allowing professionals to serve only in consultative and supportive roles.</td>
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Adapted from the IAP2 Public Participation Spectrum, developed by the International Association for Public Participation.

Note: Engagement activities can include community surveys, neighborhood outreach projects, partnerships with grassroots organizations, public meetings and efforts to select community representatives.

We want to become the best in the nation at co-creating solutions hand in hand with families. So, in each of our goal areas, we plan to advance solutions built with moms. Who can come up with new ways to help women quit smoking? Moms working hard to quit themselves. Who can best help develop new safe sleep solutions? Families currently struggling to get their two month old to sleep through the night. Having families at the leadership table will become the rule rather than the exception.
Positive health messaging can empower families to make behavior changes that support healthy pregnancies and healthy babies. For example, our Queen City smoking cessation campaign resulted in 3 times the number of Hamilton County calls to the Ohio Tobacco Quit Line. And we consistently see a spike in calls for cribs when we run safe sleep ads. As such, communications will continue to be one of the cornerstones of our work. Over the next five years, we will:

**Develop and disseminate culturally-competent messaging**
In partnership with families, local leaders and branding firm Deskey, we will develop and implement messaging campaigns on maternal smoking cessation, safe sleep, available local resources and more. Community members – moms, in particular – will be key in creating messaging that is culturally-competent and that resonates with families. Campaigns will include radio, television, outdoor and indoor advertising, social media and more.

**Spread messaging to influencers**
We know that moms place importance on information from a variety of sources. And the weight of that importance can change during a woman’s pregnancy and afterward. For example, a recent study found that families are more likely to follow safe sleep advice from their nurses and doctors immediately after the birth of their child, but prioritize advice from family and friends mere weeks later.

Influencers advise on a variety of topics, from birth spacing to safe sleep to maternal stress and everything in between. That advice, however, may not always be accurate. Safe sleep recommendations have changed dramatically over the last few decades. Grandparents often tell us that they were advised to place their baby to sleep on his or her stomach or side. And birth spacing is a relatively new topic, even among healthcare providers.

Each set of influencers needs to be armed with accurate information that helps mom during pregnancy and with her baby. That's why we will develop messaging specifically for dads, grandparents, aunts, uncles and other individuals in mom’s network: individuals who don’t often receive this information

**Provide clarity among conflicting advice**
Pregnancy and infant health advice can at times be conflicting - even information that is shared by the medical community. Personal beliefs as well as myths and misconceptions can stand in direct opposition of sound health messaging and lead to confusion for new parents. Cradle Cincinnati will continue to develop and promote evidence-based messaging that is uniformly spread throughout our community by diverse voices and partners. This will include a catalogue of publicly-available messaging tools, including videos, posters, fliers and social media posts.

**Share real family stories**
Most importantly, we will keep the faces and families affected by infant loss at the forefront of our work. Testimonials – like those we have previously shared from the Alexanders, Hankes, Jones and Lapthorns – speak directly to the hearts of Cincinnatians and show the true face of this issue.
As a global community, we know far too little about what causes preterm birth and infant death. For too many infants each year in Hamilton County, our best answer for the root cause of death is still “we don’t know.” Research will help us learn more about our infant mortality problem. With more knowledge and an increased understanding of the factors that influence birth outcomes and the individuals most affected, we can create better and more targeted strategies to reduce infant death. Research will enable us be efficient with our initiatives and help us contribute to a growing body of evidence around infant mortality reduction interventions. We will ensure that care and resources provided to women are up-to-date and beneficial by monitoring and studying their effects and impact on research.

There are many reasons why Hamilton County is a great place to expand our knowledge of infant mortality through research. Collaboration with other organizations in and outside of the field of infant health allows us to strategically build on our partners efforts and the work we have done so far. We also have several unique resources available for conducting infant mortality research, including the Maternal and Infant Data Hub, access to Vital Statistics, data from Fetal and Infant Mortality Review (FIMR), and personnel with statistical and data management expertise. These resources will allow us to answer interesting and meaningful questions in order to better understand and, ultimately, reduce infant death.

Research questions and topics of interest include:

- A variety of interventions have made an impact on infant mortality reduction by decreasing extreme preterm birth and sleep-related deaths. What component(s) of these interventions is responsible for this change?
- We launched a public health campaign on safe sleep and saw a reduction in sleep-related deaths. Was the public health campaign responsible for the reduction? Or did something else happen during the campaign that led to less sleep-related deaths?
- Through “Start Strong”, we successfully eliminated extreme preterm births in an at-risk population. What aspects of this intervention were responsible for eliminating extreme preterm birth in the Avondale community?
- We want to build on existing observational and descriptive epidemiology to learn more about the nature of infant deaths, especially extreme preterm births and sleep-related deaths.
- How does structural racism and implicit bias translate to infant mortality? How does it impact care? How does it affect social factors that lead to poor health?
Cradle Cincinnati Learning Collaborative

The Cradle Cincinnati Learning Collaborative (CCLC) was launched in 2015 as a network of healthcare staff who wanted to transform the way prenatal care is provided in Hamilton County. Over 20 prenatal care sites participate, including the Cincinnati Health Department, UC Health, TriHealth, Christ Hospital and more. Using quality improvement science, data-sharing and an “all teach, all learn” model, the CCLC serves as an opportunity to activate change within prenatal care.

The CCLC has activated 4 key drivers that we believe can reduce preterm birth: first trimester access to care, maternal tobacco cessation, connection to community health workers and team-based prenatal care. Over the next 5 years, all interventions implemented through the CCLC will focus on those key drivers.

ODM Cradle Collaborative

In 2016 and 2018, the Ohio Department of Medicaid and its five contracted managed care plans awarded funding to support Cradle Cincinnati partner agencies to work together to decrease black infant mortality. Funded projects include a substantial expansion of community health workers through 5 partner agencies (Cincinnati Health Department, Cradle Cincinnati Connections, Every Child Succeeds, Healthy Moms and Babes and TriHealth) to serve moms in the 20 zip codes with the highest infant mortality rates in Hamilton County.

There are approximately 7,800 moms served by Ohio Medicaid each year who are either pregnant or have a baby under the age of one in Hamilton County. Even with our recently expanded community health worker capacity, Hamilton County partners only have the potential to serve at most 50% of the prenatal and first year of life population. Every mom who wants to have a community health worker during pregnancy should have one. The ODM Cradle Collaborative is bringing together local community health worker agencies to improve efficiency in order to maximize caseloads – and support more women.

Cradle Cincinnati Connections

Cradle Cincinnati Connections is dedicated to helping families thrive in Cincinnati. We connect moms-to-be with the services they need, filling system gaps that families fall through all too often. Cradle Cincinnati Connections is designed to enhance and support maternal and child health social support programs by streamlining the use of existing resources for families. Additionally, Cradle Cincinnati Connections directly serves families and children by providing access to a team that includes a nurse, social workers, community health workers, a dietitian and a mental health specialist. In 2017, Cradle Cincinnati Connections served 599 women and engaged 1,043 total participants on Cincinnati’s West Side. In 2018, we will expand to additional neighborhoods and plan to apply for a “Healthy Start Level 3” grant that will allow us to take the program countywide and serve a much larger population.
Potential for positive pregnancy outcomes is optimized through an individualized approach ensures that each woman receives support she values. The team builds authentic relationships driven by a uniform commitment to solve patient problems, whether directly pertinent to their prenatal care or relevant as social determinants of health. Execution is simply characterized as a willingness on the part of the team to always say “yes.” Even if a mother is unable to appear for scheduled appointments, or does not respond to communication requests, the team will not end the relationship. Cradle Cincinnati Connections is committed to prompt follow through with a stated goal to always solve problems, using Mom’s self-identified needs as a framework for prioritization.

**Fetal and Infant Mortality Review**

Fetal and Infant Mortality Review is a partnership housed at Hamilton County Public Health that conducts a deep review of every infant death. When possible, this includes a standardized interview with the family of the child. Our goal is to increasingly link these findings with the interventions implemented by Cradle Cincinnati partners and to look for opportunities to learn even more from these families.

**Ohio Equity Institute**

The Ohio Equity Institute is a state-funded partnership housed at Hamilton County Public Health. In 2018, the work is evolving significantly to focus on identifying women early in their pregnancies and connecting them to evidence-based services. It is our hope that a new network of navigators funded through this program will add to the already significant workforce that has dedicated itself to supporting women during pregnancy.
Budget

Our Goal is to raise $25 million to combat infant mortality in Hamilton County over the next 5 years. Resources will be distributed amongst a variety of partners who are best positioned to lead each element of the plan.

We are building a sustainable funding infrastructure for this work beyond 2023. That includes:

- An increasing reliance on public funds, from 40% to 60% of our budget for our second strategic plan.
- Developing income streams by consulting with other cities’ infant mortality efforts.
- Partnering on technology solutions that can be marketed among national health efforts.
- Identifying payment models in partnership with the State of Ohio that can support strategies that are proven to reduce preterm birth.
Appendix

I. Our strategic planning process

II. Community listening sessions overview

III. Supporting data
Planning began in Summer of 2017 with a series of community listening sessions including more than 450 Hamilton County residents. In phase 2, our Advisory Board conducted a thorough review of the best available evidence linking various factors to preterm birth. Using both community input and scientific evidence, we next selected a small number of priority focus areas. Finally, we worked with local families to select a series of interventions designed to impact those areas of focus. Complete details are available at cradlecincinnati.org/planning.
<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Organization</th>
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<tbody>
<tr>
<td>Mr. Todd Portune</td>
<td>Hamilton County Commissioner</td>
</tr>
<tr>
<td>Mr. Ryan Adcock</td>
<td>Executive Director, Cradle Cincinnati</td>
</tr>
<tr>
<td>Mr. Tom Boeshart</td>
<td>Epidemiologist, Hamilton County Public Health</td>
</tr>
<tr>
<td>Ms. Lauren Bostick</td>
<td>Community Health Worker, Cincinnati Health Department</td>
</tr>
<tr>
<td>Ms. Anita Brentley</td>
<td>Community Engagement Consultant, All Children Thrive</td>
</tr>
<tr>
<td>Ms. Ebony Butts</td>
<td>Community Champion</td>
</tr>
<tr>
<td>Ms. Ruby Crawford-Hemphill</td>
<td>Assistant Chief Nursing Officer, UC Health</td>
</tr>
<tr>
<td>Dr. Marilyn Crumpton</td>
<td>Interim Health Commissioner, City of Cincinnati</td>
</tr>
<tr>
<td>Sister Tricia Cruise</td>
<td>President and CEO, Healthy Moms and Babes</td>
</tr>
<tr>
<td>Dr. Tiffany Diers</td>
<td>Assistant Professor, UC Health</td>
</tr>
<tr>
<td>Dr. Dave Dhanraj</td>
<td>Medical Director, TriHealth Faculty Medical Centers</td>
</tr>
<tr>
<td>Ms. Megan Folkerth</td>
<td>Program Officer, Interact for Health</td>
</tr>
<tr>
<td>Dr. Jim Greenberg</td>
<td>Co-Director, Perinatal Institute, Cincinnati Children’s Hospital Medical Center</td>
</tr>
<tr>
<td>Dr. Sam Hanke</td>
<td>Father of Charlie</td>
</tr>
<tr>
<td>Ms. Gina Hemenway</td>
<td>Director of Program Strategy and Design, Mercy Health</td>
</tr>
<tr>
<td>Mr. Tim Ingram</td>
<td>Health Commissioner, Hamilton County Public Health</td>
</tr>
<tr>
<td>Ms. Tina Jackson</td>
<td>Executive Director, March of Dimes Cincinnati / Dayton / NKy</td>
</tr>
<tr>
<td>Ms. Danielle Jones</td>
<td>Mother of Christopher</td>
</tr>
<tr>
<td>Dr. Elizabeth Kelly</td>
<td>Director, Community Women’s Health, University of Cincinnati Medical Center</td>
</tr>
<tr>
<td>Mr. Jeremiah Kirkland</td>
<td>Executive Director, TriHealth Women’s Institute</td>
</tr>
<tr>
<td>Dr. Michael Marcotte</td>
<td>Director of Quality for Maternal Services, TriHealth, Inc</td>
</tr>
<tr>
<td>Ms. Jodi Mesina</td>
<td>MC Regional Care Coordinator, CareSource</td>
</tr>
<tr>
<td>Mr. Ross Meyer</td>
<td>Vice President, Community Impact, United Way of Greater Cincinnati</td>
</tr>
<tr>
<td>Dr. Jennifer Mooney</td>
<td>Director, Family Health Division, Cincinnati Health Department</td>
</tr>
<tr>
<td>Dr. Elbert Nelson</td>
<td>Director, The Christ Hospital Birthing Center, The Christ Hospital</td>
</tr>
<tr>
<td>Ms. Molly Robertshaw</td>
<td>Program Officer, The Greater Cincinnati Foundation</td>
</tr>
<tr>
<td>Mr. Chris Rowland</td>
<td>Vice President, Deskey</td>
</tr>
<tr>
<td>Dr. Richard Shonk</td>
<td>Chief Medical Officer, Greater Cincinnati Health Council</td>
</tr>
<tr>
<td>Ms. Kiana Trabue</td>
<td>Executive Director, Gen-H</td>
</tr>
<tr>
<td>Dr. Judith Van Ginkel</td>
<td>President, Every Child Succeeds</td>
</tr>
<tr>
<td>Ms. Judith Warren</td>
<td>President and CEO, Health Care Access Now</td>
</tr>
<tr>
<td>Mr. Larry Williams</td>
<td>Principal, Shroder Paideia High School</td>
</tr>
</tbody>
</table>
Additional thanks for their strategic input:

- Andrea Chitteron
- Angela Bailey
- Crystal Brown
- Donna Porter Jones
- Dorothy Payne
- Felicia Jones
- Jill Miller
- Kadijah Harris
- Kelley Edelmann
- Kim Saxon
- Lisa Hyde-Hill
- Lou Muglia
- Linda Overstreet
- Mark Mallory
- Mary Newman
- Nicole Harris
- Nicole McCullum
- Ramsey Ford
- Tamaya Dennard
- Vernice Saturday
- Yvonne Lackey
- The Cradle Cincinnati and Cradle Cincinnati Connections teams
- Community members from Forest Park, Price Hill, North Fairmount, South Fairmount, Villages at Roll Hill and Westwood.

Community Listening Sessions

We began our strategic planning process by engaging more than 450 Hamilton County residents through 6 listening strategies summarized below. Complete details along with a full report on the results of each strategy are available at cradlecincinnati.org/planning

Families who have experienced loss

In depth interviews with more than 50 families who have lost an infant through Fetal and Infant Mortality Review.

The Community at Large

“Kitchen Conversations” with families who live in neighborhoods with high rates of infant loss.

Focus groups with two groups of African American moms and one group of African American dads.

Online Portal - short questionnaire spread through social media.

POP-UP engagements – creative neighborhood engagements at recreation centers, libraries and parks.

Our Advisory Board

One-on-one in-depth discussions with a small cohort of Advisory Board members.
Below is a list of the literature reviewed for this Strategic Plan:


## Supporting Data

Green = better compared to 2012-2016. Red = worse compared to 2012-2016. All numbers are percentages unless otherwise indicated. To read definitions of each indicator, download our data dictionary at cradlecincinnati.org.

### Women’s Health

#### Pre-pregnancy Body Mass Index
(among women who had live births)

<table>
<thead>
<tr>
<th></th>
<th>Hamilton County 2017</th>
<th>Hamilton County 2012-2016</th>
<th>Ohio 2012-2016</th>
<th>White, non-Hispanic 2017</th>
<th>Black, non-Hispanic 2017</th>
<th>Hispanic 2017</th>
<th>Asian 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight (BMI &lt; 18.5)</td>
<td>3.7</td>
<td>3.5</td>
<td>4.0</td>
<td>3.4</td>
<td>4.1</td>
<td>2.3</td>
<td>7.5</td>
</tr>
<tr>
<td>Obese (BMI ≥ 30)</td>
<td>25.8</td>
<td>25.3</td>
<td>25.7</td>
<td>21.8</td>
<td>35.8</td>
<td>22.8</td>
<td>7.3</td>
</tr>
</tbody>
</table>

#### Sexually Transmitted Infection
(among women who had live births)

<p>| | | | |</p>
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Syphilis</td>
<td>0.6</td>
<td>0.8</td>
<td>0.1</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>1.7</td>
<td>1.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>4.9</td>
<td>4.9</td>
<td>2.9</td>
</tr>
</tbody>
</table>

#### Unintentional Pregnancy
(among women who had live births)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>40.7% (2016)</td>
<td>44.1 (2013)</td>
<td>40.0% (2016)</td>
</tr>
</tbody>
</table>

#### Inadequately Spaced Pregnancy
(among non-first time moms who had live births)

<p>| | | | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>&lt;6 month Interpregnancy Interval</td>
<td>6.1</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td>&lt;12 month Interpregnancy Interval</td>
<td>17.6</td>
<td>18.1</td>
<td>18.1</td>
</tr>
<tr>
<td>&lt;18 month Interpregnancy Interval</td>
<td>32.4</td>
<td>32.9</td>
<td>33.0</td>
</tr>
</tbody>
</table>

#### Stress
(among all women)

|                                |                |                |
|--------------------------------|----------------|----------------|----------------|
| Reported a high level of stress during the past month | 23.2           | –              | –              | 24.4                     | 20.3                     | –             | –         |

#### Smoking Rates
(among all women)

|                                |                |                |
|--------------------------------|----------------|----------------|----------------|
| Smoking                        | 19.4           | 25.6 (2013)    | –              | 20.5                     | 20.0                     | –             | –         |

### Community Health

#### Housing

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Renters</td>
<td>43.2 (2016)</td>
<td>41.7 (2011-2015)</td>
<td>33.7 (2014-2015)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Reported difficulty paying rent before pregnancy (among women who had live births)</td>
<td>10.8% (2016)</td>
<td>–</td>
<td>14.2% (2016)</td>
<td>8.7% (2016)</td>
<td>23.9% (2016)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Reported housing as fair and poor</td>
<td>13.2</td>
<td>13.0 (2013)</td>
<td>–</td>
<td>10.5</td>
<td>20.9</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

#### Neighborhood Conditions

<p>| | | | | | | | |</p>
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</tr>
</thead>
<tbody>
<tr>
<td>Reported always or often feeling unsafe in their neighborhood (among women who had live births)</td>
<td>3.2% (2016)</td>
<td>2.7 (2013)</td>
<td>2.9% (2016)</td>
<td>2.1% (2016)</td>
<td>8.0% (2016)</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

#### Transportation
(among all adults)

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hamilton County 2017</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>Preterm Birth Rate</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;37 Weeks</td>
<td>11.2</td>
</tr>
<tr>
<td>&lt;28 Weeks</td>
<td>1.03</td>
</tr>
<tr>
<td>&lt;23 Weeks</td>
<td>.29</td>
</tr>
<tr>
<td><strong>Prenatal Care</strong></td>
<td></td>
</tr>
<tr>
<td>(among women who had live births)</td>
<td></td>
</tr>
<tr>
<td>Accessed Care in the 1st Trimester</td>
<td>69.0</td>
</tr>
<tr>
<td>Accessed Care in the 3rd Trimester</td>
<td>3.4</td>
</tr>
<tr>
<td>No Prenatal Care</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Maternal Cigarette Smoking</strong></td>
<td></td>
</tr>
<tr>
<td>(during 2nd or 3rd trimester)</td>
<td>8.7</td>
</tr>
<tr>
<td><strong>Drug Exposure During Pregnancy</strong></td>
<td></td>
</tr>
<tr>
<td>(among women who had live births)</td>
<td></td>
</tr>
<tr>
<td>Drug Exposure During Pregnancy</td>
<td>8.5</td>
</tr>
<tr>
<td>Opioid Exposure During Pregnancy</td>
<td>2.9</td>
</tr>
<tr>
<td><strong>Previous Preterm Birth</strong></td>
<td></td>
</tr>
<tr>
<td>(among women with previous births)</td>
<td></td>
</tr>
<tr>
<td>7.6</td>
<td>7.8</td>
</tr>
<tr>
<td><strong>Chronic Illness During Pregnancy</strong></td>
<td></td>
</tr>
<tr>
<td>(among women who had live births)</td>
<td></td>
</tr>
<tr>
<td>Gestational Diabetes</td>
<td>9.0</td>
</tr>
<tr>
<td>Hypertension</td>
<td>15.1</td>
</tr>
<tr>
<td><strong>Stillbirth rate</strong></td>
<td>6.7/1,000 (2016)</td>
</tr>
<tr>
<td><strong>Stress</strong></td>
<td></td>
</tr>
<tr>
<td>Reported life being very stressful during pregnancy</td>
<td>17.2</td>
</tr>
<tr>
<td>(among all women)</td>
<td></td>
</tr>
<tr>
<td>Reported having someone to talk to about problems during pregnancy</td>
<td>88.7 (2016)</td>
</tr>
<tr>
<td>(among women who had live births)</td>
<td></td>
</tr>
<tr>
<td>Reported living with father of baby during pregnancy</td>
<td>88.0 (2016)</td>
</tr>
<tr>
<td>(among women who had live births)</td>
<td></td>
</tr>
<tr>
<td><strong>Maternal Mortality</strong></td>
<td>.11/1000 (Ohio 2014)</td>
</tr>
<tr>
<td>(Pregnancy-related mortality)</td>
<td></td>
</tr>
</tbody>
</table>
## Infant Health

Green = better compared to 2012-2016. Red = worse compared to 2012-2016. All numbers are percentages unless otherwise indicated. To read definitions of each indicator, download our data dictionary at cradlecincinnati.org.

<table>
<thead>
<tr>
<th></th>
<th>Hamilton County 2017</th>
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<th>Ohio 2012-2016</th>
<th>White, non-Hispanic 2017</th>
<th>Black, non-Hispanic 2017</th>
<th>Hispanic 2017</th>
<th>Asian 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding Rates</td>
<td>73.5</td>
<td>68.4</td>
<td>72.5</td>
<td>77.9</td>
<td>63.0</td>
<td>79.7</td>
<td>90.0</td>
</tr>
<tr>
<td>(upon hospital discharge)</td>
<td></td>
<td></td>
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<tr>
<td>Postpartum Depression</td>
<td>6.3* (2016)</td>
<td>9.3 (2013)</td>
<td>8.6* (2016)</td>
<td>5.7* (2016)</td>
<td>10.9* (2016)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(among women who had live births)</td>
<td></td>
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<tr>
<td>Multiple Births (twins, triplets, etc.)</td>
<td>3.8</td>
<td>4.2</td>
<td>3.7</td>
<td>3.9</td>
<td>4.1</td>
<td>3.7</td>
<td>1.8</td>
</tr>
<tr>
<td>(among women who had live births)</td>
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<tr>
<td>Birth Defect/Congenital Anomaly Rates</td>
<td>0.9</td>
<td>0.8</td>
<td>0.5</td>
<td>0.9</td>
<td>1.0</td>
<td>0.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Birth Defect/Congenital Anomaly Deaths</td>
<td>1.7/1,000</td>
<td>1.6/1,000</td>
<td>1.2/1,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(deaths per 1,000 live births)</td>
<td></td>
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<tr>
<td>Unsafe Sleep Deaths</td>
<td>1.2/1,000</td>
<td>1.2/1000</td>
<td>1.0/1,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>(deaths per 1,000 live births)</td>
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<tr>
<td>Reported consistently placing infant on his or her back for sleep</td>
<td>86.8* (2016)</td>
<td>79.9 (2013)</td>
<td>87.2* (2016)</td>
<td>89.6* (2016)</td>
<td>78.6* (2016)</td>
<td>-</td>
<td>-</td>
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<tr>
<td>(among women who had live births)</td>
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</tr>
<tr>
<td>Reported always placing a baby in crib for sleep</td>
<td>70.5* (2016)</td>
<td>-</td>
<td>68.6* (2016)</td>
<td>75.2* (2016)</td>
<td>56.7* (2016)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(among women who had live births)</td>
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<td></td>
</tr>
<tr>
<td>Reported receiving paid leave from employer after baby was born</td>
<td>38.9 (2016)</td>
<td>59.3 (2013)</td>
<td>35.0* (2016)</td>
<td>46.2* (2016)</td>
<td>22.3* (2016)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Sources:** 2017 Ohio Department of Health, Office of Vital Statistics; 2012-2016 Ohio Department of Health, Office of Vital Statistics; 2013 Pregnancy Risk Assessment Monitoring System (PRAMS); 2012-2016 American Community Survey; 2013 and 2016 Greater Cincinnati Community Health Status Survey; 2012-2017 Fetal Infant Mortality Review (FIMR) Program; Cincinnati Children’s Hospital Medical Center Perinatal Institute, Centers for Disease Control and Prevention; 2016 Ohio Pregnancy Assessment Survey (OPAS); 2017 UC Infant Health Awareness Survey

*See Data Dictionary at cradlecincinnati.org for confidence intervals for these proportions.