Study of Mortality Rates of African American Infants and Infants in Rural Areas

Report to the Senate Finance Committee and the House Health and Government Operations Committee

DRAFT FOR WORKGROUP REVIEW

August 2019

Andrew N. Pollak, MD, Chairman
Ben Steffen, Executive Director

Draft REPORT for Work Group Review on 8/27/2019

Contents

Contents ii
Table of Figures iv
Table of Tables v
Executive Summary vi
Overview 1
Study Process 1
Description of Maryland Health Care Commission 2
Background on Live Births and Infant Mortality in Maryland 3
Infant Mortality by Geography and Race 5
Factors Impacting Infant Mortality in Black and Rural Communities 6
Overview of Literature Review on Factors Impacting Infant Mortality 6
Maryland Data Analysis 6
Individual-Level and Demographic Factors- Literature Review and Maryland Data 7
Access to Quality Health Care- Black Infants and Rural Infants 11
Health Insurance 11
Access to Care and Utilization of Services 12
Social Determinants of Health 13
Best Practices and Lessons Learned for Infant Mortality Reduction Programs 14
Literature Review of Best Practices 14
An Inventory of Maryland Programs Focused on Infant Mortality 16
Service programs: Types of services offered 17
Service programs: Client demographics and geographic location 18
Surveillance and oversight programs 18
Summary of Maryland's Managed Care Organizations (MCOs) 19
Community Health Workers- Overview and Interview Findings 21
Economic Costs of Preterm Birth, Low Birth Weight, and Infant Mortality 23
Areas for Future Study 23
Recommendations 23
Theme: Care Coordination 23

Recommendation 1: Improve existing care coordination processes and tools. 24

Recommendation 2: Care coordination should include programs to address social determinants of health outcomes, including the impact of racism and bias. 25

Recommendation 3: Implement rigorous implicit bias training in relevant health care providers' education and clinical practices. 26

Recommendation 4: Strengthen coordination of care by assessment and referral to necessary mental health and substance abuse treatment programs 27

Recommendation 5: Improve continuity of care 28

Recommendation 6: Increase adoption of breastfeeding prior to hospital discharge and support continuation through the first year of life. 29

Recommendation 7: Health care providers, community health workers, and other organizations should enhance patient education on pregnancy spacing. 30

Theme: Expanding and Enhancing Access and Utilization of Services 30

Enhanced Prenatal Care Models 30

Recommendation 8: Expand home visiting programs throughout the State as a cornerstone in the effort to improve maternal and infant health and reduce infant mortality and disparities. 30

Recommendation 9: Increase adoption of evidence-based group prenatal care programs. 31

Recommendation 10: Enhance the use of telehealth to provide care in rural communities. 31

Recommendation 11: Improve clinical adoption of evidence-based use of progestogens to prevent preterm birth. 32

Enhancing Access and Utilization of Other Critical Programs 33

Recommendation 12: State and local health agencies should invest in an infant mortality prevention health literacy initiative across sectors to create an informed and activated community of residents, health and social service providers and facilities. 33

Recommendation 13: Continue investment in safe sleep education and increase investment in safe sleep resources. 33

Theme: Need for a Sustained and Centralized Focus on Infant Mortality 34

Recommendation 14: FOR WORKGROUP DISCUSSION: Optional approaches to address this topic: 34

Appendix A: Detailed Data Analysis 35

Appendix A2: MCH Presentation 35

Appendix B: Cost Analysis 35

Appendix C: Risk Factors Literature Review 35

Appendix D: Effective Programs Literature Review 35

Appendix E: Inventory of Maryland Programs 35
Appendix E2: Survey Instrument 35
Appendix E3: Website Extraction Table 35
Appendix F: Interviews about Community Health Workers 35
Appendix F2: Interview Protocol 35
Appendix G: Issue Paper Permanent Council 36
Appendix H: Glossary of Terms and Abbreviations 36
Appendix I: Workgroup Structure and Participants 36
Appendix J: List of Birthing Hospitals in Maryland 36
End Notes 37

Table of Figures

Figure 1: Infant Mortality Rates by Race & Rural/Urban Counties, Maryland, 2007 - 2016 4
Figure 2: Infant Mortality Rates by Race & Rural/Urban Counties, Maryland, 2007 - 2016 5
Figure 3: Infant Mortality Rate by Breast Feeding Status before Discharge, Race, and Geography, Maryland, 2012-2016 7
Figure 4: Infant Mortality Rate by Interval between Pregnancies, Race, and Geography, Maryland, 2012-2016 8
Figure 5: Infant Mortality Rate by Maternal Smoking, Race, and Geography, Maryland, 2012-2016 10
Figure 6: Infant Mortality Rate by Pre-pregnancy BMI, Race, and Geography, Maryland, 2012-2016 10
Figure 7: Infant Mortality Rate by Parental Marital Status, Race, and Geography, Maryland, 2012-2016 11
Figure 8: Infant Mortality Rate by Utilization of Prenatal Care, Race, and Geography, Maryland, 2012-2016 13
Figure 9: Infant Mortality Rate by Maternal Education Level, Race, and Geography, Maryland, 2012-2016 26

Table of Tables

Table 1: Live Births in Maryland by Geography, 2017 3
Table 2: Live Births by Race and Ethnicity, Maryland, 2017 3
Table 3: Poor Birth Outcomes as a Percent of Live Births, Maryland, 2017 3
Table 4: Relative Risk of Not Breastfeeding before Hospital Discharge at Birth v. Breastfeeding, Maryland, 2012-2016 7
Table 5: Infant Mortality Rate for Chronic and Gestational Hypertension by Race and Geography, Maryland, 2012-2016 9

Draft REPORT for Work Group Review on 8/27/2019

Executive Summary

Senate Bill 266 from the 2018 legislative session directed the Maryland Health Care Commission, in collaboration with agencies within the Maryland Department of Health (MDH) and stakeholders to study and report on the issue of infant mortality in African-American infants and infants in rural communities in Maryland.

[ADDITIONAL CONTENT TBD]

Draft REPORT for Work Group Review on 8/27/2019

Overview

In 2018, the Maryland General Assembly passed a bill requiring the Maryland Health Care Commission (MHCC) to conduct a study on mortality rates for Black infants and infants in rural areas ("the Study").[1] Chapter 83 of the 2018 State Laws of Maryland required MHCC, in consultation with the Office of Minority Health and Health Disparities, the Maternal and Child Health Bureau, the Vital Statistics Administration, and interested stakeholders, to conduct a study regarding the mortality rates of Black infants and infants in rural areas. The statute requires that MHCC--

(1) examine factors, beyond the known factors of low birth weight, teen pregnancy, poor nutrition, and lack of prenatal care, affecting the mortality of Black infants and infants in rural areas in the United States and in the State;
(2) research programs in other countries, states, and localities, including Baltimore City, that have aimed to reduce the infant mortality rate;
(3) make recommendations on methods to reduce the mortality rate of Black infants and infants in rural areas;
(4) make recommendations on ways to use pregnancy navigators or community health workers to assist pregnant women with the goal of reducing the infant mortality rate;
(5) make legislative recommendations regarding the establishment of a permanent council for lowering rates of disparity with respect to infant mortality; and
(6) make recommendations regarding methods to reduce the costs associated with low birth weight infants and with infant mortality.

This report contains the findings and recommendations resulting from this study. The work in this study builds off of a 2011 epidemiological study and plan focused on infant mortality in Maryland[2], which proposed programmatic interventions across a parent's life span, including improving primary care and family planning services integration before pregnancy, improving access to Medicaid and prenatal care during pregnancy, and increasing community services referrals after pregnancy and working with hospitals on perinatal standards.

Since 2011, significant change has occurred in the health care environment in Maryland, including expansion of health insurance coverage under the Affordable Care Act and increased focus on patient safety and quality initiatives related to newborn health in hospitals. The 2011 Plan for Reducing Infant Mortality in Maryland had a goal of reducing the infant mortality rate to 6.5/1,000 live births, by 2012, through a reduction of 4.2% in the Black infant mortality rate, from 11.8/1,000 live births in 2010 to 11.3/1,000 in 2012.

As of 2017, the infant mortality rate in Maryland was 6.5/1,000, representing no progress from the 2012 goal. The Black infant mortality rate was 10.9/1,000, just under the 2012 goal.[3] The purpose of this report is to recommend action that can foster improvements in the overall infant mortality rate in the State, but more importantly reduce disparities based on race and geography.

Study Process

MHCC conducted the study through (1) collaboration with other State offices and agencies to plan the study and analyze State data; (2) an agreement with the Department of Family Science (FMSC), School of Public Health, University of Maryland in College Park which provided research, meeting support and project management for the study; and (3) a stakeholder workgroup.

Throughout the study, MHCC worked with the Office of Minority Health and Health Disparities, the Maternal and Child Health Bureau, the Vital Statistics Administration, the Health Resources Cost Review Commission to plan study activities; and other Agencies within the Maryland Department of Health. State staff also analyzed State data to better understand "factors … affecting the mortality of Black infants and infants in rural areas in the … State" and "costs associated with low birth weight infants".[4]

The Department of Family Science (FMSC), School of Public Health, University of Maryland in College Park provided research, report drafting support, meeting support, and project management for the Study. The research conducted by the team included literature reviews on factors related to infant mortality (Appendix C) and programs aimed at reducing infant mortality (Appendix D). A limited literature review was also conducted on the cost implications of infant mortality and poor birth outcomes (Appendix B). The FMSC team also created an inventory of programs in Maryland that focus on infant mortality (Appendix E). A limitation of this program inventory is that it does not include programs operated by insurers, including Medicaid Managed Care Organizations. Discussion of the role of Medicaid Managed Care Organizations is included in this report. Finally, the FMSC team conducted qualitative interviews with leaders of community-based programs in rural and Black communities in Maryland and other states. These interviews focused on the use of community health workers and similar staff in infant mortality prevention efforts (Appendix F); and an initial cost analysis based on literature. The FMSC team conducted this research and analysis under the direction of MHCC, with advice and input from other State staff the Study's work group and subgroups.

The Study workgroup met 8 times between September 2018 and October 2019. The workgroup was chaired by Ben Steffen, Executive Director of MHCC. Dr. Lee Woods, the Medical Director for the Maternal and Child Health Bureau at MDH, and Dr. Noel Brathwaite, the Director of the Office of Minority Health and Health Disparities at MDH, served as workgroup co-chairs. The workgroup had three subgroups that developed and refined information on specific topics and provided draft recommendations to the larger work group for consideration. More than sixty individuals participated in the study through participation in a workgroup meeting or subgroup meeting. Additional information on the workgroup structure and a list of individuals who participated in the workgroup and/or a subgroup is available in Appendix I. Additional information on workgroup meetings is available at https://mhcc.maryland.gov/mhcc/pages/home/workgroups/workgroups_african_american_rural.aspx .

Description of Maryland Health Care Commission

The Maryland Health Care Commission (MHCC) is an independent regulatory agency of the State of Maryland whose mission is to plan for health system needs, promote informed decision-making, increase accountability, and improve access in a rapidly changing healthcare environment by providing timely and accurate information on availability, cost, and quality of services to policy makers, purchasers, providers and the public.[2] The Commission's vision for Maryland is to ensure that informed consumers hold the health care system accountable and have access to affordable and appropriate health care services through programs that serve as models for the nation. MHCC has fifteen commissioners who are appointed by the Governor.

Draft REPORT for Work Group Review on 8/27/2019

Background on Live Births and Infant Mortality in Maryland

More than 71,000 infants were born in Maryland in 2017.[5] The focus of this study is Black infants and infants in rural communities. Thirty-two percent of all infants born in Maryland in 2017 are Non-Hispanic Black (Table 2). Approximately 26 percent of these infants were born to individuals residing in rural counties in the State (Table 1).[6] Table **2**: Live Births by Race and Ethnicity, Maryland, 2017

Table 1: Live Births in Maryland by Geography, 2017
Source: Maryland Vital Statistics

	Number	Percent
Rural	18,340	26%
Non-Rural	53,249	74%
TOTAL	**71,589**	**100%**

Table 2: Live Births by Race and Ethnicity, Maryland, 2017
Source: Maryland Vital Statistics

	Number	Percent of total
White Non-Hispanic	30,392	42%
Black Non-Hispanic	23,043	32%
Hispanic	12,211	17%
Asian and Pacific Islander, Non-Hispanic	5,493	8%
Native American, Non-Hispanic	119	0%
Other	331	0%
Total	**71,589**	100%

In 2017, 462 infants died in Maryland in their first year of life, contributing to an infant mortality rate (IMR) of 6.5 per 1,000 live births[7]. For purposes of this study, infant mortality is defined as a death within the first year of life. In Maryland in 2017, the leading cause of infant death was low birth weight.[8] Approximately nine percent of infants born in Maryland in 2017 had a low birth weight (less than 2500 grams). In 2017, approximately eleven percent of infants were born before 37 weeks of gestation (Table 3**Error! Reference source not found.**).

Table 3: Poor Birth Outcomes as a Percent of Live Births, Maryland, 2017
Source: Maryland Vital Statistics

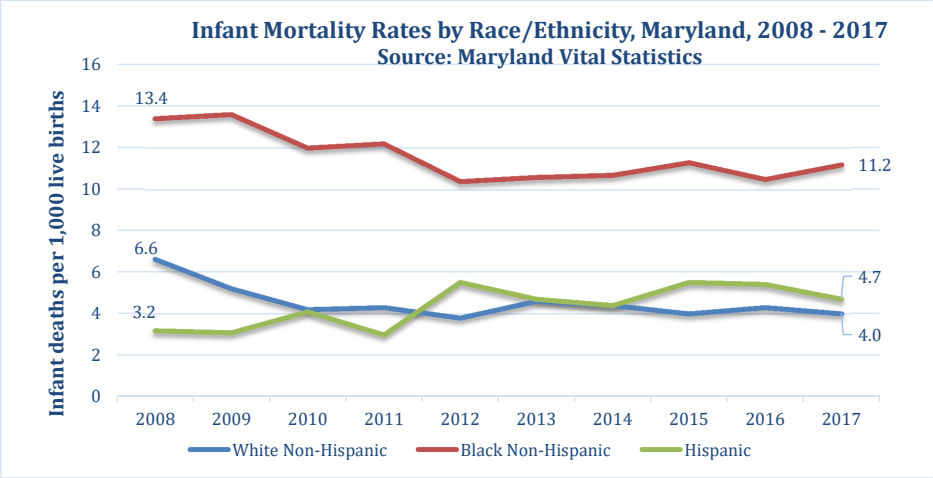
Low Birth Weight (<2500 grams)	8.9%
Very Low Birth Weight (<1500 grams)	*1.8%*
Pre-term birth (born <37 weeks of gestation)	10.5%

According to the Kaiser Family Foundation, in 2016 Maryland's infant mortality rate (IMR) ranked 35th in the nation.[9] The infant mortality rate in Maryland has been above the national average throughout the past 25 years, even as the IMR has declined (see Appendix A2). Between 2014 and 2017, Maryland's IMR remained about one percentage point above the national average, translating to 1,908 preventable deaths during this period.[10] According to the Vital Statistics Administration, Maryland continues to remain short of the Healthy People 2020 benchmark rate of 6.0 deaths per 1,000 live births.[6]

Historically, Maryland's IMR has been higher than the national average in part, because the state also has a higher proportion of Black residents, and the burden of infant mortality is borne disproportionately by people of color.[11] Among infants born in Maryland, non-Hispanic Black infants have the highest mortality rate compared to other racial and ethnic groups. In 2017, the infant mortality

rate for White Non-Hispanic infants was 4.0 per 1000 births, while the infant mortality rate for Black Non-Hispanic Births is 11.2 per 1000 births. In 2019, Black Non-Hispanic infants are 2.8 times more likely to die in their first year of life than White Non-Hispanic Infants. While disparities exist for Hispanic infants, the scale of the disparity is much smaller. In 2017, the infant mortality rate for Hispanic infants in Maryland was 4.7 per 1000 births.[12]

Figure 1: Infant Mortality Rates by Race & Rural/Urban Counties, Maryland, 2007 - 2016



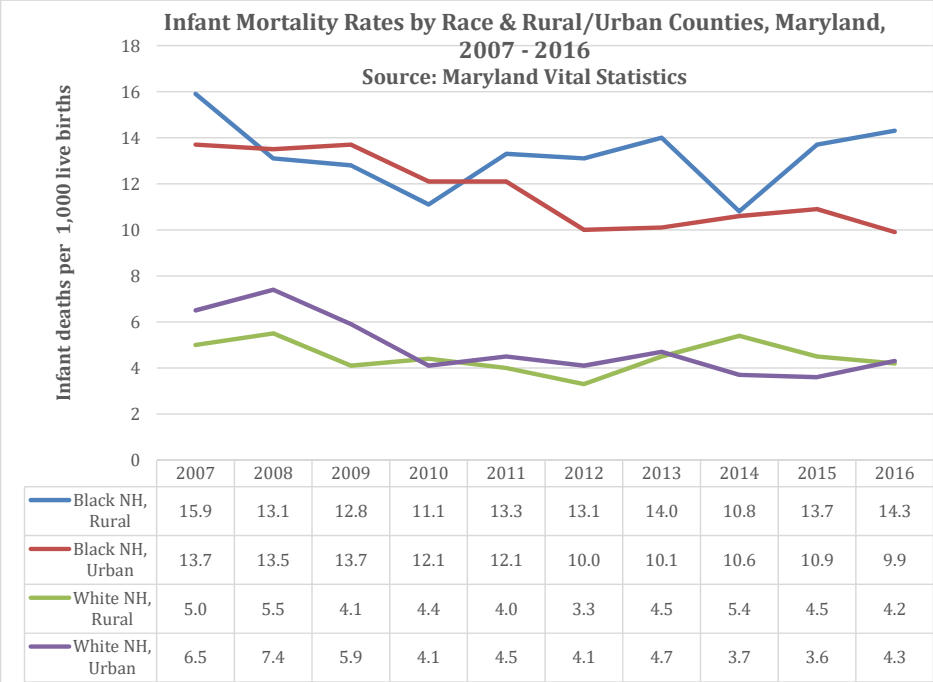
Looking at data from 2016, Maryland's infant mortality rate for Black Infants ranked 9th in the United States, better than the national average.[13] However, the size of the disparity between the infant mortality rates for Black and White Non-Hispanic infants is larger than the national figure (see Appendix A2).[14] While mortality rates among both white and Black infants have declined over the past 25 years, the disparity between the two groups has persisted. The Maryland Maternal and Child Health Bureau estimates that IM among Blacks must be reduced 59% in order to achieve racial parity.[15]

In 2017, the leading causes of infant deaths in Maryland include low birth weight (22%), congenital anomalies (19%), Sudden Infant Death Syndrome (SIDS) (12%), and maternal complications of pregnancy (8%).[16] In 2017 most infant deaths (68 percent) occur in the neonatal period (the first month of life).[17] In recent years, deaths due to SIDS remained nearly steady at approximately 50 deaths annually, but 2017 marked an increase with 55 SIDS related deaths.[18] A recent Maryland State Child Fatality Review Report focused on SIDS indicated that the majority (84 percent) of these deaths occurred before 5 months of age and that unsafe sleep was indicated as a factor in the majority of cases (240 of 262 cases from 2012-2016).[19] Vital statistics data from 2017 indicate that compared to White infants, Black infants were 4 times more likely to die from low birth weight, 2 times more likely to die from congenital abnormalities, 2.5 times more likely to die from SIDS, and 13 times more likely to die from maternal complications of pregnancy.[4]

The Vital Statistics Administration annually reports on births and infant mortality. Those reports are available here: https://health.maryland.gov/vsa/Pages/reports.aspx.

Infant Mortality by Geography and Race

Figure 2: Infant Mortality Rates by Race & Rural/Urban Counties, Maryland, 2007 - 2016



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Black NH, Rural	15.9	13.1	12.8	11.1	13.3	13.1	14.0	10.8	13.7	14.3
Black NH, Urban	13.7	13.5	13.7	12.1	12.1	10.0	10.1	10.6	10.9	9.9
White NH, Rural	5.0	5.5	4.1	4.4	4.0	3.3	4.5	5.4	4.5	4.2
White NH, Urban	6.5	7.4	5.9	4.1	4.5	4.1	4.7	3.7	3.6	4.3

For this study, data was analyzed for Black and White non-Hispanic infants in all jurisdictions of the State. In the 2012-2016 time period, the rural infant mortality rate was 5.8/1000, while the urban infant mortality rate was 6.5/1000.[20] Historically, rates of infant mortality have been higher in urban areas than in rural areas.[21] While infant mortality rates have declined across the State, these declines have not been uniform. Between 2007-11 and 2012-16 in rural areas of Maryland, the infant mortality rate among Black and White residents decreased by <1% and 5% respectively. In contrast, in urban areas during that same time period, the infant mortality rate among Black and White Non-Hispanic infants decreased by 21% and 29% respectively. In some rural areas, infant mortality rates have been increasing (comparing the 2008-2012 time period with the 2013-2017 time period).[22] It is important to note the rural/urban comparison is confounded by race. While the statewide burden of IM remains somewhat higher in urban than rural counties, in 2016, Black infants born in rural Maryland had a higher mortality rate (14.3 per 10000) than Black infants born in urban counties (9.9 per 1000) (2). Additional findings from this data analysis are in Appendix A.

Factors Impacting Infant Mortality in Black and Rural Communities

The statute authorizing this Study required an examination of "factors, beyond the known factors of low birth weight, teen pregnancy, poor nutrition, and lack of prenatal care, affecting the mortality of Black infants and infants in rural areas in the United States and in the State".[23] These factors where identified through a literature review and an analysis of Maryland data.

Overview of Literature Review on Factors Impacting Infant Mortality

The FMSC team completed a review of peer-reviewed literature published between 2008 and 2018 (See Appendix C for the complete literature review and related conceptual framework). Individual-level, demographic, and access to care issues do not fully explain the persistent racial disparities in infant mortality. The literature review confirmed the importance of preventing the five recognized causes of infant mortality: preterm birth, low birth weight, SIDS, obstetric complications, and accidents. In Maryland, these five factors make up 46 percent of the major causes for infant mortality, and thus deserve continued attention. Other major causes are congenital anomalies (18.8%), Newborn complications (3.7%), Newborn sepsis (2.6%), and Neonatal hemorrhage (2.4%).[24]

The literature review identified additional factors related to individual health and behavior, demographic factors, and access to quality care. Infant mortality is a multifactorial phenomenon, with determinants that include the mother's health prior to and during pregnancy, those related to the clinical course of pregnancy, those associated with the birth and postpartum experience, and infant and maternal health during infancy. Therefore, reducing disparities in infant mortality will require attention to the diverse and inter-related set of risk factors and their causes.

A substantial literature exists on factors impacting infant mortality for Black Infants. Fewer peer-reviewed studies exist that are specifically focused on infant mortality in rural populations.

Maryland Data Analysis

Maryland State Staff analyzed data from Maryland Vital Statistics (i.e. birth certificates and death certificates). Most of the data in this section of the report is from a data set that links birth data from 2012-2016 with death data from 2012-2017 (hereafter referred to as the Linked Birth-Infant Death Cohort, 2012-2016 Births). Because infant mortality is a relatively rare event, the data in this section of the report is not presented by individual year or jurisdiction, to avoid reporting small cell sized and to improve statistical accuracy. The factors examined in the Maryland data for this study are educational attainment, smoking, marital status, insurance source, prenatal care utilization, chronic hypertension, gestational hypertension, gestational diabetes, breastfeeding before hospital discharge, the length of the inter-pregnancy interval, and pre-pregnancy body mass index (BMI). For all factors studied in this data, the infant mortality rate for non-Hispanic Black infants was higher than the infant mortality rate for non-Hispanic White infants. Differences in risk between urban and rural jurisdictions were specific to each risk factor (e.g. Smokers in urban jurisdictions have a higher risk of infant mortality than smokers in

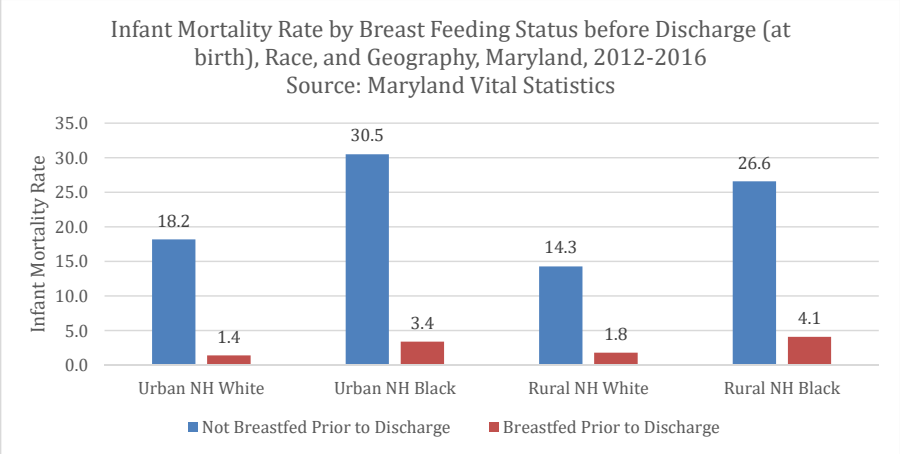
rural jurisdictions, while late or no prenatal care has a worse impact in rural communities). Additional information about the data analysis is in Appendix A.

Individual-Level and Demographic Factors- Literature Review and Maryland Data

According to Maryland Vital Statistics data, the largest factors in infant mortality for non-Hispanic Black infants are breastfeeding and the length of the inter-pregnancy interval.

Breastfeeding is protective for many health risks.[25] According to the national literature review, black infants are the least likely to be breastfed, compared to infants of other races and ethnicities.[26] Additionally, a lower proportion of rural children are ever breastfed, in comparison to urban children.[27]

Figure 3: Infant Mortality Rate by Breast Feeding Status before Discharge, Race, and Geography, Maryland, 2012-2016



According to Maryland data from 2012-2016, failure to start breastfeeding before hospital discharge at birth is one of the strongest predictors of infant mortality for Non-Hispanic Black infants in the data analyzed for this study. Non-Hispanic Black women living in urban areas of the State who do not start to breastfeed before the leaving this hospital after birth face an infant mortality rate of 30.5/1,000, compared to a rate of 3.4/1,000 for their peers who breast feed. The rates are lower for women in rural areas, but are much higher than the overall infant mortality rate for all race and geographic groups in this study. The relative risks of not breast feeding v. breastfeeding are also higher than any other risk factor studied for all groups of women.

Table 4: Relative Risk of Not Breastfeeding before Hospital Discharge at Birth v. Breastfeeding, Maryland, 2012-2016

Source: Maryland Vital Statistics

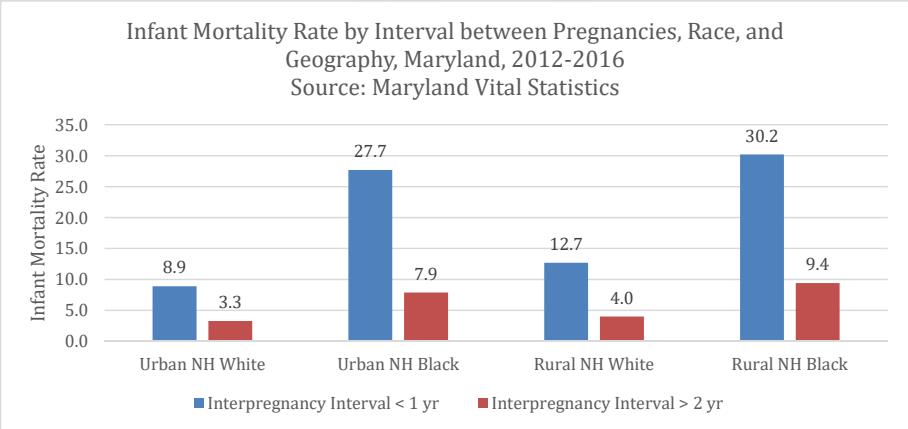
Urban NH White	Urban NH Black	Rural NH White	Rural NH Black

13.00	8.97	7.94	6.49

To support breast feeding after birth, Maryland's Perinatal System Standards (Standard 6.7) require birthing hospitals to "have at least one full-time equivalent International Board Certified Lactation Consultant who shall have programmatic responsibility for lactation support services which shall include education and training of additional hospital staff members in order to ensure availability of lactation support seven days per week"[28]

The Maryland Vital Statistics data also showed that inter-pregnancy interval (the time between pregnancies) played an important role in infant mortality. A non-Hispanic black infant in a rural area who was born less than 1 year after a sibling faces an infant mortality rate of 30.2 per 1,000 infants, while an infant with the same characteristics born more than 2 years after the most recent sibling faces an infant mortality rate of 9.4 per 1,0000. A short time period between pregnancies (less than 1 year) was associated with infant mortality for all groups of women, compared to longer intervals between pregnancies. The protective effect (relative risk) of longer intervals between pregnancies was relatively similar for all women studied.

Figure 4: Infant Mortality Rate by Interval between Pregnancies, Race, and Geography, Maryland, 2012-2016



The FMSC team identified additional individual-level clinical risk factors for IM among Blacks through the literature review. These include maternal hypertension (either chronic or pregnancy-related); [29]history of a previous stillbirth or death of child in infancy;[30] and maternal depression, during either the prenatal or postpartum period.[31] Maternal depression was also found to increase risk for bed sharing and reduce the likelihood of breastfeeding, both risk factors for SIDS.[32] Apart from specific risk factors for IM, maternal depression is an established risk factor for or co-morbidity with health behaviors, including smoking and substance abuse, which also increase risk of infant mortality.[33]

Maryland data on maternal hypertension supports the findings of the literature review, although the scale of the impact of hypertension on infant mortality is not as large as the impact of the factors described above. In addition, both the infant mortality rate and the relative risk of chronic hypertension is highest for Rural Black Non-Hispanic infants (relative risk is 2.3 for the 2012-2016 period compared to 1.7 for Rural White Non-Hispanic infants), suggesting a possible population for focused intervention.

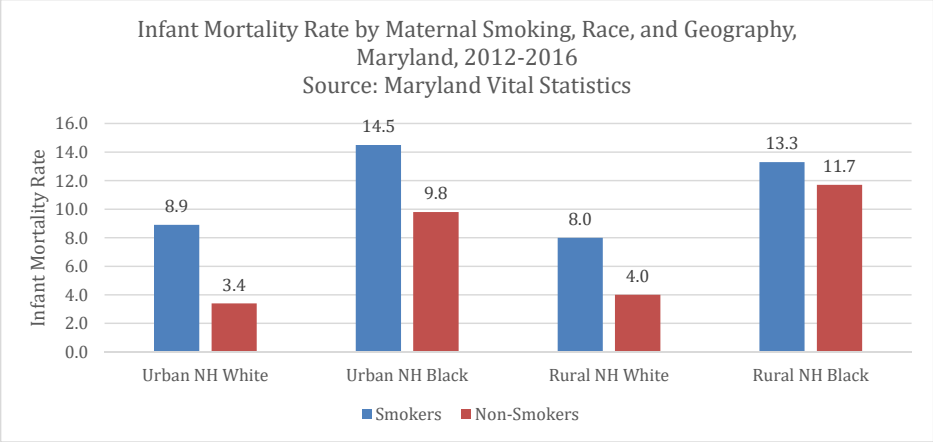
Table 5: Infant Mortality Rate for Chronic and Gestational Hypertension by Race and Geography, Maryland, 2012-2016

	Urban Non-Hispanic White	Urban Non-Hispanic Black	Rural Non-Hispanic White	Rural Non-Hispanic Black
Chronic Hypertension	8.2	14.3	7.7	26.1
No Chronic Hypertension	3.7	9.8	4.5	11.2
Gestational Hypertension	4.7	10.0	5.3	10.5
No Gestational Hypertension	3.8	10.0	4.5	12.0

History of previous loss of a child and maternal depression were not included in the analysis of Maryland data (for a description of methodology, see Appendix A). Bed-sharing between parents and infants is associated with a two-fold increase in SIDS risk, and several recent studies have found racial differences in sleep practices, with more reports of bed-sharing among Black families.[34]

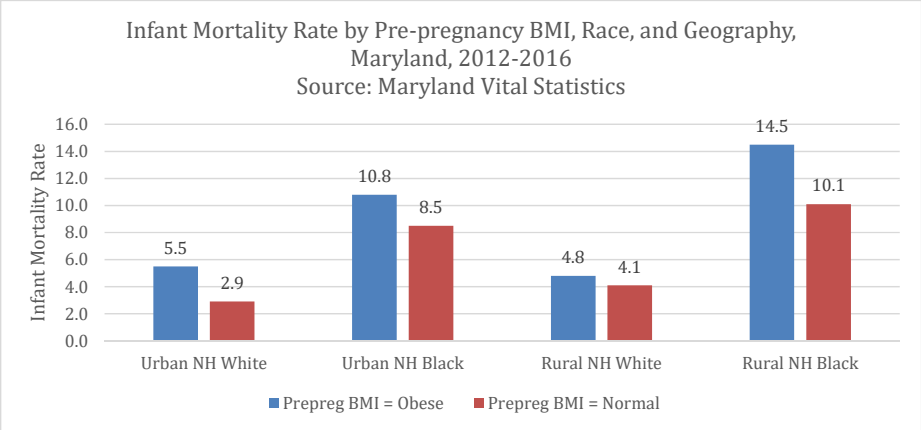
Smoking is an additional risk factor for infant mortality, including for Black non-Hispanic infants. Smoking is associated with an increased risk of SIDS death, low birth weight, and preterm birth.[35] [ADD DATA IN ON PREVELANCE: smoking is more common in white women.] The reviewed literature emphasizes the importance of early availability of smoking cessation programs (Maryland's Quit Line provides smoking cessation support with heightened incentives for pregnant individuals).[36]. However, the difference in outcomes between smokers and nonsmokers is smaller for black families than for white families. Rural areas have a high prevalence of smokers. Rural children are more likely to live with a smoker than urban children, irrespective of race.[37] The analysis of Maryland data supports some association between smoking during pregnancy and infant mortality (Figure 5).

Figure 5: Infant Mortality Rate by Maternal Smoking, Race, and Geography, Maryland, 2012-2016



Obesity is consistently linked with an elevated risk of infant mortality in the national literature. According to Maryland data, while pre-pregnancy weight may have some impact on infant mortality, that impact is small compared to other risk factors.

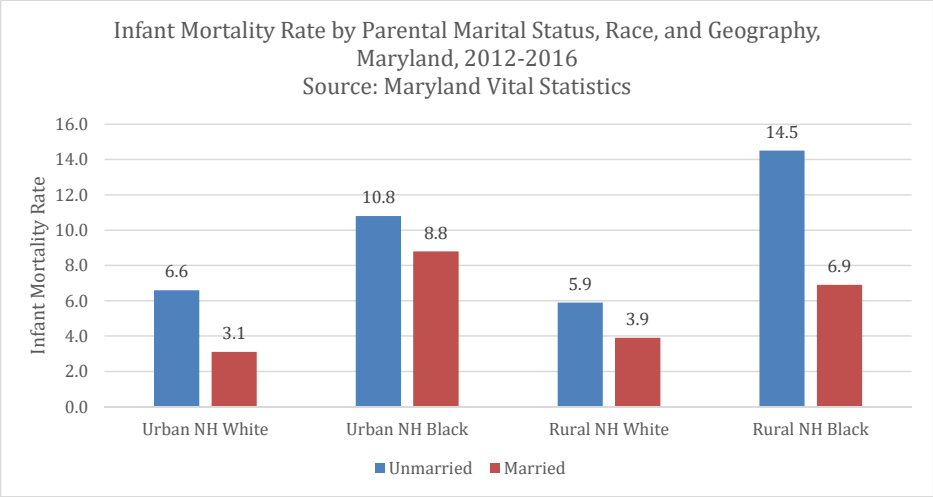
Figure 6: Infant Mortality Rate by Pre-pregnancy BMI, Race, and Geography, Maryland, 2012-2016



Behavioral risk factors are not exclusively the responsibility of the mother. Other caregivers play a role in sleep placement of infants and exposure to smoke. In addition, the non-birth parent's choices matter: the literature review suggest that that infants without paternal involvement have an elevated risk of IM. Data on the impact of parental involvement for unmarried partners in Maryland was not

available for analysis for this study. In Maryland, infant mortality is twice as likely for unmarried White Non-Hispanic urban parents and Black Non-Hispanic Rural Parents than their married counterparts. The relative risk for Urban Non-Hispanic Black Infants and Rural Non-Hispanic White Infants is lower. (Figure 7). Marital status is not a complete measure of non-birth parent involvement or social and family supports. Numerous social, economic, and generational factors impact marital status.

Figure 7: Infant Mortality Rate by Parental Marital Status, Race, and Geography, Maryland, 2012-2016



Access to Quality Health Care- Black Infants and Rural Infants

The literature review focused on the importance of access to and utilization of quality prenatal care (especially for individuals with preexisting conditions) and quality hospital care at birth, as well racial disparities in access and utilization of care. There are a number of components to access and utilization of care, including health insurance coverage/financing, availability of providers (which may be impacted by geographic location), the quality of available providers, and utilization of available providers (which may be influenced by social determinants of health such as transportation, income, health literacy, etc.).

Health Insurance

Health insurance coverage is crucial to access to care and utilization of care, as it allows patients to pay for health care services. Health insurance coverage before pregnancy (for preventive care and management of chronic conditions), during pregnancy (for prenatal care and birth), and after pregnancy are all important to outcomes for both mother and child. In Maryland, the uninsured rate is six percent.[38] Most adults with commercial health insurance receive insurance through their employers.[39]

Seven percent of adults in Maryland receive coverage through the individual health insurance market. Subsidies for the purchase of qualified health plans (QHPs) are available through the Maryland Health

Connection for individuals with incomes below 400 percent of the federal poverty level (FPL).[40] QHPs offered through the Maryland Health Connection cover preventive, maternity, and newborn care.[41] Changes to family status, such as the birth of child, allow families to enroll in a QHP outside of the annual open season.[42] A bill passed in the 2019 legislative session also provides a special enrollment period for pregnancy.[43]

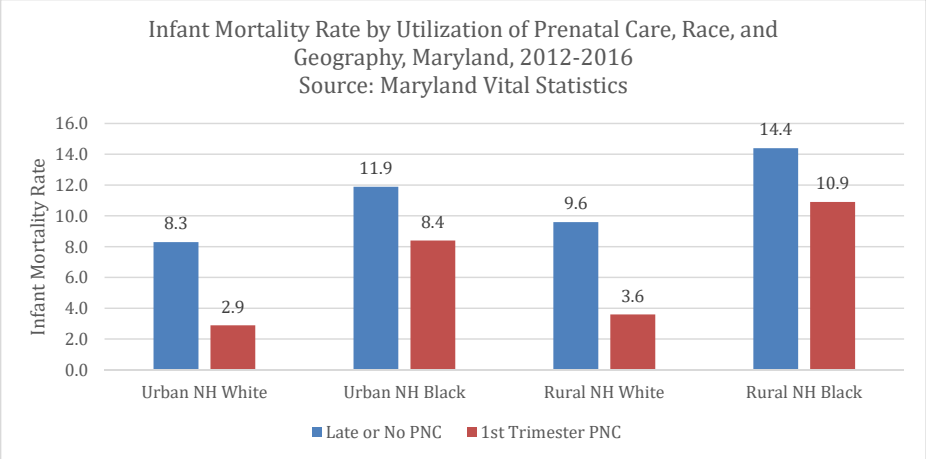
Pregnant individuals with incomes below 259 percent of the FPL qualify for all Medicaid benefits (including prenatal and postpartum care) for the length of the pregnancy plus 60 days after birth. Medicaid and MHBE data show that over 81 percent of women who receive Medicaid under the pregnancy eligibility category retained Medicaid coverage after the post-partum period; another nearly seven percent were enrolled in qualified health plans in the individual market (2016 data). These women also continue to be eligible for the Medicaid family planning program if their income is below 264 percent of FPL. As of 2017, 43 percent of births in Maryland were financed through Medicaid.[44] Most pregnant women in the Medicaid program receive their health care services through a Medicaid Managed Care Organization (MCO), which is responsible for coordination of care. There are 9 MCOs in Maryland. MCOs are held accountable for quality performance metrics, including quality measures related to maternal, infant and child health.

Non-pregnant adults with incomes below 135 percent of the FPL qualify for Medicaid coverage in Maryland. The benefit package for adults covered by Medicaid includes routine preventive care and comprehensive family planning services (office visits, laboratory tests, contraceptive devices and supplies, and voluntary sterilization with no copayments). In addition, individuals with incomes below 264 % FPL qualify for Maryland Medicaid's Family Planning program, which includes contraceptive services.

Access to Care and Utilization of Services

The literature review identified the importance of prenatal care to outcomes for Black women. A study in Mississippi found that when compared to White women, Black women were more likely to receive inadequate prenatal care, despite carrying a greater burden of chronic conditions.[45] Looking at Maryland data, early utilization of prenatal care appears to have more of a protective effect for White women than for black women.

Figure 8: Infant Mortality Rate by Utilization of Prenatal Care, Race, and Geography, Maryland, 2012-2016



Primary care and preventive care is important before individuals become pregnant because the pre-conception health has an impact on the health of the infant. The literature also documents the lower likelihood that residents of rural areas will receive preventive care, which is important given that chronic disease pre-pregnancy can pose risks to the child (see discussion of chronic hypertension above). In many rural areas, access to healthcare is a challenge because of geographic distances and limited transportation options.

A study focused on New York City found that 35 percent of the disparity in IM between Black and White infants is attributable to differences in the quality of hospitals where the infants were born (as measured by risk adjusted neonatal mortality rates).[46] This study did not analyze Maryland infant mortality data by hospital of birth. Data on childbirth quality for Maryland Hospitals is available through the Maryland Health Care Quality Reports, published by the Maryland Health Care Commission.[47] The Maryland Patient Safety Center works with birth hospitals in the State on quality improvement initiatives related to prenatal care.[48]

Rural residents may have limited access to neonatal intensive care units (NICUs) which provide care for medically-at-risk infants. In Maryland, only one hospital with a NICU is in a rural county (Frederick), all other hospitals with NICUs are in the center of the State, in urban jurisdictions.[49]

Social Determinants of Health

The literature review identified several social determinants that impact infant mortality in black infants, including residence in segregated areas and income inequality. Residence in segregated areas appears to limit access to health promoting resources and exposes individuals to stressful circumstances.[50] The

few studies included within this review present some evidence that residence in segregated areas may be associated with a direct risk of IM. The reviewed evidence also supported the existence of a modest association between income inequality and risk of infant mortality.

Best Practices and Lessons Learned for Infant Mortality Reduction Programs

An important element of this study is the identification of programs that work to reduce the infant mortality rate and barriers to success that exist in Maryland. The FMSC team completed a literature review of on programs related to infant mortality that service Black families and/or rural communities (Appendix D)., conducted a survey to construct an inventory of direct service programs in the State that work on infant mortality, and interviews with community leaders related to the use of community health workers. The findings from these activities are reported in this section.

Literature Review of Best Practices

The literature review of evidence-based interventions for Black infants and rural infants in the U.S. and globally identified the following programs as promising models:

a) enhanced perinatal care models, including home visiting programs and group prenatal care models such as Centering Pregnancy (™);

b) the Women, Infants and Children (WIC) program of the U.S. Department of Agriculture's food and nutrition service (not discussed further here, since it is a federal program);

c) behavioral interventions seeking to reduce known risk factors for poor birth outcomes;

d) community-based interventions;

e) telehealth interventions; and

f) prenatal administration of progestogens to reduce repeat PTB.

A detailed discussion of the methodology, approach, and findings from this literature review are in Appendix D.

Home visiting is an import tool to provide supports to pregnant individuals and young families. Home visiting programs discussed in the literature review include Healthy Start, Nurse Family Partnership; the Maternal Infant Health Outreach Worker Program; Maternity Care Coordination.[51] Healthy Start is a federally-funded home visiting program employing nurses and community health workers (CHWs) and targeting high-risk pregnant women, operates in 37 states.[52] The literature failed to find consistent evidence that Healthy Start program lowered infant mortality or its antecedents.[53] The Nurse Family Partnership provides free home visits from a nurse for first-time mothers in underserved areas. This program has been shown to improve early childhood mortality in an Black urban population, as well as being positively correlated with breastfeeding, immunization, and higher birth weight in both Black and rural communities. A home visiting program called the "The Maternal Infant Health Outreach Worker program" that employs local community health workers in rural Appalachia improved breastfeeding, safe

sleep, and lowered postpartum depression among participants in one, limited evaluation.[54] An additional program, the Maternity Care Coordination (MCC) program in North Carolina, incorporated elements of home visiting by employing trained nurses, social workers and paraprofessionals to aid pregnant women receiving Medicaid in navigating the healthcare system, and showed efficacy in improving birth outcomes in both rural and Black populations.[55]

The Federal Health Resources and Services Administration and the Administration for Children and Families funds twenty evidence-based home visiting programs in States.[56] Five of these programs operate in Maryland, including the Nurse-Family Partnership, Healthy Families America, Parents as Teachers, Home Instruction for Parents of Preschool Youngsters (HIPPY), and Early Head Start.[57] Evidence-based home visiting programs operate in every jurisdiction in Maryland.

Group prenatal care, another identified intervention with demonstrated efficacy in the literature, involves bringing together groups of women of the same gestational age for multiple prenatal visits/meetings conducted by a certified nurse midwife (CNM) or physician. The original model of group prenatal care, Centering Pregnancy, has been evaluated in numerous studies and has been adopted in over 585 clinical practice sites within the U.S.[58] In the published literature, Black women showed significantly reduced PTB when participating in this program and rural program participants had lower than average rates of PTB for their local area.[59] Centering Pregnancy is only available to women with medically low-risk pregnancies. Health care practices that adopt this model must reorganize their care delivery model to support group prenatal care.

Group prenatal care programs for higher medical risk populations (such as women with gestational diabetes) have a limited evidence base.[60] The March of Dimes recently introduced a new model of group prenatal care that is available to women with comorbid conditions including hypertension, obesity, diabetes, and heart disease. Evaluations on this new model have not been published as of this writing.

The literature demonstrates that behavioral interventions that use trained behavioral health professionals to encourage women to change behaviors that are risk factors for poor birth outcomes have shown efficacy. Behavioral interventions may focus on smoking, exposure to secondhand smoke (ETS), coping with perinatal depression, safe sleep practices/bed sharing, breastfeeding, and other behaviors. Effective programs use validated techniques such as motivational interviewing for smoking cessation, cognitive behavioral therapy for depression, and role playing to negotiate for reduced exposure to ETS. A review of an 18-year multi-pronged program to reduce Black infant mortality in Washington, D.C. found that behavioral interventions were more effective when they included family members in addition to pregnant women.

Behavioral interventions can be enhanced through the provision of resources. For example, an intervention that provided a free portable crib and sheets appeared more effective at supporting adoption of safe sleep behaviors than an intervention that only provided information/education on safe sleep.

Community-based interventions show some promise for both rural and Black populations. An example of a community-based intervention is a community baby shower. At a community baby shower community educators inform pregnant women about safe sleep, breastfeeding benefits, and smoking cessation while providing “shower gifts” such as diapers, toys, and cribs. Another example is Comenzado

Bien/Becoming a Mom, a six-session training program developed by the March of Dimes and implemented using trained community health workers who inform women of risk reduction behaviors and educate them on infant and postpartum care as well as services available in the community, while providing free cribs and diapers. Evaluations these community programs showed that participants improved their knowledge of behavioral factors related to healthy pregnancy and infant safety. Researchers did not follow-up on participants after the event(s), so it was not clear whether the program changed birth outcomes. Other community-based approaches are discussed in Appendix D.

Technology-enabled interventions have also showed evidence of efficacy in rural and Black populations. Two interventions that provided emails, text messages, and videos to new mothers about safe sleep and prenatal wellness showed some improvement in birth outcomes but warrant more rigorous evaluation.

Care management is also important. A telephone-based nurse case management program for pregnant Medicaid recipients in the South Carolina low country - an area with a largely rural and Black populations - was associated with small but significant reductions in rates of very preterm births (VPTB) (<28 weeks) and days in neonatal intensive care units in the region.[6132]

The literature review also includes a clinical intervention for women with previous PTB: the administration of progestogens (injections of 17- [alpha]-hydroxyprogesterone caproate (17P) or vaginal progesterone suppositories). Published literature shows strong evidence that both methods of administration, when delivered early in pregnancy, reduce repeat PTB. This literature also highlighted systemic challenges with this intervention, including required insurance pre-authorization requirements, late entry into prenatal care, cost, and lack of education among healthcare providers. Some states have successfully addressed these challenges and that models exist for effective coordination of care integrating progestogens for women at elevated risk of PTB.

Overall, our reviews demonstrate that many modes of outreach to pregnant women at risk of poor birth outcomes can be effective.

An Inventory of Maryland Programs Focused on Infant Mortality

The FMSC team conducted an inventory of Maryland's local and State programs focused on infant mortality, its causes (e.g., low birthweight, sudden infant death syndrome), or its risk factors (e.g., teen pregnancy, birth spacing). The inventory provides information about the entities working to address infant health in Maryland, their mission and role, the types of services provided, and best practices and challenges for sustaining effective programs (see Appendix E).

Programs only included in the inventory if they identified pregnant women, mothers/fathers, or infants as a special population within their program. Medicaid and Medicaid Managed Care organization programs were not included in this inventory, but information on Maryland Medicaid requirements and initiatives related to Maryland's Medicaid Managed Care Organizations (MCO) and their efforts to address the preconception, prenatal, and postpartum health of low-income women are discussed below.

Service programs: Types of services offered

The inventory identified 72 state, local, or non-profit programs that provided direct services to Maryland residents. Overall, programs addressed a range of clinical and social services from reproductive health to housing. As noted above, HealthChoice/MCO programs were not included in this inventory which is a limitation of this project.

Evidence from the inventory of infant mortality programs in Maryland suggests that existing services are available to address a range of risk factors for infant mortality and could be enhanced to further integrate these services. The most common services identified were service linkage (i.e., referral or care coordination), health education, home visiting, and safe sleep education and resources (mostly in the form of information rather than safe sleep resources). Although safe sleep education was commonly provided, survey respondents noted this as a service that needed further investment, particularly in light of recent increases in SIDS deaths in Maryland in 2017. Behavioral health and social services were less frequently mentioned as services provided by programs in the State. Of these types of services, smoking cessation was the most commonly offered service. Mental health, substance use/abuse, and housing services were less frequently mentioned as a service that was provided by the programs in the inventory; however, program staff cited behavioral health services as essential needs of their clients.

Medicaid enrollees have access to physical and behavioral (encompassing mental health and SUD) health services. The MCOs and the behavioral health ASO are required to coordinate care across services. The BH ASO also administers BH services for the uninsured (and services not covered by Medicaid).

Enhanced prenatal care: Home Visiting Programs & Group Prenatal Care

Federal, State, and local funds support expansion of home visiting models in the State. These programs have been shown to reduce barriers to receiving traditional prenatal care and improve birth and infant health outcomes (Appendix D). Many home visiting programs offer enhanced inter-conception care and deliver safe sleep interventions, breastfeeding support, and other infant care services that address risk factors for infant mortality in the State.[62]

Group prenatal care is another model of enhanced prenatal care and its effectiveness is discussed above. The program inventory identified that a few programs in Maryland were providing group prenatal care services in addition to traditional prenatal care. Other programs have used home visiting or group settings as a way to deliver specific types of care (e.g., counseling), such as to women who have experienced a fetal or infant loss.[36]

Outreach Strategies

The FSMC team identified several outreach strategies including community baby showers; information sessions or community input sessions in schools, communities, churches, and barbershop/hair salons; partnering with other local organizations; utilizing community health workers in at-risk communities;

and including a male involvement coordinator for teen programs. These strategies enhance initial client connection to the programs and continued use of services.

Supplemental Practices

The inventory also identified key supplemental practices that support clients' or providers' needs and goals. For providers, offering online training with continuing education credits or specific designations for hospitals (e.g., Baby Friendly Hospital) helps enhance provider participation. For clients, the use of a reproductive life plan as part of preconception care could facilitate appropriate follow-up care depending on client needs, as outlined in the joint CDC-OPA recommendations for Quality Family Planning.[63] Phone hotlines (e.g., smoking cessation, 211) provide another approach to supplement services offered through existing programs. Phone and other technology-enabled services may be especially useful for clients living in rural areas where distance to programs or transportation access are barriers to program participation. Other supplemental practices include support of family needs (e.g., baby sitting, transportation, GED support, meal planning), social support through peer networks, resources (e.g., cribs, doulas, educational toys and books), enabling services (e.g., language services, disability support), and engaging in policy and advocacy related to their mission.

Service programs: Client demographics and geographic location

The majority of programs in the Maryland survey mentioned that they serve low-income or underinsured populations. In terms of the geographic distribution of programs, about half of all identified programs served clients in rural communities. The highest number of programs were located in the more populated counties (Anne Arundel, Baltimore, Baltimore City, Howard, Montgomery, and Prince George's). The number of programs per county ranged from a minimum of 8 programs (Somerset, Cecil counties) to 24 programs (Baltimore City).

Surveillance and oversight programs

The program inventory identified 12 programs provided surveillance of maternal and child health data or made recommendations for the provision of maternal and child health services in the State (rather than providing direct service). The Maryland Department of Health administers many of these programs. Examples include the Pregnancy Risk Assessment Monitoring System (PRAMS); vital records data (including data from birth and death certificates); and the Birth Defects Reporting and Information System through the Office of Genetics and People with Special Health Care Needs. These surveillance systems enable the State and local jurisdictions to monitor progress on key maternal and child health outcomes and risk factors.

The State also has three review systems which make recommendations for improvements in the provision of care and services related to maternal and infant health. These systems are the Fetal and Infant Mortality Review (FIMR), Maternal Mortality Review Committee (MMRC), and Child Fatality Review (CFR) programs. A thorough review of each death is conducted by a committee of experts in the State, who review information from vital records, family interviews, and medical records. These review

systems provide a better understanding of factors related to each death, which inform strategies to improve care and prevent future deaths.

Lastly, a number of programs were identified that provide evidence-based recommendations, hospital standards and certifications, regulation of those standards, and reporting of activities within the State. For example, the non-profit Maryland Patient Safety Center has developed recommendations for neonatal abstinence syndrome and runs the perinatal quality care collaborative with hospitals in the State. Currently, the Patient Safety Center is working on a two-year initiative to model safe sleep practices within hospitals. The Maryland Department of Health's Perinatal System Standards set standards birthing hospitals in conjunction with the Institute for Emergency Medical Services System (MIEMSS). Additionally, MDH provides training, continuing education, and technical support to providers and hospitals implementing the Maryland Hospital Breastfeeding Policy Recommendations. This is just a sample of the activities and programs conducted in the State to support maternal and child health policy and services.

Best practices and challenges for sustaining effective programs

The best practices for sustaining effective programs and reducing costs that emerged in the survey findings were the use of incentives, outreach, and partnerships. Incentives were effective for engaging and retaining participation in the programs, especially for vulnerable populations facing issues such as substance abuse or income restrictions. Programs reported that partnerships allowed the programs leverage existing community resources to address the unmet needs of clients which the programs could not address directly. Many programs emphasized their focus on both social and health factors to better serve their clients.

Most programs reported concerns regarding financial sustainability, with challenges described for both grant funding and reimbursement. Competition for funding, changing priorities, and flat funding despite increasing costs were common concerns. Programs reported the need for funding to provide and enhance services, including services focused on the needs of specific vulnerable populations (i.e. undocumented, low income, substance use). Programs also identified challenges connecting high-risk individuals and families, including mothers and infants, to appropriate social service and health programs. Work group members noted that some communities had limited options for referral to these types of programs or had long waiting lists for these services even when referral was an option. Other challenges include participant recruitment and retention, program enrollment and eligibility, and transportation.

Summary of Maryland's Managed Care Organizations (MCOs)

While not captured in the program inventory directly, Medicaid is a key provider of maternal and child health services for low-income women and children. As of 2017, 43 percent of births in Maryland were financed through Medicaid. In Maryland, most Medicaid enrollees participate in HealthChoice, Maryland's Medicaid managed care program. According to a 2018 evaluation, in 2016, HealthChoice served over 1.1 million Maryland residents, over 84 percent of the enrollees of Maryland Medicaid and

the Maryland Child Health Program.[64] HealthChoice members are enrolled in 1 of 9 managed care organizations (MCOs), which provide a range of clinical and care coordination services relevant to maternal and infant care. All HealthChoice MCOs are required to provide medically necessary pregnancy-related services including comprehensive prenatal, perinatal, and postpartum care.[65] The coverage must, at a minimum, follow American College of Obstetricians and Gynecologists (ACOG) guidelines for pregnant and postpartum women. MCOs facilitate the completion of a prenatal risk assessment at the first prenatal visit, provide enriched maternity services including counseling and education, and provide home visitation services.

Pregnant and postpartum women are considered a special needs population within Maryland regulations; therefore, MCOs are required to ensure access to appropriate referrals, and provide outreach to bring women in to care. HealthChoice MCOs have varied approaches to outreach for pregnant and postpartum women, including the use of incentives for timely prenatal and postpartum visits. The Maryland Department of Health also operates a dedicated helpline for pregnant women (the HealthChoice Helpline for Pregnant Women). Women who contact the help line are referred to Medicaid-funded Administrative Care Coordination Units (ACCUs) within each local health department, and the ACCUs assist all eligible and enrolled pregnant women navigate the health care benefits through their MCO.

Federal regulations require that state Medicaid programs have a plan to ensure that Medicaid participants have transportation to and from Medicaid covered services, commonly referred to as "non-emergency medical transportation" (NEMT). The State of Maryland provides transportation to and from covered services via ambulance, sedan, publicly available transportation services, and fixed wing air ambulance modes. Covered medical services include, but are not limited to, scheduled trips to primary care physicians, prenatal visits, well child visits, dental services and trips to the pharmacy for prescriptions no matter what region of Maryland. A full Medicaid benefit participant shall be screened to determine eligibility for NEMT. If personal vehicles, public fixed routes, para transit services or other community services be available, a participant may not be eligible for NEMT services.

In addition to the services provided by HealthChoice MCOs, a Home Visiting Services (HVS) Pilot program is currently underway through Maryland Medicaid's section 1115 HealthChoice Waiver, which allows participating lead local governmental entities to fund fifty percent of total HVS Pilot costs with local dollars, and access matching Federal funds to expand existing evidence-based home visiting programs (Nurse-Family Partnership and Healthy Families America) for at risk pregnant women and children up to age 2. To date, MDH has approved two lead entities, Harford County Health Department and Garrett County Health Department, for federal matching funds in support of a HVS Pilot. The application and review process for the HVS Pilot is now closed.

HealthChoice MCOs outperformed national averages for quality measures related to prenatal care. For example, the HEDIS measure for timeliness of prenatal care assesses the percentage of deliveries for which the mother had a prenatal care visit in the first trimester (or within 42 days of HealthChoice enrollment). In 2016, 87.6% of HealthChoice deliveries met this criteria, compared with 81.7% nationally among Medicaid HMOs.[66] Because Maryland MCO outperform national averages,

HealthChoice uses Maryland-specific benchmarks for the Health Choice value-based payment program. This ensures that MCOs continue to be incentivized to improve.

Given the scope of services and high rate of coverage of low-income women and infants, HealthChoice MCOs are key stakeholders in addressing infant mortality in the State.

Community Health Workers- Overview and Interview Findings

The statute that authorized this study requires that the study include "recommendations on ways to use pregnancy navigators or community health workers to assist pregnant women with the goal of reducing the infant mortality rate." The FMSC team interviewed ten experts on the use of Community Health Workers (CHW) to improve infant and maternal health in Black and/or rural populations (see Appendix F). The interviews aimed to clarify how CHWs facilitate infant and maternal health and how CHWs could be better utilized to address infant mortality in Maryland. A detailed explanation of the procedures followed (including the interview protocol) and findings are included in an appendix to this report (see Appendices F and F2).

In Maryland law, a community health worker is "a frontline public health worker who:

(1) Is a trusted member of, or has an unusually close understanding of, the community being served;

(2) Serves as a liaison to, link to, or intermediary between health and social services and the community to:

(i) Facilitate access to services; and

(ii) Improve the quality and cultural competence of service delivery; and

(3) Builds individual and community capacity by increasing health knowledge and self–sufficiency through a range of activities, including:

(i) Outreach;

(ii) Community education;

(iii) The provision of information to support individuals in the community;

(iv) Social support; and

(v) Advocacy."[67]

For purposes of this report, the term "Community Health Worker" is defined broadly to include a variety of types of workers who are expert in the communities they serve and provide services related to infant and maternal health, including some home visitor program staff, doulas (specially trained laypersons involved in perinatal care), as well "outreach workers" and "resource parents". CHWs provide different services than nurses or social workers.

Maryland is in the process of developing a certification and training program for CHWs in Maryland.[68] The Maryland Department of Health estimates that there are nearly 1,500 CHWs in Maryland (working on all health care topics).

CHWs working in maternal and infant health often have parenting experience, cultural and community connections to the women in the program, and specific short-term training by the organizations, associations, hospitals, or practices that employ the CHW.

Limitations

The research project using interviews on the use of CHWs for maternal and infant health was exploratory in design and limited in scope. The project did not generate an exhaustive inventory of programs in Maryland that use CHWs for maternal or infant health or delineate specific funding structures for CHWs.

Findings from interviews

This section contains the key findings from the interviews related to CHWs working in maternal and infant health. Overall, Interviewees emphasized the unique ability of the CHW to meet the mother "where she is [and] where her family is," and to work with the mother to meet her goals, rather than setting expectations about behavior and adherence to treatment without considering her social and family circumstances or her cultural needs. CHWs often go out into the community to recruit pregnant women for the programs in which they serve, sometimes through innovative events such as community baby showers, but also through word of mouth or referral from health care providers. CHWs can be assigned to medical practices. CHWs sometimes visit pregnant women at home or at other convenient sites in the community. CHWs maintain contact with clients through email, text message and phone, and may hold support groups for pregnant women.

CHWs can play a unique and flexible role in serving women at risk of poor birth outcomes and can provide a wide array of supports to pregnant women and young families. The CHW, by virtue of connections to the community and culture, parenting experience, relational skills, and training can gain the trust of a pregnant woman and her family. CHWs work in the context of a care team, supported by other types of health professionals. CHWS can play an important role in understanding client goals and helping the client communicate those goals to their health care providers (such as through a birth plan). CHWs can help mediate clinician-patient interactions to ensure that they are respectful and culturally sensitive. In the context of a team of providers, CHWs can identify client needs that impact their health and ability to access medical care, provide care coordination, and assist in monitoring pregnant individuals between prenatal visits. Some CHWs are trained in identifying and responding to mental health concerns (for example, through mental health first aid), substance abuse, and other risk factors. In one program, CHWs administering a perceived stress scale and an everyday discrimination scale to better understand client stress related to racial and other discrimination. Post-partum, CHWs can promote breastfeeding, infant nutrition, and safe sleep education.

Interviewees indicated that institutional/organizational knowledge about how to effectively use perinatal CHWs has often stayed within existing programs and organizations, where are focused on operations and program delivery, rather than on publishing and disseminating best practices. Wider diffusion of this knowledge of best practices and innovative practices/models could help expand and improve these models.

The interviewees identified organizational or programmatic level barriers to more effectively engagement of CHWs in improving birth outcomes, including program capacity, funding sustainability, data sharing, training, transportation services for clients, and low CHW wages.
Maryland is currently in the process of developing a certification program for CHWs, which will include accredited training programs.[69]

Economic Costs of Preterm Birth, Low Birth Weight, and Infant Mortality

In addition to the human costs of infant mortality, there are significant financial costs associated with preterm birth, low birth weight infants and with infant mortality. Appendix B provides an overview of some of the costs associated with infant mortality. This study does not include a broad economic or actuarial analysis of costs related to infant mortality, but rather a limited literature review to provide context. Existing data demonstrate that hospitalization costs associated with conditions such as preterm birth and low birth weight, key risk factors for infant mortality, are consistently higher than other hospital-based births. Lifetime economic and health costs of poor birth outcomes, beyond initial hospitalization at birth, demonstrate the consequences of these conditions (See Appendix B). Prevention of LBW and PTB can directly save families and society in both the immediate period after birth and into childhood. If specific funding or payment reform approaches are considered in the future, a more thorough actuarial or economic analysis would be appropriate.

Areas for Future Study

The scope of this study was limited by a statutory focus on African American infants and rural communities, by State resources, and time. Over the course of the study, potential areas for future study were identified. These topics include the study of data and effective programs related to other racial and ethnic groups; additional study of clinical, payment, and technology based reforms; and more detailed cost analysis.

Recommendations

The following recommendations on methods to reduce the infant mortality rate of Black infants and infants in rural communities were developed as a result of the Study findings detailed above and refined through discussion and feedback from multiple State agencies and members of the workgroup. The recommendations are organized into three themes: 1) Care Coordination, 2) Expanding and Enhancing Access and Utilization of Services, and 3) the Need for a Sustained and Central Focus on Infant Mortality within the State.

Theme: Care Coordination

A challenge identified through the work group discussions and research described above was care coordination; i.e. how to ensure that families are identified and connected to services that they need

and qualify for, and that care is coordinated through the preconception period, pregnancy, birth, and post-partum period. Models to address infant mortality and reduce disparities rely on health care across the life course (i.e. preconception, prenatal, and postpartum care).

Care coordination requires: 1) screening for needs (through a screening tool), 2) identification of resources and supports (through a directory of programs), 3) referrals to appropriate services and supports (which in turn must have the ability to accept new clients), and 3) follow-up to ensure the client is receiving and benefiting from the services.

A number of existing processes and programs exist to support care coordination. Home visiting programs provide opportunities for integrating across prenatal and postpartum care, which could also serve to enhance inter-conception care (i.e., preconception care for the next pregnancy). Primary care and family planning services are the main providers of preconception care but may not be fully integrated with obstetric and pediatric practices. Health insurance can play an important role in coordinating these services. Medicaid regulations mandate that Medicaid Managed Care Organizations provide care coordination for special needs populations, such as pregnant individuals and infants.

Recommendation 1: Improve existing care coordination processes and tools.

Existing processes and tools for care coordination should be enhanced and adoption of those tools by providers, insurers, and others should be encouraged. A number of existing processes and programs exist to support care coordination. An example of an existing screening tool is Medicaid's Prenatal Risk Assessment (a screening tool to identify risks and needs for pregnant women). A number of public and private tools exist as resource directories, and some software vendors (including electronic health record vendors) are developing tools to support better referral and follow-up of patients.

The following recommendations relate to improving existing care coordination processes and tools:

a) Providers should use effective assessment tools to determine client needs and link to the electronic health record. Such tools are available from multiple sources.[70]
   i) Providers should improve use of existing tools, such as the Medicaid prenatal risk assessment and the Postpartum Infant and Maternal Referral (PIMR), to connect clients with resources to address client needs.

b) *Electronic data sharing to support connections between providers to meet client needs*
   i) MHCC should continue work to support the connection of electronic health records with electronic methods of data exchange (such as a Health Information Exchange).
   ii) One improvement would be moving paper screening and referral documents to an electronic format that allows for efficient and accurate data sharing between providers. Depending on the data storage policies, this could also improve availability of data for program evaluation. For example, developing a system for the PRA that allows electronic submission by providers and receipt by Medicaid Administrative Care Coordination Units and MCOs could allow for more rapid and accurate referral to appropriate services for women in Medicaid.
   iii) Providers and insurers should enhance electronic communication across care delivery systems to improve preconception health and care during pregnancy and the post-partum period.
   iv) Any approach that includes electronic data sharing of individually identifiable health information will require appropriate data sharing agreements between organizations and privacy safeguards, including patient consent.

Commented [MR1]: Should this recommendation be focused on electronic care coordination and SDH referral systems, rather than EHRs? EHRs are covered in recommendation #5

c) The State Medicaid Agency should identify challenges and opportunities to optimize use of Medicaid Administrative Care Coordination Units for care coordination among Medicaid participants. The purpose of the ACCU Program is to assist Medicaid/HealthChoice eligible beneficiaries in accessing and appropriately using their Medicaid benefits.
d) Health care providers should integrate preconception through postpartum care services.
   i) Providers could use a reproductive life plan could identify women who may want to become pregnant and direct preconception care and education to these women.
e) *Alternative to recommendation (1)(c):* The General Assembly should establish a state-led entity for improving care coordination across multiple systems, including family planning, primary care, prenatal, and postpartum, as well as across different social services. This entity would—
   i) support the development of protocols for timely referrals and consults;
   ii) provide resources for appropriate referral sites for different types of care and services; and
   iii) develop training for CHWs in maternal and infant health, to strengthen and expand the use of CHWs.
f) Providers should consider colocating postpartum and pediatric care.
g) Providers and insurers (including public payers) should improve rates of screening for maternal depression and anxiety and the increase the provision of guidance on safe sleep, breastfeeding, and child safety in prenatal care and well-child visits.

Commented [MR2]: Perhaps move to theme " Need for Sustained and Centralized Focus on Infant Mortality"?

Recommendation 2: Care coordination should include programs to address social determinants of health outcomes, including the impact of racism and bias.

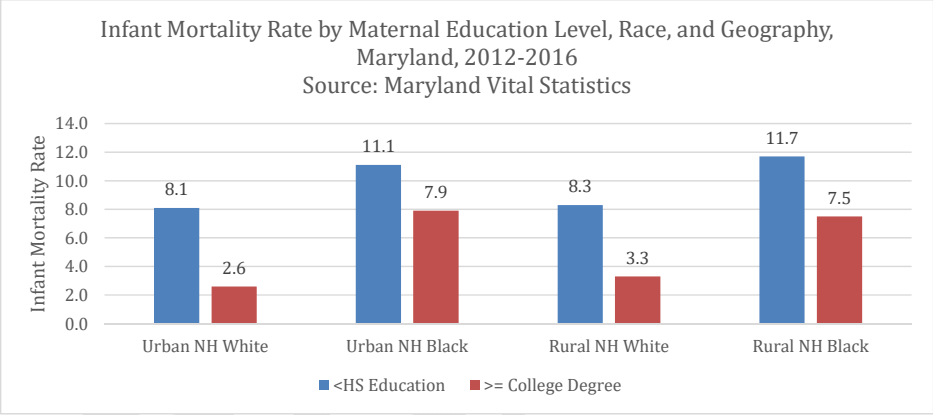
Many factors affect the health and well-being of our children. A life course approach that addresses the needs of both families and communities is critical. Such an approach must address systemic inequities, bias, and health disparities. Coordinating programs that address social determinants of health and address the root causes of these systemic inequities. These resources include nutrition and food access, housing, transportation, and job training and workforce development programs will have long term impacts on infant mortality and infant well-being. The following recommendations relate to addressing social determinants of health that impact infant mortality:

a) Programs serving families should use tools and approaches that are appropriate for their community to connect clients with social supports and resources. Many existing tools exist in the community and nationally to provide these connections.
b) *Housing* – House programs should prioritize pregnant and postpartum women for temporary housing programs, subsidized housing, and coordinate support for pregnant mothers/families to avoid evictions. .
c) The General Assembly, State agencies, payers, and funders should work to provide sufficient funding to ensure infrastructure supports for care coordination addressing social determinants of health, including appropriate engagement of public and community agencies.
d) The Health Services Cost Review Commission, Medicaid, and private payers should explore necessary changes in payment models to support care coordination to address social determinants of health, including considering flexibilities available under the Total Cost of Care Model.

Recommendation 3: Implement rigorous implicit bias training in relevant health care providers' education and clinical practices.

The analysis of Maryland data in appendix A shows that Black women experience higher levels of risk for every risk factor examined. This finding is also supported by the literature review: Black women experience an elevated risk of infant mortality regardless of their risk profile.[71] As an example, well-educated and high-income Black families do not experience the same degree of reduction in infant mortality rate as White families with similar levels of education and income. These means that there is an underlying factor that is increasing infant mortality for Black women that is not addressed by the factors analyzed in Appendix A. Researchers increasingly attribute a portion of this latent risk for black families to the impact of structural racism, implicit bias, and maternal stress and risk related to the impact of perceived racism and bias (for example, distrust of the health care system).[72]

Figure 9: Infant Mortality Rate by Maternal Education Level, Race, and Geography, Maryland, 2012-2016



Multiple health professional organizations from the American College of Obstetricians and Gynecologists, the American Academy of Pediatrics, the American Medical Association, and the American Psychological Association, among others, have all called for their members to take action to identify and reduce implicit and explicit bias in their practices. In July 2019, the American Academy of Pediatrics released an official policy statement recognizing that discrimination is linked to maternal stress and infant mortality and calling for multiple individual and structural level approaches to address racism in pediatric practices. These approaches include implicit bias training for health care providers and office staff, identifying and providing appropriate referrals for needs associated with social determinants of health, and increasing awareness and understanding of the communities from which their patients come. Unlike many short, cognitive focused, "cultural competence" trainings, implicit bias training focuses on self-reflection and awareness about one's own biases, understanding how to recognize and address bias, and importantly, is a life-long learning process aimed at increasing cultural humility, self-awareness, and effective relationship and communication skills. When planning efforts to reduce infant mortality rates, an approach that addresses systemic inequities, implicit bias in the health care setting, and health disparities is critical.

a) Physicians, nurses and other health care professionals who treat pregnant individuals and/or infants should participate in evidence-based implicit or unconscious bias training. Health systems, hospitals, practices, and clinics should provide this training for their patient-facing staff.
    i) Professional organizations can support these goals by including this training as a component of on-going quality improvement efforts.
    ii) Training programs could be required through State licensure processes or private accreditation organizations.
b) Organizations that provide services to pregnant and postpartum women should provide evidence-based implicit or unconscious bias training for program staff.
c) Health systems and health care institutions should develop a process for reviewing standards and implementation of Cultural, Linguistic and Appropriate Services (CLAS).
d) The Maryland Department of Health, in collaboration with academic institutions in Maryland, should create a strategic vision to increase the diversity of the healthcare workforce and students in training for roles that support maternal and infant health.

Recommendation 4: Strengthen coordination of care by assessment and referral to necessary mental health and substance abuse treatment programs

Mental health and substance abuse treatment is a critical need identified in the literature, program inventory, interviews, and the workgroup discussions. Maternal depression, past exposure to trauma, and intimate partner violence all place mothers and infants at risk. The Maryland Department of Health has identified drug overdose as the leading cause of death of pregnant women and new mothers in Maryland.[73] Loss of a mother has a direct impact on infant wellbeing. The Behavioral Health Administration is currently engaged in a gap analysis and concurrent implementation of a quality improvement framework with the goal of increasing service capacity, increasing quality and operational efficiency, and improving health outcomes.

a) *Substance abuse* – The Behavioral Health Administration should strengthen and expand referral systems to substance abuse programs and ensure follow-up to determine clients have been successful in accessing the services. Additionally, these programs should identify pregnant and postpartum women as special populations within their program and provide targeted services.
b) *Mental health* - The Behavioral Health Administration should strengthen and expand referral systems to mental health programs and ensure follow-up to determine clients have been successful in accessing the services. Additionally, these programs should identify pregnant and postpartum women as special populations within their program and provide targeted services.
c) *Grief counseling* – Local Health Departments should expand access and referrals to grief counseling programs and support groups for mothers experiencing fetal or infant loss.
d) The licensing boards or professional accreditation organizations should ensure that Maryland health care providers (obstetricians, pediatricians, nurse practitioners, midwives, etc.) receive continuing education in mental health issues for pregnant and postpartum women, and in recognizing and addressing substance abuse problems.
e) Home visiting programs should ensure that home visitors receive training on recognizing mental health, trauma and substance abuse problems and providing appropriate referrals to community resources.

Commented [MR3]: Discussion question: is the issue referral? Availability of treatment slots? Willingness of treatment providers to accept pregnant women? Cost? Co-location of services/convenience? Child care? What about workforce development. I want to make sure we are making recommendations to address the problem. The problem may not be the lack of referrals, but rather the lack of resources to refer to.

Recommendation 5: Improve continuity of care

Pre/interconception, prenatal, and postpartum care are essential for ensuring infant and maternal health. Women and infants benefit from the mother's lifelong access to patient-centered, culturally-sensitive primary care, management of chronic conditions, family planning services, and health education. Continuity of care is most concerning for women who are uninsured before, during, and/or after pregnancy. The following recommendations are designed to support continuity of care throughout the life course for the purpose of improving birth outcomes and infant and maternal health.

Disruptions in care resulting from transitions in insurance coverage and related provider networks can interfere with health outcomes. One of the most common transitions of coverage for women who receive Medicaid coverage during pregnancy occurs 60 days after childbirth, when eligibility for Medicaid through the pregnant woman eligibility category ends. Women may continue to qualify for Medicaid under other eligibility categories (for example, women with incomes under 138% of the Federal poverty level qualify under the adult Medicaid expansion eligibility category). Women who lose Medicaid coverage must inform the Maryland Health Connection of their change in coverage to allow for enrollment in a subsidized Marketplace insurance plan.[74]

ACOG and the AMA have strongly endorsed the extension of Medicaid coverage to 12 months postpartum.[75] Additionally, extending postpartum coverage beyond 60 days is under consideration in 3 states (Texas, New Jersey, and Illinois) and is being considered in two bills at the federal level.[76] In Maryland, the state chapter of the American Academy of Pediatrics (MDAAP) endorses the recommendation of the Maryland Chapter of the American College of Obstetricians and Gynecologists (MDACOG) to expand Medicaid coverage postpartum from 60 days to 1 year for women at or below 250% of poverty.

The following recommendations facilitate integration across preconception, prenatal, and postpartum health:

a) State Agencies should improve systems to ensure that health insurance coverage continues into the postpartum period, particularly for pregnant women on Medicaid who risk losing coverage after 60 days postpartum. This should include:
   i) The State Medicaid Agency should consider requesting approval from the Federal Centers for Medicare and Medicaid Services to expand eligibility for Medicaid for new mothers through 1 year postpartum. This proposal will require State funding.
   ii) The State Medicaid Agency and the Maryland Health Benefit Exchange should continue their work to strengthen and streamlining systems and supports (including use of insurance navigators) for women who need to transition from Medicaid to Marketplace coverage after birth.
b) Providers should co-locate and integrate preconception through postpartum care services when possible to link family planning and primary care to obstetricians and prenatal care providers and vice versa.
   i) Providers should discuss reproductive life planning goals with their patients to identify women who may want to become pregnant or who may want to avoid pregnancy. Providers should refer women who wish to have children to preconception services and support women who do not wish to become pregnancy through access to appropriate contraception.

Commented [MR4]: Requires discussion

ii) The Maryland Department of Health has a tool called the Postpartum Infant and Maternal Referral (PIMR), which is used by hospitals at discharge after birth to identify high-risk infant and/or mothers (medical, psychosocial needs). Hospitals should increase their utilization of this tool to improve the identification of high-risk infants and mothers, who may not have been identified prenatally, for referral to local health department for community-based services.

iii) Hospitals, health systems, and other providers should enhance electronic communication and data sharing across care delivery systems providing pre/interconception, prenatal, and postpartum services through the use of interoperable electronic health records, health information exchange, and other tools and processes.

c) Health care services and direct service programs should focus on the mother-infant dyad and the whole family unit.

i) Well-child visits with pediatricians provide an opportunity for screening for maternal depression and anxiety along with guidance on safe sleep, breastfeeding, and child safety. The American Academy of Pediatrics (AAP) recommends screening of maternal depression and anxiety during well-child visits.[52] Integration and appropriate referral should also be coordinated and facilitated, and follow up conducted to ensure successful entrance into appropriate mental health treatment programs.

ii) Payers should ensure that these services are reimbursed at appropriate rates and appropriate payment models should be used to maximize maternal depression screening during well-child visits, given the magnitude and impact of maternal mental health on infant health.[53]

Recommendation 6: Increase adoption of breastfeeding prior to hospital discharge and support continuation through the first year of life.

The Maryland data showed that breast feeding has a major impact on infant mortality outcomes for infants, and especially Black non-Hispanic infants. As noted above, the Maryland Perinatal System Standards already require birthing hospitals to have a lactation consultant on staff. Five hospitals in Maryland have also achieved "Baby-Friendly" hospital certification, a certification from a third-party organization which is the U.S. national authority for the World Health Organization and United Nation Children's Fund international Baby-Friendly Hospital Initiative.[77]

a) The Maryland Department of Health and the Maryland Patient Safety Center should consider additional ways to support increased breast feeding rates in hospitals.

b) Birthing hospitals in Maryland should seek certification as Baby Friendly Hospitals.

c) Healthcare providers should integrate assessment of breast-feeding into pediatric and post-partum visits, including addressing barriers and providing additional supports

d) Community health workers and doulas should receive training in the importance of breastfeeding to prevent infant mortality and how to identify and address barriers to breastfeeding.

e) Research has shown that support of breastfeeding by respected members of the parent's social network is key to breastfeeding adoption.[78] Community health workers can help develop these advocates in the family and friend networks of new and expecting parents.

Recommendation 7: Health care providers, community health workers, and other organizations should enhance patient education on pregnancy spacing.

The Maryland data showed that short intervals between pregnancies can contribute to the risk of infant mortality and other adverse outcomes.

a) Physicians, nurses, doulas, community health workers and other care providers should provide information to pregnant women and women who have given birth about the importance of pregnancy spacing and the availability of tools (such as long-acting birth control) to support the woman's family planning decisions.

Theme: Expanding and Enhancing Access and Utilization of Services

Enhanced Prenatal Care Models

The research conducted in this Study, as well as the workgroup discussions, provided strong evidence for the feasibility and efficacy of home visiting programs and group prenatal care programs in reducing infant mortality, increasing breastfeeding support, and optimizing health among both Black and rural infants and mothers.

Some evidence has shown that telehealth can be a useful adjunct in improving access to care for rural high-risk pregnant women. Existing initiatives in the state have piloted telehealth programs to supplement care in [TBD].

Recommendation 8: Expand home visiting programs throughout the State as a cornerstone in the effort to improve maternal and infant health and reduce infant mortality and disparities.

Evidence-based home visiting programs use trained, culturally competent staff including community health workers (CHWs) (including Doulas and/or "resource parents" from the community); nurses; social workers, or a combination of both types of staff. Program staff visit the client's home regularly during pregnancy and postpartum.[79] A number of evidence-based home visiting programs are in use in Maryland. Some of these programs are operated under the Maternal, Infant, and Early Childhood Home Visiting Program, which is funded through Federal funds and administered by the Maryland Department of Health. These programs operate in all 24 jurisdictions in Maryland. In addition, Medicaid is currently operating a home visiting pilot program in Maryland.

Interviews with home visiting program leaders indicated that many existing programs lack reliable funding sources and that reaching clients can be challenging, either due to resource constraints or client availability. Funding for home visiting programs in Maryland currently comes from a variety of Federal, State, and Local sources.

The following items support the goal of expanding the use of evidence-based home visiting programs for maternal and infant health in Maryland and stabilizing existing programs.

a) State agencies, payers, and funders should continue to develop approaches for improving funding for evidence-based home visiting programs. This may include reimbursement of services provided by nurses and certified community health workers through evidence-based home visiting programs.[80]
    i) If the Medicaid home visiting pilot is successful, Medicaid should consider expanding the program.

   ii) Private insurance companies should consider their procedures for identifying pregnant women with high risk pregnancies and/or needs for support with social determinants of health and provide adequate resources to improve opportunities for a healthy birth outcomes.

b) Payers, providers, and home visiting programs should seek to better coordinate care to improve outcomes for the families that they serve. The State Medicaid Agency should continue to work with the MCOs to improve coordination between the MCOs and existing home visiting programs in the State.
c) Maryland should consider the best practices from other States for implementing evidence-based home visiting programs, including best practices related to recruiting and training the workforce.
d) The Maryland Department of Health should consider developing a specialty certification for CHWs in maternal and child health, as part of the certification program for CHWs that is currently in development. The Department should identify training programs that support the competencies for that specialty area. This training could include trainings for existing evidence-based home visitor programs.
e) Organizations that provide home-visiting programs should ensure that pregnant women and community health workers are engaged in planning for expansions of evidence-based group prenatal care programs.

Recommendation 9: Increase adoption of evidence-based group prenatal care programs.

Group prenatal care (including, but not limited to the "Centering Pregnancy" model) appears to be effective in improving birth outcomes among Black and rural women with high risk related to social determinants of health but with pregnancies that are of low medical risk (see appendix D). In group prenatal care, women with pregnancies of the same gestational age meet regularly for visits with a clinician. The group participates in self-assessment, support, and prenatal education. Group prenatal care has a high initial startup cost but saves money in the long term (see appendix D). Group prenatal care models are already in use in Maryland. The following recommendations support increased adoption of group prenatal care programs:

a) Expand existing group prenatal care programs throughout the State.
   i) Providers considering adopting or expanding group prenatal care should focus on populations for which the program has demonstrated success.
   ii) Funders and payers should consider funding start-up costs for providers to encourage implementation of "Centering Pregnancy", the March of Dimes "Supportive Pregnancy Care", and other group prenatal care models, to encourage providers to adopt this model.
   iii) Payers should consider innovative financing and reimbursement models for group prenatal care, including pilot studies conducted in other states, to facilitate wider adoption of this model in Maryland

Recommendation 10: Enhance the use of telehealth to provide care in rural communities.

In 2017, the State of Maryland conducted a study on Rural Health Care.[81] That study found that there are only 9 obstetrics and gynecology providers in the five county mid-shore area (and area with an estimated population of 171,166). Three of the five counties (Caroline, Dorchester, and Queen Anne's) had no obstetrics and gynecology providers at that time. The number of psychiatrists and behavioral health specialists was also limited (10 psychiatrists, with none in Caroline and Kent counties).[54]

Telehealth has long been perceived as a tool to increase access to care for rural residents. The Health Resources and Services Administration defines telehealth as the use of electronic communication and information technologies to provide or support long-distance clinical health care, patient and professional health-related education, public health and health administration. In rural areas, where long distances and provider shortages are barriers to care, telehealth services increase patient access to services such as emergency department care, home health, specialty care, medication adherence and intensive care monitoring. There is some literature on the use of telehealth for prenatal care.

In Maryland, the Maryland Health Care Commission has compiled information on challenges and considerations for telehealth implementation although the reviewed programs are not related to maternal or infant health.[82] The Maryland Board of Physicians recently adopted new telehealth regulations. Maryland Medicaid also has policies related to telehealth.

a) The Maryland Department of Health should conduct an examination of the peer-reviewed literature on promising use of telehealth for prenatal and postpartum care and other critical care identified in this study (such as mental health care) in rural areas. The literature review should include literature on barriers to the adoption and use of telehealth (such as the need for provider training and integration into the provider workflow). The literature review should also consider access to and acceptance of this technology by providers and patients.
b) Funders in the State should consider providing grant funding for pilot projects for telehealth related to maternal and infant health.

Recommendation 11: Improve clinical adoption of evidence-based use of progestogens to prevent preterm birth.

Individuals who have had a baby pre-term are at higher risk for a pre-term birth for subsequent pregnancies. The administration of progestogens through injections or as vaginal suppositories, when begun by the 16-20th week of pregnancy, significantly reduces rates of repeat preterm birth in mothers with a previous preterm birth. The literature suggests adoption of these practice could be improved. The following recommendations are based on these findings:

a) The Maryland Patient Safety Center should consider providing trainings for clinicians and leaders of organizations involved in perinatal care on the availability and use of 17p in order to increase the technical capacity of the clinical workforce in providing this treatment.
b) Health systems should consider implementing patient education programs to individuals with a prior preterm birth who indicate a desire to have additional child. The education programs should provide information about the benefits of progestogens in reducing the risk of PTB and infant mortality, using tools such as the Progesterone Messaging Toolkit adopted by the Ohio Department of Health.
c) CHWs, nurses, and other home visiting staff should be provided with training about the importance of identifying pregnant women with a prior preterm birth and encouraging them to discuss that history with their medical provider to help ensure that they receive appropriate care.

Enhancing Access and Utilization of Other Critical Programs

Recommendation 12: State and local health agencies should invest in an infant mortality prevention health literacy initiative across sectors to create an informed and activated community of residents, health and social service providers and facilities.

In this study, health literacy emerged as a concern from the workgroup and individual interviews. This concern was also identified in the 2017 Rural Health Study, which recommended the development of community-based health literacy across sectors to support a more informed and health literate Mid-Shore population.[83] Health literacy initiatives would empower self-care to support a healthy pregnancy and healthy lifestyle behaviors; support adoption of safe sleep practices; train providers; create an easy to navigate road map to access coordinated care; and provide guidance on how to use health insurance. A commitment to incorporate health literacy principles in health care organizations and other sectors such as education, social services, mental health and substance abuse and the faith community, could enhance the ability of Black and rural families to effectively use appropriate services and prevent risk factors for infant mortality. There are numerous, high quality resources available for use by providers including:

a) AHRQ Health Literacy Universal Precautions Toolkit, 2nd Edition: https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/index.html
b) CDC Resources: https://www.cdc.gov/healthliteracy/index.html
c) Ten Attributes of Health Literate Health Care Organizations: https://nam.edu/wp-content/uploads/2015/06/BPH_Ten_HLit_Attributes.pdf
d) The Horowitz Center for Health Literacy at the University of Maryland School of Public Health

Recommendation 13: Continue investment in safe sleep education and increase investment in safe sleep resources.

Safe sleep programs reduce infant mortality. Sudden unexpected infant death (SUID) is the third leading cause of IM in Maryland.[84] Nationally, the rate of sudden unexpected infant death (SUID) is higher among black infants than among white infants.[85] Evidence from existing national and local programs suggests that safe sleep education can dramatically reduce the number of unsafe sleep practices. However, the program inventory identified a need for more programing related to safe sleep education and resources, including programming targeted at high risk families (families with smokers, infants in the NICU, teen parents, and parents with unstable housing). While safe sleep education is beneficial, providing resources like cribs, Pack n' Plays, or other safe sleep environments to reinforce safe sleeping practices can enhance program success. 'Bedtime Basics for Babies' is an example of a program model that provides safe sleep resources. In Maryland, B'more Healthy Babies provides cribs to some families. Most birthing hospitals in Maryland are currently participating in a collaborative with the Maryland Patient Safety Center to improve modeling of safe sleep behavior in the hospital setting. The following recommendations are intended to improve Safe Sleep programming throughout the State.

a) Hospitals and other providers should model safe sleep behavior when infants are in their care and provide education to parents on safe sleep.
b) Programs serving pregnant individuals and infants should provide safe sleep education and promote breastfeeding (a protective factor against SIDS).

c) Programs should consider providing safe sleep resources, in addition to education, for at-risk families.
d) Promote public awareness through safe sleep marketing campaigns.

Theme: Need for a Sustained and Centralized Focus on Infant Mortality

DISCUSSION: The legislative mandate for this report explicitly stated that the MHCC make legislative recommendations regarding the establishment of a permanent council on infant mortality. While there has been improvement in infant mortality in Maryland over the past 20 years, Black and rural infants continue to be at higher risk for infant death. Disparities for infant mortality likely exist for other population groups (ex. ethnicity, income, etc.) that were not examined in this study.

A number of entities in the State government have responsibility for taking action to narrow this gap. In the January work group meeting, work group members expressed an interest in having a function within the State government that could focus public and stakeholder attention on disparities in infant mortality and provide a plan, structure, and accountability for continuing change. Work group members noted that it is important that this entity or function not pull resources from existing infant and maternal mortality work within the State. With limited resources, it is important not to duplicate work and effort. Rather, the entity or function should help coordinate existing resources and fill gaps. If a new entity or function is recommended, it must receive adequate funding for staff and other necessary resources, to avoid stressing already stretched resources focused on necessary program delivery and public health surveillance.

Recommendation 14: FOR WORKGROUP DISCUSSION: Optional approaches to address this topic:

Option 1: A recommendation to establish a new permanent council focused on disparities in infant mortality

Option 2. A recommendation to establish a new permanent council focused on disparities in infant mortality and maternal mortality

Option 3. An additional or expanded set of roles and responsibilities for an existing component within the Maryland Department of Health to increase focus and accountability related to infant mortality.

Option 4. A regular (bi-annual) reporting requirement that pulls together information from multiple agencies and assesses progress made.

The discussion document prepared for the July work group meeting is in Appendix G.

Appendix A: Detailed Data Analysis

TBD

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/workgroups_african_american_rural.aspx

Appendix A2: MCH Presentation

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/IM%20_AA_Rrl_Wrkgrp_Prsttn_20180917_FINAL_POSTED.pdf

Appendix B: Cost Analysis

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppxB_Cost.pdf

Appendix C: Risk Factors Literature Review

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppxC_RskFctrs_Lit.pdf

Appendix D: Effective Programs Literature Review

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppxD_EffctvPrgrms.pdf

Appendix E: Inventory of Maryland Programs

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppxE_Invntry.pdf

Appendix E2: Survey Instrument

Available on request

Appendix E3: Website Extraction Table

Available on request

Appendix F: Interviews about Community Health Workers

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppxF_IntrvwSmmry.pdf

Appendix F2: Interview Protocol

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppxF2IntrvwPrtcl.pdf

Appendix G: Issue Paper Permanent Council

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppxGPermCnclDsscss.pdf

Appendix H: Glossary of Terms and Abbreviations

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppHGlssry.pdf

Appendix I: Workgroup Structure and Participants

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppI_WrkgrpStrctr.pdf

Appendix J: List of Birthing Hospitals in Maryland

https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/AppJ_MDBrtHosp.pdf

End Notes

[1] Chapter 83 of the 2018 State Laws of Maryland, http://mgaleg.maryland.gov/2018RS/chapters_noln/Ch_83_sb0266E.pdf
[2] Department of Health and Mental Hygiene "Plan for Reducing Infant Mortality in Maryland", December 2011, https://health.maryland.gov/babiesbornhealthy/pdf/Plan_Reducing_Infant_Mortality_MD_Dec2011.pdf, and Department of Health and Mental Hygiene, "Maryland Infant Mortality Epidemiology Work Group: Findings from Data Analysis and Overall Recommendations, August 24, 2011, https://health.maryland.gov/babiesbornhealthy/pdf/IM_Epi_Work_Group_%20Report_Final_Aug_24_2011.pdf
[3] Vital Statistics, "Infant Mortality in Maryland, 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Infant%20Mortality/Infant_Mortality_Report_2017_20180919.pdf. This rate is for all black infants. The rate for non-Hispanic Black infants was 11.2 in 2017.
[4] Chapter 83 of the 2018 State Laws of Maryland, http://mgaleg.maryland.gov/2018RS/chapters_noln/Ch_83_sb0266E.pdf
[5] Vital Statistics, "Live Birth Data: 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Live%20Births/Live_Birth_2017.pdf
[6] Vital Statistics, "Additional 2017 Jurisdictional Data: Births", Maryland Department of Health, https://health.maryland.gov/vsa/Pages/jurisdictional.aspx. Table created by MHCC staff.
[7] Vital Statistics, "Infant Mortality in Maryland, 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Infant%20Mortality/Infant_Mortality_Report_2017_20180919.pdf
[8] Vital Statistics, "Infant Mortality in Maryland, 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Infant%20Mortality/Infant_Mortality_Report_2017_20180919.pdf
[9] State Health Facts: Infant Mortality Rate, 2016, Kaiser Family Foundation, https://www.kff.org/other/state-indicator/infant-death-rate/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Infant%20Deaths%22,%22sort%22:%22asc%22%7D, accessed August 8, 2019.
[10] The number of preventable deaths is calculated by the number of infant deaths that occurred between 2014-2017 minus the number of deaths that would be expected if the infant mortality rate were the same as the national average.
[11] Vital Statistics, "Infant Mortality in Maryland, 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Infant%20Mortality/Infant_Mortality_Report_2017_20180919.pdf
[12] Vital Statistics, "Infant Mortality in Maryland, 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Infant%20Mortality/Infant_Mortality_Report_2017_20180919.pdf
[13] State Health Facts: Infant Mortality Rate by Race/Ethnicity, 2016, Kaiser Family Foundation, https://www.kff.org/other/state-indicator/infant-mortality-rate-by-race-ethnicity/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Non-Hispanic%20Black%22,%22sort%22:%22asc%22%7D, accessed August 8, 2019.
[14] Nationally, Black Non-Hispanic infants are 2.3 times more likely to die in the first year of life than White Non-Hispanic infants. [Add Source]
Lawrence D. Reid. Infant Mortality among Black & Rural Populations in Maryland. Presentation presented at the: Maryland Health Care Commission. https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/IM%20_AA_Rrl_Wrkgrp_Prsttn_20180917_FINAL_POSTED.pdf. Accessed August 1, 2019.
[15] Maternal and Child Health Bureau, Maryland Department of Health. Babies Born Healthy. https://health.maryland.gov/babiesbornhealthy/Pages/home.aspx. Published September 2018. Accessed August 1, 2019.
[16] Vital Statistics, "Infant Mortality in Maryland, 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Infant%20Mortality/Infant_Mortality_Report_2017_20180919.pdf
[17] Maryland Vital Statistics

[18] State Child Fatality Review Team. Maryland State Child Fatality Review Team 2017 Annual Legislative Report. https://health.maryland.gov/talbotcounty/Documents/2017%20Maryland%20State%20Child%20Fatality%20Review.pdf. Accessed August 1, 2019.
[19] State Child Fatality Review Team. Maryland State Child Fatality Review Team 2017 Annual Legislative Report. https://health.maryland.gov/talbotcounty/Documents/2017%20Maryland%20State%20Child%20Fatality%20Review.pdf. Accessed August 1, 2019.
[20] Maryland Vital Statistics, Linked Birth/Death file for 2012-2016 births.
[21] Unless otherwise specified, this data is calculated using State of Maryland Department of Health definitions of "urban" and "rural". Rural includes Allegany, Calvert, Caroline, Carroll, Cecil, Charles, Dorchester, Frederick, Garrett, Harford, Kent, Queen Anne's, Somerset, Saint Mary's, Talbot, Washington, Wicomico, and Worcester counties. Urban includes Baltimore County and City, Anne Arundel, Howard, Montgomery, and Prince George's Counties.
[22] Vital Statistics, "Infant Mortality in Maryland, 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Infant%20Mortality/Infant_Mortality_Report_2017_20180919.pdf
[23] Chapter 83 of the 2018 State Laws of Maryland, http://mgaleg.maryland.gov/2018RS/chapters_noln/Ch_83_sb0266E.pdf
[24] Maryland Vital Statistics.
[25] U.S. Department of Health and Human Services, Health Resources and Services Administration. The Health and Well-Being of Children in Rural Areas: A Portrait of the Nation 2007. Washington, D.C; 2011. https://mchb.hrsa.gov/nsch/07rural/moreinfo/pdf/nsch07rural.pdf. Accessed August 1, 2019.
[26] U.S. Department of Health and Human Services, Health Resources and Services Administration. The Health and Well-Being of Children in Rural Areas: A Portrait of the Nation 2007. Washington, D.C; 2011. https://mchb.hrsa.gov/nsch/07rural/moreinfo/pdf/nsch07rural.pdf. Accessed August 1, 2019.
[27] U.S. Department of Health and Human Services, Health Resources and Services Administration. The Health and Well-Being of Children in Rural Areas: A Portrait of the Nation 2007. Washington, D.C; 2011. https://mchb.hrsa.gov/nsch/07rural/moreinfo/pdf/nsch07rural.pdf. Accessed August 1, 2019.
[28] Recommendations of the Perinatal Clinical Advisory Committee, "The Maryland Perinatal System Standards, Revised April 2019", https://phpa.health.maryland.gov/mch/Documents/perinatal_newsletters/Maryland%20Perinatal%20System%20Standards_Revised%20April%202019_FINAL.pdf
[29] A 2011 study of infant mortality in Mississippi found that Black women with hypertension were 2 and 3 times more likely to have a preterm birth or a low birth weight baby. Zhang L, Cox RG, Graham J, Johnson D. Association of maternal medical conditions and unfavorable birth outcomes: Findings from the 1996–2003 Mississippi linked birth and death data. Matern Child Health J. 2011;15(7):910-920.
[30] Several studies of Black IM have found a strong association between having a previous live birth ending in death and risk of IM in a second pregnancy.
[31] Wallace M, Green C, Richardson L, Theall K, Crear-Perry J. "Look at the Whole Me": A Mixed-Methods Examination of Black Infant Mortality in the US through Women's Lived Experiences and Community Context. Int J Environ Res Public Health. 2017;14(7):727. Broussard DL, Sappenfield WM, Goodman DA. The Black and White of infant back sleeping and infant bed sharing in Florida, 2004–2005. Matern Child Health J. 2012;16(3):713-724.
[32] Accortt EE, Cheadle AC, Schetter CD. Prenatal depression and adverse birth outcomes: An updated systematic review. Matern Child Health J. 2015;19(6):1306-1337.
[33] Riaz M, Lewis S, Naughton F, Ussher M. Predictors of smoking cessation during pregnancy: A systematic review and meta-analysis. Addiction. 2018;113(4):610-622.
[34] Broussard DL, Sappenfield WM, Goodman DA. The Black and White of infant back sleeping and infant bed sharing in Florida, 2004–2005. Matern Child Health J. 2012;16(3):713-724. Fu LY, Moon RY, Hauck FR. Bed sharing among black infants and sudden infant death syndrome: Interactions with other known risk factors. Acad Pediatr. 2010;10(6):376-382.
[35] [Add Citation]
[36] [Add citation to slide deck from Baltimore City sleep event]

[37] U.S. Department of Health and Human Services, Health Resources and Services Administration. The Health and Well-Being of Children in Rural Areas: A Portrait of the Nation 2007. Washington, D.C; 2011. https://mchb.hrsa.gov/nsch/07rural/moreinfo/pdf/nsch07rural.pdf. Accessed August 1, 2019.
[38] Kaiser Family Foundation, "Health Insurance Coverage of the total Population" State Health Facts, 2017, https://www.kff.org/other/state-indicator/total-population/?currentTimeframe=0&selectedRows=%7B%22states%22:%7B%22maryland%22:%7B%7D%7D%7D&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D
[39] 67% of age 19-64. Kaiser Family Foundation, "Health Insurance Coverage of Adults 19-64", State Health Facts, 2017, https://www.kff.org/other/state-indicator/adults-19-64/?currentTimeframe=0&selectedRows=%7B%22states%22:%7B%22maryland%22:%7B%7D%7D%7D&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D
[40] [Add citation]
[41] [Add citation]
[42] https://www.marylandhealthconnection.gov/get-answers/pregnant-women-and-new-moms/
[43] Chapter 355 of the 2019 State Laws of Maryland, http://mgaleg.maryland.gov/2019RS/chapters_noln/Ch_355_hb0127T.pdf
[44] Vital Statistics, "Live Birth Data: 2017", Maryland Department of Health, https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Live%20Births/Live_Birth_2017.pdf
[45] Cox RG, Zhang L, Zotti ME, Graham J. Prenatal care utilization in Mississippi: Racial disparities and implications for unfavorable birth outcomes. Matern Child Health J. 2011;15(7):931-942.
[46] Howell EA, Hebert P, Chatterjee S, Kleinman LC, Chassin MR. Black/white differences in very low birth weight neonatal mortality rates among New York City hospitals. Pediatrics. 2008;121(3):e407-e415.
[47] https://www.marylandqmdc.org/MarylandHospitalCompare/index.html#/professional/quality-ratings/condition?topic=8&subtopic=18
[48] https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/african_american_study/PtntSftyCnterHndout07192019WGmeeting.pdf
[49] Level III and level IV perinatal hospitals in Maryland have NICUs. See Appendix J.
[50] Landrine H, Corral I. Separate and unequal: Residential segregation and black health disparities. Ethn Dis. 2009;19(2):179.
[51] B'more for Healthy Babies. HOPE Project. http://www.healthybabiesbaltimore.com/our-initiatives/hope-project. Published 2019. Accessed August 1, 2019.
[52] Health Resources and Services Administration, Maternal and Child Health. Healthy Start. https://mchb.hrsa.gov/maternal-child-health-initiatives/healthy-start. Published 2019. Accessed August 1, 2019.
[53] However, a Healthy Start program that targeted non-pregnant, high-risk Black adolescent girls in Jacksonville, Florida significantly improved birth outcomes among those who became pregnant, suggesting that preconception programming can help address racial disparities in infant mortality. The Jacksonville program provided case management to address risk behaviors, care coordination for well woman care, and health education. Medicaid and CHIP Payment and Access Commission. Medicaid Payment Initiatives to Improve Maternal and Birth Outcomes. Washington, D.C; 2019. https://www.macpac.gov/wp-content/uploads/2019/04/Medicaid-Payment-Initiatives-to-Improve-Maternal-and-Birth-Outcomes.pdf. Accessed August 1, 2019.
[54] Lutenbacher M, Elkins T, Dietrich MS, Riggs A. The efficacy of using peer mentors to improve maternal and infant health outcomes in Hispanic families: Findings from a randomized clinical trial. Matern Child Health J. 2018;22(1):92-104.
[55] Hillemeier MM, Domino ME, Wells R, et al. Effects of maternity care coordination on pregnancy outcomes: Propensity-weighted analyses. Matern Child Health J. 2015;19(1):121-127.
[56] https://phpa.health.maryland.gov/mch/Pages/home_visiting.aspx ; Effective Home Visiting Programs https://homvee.acf.hhs.gov/models.aspx
[57] https://phpa.health.maryland.gov/mch/Pages/home_visiting.aspx
[58] Centering Healthcare Institute. Centering Pregnancy. https://www.centeringhealthcare.org/what-we-do/centering-pregnancy. Published 2019. Accessed August 1, 2019.
[59] Ickovics JR, Kershaw TS, Westdahl C, et al. Group prenatal care and perinatal outcomes: A randomized controlled trial. Obstet Gynecol. 2007;110(2 Pt 1):330. Picklesimer AH, Billings D, Hale N, Blackhurst D, Covington-Kolb S. The effect of Centering Pregnancy group prenatal care on preterm birth

in a low-income population. Am J Obstet Gynecol. 2012;206(5):415-e1. Crockett A, Covington-Kolb S, Zang L, Chen L. The South Carolina centering pregnancy expansion project: Improving racial disparities in preterm birth. Am J Obstet Gynecol. 2017;216(1).

[60] Schellinger MM, Abernathy MP, Amerman B, et al. Improved outcomes for Hispanic women with gestational diabetes using the Centering Pregnancy© Group Prenatal Care Model. Matern Child Health J. 2017;21(2):297-305.

[61] Newman RB, Sullivan SA, Menard MK, et al. South Carolina Partners for Preterm Birth Prevention: A regional perinatal initiative for the reduction of premature birth in a Medicaid population. Am J Obstet Gynecol. 2008;199(4):393.e1-393.e8. doi:10.1016/j.ajog.2008.07.047

[62] Johnson K, Posner SF, Biermann J, et al. A Report of the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care.; 2006. https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5506a1.htm. Accessed August 1, 2019.

[63] U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Providing Quality Family Planning Services Recommendations of CDC and the U.S. Office of Population Affairs. MMWR Morb Mortal Wkly Rep. 2014;63(4). https://www.cdc.gov/mmwr/pdf/rr/rr6304.pdf.

[64] Maryland Department of Health. 2018 HealthChoice Evaluation (CY 2012-2016).; 2018. https://mmcp.health.maryland.gov/healthchoice/Documents/HealthChoice%20Evaluations/2018%20HealthChoice%20Evaluation%20(CY%202012-CY%202016).pdf. Accessed August 1, 2019.

[65] 2019 HEALTHCHOICE MANAGED CARE ORGANIZATION AGREEMENT. September 2018. https://mmcp.health.maryland.gov/healthchoice/Documents/MCO%20Agreement%202019%20for%20CY%202019%20MCO%20file.pdf. Accessed August 1, 2019.

[66] Maryland Department of Health. 2018 HealthChoice Evaluation (CY 2012-2016).; 2018. https://mmcp.health.maryland.gov/healthchoice/Documents/HealthChoice%20Evaluations/2018%20HealthChoice%20Evaluation%20(CY%202012-CY%202016).pdf. Accessed August 1, 2019. National Committee for Quality Assurance. Prenatal and Postpartum Care (PPC). Washington, D.C; 2019. https://www.ncqa.org/hedis/measures/prenatal-and-postpartum-care-ppc/. Accessed August 1, 2019.

[67] Health General, §13–3701, Annotated Code of Maryland

[68] https://health.maryland.gov/mhhd/Pages/Community-Health-Worker.aspx

[69] https://pophealth.health.maryland.gov/Community-Health-Workers/Pages/Advisory-Committee.aspx

[70] Examples of tool kits include the National Association of Community Health Centers [INSERT URL] and the Health Leads: Social Needs Screening Toolkit at https://healthleadsusa.org/resources/the-health-leads-screening-toolkit/ Additionally, Kaiser Permanente is developing a similar toolkit that will be accessible to non-KP clients and providers:https://healthitanalytics.com/news/kaiser-permanente-launches-full-network-social-determinants-program; their kit and tools will be linked to the electronic medical record for their patients. Note: MHCC does not endorse any single screening or referral tool. Named tools are included as examples only. Health care providers and communities should select the tools that work best for their organizations and communities

[71] [ADD Citation]

[72] [ADD citation]

[73] [Insert reference to MMR annual report]

[74] Stube A, Moore JE, Mittal P, Reddy L, Low LK, Brown H. Extending Medicaid Coverage for Postpartum Moms. Health Aff Blog. May 2019. https://www.healthaffairs.org/do/10.1377/hblog20190501.254675/full/.

[75] https://www.acog.org/About-ACOG/News-Room/Statements/2019/AMA-Support-for-12-Months-Postpartum-Medicaid-Coverage; https://www.ama-assn.org/press-center/press-releases/ama-adopts-new-policies-2019-annual-meeting

[76] Henry J Kaiser Family Foundation. Expanding Postpartum Medicaid Coverage. Women's Health Policy. https://www.kff.org/womens-health-policy/issue-brief/expanding-postpartum-medicaid-coverage/. Published May 22, 2019. Accessed August 1, 2019.

[77] https://www.babyfriendlyusa.org/about/

[78] [ASK Rebecca Dineen for cite from presentation from safe sleep event]

[79] CHW programs have been shown to be as effective as nurse-based programs.

[80] The Maryland Department of Health will begin certifying CHWs starting September 2019. Training programs will begin to be accredited in January 2020. https://pophealth.health.maryland.gov/Community-Health-Workers/Pages/Home.aspx

[81] Maryland Health Care Commission, "Transforming Maryland's rural healthcare system: A regional approach to rural healthcare delivery Report of the Workgroup on Rural Health Delivery to the Maryland

Health Care Commission As Required by Senate Bill 707", 2017 https://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/rural_health/Final%20Report/LGSRPT_FinalReport_rpt_23102017.pdf

[82] https://mhcc.maryland.gov/mhcc/pages/hit/hit_telemedicine/hit_telemedicine.aspx

[83] Maryland Health Care Commission. HEALTH MATTERS: Navigating an Enhanced Rural Health Model for Maryland LESSONS LEARNED FROM THE MID-SHORE COUNTIES. http://sph.umd.edu/sites/default/files/images/Rural%20Health%20Report/20171103%20Rural%20Health%20Report%20ExecReport_PostProductionEdits_HL_v3.pdf. Accessed August 1, 2019.

[84] https://health.maryland.gov/vsa/Documents/Reports%20and%20Data/Infant%20Mortality/Infant_Mortality_Report_2017_20180919.pdf

[85] https://www.npr.org/sections/health-shots/2017/05/15/528173372/racial-and-ethnic-disparities-persist-in-sudden-infant-deaths