

**2016 Thriving Infants Report**  
**Virginia Department of Health**  
**Office of Family Health Services**  
**Division of Child and Family Health**  
**November 15, 2016**

## Contents

Executive Summary:.....	3
Improving Birth Outcomes.....	6
Implement health promotion efforts .....	7
Ensure quality of health care for all women and infants.....	10
Improve maternal risk screening for all women of reproductive age .....	11
Enhance service integration for women and infants.....	12
Improve access to health care for women before, during and after pregnancy .....	13
Develop data systems to understand and inform efforts.....	14
Assure conditions that promote health opportunity.....	15
Reducing teen pregnancy and unintended pregnancy and improving birth spacing.....	15
Virginia Perspective .....	19
Policy Recommendations.....	20
Resources.....	22
Appendices.....	24

## **Executive Summary:**

In Item 294 of the 2016 Appropriation Act, the Virginia General Assembly directed that:

“the Virginia Department of Health shall report on state policies and programs that would improve birth outcomes in the Commonwealth and make recommendations to the General Assembly. The department shall evaluate and report on the most effective models for improving birth outcomes, reducing teen pregnancy, reducing unintended pregnancies, and improving the spacing between births.”

### **Improving Birth Outcomes**

Virginia’s Plan for Well-Being (The Plan) is a call to action for Virginians to create and sustain conditions that support health and well-being. It provides an outline to guide the development of projects, programs, and policies to advance Virginia’s health. One of The Plan’s key aims is to ensure a strong start for children. The well-being of children determines the health of families and communities and can help predict future public health challenges. To give children a strong start, The Plan recommends a focus on helping Virginians plan their pregnancies and eliminating the racial disparity in infant mortality as foundational to achieving the aim. Strategies include increasing access to quality family planning services for all women of child-bearing age; expanding access to and use of preconception health services to enable optimal health prior to pregnancy; eliminating early elective deliveries; and expanding home visiting and family support programs.

A comprehensive approach to improving birth outcomes, reducing teen pregnancy, reducing unintended pregnancies, and improving birth spacing that aligns with Virginia’s Plan for Well-Being can be developed using the Health Impact Pyramid. The Health Impact Pyramid categorizes public health interventions according to both population health impact and individual effort needed. Within this framework, there are seven domains for improving birth outcomes: Implement Health Promotion Efforts; Ensure Quality of Care for All Women and Infants; Improve Maternal Risk Screening for All Women of Reproductive Age; Enhance Service Integration for Women and infants; Improve Access to Health Care for Women Before, During and After Pregnancy; Develop Data Systems to Understand and inform Efforts; and Assure Conditions that Promote Health Opportunity.

#### Implement Health Promotion Efforts

Preconception health behaviors that can affect pregnancy and infant related health include substance use. Smoking by pregnant women is associated with 30 percent of small-for-gestational age infants, 10 percent of preterm infants and 5 percent of infant deaths (Association of Maternal and Child Health Programs, 2012). In Virginia, 16.4% of women ages 18-44 are current smokers (BRFSS, 2015)(BRFSS 2015) and 9.8% of women smoke during pregnancy (PRAMS, 2012-2013)(PRAMS 2012-2013). Smoking prevention and cessation efforts can positively impact birth outcomes. QuitNow Virginia, the telephone and on-line tobacco cessation counseling service available to Virginians 13 years and older, demonstrates a return on investment of \$10.16 for every \$1 spent on the quitline services and tobacco cessation media. This represents a saving of \$2.1 million in medical expenses; \$962,000 in lost productivity; \$7.1 million in worker’s compensation; and \$328,000 in exposure to second hand smoke.

The U.S. Centers for Diseases Control and Prevention (CDC ) has recommended that Virginia’s minimum annual investment in its state quitline should be \$21,000,000, which would provide comprehensive services to 105,000, or 8.6%, of Virginia smokers. FY15 funding for QuitNow Virginia was approximately \$350,000, only 1.7% of the recommended level, with CDC as the sole source of funding.

#### Enhance Service Integration for Women and infants

Integrated service delivery is an approach to meet the health and well-being needs of women, children and families by providing access to a quality, comprehensive and coordinated community-based system of services (Association of Maternal and Child Health Programs, 2012). For women of reproductive age, this may mean providing and coordinating maternity, reproductive health, primary care and child health services. Through comprehensive home visiting programs, nurses, social workers, and community health workers work with at-risk families to provide education and links to services that positively impact maternal and newborn health, improve school readiness, and prevent child abuse. Home visiting programs can help reduce long-term costs and promote healthy social and emotional development in later years (Association of Maternal and Child Health Programs, 2012). Virginia invests over \$30 million in early childhood/home visiting (Virginia Home Visiting Consortium, 2016). Currently, the Virginia Home Visiting Consortium serves 9,066 families in 110 communities, meeting 7.5% of the estimated need. The highest quality nurse home visiting programs can generate returns of \$5.70 for every \$1.00 spent, in reduced mental health and criminal justice costs, decreased dependence on welfare, and increased employment (The Pew Center on States, 2004). This translates into a total benefit to society of more than \$41,000 per family served (Karoly, Kilburn, & Cannon, 2005).

#### **Reducing Teen Pregnancy, Unintended Pregnancy and Improving Birth Spacing**

Almost half of all pregnancies in the United States are unintended. Unintended pregnancies are associated with several negative health and economic consequences, including delays in initiating prenatal care; reduced likelihood of breastfeeding; maternal depression; and increased risk of physical violence during pregnancy (Healthy People 2020, 2016). The negative consequences associated with unintended pregnancies are greater for teen parents and their children. Comprehensive family planning and preconception health lead to improved birth outcomes, which are associated with better health and cognition as children grow. Family planning services include contraceptive and broader reproductive health services, such as patient education and counseling; breast and cervical cancer screening; sexually transmitted infection prevention education, counseling and testing; and pregnancy diagnosis and counseling (Healthy People 2020, 2016). Each year in the U.S., publicly-funded family planning services prevent 1.94 million unintended pregnancies, including 400,000 teen pregnancies (Healthy People 2020, 2016). Preconception care for females and males includes health screenings, counseling and clinical services that enable them to become as healthy as possible before a pregnancy. The Virginia Department of Health (VDH) has provided family planning services through local health departments for more than 40 years using local cooperative budgets and the Title X family planning grant. In 2015, VDH Title X served 52, 598 women. While annual funding allocations for Title X have decreased by 26 percent (from \$4,826,614 in 2010 to \$3,594,600 in 2016) VDH has maintained all of its 132 service sites and remains committed to its role as a safety-net provider of family planning services.

Innovative models of family planning service delivery focused on reducing unintended pregnancies and teen pregnancies have recently come to national attention. The Colorado Department of Public Health and Environment's (CDPHE) Colorado Family Planning Initiative (CFPI) increased funding to Title X family planning clinics to improve the program's operations, facilitate health care provider training and reduce the costs of the most effective forms of contraception, specifically long acting reversible contraceptives (LARC), for women in need. When LARCs (i.e., intrauterine devices and implants) became more readily available in Colorado between 2009-2013, the birth rate fell by 40% among women ages 15-19 and 9% among women ages 20-24, and the number of repeat teen births dropped by 53% from 2009-2013. In addition, the abortion rate fell by 42% among women ages 15-19 and 18% among women ages 20-24 (CDPHE, 2016). Similarly, the CHOICE project was a research study conducted by Washington University in St. Louis to remove the financial barriers to contraception, promote the most effective methods of birth control, and reduce unintended pregnancy. As part of this project, women using LARC had the highest satisfaction at 1-year follow-up. Women using LARC or a birth control shot had the lowest unintended pregnancy rates at one, two, and three years of follow-up.

### **Recommendations**

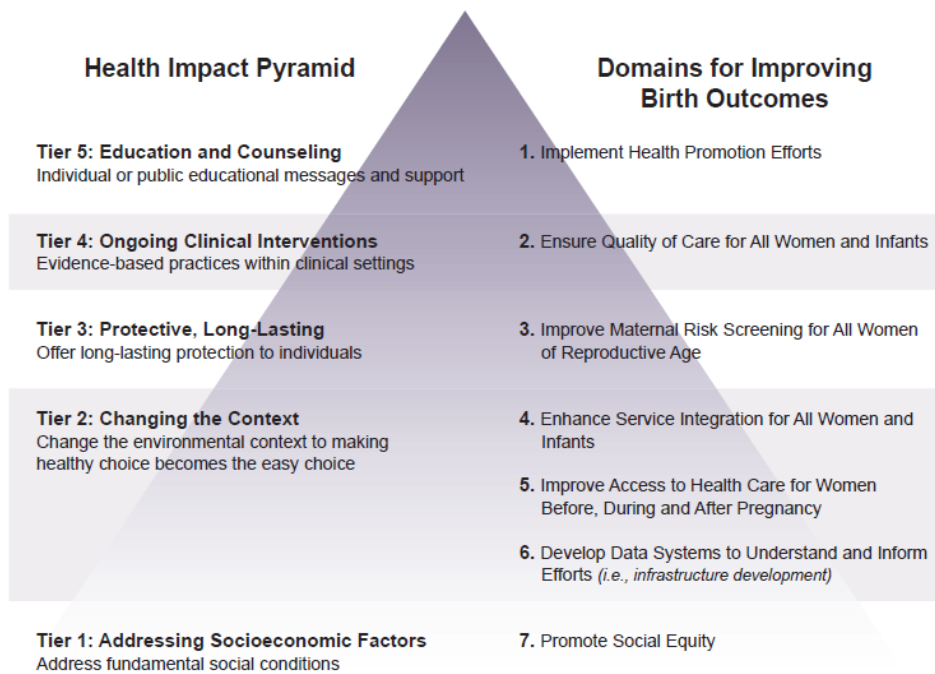
In Virginia, there are opportunities to build on work currently underway to improve birth outcomes, prevent teen pregnancy, reduce unintended pregnancy, and improve birth spacing through implementation of programs, policies, and infrastructure. The General Assembly may wish to consider implementing the following recommendations intended to improve pregnancy outcomes in Virginia

1. Authorize use of state funds to develop a pilot program in Virginia Department of Health Title X family planning clinics to increase education about reproductive choices available to women and to expand access to long acting reversible contraception (LARC). Appropriate \$3,000,000 the first year and \$6,000,000 the second year from the Temporary Assistance for Needy Families (TANF) block grant and provide one position for the purpose of developing the pilot program. The pilot should expand family planning services to an additional 30,000 women in the state, enabling them to choose the most effective contraceptives. A report should be submitted to the Governor, Chairmen of the House Appropriations and Senate Finance Committees, Secretary of Health and Human Resources, and Director, Department of Planning and Budget that details program results and actual program expenditures no later than October 1 of each year for the preceding fiscal year ending June 30.
2. Appropriate state funds to support QuitNow Virginia, the tobacco cessation counseling telephone and online service administered by the Virginia Department of Health, sufficient to cover 100% of the administrative cost of serving Medicaid beneficiaries receiving QuitNow services
3. Appropriate state funds to expand home visiting services to at least 20% of the families in need across the Commonwealth, working closely with the Virginia Home Visiting Consortium to coordinate the home visiting services.

## Improving Birth Outcomes

Improving the health and well-being of mothers, infants, and children is an important public health goal for the United States and the Commonwealth of Virginia. Their well-being determines the health of the next generation and can help predict future public health challenges for families and communities. The Health Impact Pyramid (Figure 1) serves as a useful framework for understanding comprehensive approaches to improving birth outcomes, reducing teen pregnancy, reducing unintended pregnancies, and improving birth spacing (Association of Maternal and Child Health Programs, 2012). The five-tiered pyramid categorizes the impacts of different types of public health interventions and organizes the health interventions along dual continuums: population impact and increasing individual effort needed. Interventions with the smallest population impact and largest individual effort are at the top of the pyramid whereas the actions with the largest population impact and minimal individual effort are at the bottom of the pyramid (Association of Maternal and Child Health Programs, 2012). A comprehensive approach to addressing birth outcomes, teen pregnancy, unintended pregnancies, and birth spacing will include interventions across all levels of the pyramid.

FIGURE 1: The core recommendations for improving birth outcomes align with the Health Impact Pyramid.



Within this framework, there are seven core recommendations for building a comprehensive plan to improve birth outcomes. These recommendations outline core areas for focus and planning:

- 1) Implement Health Promotion Efforts
- 2) Ensure Quality of Care for All Women and Infants
- 3) Improve Maternal Risk Screening for All Women of Reproductive Age
- 4) Enhance Service Integration for Women and infants

- 5) Improve Access to Health Care for Women Before, During and After Pregnancy
- 6) Develop Data Systems to Understand and Inform Efforts
- 7) Assure the Conditions that Promote Health Opportunity

This framework and the recommendations that follow align well with Virginia's Plan for Well-Being (The Plan) and its focus on a strong start for children (Virginia's Plan for Well-Being, 2016). Virginia's Plan for Well-Being is a call to action for all Virginians to work together to make Virginia the healthiest state in the nation. The Plan lays out the foundation for giving everyone a chance to live a healthy life:

- Factoring health into policy decisions related to education, employment, housing, transportation, land use, economic development, and public safety;
- Investing in the health, education, and development of Virginia's children;
- Promoting a culture of health through preventive actions; and
- Creating a connected system of health care.

The Plan highlights specific goals and strategies on which communities can focus so Virginia can make measurable health improvement by 2020.

To ensure a strong start for children, The Plan recommends a focus on helping Virginians plan their pregnancies by increasing access to quality family planning services for all women of child-bearing age; expanding access to and use of preconception health services to enable optimal health prior to pregnancy; and increasing education about and access to the most effective methods of contraception. Comprehensive family planning and preconception health lead to improved birth outcomes, which are associated with better health and cognition as children grow. In addition, the trend toward having smaller families and waiting at least 24 months between pregnancies has also led to better health of infants and children. The Plan also recommends efforts to eliminate the racial disparity in Virginia's infant mortality rate. Specific strategies include eliminating early elective deliveries; expanding home visiting and family support programs; and implementing policies supporting breastfeeding. The goals and strategies detailed in The Plan serve as a useful outline for action to give Virginia's children a strong start. The following sections describe seven core recommendations based on the Health Impact Pyramid and provide evidence for relevant best practices to improve birth outcomes.

### **Implement Health Promotion Efforts**

Health promotion is the art and science of helping persons understand the impact of health and become motivated to achieve optimal health (O'Donnell, 2009). Health promotion can target individual level change through education and increased skills and self-efficacy. Health promotion can also affect population level change by influencing environments such that the healthiest choice is the easiest choice.

Health promotion activities can directly improve birth outcomes and influence the causes of infant morbidity and mortality by educating on health behaviors, such as those that prevent Sudden Unexplained Infant Death (SUIDS) and Sudden Infant Death Syndrome (SIDS). Health education campaigns, such as Back to Sleep, promoted safe sleep positions and environments in an effort to reduce the incidence of SIDS and likely contributed to the decline in the rate of SIDS by over 50%

(Sudden Unexpected Infant Death and Sudden Infant Death Syndrome, 2016). According to research, the risk of SIDS can be lowered by promoting health behaviors such as breastfeeding, immunizations, and reducing substance use (Association of Maternal and Child Health Programs, 2012). Safe sleep education campaigns that emphasize these positive health behaviors can be implemented by working closely with the public, new parents and their families, caretakers and healthcare providers (ASTHO, 2015).

Birth defects affect about one in every 33 babies born in the United States and are a leading cause of infant mortality (CDC Birth Defects, 2015). Neural tube defects are serious birth defects of the brain (anencephaly) and spinal cord (spina bifida). Research has shown that community wide education campaigns are an effective way to promote the use of folic acid supplements among women of childbearing age (Preventing birth defects: community wide campaigns to promote the use of folic acid supplements, 2015). For the past few decades, birth defects have declined due to the promotion of healthy preconception and prenatal behaviors, as well as proper health care before and during pregnancy. Notably, since the United States began fortifying enriched grains with folic acid, there has been a 27% decline in spina bifida and anencephaly affected pregnancies (Prevention, 2004). Neural tube defects can also be prevented by avoiding teratogenic medications and managing obesity and diabetes (Association of Maternal and Child Health Programs, 2012) prior to pregnancy (Association of Maternal and Child Health Programs, 2012).

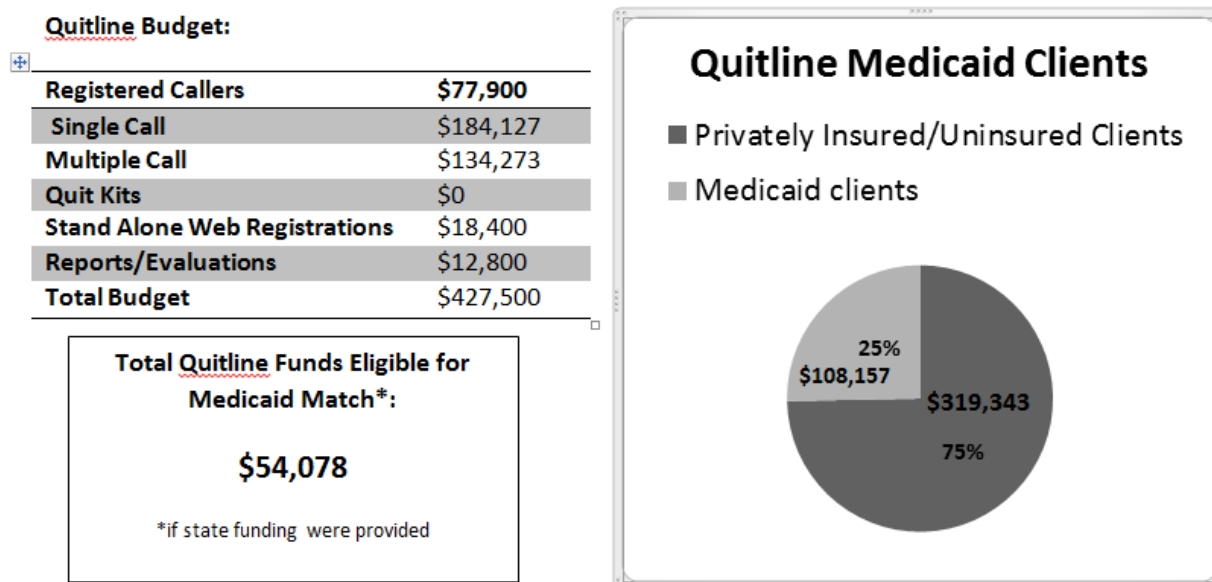
The health of a mother as a woman should be a priority focus area in order to reduce the impact maternal health behaviors can have on infant morbidity and mortality. Preconception health behaviors that can affect pregnancy and infant related health include substance use. Smoking by pregnant women is associated with 30 percent of small-for-gestational age infants, 10 percent of preterm infants and 5 percent of infant deaths (Association of Maternal and Child Health Programs, 2012). While smoking rates are decreasing, current estimates maintain that 10 percent of women in the United States smoke while pregnant (PRAMS, 2011). In Virginia, 16.4% of women ages 18-44 are current smokers (BRFSS, 2015)(BRFSS 2015) and 9.8% of women smoke during pregnancy (PRAMS, 2012-2013)(PRAMS 2012-2013). Positive health behaviors, such as smoking cessation, are choices a woman can make to improve her health and the birth outcomes of her children. Importantly, preventing nicotine dependency is a goal of Virginia's Plan for Well-Being. Community level environmental change, such as ensuring tobacco free spaces and community based smoking cessation programs and resources, would play a role in birth outcomes.

In Virginia, smoking costs over \$7 billion annually. To obtain support for quitting tobacco, Virginia residents can access QuitNow Virginia, a free telephone and online tobacco cessation counseling program available 24 hours a day, 7 days a week to persons 13 years and older. Pregnant women participating in QuitNow Virginia receive 10 free counseling sessions; nicotine replacement patches are provided based on available funding. QuitNow Virginia is solely supported with federal funds; the per-person cost of comprehensive services includes \$14 for registration, \$138 for multi-call program, and \$12/week of nicotine replacement therapy.



QuitNow Virginia demonstrates a return on investment of \$10.16 for every \$1 spent on the quitline and tobacco cessation media. This represents a saving of \$2.1 million in medical expenses; \$962,000 in lost productivity; \$7.1 million in worker’s compensation; and \$328,000 in exposure to second hand smoke. The Centers for Disease Control (CDC) recommends that state quitlines seek to reach 8% of their state’s tobacco users annually with a target of 90% of those users accepting services. (CDC, 2014). This recommendation is based on the experiences of highly productive state quitlines; the expectation that more providers will refer patients to quitlines due to Meaningful Use requirements and utilization of electronic health records; the expectation that more health plans will refer members to quitlines due to the Affordable Care Act (ACA); and that callers will be driven to quitlines in response to the CDC’s National tobacco education campaigns (CDC, 2014). The CDC has recommended that Virginia’s minimum annual investment in its state quitline should be \$21,000,000, which would provide comprehensive services to 105,000, or 8.6%, of Virginia smokers. FY15 funding for QuitNow Virginia was approximately \$350,000, which was only 1.7% of the recommended level, with CDC as the sole source of funding. The FY15 funding level represented an 18% decrease from the FY13 funding level, at which time 5,518 or 0.3% of adult smokers in Virginia were served by QuitNow (Table 1).

Table 1. FY13 Tobacco Quitline Costs



\*Registered callers- clients enrolling in single or multiple calls complete standard registration questions which provide information for tailored counseling and program evaluation; Single call- one call is made by the quitline counselor to the client; Multiple call-up to 10 calls are made by the quitline counselor to the client; Quit kits are provided to all clients and include printed educational

In June 2011, the Centers for Medicaid and Medicare Services (CMS) issued a letter to States regarding cessation services per the ACA encouraging States to offer evidence-based telephone quitline services for all Medicaid beneficiaries as an effective means of providing cessation counseling. All quitlines that follow evidence-based protocols, such as QuitNow Virginia, are regarded by CMS as an allowable Medicaid administrative activity, which can be claimed at the 50% match rate. However, because the

quitline currently does not receive any state funds, Virginia is unable to claim the match. The addition of state funding to the quitline would enable these additional funds to be accessed. In FY14, 25.3% of clients served by the quitline were Medicaid clients.

Another positive health behavior that mothers can adopt that has beneficial impact on both maternal and infant health outcomes is breastfeeding. Exclusive breastfeeding for 6 months after birth is sufficient to support an infant's optimal growth and development (CDC, 2015). Additionally, breastfeeding protects an infant against infectious and chronic diseases and reduces infant mortality due to diarrhea or pneumonia (WHO, 2016). The American Academy of Pediatrics (AAP) recommends that breastfeeding continue for at least 12 months, and thereafter for as long as mother and baby desire (CDC, 2015). The World Health Organization recommends continued breastfeeding up to 2 years of age or beyond. In 2014, 81.1% of infants started out breastfeeding, indicating that most mothers in the United States want to breastfeed and are trying to do so (CDC, 2016). Over half, 51.8%, were breastfeeding at 6 months; and almost one-third, 30.7%, were breastfeeding at 12 months (CDC, 2016). Similarly in Virginia in 2013, 82% of infants were breastfed, with over half, 55.2%, partially breastfed at 6 months and over one-third, 35.5% partially breastfed at 12 months.

Research demonstrates that a woman's ability to initiate and sustain breastfeeding is influenced by several factors, including the community in which she lives (CDC, 2015). The diverse components of a woman's community, such as public health, coalitions, community based programs, schools and childcare centers, businesses and industry, and media, and the extent to which these entities support or discourage breastfeeding may significantly impact a woman's success with breastfeeding. With support from their families, particularly their partners and mothers, and their communities, women are more likely to be able to achieve their breastfeeding goals. Communities can use social marketing and new types of media to ensure that families understand the value of breastfeeding and make well-informed decisions about how to feed their babies. Communities can also create environments conducive to breastfeeding by setting up programs for new fathers and grandmothers; strengthening mother-to-mother support; connecting mothers to community resources; and removing barriers to breastfeeding for working mothers (CDC, 2011).

Health promotion programs and activities should employ new technologies and social media opportunities to optimize the reach of messages to target populations. Culturally and linguistically appropriate materials and campaigns should be available for families, providers, and communities to ensure increased awareness and reinforcement of positive individual health behaviors and practices.

### **Ensure quality of health care for all women and infants**

Birth outcomes can be improved by ensuring the provision of high quality and evidence based care for all pregnant women and infants. Leading perinatal health indicators show need for improvement. In particular, the U.S. rate of low-risk cesarean deliveries (i.e., non-medically indicated) was 18.4% in 1997 and rose steadily to a high of 28.1% in 2009. In response, significant effort in recent years has focused on reducing the occurrence of non-medically indicated cesarean delivery and induction of labor, with special emphasis on deliveries under 39 weeks gestation (Osterman, 2014). Eliminating early elective deliveries is a goal of Virginia's Plan for Well-Being to address the racial disparity in the infant mortality

rate. Research shows that elective deliveries at less than 39 weeks are associated with increased infant morbidity, specifically neonatal intensive care unit admissions, respiratory distress syndrome, use of ventilator support, and newborn feeding issues (Association of Maternal and Child Health Programs, 2012). Late preterm delivery may also increase the risk of brain injury and long-term neurodevelopmental abnormalities (Association of Maternal and Child Health Programs, 2012). Between 2009 and 2013, the rate of low-risk cesarean deliveries declined to 26.9% in the U.S. due to targeted efforts including new guidelines from the American Congress of Obstetricians and Gynecologists; public education campaigns such as “39 weeks is Best” by the March of Dimes; initiatives to improve the quality of perinatal care; and changes to hospital policy to disallow elective delivery before 39 weeks. Several states, including Virginia, engaged in perinatal quality improvement collaboratives through which multisector stakeholders spanning hospitals, payers, community partners, and clinicians voluntarily enacted policies to reduce early, elective induction and delivery and then transitioned to nonpayment for hospital and physical charges associated with early births. As of March 2016, Virginia’s early elective delivery rate was 0.68%, a reduction of over 50% since the collaborative began in 2013 (Virginia Hospital and Healthcare Association).

Perinatal regionalization is a system of care linking each hospital to a network of education and interhospital transport to provide risk-appropriate care across the continuum of perinatal care (Association of Maternal and Child Health Programs, 2012). Research shows very low birth weight (VLBW) and preterm infants born outside of a level III hospital are associated with an increased likelihood of neonatal or postdischarge mortality. Regionalization, which has resulted in increased survival of high-risk neonates, is cost effective, because it concentrates relatively rare cases at a few locations, centralizing expensive technologies and the opportunity for provider teams to develop expertise (March of Dimes, 2010). To help optimize the effective regionalization of maternal and newborn care, development of standard definitions and guidelines across the country for levels of maternal and infant care that are consistently utilized is recommended (March of Dimes, 2010).

A critical aspect of improving quality is ensuring that all care is patient and/or family centered. This approach is grounded in mutually beneficial partnerships that involve comprehensive assessments and shared decision making among health care providers, consumers and families. Patient-centered care means all childbearing women are treated with kindness, respect, dignity and cultural sensitivity, throughout their maternity care experiences.

### **Improve maternal risk screening for all women of reproductive age**

Various modifiable risk factors and chronic conditions can cause significant disease and death during pregnancy and lead to the development of lifelong chronic disease (Association of Maternal and Child Health Programs, 2012). Women of childbearing age have chronic conditions, including diabetes, hypertension, obesity, and depression, and are exposed to or consume substances, such as alcohol and tobacco, that can have an adverse effect on pregnancy outcomes leading to pregnancy loss, infant death, birth defects or other complications for mothers or infants. Preventing and managing these risk factors can prevent poor birth outcomes and reduce rates of chronic disease in women overall (Association of Maternal and Child Health Programs, 2012). These factors can best be addressed prior to pregnancy or between pregnancies, rather than waiting until a pregnancy occurs. Preconception and

interconception care provide the framework to assess and address these modifiable risk factors and improve a woman's health and future birth outcomes.

Preconception care involves screening and interventions for medical and social risk factors; providing vaccinations; guiding reproductive life planning (whether and when to have children); supporting the use of appropriate contraceptive methods; and delivering health promotion counseling and health education specific to a woman or couple's risk profile (March of Dimes, 2010). Preconception care can be built into annual preventive visits. This approach to care focuses on wellness for women of reproductive age and takes a life-course perspective, meaning the interplay of biological, psychological and social/environmental protective and risk factors related to birth outcomes over a woman's life is considered when developing the care plan (March of Dimes, 2010). Similar risk assessment occurs during interconception, especially for women with a prior history of adverse pregnancy outcomes. Interconception denotes the time between the end of one pregnancy and the conception of the next pregnancy; it is treated as an open-ended period of time and preconception is often used to convey both interconception and preconception (March of Dimes, 2010).

Since nearly half of all pregnancies in the United States are unintended, screening all women of reproductive age (18-44) for chronic conditions and other psychosocial risk factors for poor birth outcomes can have a positive effect on improving women's health and birth outcomes (Association of Maternal and Child Health Programs, 2012). Comprehensive risk assessment and screening for all women, in the setting of preconception and interconception health care, can identify risk factors for poor birth outcomes and allow for recognition and intervention prior to pregnancy.

Prenatal care should begin with the preconception visit, the most important visit regarding pregnancy (March of Dimes, 2010). Prenatal care is provided to prevent complications and decrease the incidence of perinatal and maternal morbidity and mortality. It involves comprehensive risk assessment and screening with subsequent care based on the identified level of risk.

### **Enhance service integration for women and infants**

Integrated service delivery is an approach to meet the health and well-being needs of women, children and families by providing access to a quality, comprehensive and coordinated community-based system of services (Association of Maternal and Child Health Programs, 2012). For women of reproductive age, this may mean providing and coordinating maternity, reproductive health, primary care and child health services. Service integration is guided by a life course approach to health and well-being, which recognizes the interplay of risk and protective factors, such as socioeconomic status, toxic environmental exposures, health behaviors, stress and nutrition, as well as their influence on the health of an individual over the course of their life (Association of Maternal and Child Health Programs, 2012). In addition, advancing the concept of a medical home, or health home, for all women and children is a key feature of service integration. A medical home is a model of delivering primary care that is accessible, continuous, comprehensive, and culturally effective. Within the medical home, the continuum of preconception, prenatal, and interconception care could be seamlessly facilitated. The pregnancy centered medical home model embraces the team concept of comprehensive care for

pregnant women and provides a high level of care management with built-in quality control measures (AMCHP, 2013).

Beyond the medical home, specific models that promote service integration and target healthy birth outcomes and infant mortality reduction include colocation of reproductive and other health services, home visiting and parenting programs. Service integration approaches that provide women with comprehensive health services and link them to appropriate health and social service have been shown to improve women's health and birth outcomes (Association of Maternal and Child Health Programs, 2012). Models that integrate women's preventive health services into family planning settings also have shown effectiveness (Association of Maternal and Child Health Programs, 2012).

Authorized by the ACA, the Maternal, Infant and Early Childhood Home Visiting (MIECHV) Program provides funding to all 50 states to support evidence-based home visiting programs to improve the well-being of families with young children (Association of Maternal and Child Health Programs, 2012). Through comprehensive home visiting programs, nurses, social workers, and community health workers work with at-risk families to provide education and links to services that positively impact maternal and newborn health, improve school readiness, and prevent child abuse. Home visiting programs can help prevent more long-term costs and promote healthy social and emotional development in later years (Association of Maternal and Child Health Programs, 2012). Due to its proven benefits, expanding home visiting services is a recommended strategy of Virginia's Plan for Well-Being to eliminate the racial disparity in the infant mortality rate.

Virginia invests over \$30 million in early childhood/home visiting (Virginia Home Visiting Consortium, 2016). To provide a family with home visiting services for a year costs about \$3,800. Several studies have been conducted to assess the short and long term impact of home visiting programs on family economic stability, school readiness, workforce preparation, welfare program use, and criminal justice system interaction. The highest quality nurse home visiting programs can generate returns of \$5.70 for every \$1.00 spent, in reduced mental health and criminal justice costs, decreased dependence on welfare, and increased employment (The Pew Center on States, 2004). This translates into a total benefit to society of more than \$41,000 per family served (Karoly, Kilburn, & Cannon, 2005). Using 2014 Census data to identify the number of families with children ages 0-5 who have incomes up to 185% of the federal poverty level as a proxy for need for services, there are over 100,000 families in Virginia with young children in need of home visiting. Currently, the Virginia Home Visiting Consortium serves 9,066 families in 110 communities, meeting 7.5% of the estimated need.

### **Improve access to health care for women before, during and after pregnancy**

Access to health care coverage is a crucial component of ensuring healthy birth outcomes for women and infants. Lack of health care often means late or no entry into prenatal care for women, which can result in pregnancy complications and delayed diagnosis of treatable conditions. Furthermore, science indicates that prenatal care may be too late to intervene to fully assure the health of mothers and babies (Association of Maternal and Child Health Programs, 2012). Providing comprehensive medical services for women before, during and between pregnancies is a proven intervention for improving birth outcomes.

The ACA expands coverage and provides tools and resources to improve access to quality care for women. In particular, the ACA covers several women's health services, such as well-woman visits, screening for gestational diabetes, FDA approved contraception and contraceptive counseling, and breastfeeding support without cost-sharing (Association of Maternal and Child Health Programs, 2012). In addition to the coverage expansion, the ACA also includes a ban on pre-existing condition exclusions, which means that insurers can no longer deny a pregnant woman coverage if she attempts to obtain coverage after discovering her pregnancy. The ACA also requires maternity and newborn care to be part of the comprehensive benefits package. The ACA's extension of coverage for young adults on the plans of their parents up to age 26 should also improve access to health care for women of reproductive age. Public and private insurance coverage options should be comprehensive in scope, covering women before, during and after childbirth (AMCHP, 2013).

Medicaid requires that states cover family planning services without cost sharing. In Virginia, Plan First, is administered by the Department of Medical Assistance Services, and offers yearly family planning exams, contraceptives, lab testing, family education and more. The program is comprehensive for those who qualify as it covers pap smears, sexually transmitted infection testing, prescription contraceptives, over-the-counter contraceptives and transportation to covered family planning services. In order to be eligible for Plan First, an individual must be a Virginia resident, a U.S. citizen or qualified legal immigrant, and meet certain monthly income limits.

Medicaid further addresses the issue of access through the hospital-based presumptive eligibility program, which allows hospitals to screen patients for Medicaid and Children's Health Insurance Program (CHIP) eligibility and immediately enroll individuals who appear to be eligible, providing individual's access to Medicaid or CHIP services without waiting for an eligibility determination from the Medicaid agency. A patient provides basic information regarding their individual or family income and household size and, if the patient appears to be eligible for Medicaid based on this information, a hospital can presume the patient is eligible for Medicaid and the hospital will be reimbursed for services provided as though the patient were already enrolled in Medicaid. Hospital-based presumptive eligibility became mandated by the Centers for Medicare and Medicaid Services (CMS) starting January 1, 2014. (CDC, 2016) This policy change supports women receiving prenatal care earlier in their pregnancy.

Access to comprehensive health care should also include access to oral health care. Research suggests oral bacteria and poor oral health play a causal role in adverse pregnancy outcomes (Association of Maternal and Child Health Programs, 2012). Pregnancy related health care might be an opportune time to address oral health needs for women who may not otherwise routinely access care. In Virginia, as of March 1, 2015, pregnant women enrolled in Medicaid and FAMIS MOMS who are 21 years of age and older are eligible to receive comprehensive benefits, excluding orthodontics, covered by the Smiles For Children program. Dental benefits for pregnant women who are 21 years of age and older are discontinued at the end of the month following their 60th day postpartum.

### **Develop data systems to understand and inform efforts**

Building data infrastructure is central to understanding a problem, implementing interventions and evaluating comprehensive efforts. Creating a comprehensive picture of infant mortality requires working with a variety of stakeholders to share data across systems and programs, creating data linkages where possible (Association of Maternal and Child Health Programs, 2012). Key partners may include Medicaid and other health insurers, vital statistics, chronic disease programs, birth defects registries and hospitals. Enhancing and supporting ongoing data collection and monitoring systems

through linkage of data sources are crucial to developing a comprehensive picture of infant mortality and strategies to improve birth outcomes. Fetal and infant Mortality Review, birth defects registries, newborn screening (bloodspot and hearing), immunization registries, maternal and infant hospitalizations, Medicaid claims, WIC program data, Pregnancy Risk Assessment Monitoring System (PRAMS), and Title V Maternal Child Health Services Block Grant performance measures are critical components of a comprehensive data system. As a comprehensive, linked data system is established, translating data into information for action to facilitate the design of targeted interventions is a crucial next step.

### **Assure Conditions that Promote Health Opportunity**

Race and ethnicity are central factors in risks for poor birth outcomes. Poverty and education are also important factors associated with poor birth outcomes. There is an inverse relationship between income and health, meaning women with lower incomes are more likely to have an infant die than women with high incomes (Association of Maternal and Child Health Programs, 2012). Educational attainment has a similar inverse pattern of decreasing infant mortality rates as education level increases. Research has shown that historical segregation, social bias (i.e. racism, classism, sexism, nativism), stress, and discrimination contribute to the disparate burden experienced by some populations (Association of Maternal and Child Health Programs, 2012). Over the course of the life of an individual, race, ethnicity, poverty and education intersect with health factors and social influences to produce cumulative impacts on health (Association of Maternal and Child Health Programs, 2012). Health disparities can only be addressed with strategies related to both health and social programs that work more broadly and support equitable access to health care services and promote community wellness, which focuses on ameliorating the social, environmental and economic conditions that contribute to poor health (AMCHP, 2013).

### **Reducing teen pregnancy and unintended pregnancy and improving birth spacing**

Almost half of all pregnancies in the United States are unintended. Unintended pregnancies are associated with several negative health and economic consequences, including delays in initiating prenatal care; reduced likelihood of breastfeeding; maternal depression; and increased risk of physical violence during pregnancy (Healthy People 2020, 2016). Births resulting from unintended pregnancies can have negative consequences such as birth defects and low birth weight. The negative consequences associated with unintended pregnancies are greater for teen parents and their children. Eighty-two percent of pregnancies to mothers ages 15 to 19 in the U.S. are unintended (Healthy People 2020, 2016). Teen mother/fatherhood is associated with lower educational attainment and lower income (Healthy People 2020, 2016). Children of teen parents are more likely to have lower cognitive attainment and exhibit more behavior problems (Healthy People 2020, 2016).

The availability of family planning services ensures individuals have the support and resources needed to plan and space their pregnancies and prevent unintended pregnancies. Family planning services include contraceptive and broader reproductive health services, such as patient education and counseling;

breast and cervical cancer screening; sexually transmitted infection prevention education, counseling and testing; and pregnancy diagnosis and counseling (Healthy People 2020, 2016). Preconception care, the set of interventions designed to identify and reduce risks to a woman's health and improve pregnancy outcomes through prevention and management of health conditions, can be delivered as a component of family planning services. Altogether, family planning services contribute to improved health outcomes for infants, children, women and families (Healthy People 2020, 2016). Each year in the U.S., publicly-funded family planning services prevent 1.94 million unintended pregnancies, including 400,000 teen pregnancies (Healthy People 2020, 2016).

Within Virginia, there are three provider types that serve as the safety-net for family planning services and ensure access for low-income and high risk populations: VDH, Planned Parenthood, and Federally Qualified Health Centers (FQHCs). While free clinics and rural health clinics across the Commonwealth provide subsidized care, these safety-net providers are not mandated to provide family planning services. Currently, most free clinics and rural health clinics do not offer a full range of contraceptive services. The Virginia Department of Health (VDH) has provided family planning services through local health departments for more than 40 years using state/ local cooperative budgets and the Title X family planning grant. According to recent estimates, there are 446,040 women in need of publicly supported family planning services, such as Title X, either because they are teens under 20 (n=117,220) or adult women (ages 20-44) living at or below 250 percent of the poverty level (n=328,820). VDH's reach varies by community, in some communities the Title X family planning services reach 4.4 percent of teens and 10.2 percent of women in need, whereas in others 63 percent of teens and 72.8 percent of women in need receive services; in 2015, VDH Title X served 52, 598 women. While annual funding allocations for Title X decreased by 26 percent, from \$4,826,614 in 2010 to \$3,594,600 in 2016, VDH has maintained all of its 132 service sites and remains committed to its role as a safety-net provider of family planning services.

Innovative models of family planning service delivery focused on reducing unintended pregnancies and teen pregnancies have recently come to national attention. The Colorado Department of Public Health and Environment's (CDPHE) Colorado Family Planning Initiative (CFPI) increased funding to Title X family planning clinics to improve the program's operations, facilitate health care provider training and reduce the costs of the most effective forms of contraception, specifically LARCs, long acting reversible contraceptives, for women in need. LARCs are intrauterine devices (IUDs) and implants. CDPHE addressed the barriers of accessibility and high cost preventing women from being able to select LARCs as their contraceptive method. The CFPI successfully expanded contraceptive options and enabled more than 30,000 women in the state to choose the most effective contraceptives. When LARCs became more readily available in Colorado between 2009-2013, the birth rate fell by 40% among women ages 15-19 and 9% among women ages 20-24, and the number of repeat teen births dropped by 53% from 2009-2013. The abortion rate fell by 42% among women ages 15-19 and 18% among women ages 20-24 (Table 2) (CDPHE, 2016).

The CHOICE project was a research study conducted by Washington University in St. Louis to remove the financial barriers to contraception, promote the most effective methods of birth control, and reduce unintended pregnancy. The program enrolled nearly 10,000 women, 75% of whom chose LARC after



receiving counseling on all methods of birth control (Choice Project, 2016). Teens also chose LARC with over 40% of young women 14-17yrs choosing the implant. Among women who chose a LARC method, 86% were still using their method one year later. Only 55% of women who chose non-long-acting methods, such as pills, vaginal birth control ring, patch, or a birth control shot, were still using their method one year later. Women using LARC had the highest satisfaction at one year follow-up (Figure 2). Women using LARC or a birth control shot had the lowest unintended pregnancy rates at one, two, and three years of follow-up (Figure 3) (Choice Project, 2016). Pill, vaginal birth control ring and patch users had a pregnancy rate that was 20 times higher than LARC users. LARC was very effective at preventing pregnancy regardless of age, but women under age 21 using the pill, ring or patch were two times more likely to get pregnant than women over age 21 using the pill, ring or patch (Choice Project, 2016).

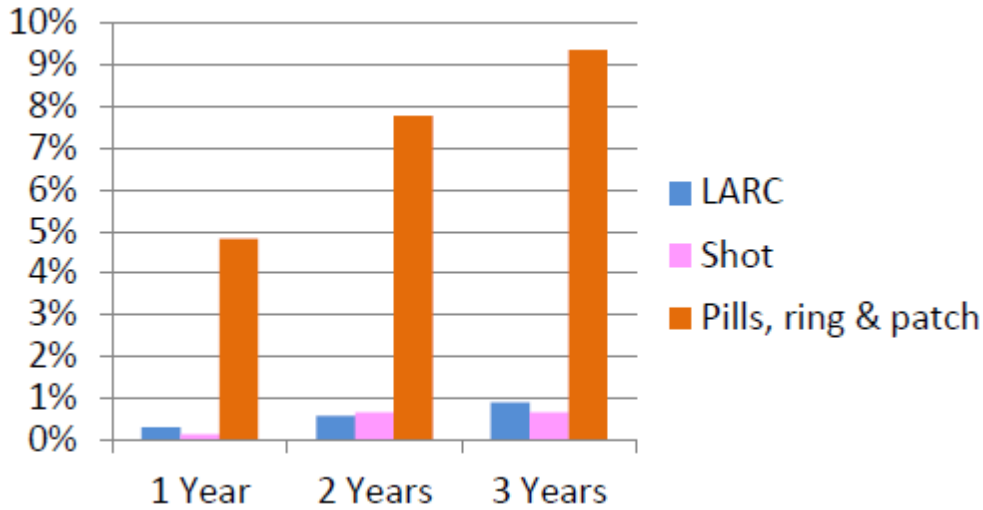
**Table 2. Colorado Family Planning Initiative**

Number of women with LARC access	30,000
Birth rate, 2009-2013	
Women, age 15-19	Decreased 40%
Women, age 20-24	Decreased 9%
Birth rate, 2009-2012	
Low income women, age 15-19	Decreased 39%
Low income women, age 20-24	Decreased 22%
Abortion rate, 2009-2013	
Women, age 15-18	Decreased 42%
Women, age 20-24	Decreased 18%

**Figure 2. CHOICE Project, Satisfaction with Birth Control Method**



**Figure 3. CHOICE Project, Unintended Pregnancy Rate at 1, 2, and 3 years of Follow-up**



A comprehensive approach to prevent unintended pregnancies and teen pregnancies requires strategic directions and interventions across multiple levels of the Health Impact Pyramid (Figure 1). Regarding counseling and education, model practices include conducting outreach efforts to engage high-risk populations in clinical family planning services and community-based prevention programs; identifying and promoting educational messages on delaying sexual activity, consistent contraceptive use, preventive health care, taking individual responsibility, and the male's role in preventing pregnancy; and promoting access to contraceptive counseling (NYSDH, 2016). Recommended clinical interventions include educating about all contraceptive methods and their level of effectiveness; improving post-abortion counseling and contraceptive methods to prevent future unintended pregnancies; and screening for and addressing factors that increase the risk for and multiply the effects of teen pregnancy/parenting, such as depression, poor education and adverse childhood experiences (NYSDH, 2016).

Long-lasting protective interventions include implementing comprehensive, evidence-based, age-appropriate family life and sexuality education in schools; developing and providing media literacy programs for adolescents to counteract the prevalent media messages about sex; and engaging high-risk pregnant women and families in evidence-based home visiting programs that have demonstrated positive impact on subsequent pregnancy spacing and economic self-sufficiency (NYSDH, 2016). Strategic interventions aimed at changing the context to make individual decisions healthy include conducting research to better understand and develop interventions to address the multiple dimensions related to pregnancy intention; ensuring access to, and affordability of, confidential contraceptive service; facilitating reimbursement for providers for contraceptive services, particularly LARCs; and increasing the number of school-based health centers providing comprehensive reproductive health care/family planning services and/or fostering relationships between schools and nearby reproductive health care providers.

Strategies to address socioeconomic factors impacting unintended pregnancies and teen pregnancies include creating economic and educational opportunities for women in high-risk communities and circumstances; training and deploying paraprofessionals in community health promotion programs and other individuals in their communities; and engaging affected populations in local strategies to raise awareness of health disparities and identify, develop, implement and evaluate collective solutions to community health issues. For many women, a family planning clinic is the entry point into the health care system and is considered their usual source of care (Healthy People 2020, 2016). However, women with lower levels of education and income, uninsured women, Latina women, non-Hispanic black women, and men are less likely to have access to family planning services (Healthy People 2020, 2016). Efforts to increase access to family planning services should address existing barriers, which include cost of services; lack of awareness of existing services among hard-to-reach populations; lack of transportation; lack of youth- friendly services; and limited access to insurance coverage (Healthy People 2020, 2016).

## **Virginia Perspective**

In 2014, the Thriving Infants Strategic Plan (TISP) was completed and disseminated to partners and stakeholders throughout Virginia. The purpose of the plan was to (1) document the state of Maternal and Infant Health in the Commonwealth; (2) engage current stakeholders in Virginia that are working to reduce infant mortality and improve birth outcomes; and, (3) describe best practices in maternal and child health to improve programs and services. The TISP was developed over a two-year period and engaged over 100 different stakeholders including but not limited to multidisciplinary health care providers, health systems representatives, the March of Dimes and other non-profit organizations, state agencies, advocacy groups, researchers, experts in health equity and social determinants of health (SDOH), community members, faith community representatives, and insurance/payer representatives (Appendix 1). The strategic planning process included multiple meetings, conference calls, data collection and review by multiple stakeholders and concluded with a large one-day community meeting. From the onset, the VDH emphasized inclusion of the many diverse community voices and stakeholder engagement. In addition, VDH stressed the importance of valid, reliable and up-to-date data. All of this work culminated into the TISP that prioritized four areas for action: pre-and inter-conception health of women; prevention of preterm birth and low birth weight; quality family planning and access to care; and, positive parenting and child injury prevention.

Each of the four priority areas includes specific objectives and strategies that are best practices for positive birth outcomes and thriving infants. Strategies within preconception health include having a medical home, access to healthcare providers, and insurance coverage for women. Key strategies in the prevention of preterm births include smoking cessation for pregnant women, availability of 17P for women in preterm labor, early and adequate prenatal care, and reduction of early elective deliveries. 17P (17 alpha-hydroxyprogesterone caproate) is a synthetic form of progesterone that has been shown to reduce the recurrence of preterm births by 33 percent for women with singleton gestations (i.e. a single infant, not twins or higher multiples) that have a history of prior preterm births (ASTHO, 2013). 17P is administered through weekly injections beginning at 16-24 weeks until delivery. Strategies in the

quality family planning area include access to all methods of contraception, including LARCs (IUDs and implants), and high-quality contraceptive counseling. Finally, education and outreach to new parents regarding parenting skills and child development, early universal screening for infants, and comprehensive safe sleep education are the fundamental strategies within the child injury prevention area.

Once the TISP was completed, working groups were launched to implement each of the four action areas. Accomplishments include conducting research on best business practices to improve access to all contraceptive methods, including LARCs, and effective contraceptive counseling methods; alignment of tobacco cessation efforts between the March of Dimes and VDH's programs to provide all localities in Virginia with smoking cessation resources; implementation of text4baby, a program that sends educational text messages and Virginia-specific resources to pregnant women who enroll in the free program; implementation of a quality improvement program in Virginia's hospitals to decrease early elective deliveries; promotion of breastfeeding in worksites and hospitals; and promotion of home visiting programs.

Simultaneously, the federal Maternal and Child Health Bureau (MCHB) convened the Collaborative Improvement and Innovation Network to Reduce Infant Mortality (CoIIN) in which Virginia was selected to participate. Workgroup members chose safe sleep as Virginia's focus. The group has coordinated safe sleep education in Virginia's hospitals and among Virginia's home visiting programs.

## **Policy Recommendations**

In Virginia, there are opportunities to build on work currently underway to improve birth outcomes, prevent teen pregnancy, reduce unintended pregnancy, and improve birth spacing through implementation of programs, policies, and infrastructure. Included as an Appendix are state and local level best practice policies and strategies recommended by leading national experts on maternal and child health, specifically the Association of Maternal and Child Health Programs and the Commonwealth Fund (Appendix 2).

The General Assembly may wish to consider implementing the following recommendations intended to improve pregnancy outcomes in Virginia

1. Authorize use of state funds to develop a pilot program in Virginia Department of Health Title X family planning clinics to increase education about reproductive choices available to women and to expand access to long acting reversible contraception (LARC). Appropriate \$3,000,000 the first year and \$6,000,000 the second year from the Temporary Assistance for Needy Families (TANF) block grant and provide one position for the purpose of developing the pilot program. The pilot should expand family planning services to an additional 30,000 women in the state, enabling them to choose the most effective contraceptives. A report should be submitted to the Governor, Chairmen of the House Appropriations and Senate Finance Committees, Secretary of Health and Human Resources, and Director, Department of Planning and Budget that details

program results and actual program expenditures no later than October 1 of each year for the preceding fiscal year ending June 30.

2. Appropriate state funds to support QuitNow Virginia, the tobacco cessation counseling telephone and online service administered by the Virginia Department of Health, sufficient to cover 100% of the administrative cost of serving Medicaid beneficiaries receiving QuitNow services
3. Appropriate state funds to expand home visiting services to at least 20% of the families in need across the Commonwealth, working closely with the Virginia Home Visiting Consortium to coordinate the home visiting services.

## Resources

- AMCHP. (2013). Retrieved September 28, 2016, from Connecting the Dots to Improve Birth Outcomes: Key Considerations and Recommendations from a National Meeting: <http://www.amchp.org/SiteCollectionDocuments/Connecting%20the%20Dots%20Proceedings%20FINAL.pdf>
- Association of Maternal and Child Health Programs. (2012). *Forging a Comprehensive Initiative to Improve Birth Outcomes and Reduce Infant Mortality: policy and Program Options for State Planning*.
- ASTHO. (2013). *17 Alpha-hydroxyprogesterone caproate (17P)*. Arlington: ASTHO.
- ASTHO. (2015, March). Retrieved September 27, 2016, from Improving Birth Outcomes- Position Statement: <http://www.astho.org/Policy-and-Position-Statements/Improving-Birth-Outcomes/>
- BRFSS. (2015). Office of Family Health Services. Division of Population Health Data.
- CDC. (2011). Retrieved September 27, 2016, from How Communities can help: The Surgeon General's Call to Action to Support Breastfeeding: [http://www.cdc.gov/breastfeeding/pdf/actionguides/Communities\\_in\\_Action.pdf](http://www.cdc.gov/breastfeeding/pdf/actionguides/Communities_in_Action.pdf)
- CDC. (2014). *Best Practices for Comprehensive Tobacco Control Programs*.
- CDC. (2015, June 16). Retrieved September 27, 2016, from Breastfeeding: <http://www.cdc.gov/breastfeeding/faq/index.htm>
- CDC. (2015, June 17). Retrieved September 27, 2016, from Breastfeeding: Communities: <http://www.cdc.gov/breastfeeding/promotion/communities.htm>
- CDC. (2016, August 22). Retrieved September 27, 2016, from Breastfeeding Rates Continue to Rise in the U.S.: <http://www.cdc.gov/breastfeeding/data/breastfeeding-report-card-2016.html>
- CDC Birth Defects. (2015, November 17). Retrieved September 27, 2016, from U.S. Centers of Disease Control and Prevention: <http://www.cdc.gov/ncbddd/birthdefects/aboutus.html>
- CDPHE. (2016). Retrieved September 28, 2016, from Reducing Unintended Pregnancies in Colorado: [https://www.colorado.gov/pacific/sites/default/files/HPF\\_FP\\_UP-Reducing-Unintended-Pregnancies-in-CO.pdf](https://www.colorado.gov/pacific/sites/default/files/HPF_FP_UP-Reducing-Unintended-Pregnancies-in-CO.pdf)
- Choice Project. (2016). Retrieved from Choice Project: <http://www.choiceproject.wustl.edu/>
- Healthy People 2020. (2016, September 28). Retrieved September 28, 2016, from Family Planning: <https://www.healthypeople.gov/2020/topics-objectives/topic/family-planning#seven>
- Johnson, K. (2012). *Addressing Women's Health Needs and Improving Birth Outcomes: Results from a Peer-to-Peer State Medicaid Learning Project*. Commonwealth Fund.

- March of Dimes*. (2010, December). Retrieved September 27, 2016, from Toward Improving the Outcome of Pregnancy III: <http://www.marchofdimes.org/materials/toward-improving-the-outcome-of-pregnancy-iii.pdf>
- NYSDH*. (2016, January). Retrieved from New York State Health Department: Focus Area 3, Reproductive, Preconception, and Interconception Health: [https://www.health.ny.gov/prevention/prevention\\_agenda/2013-2017/plan/wic/focus\\_area\\_3.htm#g6.2](https://www.health.ny.gov/prevention/prevention_agenda/2013-2017/plan/wic/focus_area_3.htm#g6.2)
- O'Donnell, M. (2009). Definition of health promotion 2.0: embracing passion, enhancing motivation, recognizing dynamic balance, and creating opportunities. *Am J Health Promotion*.
- Oringanje, C. (2016). Intervention for preventing unintended pregnancy among adolescents. *Cochrane Database of Systematic Reviews*(2).
- Osterman, M. e. (2014). *Trends in Low Risk Cesarean Delivery in the United States, 1990-2013*. Hyattsville: CDC.
- PRAMS. (2011). *CDC*. Retrieved October 18, 2016, from Reproductive Health: Tobacco Use and Pregnancy: <http://www.cdc.gov/reproductivehealth/maternalinfanthealth/tobaccousepregnancy/>
- PRAMS. (2012-2013). Office of Family Health Services. Division of Population Health Data.
- Preventing birth defects: community wide campaigns to promote the use of folic acid supplements*. (2015, December 16). Retrieved September 27, 2016, from Guide to Community Preventive Services: <http://www.thecommunityguide.org/birthdefects/community.html>
- Prevention, U. C. (2004). Spina Bifida and Anencephaly Before and After Folic Acid Mandate- United States 1995-1996 and 1999-2000. *Morbidity and Mortality Weekly Review*, 53(17), 362-365.
- Sudden Unexpected Infant Death and Sudden Infant Death Syndrome*. (2016, February 8). Retrieved September 27, 2016, from U.S. Centers for Disease Control and Prevention: <http://www.cdc.gov/sids/data.htm>
- Virginia Home Visiting Consortium*. (2016). Retrieved from About the Home Visiting Consortium: <http://homevisitingva.com/about.php>
- WHO*. (2016). Retrieved September 27, 2016, from Nutrition:Exclusive Breastfeeding: [http://www.who.int/nutrition/topics/exclusive\\_breastfeeding/en/](http://www.who.int/nutrition/topics/exclusive_breastfeeding/en/)

## Appendix 1

### Thriving Infant Strategic Plan Workgroup Member Organizations

Virginia Hospital and Healthcare Association

Virginia Department of Medical Assistance Services

Sentara Norfolk General Hospital

Rappahannock-Rapidan Health District

Office of Governor Terry McAuliffe

March of Dimes, Virginia State Chapter

Virginia Community Healthcare Association

Virginia Chapter, American College of Obstetrics and Gynecology

Anthem

Virginia Business Coalition on Health

Virginia Council of Churches

Virginia Department of Social Services

CHIP of Virginia

Bragg Hill Family Life Center

Amerigroup

Virginia Department of Behavioral and Developmental Health Services

Virginia Commonwealth University

University of Virginia Children's Hospital

Virginia Commonwealth University

Virginia Department of Health



## Appendix 2

Improving Pregnancy Outcomes: Recommendations for State Agencies and Partners from the American Maternal and Child Health Bureau and the Commonwealth Fund, (American Maternal and Child Health Bureau, 2012), (Commonwealth Fund, 2012)

4. Implement Health Promotion Efforts
  - Increase preconception health education to adolescents and young adults in school-based clinics and university programs
  - Increase access to drug and alcohol treatment programs for pregnant women
  - Create population-based obesity prevention and “healthy weight” programs with messages about healthy weight gain and loss during pregnancy
  
5. Ensure quality of health care for all women and infants
  - Utilize the Joint Commission endorsements to collect and share key perinatal data at state, regional and hospital levels. Measures may include early elective deliveries, NICU admissions and neonatal outcomes, rates of exclusive breastfeeding, and neonatal bloodstream infections
  - Expand efforts to ensure consistency and accuracy of birth certificate data by providing training on recording and entering birth certificate data
  - Enhance the capacity of the Fetal and Infant Mortality Review process to ensure all maternal, pregnancy-related and infant deaths are reviewed, and recommendations for system improvements are shared in a timely manner
  - Create systems for hospitals to use the postpartum discharge process as an opportunity to ensure women are provided with contraception as indicated and are connected with family planning services to promote appropriate interpregnancy intervals
  - Expand resources to provide lactation support for all mothers, including information about the benefits of breastfeeding, lactation consultation and breastfeeding support groups
  
6. Improve maternal risk screening for all women of reproductive age
  - Expand the number of providers who emphasize preconception care, conduct medical and psychosocial risk assessment at the initial prenatal visit and throughout pregnancy
  - Increase the capacity of clinical providers to use motivational interviewing with their patients to reduce alcohol and other substance use during pregnancy
  - Provide awareness and training in evidence-based models of tobacco cessation to obstetric and neonatal providers and other public health and social service providers who see pregnant and postpartum women
  - Expand screening for intimate partner violence in clinical and social service settings
  - Screen all pregnant and postpartum women for depression as part of prenatal and postpartum care
  
7. Enhance service integration for women and infants

- Enhance the network of family planning clinics to increase clinical operations by implementing electronic health records and providing or linking women to comprehensive preventive health care for women
  - Use managed care approaches to encourage delivery of prevention services through well-woman, postpartum, and other visits, including screenings, tobacco cessation services, and integration with behavioral health care, oral health care and community supports
  - Provide multi-faceted care coordination that includes health and parenting education
  - Expand comprehensive home visiting programs services to increase capacity to reach all high-risk families in Virginia
  - Integrate home visiting with clinical care and other programs and supports
8. Improve access to health care for women before, during and after pregnancy
- Engage with health insurance exchange boards to provide guidance in the development and strengthening of outreach and enrollment processes to ensure that the unique needs of maternal and child health populations are considered in the development of eligibility and enrollment processes
  - Assess the availability of family planning and prenatal care needs and service sites to ensure statewide access especially in high-risk areas
  - Promote social media efforts that help inform women, children and families about enrollment in FAMIS and the health insurance exchanges
9. Develop data systems to understand and inform efforts
- Create formal documents between state agencies to facilitate timely and ongoing data sharing
  - Enhance the capacity of state agencies to utilize mapping tools and techniques to conduct an in-depth assessment of geographic areas with high infant mortality; use data to identify communities and neighborhoods at highest risk of poor outcomes; and create maps that help stakeholders visualize poor birth outcomes and make data publicly available through an online-user-friendly web page.
  - Enhance the capacity of VDH and DMAS to use Medicaid data linked with vital records and public health survey data to identify gaps in services, monitor outcomes, and drive decision-making
10. Promote social equity
- Enhance state agency use and promotion of the Health Opportunity Index to inform communities in better understanding areas of need and planning interventions
  - Enhance state agency capacity to provide technical assistance and training to providers to improve the level of cultural competence in health care delivery
  - Enhance Virginia's capacity to provide incentives to attract providers of all backgrounds in areas of need
11. Family Planning

- Increase preconception health education to adolescents and young adults in school-based clinics, and through university programs
- Create systems for hospitals to use the postpartum discharge process as an opportunity to ensure women are provided with contraception as indicated and are connected with family planning services to promote appropriate interpregnancy intervals
- Enhance Virginia's network of family planning clinics to increase clinical operations by implementing electronic health records and increasing promotion of contraceptive use through education and access to contraceptive services, including LARCs, particularly for women living in rural or other underserved areas