LOOKING BACK MOVING FORWARD

North Carolina's Path to Healthier Women and Babies

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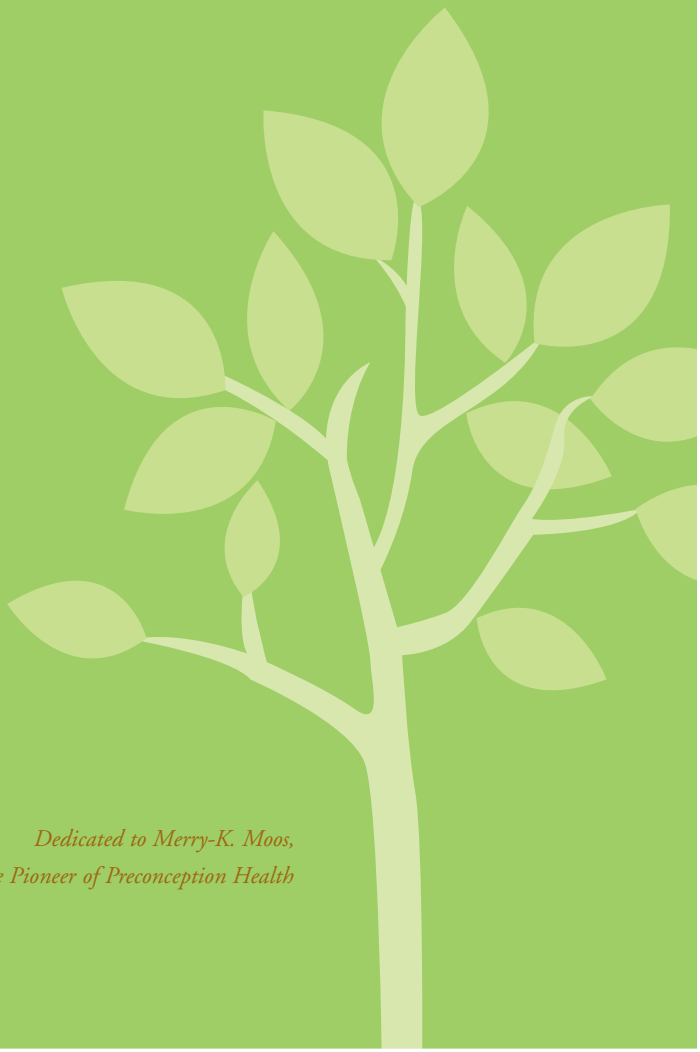

Dedicated to Merry-K. Moos,
The Pioneer of Preconception Health

THANK YOU

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INTRODUCTION

by Merry-K. Moos

"Much of the literature about prevention of low birthweight focuses on the period of pregnancy... Only casual attention has been given to the proposition that one of the best protections available against low birthweight and other poor pregnancy outcomes is to have a woman actively plan for pregnancy, enter pregnancy in good health with as few risk factors as possible, and be fully informed about her reproductive and general health."

– Moos M-K. "Preconceptional Health Promotion: A Health Education Opportunity for All Women." *Women and Health* 1989; 15(3): 55-68.

More than 20 years ago, the Women's Health Branch of the North Carolina Department of Health and Human Services pioneered a new component to family planning services. In 1984, Marge Rose and Mike Newton said "yes" to the chance to introduce preconception health into family planning clinics. Nowhere in the United States was preconception health being provided as a routine component of care until these visionaries realized the potential prevention opportunities of reframing the scope of the routine family planning visit. The model was later replicated in states across the nation, resulting in the public health care sector having a far more organized and integrated approach to preconception health than its private sector counterpart. Similarly, 18 years ago, Bob Frye and other leaders in the North Carolina Department of Public Instruction, in partnership with individual teachers from the mountains to the coast, actively engaged in the development, testing, and dissemination of a school health curriculum designed to change the way the public considers the prevention of poor pregnancy outcomes. This program has also been disseminated to other states and continues to be viewed as a model approach to engaging teachers in the education of difficult health concepts. In 1994, three forward-thinking manufacturing companies in North Carolina agreed to test a worksite reproductive health promotion program called "New Beginnings." This innovative program expanded worksite health programming to address a continuum of reproductive wellness issues before, during, and after pregnancy.

Recently, the nation has moved toward actualizing the preconception health energy that was created, in large part, by the vision of North Carolina leaders in state government and the private sector. This booklet shares these new directions and offers suggestions for more action in our state. North Carolina's leaders in health, education, public policy, and business have created a legacy of innovation in North Carolina, positioning us to achieve new and more far-reaching accomplishments in preconception health promotion. As in the past, the efforts of many will create a brighter future for the women of today and the unborn children of tomorrow. Let the work begin!

OVERVIEW

Preconception health offers a new perspective on an old problem. Instead of focusing on women only when they are pregnant, this vision presents healthy women as a desirable end in itself, as well as an important way to improve the health of their children. The goals of this booklet are to detail this exciting new vision, describe the foundational programs undertaken to make this vision a reality, and challenge ourselves to move to the next level of engagement and creativity. It is hoped that each reader will accept the invitation to engage in collaborative work around preconception health. The focus is on all women of reproductive age in our state: our daughters, mothers, sisters, friends and neighbors. Please join us in this important dialogue.

"As attractive and relatively inexpensive as prenatal care is, a medical model directed at a 6-8 month interval in a woman's life cannot erase the influence of years of social, economic, and emotional distress and hardship."

– Dillard RG. "Improving Prepregancy Health Is Key to Reducing Infant Mortality." *NC Med Journal* 2004; 65(3): 147-148.

Vision

The Centers for Disease Control and Prevention (CDC), along with 35 national partner organizations and over 100 experts from around the country, recently set forth a vision for improving preconception health and health care in the United States. This vision puts forward the following ideas: a) all women and men of childbearing age will have high reproductive awareness (i.e., understand risk and protective factors related to childbearing); b) all women will have a reproductive life plan (i.e., if or when they wish to have children and how they will maintain their reproductive health); c) all pregnancies will be intended and planned; d) all women and men of childbearing age will have health coverage; e) all women of childbearing age will be screened before pregnancy for risks related to the outcome of pregnancy; and f) women with a previous adverse pregnancy outcome will have access to interconception care aimed at reducing their risks.[1] A comprehensive path for achieving this vision was offered through four goals, 10 recommendations, and over 40 action steps (reprinted in the back of this booklet).

Is That Vision Achievable?

The CDC's vision is ambitious, perhaps even overwhelming. But visions are meant to hold forth ideals and challenge our sense of the achievable. Opportunities abound for many different organizations, health care providers, and community advocates to help move North Carolina closer to this vision. In some cases it may be the addition of an evidence-based, low cost service or a modification in the way that a health message is presented. In others, it may be groups of people coming together to advocate for substantive change. North Carolina has historically been an innovator and already has played an important part in the national movement for preconception health. This booklet challenges us to consider ways to draw on that history as we move forward to the future.

BACKGROUND

What is Preconception Care?

The CDC defines preconception care as interventions that aim to identify and modify biomedical, behavioral, and social risks to a woman's health or pregnancy outcome through prevention and management, emphasizing those factors which must be acted on before conception or early in pregnancy to have maximal impact. Preconception care is more than a single visit to a health care provider and less than all well-woman care. It includes the full scope of preventive and primary care services for women before a first pregnancy or between pregnancies (interconception care). While this definition specifically addresses women's health, it also includes interventions directed at males, couples, families, and society at large.[1]

Improving preconception health and pregnancy outcomes will require more than effective clinical care for women. Changes in the knowledge, attitudes, and behaviors related to reproductive health among both men and women are paramount. Emphasis should be placed on the systems and policies that facilitate improved access to services and support as well as on individuals. Health care providers and communities will need to support women and families in making healthy lifestyles and behaviors a habit.

The fundamental elements of preconception care include screening for medical and social risk factors, providing health education, and delivering effective interventions. Components include assessment of both medical and social risk factors (e.g., family history, current medications, substance use, domestic violence, and obstetric and gynecologic history); vaccinations (e.g., rubella, varicella, and Hepatitis B); screening (e.g., HIV, sexually transmitted infections, and genetics); and counseling (e.g., folic acid consumption, weight management, abstaining from tobacco use, and spacing of pregnancies). The CDC's Select Panel on Preconception Care identified conditions for which clinical practice guidelines exist and for which there is scientific evidence demonstrating effectiveness in improving pregnancy outcomes as well as women's health.[2]

Preconception Risks[1]

Alcohol misuse

Poorly controlled diabetes

Folic acid deficiency

Use of teraterogenic prescription drugs for chronic conditions, including:
Isotretinoins (e.g., Accutane for acne), anti-epileptic drugs (e.g., valproic acid), Levothyroxine (for hypothyroidism), and oral anticoagulants (e.g., Warfarin)

Lack of immunizations, particularly for Hepatitis B and rubella seronegativity

HIV/AIDS

Poorly controlled maternal PKU

Obesity

Exposure to sexually transmitted infections (STIs)

Tobacco use

Other Factors Also Known to Increase Risks[3]

Short intervals between pregnancies

Starting a family before the age of 18 or after the age of 35

Previous poor birth outcome *(prematurity, stillbirth, fetal death, or infant with birth defects)*

Poor oral hygiene

High levels of stress *(e.g., poverty, homelessness, domestic violence, and racism)*

Substance abuse

Poor mental health

Not a New Idea

While preconception health may be gaining major attention nationwide, the importance of good health prior to pregnancy is not a new concept. The first federal position paper on the topic was released in 1979. Several years later, in 1985, a report from the Institute of Medicine on the prevention of low birthweight highlighted the importance of a woman's health prior to conception. In 1983, the American Academy of Pediatrics, American College of Obstetricians and Gynecologists, and the March of Dimes Foundation published the first *Guidelines for Perinatal Care.* This emphasized that preparation for parenthood should begin before conception. In 1989, the Expert Panel on the Content of Prenatal Care suggested that preconception care would be most effective in the context of general preventive care and primary care visits, thus illustrating the idea of "opportunistic care."[4] When the *Healthy People 2000* objectives were published in 1990, preconception care was highlighted and considered a "standard expectation within the health care system." In 1993, the March of Dimes published *Toward Improving the Outcome of Pregnancy: The 90s and Beyond.* In this report, the term "reproductive awareness" was introduced. It emphasized that awareness of reproductive risks, healthy behaviors, and family planning options is essential to improving the outcome of pregnancy. The March of Dimes declared that a society-wide change in reproductive awareness was needed in the United States, calling for a new strategy to reach each woman of childbearing age with reproductive awareness messages at every health encounter. A few years later, in 1995, the American College of Obstetricians and Gynecologists published its first technical bulletin on preconception care. This stressed the importance of comprehensive risk identification, education tailored to the patient's needs, and appropriate interventions. They recommended that routine visits by all women are important opportunities to educate about preconception health and planning for a pregnancy.[4]

"Women who are healthy are a vital component of North Carolina's future, whether they are pregnant or not. It's time to make the investment, to assure the health of women, and to have a long-term, positive impact on the health of newborns."

– DeClerque JL, Freedman JA, Verbiest S, Bondurant S. "North Carolina's Infant Mortality Problems Persist: Time for a Paradigm Shift." *NC Med J* 2004; 65(3): 138-142.

THE CASE FOR PRECONCEPTION HEALTH

For Healthy Babies

A woman's health before she becomes pregnant can help reduce the risk of having a baby born too soon or with preventable birth defects. Preterm birth is the leading cause of child fatality in North Carolina, with 13.5% of all babies being born too soon. This means that more than 16,171 babies are born too early in North Carolina annually, and the number is increasing each year. Infant mortality numbers have remained the same for several years, ranking North Carolina one of the states in the nation with the highest rates of infant death. Racial disparities in infant mortality and premature birth continue to persist, with a 2.5 fold greater risk of death for African-American infants than Caucasians.[5] Preterm birth can have a lifelong impact on a child's health. Barker's work around the concept of fetal disease and wellness suggests that premature birth puts the fetus at greater risk for insulin resistance syndrome, coronary heart disease, and certain cancers as he/she ages.[6] There are many other short- and long-term impacts of premature birth, including vision problems, cerebral palsy, and asthma. As many as half of all pediatric neurodevelopmental problems can be attributed to preterm birth.[7]

In addition to preterm births, each year in North Carolina over 3,000 babies are born with serious birth defects, another major cause of infant death and sickness. Babies born with birth defects almost always require special care and services. Some problems, such as certain heart defects, may be surgically repaired, while other conditions may not be compatible with life. Problems that affect a baby's kidneys, heart, lungs, nervous system, or chromosomes are particularly dangerous. Many birth defects occur early in the baby's development–as early as the first week of gestation–often before a mother even knows she is pregnant. For example, neural tube defects occur in the first few weeks of pregnancy. Mothers with adequate supplies of folic acid in their body before pregnancy are less likely to have a baby with these defects. A woman who is healthy before she becomes pregnant improves her chances of having a positive birth outcome.



For Healthy Women

The health status of American women suggests that they would benefit from programs and community support to help them modify some behaviors and learn to navigate other situations that put them at risk. The U.S. Department of Health and Human Services reports that 6.1% of women of reproductive age have asthma, 3.4% have cardiac disease, 3% are hypertensive, 9.3% are diabetic, and 1.4% have a thyroid disorder.[2] In North Carolina, over 52% of adults are overweight or obese.[9] The *North Carolina Women's Health Report Card* revealed that in 2003, 24.4% of women of childbearing age (18-44 years) reported smoking. A grade of "F" was assigned for the high number of chlamydia cases (617.9 per 100,000).[10] Within the last two years, nearly 28% of all women in North Carolina have not engaged in physical activity, and 13% of women did not have a pap smear. Additionally, in 2003, there were 4,330 hospitalizations per 100,000 women for substance abuse or mental health diagnoses, with 6.8% of women of childbearing age reporting binge drinking in the past month. During 2001-2003, about one in five women of childbearing age (21.8%) was uninsured in North Carolina. In North Carolina, it is estimated that 45% of the births each year are unplanned. Women with unplanned pregnancies are less likely to seek early prenatal care, more likely to smoke during pregnancy, and more likely to experience a poor birth outcome, such as low birthweight.[11]

Women who experience one poor birth outcome (fetal death, stillbirth, birth defects, premature infant) have a significant risk for having another adverse outcome if they become pregnant again. These women have a heightened need for attention to health conditions, exposures, lifestyle behaviors, and emotional well-being.[12-15] Continuing to improve women's health in North Carolina is good for women as well as for babies.

To Reduce Health Disparities

The *Women's Health Report Card* clearly shows that African-American women are disproportionately affected by poor health, experiencing higher rates of almost all conditions tracked by the report card, including diabetes, obesity, heart disease, stroke, and breast cancer. They also are at greater risk of infant mortality, inadequate prenatal care, and sexually transmitted infections, including HIV/AIDS. More African-American women lack health insurance, are unemployed, and live below the poverty level than white women.[10] The weathering hypothesis suggests that the health of African-American women is affected by cumulative socioeconomic disadvantage. The generational impact of poor birth outcomes and women's health on African-Americans is severe and evident in North Carolina.[16] Attention to the various components of preconception health with a special focus on African-American women holds particular promise for addressing the health disparities experienced by these women and their families. It may also help protect other women at growing risk for poor birth outcomes, such as Hispanic women.

To Improve the Health Care System

Integrated health care is a key component of preconception wellness. Women should not only receive preconception messages when they signal a readiness for pregnancy, they should receive these important health messages during all their encounters with the medical community. Unfortunately, the way women's health care is structured results in many missed opportunities for prevention messages. Women's reproductive health care is fragmented in our current system. It often begins in pregnancy, increasing in intensity as labor and delivery approach, with the birth of the infant at the pinnacle of service and attention. After delivery, care intensity declines rapidly until hospital discharge, then falls off significantly for women's wellness and family planning services. This generates a tremendous gap in care for women, resulting in poor continuity of health care for a woman throughout her reproductive life cycle.[17] National data suggest that 20% of women with private health insurance and half of women with Medicaid miss their postpartum visit, representing one clear example of a lost opportunity for preventive care.[18] Without continuity of care, the provider or providers who care for women may not have information about prior health behaviors, pregnancy risk, or outcomes, and are less likely to address all of a woman's health needs. Serious questions about the ability of the current model to further reduce infant death and maternal morbidity/mortality have been raised by a number of leaders in maternal and child health.[17,19]

Part of the problem can be attributed to the providers' need for additional education about preconception health as well as the absence of reimbursement for this service. Current practice is also affected by a poor appreciation of the high incidence of unintended pregnancy, the lack of confidence that preconception health counseling makes a difference, and a belief that women function as informed consumers and seek the care they need.[20] Greater attention to preconception care holds tremendous potential to lead to a system that provides better health care.




The Financial Case for Preconception

Not only are prematurity and birth defects the leading causes of child fatality in North Carolina, they are also financially costly to families and the state. Nationally, in 2004, over $18 billion was spent on providing neonatal intensive care services to infants born prematurely. Direct employer health care costs for a preterm birth are estimated at $41,610 in comparison to $2,830 for a healthy birth. Hospitalizations for pregnancy complications nationally cost over $1 billion annually and account for more than two million hospital days of care.[21] In North Carolina, Medicaid data indicate that sick newborns made up only one-third of the babies born in hospitals but account for 85% of the health care dollars spent on babies. Estimated Medicaid costs for preterm babies for one year total over $240 million in North Carolina. The NC Healthy Start Foundation calculated the average expenses post-discharge for babies born preterm for the first year. It costs about $63,000 per baby to care for a premature infant in North Carolina during the first year of life. Costs include items such as pulse oximeters, oxygen, apnea monitors, and RSV immunizations.[22]

LEADING THE WAY

North Carolina has a rich history in blazing the trail for preconception health. The inventory section of this booklet in Appendix A highlights some of the groundbreaking work that has and continues to take place in our state. We hope you will take the time to review this work and consider these efforts as you think about preconception health activities. Step by step, we continue to change the way we view the health of women and infants, sharpen our ability to reach out to women and communities, and expand the way we work together.

Our state's commitment to preconception health is evident. Only 23 states nationally have identified a preconception health need as part of their Title V 2005-2010 Needs Assessment Cycle. Of these states, North Carolina had the highest number of performance measures for preconception, with a focus on neural tube defects/folic acid, unintended pregnancy, and healthy weight/obesity.[23] This readiness to champion positive change is clear in our historical commitment to preconception health and reaffirmed in the May/June 2004 issue of the *North Carolina Medical Journal* published by the North Carolina Institute of Medicine. The issue included a historical sketch of perinatal care in North Carolina beginning in 1972, as well as articles by experts in North Carolina relating to infant mortality. In chronicling where we have been, this issue of the journal explicitly gave the clarion call to shift our infant mortality prevention paradigm from prenatal health to that of the health of the mother prior to pregnancy.

North Carolina has benefited greatly from being the home of national experts in preconception health. A number of North Carolinians served on the CDC Select Panel on Preconception Health, as part of national preconception health workgroups, and/or as authors of the September 2006 special issue of the *Maternal and Child Health Journal* on preconception health. North Carolina has leaders in smoking cessation, diabetes, nutrition, oral health, the content of postpartum/interconception care, health disparities, prematurity, and social marketing. The CDC has selected Merry-K. Moos to create the national preconception curriculum for practitioners and to be the co-creator of the national guidelines for the content of preconception care. While the amount of work to be done to realize a new vision for preconception health may seem daunting, in truth North Carolina is ahead of the game and already providing national leadership. North Carolina, with its long history of demonstrated commitment, capacity, and resourcefulness, is a great place to seed a new national preconception care initiative.

IDEAS FOR ACTION

Preconception health is a national priority that can improve infant health and change women's lives. North Carolina is a leader in preconception health and continues to drive innovation nationwide. It is time for us to look forward and think about how our energy and resources should best be invested to improve the health of North Carolina's women and children.

Preconception health messages and health care strategies must be structured to reach a diverse audience of women at multiple points in time through many avenues. Achieving the national vision will require efforts that span professions, geography, spheres of influence, policies, and individuals. In planning, there is the risk of becoming overwhelmed quickly. There is also the risk of thinking too narrowly and missing the opportunity for instituting significant change. Striking a balance between actions that can be accomplished today and the steps required to lay the foundation for institutional change will likely be the hallmark of a successful state effort.

The ideas suggested in this booklet come from a variety of sources, including: CDC Recommendations, the State Infant Mortality Collaborative, the 1998 Women's Health Summit, the work of the Institute of Medicine Task Force in the late 1980s, input from experts, and a review of North Carolina's current programs. Ideas with the potential to have an impact on women's health were included as well as ideas considered feasible, fundable, and likely to be acceptable. The ideas are meant to be conversation starters. Like them? Hate one? Have more to add? Please join the discussion!

"The nation's approach to women's health care may well be at the tipping point of redefining the perinatal period to include women's wellness across the reproductive life span as an appropriate and favored approach to impacting reducing poor pregnancy outcomes."

– Freda MC, Moos M-K, Curtis M. "The History of Preconception Care: Evolving Guidelines and Standards." *Maternal Child Health J* 2006; 10(S): S43-52.

1. Increase health coverage among high-risk women of childbearing age who are uninsured or under-insured.

Women at risk for poor birth outcomes need to have access to appropriate medical services to help reduce their risk. Health care payers and providers, along with public health professionals, should convene to review existing benefits, services, needs, and gaps in care for these women. Service expansions, such as an extension of Medicaid coverage through the first year postpartum for mothers with poor birth outcomes, pregnancy losses, and/or chronic conditions, should be considered. North Carolina has a strong initiative that focuses on medical homes for children. Thought should be given to expanding this initiative or one like it to high-risk women.

2. Extend interconception care to the mothers of babies born prematurely.

Communication among health care providers, public health agencies, and community resources should be improved to increase the likelihood that mothers of preterm babies have access to the psychosocial and medical services they need after having a preterm infant. Mothers of premature babies should receive special services, including health appraisals, education, medical care, and resources for caring for themselves. Research of diverse populations of mothers with premature infants should be conducted to increase our understanding of their needs.

3. Use existing public health programs to promote preconception health.

With planning and coordination, women could receive consistent support across systems for achieving their health and reproductive life goals. Programs such as *Healthy Weight, Healthy Women,* the Family Planning Waiver, smoking cessation, WIC, immunizations, the folic acid campaign, and care coordination already play an important role. The public health system has a tremendous impact on women's health in North Carolina. Not only are professionals deployed across the state to help men, women, and new families, their target population has some of the greatest need. Coordinating across disciplines and systems, public health programs can help identify system barriers for women and families in achieving their reproductive life goals and explore innovative ways to address them.

4. Increase consumer awareness about the new Family Planning Waiver program.

More could be done statewide to promote and support the increased coverage now available to families through the Medicaid Family Planning Waiver. Pilot projects to expand the health services offered through this program should be funded. Women's wellness education, including smoking cessation and multivitamins, should be included in routine screening opportunities and during teachable moments, such as negative pregnancy tests. The Family Planning Waiver provides an opportunity to reach out to women (and men) when they are not pregnant to discuss their health status, address health care needs, and to plan their reproductive paths.

5. Promote preconception health and health care at the community level via local task forces, coalitions, and committees.

North Carolina has many strong community-based infant mortality prevention coalitions, task forces, and programs. These groups could come together to share their collective knowledge and ideas about reaching women with expanded health messages and services. These groups can raise awareness about the importance of preconception health and health care, integrate new messages into their current efforts, foster collaboration including public private partnerships, and provide leadership to initiatives for sweeping change.

Blue Ridge Paper Products, Inc. Steps into Action

*Preconception health promotion and wellness are highly valued at **Blue Ridge Paper Products** in Canton, North Carolina. Their innovative **Be Well Prepregnancy Program** provides education and support to employees and their partners who are considering pregnancy. Participants in this program are eligible for several preventive services, including a periodontal scaling and gum disease treatment prior to conception, free prenatal vitamins and folic acid supplements, and 100% reimbursement for immunizations. An integral piece of this program is the nurse coach, who conducts a pre-pregnancy assessment and works with participants to help identify and reduce health risks. At a positive pregnancy test, participants are seamlessly transitioned into the Healthy Babies Program. These programs are part of a larger wellness initiative that also focuses on chronic disease management, nutrition, and exercise.*

6. Create nontraditional partnerships to begin to integrate reproductive health messages into existing health services and health promotion campaigns.

Building partnerships across silos will expand North Carolina's ability to improve preconception health and birth outcomes. Pharmacists, diabetes educators, pediatricians, and fitness experts are examples of some of the many professionals who could be engaged in this effort. STI/HIV/AIDS programs, youth obesity prevention projects, and chronic disease management services can also play a key role in preconception health by introducing reproductive life planning messages and raising awareness about the impact of these conditions on future birth outcomes as well as on current health. Businesses and industry have an investment in the health of their employees and their children. As in past infant mortality prevention efforts, these stakeholders must be at the table to ensure success.

7. Promote the North Carolina School Healthful Living Standard Curriculum and increase outreach efforts to adolescents.

North Carolina is fortunate to have a preconception health school curriculum in place through the Department of Public Instruction. The curriculum should continue to be reviewed, updated, and promoted to teachers, many of whom could also benefit from preconception health messages themselves. Partnerships with organizations working with adolescents could encourage the introduction of reproductive life planning concepts as well as insuring that immunizations are up to date, chronic conditions controlled or prevented, vitamins taken regularly, and tobacco cessation messages promoted.

8. Use surveillance and reporting to raise awareness about preconception health and benchmark progress.

Data can be used to identify communities of women at risk and opportunities to improve community/provider follow-up; data sources should be reviewed for indicators relevant to preconception health. New questions could be added to the Pregnancy Risk Assessment and Monitoring System and the Behavioral Risk Factor Surveillance System to better assess preconception health indicators. To galvanize support and assess progress, publicize data via the *Women's Health Report Card.* Wellness services, chronic disease among women of reproductive age, smoking, postpartum services, and other women's health indicators could be reviewed based on region, hospital, provider site, and payer group. A special issue of the *State Center for Health Statistics Brief,* as well as special reports in publications such as the *North Carolina Medical Journal,* could be written.

9. Launch studies to enhance the body of knowledge on preconception health issues.

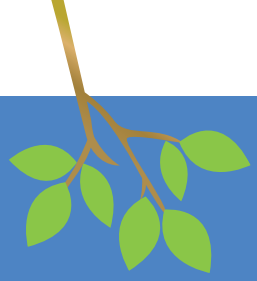
There are many unanswered questions about preconception health and health care. The CDC Recommendations list many areas where more study is needed. North Carolina is home to many outstanding research institutions that could contribute valuable information to guide not only our work but the nation's as well.

10. Turn up the volume on the discussion.

Local and regional meetings should include conversation starters and updates on preconception health. A statewide symposium sponsored by the March of Dimes will be held in 2007 to develop a formal action plan. Information about best practices, local events, and questions should be shared either directly through **www.mombaby.org** or through representatives on state committees, such as the Perinatal Health Committee of the Child Fatality Task Force, the March of Dimes, or the NC Perinatal Association. Conversations should be started with policy makers, funders, and the media to begin to raise interest in this topic and encourage engagement on the issue. Frank discussion of the challenges and barriers to the national vision should be held so that problem solving from a wide range of stakeholders can be sought.

11. Add your idea.

12. Add an idea suggested by the women and men you serve or interact with daily.



We hope this document has offered some food for thought. Infant mortality continues to be a major issue for North Carolina; numbers are stagnant and infant morbidity is on the rise. A fresh look at this problem from the perspective of women's health is an important step in ongoing efforts to improve outcomes as well as to improve the well-being of our sisters, daughters, mothers, and friends. Please join in the effort.

To Do List

- ❑ Read the CDC Recommendations at the end of the booklet.
- ❑ Share the booklet with a friend or colleague.
- ❑ **Send us your ideas, thoughts, and suggestions at www.mombaby.org.**
- ❑ Share local successes and challenges.
- ❑ Take a multivitamin!
- ❑ Ask questions.
- ❑ Watch for invitations to meetings and conferences.
- ❑ Think about one easy thing you can do today to contribute to this effort. Take action!

The Center for Maternal and Infant Health is offering its website as a clearinghouse for information on pre-conception health. Online resources, phone numbers, a copy of this booklet, links to articles, and information about the activities and partners mentioned in this report have been posted. Check it out and then follow up with one of the many North Carolinians working on this issue. Let us know what you think!

"The real voyage of discovery exists not in seeking new landscapes but in having new eyes." Marcel Proust

APPENDIX A
An Inventory of North Carolina's Work

"Because preconception interventions can take place at any time during a woman's reproductive life and across a variety of dimensions, countless opportunities exist for positively influencing the health of women, children, and families."
– Boulet SL, Johnson K, Parker C, Posner SF, Atrash HK. "A Perspective of Preconception Health Activities in the United States." *Maternal Child Health J* 2006; 10(S): S13-20.

EARLY ACHIEVEMENTS

THE BOOK

Published in 1988, *Preconceptional Health Care: A Practical Guide* by Dr. Robert Cefalo and Merry-K. Moos from the University of North Carolina at Chapel Hill's Department of Obstetrics/Gynecology was the first textbook to detail the need for and components of preconception health. This book continues to be a key source of information for clinicians and public health advocates.

PRECONCEPTION HEALTH RISK APPRAISAL

In 1984, Merry-K. Moos and Dr. Robert Cefalo received a grant from the American College of Obstetricians and Gynecologists to develop and test a preconception health risk appraisal. A two-page form with 53 questions was created and pilot tested through public health departments and community-based practices in North Carolina. The form was self-administered and identified potential risk factors in the areas of social, family, medical, reproductive, and drug history as well as nutrition. The form included a section, which the health care provider completed, regarding immunization status and patient height and weight. The first of its kind, this appraisal form had a unique feature that allowed women to tear off a back sheet and have information directly related to items they may have checked. Individual counseling by a health care provider, along with the self-appraisal, was the best practice use of this form. Updated versions of this appraisal continue to be used in North Carolina, in practices across the country, and even internationally.

PRECONCEPTION HEALTH IN FAMILY PLANNING CLINICS

In 1985, the North Carolina Family Planning Branch, in partnership with the University of North Carolina at Chapel Hill's Division of Maternal Fetal Medicine, received funding from a Title X Special Initiative grant to implement preconception health promotion activities in health department-based family planning clinics. The project used the preconception health appraisal with patient education materials. *Looking Ahead* pamphlets were designed to provide more extensive information about selected reproductive risks. Each family planning site was to review the woman's appraisal results with her and refer her to additional community and specialized services as needed.

Seventeen health departments were selected to participate in the initial project. Their training included a comprehensive overview of issues in preconception health, guidelines for counseling patients with identified risks, and procedures for implementation of preconception health services. Each clinic designed a system for referral and follow-up, including the availability of a genetic consultation for patients who wished to have one. Between 1985 and 1993, 58 counties received training about preconception health. This represented an expanded effort on the part of the state to move the preconception program beyond the original 17 counties. In 1993, a committee on service integration was formed to consider factors that impact clinic efficiency and promote more effective integration of the preconception message. Over this eight-year period, a series of program evaluations were conducted. Lessons learned from this effort continue to inform current dialogue regarding audience segmentation, social marketing, and provider engagement.[24, 25]

TASK FORCE FOR REDUCING INFANT MORTALITY AND MORBIDITY

In the late 1980s, the North Carolina Institute of Medicine convened a task force to examine issues around infant sickness and death, and offer recommendations for improvements. The report, titled *Improving the Odds: Healthy Mothers and Babies For North Carolina,* was submitted to the Kate B. Reynolds Charitable Trust as a blueprint for the state. The report highlighted the importance of preconception health, stressing that women's health prior to pregnancy and during the first weeks of gestation has a critical impact on birth outcome. Some of the recommendations, such as school-based education, were successfully acted upon. Others remain undone but highly relevant today.

WORKSITE HEALTH PROMOTION

The Babies and You program was developed in 1982 by the March of Dimes as a national effort to reach out to women who work outside the home. While largely focused on prenatal care, the program added a topic focused on preconception health in 1989. Today, the March of Dimes has refashioned this program into a web-based program called Healthy Babies, Healthy Business.

A different program focusing on manufacturing companies was started in 1988 in North Carolina through funding from the CDC. The grant supported the work of Merry-K. Moos and colleagues to develop a worksite Reproductive Health Promotion Project. The New Beginnings program was designed to educate women in the manufacturing setting about preconception health, prevention of sexually transmitted infections (STIs), family planning, prenatal education, and returning to work following the birth of a baby. Implemented by an occupational health nurse, the program included a strong focus on preconception care. Classes promoting general adult health were available and covered weight management, fitness, contraception, and STIs. One example of a company who adopted elements of these programs is Sara Lee. This company, based in Winston-Salem, created a *Healthy Workplace, Healthy Babies,* and *Healthy Families* series of programs using modules for stress management, general health issues, and women's wellness.[26]

In 1991, the Governor's Commission on the Reduction of Infant Mortality formed a Business and Industry Task Force to provide information and encouragement to businesses with the goal of increasing their involvement in the fight against infant mortality. Their effort included *Babies and Business: A Partnership for the Future*, a customized book for each county with information on problems, costs, and local resources relating to infant mortality. *A Guidebook for Business and Industry* was created as a "how to" guide for local business leaders on infant mortality prevention. By the end of 1992, this effort had reached more than half of the state's top employers.

The North Carolina Folic Acid Campaign has had success reaching young women across the state through direct outreach at employer health fairs and wellness programs. This slightly modified worksite wellness approach should be further considered as part of preconception outreach efforts, especially given early receptiveness by the business community as well as the large number of women of reproductive age who work in North Carolina.

SCHOOL CURRICULUM

The importance of educating middle and high school students about preconception messages was understood in North Carolina over a decade ago. A comprehensive curriculum, *Smart Planning…Healthier Babies,* developed by Merry-K. Moos and colleagues, was introduced in the early 1990s. The Department of Public Instruction expressed interest in the curriculum, and in the 1994-1995 school year, the unit became a standard component of the state's home economics courses. The goal was to teach the link between the health and habits of males and females and the health of their future children. This was done through interactive exercises that taught students about the major causes of infant death and disability as well as opportunities for prevention. The School Health Training Center at Appalachian State University has continued to provide training and support to educators who implement this program in the public schools. The curriculum continues to receive national and international attention. The *Healthful Living* curriculum portion of the NC Standard Course of Study has objectives for abstinence until marriage education beginning in the seventh grade. Many additional topics, such as folic acid, prevention of sexually transmitted infections, alcohol and drug use, exercise, and nutrition, are covered. In 2002, the Bowles Center for Alcohol Studies at UNC-CH, with the support of a grant from the National Institute of Alcohol Abuse and Alcoholism, developed a science curriculum called *Better Safe Than Sorry: Preventing a Tragedy.* The curriculum was designed for science and health teachers to use hands-on experiments to teach about alcohol and its effects on a developing fetus.

WOMEN'S HEALTH CONFERENCES

In 1998, a three-day Women's Health Summit called *Vision and Strategies for a Healthier Tomorrow* was organized by the North Carolina Division of Women's and Children's Health. Over 120 participants representing diverse stakeholders in women's health attended the Summit. The goals were to create a shared future vision for women's health across the life span and to enable all stakeholders to identify common ground and commit to action. Discussions addressed a variety of issues facing women in North Carolina and resulted in lists of accomplishments, barriers overcome, disappointments, and "things that nobody is doing." Participants reviewed the research, voted on the priority issues, and determined commitments their organizations could make to take ownership for a portion of the work that needed to be done. A few of the many action areas included: greater attention to prevention and intervention around domestic violence; ensuring wider dissemination of data on women's health in a manner and format that is user-friendly; increase the number of women in the General Assembly who are supportive of the Summit objectives; have an educational system that includes information about relationships; conflict resolution; leadership; comprehensive sex education; and assuring that all women are treated with equal respect and sensitivity when they seek and receive reproductive health services.

In 2004, the March of Dimes hosted a preconception conference called *Changing the Face of Prematurity: A Woman's Health Perspective.* The statewide event continued to move discussion about women's wellness in North Carolina forward another step.

RECENT & ONGOING SUCCESSES

FAMILY PLANNING MEDICAID WAIVER

While many women become eligible for Medicaid during pregnancy, more than two-thirds lose coverage 60 days postpartum when these benefits end. In 2005, North Carolina received a Demonstration Medicaid Waiver that extends eligibility for family planning services to all women and men ages 19 to 55 with incomes at or below 185% of the federal poverty level. Key goals of the Be Smart program are to reduce unintended pregnancies and improve the well-being of children and families in North Carolina. Since more than 60% of pregnancies among low-income women are unintended, this program is essential if women are to realize their reproductive life goals and have more continuous access to services. Unintended pregnancies are associated with other risk factors, such as never taking a multivitamin, late entry into prenatal care, and smoking during pregnancy. The Family Planning Waiver covers the following services: annual family planning exams (including counseling, patient education, and treatment), most types of birth control, pregnancy testing, screening for HIV, screening and treatment for STIs, and voluntary sterilization.[27]

SUPPORT SERVICES

North Carolina has developed several programs that have addressed some of the social preconception health risks faced by low-income women. The *Baby Love* program was implemented in 1987 to finance the health care and support service needs of low-income pregnant women and their young children. In addition to prenatal care, the program provides support via a maternity care coordinator to Medicaid-eligible mothers in pregnancy, postpartum and well-baby care periods. Evaluation of the *Baby Love* program shows that women who receive the services of a maternity care coordinator are more likely to receive postpartum family planning services. This program was expanded to a number of high-risk counties through the federally funded *Baby Love Plus* programs. Services in these counties include screening and follow-up for women who have experienced a poor birth outcome for two years postpartum.

There are also public health programs designed for infants and young children. A newborn home visit is available to many babies in the first few weeks of life. Babies with special health needs are eligible for the Child Service Coordination Program, and those with developmental delays and certain neonatal conditions are served through the NC Infant Toddler Early Intervention Program. These programs all provide close interactions between families and the public health system, offering potential opportunities for outreach and education for the wellness of both the mothers and their babies.

Continuity conferences, begun two decades ago by Merry-K. Moos, convene a multidisciplinary team following an adverse birth outcome to consider contributing factors and possible health system changes to address such risks in other patients. Model care plans are used as part of the evaluation. The care plans provide information about the contributing risks for a variety of maternal and infant health conditions. All the *Baby Love Plus* counties have continuity conferences.

HEALTH CARE PROFESSIONAL EDUCATION

In 1988, Merry-K. Moos, with the UNC Division of Maternal Fetal Medicine, created an educational program for health care professionals called the *Implementation of North Carolina's Preconception Health Promotion Program.* In 2000, the Folic Acid Council created a second wave of momentum by focusing campaign efforts on outreach to health care providers. In partnership with Merry-K. Moos and Trish Payne, a revised curriculum was developed framing folic acid education from a women's health perspective. The outreach included a major CME project, peer education, the use of teleconference for training, and the development of posters and tools for providers. A pocket card about folic acid and neural tube defects produced by the March of Dimes, as well as a women's wellness prescription pad, continue to be used today. In partnership with the March of Dimes, Moos developed a Preconception Health Promotion Nursing Module. The March of Dimes has a free online preconception curriculum for health care providers as well as all presentations from the June 2005 National Preconception Summit.

THE STATE INFANT MORTALITY (SIM) COLLABORATIVE

In 2004, North Carolina and four other states committed to working with the CDC for two years to consider the national problem of stagnating and, in some cases, increasing rates of infant death. The work of the collaborative was data driven, with one product being a comprehensive toolkit to help states better study this issue. The SIM Collaborative project in North Carolina highlighted the need to consider women's health, access to quality care, and disparities as essential issues to address for any future progress in infant mortality reduction.

WOMEN'S HEALTH: ATTITUDES AND PRACTICES REPORT

In the spring of 2005, in partnership with the North Carolina SIM Collaborative and the Division of Public Health, the North Carolina Healthy Start Foundation conducted a series of 21 focus groups to learn how North Carolinian women define, understand, and practice health-promoting behaviors. The result was *Women's Health: Attitudes and Practices in North Carolina,* a report with rich insight into how women view their health, health practices, and available services. The majority of the women had a complex, well-rounded idea of health. Family support, a

stable environment, a relationship with a health care provider, empowerment, and the ability to manage stress were listed as critical to maintaining health. Conversely, financial and time constraints, poor body image, and limited access to quality medical care served as barriers to optimal well-being. The report highlighted the fact that women have many responsibilities caring for the people in their lives. This often means putting their needs last on the list of things to be done. Many women also know that they need to eat well and exercise, but finding the time and resources to do so is a challenge.[28] The results of this study echoed some of the thoughts expressed by women in the late 1980s as part of a preconception risk assessment tool survey as well as those shared by women who participated in pre-Summit focus groups.

EDUCATIONAL TOOLS

The first preconception brochures were designed in 1984 through a partnership with the North Carolina Developmental Disabilities Council and UNC. Since that time, the March of Dimes has developed a series of booklets about preconception health. Starting in the mid 1990s, the North Carolina Healthy Start Foundation has produced and distributed preconception brochures for men and women through the First Step Campaign. A magazine-style booklet for new mothers on staying healthy, *Taking Care of Me,* was funded by the NC Division of Public Health and developed by the North Carolina Healthy Start Foundation in 2005. Funding from the Kate B. Reynolds Charitable Trust has supported regional *Next Step for Mom* trainings, which build on the *Taking Care of Me* publication. These materials are available for free or at low cost, and may be ordered in English or Spanish at varying literacy levels.

PROGRAMS FOR SPECIFIC RISK FACTORS

FETAL ALCOHOL SYNDROME AND EFFECT

A major effort to raise awareness about the impact of alcohol use during pregnancy took place in the 1980s. Through Ruby Hooper's leadership, a broad coalition was formed which addressed Fetal Alcohol Syndrome and disorder prevention education to health care providers, public health, and the general population. A state FAS Hotline was started out of Bowman Gray Medical Center, which later grew to include information for all preconception/prenatal exposures. A perinatal specialist position was created as part of the NC Family Health Resource Line to address the need for specialized education, referral, and support services for women who use drugs and alcohol during their reproductive years. The Governor's Institute in Research Triangle Park, the North Carolina Alcohol and Drug Council, and the Division of Substance Abuse Services continue to address this important prevention topic.

FOLIC ACID

In 1994, the North Carolina Neural Tube Defect Task Force was created to address the unacceptably high rates of defects of the spine and nervous system. North Carolina had one of the highest rates of neural tube defects (NTDs) in the nation, with the western region of the state experiencing some of the worst rates in the world. In 2000, the Task Force changed its name to the North Carolina Folic Acid Campaign. Now in operation for over a decade, the campaign has focused concerted effort on a number of different target audiences, including: a) women planning a pregnancy, b) Hispanic women, c) women who are not planning a pregnancy, d) health care providers, e) women who have a child with spina bifida, and f) young women ages 18 to 24. The long-term goal of the campaign is to increase the consumption of multivitamins by all women of childbearing age in North Carolina. The Campaign is multi-faceted, using a combination of grassroots organizations and community educators, health care provider education, media, and partnerships to share the folic acid message. Thanks to the work of the Council, the rate of NTDs in the western region of the state has declined by almost 75%.

The campaign has several unique programs. Community Ambassadors provide presentations on folic acid to audiences, including local civic groups, churches, teen groups, ESL classes, factory/work sites, moms' groups, house parties, and beauty salons. The Office Champion program provides in-office education to health care providers, along with the appointment of the folic acid "champion" to share the message in the health care provider's office. The program is designed to encourage providers to talk to their patients about taking folic acid since 89% of women who do not take vitamins say that they would if their health care providers recommended it. The campaign's outreach to Hispanic women in North Carolina is innovative, contributing new research to the national folic acid network regarding the best ways to share this message with this population.

The Folic Acid Campaign continues to develop innovative and well-tested educational materials as well as fun items to remind women to take their vitamins. The Folic Acid Council has been conducting social marketing research for almost a decade on the topic of folic acid, preconception health, and the use of a daily multivitamin. Many of the campaign materials have received national recognition and awards. The campaign has supported radio and print public service announcements to promote its message directly to women. A recent report by the CDC indicated that North Carolina was one of only three states to show statistically significant improvements in vitamin consumption. While 34.3% of women in North Carolina take a vitamin at least four times a week, the national goal by 2010 is 80%.[29]

HEALTHY WEIGHT

The *Healthy Weight, Healthy Women* (HWHW) project is a collaborative effort between the Women's Health, the Physical Activity and Nutrition, and the Nutrition Services branches in the North Carolina Division of Public Health as well as the East Carolina Brody School of Medicine. The project addresses issues related to weight in women of childbearing age through family planning and prenatal care clinics. Based on information collected through a statewide provider survey, maternal and high-risk maternity clinics now calculate body mass index (BMI), and it has been recommended that family planning clinics do the same. The HWHW program seeks to change the Medicaid Family Planning Waiver to include pre-gravid BMI assessment and to improve breastfeeding initiation and duration rates. Breastfeeding has many health benefits for women, including weight loss and pregnancy spacing. The North Carolina Blueprint for Breastfeeding and the Center for Infant and Young Child Feeding and Care reflect the state's strong interest in supporting women in their decision to breastfeed their young. The HWHW program also encourages maternal weight gain in pregnancy to be within the Institute of Medicine's guidelines and promotes the use of North Carolina's *Eat Smart Move More* educational materials in women's health care practices statewide. A growing number of organizations in North Carolina are addressing obesity and overweight. These include Be Active North Carolina, NC Prevention Partners, projects funded through the North Carolina Health and Wellness Trust Fund, and projects supported by Blue Cross and Blue Shield of North Carolina.

SMOKING CESSATION

Much work has been done in North Carolina over the past decade to address issues around the use of tobacco. Groups such as Project Assist, North Carolina Prevention Partners, QuitNow NC, Smoke Free Families, and the Women and Tobacco Coalition for Health (WATCH) have worked to reduce smoking and secondhand smoke exposure throughout the state. Special attention has been focused on adolescents, pregnant women, policies, and provider training. North Carolina launched a toll-free Quitline that takes faxed provider referrals and proactively contacts people who have expressed an interest in smoking cessation. *A Guide for Counseling Women Who Smoke,* produced by WATCH, has received national awards as a training tool for providers. The third version is currently being written and will include information about smoking cessation prior to pregnancy as well as in between pregnancies. In addition, health departments in North Carolina now mandate the use of the 5A's counseling method for smoking cessation with pregnant women.

SEXUALLY TRANSMITTED INFECTIONS

North Carolina's Syphilis Elimination Project began in 1998 when the state ranked first in the nation for the number of primary and secondary syphilis cases.[30] The project worked to reduce syphilis rates through community involvement, surveillance, rapid outbreak response, and health promotion. Since 1998, the number of early syphilis cases has declined by 40%. Current efforts continue to strive for syphilis elimination, with one of the goals being to improve infant health by reducing the number of congenital cases. Another initiative by the HIV/STD Prevention and Care Branch of the Division of Public Health was coordinated with 12 historically minority colleges and universities across the state. The goal was to empower university students, with special emphasis on African-Americans and American Indians, to address behaviors that put them at risk for HIV/STDs. *Project Commit to Prevent* successfully helped each university implement HIV/STD awareness-raising/risk-reduction activities.[30]

In May 1999, the NC Division of Public Health's Women's and Children's Health Section, the HIV/STD Prevention and Care Section, and the Office of Minority Health teamed up to sponsor a Women's Health Mini-Summit: Developing a Message for the New Millennium. The event had over 130 participants and worked to identify key messages for 10 different groups of women regarding STDs, HIV, and AIDS. The event was rolled into a three-day state conference in December 1999 on HIV/AIDS, which included an HIV Prevention Forum for North Carolina college and university students.

The new human papillomavirus (HPV) vaccine offers a promising intervention for the prevention of STDs among young women. The Advisory Committee on Immunization Practices, a CDC subcommittee, recommends that all girls and women between the ages of nine and 26 receive the vaccine.

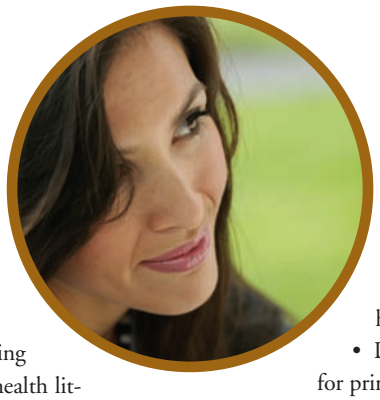
"Today, the greatest opportunities for further improvement in pregnancy outcomes—in improving the health of women and their children—lie in prevention strategies that must be implemented prior to conception to be effective."

– Atrash HK, Johnson K, Adams M, Cordero JF, Howse J. "Preconception Care for Improving Perinatal Outcomes: The Time to Act." *Maternal Child Health J* 2006; 10(S): S3-11.

APPENDIX B

Recommendations to Improve Preconception Health

U.S. Centers for Disease Control and Prevention, April 21, 2006



1. Individual Responsibility Across the Life Span.

Each woman, man, and couple should be encouraged to have a reproductive life plan.

- Develop, evaluate, and disseminate reproductive life planning tools for women and men in their childbearing years, respecting variations in age; literacy, including health literacy; and cultural/linguistic contexts.
- Conduct research leading to development, dissemination, and evaluation of individual health education materials for women and men regarding preconception risk factors, including materials related to biomedical, behavioral, and social risks known to affect pregnancy outcomes.

2. Consumer Awareness.

Increase public awareness of the importance of preconception health behaviors and preconception care services by using information and tools appropriate across various ages; literacy, including health literacy; and cultural/linguistic contexts.

- Develop, evaluate, and disseminate age-appropriate educational curricula and modules for use in school health education programs.
- Integrate reproductive health messages into existing health promotion campaigns (e.g., campaigns to reduce obesity and smoking).
- Conduct consumer-focused research to identify terms that the public understands and to develop messages for promoting preconception health and reproductive awareness.
- Design and conduct social marketing campaigns necessary to develop messages for promoting preconception health knowledge and attitudes, and behaviors among men and women of childbearing age.
- Engage media partners to assist in depicting positive role models for lifestyles that promote reproductive health (e.g., delaying initiation of sexual activity, abstaining from unprotected sexual intercourse, and avoiding the use of alcohol and drugs).

3. Preventive Visits.

As a part of primary care visits, provide risk assessment and educational and health promotion counseling to all women of childbearing age to reduce reproductive risks and improve pregnancy outcomes.

- Increase health provider (including primary and specialty care providers) awareness regarding the importance of addressing preconception health among all women of childbearing age.
- Develop and implement curricula on preconception care for use in clinical education at graduate, postgraduate, and continuing education levels.
- Consolidate and disseminate existing professional guidelines to develop a recommended screening and health promotion package.
- Develop, evaluate, and disseminate practical screening tools for primary care settings, with emphasis on the 10 areas for preconception risk assessment (e.g., reproductive history, genetic, and environmental risk factors).
- Develop, evaluate, and disseminate evidence-based models for integrating components of preconception care to facilitate delivery of and demand for prevention and intervention services.
- Apply quality improvement techniques (e.g., conduct rapid improvement cycles and establish benchmarks) to improve provider knowledge, attitudes, and practices in regard to well woman health promotion and screening.
- Use the federally funded collaboratives for community health centers and other Federally Qualified Health Centers to improve the quality of preconception risk assessment, health promotion, and interventions provided through primary care.
- Develop fiscal incentives for screening and health promotion.

4. Interventions for Identified Risks.

Increase the proportion of women who receive interventions as follow-up to preconception risk screening, focusing on high priority interventions (i.e., those with evidence of effectiveness and greatest potential impact).

- Increase health provider (including primary and specialty care providers) awareness concerning the importance of ongoing care for chronic conditions and intervention for identified risk factors.
- Develop and implement modules on preconception care for specific clinical conditions for use in clinical education at graduate, postgraduate, and continuing education levels.
- Consolidate and disseminate existing guidelines related to evidence-based interventions for conditions and risk factors.
- Disseminate existing evidence-based intervention that address risk factors that can be used in primary care settings (i.e., iotretinoins, alcohol misuse, anti-epileptic drugs, diabetes [preconception], folic acid deficiency, Hepatitis B, HIV/AIDS, hypothyroidism, maternal phenylketonurea, Rubella seronegativity, obesity, oral anticoagulant, STD, and smoking).
- Develop fiscal incentives (e.g., pay for performance) for risk management, particularly in managed care settings.
- Apply quality improvement techniques and tools (e.g., conduct rapid improvement cycles, establish benchmarks, use practice self-audits, and participate in quality improvement collaborative groups).

5. Interconception Care.

Use the interconception period to provide additional intensive interventions to women who have had a previous pregnancy that ended in an adverse outcome (i.e., infant death, fetal loss, birth defects, low birth weight, or preterm birth).

- Monitor the percentage of women who complete postpartum visits (e.g., using the Health Employer Data and Information Set measures for managed care plans and Title V Maternal Child Health Block Grant state measures) and use these data to identify communities of women at risk and opportunities to improve provider follow-up.
- Develop, evaluate, and replicate intensive evidence-based interconception care and care coordination models for women at high social and medical risk.
- Enhance the content of postpartum visits to promote interconception health.
- Use existing public health programs serving women in the postpartum period to provide or link to interventions (e.g., family planning, home visiting, and the Special Supplemental Nutrition Program for Women, Infants, and Children).
- Encourage additional states to develop preconception health improvement projects with funds from the Title V Maternal Child Health Block Grant, Prevention Block Grant, and similar public health programs.

6. Prepregnancy Checkup.

Offer, as a component of maternity care, one prepregnancy visit for couples and persons planning a pregnancy.

- Consolidate existing professional guidelines to develop the recommended content and approach for such a visit.
- Modify third-party payer rules to permit payment for one prepregnancy visit per pregnancy, including development of billing and payment mechanisms.
- Educate women and couples regarding the value and availability of prepregnancy planning visits.

7. Health Insurance Coverage for Women with Low Incomes.

Increase public and private health insurance coverage for women with low incomes to improve access to preventive women's health and preconception and interconception care.

- Improve the design of Family Planning Waivers by permitting states (by federal waiver or by creating a new state option) to offer interconception risk assessment, counseling, and interventions along with family planning services. Such policy developments would create new opportunities to finance interconception care.
- Increase health coverage among women who have low incomes and are of childbearing age by using federal options and waivers under public and private health insurance systems and the State Children's Health Insurance Program.
- Increase access to health care services through policies and reimbursement levels for public and private health insurance systems to include a full range of clinicians who care for women.

8. Public Health Programs and Strategies.

Integrate components of preconception health into existing local public health and related programs, including emphasis on interconception interventions for women with previous adverse outcomes.

- Use federal and state agency support to encourage more integrated preconception health practices in clinics and programs.
- Provide support for CDC programs to develop, evaluate, and disseminate integrated approaches to promote preconception health.
- Analyze and evaluate the preconception care activities used under the federal Healthy Start program and support replication projects.
- Convene or use local task forces, coalitions, or committees to discuss opportunities for promotion and prevention in preconception health at the community level.
- Develop and support public health practice collaborative groups to promote shared learning and dissemination of approaches for increasing preconception health.
- Include content related to preconception care in educational curricula of schools of public health and other training facilities for public health professionals.

9. Research.

Increase the evidence base and promote the use of the evidence to improve preconception health.

- Prepare an updated evidence-based systematic review of all published reports on science, programs, and policy (e.g., through the Agency for Healthcare Research and Quality).
- Encourage and support evaluation of model programs and projects, including integrated service delivery and community health promotion projects.
- Conduct quantitative and qualitative studies to advance knowledge of preconception risks and clinical and public health interventions, including knowledge of more integrated practice strategies and interconception approaches.
- Design and conduct analyses of cost-benefit and cost-effectiveness as part of the study of preconception interventions.
- Conduct health services research to explore barriers to evidence-based and guideline-based practice.
- Conduct studies to examine the factors that result in variations in individual use of preconception care.

10. Monitoring Improvements.

Maximize public health surveillance and related research mechanisms to monitor preconception health.

- Apply public health surveillance strategies to monitor selected preconception health indicators (e.g., folic acid supplementation, smoking cessation, alcohol misuse, diabetes, and obesity).
- Expand data systems and surveys (e.g., the "Pregnancy Risk Assessment and Monitoring System" and the "National Survey of Family Growth") to monitor individual experiences related to preconception care.
- Use geographic information system techniques to target preconception health programs and interventions to areas where high rates of poor health outcomes exist for women of reproductive age and their infants.
- Use analytic tools (e.g., Perinatal Periods of Risk) to measure and monitor the proportion of risk attributable to women's health before pregnancy.
- Include preconception, interconception, and health status measures in population-based performance monitoring systems (e.g., in national and state Title V programs).
- Include a measure of the delivery of preconception care services in the Healthy People 2020 objectives.
- Develop and implement indicator quality improvement measures for all aspects of preconception care. For example, use the Health Employer Data and Information Set measures to monitor the percentage of women who complete preconception care and postpartum visits or pay for performance measures.

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