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What We Know About the Prevention of Pre-Term Birth

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What We Know About the Prevention of Pre-Term Birth

A POLICY BRIEF PREPARED BY THE CHILD POLICY RESEARCH CENTER IN CINCINNATI, OHIO

Most people know that pregnancy lasts nine months, but not everyone knows that pregnancy is most commonly measured in weeks. The normal duration (called "full term") is 280 days or 39 to 41 weeks from the first day of the last normal menstrual period. Something else that many people don't know is that preterm birth, before 37 weeks, is now the leading cause of perinatal and infant mortality in the U.S. (U.S.)1. The prematurity or preterm birth rate in the U.S. (U.S.) has increased by 35% in 25 years from 9.5% in 1981 to 12.8% in 2006². In 2004 in the U.S., preterm births accounted for 64% of the more than 5000 infant deaths occurring before one year of age³. Today 13% of U.S. births occur before 37 weeks

gestational age, often leading to a personal and financial tragedy for families. The public policy implications of preterm birth include alarmingly high health care expenditures over the life course and, from a societal perspective, a significant loss of well-being and workforce productivity.

In this brief, we summarize current evidence for what causes preterm birth and what works to prevent preterm birth. We also present recent national policy recommendations and their potential implications for state and local policymakers.

Key Findings

- For some segments of the U.S. population and in other countries, the preterm birth rate is consistently much lower than the overall U.S. rate. These differences are poorly understood, but suggest that many preterm births should be preventable. For some high-risk women, access to preventive care is limited by lack of continuous health insurance coverage and other barriers.
- •In Ohio, for example, more than 8000 preterm births per year may be preventable.
- There are multiple, opportunities for substantial public and private cost savings associated with a reduction in preterm births.
- Public and private systems that pay for care are not aligned with recommended, evidence-based clinical practice. The benefit packages of health insurance programs, including Medicaid, should be aligned with best evidence so that continuous access to care that improves health is available.
- Although public education has had a significant impact on U.S. smoking rates, the number of pregnant women smoking during pregnancy remains unacceptably high. In 2007, the percentage of women who smoked during

- pregnancy was 35%, 27% and 20% in Kentucky, Ohio and the U.S., respectively². Available, evidence-based smoking cessation interventions targeted to pregnant women have a higher success rate than interventions before or after pregnancy. Policies to address smoking cessation have not been widely implemented in health care delivery systems and communities.
- Elective delivery of healthy women prior to term results in increased infant complications and cost⁴.
- New therapies and care strategies shown to improve health are adopted into actual practice very slowly, often more than a decade after they were first shown to be effective. In pregnancy, this meant that optimal strategies to use antenatal steroids to reduce the mortality and morbidity of preterm birth were not developed for many years after the benefits of this treatment were known. Recent studies showing a 35% reduction in recurrent preterm birth in women treated with supplemental progesterone has not resulted in widespread adoption of this treatment for women with a prior preterm birth. Proven therapies need to be adopted by all care providers more rapidly. Organized strategies to improve care, for example through improvement collaboratives, may speed the adoption of evidence-based practice⁵.

PREVENTION OF PRETERM BIRTH: FROM EVIDENCE TO PUBLIC POLICY

Defining preterm birth

Preterm birth or prematurity is commonly defined as birth before the 37th week of gestation. Normal pregnancies are expected to last 39 to 41 weeks¹.

In this policy brief, we summarize evidence that could be used by state and local policy makers to assist their decision-making related to reducing the risk of preterm and elective near-term birth. We are indebted to a recently published review of the literature on primary and secondary prevention of preterm birth⁶.

For any group of pregnant women, the number of infants born preterm can be calculated as the number of women in the group multiplied by that group's prematurity rate. Thus, for adolescent or teen pregnancies, the number of preterm infants born each year is the number of teenage pregnancies times the prematurity rate for teens. Much attention has been focused on pregnancies among teens and older mothers, but these represent a relatively small part of the problem. Table 1 illustrates this point for births in Ohio in 2007. While attention has been focused on teens and women in the later childbearing years, three-fourths of all preterm births occur to women 20-34 years of age.



Table 1, Births in Ohio, 2007¹

Age of mother	Number of births	Percent of all births (%)	Preterm births <37 weeks n (%)	Percent of all preterm births (%)
Less than 20	16,795	11	2489 (14.8)	12
20 to 34	118,379	77	14,807 (12.5)	74
35 and over	18,835	12	2,780 (14.8)	14
Total	154,009	100	20,076 (13.0)	100

¹ Births at 37 and 38 weeks gestation, which are more costly and at increased risk of significant health problems for the baby compared to births at full term, are neither categorized as preterm (less than 37 weeks) nor full term (39–41 weeks).

2 Source: Child Policy Research Center tabulations of vital statistics file obtained from

Consequences of preterm birth

The estimated, annual, short-term U.S. costs associated with preterm birth in 2005 was \$26.2 billion, with approximately 40% of these costs paid by Medicaid^{7.8}. These estimates do not account for the lifetime costs accumulated as a consequence of the many premature infants with permanent disability.

The consequences of preterm birth include an increased risk of life-long handicapping conditions and markedly increased health care costs⁸. Despite significant advances in newborn intensive care in the last 30 years, today. approximately 30-50% of very preterm infants, born before 29 weeks gestation, either die or have permanent disability⁹. Among survivors, as many as 50% have behavioral problems or learning disabilities and another 20% have mental retardation or cerebral palsy. Considering the number of individuals affected (approximate 50,000,000 living Americans were born preterm) and the cumulative, lifetime costs of care and lost productivity, preterm birth produces a sizeable negative impact on U.S. social and economic well-being.

Although the negative effects of preterm birth in the U.S. are quantitatively and qualitatively large, there is strong reason to believe that improvements are possible.

Although the negative effects of preterm birth in the U.S. are quantitatively and qualitatively large, there is strong reason to believe that improvements are possible. The U.S. ranks 40th among developed nations in both prematurity and its serious consequence of infant mortality. Differences among these nations are large, with preterm birth rates and infant death rates three-fold greater in the U.S. than some Scandinavian, European and Asian countries¹⁰. Understanding the contributions of differences in health

² Source: Child Policy Research Center tabulations of vital statistics file obtained from Ohio Dept. of Health

policy to differences in population health may suggest changes to U.S. health care policymakers, with particular benefit for the problem of preterm birth.

Known as the Preemie Act, Public Law 109-450 was passed by the 109th Congress and signed into law in 2006 (Prematurity Research Expansion and Education for Mothers Who Deliver Infants Early Act). This new federal law is helping others to formulate their action plans.

National policy agendas have recently been put forth by the Institute of Medicine (IOM), the March of Dimes and the U.S. Surgeon General^{7, 11, 12}. Public awareness of the magnitude and severity of the U.S. prematurity problem is low¹³. Public education, for example, about the importance of care prior to conception, the risks of uterine surgery, the risks and benefits of infertility treatment and the benefits of going to full term could help to reduce the risk of preterm birth.

WHAT HAS BEEN SHOWN TO WORK TO REDUCE THE CHANCES OF PRETERM BIRTH?

Evidence-based guidelines exist to address factors that can improve pregnancy outcomes¹⁴. Unfortunately, as in many other aspects of health care, these guidelines are not implemented consistently.

The mother's health and health care prior to conception is an important factor in optimal pregnancy health and prevention of preterm birth.

There are more than four million births is the U.S. every year. As many as 40% of U.S. women who deliver prematurely have potentially contributing risk factors. Some of these risk factors may be modified by preconception care with a corresponding reduction in the

In 2006, the U.S. Centers for Disease Control and Prevention released recommendations related to the timing and content of preconception care¹⁹:

- Each woman, man, and couple should be encouraged to have a reproductive life plan.
- 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.
- 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 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).
- 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 birthweight, or preterm birth).
- Offer, as a component of maternity care, one prepregnancy visit for couples and persons planning pregnancy.
- 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.
- Integrate components of preconception health into existing local public health and related programs, including emphasis on interconception interventions for women with previous adverse outcomes.
- Increase the evidence base and promote the use of the evidence to improve preconception health.
- Maximize public health surveillance and related research mechanisms to monitor preconception health.

risk of preterm birth¹⁵. The U.S. Centers for Disease Control and Prevention strongly recommends improved preconception care as a means to improve the outcomes of pregnancy. The mother's age of childbearing, nutritional status, use of potentially harmful substances, social support and other factors can be effectively modified prior to becoming pregnant. For example, women who smoke and those with high blood pressure or diabetes may benefit from preconception planning and care.

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Infants born before 26 weeks gestational age are at highest risk of death or permanent disability. To achieve any benefit of prenatal care, the mother must, before her first prenatal visit, suspect she is pregnant, confirm the pregnancy, identify a willing prenatal care provider, make a mutually-acceptable appointment, confirm the expected due date, participate in a thorough risk screening process and initiate any necessary interventions. The time required to complete these steps is sufficiently long that it is unreasonable to expect that early prenatal care will have a significant effect on prematurity. In fact, the content of prenatal care, as currently delivered, `is not focused on and seems to have little effect on the risk of preterm birth^{16–18}.

Optimal interconception care can improve outcomes in women with high-risk pregnancies^{20–22}.

For nearly 200,000 U.S. women having their first child each year, the baby will be born preterm. Among these women the risk of having a second preterm infant is more than twice that of the population overall. Repeat preterm birth may be caused by readily identifiable risks, such as short interpregnancy interval, smoking, and poor maternal, health such as genitourinary infections. To

be optimally effective, interventions to ameliorate these high-risk conditions should be initiated prior to the woman becoming pregnant again.

Many health insurance providers, including some Medicaid programs, do not provide benefits for the mother between pregnancies. Lack of access to care, particularly lack of health insurance, reduces use of appropriate health services²³.

Prematurity is defined as birth more than 3 weeks before the due date; but the due date is often uncertain.

The due date or gestational age of the baby is estimated by different methods by different providers and recorded differently on birth certificates by different birth hospitals. Determining the due date solely based on the mother's last menstrual period has been surpassed by more accurate methods, such as ultrasound. Early ultrasound assessment of gestational age is more accurate than any other method. Despite wide availability of ultrasound services, many women do not receive prenatal care early enough to determine gestational age with optimal accuracy.

Clinician and consumer decision making about the expected delivery date is critical to prevention of preterm birth. Better quality data in state and local vital statistics systems would permit ongoing evaluation of the effectiveness of public and private programs designed to reduce preterm birth. Confidently knowing the gestational age of the fetus can help clinicians make the right decisions about when preterm birth should be allowed and when we should try to prevent preterm birth.

The Institute of Medicine recently recommended that all women have accurate dating of pregnancy that includes performance of an ultrasound for dating in the first weeks of pregnancy⁷. Pregnant women are often unaware of the importance of accurate dating of the pregnancy in the first weeks after conception. Clinicians must rely on less accurate methods of dating. Moreover, both public and private insurance programs sometimes do not include all indicated ultrasounds as part of their benefit packages.

When the birth due date is uncertain, clinician and consumer decision making may inadvertently lead to preterm birth when delivery is scheduled too early.

Nearly half of infants of multiple births cared for in neonatal intensive care units are associated with infertility treatment.

Prenatal care, as it is currently delivered, does not prevent preterm birth.

Studies of the effect of prenatal care on prematurity suggest that the content and timing of prenatal care does not address the problem of preterm birth¹⁸. Interventions reported to reduce the risk of preterm birth are most effectively applied in the first or early second trimester. By the time a women confirms that she is pregnant, identifies a care provider and enters into care, it may be too late to provide the care necessary to prevent preterm birth²⁴.

Evidence is accumulating that initiating care prior to pregnancy may be an important practice in the effort to improve preterm birth²⁵. Prevention of many birth defects, which are often associated with preterm birth, requires that the woman be in good health at the time she conceives. It is not surprising that, when care is initiated after conception, opportunities to prevent preterm birth are not applicable. Improved nutritional status, including folic acid supplementation²⁶, smoking cessation and identification of specific risk factors, should optimally occur prior to conception.

Predicting who will have a preterm baby is an inexact science. However, certain groups of women are known to have a markedly increased risk of preterm birth. These high-risk groups include women who have had one or more prior preterm births and women with twins, triplets and quadruplets.

Giving special attention to women who have had at least one preterm birth before they become pregnant again

provides an important opportunity to prevent preterm birth. Many health insurance programs, including many state Medicaid programs, do not insure women until they become pregnant. This limits access to effective health care prior to conception and between pregnancies.

Medical treatments for infertility often lead to multiple births (twins, triplets, etc.) and preterm birth²⁷.

Fertility declines for both men and women as age increases after the early to mid 20's. In recent years, career, financial and other considerations have caused many women to defer childbearing. These factors have led to a marked increase in the number of families seeking treatment for infertility and a dramatic rise in the rate and number of multifetal pregnancies²⁸. For unknown reasons, fertility treatment is also associated with a two-fold increase in preterm birth in singleton pregnancies. Nearly half of infants of multiple births cared for in neonatal intensive care units are associated with infertility treatment ²⁷. The proportion of multiple births in the U.S. has doubled in the last 10–15 years. Because more than 50% of twins and 90% of triplets are born preterm, it is estimated that half of the recent increase in the U.S. prematurity rate is due to this increase in twins, triplets and higher order multiples²⁹. According to the 1995 National Survey of Family Growth, 1.2 million (2%) of the 60 million women of reproductive age had an infertility-related medical appointment within the previous year and an additional 13% received infertility services sometime in their lives³⁰.

U.S. cultural norms often promote a "do everything" attitude which may increase risk of prematurity.

Treatment strategies for infertility with high pregnancy success rates and minimal risk of preterm birth are available. However, U.S. cultural norms often promote a "do everything" attitude which may increase risk of prematurity. The major types of infertility treatment (drug-stimulated increases in egg production and in vitro fertilization), as

currently used, are associated with a dramatically increased risk of having twins, triplets or more.

Elective early delivery for pregnant women with underlying illness or complications may result in improved outcomes. However, when healthy women opt for an early delivery, their babies are at an increased risk for long-term health problems.

Much of the increased demand for fertility treatments may have occurred without sufficient consumer awareness of the risks associated with multiple births. To decrease the impact of infertility treatment on risk of prematurity, some health insurance programs limit the number of fertilized eggs that can be transferred to the woman.

Smoking cessation programs work for women of childbearing age.

As many as 15–30% of U.S. women smoke cigarettes during pregnancy. Smoking rates are highest for women 18 to 24 years old and for those who attended but did not graduate from high school. In Ohio and Kentucky, these estimates are 27% and 35%, respectively. Smoking is associated with an approximately 1.5-fold to 2-fold increase in the risk of preterm birth. Conservatively, this means that there are 35,000 preterm births in the U.S. associated with smoking. A systematic review of 48 randomized trials of smoking cessation programs initiated during pregnancy found that these programs result in a significant reduction in smoking³¹. More than 2,000 U.S. preterm births annually could be prevented by standardized application of smoking cessation programs nationally. In Ohio alone, up to 300 preterm births could be prevented each year.

Nearly 100% of pregnant women smokers interact with the health care system. Smoking should be consistently identified and treated as a chronic, relapsing disease. Smoking cessation support must be embedded into systems of care so that every interaction in a health care setting serves to offer support, encouragement, and tools to help pregnant women quit smoking. Evidence shows that health care policies significantly affect the likelihood that smokers will receive treatment and stop smoking successfully. Systems approaches recommended by the Centers for Disease Control and Prevention, such as increasing cigarette taxes and implementing smoke-free ordinances, can reduce the prevalence of smoking in women of childbearing age, reduce smoking in pregnant women, and reduce fetal and infant exposures to second-hand smoke³².

The recent rise in preterm births is due in part to an increase in the number of births that occur near the end of pregnancy but before the due date³³.

For pregnant women with underlying illnesses or complications, elective delivery before the due date may result in improved outcomes for both the baby and mother. Many times this is because there is concern that waiting puts the baby at risk of dying in utero or being very sick in the newborn period. In fact, a reduction in perinatal mortality, overall, has been observed at the same time as the recent increase in U.S. preterm births. This is a positive result.

Increasingly, however, healthy women and their physicians choose to deliver the babies before the due date. It is estimated that 20–30% of elective deliveries before the due date are among healthy women with healthy babies. These babies, when delivered early, are at a markedly increased risk of high-cost health problems, some of which persist for many years³⁴.

Across the U.S., groups such as the Ohio Perinatal Quality Collaborative (www.OPQC.net), funded in part by the Ohio Department of Job and Family Services, are working with providers to decrease unnecessary deliveries before the due date.

Providers, payers and policy makers could collaborate to make certain that treatments of proven benefit are brought to the public in a timely manner.

A few days make a big difference.

Regardless of how preterm birth is defined, the earlier in gestation that infants are born, the greater the chances of death or life-long disability and the greater the health care costs. Many babies born 10-15 weeks before their due date die or have life-long handicaps. For these babies, all of whom are preterm births, staying a few more days in the mother's womb makes a big difference in their chances of going home without handicap. When the woman at risk of delivering very preterm receives appropriate care before labor has progressed, the chances of delaying delivery for a few days and providing appropriate pre-delivery care are greatly increased, particularly if antenatal steroids can be given. A few more days in utero, with close observation of the mother and baby in a specialized center, can dramatically improve the chances of going home healthy ³⁵.

For babies born very prematurely, birth in a hospital with specialized, intensive newborn services more than doubles the chances of intact survival³⁶.

Many States have systems of regionalized perinatal care in which specialized services for high-risk women and babies are centralized. In this setting, hospitals without specialized services may transfer high-risk patients to hospitals that offer such services. For women at risk of delivery prior to 32 weeks gestation, the American College of Obstetricians recommends transfer of the mother, rather than the high-risk newborn, to a center with specialized services¹⁴. In Ohio, it is estimated that 10–20% of births

prior to 32 weeks occur outside of regional centers³⁶. Transfer of a high-risk mother or infant from one hospital and one set of clinicians to another means that the revenue associated with those patients is also transferred. This is a disincentive to appropriate transfer. Quality measures that include appropriate transfer may be helpful.

Proven, new strategies for prevention of preterm birth may be adopted very slowly by clinicians.

In the last few years, it has been shown that progesterone given to pregnant women who have had a previous preterm birth substantially improves the baby's outcome and reduces costs^{37–39}. It is known that women who have had one or more previous preterm birth are at extremely high-risk of having another preterm infant if they become pregnant. A cost savings of as much as \$2 billion is possible^{40, 41}.

Women and infants waited more than 20 years before the health care system provided optimal access to the proven benefits of steroids given to the mother to improve newborn survival and outcome Even today, many infants do not receive the benefits of antenatal steroid. Providers, payers and policy makers could collaborate to make certain that treatments of proven benefit are brought to the public in a timely manner.

A few more days in utero, with close observation of the mother and baby in a specialized center, can dramatically improve the chances of going home healthy.

IMPROVING OUR UNDERSTANDING OF WHAT CAUSES PREMATURITY

We know many, but not all, of the factors that increase a woman's risk of having a premature baby. What is not fully understood is how these risk factors fit together and lead to preterm birth. We know how to prevent some preterm births, and we know much about choosing when to allow preterm birth.

Unfortunately, we don't know exactly what causes preterm birth. To compound this problem, many women without apparent risk factors also deliver prematurely. Onset of labor prior to term is the end result of multiple, different processes and, thus, is not likely to respond to a single treatment⁴².

Based on current understanding, there is an interplay among multiple risk factors contributing to preterm birth. To date, most studies attempted to isolate one or more factors without accounting fully for these inter-relationships. For new approaches to work, social, epidemiologic and biologic researchers will need to design studies together that, at the same time, evaluate the effects of psychological (e.g., stress and isolation), social (e.g., neighborhood, employment and access), behavioral (e.g., smoking), medical (e.g., reliable delivery of evidenced-based care), and biological (e.g., genetic predisposition) factors on the risk of preterm birth. An example of a cross-cutting factor is racism, which is largely considered a psychosocial and socioeconomic stressor, but may function more potently through adverse effects on the maternal and fetal immune systems⁴³.

This section of the policy brief highlights the substantive work related to prematurity that has occured over the last two years in the scientific and policy communities. We provide a summary of three esteemed national sources of information: The Institute of Medicine, the U.S. Surgeon General's office and the March of Dimes. For detailed information on these recommendations, including the evidence base supporting them, please refer to individual references listed at the end of this brief.

WHAT DOES NOT CAUSE PREMATURITY?

Despite widespread beliefs that preterm birth is caused by poor prenatal care, aberrant maternal behavior and poor socioeconomic conditions, research to date has not established that any of these are direct causes of preterm birth. Many large-scale interventions to reduce prematurity have been designed to ameliorate these conditions, with disappointing results.

Among the prevention strategies that have been evaluated, few have been found to be helpful. For prenatal care as an intervention, studies do not support that improvement in access to prenatal care results in reduced risk of preterm birth¹⁸. A study of group prenatal care showed a trend toward fewer preterm births and higher birth weights⁴⁴. A subgroup analysis of a randomized trial of prenatal nurse home visits showed fewer preterm births among adolescents⁴⁵. Other prevention strategies that have been evaluated and do not seem to help include: nutritional supplements of protein, vitamin or mineral supplements, other forms of social support and transportation to prenatal visits, medications to relax the uterus and monitors to detect early labor.

The Institute of Medicine (IOM)

Recommendation V-1 of the IOM⁷ states: "The National Institutes of Health and private foundations should establish integrated multidisciplinary research centers. The objective of these centers will be to focus on understanding the causes of preterm birth and the health outcomes for women and their infants who were born preterm."

The March of Dimes

The March of Dimes¹¹ highlights the need for "research funded by the National Institutes of Health, the Centers for Disease Control and Prevention and other Federal agencies to increase knowledge relating to the prevention of birth defects, prematurity and infant mortality."

The U.S. Surgeon General

Workgroups from the June, 2008 U.S. Surgeon General's Conference on Prevention of Preterm Birth emphasize the need for more research to identify¹²:

- the causes of the rise in preterm birth
- the etiology of late preterm births
- the causes of multiple births (twins, triplets, etc.)
- the causes of "non-medically indicated preterm birth"
- prevention strategies
- the differential outcomes of preterm birth by cause
- clinical, biologic, social, genetic and behavioral factors simultaneously
- information that will "inform public policy and Medicaid, SCHIP, Medicare and private insurance."

HOW CAN CARE BE IMPROVED IF THE QUALITY OF CARE IS NOT MEASURED46?

Those in states working to reduce preterm birth are dependent on birth and death certificate systems (vital statistics) that are managed by states. The lack of timely, high-quality vital statistics is a significant barrier to improving care and outcomes of pregnant women. In many states, vital statistics systems have recently moved from paper to electronic data management. Electronic data collection and reporting is essential for a quick turnaround of crucial data that informs programs, consumers and health care providers of birth outcomes and risks. For example, without effective vital statistics systems, those working to reduce preterm birth in 2008 may find it difficult to improve the systems of care if they have to wait until 2010 to see the results of their efforts.

The Institute of Medicine

Recommendation V-2 of the IOM⁷: "Establish a quality agenda. Investigators, professional societies, state agencies, payers and funding agencies should establish a quality agenda with the intent of maximizing outcomes with current technology for infants born preterm."

The March of Dimes

The March of Dimes¹¹ advocates "implementation of State level performance measures designed to improve the quality of maternity and pediatric care"...and... "federal support for the development and dissemination of performance measures designed to improve the quality of maternity and pediatric care."

The U.S. Surgeon General

Workgroups from the June, 2008 U.S. Surgeon General's Conference on Prevention of Preterm Birth¹² emphasized the need:

- to collect data about the quality of patient care and services provided
- for practitioners to participate in clinical research, be prepared to translate new biomedical knowledge and technology.
- for payers of health services to align with recommended clinical practice
- to include assessment of long-term morbidity, mortality and quality of life to inform policy

HOW EFFECTIVE IS THE CURRENT SYSTEM AT DELIVERING THE BEST CARE AND ACHIEVING THE BEST RESULTS?

The U.S. health care system is complex and costly, with many large publicly-funded programs. International comparisons suggest that return on the U.S. investment in health care is not optimal. Evaluation of the effectiveness and cost of existing large-scale prevention and care programs may lead to information that allows concentration of resources in programs that work.

The World Health Organization (WHO) ranks the U.S. as having the 37th best health care system in the world⁴⁷. Rankings were based on the health of the population, responsiveness to patient needs, fairness in financial contribution and overall performance. In 2005, the U.S. spent an average of \$6350 per person for health care¹⁰. In contrast, WHO ranked France as having the best health care system in the world despite spending only \$3819 per person in 2005.

The Institute of Medicine

Recommendation V-3 of the IOM7: "Conduct research to understand the impact of the health care delivery system on preterm birth. The National Institutes of Health, the Agency for Healthcare Reseach and Quality, and private foundations should conduct and support research to understand the consequences of the organization and financing of the health care delivery system on access, quality, cost, and the outcomes of care as they relate to preterm birth throughout the full reproductive and childhood spectrum."

Recommendation V-4 of the IOM7: "Study the effects of public programs and policies on preterm birth. The National Institutes of Health, the Centers for Medicare and Medicaid Services, and private foundations should conduct and/or support research on the role of social programs and policies on the occurrence of preterm birth and the health of children born preterm."

The U.S. Surgeon General

Workgroups from the June, 2008 U.S. Surgeon General's Conference on Prevention of Preterm Birth emphasize that¹²: "... high-quality evaluation of existing large-scale intervention programs" is needed.

WHAT PUBLIC POLICIES ARE MOST EFFECTIVE IN REDUCING PRETERM BIRTH?

Because the cost of caring for preterm infants is so large, the return on public investment in discovering effective ways to prevent preterm birth is also large⁸. Because 30–40% of births occur to women with Medicaid and because Medicaid eligibility is associated with a markedly increased risk of preterm birth, prematurity is one of the causes of skyrocketing state Medicaid expenditures. For each preterm birth prevented, it would be important prospectively to invest the savings in implementing and disseminating effective prevention programs.

Studies in both the U.S. and Europe show that certain types of jobs held by pregnant women are associated with increased likelihood of preterm birth – especially jobs with prolonged standing, working night shift and long work weeks^{48, 49}. It is estimated that nearly 50% of preterm births are preventable⁵⁰. Based on comparisons between geographic regions with low and high prematurity rates, there are strong reasons to believe that many preterm births are preventable using strategies that have been shown to work.

The Institute of Medicine

Recommendation V-5 of the IOM7: "Conduct research that will inform public policy. In order to formulate effective public policies to reduce preterm birth and assure healthy outcomes for infants, public and private funding agencies and organizations, state agencies, payers, professional societies, and researchers will need to work to implement all of the previous recommendations. Research in the areas of better defining the problem of preterm birth, clinical investigations, and etiologic and epidemiologic investigations is critical to conduct before policy makers can create policies that will successfully address this problem."

The March of Dimes

The March of Dimes¹¹ advocates "for the full spectrum of both private and public maternity coverage, including preconception and inter-conception care...and...for Medicaid targeted case management for women at risk of preterm birth and infants with significant medical conditions associated with prematurity...and...for implementation of State level performance measures designed to improve the quality of maternity and pediatric care".

The U.S. Surgeon General

Workgroups at the June 2008 U.S. Surgeon General's conference emphasize¹²:

- The shortage of scientists and physician-scientists is a major barrier to understanding and preventing preterm birth.
- Development of "a blue ribbon panel for studying stress... in prematurity research."
- Employment law is an issue because employers and employees want a date certain for delivery and parents what to maximize time with the newborn.
- Professional organizations should "inform policy-makers of core issues in preterm birth."
- There should be a "national education and action program to communicate what we know about preterm birth and how to reduce its incidence."
- Research that will inform public policy and Medicaid, SCHIP, Medicare, and private insurance.
- Access to services should include "access to health care coverage and care for all women of childbearing age, preconception, inter-conception, and early prenatal care, and access to health care coverage and care for all children."
- Payers for health services should align with recommended clinical practice.

WHAT CAN BE DONE ABOUT THE SIZEABLE SOCIOECONOMIC AND RACIAL/ETHNIC DISPARITIES IN PRETERM BIRTH?

Wide disparities in care and outcomes in the U.S. account for a large proportion of the much higher U.S. prematurity rate compared to other developed nations - especially countries in Southeast Asia and Europe. Compared to these countries, with overall much lower health spending, the U.S. places much less emphasis on prevention and public health and much, much more per capita spending on care after the illness or disability has occurred 51.

The Institute of Medicine

The IOM states in Recommendation II-37: "Expand research into the causes and methods for the prevention of the racial-ethnic and socioeconomic disparities in the rates of preterm births...This research agenda should continue to prioritize efforts to understand factors contributing to the high rates of preterm birth among African-American infants and should also encourage investigation into the disparities among other racialethnic subgroups."

The March of Dimes

The March of Dimes¹¹ states that for "women from racial and ethnic groups with increased incidence of prematurity (particularly African American women)" it is important to:

- Define the social, environmental, and cultural determinants of prematurity, assess the barriers to research in this area, and develop a strategy to address this problem, and allocate resources accordingly
- Elucidate the biologic factors (e.g., population based genetic variance, gene-environment interaction) that results in a higher rate of prematurity among African American women

- Develop and evaluate and replicate if successful community-based model programs to decrease health disparities among minority populations at risk for prematurity.
- Recruit as Alliance members consumer-focused organizations with maternal and child health interests that serve communities of color. Include at least one faith-based organization to strengthen and pilot national faith-based outreach.

The U.S. Surgeon General

Workgroups at the June 2008 U.S. Surgeon General's conference emphasized¹²:

- Research and services for African-Americans is a priority as they bear the highest burden of prematurity.
- Research on the race, racism and social injustice is a priority.

Conclusions

MAJOR CONCLUSIONS RELEVANT AT THE NATIONAL, STATE AND LOCAL LEVEL:

- For some segments of the U.S. population and in other countries, the preterm birth rate is consistently much lower than the overall U.S. rate. These differences are poorly understood, but suggest that many preterm births should be preventable. For some high-risk women, access to preventive care is limited by lack of continuous health insurance coverage and other barriers. In Ohio, for example, more than 8000 preterm births per year may be preventable.
- Many factors increase a woman's risk of preterm birth: medical, social, behavioral, psychological, behavioral and environmental.
- There are multiple opportunities for substantial public and private cost savings associated with reduction in preterm births.
- Racial-ethnic and socioeconomic disparities in care and outcomes account, in large part, for the poor U.S. standing among developed nations. The U.S. will not be able to improve its standing in the world unless these disparities are directly and specifically addressed.
- More research is needed to better understand the causes of preterm birth and to evaluate existing and new interventions to reduce and prevent premature birth.

- Seventy-five percent of all premature births occur to women between the ages of 20 and 35.
- Evaluation of broad-scale, public interventions to prevent preterm birth may help identify highly effective programs. If existing programs were optimally effective, one could expect that the U.S.' preterm birth rate would be lower.
- Achieving improvements in the quality of care for women may require measurement systems that do not currently exist. Vital statistics systems are believed by many to be slow and of suboptimal quality. Public reporting of valid measures of high quality care and its outcomes is not widely available.
- Accurately determining the due date for every pregnancy is essential to preventing preterm birth.
 As recommended by the IOM, this will require early and easy access to quality obstetrical ultrasound services for all pregnant women. Policy makers, clinicians, payers will need to work aggressively together to make this happen.
- Public and private systems that pay for care are not aligned with recommended, evidence-based clinical practice. The benefit packages of health insurance programs, including Medicaid, should be aligned with best evidence so that access to care that improves health is available.

- Aggressive treatment of infertility leads to many preventable preterm births. Public educational campaigns aimed at consumers, payers and clinicians may be helpful.
- Although public education has had a significant impact on U.S. smoking rates, the number of pregnant women smoking during pregnancy remains unacceptably high. Available smoking cessation programs for pregnant women work but are not widely used. Evidence-based practices should be embedded in all parts of the health care delivery system. Policies can significantly affect change, particularly by assuring coverage for interventions that work. Second-hand smoke is a health hazard that could be addressed at the policy level, be it local, state, or national.
- Making sure that women get to the right care at the right time has an important impact on the risk of preterm birth. Every day in the womb makes a difference to the chances for a healthy infant. Care of high-risk women in hospitals with specialized services allows access to optimal care and results in much better infant outcomes.

- Elective delivery of infants near, but not yet at, their due date can improve outcomes for women with pregnancy complications. However, delivery of healthy women prior to term results in increased infant complications and cost.
- As it stands today, bringing research that identifies helpful new therapies to the care of people is a very slow process. This means that many women and infants miss the opportunity to receive proven beneficial treatment. Improvement collaboratives may speed the adoption of evidence-based practices⁵.

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