
MOTHER AND CHILD: A MULTI-DETERMINANT MODEL FOR MATERNAL AND INFANT HEALTH OUTCOMES IN URBAN, LOW-INCOME COMMUNITIES AND THE EFFECTIVENESS OF PRENATAL CARE AND OTHER INTERVENTIONS

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Research examining the outcomes of prenatal care has largely been restricted to medical interventions. Focusing on low-income women in urban communities, this paper first describes a broadened set of expectations of prenatal care and other interventions. It proposes a more holistic framework for analyzing policy choices by examining the numerous determinants that affect maternal and child health outcomes. Then, it examines policy options through these determinants.

INTRODUCTION

What we currently have in place is not a health care system but a disease care system. We have created a medical complex that is pretty darn good at diagnosing disease, managing disease, and sometimes curing disease, but not nearly so good at preventing disease—and

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sometimes it's only too good at creating disease.

—Dr. Ronald David, Wiener Center for Social Policy at the
Kennedy School of Government

Pregnancy, in economic terms, provides an opportunity for increased assets to a community as well as a demand for increased support from a community. A developed society responds to this demand and attains the assets primarily through prenatal care, a health-based intervention to assist the mother in carrying and delivering a healthy child. The goal of prenatal care, then, seems to be maximizing the health outcomes, however defined, of the mother and child. To put the objective more poetically, our society has committed to assisting the development of new lives.

This vision of pregnancy and childbirth is far from a reality in the United States, where infants are more likely to be born with low-birth weight than those born in almost any other developed country (Reichman & Teitler 2005, 151). Every year about 70,000 women, roughly 2 percent of pregnant women, receive no prenatal care (Taylor et al. 2005, 125). Minorities lack prenatal care disproportionately: 66 percent of those who receive no prenatal care are black or Hispanic, even though 65 percent of the pregnant population is white (ibid.).

Yet, prenatal care exemplifies the merits of preventative care. To the extent that proper care and education is given to the mother and diagnostics performed to anticipate any complications in the pregnancy to ensure greater predictability of labor, delivery, and the infant's antenatal care, prenatal services are extremely worthwhile from a simple cost-benefit analysis.

Historically, prenatal care's role has evolved from an obstetric intervention to a public health intervention that serves as a platform to other services (Agency for Healthcare Research and Quality 2000, 5). Because prenatal care is somewhat nebulous, it is increasingly difficult for researchers to recognize what characteristics are having a positive impact on the desired outcomes in their studies.

Generally, the use of prenatal care services has had a positive effect on the birth outcomes of infants (Gortmaker 1979; Institute of Medicine 1985; McLaughlin et al. 1992). Prenatal care has also proven apt in mitigating high-risk pregnancies (Sokol, Woolf, and Rosen 1980; Quick, Greenlick, and Roghmann 1981; Poland, Ager, and Sokol 1991). Moreover, a lack of prenatal care correlates to increased risks of premature births, low birth weight, neonatal and infant mortality, and maternal mortality (Showstack, Budetti, and Minkler 1984; Fisher, LoGerfo, and Daling 1985; Koonin et al. 1991).

While the number of women not receiving any care has dropped and the number of mothers commencing prenatal care in the first trimester has increased (U.S. Department of Health and Human Services, Health Resources and Services Administration 2005), a proportionate improvement in birth outcomes has not been evinced. Therefore, many question the efficacy of prenatal care for its inability to reduce premature births and low birth weight (Strong 2000). Prenatal care still fails to address some of the most persistent causes of poor health outcomes for both the infant and the mother. For example, a 1998 Patient Outcomes Research Team study revealed that eleven traditional interventions had no or only marginal effects on preterm birth rates or survival rates of low birth weight babies (Goldenberg 2002). The interventions were prenatal care, risk screening, nutrition counseling, bed rest, hydration, home uterine activity monitoring, and caloric, protein, and/or iron supplementation.

One explanation is that combining “complicated” and “normal” pregnancies makes prenatal care seem ineffective (Conway and Deb 2005). The data from the National Maternal and Infant Health Survey (NMIHS) demonstrates prenatal care’s effectiveness in reducing premature births and low birth weight in “normal” pregnancies. Since the purpose of this paper is to examine determinants of all birth outcomes, the exclusion of “complicated” pregnancies is inadequate.

Further, the outcomes measured should not be limited to birth outcomes. Rather, evidence suggests the benefits of prenatal care for women’s general health during pregnancy and postpartum (Haas et al. 2004, 48-9). Utilization of prenatal care services predicts the continuation of healthcare services after giving birth for both the mother and for the child (York, Tulman, and Brown 2000, 39).

One way of increasing the scope of prenatal care is to pursue a life-course perspective in which pregnancy is not an isolated event but instead a possibility during the childbearing age of a women’s life (Misra, Guyer, and Allston 2003). In this context, one can better analyze what prenatal care must address and what outcomes it should pursue. In addition, this model looks at prenatal care as only one of many forms of policy interventions.

Prenatal care has an enormous impact on not only the immediate maternal health and the infant characteristics such as gestational age and infant birth rate, but also on the child’s quality of life, including educational and economic outcomes (Herzig et al. 2005, 1). Additionally, access to quality prenatal care also has the potential of improving quality of life for the mother by serving as an entry point to adequate medical care and other related social services that might alter the trajectory of the mother’s life path.

Because of its prominence, prenatal care warrants much study. Strangely, much of the evaluation is done through review processes that focus on maternal, child, infant, and fetal mortality (Hutchins, Grason, and Handler 2004, 259). These retrospective approaches take only the most extreme cases and ignore the more subtle and subversive products of the inadequacy of maternal and child health services. Thus, by focusing on fatalities, these reviews ignore the populations whose health is adversely affected or not significantly improved through pregnancy.

Despite this limitation, much research concerns itself with the characteristics required to provide adequate prenatal care. Additionally, researchers have isolated several pre-pregnancy factors that have an enormous impact on the maternal and infant health outcomes. Yet, largely absent from the discussion is what policy interventions, in addressing these pre-pregnancy determinants, would most readily improve the maternal and infant health outcomes.

Also buried in the clash over competing ideas of service provision and behavioral interventions is the notion that prenatal care can serve as an opportunity for women and the society in which they live. In this way, prenatal care can help to undo past harms, alter risky behaviors, build capacity for better health, broadly defined, and create bridges between women and the community. Thus, pregnancy has the potential to serve as an opportunity to ensure a healthier child and mother (Herzig et al. 2005, 1).

Given the current state of research on prenatal care and the policy environment on the subject, this paper seeks to perform five interrelated tasks: (1) describe the population of urban, low-income women of childbearing age and their relationship with pregnancy and childbirth, (2) outline the desired outcomes in this policy arena, (3) explore all of the major determinants, prior to and during pregnancy, of maternal and infant health outcomes, (4) survey the main policy interventions currently available, and (5) propose a more expansive and ambitious model for evaluating prenatal care outcomes and analyzing policy choices.

IDENTIFICATION OF THE POPULATION

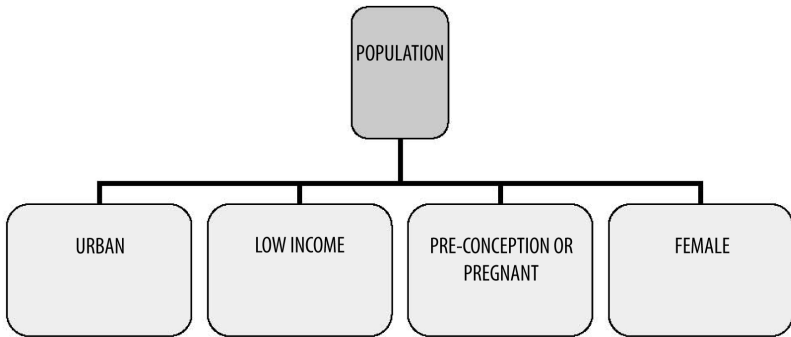
The horrible part is the disparity. The places where kids do well, they do very, very well. And places not doing well, they do very, very badly.

—Anne Roberts, executive director of the
Oklahoma Institute for Child Advocacy

As advocated at a conference held by the Agency for Healthcare Research and Quality in the summer of 2002, research must explore the effectiveness of prenatal care on different populations. While studies have analyzed the varying role of prenatal care in women of specific subgroups that have below average maternal and child outcomes, they tend to focus on specific interventions or determinants. This paper is unique in applying a multi-determinant framework to the population of urban, low-income women of childbearing age in the United States. Because other groups deserve exploration, this approach might serve as a guide to future studies.

Before exploring the determinants, this paper will assess the focus population and explain how the subgroup fits into the whole population of pregnant women in order to better understand the context.

Table 1: Focus Population



The target population is women of childbearing age who live in American, urban, low-income communities (See Table 1). The reasons for selecting this population are three-fold: (1) because they suffer from poor or no prenatal care disproportionately, (2) because this group has several factors that make it a recognizable subset of the population, and (3) because several policy interventions have targeted this community. More than 20 percent of women ages eighteen through twenty-four live below the federal poverty level, compared to a national average of less than 13 percent (U.S. Census Bureau 2005).

These women also live in communities of concentrated poverty (Bishaw 2005, 11). Half of all low-income families live in metropolitan areas, while cities only contain one-third of the population. In Detroit, Michigan, El Paso, Texas, and Miami, Florida the poverty rate surpassed 28 percent (U.S. Census Bureau, American Community Survey Office 2004). These

high-poverty city neighborhoods experience much higher incidents of chronic and infectious diseases and poorer medical outcomes (National Neighborhood Indicators Partnership 2005, vii). Seventy-two percent of city dwellers are racial and ethnic minorities.

Within these communities, the number of births are increasing for Hispanic, Asian/Pacific Islander, and American Indian women and remaining stagnant for non-Hispanic black women. In contrast, births for non-Hispanic white women have continued to decline. (Hamilton et al. 2004, 1).

In 2004, 84.1 percent of all mothers initiated prenatal care in their first trimester (Martin et al. 2005, 3). Only 76.0 percent of non-Hispanic black women and 77.4 percent of Hispanic women receive prenatal care in their first trimester, compared to 89 percent of non-Hispanic white women (Martin et al. 2005, 624). Consequently, disparities in birth outcomes amongst these groups remain. In Detroit, for example, the infant mortality rate for black babies is 18 out of every 1,000 births compared to 6.7 out of every 1,000 white babies statewide (Anstett 2005, 1).

Three and one-half percent of women received care beginning in the last trimester or did not receive care at all in the United States. According to Taylor, Alexander, and Hepworth, the most dominant cluster of women who do not receive care is young, black, poorly educated, and has very high behavioral risk factors (2005). When researchers control for the different financial determinants that would affect access to care, by examining pregnant women on Medicaid, they still found that the chances that a black non-Hispanic woman lacked prenatal care was two to three times higher than for a white non-Hispanic woman (Gavin et al. 2004, 121). Minority women were also less likely to initiate prenatal care early, to receive recommendations for services such as ultrasounds and alpha-fetoprotein tests, and to accept these services (Gavin et al. 5).

For those women who received no prenatal care, their infants were six times more likely to be born with very low birth weight, five times more likely to be stillborn, and six times more likely to die within the first year (Taylor et al. 2005, 128-9).

In 2003, the percentage of children born with low birth weight rose to its highest level since 1970 (Martin et al. 2005, 619). Almost 8 percent of all births were classified as having low birth weight (less than 2,500 grams) (Martin et al. 2005, 2). Infants with very low birth weight (less than 1,500 grams or 3 lb. 4 oz.) are nearly one hundred times more likely to die in their first year of life than infants who weigh more than 2,000 grams. Additionally, 12 percent of all babies were born preterm (Martin et al. 2005, 1).

OUTCOMES

While it may seem perfunctory, it is critical to outline the expectations of prenatal care and other policy interventions targeting pregnant women. These goals can be divided into four areas: child, maternal, programmatic, and social. In general, this section will take a more expansive view of the goals of this policy arena than are currently in place. Still, each area will include with some of the objectives proposed as National Performance Measures by the Maternal and Child Health Services Title V Block Grant Program (HRSA Maternal and Child Health Bureau 2005). Where applicable, the goal will note the Healthy People 2010 (HP) objective with which it aligns (U.S. Department of Health and Human Services “*Healthy People 2010*” 2000).

The presence of the child is the distinguishing feature of prenatal treatment. Therefore, policy goals tend to focus on infant health. One goal is increasing the average gestational age at delivery. Another is decreasing the percentage of infants born with low and very low birth weight (HP 16-10a, b).

In terms of educating the mother, one marker is to increase the percentage of mothers who breastfeed their infant at six months of age (HP 16-19a). As a signal of the integration of the child into the community, another goal is decreasing the percentage of children without health insurance (HP 1-1). A final, more long-term objective is ensuring that the child continuously functions at or above developmental age.

Because the pregnant woman is the intended recipient of services, her compliance and satisfaction tends to take primacy. The first goal is to increase initiation of prenatal care in the first semester (HP 16-16a). Next, the providers seek to improve the adequacy of prenatal care according to the Adequacy of Prenatal Care Utilization (Kotelchuck) index (HP 16-16b). Goals that focus on the mother’s health include decreasing maternal mortality, decreasing short- and long-term maternal diseases and complications, and generally improving health and well-being. Related interests might include substance abuse cessation (HP 27-6), domestic abuse response, and acquisition of job-related skills.

Outcomes may also be measured from a programmatic viewpoint. These concerns include increasing the retention rate of mothers in prenatal care programs, reducing the number of skipped appointments, and increasing satisfaction of patients with the quality of care.

The goals of prenatal policy can be stated more broadly. Chiefly, the focus will be on eliminating inequities in pregnancy health outcomes by race and ethnicity, by federal program enrollment, and by geography.

DETERMINANTS

Many different factors affect the maternal and infant health outcomes. They can be divided into three categories: (1) pre-pregnancy factors (those characteristics belonging to the mother), (2) individual responses (the choices a woman makes after conception and the attitudes that shape them), and (3) system responses (how health care and other service providers care for the pregnant women). These areas then encapsulate the more specific determinants that play a role in the outcomes related to childbirth.

Pre-pregnancy factors

Risk factors are not limited to what is present or measurable during pregnancy. Rather, a life-course perspective includes variables of maternal health prior to pregnancy through either the early programming mechanism or the cumulative pathway mechanism (Lu and Halfon 2003, 16). These traits do not cease to exist once a woman becomes pregnant. Instead, many tend to play an even larger role in determining health outcomes. However, most studies tend to examine this demographic information as unimportant until the point of conception. The life-course framework evaluates how these factors shape decisions before, during, and after pregnancy.

One major factor in the health outcomes of the mother and child is the health status of the mother prior to becoming pregnant. An evaluation of the outcomes of childbirth must consider genetic predispositions, including a woman's health behaviors. For example, a woman's pre-conception diet, particularly consumption of folic acid, can have a tremendous impact on infant health outcomes. Folic acid reduces the risk of neural tube defects, placenta-mediated pregnancy complications, and orofacial clefts (D'Angelo and Gilbert 2002, 12).

In addition, substance abuse has been linked generally to several adverse birth outcomes (Little et al. 2005). Maternal smoking leads to several negative outcomes, including fetal and infant mortality, prematurity, and intrauterine growth retardation (D'Angelo and Gilbert 2002, 6). Postpartum exposure to smoking also places children at increased risk for lower respiratory infection, ear infection, and asthma (6). Alcohol consumption during pregnancy can cause Fetal Alcohol Syndrome, Alcohol-Related Neurodevelopmental Disorder, low birth weight, and premature delivery (Day et al. 2002, 1584; Mattson, Schoenfeld, and Riley 2001, 185; Morse and Hutchins 2000, 225; Mick 2002, 1392; Richardson et al. 2002, 309; Zuckerman and Bresnahan 1991, 1387). Drug abuse also negatively affects maternal attachment and infant temperament (Quinlivan and Evans 2005, 191).

Pre-pregnancy factors are not limited to physical health; they include mental health as well. Women that are lower income, unmarried, less educated and live in an urban setting tend to have higher incidence of depression (Seto et al. 2005). Nationally, 8.5 to 11 percent of women experience minor or major episodes of depression while pregnant (Women's Health USA 2005). The strain of a woman's life can have an adverse impact on the development of the fetus and can contribute to chronic depression (Seto et al. 2005, 8).

Beyond health, age, poverty level, marital status, and minority status are other important demographic factors. Teen mothers are at an increased risk of obtaining late or no prenatal care (Kiely and Kogan 1993, 108; The Alan Guttmacher Institute 2004, 2). Women living below the federal poverty line also fare poorly in initiating prenatal care (Kiely and Kogan 1993). The insufficiency or inadequacy of prenatal care providers in low-income areas limits the use of prenatal care (Kiely and Kogan 1993). Additionally, women who report racial discrimination have impaired health outcomes, so while race and ethnicity have little effect as a biological factor, they do play a role socially (Lu and Halfon 2003, 23). In 1988, unmarried mothers were over three times more likely to receive late or no prenatal care (Kiely and Kogan 1993).

The physical and social environment in which a woman lives also plays a role in pregnancy outcomes. Toxins and other ecological determinants are important factors in birth outcomes. Yet, maternal and child health research largely neglects environmental policy. Housing is also a key component in improving outcomes. Homeless or under-housed women gave birth to infants one week earlier and weighed 260 grams less than the control group (Little et al. 2005, 616).

In urban, low-income settings, domestic violence is another threat. Twenty-five percent of women in the United States report having experienced an incident in which an intimate partner committed a violent act towards them (Lipsky et al. 2004, 55). Between 4 and 8 percent of women reported abuse while pregnant (ibid.). One-third of the women with reported intimate partner violence were non-Hispanic African American and one-third were non-Hispanic white (ibid., 58). In general, they were younger, had lower educational attainment, more likely to be enrolled in a public health program, and had subsidized or no insurance (Lipsky et al. 2004, 58-9; McFarlane et al. 2005, 101). This violence not only threatens the immediate maternal and fetal health but also creates poorer maternal attachment and infant temperament (Quinlivan and Evans 2005, 191; D'Angelo and Gilbert 2002).

Ties to the community and life stability, namely through education and employment, relates to the likelihood of success with prenatal care. Only 53 percent of mothers without a high school diploma sought prenatal care in the first trimester (Kiely and Kogan 1993). Even when given access to prenatal care, women with low educational attainment are still one and one-half times less likely to initiate prenatal care (Kaiser Family Foundation 2003, 3-4). While research has not found a direct link between holding a job and childbirth outcomes, many jobs offer private health insurance. Employment also provides a social support network and may offer an opportunity for a woman to take leave in order to recover. For these reasons, employment is another important factor to consider. Likewise, the ability to reach out to family, friends, or members of the community may have a strong coping effect in helping to deal with the strain of pregnancy and other life events.

Usage of quality health services is a critical factor in “preventing disease and improving women’s quality of life” (U.S. Department of Health and Human Services “Women’s Health” 2005, 62). Attending regular visits from the same provider ensures a wide range of services. Yet, 22 percent of low-income California women had health insurance but lacked a regular provider prior to conception (Braveman, Marchi, and Egerter 2000, 876). This lack of utilization results not only in poorer health outcomes, but also higher costs (U.S. Department of Health and Human Services “Women’s Health” 2005). The primary barriers to healthcare are enormous costs and lack of insurance. The U.S. Census’s Current Population Survey estimates that 45 million individuals, or 15.6 percent of the U.S. civilian non-institutionalized population, lacked health insurance for the entire year (Callahan and Mays 2005, 1).

However, public insurance programs have helped to fill this gap and allow women to receive prenatal care (Salganicoff 1997, 78). For example, the expansion of California’s Medicaid over the past two decades has led to a sizeable increase in prenatal care coverage and utilization (Rittenhouse, Braveman, and Marchi 2003, 75). Participation in other federal programs such as food stamps or Women, Infants, and Children (WIC) may ameliorate some of the other determinants such as nutrition and affordability of healthcare (U.S. Department of Health and Human Services “Women’s Health” 2005). Nevertheless, in the wake of welfare reform, many women are not receiving insurance until after they realize they are pregnant, further delaying the initiation of services (Handler 2004, 3-4).

Even when health insurance is available, the information a woman has on basic health and where she acquired this knowledge are important fac-

tors in understanding how she views her health and the healthcare system (Lewallen 2004, 200).

Individual Responses

Once a woman is pregnant, she engages in a set of behaviors that can have tremendous consequences on her health and the health of her child. To realize the importance of her actions, a woman must first know she is pregnant. This is not always the case. Twenty percent of pregnant women do not initiate prenatal care in the first trimester because they are unaware that they are pregnant (Kaiser Family Foundation 2003, 3). Intuitively, a woman cannot seek prenatal care until she knows she is pregnant.

How a woman embraces the news also shapes the level of prenatal care sought. In a study of low-income women in California who had insurance but did not seek prenatal care, 43 percent had unwanted pregnancies and 66 percent had unplanned pregnancies (Braveman, Marchi, and Egerter 2000, 875). Intention strongly relates to birth outcomes, such as low birth weight, and correlates with risky maternal behaviors such as drug use and failure to commence prenatal care (D'Angelo and Gilbert 2002, 4).

A lack of early prenatal care prevents health care workers from giving tests and imparting health education, increasing the risk of complications going unnoticed or risky behaviors being maintained (U.S. Center for Disease Control 2000, 2924). A number of other determinants explain why women do not commence prenatal care sooner or at all. Of the 70,000 women annually who receive no prenatal care, 29 percent were married, compared to the population of 67 percent. Thirty-six percent were living in an urban residence, whereas only 22 percent of all pregnant women live in this environment. In all, "women receiving no care were more likely to be black or Hispanic, unmarried, younger, less educated, foreign born, multi-parous, and urban dwelling" (Taylor 2005, 127).

Even if a patient receives Medicaid, prenatal care still comes at a cost. In a study examining why women did not access prenatal care, many cited personal reasons including difficulty with appointment scheduling, transportation, and childcare (York et al. 1999, 57). The woman must pay for transportation to the provider site. Moreover, women with other children must find childcare during their visits (Stringer, Ratcliffe, Evans, and Brown 2005, 555). The long wait at the clinic creates lost opportunities. In order to attend prenatal care visits, women must sacrifice time from work or school (Stringer, Ratcliffe, Evans, and Brown 2005, 555).

Lastly, a belief that the receipt of prenatal care was unimportant also made it less likely she would attain prenatal care (Kaiser Family Foundation

2003, 4). In situations where a strong social network exists, a woman may have the power to embrace pregnancy and alter her behavior. Closely linked to the above determinant, awareness of pregnancy may create, on its own, a willingness to alter certain behaviors that place the infant at risk.

System Responses

The next set of processes describes how the healthcare system and related services respond to the need for prenatal care. The distribution of obstetricians and gynecologists is not proportionate to the areas of need. In some neighborhoods, access to a qualified provider may be difficult. Even if a woman has a local obstetrician, facilities for high-risk deliveries and neonates may be lacking. If complications occur, special facilities may be required to assist in treating the mother and child.

Ross and Begala have identified eighty-one program measures that serve as checklist for inputs that provide quality care (2005, 65). While these cannot all be examined here, a few key inputs will be discussed. First, the length of interaction with providers is crucial. Caregivers who thoroughly explain procedures to their patients improve patient satisfaction with care, which is linked with better health outcomes (Handler et al. 1998, 685).

The way in which providers coordinate their services may influence the effectiveness of individual interventions and reduce the costs to the patient. The availability of ancillary services such as childhood education may also make low-income women more satisfied with prenatal care (Handler et al. 1998, 680). Given some women's negative view of healthcare systems, providers and provider sites must be keenly aware of the need to consider the patient's reservations and to approach them with caution and respect. One tangible requirement is the presence of a staff member who can speak the language of the patient (HRSA 2004, 16). Generally, the way providers present their services will affect the way a patient embraces the services.

POLICY OPTIONS

This section includes information about what policy choices these determinants may signal. While a thorough analysis of each policy option is not possible at this point, each policy surveyed addresses its effectiveness and feasibility in the context of the determinants. These policy interventions form two categories: pre-conception and prenatal. These are obviously not exhaustive, as there is a whole range of neonatal and early childhood interventions that may have an impact on the child's health. Finally, this section will discuss further research areas, and how this methodological approach could be used for a more expansive study that could then draw

more concrete recommendations for public health policy. The result is to encourage policymakers to take a more holistic account of improving maternal and child health outcomes by tailoring a coordinated package of services.

Preconception Interventions

As the pre-pregnancy determinants indicate, the health of the mother and child does not begin at conception. Therefore, a large potential arena for improving the condition in which women arrive for their first prenatal care appointment is to not limit social programs to pregnant women. Rather, policymakers should take a more expansive approach to include all women of or nearing childbearing age.

Education: As educational attainment is an important factor in initiation of prenatal care and birth outcomes, one option would be to increase the educational attainment of women of childbearing age, either by improving the public education system as a whole or by targeting programs toward this population, such as evening General Equivalency Diploma courses for women who work. These interventions would not only yield a better educated group, and thus a more productive group, but also have a residual impact on maternal and child health outcomes. However, funding and participation would be two major obstacles.

Health insurance: While some forms of public insurance are now generally available for pregnant women, another vehicle for improvement might be the expansion of health insurance. This recommendation entails not only reduction of eligibility requirements, but also improvements in convenience of enrollment and participation. Having health insurance prior to conception would serve two main purposes: It would build a bridge between women and healthcare providers and decrease the lag-time between conception and enrollment in “pregnancy” insurance. If Medicaid expansion in the 1990s had included low-income women generally, half of the women currently without insurance would have Medicaid coverage (Hughes and Runyan 1995, 156). The major feasibility issues under such a scheme are costs, infrastructure, the quality of service provided, and the level to which eligibility expands.

Employment: While this may seem counterintuitive to the efforts made by the National Family and Medical Leave Act, employment can be a positive force in childbirth outcomes as it expands the woman’s social network, extends an additional incentive to end risky behaviors, and, in some cases, provides a woman with private health insurance. For women who are unable to attain insurance through an employer because they lack

marketable skills, an integrated job-training program would be helpful in securing a steady stream of income, more extensive contact with the community, and a more consistent environment for the child. The feasibility of job training and placement strongly depends on the effectiveness of educational interventions.

Nutrition: Because women's dietary circumstances prior to conception play a contributing role in health outcomes, certain nutrition programs like WIC and food stamps should be extended to women who are of child-bearing age, but who may not meet the income requirements. Increasing the percent of federal poverty level cut-off or by creating new eligibility requirements based on age and gender (such as all women between the ages of fourteen and forty-four) could accomplish this result. Early participation in the New York State WIC contributed to higher birth weights (Bauer et al. 2004, 80). This policy would face obstacles of cost, American social concepts of deservingness, and the limitations of these current programs to improve nutrition.

Access to contraception/family planning: A major contributor to the desirability of the pregnancy is the availability of family planning services. As the population experiences a great deal more unwanted and unplanned pregnancies, it points to a need for expanded family planning resources (D'Angelo and Gilbert 2002; Kaiser Family Foundation 2003). Services that provide access to family planning should be expanded. Again, political considerations challenge this policy option.

Prenatal Interventions

These policies are restricted to the treatment of women once they discover they are pregnant. They represent the bulk of efforts to improve maternal and child health outcomes. They generally call for expanding the access to prenatal care, the content of the services, and quality of care.

Access

Despite tremendous efforts on this front, each year, about 70,000 women in the United States receive no prenatal care (Taylor, Alexander, and Hepworth 2005, 125). As discussed in the Determinants section, lack of access disproportionately affects this study's target population. Here are a few specific interventions designed to improve prenatal care access.

Insurance coverage: One of the greatest barriers is lack of insurance. The expansion of Medi-Cal serves as an important lesson to the potential of improving the utilization of services by increasing insurance coverage (Rittenhouse, Braveman, and Marchi 2003, 75). The improvement in utilization also coincided with the shift from fee-for-service to managed

care, demonstrating the interrelatedness of these policy interventions (83). However, a change in services may disrupt enrollment procedures, as was seen in Tennessee's move to capitated Medicaid care (Ray et al. 1998, 316).

Speeding up initiation of services: Since low-income women make up the bulk of the maternity population, programs designed to improve timely care should not be limited to Medicaid populations or other special needs groups (Braveman, Egerter, and Marchi 1999, 868). The availability of prenatal care depends heavily on the burden to the mother of scheduling and keeping an appointment. These factors include location, available times for appointments, waiting time, transportation, childcare arrangements, and other barriers (Golden, Besculides, and Laraque 2001, 6).

While some clinics accept the presence of older siblings in the waiting room, others discourage it. The availability of childcare to allow the mother to attend prenatal visits and other related service meetings would ease this burden. Understanding and responding to the burdens placed on women in accessing prenatal care is necessary to encourage program retention and the adequacy of care.

Content

Once the care begins, the content of services becomes important. Korst and others discuss the various indicators to measure maternal quality of care (2005, 1). Among the indicators are various screenings included such as Triple Marker, Chlamydia screening, and HIV Testing (U.S. Centers for Disease Control 2002, 2679). The indicators also include in-house anesthesia, continuous fetal monitoring, and antenatal corticosteroid use. This list of standard medical tests and procedures should be revised to include the most up-to-date and relevant protocols and adopted by state obstetrics and gynecology boards in order to ensure a satisfactory level of care by all providers (Jessop et al. 2005, 259-60).

Mental health counseling: Depression during the childbearing years has negative consequences for the mother and her offspring (Gelfand 1990, 329). Depressive symptoms, once present during pregnancy, are likely to continue across ten postpartum years (Seto et al. 2005, 1). Providing medical health counseling to women who demonstrate depressive symptoms during pregnancy may improve the climate of fetal development and reduce the prevalence of post partum depression (Seto et al. 2005).

Health promotion and psychosocial services: Another intervention, which has inconsistent availability, is health education. These classes may cover prenatal behavior (Taylor et al. 2005, 177), childbirth, parenting, and breastfeeding (Mitra et al. 2004, 67). Receiving health promotion

and psychosocial services during prenatal visits attributed to patients' increased satisfaction with their prenatal care (Korenbrodt, Wong, and Stewart 2005, 135).

Substance abuse screening: Screening for alcohol use and abuse is sporadic at best. However, at least one program demonstrated the possibility of screening 95 percent of pregnant women for alcohol use and successfully providing at least one intervention within the prenatal office visit for 77 percent of the women who tested positive (Kennedy et al. 2004, 137). In addition to screening, treatment should include new drug therapies that improve the likelihood of cessation (Rayburn and Bogenschutz 2004, 191). Another interesting observation is that women who have partners who are quitting smoking at the same time are more likely to also quit and maintained their cessation through the postpartum period (Ma et al. 2005, 1), again demonstrating the interrelatedness of the policy interventions.

Housing: Homelessness or inadequate housing makes a mother almost seven times more likely to deliver an infant with low birth weight (Little et al. 2005, 615). Programs that provide free housing for homeless pregnant women may reduce women's exposure to environmental pollutants and risky behaviors.

Domestic violence prevention & intervention: Women experiencing intimate-partner violence were more than twice as likely to be hospitalized with a pregnancy-related condition (Lipsky et al. 2004, 59). Therefore, much of the research recommends domestic violence screening for all pregnant women (Korst et al. 2005, 7). Because women will likely receive more healthcare while pregnant than any other time, prenatal care serves as a window to end the cycle of intimate partner violence plaguing many women (McFarlane, Socken, and Wiist 2000, 449).

Other general services: Education, employment, and nutrition programs may still be effective if introduced during the perinatal period. However, one challenge is the limited opportunity to achieve programmatic goals (nine months), and the additional burden these goals would place on pregnant women already stretched by new health needs.

Quality

While the type of services provided matters, equally important is the manner in which they are provided. Healthcare providers have made efforts to improve delivery models, to make their services more accessible, and to ensure they are getting the results they seek. However, more can be done to improve the delivery model, the cultural competency, and accountability mechanisms.

Delivery models: Another potential area of improvement is through the

reevaluation of models of care (Singer and Regenstein 2002, 11). Outreach services could improve by collaborating with other community organizations and hiring committed health professionals (37-8). Additionally, adaptability and individualization are key components in improving prenatal outcomes and managing health care costs (Walker and Rising 2004/2005, 20). Research also indicates that age-based, specifically teen-centered models, may improve outcomes in those subgroups by modifying the manner in which the services are provided and creating a more welcoming environment (Bensussen-Walls and Saewyc 2001, 432).

Cultural Competency: Parallel to the idea of tailored delivery models is the need for cultural competency. Healthcare providers must be aware of the context in which they are addressing their patient's health needs. Providers must also be able to communicate in the style and language of the patient's preference. This approach increases the adequacy of care by making mothers more likely to attend visits and follow doctors' orders (HRSA 2005, 1).

Accountability Mechanisms: In order to ensure the content and quality of care is standardized for specific populations, local health departments should hold the role of monitoring prenatal care provision and standard operating procedures (Strobino et al. 2002, 7). This framework will discourage pockets of inadequate treatment by creating minimum or group-specific standards.

CONCLUSION: A PROPOSAL TO EXPAND THE SCOPE OF PRENATAL CARE

While fervent advocacy for particular policies would be unsubstantiated and improper at this stage, the literature unveils a heavy bias towards prenatal, medical interventions as having the greatest hopes for improved childbirth outcomes. Yet, the multi-determinant map indicates that some of the largest determinants are in place prior to conception and cannot be addressed by medical interventions. Although it is logistically more difficult to target a population pre-conception, some of the interventions addressed in this analysis may be more effective in improving maternal and infant outcomes, in addition to the myriad of other benefits they may yield.

As other authors have concluded (Lu et al. 2004, 379; Reichman and Taylor 2005, 156), prenatal care is not the silver bullet theory it once was held to be. Nonetheless, evaluations of prenatal health interventions should continue. Building from this research, a more expansive understanding of maternal and child health is vital to most effectively improving the outcomes of both mother and child.

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