OBAMA-BIDEN TRANSITION PROJECT

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The Relationship between Work-Family Benefits and Maternal, Infant and Reproductive Health: Public Health Implications and Policy Recommendations

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Work-Family Benefits Definition

Work-family benefits, or work-family reconciliation (WFR) as it is known internationally, are efforts that are designed to help women and men engage in paid employment and participate in childrearing responsibilities without jeopardizing the status of their job or the health/well-being of themselves or their families.

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Some WFR benefits assist families in reducing the costs associated with having children and redressing some of the burden of lost wages associated with caring for children. Examples of such measures include subsidized child care, tax credits/breaks, cash grants, low interest loans, and housing incentives.

Some countries have adopted policies directed at countering the long-term costs of childrearing on female employment trajectories. Examples of policies to promote gender equity in employment include tax structures that encourage second earners to work, pension systems that provide credit to parents of young children while on leave, and established mechanisms to protect female employees from workplace discrimination practices (dismissal, wage penalties, and lack of advancement/promotional opportunities).

Certain WFR policies concentrate on work conditions that allow parents to participate in the labor force while also managing their domestic responsibilities. WFR efforts include parental leave provisions and time-related supports such as flexible work schedules, sick days, and availability of part-time employment.

WFR policies are intended to address multiple issues including declining birthrates, female labor force participation, and the gender equity gap. From a public health perspective, most critical is the relationship between WFR policies and their effect on maternal, infant, and reproductive health outcomes. Examples derive from all of the previously mentioned categories and include maternity and parental leave, expansive/flexible sick leave provisions that include children's needs, breastfeeding support at work, and childcare assistance.

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Executive Summary

U.S. public policies have not kept pace with certain key social changes. These include such dramatic demographic shifts as an increase in the number of women participating in the workforce and a similar rise in the number of working mothers of young children. Women also are delaying the age of marriage and first birth as they extend their years of education and secure careers. Concurrently, the large "baby boom generation" is nearing retirement and today's workers will be confronted with the challenges involved in balancing the responsibilities of work with those of childrearing while also providing care to older relatives.

The long-term changes in women's employment patterns and stagnant policies contribute to significant work-family conflict in the U.S.

The U.S. government has done little to address the inherent difficulties of balancing family needs and work responsibilities. The long-term changes in women's employment patterns and stagnant policies contribute to significant work-family conflict in the U.S. Moreover, this policy gap has important public health implications for reproductive, maternal, and infant/child health outcomes.

Work-family benefits are designed to help women and men engage in paid employment and participate in childrearing responsibilities without jeopardizing the status of their job or the health/well-being of themselves or their families. Historically, these policies have been intended to address such issues as female labor force participation, the gender gaps in wages and employment opportunities, and declining birthrates. This report is unique as it frames the issue in terms of public health, and reviews the evidence linking work-family benefits and reproductive, maternal, and infant/child health outcomes in New York City.

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Certain Americans receive generous work-family benefits while others have minimal or no access to any assistance. In the U.S., employees with the greatest need for benefits—single-parents, low-income workers, or those with minimal education—generally are the people least likely to work at jobs with generous benefits. These inequities in access to and use of work-family benefits exacerbate preexisting health disparities, which is detrimental for children and their families and also has long-term costs for society.

This report examines the empirical associations between paid sick days, flexible work arrangements, subsidized child care, paid family leave, policies that address delayed childbearing, and the provision of breastfeeding accommodations and reproductive, maternal, and infant health outcomes. Comprising three sections—a literature review of public health implications; an overview of state and local work-family policies as they relate to public health; and policy recommendations—the report makes the public health case for developing work–family benefit policies on the local, state, and federal levels.

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Section 1 critically assesses the scientific evidence base regarding the associations between workplace conditions and specific reproductive, maternal, and infant/child health outcomes, as follows:

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Reproductive Health Outcomes:

Preterm birth: Physically demanding work including prolonged standing, long work hours, irregular work schedules, heavy lifting and high physical activity has consistently been shown to cause a significant, albeit modest, increased risk of preterm birth. Psychosocial factors such as stress have also been associated with preterm birth in a number of recent studies.

Low birthweight (LBW): Physically demanding work, including prolonged standing, irregular work schedules, long weekly working hours, physical activity, and heavy lifting consistently has been shown to be associated with a modestly increased risk of LBW.

Pregnancy-induced hypertension (PIH) and preeclampsia: Evidence on the relationship between work-related conditions and PIH is sparse and mixed. Several studies report positive associations between high levels of physical activity at work and PIH, as well as between work-related stress and increased risk for PIH, whereas other studies have not found any such significant relationships. Several studies have found an association between physically demanding work and preeclampsia but are limited by methodological problems (small sample size, retrospective study design, etc).

Spontaneous abortion: Significant associations have been found between exposure to specific solvents, heavy metals, and chemicals and increased risk for spontaneous abortion. Findings are mixed regarding any relationship between physically demanding work (prolonged standing and long weekly work hours) and spontaneous abortion.

Congenital anomalies: Findings on the relationship between work-related exposures and congenital anomalies are mixed, with some studies reporting that chemicals associated with particular occupations increase the risk for specific birth defects, while other studies did not confirm these findings.

Maternal Health Outcomes:

Delayed childbearing: Older mothers are more likely to have preexisting health conditions such as hypertension and diabetes, conditions associated with an increased risk of preeclampsia, abruption, and caesarean deliveries. These age-associated risks begin at earlier ages for African-American women

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than for white women. An additional consequence of postponing marriage and childbearing has been the increased use of assisted reproductive technologies (ARTs) in helping women to become pregnant at later, less fecund ages. Studies have found that children conceived as a result of ARTs are at an increased risk for a range of adverse health outcomes, including preterm birth and its sequelae, and specific anomalies, as compared to children who were conceived spontaneously. Policies that support earlier childbearing are limited in the U.S., but have important health implications for all women and may be even more critical for the health of African-American women.

Postpartum maternal health: The evidence is sparse but indicates that new mothers may require at least six weeks to physically recuperate following a normal spontaneous delivery. An extended period of recovery may be necessary following a cesarean section or a complicated delivery. In recent decades there has been a dramatic increase in cesarean deliveries in the U.S. and, in 2006, the national rate reached an all-time high of 31.1% of all births. Postpartum depression also is a serious maternal health issue estimated to affect approximately 12% of women. Prolonged maternity leave or other work modifications or parental supports may impact both the physical and mental health of women.

Infant/Child Health Outcomes and Needs:

Breastfeeding: Breastfeeding initiation is not adversely affected by employment unless the new mother returns to work within 6 weeks of giving birth, whereas employment status does have a strong impact on breastfeeding duration.

Developmentally-appropriate child care: There is consensus in the literature that out-of-home child care and early education for 2-4 year-olds is beneficial for both developmental and health outcomes, although consensus and data are lacking regarding child care arrangements during the first year of a child's life.

Section 2 outlines the public health rationale for WFR policies and surveys U.S. efforts at the state and local levels to address work-family issues.

The second section of this report outlines the public health rationale for WFR policies and surveys U.S. efforts at the state and local levels to address work-family issues including:

Paid Sick Days

Public Health Rationale

- Prevents sick employees from spreading infectious diseases to co-workers and others with whom they have contact.

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- Enables parents to care for sick children at home, which has been shown to help children recover more quickly from illnesses and hospitalizations.

- Reduces the likelihood that children will attend school when sick, which can lead to the spread of infectious diseases to other children and adults.

Policies

Federal	Senator Edward Kennedy (D-Massachusetts) and Representative Rosa DeLauro (D-Connecticut) introduced the Healthy Families Act.
State	California: The Healthy Families, Healthy Workplaces Act passed in the State Assembly in May 2008, but failed to pass in the State Senate.
	New York: Coalitions of advocates, labor unions, and policymakers are developing legislative proposals.
Municipal	Legislation has been enacted in Washington, DC, and San Francisco.

Flexible Work Arrangements

Public Health Rationale

- Chronic work-related stress is associated with poor health outcomes including cardiovascular disease, psychological disorders, workplace injuries, musculoskeletal disorders, and adverse pregnancy outcomes.

- Children's health suffers when parents lack the time to provide proper care and attention.

Policies

State	Hawaii, Washington: Provide tax incentives for private employers.
	New Jersey, Illinois, Virginia: Allow flexible schedules for state employees.
	California, Arizona, Virginia: Taken steps to reduce traffic congestion and pollution.
	Montana: Established job-protection laws for employees who make use of flexible work benefits.
	Florida, Oklahoma, Illinois: Established flexible work provisions that allow employees to attend to family responsibilities.

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Paid leave at birth/adoption of child

Public Health Rationale

- Helps women physically recover from labor and delivery.
- Provides time for both parents to bond with newborn or newly adopted child.
- Can contribute to prolonged breastfeeding duration.

Policies

Federal	Senators Chris Dodd (D-Connecticut) and Ted Stevens (R-Alaska) have introduced the Family Leave Insurance Act.
State	California, New Jersey, Washington: Passed paid leave legislation.
	New York, Rhode Island, Hawaii: Use existing temporary disability insurance (TDI) systems to provide paid leave.
	California, New Jersey: Expanded existing TDI systems to cover paid family leave.[1]

[1] New York State has proposed legislation to expand its TDI system to cover paid family leave.

Breastfeeding

Public Health Rationale

- Specific health benefits for children include: a reduced incidence of gastro-enteritis, diarrhea, respiratory tract infections, allergies, otitis media, diabetes mellitus, obesity, and sudden infant death syndrome (SIDS).
- Specific health benefits for women include: a reduction in postpartum bleeding, decreased risk of ovarian cancer, and premenopausal breast cancer later in life.
- Benefits for long-term health and development of children.

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Policies

Federal	Representative Carolyn Maloney (D-New York) introduced the Breastfeeding Promotion Act.
State	Oregon, Idaho, Nebraska: Allow deferral from jury duty.
	New Jersey: Established penalties/fines for those obstructing a woman from breastfeeding in public areas.
	Hawaii, Louisiana: Enacted anti-discrimination statutes.
	Alaska, Kansas: Prohibit municipalities from enacting restrictive laws.
	New York, Minnesota: Require employers to make reasonable accommodations for breastfeeding employees.

Child Care

Public Health Rationale

- High quality child care has been demonstrated to have positive benefits for children's cognitive development, language skills, and school readiness.

Policies

Federal	The Child and Dependent Care Tax (CDCTC) provides tax credits for some childcare expenses.
Joint Federal-State	Eligible low-income families receive assistance through the Child Care and Development Fund (CCDF) and through Temporary Assistance for Needy Families (TANF).
State	Minnesota, New Mexico: Established At-Home Infant Care (AHIC) Programs.
Employer	Dependent care assistance programs (DCAPs) are available to some employees.

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Reduce/Address Delayed Childbearing

Public Health Rationale

- Older mothers are more likely to have preexisting health conditions including hypertension and diabetes that increase the risk of pregnancy complications.
- Older mothers have higher rates of prolonged labor, caesarean deliveries, excessive bleeding, preeclampsia, and placental abruption.
- Use of Assisted Reproductive Technologies (ART) increases the risk for multiple gestation pregnancies and thus the risk of preterm deliveries and infant mortality.
- ART use exposes women to hormonal stimulation and other interventions with unknown long-term health risks.

Policies

State	Massachusetts: Mandates insurers to cover some ARTs.
Organizational	Some professional groups have issued voluntary guidelines regarding the number of embryos to be implanted.

The third section of this report includes a set of proposed WFR policy recommendations intended to improve maternal/infant health outcomes in NYC. These include 7 priority areas:

Section 3 includes a set of proposed WFR policy recommendations intended to improve maternal/infant health outcomes in NYC.

Recommendations:

1. Support the passage of paid sick days legislation for all employees in NYC.
2. Support the passage of paid parental leave legislation for birth/adoption of a child, and leave for long-term illness (either personal or for a family member) for all New Yorkers.
3. Support improved child care services in NYC.
4. Encourage employers in NYC and New York State (NYS) to make accommodations for breastfeeding at work sites.
5. Encourage flexible work arrangements.
6. Develop legislation to minimize adverse working conditions.
7. Support policies that enable women to pursue education, employment and, have children within the biologically optimal time period.

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Introduction

Over the last several decades, there has been a dramatic increase in the number of women participating in the workforce. In 1975, nearly half (46%) of all women above the age of 16 were participating in the labor force, and nearly two-thirds (60%) were employed by 2002 (U.S. Department of Labor, 2004). Many of these women are of reproductive age and continue to work throughout their pregnancies, often until their time of delivery.

While changed social patterns have raised a range of social policy concerns, this report focuses on those affecting health.

While these changed social patterns have raised a range of social policy concerns, this report focuses on those affecting health. Do specific workplace conditions adversely affect maternal and fetal health outcomes? Workplace conditions of concern include prolonged standing, long working hours, shift/night work, heavy lifting, physical workload, and psychosocial stress, as well as employment-related exposures, such as infectious disease agents, chemicals, heavy metals, and solvents.

In addition to changes in women's patterns of work during pregnancy, there also has been a dramatic increase in the number of mothers who work, including those with young children. In 1975, about one-third (34%) of women with children under the age of three years were in the labor force and, by 2002, this number had increased to nearly two-thirds (61%) (U.S. Department of Labor, 2004). Are there health effects or developmental consequences for children and/or health repercussions for the women themselves?

This report will critically assess the research on reproductive, maternal, and infant/child health outcomes associated with work-related factors.

This report will critically assess the research on reproductive, maternal, and infant/child health outcomes associated with work-related factors. To date, there is an extensive body of literature on this topic from Scandinavia, Canada (particularly Quebec), and France, in addition to some from developing countries such as Thailand, Mexico, and China. There are considerably fewer data from the U.S. Studies on this topic originate from a wide range of disciplines including public health, economics, public policy, sociology, and psychology. We include a chart in Appendix A for each of the articles reviewed detailing the study design, sample size, definition of exposure/outcomes, and potential for confounding. The report will be organized by health outcome, and includes: reproductive outcomes (preterm birth, low birthweight, pregnancy-induced hypertension (PIH) and preeclampsia, spontaneous abortion, and congenital anomalies); maternal health outcomes (postpartum mental and physical health); and infant/child health outcomes and needs (breastfeeding, cognitive and behavioral outcomes, and developmentally-appropriate child care).

Work-family reconciliation (WFR) efforts are designed to help women and men engage in paid employment and childrearing responsibilities without jeopardizing the status of their job or the health/well-being of temselves or

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their families. Some WFR benefits assist families in reducing the costs associated with having children and redressing some of the burden of lost wages associated with caring for children. Examples of such measures include subsidized child care, tax credits/breaks, cash grants, low interest loans, and housing incentives. Other WFR policies concentrate on work conditions. These efforts include parental leave provisions and time-related supports such as flexible work schedules, sick days, and availability of part-time employment. In the first section of this three-part report, we critically review the literature examining the associations between WFR and specific maternal, reproductive, and infant/child health outcomes.

Some WFR benefits assist families in reducing the costs associated with having children and redressing some of the burden of lost wages associated with caring for children… Other WFR policies concentrate on work conditions.

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Part 1: Literature Review

Reproductive Health Outcomes

Preterm Birth

Preterm birth is defined as the delivery of an infant before 37 weeks of gestation. Such infants are at higher risk for mortality and various morbidities including long-term neurodevelopmental problems. More than one-third of infant deaths in the U.S. are associated with prematurity (Mathews & MacDorman, (2007).

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According to the National Center for Health Statistics, the preterm birth rate rose to 12.8% in 2006, a 21% increase since 1990 (Hamilton, Martin, & Ventura, 2007). In NYC, 9.9% of all babies born in 2006 were preterm, a 2.1% increase since 1997 (NYC Department of Health and Mental Hygiene (DOHMH) Office of Vital Statistics (OVS), 2008). African-Americans consistently have the highest proportion of preterm births (13.1%), followed by Hispanics (9.6%) in 2006. However, from 1997 to 2006 the greatest percent increase in preterm births was among White non-Hispanics whose rate rose from 7.9 to 8.6%.

Some causes of preterm birth are still not sufficiently understood, although it is associated with smoking, socioeconomic status (SES), maternal race, multiple gestation, fertility treatments, and having a history of previous obstetric complications. Physically demanding work—including prolonged standing, long work hours, irregular work schedules, heavy lifting, and high physical activity—has consistently been shown to cause a significant, albeit modest, (RR < 1.5) increased risk of preterm delivery (Bonzini, Coggon, & Palmer, 2007). Five cohort studies found a significant association between standing and preterm birth (Magann et al., 2005; Misra et al. 1998; Brink-Henriksen et al., 1995; Klebanoff et al., 1990; Teitelman et al., 1990). Irregular work schedules, such as night work and shift work, were associated with an increased risk of preterm birth in two cohort studies (Zhu et al., 2004; Pompeii et al., 2005) and in a large, 16-country European case-control study (Saurel-Cubizolles et al., 2004). Two of these studies also found a moderate association between long weekly working hours and preterm birth (Brink-Henriksen, 1995)(OR=1.33, CI=1.1 to 1.6), for women working more than 42 hours per week; (Saurel-Cubizolles et al., 2004). The effects of specific conditions such as heavy lifting and high physical activity are difficult to isolate because of varied definitions of exposure across studies.

Physically demanding work—including prolonged standing, long work hours, irregular work schedules, heavy lifting, and high physical activity—has consistently been shown to cause a significant…increased risk of preterm delivery.

A meta-analysis of 29 studies by Mozurkewich et al. (2000) examined a number of occupational risks for preterm birth. In their evaluation of pooled data from 21 of the studies, they found a positive significant relationship between

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physically demanding work and preterm birth (OR 1.22; CI 1.16, 1.29). An examination of pooled data from 14 of the studies found a positive significant association between prolonged standing and preterm birth (OR 1.26, CI 1.13, 1.40). These results remained statistically significant even after sub-analyses were conducted. In an analysis of pooled data from 10 of the studies, Mozurkewich et al. (2000) did not find a significant association between long working hours and preterm birth (OR 1.03; CI 0.92, 1.16). Other significant associations were reported between cumulative work fatigue, shift work, and preterm birth; however, the results varied when stratified by study design and quality.

A meta-analysis by Bonzini et al. (2007) of 49 studies found a positive significant relationship between working hours, shift work, standing, and preterm birth with moderate effect sizes, results similar to those reported by Mozurkewich et al. (2000). Unlike the Mozurkewich et al. meta-analysis, Bonzini et al. did not include lifting or heavy workload in their analysis because definitions of exposure differed across studies.

Psychosocial factors such as stress have been linked to preterm delivery.

Psychosocial factors such as stress have been linked to preterm delivery (Wadhwa, Culhane, Rauh, et al., 2001). One body of research has examined the association between the number of stressful life events (job loss, economic insecurity, family problems, a serious illness, etc) and preterm delivery with inconsistent results. A retrospective cohort study of 33,542 women found that the number of stressful life events did not contribute significantly to the racial/ethnic disparities in preterm birth among participants (Lu & Chen, 2004). In contrast, a prospective cohort study of 1,962 pregnant women did find an increased risk of preterm delivery among those respondents who had higher counts of negative life events. (Dole, Savitz, et al., 2003). Another set of investigations have focused on racism and discrimination in relation to adverse birth outcomes as there are clear and persistent racial disparities in preterm birth rates between African-American and non-Hispanic white women, with African-American women experiencing disproportionately high preterm birth rates even after controlling for socio-economic status (SES), education, and maternal age (Giscombe & Lobel, 2005; Hogue & Bremner, 2005). In 2005-2006, 18.4% of births to African-American women were preterm compared to 11.7% to non-Hispanic white women (Hamilton, Martin, & Ventura, 2007). Preterm births among African-American women account for much of the excess deaths among African-American infants. One theory posits that chronic exposures to racism and discriminatory treatment may lead to stress aging, or "weathering," that may put African-American women at increased risk for adverse health outcomes such as preterm delivery (Geronimus, 2001; Hogue & Bremner, 2005). It has been postulated that this process operates through various immunological, neuroendocrine, or vascular pathways (Wadhwa, Culhane, et al., 2001; Giscombe & Lobel, 2005). Studies have found that women in preterm labor have higher levels of corticotrophin-releasing

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hormone (DRH), a stress-regulating chemical, compared to those women in control groups (Hobel, Dunkel-Schetter, et al., 1999; Wadhwa, Porto, et al., 1998). This may contribute to certain adverse reproductive outcomes such as preterm birth among women who have been exposed to chronic stress throughout their lives.

Low Birthweight

Low birthweight (<2500 grams at birth) infants are either born preterm or are small-for-gestational age (SGA) (birthweight below the 10th percentile). Infants born low birthweight (LBW) are at higher risk of mortality, morbidities, and cognitive-developmental deficits. The LBW rate in the U.S. is considered by many to be too high for a developed nation and has continued to increase for decades. According to the National Center for Health Statistics (CDC), the LBW rate in 2006 was 8.3% of all births, a 19% increase since 1990 (Hamilton, Martin, & Ventura, 2007). In NYC, the LBW rate in 2006 was 8.9% of all births, a 4.5% decrease since 1990 (9.3%) (NYC DOHMH, OVS, 2007). Moreover, the LBW rate among women 35 and over rose dramatically to 24.3% of all such births in 2006 compared to 13.1% in 1990, an increase of 85.5%. Some of the factors associated with having a LBW baby include cigarette smoking during pregnancy, insufficient maternal weight gain, African-American race, low SES, inadequate nutrition, small maternal stature, and multiple gestation pregnancies.

Physically demanding work, including prolonged standing, irregular work schedules, long weekly working hours, physical activity, and heavy lifting consistently have been associated with a modestly increased risk of LBW. Two cohort studies (Launer et al., 1990; Tuntiseranee et al., 1998) and two cross-sectional studies (Ceron-Mireles et al., 1996; Fortier et al., 1995) found associations between prolonged standing and SGA. A limited number of studies examined irregular work hours and SGA, with only one case-control study finding a significant association between shift work and having an SGA infant (Croteau et al., 2006) and one cohort study finding an association between long weekly working hours and SGA (Tuntiseranee et al., 1998). A limited number of studies examined heavy lifting, and did not find a significant association with SGA.

Physically demanding work, including prolonged standing, irregular work schedules, long weekly working hours, physical activity, and heavy lifting consistently have been associated with a modestly increased risk of LBW.

The two meta-analyses mentioned found significant moderate associations between SGA and physically demanding work conditions. According to the Mozurkewich et al. (2000) meta-analysis of ten observational studies, physically demanding work was significantly associated with SGA (OR 1.37; 95% CI 1.30, 1.44). These results remained significant even after sub-analyses were conducted controlling for methodological design and study quality. Bonzini et al. (2007) examined fourteen studies and found a significant moderate

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effect size between SGA and exposure to long working hours, prolonged standing, and physical activity, but no association between SGA and shift work or SGA and heavy lifting.

Pregnancy-Induced Hypertension and Preeclampsia

Pregnancy-induced hypertension (PIH) is the development of high blood pressure after the 20th week of gestation and is associated with a number of adverse maternal and perinatal health outcomes. Although the blood pressure generally returns to a normotensive state following delivery, PIH can progress to preeclampsia during pregnancy and may predict maternal hypertension later in life. Some of the risk factors for PIH include advanced maternal age, obesity, and having a preexisting medical problem such as diabetes. There are a limited number of studies that examine the relationship between work-related conditions and PIH. Several studies have found a positive association between high levels of physical activity at work and PIH (Saurel-Cubizolles, Kaminski, et al., 1985; Saurel-Cubizolles, Kaminski, et al., 1991) and between work-related stress and increased risk for PIH (Landsbergis et al., 1996; Marcoux et al., 1999). Other studies have found no significant relationship between these work factors and PIH (Irwin et al., 1994; Landsbergis & Hatch, 1996).

Several studies have found a positive association between high levels of physical activity at work and PIH.

Preeclampsia is a multi-system condition characterized by the onset of hypertension (140/90 or greater) late in pregnancy and the presence of proteinuria and edema. Preeclamptic pregnant women are more likely to give birth to infants who are preterm or LBW. If this condition is not controlled, it can progress to eclampsia, a life-threatening disease associated with seizures. While there is much that is unknown about the pathophysiology of this condition, some risk factors include primiparity, obesity, advanced maternal age, and having a multiple gestation pregnancy. Recent studies suggest that women who have preeclampsia are at increased risk for developing cardiovascular disease later in life (Roberts et al., 2003).

Several studies have found an association between physically demanding work and preeclampsia (Spinillo et al., 1995; Wergeland & Strand, 1997). Work-related activities, including frequent stair climbing, working more than five consecutive days, and standing for more than one hour without walking, have all been shown to be positively and significantly associated with preeclampsia (Haelterman et al., 2007).

Several studies have found an association between physically demanding work and preeclampsia.

A meta-analysis by Mozurkewich et al. (2000) of three studies found a significant association between physically demanding work and hypertension or preeclampsia (OR 1.97; CI 1.51, 2.56). In contrast, Bonzini et al. (2007) excluded both PIH and preeclampsia in their meta-analysis because many

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of the studies they reviewed used inconsistent definitions of these two outcomes, making meaningful comparison difficult.

Many of the studies examining work-related factors with PIH or preeclampsia are limited by methodological problems such as small sample size, retrospective study designs, high potential for confounding, and recall bias.

Spontaneous Abortion

Spontaneous abortion (or miscarriage) refers to pregnancies that end involuntarily before 20 weeks gestation. Studies have investigated whether physically demanding work, including prolonged standing and long weekly work hours, as well as exposure to solvents, heavy metals, and chemicals, is associated with increased risk of spontaneous abortion. Studies that explore the relationship between physically demanding work and spontaneous abortion have reported mixed results. One study found that women who stood for more than seven hours per day had elevated rates of spontaneous abortions compared to those who stood for fewer hours, especially if they had a history of miscarriage (Fenster, Hubbard, et al., 1997). Similarly, nurses who reported working more than 40 hours per week were 50% more likely to have a spontaneous abortion compared to those who reported working between 21-40 hours per week (Whelan, et al., 2007). However, physically demanding activities such as housework and childcare have not been associated with spontaneous abortion (Fenster, Hubbard, et al., 1997).

In addition, a relationship between irregular work schedules (night work/shift work) and the risk for spontaneous abortion has been found in several studies (Axelsson et al., 1996; Zhu et al., 2004). A prospective cohort study of U.S. female nurses found that women who reported working night shifts were 60% more likely to have a spontaneous abortion compared to those who usually worked day shifts (Whelan et al., 2007), with speculation that the biologically plausible explanation for this association is disruption in circadian rhythm.

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Finally, there are many studies that examine the risk of spontaneous abortion with occupational exposure to certain heavy metals (mercury, lead), pesticides, solvents, and chemicals. A set of high-quality epidemiologic studies indicate that women exposed to specific chemicals associated with work in healthcare (anaesthetic gases and antineoplastic drugs), dentistry (ethylene oxide or mercury amalgam), and drycleaning (tetrachloroethylene) are at increased risk for spontaneous abortion (Figa-Talamanca, 2006). Although these findings are significant, it is difficult to assess timing of exposure and to implicate single chemicals when there are multiple exposures (Figa-Talamanca, 2006).

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Congenital Anomalies

In the U.S., one out of every 33 infants is born with a congenital anomaly (CDC, 2007). Congenital anomalies are a leading cause of infant mortality and are associated with many long-term disabilities. Most birth defects develop during the first trimester of pregnancy during organogenesis; however, congenital anomalies may also result from fetal growth restriction during the second and third trimesters.

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The scientific literature has focused primarily on the relationship between teratogenic work-related exposures and their association with congenital anomalies. A review of 26 studies evaluated the evidence related to occupational exposures and specific birth defects including cardiac, neural tube, cleft lip and cleft palate, urinary tract, and limb defects (Thulstrup & Bonde, 2006) and reported inconclusive findings. Major limitations were small sample sizes, retrospective and self reported assessments of exposure, and unclear definitions of both exposures and outcomes (Thulstrup & Bonde, 2006).

Maternal Health Outcomes

Delayed Childbearing

A concurrent demographic development over the last several decades is the delay in marriage and subsequent childbearing among women who are increasing their level of educational attainment and establishing secure employment before starting families. In 1970, the average age at first birth in the U.S. was 21.4 years; this age rose to 25.2 years in 2005, a significant difference of four years (Martin, Hamilton, Sutton, et al., 2007). The birthrate for women aged 35-39 years rose to 46.3 births per 1,000 women in 2005—a 46% increase from 31.7 births per 1,000 women in 1990. For women in their 40s, there has been a similarly dramatic increase in birthrates. These national trends in delayed childbearing pertain to NYC. In 1976, approximately 3% of women over the age of 35 had their first birth whereas nearly 15% of women in this age group gave birth to their first child in 2006, a five-fold increase (NYC DOHMH OVS, 2007).

A concurrent demographic development over the last several decades is the delay in marriage and subsequent childbearing among women who are increasing their level of educational attainment and establishing secure employment before starting families.

This delay in childbearing has certain serious reproductive health implications. At older ages, women are more likely to have preexisting health conditions such as chronic hypertension and diabetes that can increase the risk of pregnancy complications and the prevalence of these chronic health conditions has been growing in the U.S. along with the rise in obesity (Martin et al., 2007). Several studies have shown that older mothers have higher rates of prolonged labor, caesarean deliveries, excessive bleeding, preeclampsia, and placental abruption (Luke & Brown 2007), complications often leading

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to preterm deliveries and LBW infants. In 2006, 12.3% of preterm births in NYC were to women 35 and over, a 3.4% increase from 1997 when the proportion was 11.9% (NYC DOHMH OVS, 2008). Older mothers are also at increased risk of having infants with chromosomal anomalies.

At older ages, women are more likely to have preexisting health conditions such as chronic hypertension and diabetes that can increase the risk of pregnancy complications.

A consequence of the postponement of marriage and childbearing has been the increased use of assisted reproductive technologies (ARTs) in helping women to become pregnant at later, less fecund ages. Since 1997, the year of the first CDC ART surveillance report, there has been a dramatic increase in the number of ART procedures performed in the U.S. from 64,681 in 1996 to 127,977 in 2004 (Wright, Chang, Jeng, et al., 2007) with an estimated 1% of total births in the U.S. resulting from ART use. Recent studies have found that children who are conceived as a result of ARTs are at an increased risk for a range of adverse health outcomes, including preterm birth and specific anomalies, as compared to children who were conceived spontaneously.

Recent studies have found that children who are conceived as a result of ARTs are at an increased risk for a range of adverse health outcomes.

Fertility treatments have been associated with a number of adverse maternal health outcomes including ovarian hyperstimulation syndrome. Many of the complications experienced by women using ARTs result from problems related to having a multiple gestation pregnancy. This phenomenon has increased significantly in NYC as well; the percent of multiple births to women 40 years and over has increased from 2.1% in 1990 to 8.4% in 2006. Similarly, there has been an increase in multiple births among women aged 30-39 from 3.1% in 1990 to 4.8% in 2006 (NYC DOHMH OVS, 2007). These women are at greater risk for developing PIH and gestational diabetes. Cesarean delivery also is a common outcome for multiple gestation pregnancies. Few studies have examined the long-term consequences of ARTs on women's health and the biologically plausible risk of hormonally induced cancers.

Maternal Health and Exposure to Infectious Diseases

In female-dominated professions such as child care, healthcare, and teaching, infectious disease exposure is common and pregnant workers are particularly at risk for adverse consequences. For example, respiratory tract and gastrointestinal infections commonly are found in day care centers. While most of these do not cause any long-term health consequences for children or their caretakers (Galtry, 2002) some, such as cytomegalovirus (CMV), coxsackie virus, and hepatitis are associated with a number of adverse reproductive outcomes for pregnant women (Colugnati, Staras, et al., 2007).

In NYC, 3% (54,952) of female employees work in child care and nearly 4% (66,249) work as teachers of young children where they have frequent contact with those who may have an infectious illness (U.S. Census Bureau, 2006).

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Nearly 15% (259,942) of women employed in NYC are working in health care-related jobs where they are exposed to a multitude of infectious agents. It is in these locations that employees can either be exposed to infectious diseases or be the source of contagion to others absent the benefit of paid sick leave. Contagion can be reduced by maintaining good hygienic practices in both health care and child care centers.

Maternal Health Postpartum

Medical consensus holds that most women require at least six weeks to physically recuperate after a normal spontaneous delivery. Postpartum complications can include infections such as endometritis and mastitis.

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First-time mothers in the U.S. who work during pregnancy take little leave time from work after childbirth. Indeed, during the time period 2000-2002, 55% returned to work within six months of giving birth whereas only 14% had done so in the early 1960s (Johnson, 2008). First-time mothers who were 30 or older and who had a high school degree or higher were more likely to return to work within 3 months than those who were younger and less educated, perhaps because of concern over their future career trajectories, commitment to their jobs, or because of the need to maintain their current salary/benefits levels. The method of delivery also has consequences for recovery time. Cesarean deliveries require an extended healing period. In 2006, the rate of cesarean delivery in the U.S. reached 31.1 % of all births, the highest it has ever been, a 50% increase from the rate in 1996 (20.7%); the rate increased for women of all racial, ethnic, and age groups (Hamilton, et al., 2007). The pattern held for NYC, with a cesarean delivery rate of 30.6% in 2006 (NYC DOHMH OVS, 2008).

A prospective cohort study by McGovern, Dowd, Gjerdingen, et al. (2006) examines how women's health is affected by type of delivery and breastfeeding status among a group of employed mothers five weeks postpartum. Women who gave birth via cesarean section reported a greater number of physical health problems (including pain and role limitations) at five weeks postpartum compared to women who delivered vaginally, suggesting that more leave time from work is required in order to fully recover from a cesarean section. Women who were breastfeeding experienced more postpartum symptoms such as fatigue, constipation, and neck and back pain compared to those women who were not breastfeeding.

Postpartum depression is a serious maternal health issue estimated to affect approximately 12% of U.S. parturients (CDC, 2004). A study by Chatterji & Markowitz (2005) used national data from the 1988 National Maternal and

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Infant Health Survey (NMIHS) to examine the association between length of maternity leave and the number of maternal depressive symptoms (measured by the Center for Epidemiological Studies Depression Scale, a commonly used psychiatric scale). The majority (75%) of women in the study had returned to work within 12 weeks of delivery. The authors found that extending the period of leave by one week could reduce depressive symptoms by 6-7%. The NMHIS oversamples disadvantaged mothers and may not be generalizable to all employed women.

Because the research on postpartum maternal health outcomes has been sparse, there is a need for additional studies to investigate how length of maternity leave or other work modifications or parental supports may affect both the physical and mental health of women.

Breastfeeding

Breastfeeding has both nutritional and immunological benefits for infants and important health advantages for mothers. Despite the recommendations from the World Health Organization (Kramer & Kakuma, 2002) and the American Academy of Pediatrics (American Academy of Pediatrics, 2005) advising new mothers to breastfeed their infants for at least the first six months of life, the rates of exclusive breastfeeding in the U.S. are low compared to those in other industrialized countries. Data from the National Immunization Survey (NIS) show that, while 74% of U.S. infants born in 2004 were ever breastfed, only 31% of infants were exclusively breastfed at three months; by six months this number declined to 11% (CDC, 2006). In NYC, 74% of infants were ever breastfed, only 21% of infants were exclusively breastfed at three months; by six months this number had declined to 10% (CDC, 2006) (Appendix B). The lack of a national paid maternity leave policy and the limited access to flexible work schedules for many employees are two important factors leading to early discontinuation of breastfeeding.

The rates of exclusive breastfeeding in the U.S. are low compared to those in other industrialized countries.

Several studies have shown a relationship between breastfeeding and postpartum employment status. This literature engages with two main breastfeeding outcomes: initiation (ever breastfed) and duration (length of time a woman breastfeeds). A review of the literature suggests that breastfeeding initiation is not adversely affected by employment unless the new mother returns to work within six weeks of giving birth (Nobel et al., 2001; Kurinij et al., 1989; Hawkins et al., 2007). However, employment status does have a strong impact on breastfeeding duration. One study found that non-African-American women who work part-time continue to breastfeed for longer than those who work full-time, suggesting that the number of hours of work may be an important factor influencing maternal breastfeeding behavior (Lindberg, 1996). Another study of mostly white, older mothers corroborates these findings.

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Women who returned to full-time work within three months of delivery reduced the duration of breastfeeding compared to mothers who did not work. Women who worked full-time breastfed for an average of only 16.5 weeks, 8.6 weeks less than for nonworking women (Fein & Roe, 1998). Although time constraints and logistical concerns create barriers to breastfeeding for all working women, occupational environments can either alleviate or exacerbate these barriers. Workplaces can do several things to make breastfeeding as comfortable as possible, such as providing accommodations for nursing women (breaks and private rooms for expressing milk) and fostering an environment where the practice is viewed as normal both among employees and management.

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In the U.S., there are important differences in breastfeeding rates by race, education level, and SES, with the children most in need of the health benefits associated with breastfeeding the ones least likely to be breastfed. According to a Morbidity and Mortality Weekly Report of national data, 72% of non-Hispanic white children were ever breastfed compared to only 50% of African-American children (Grummer-Strawn, Scanlon, et al., 2006). In NYC, 72% of White non-Hispanic women breastfed for at least 8 weeks compared to only 61% of African-American mothers (NYC Pregnancy Risk Assessment Monitoring Survey Data, 2006) (Appendix C). Both national and NYC-specific breastfeeding rates also are lower among mothers with less than a high school education, low-income women, and younger mothers.

One reason for the disparities in breastfeeding rates among women may be occupational stratification. The Fragile Families and Child Wellbeing Study, comprising mostly low-income, unmarried women, found that those in professional jobs had similar rates of breastfeeding duration as stay-at-home mothers whereas mothers in administrative positions and those in manual jobs had higher odds of discontinuing breastfeeding than stay-at-home mothers (Kimbro, 2006). It has been postulated in a number of studies that a lack of workplace flexibility, minimal autonomy concerning the timing of breaks, and little access to paid maternity leave or to employers who are willing to make workplace accommodations may account for some of the disparities in breastfeeding rates the U.S. (Kurinij et al., 1989; Visness et al., 1997; Kimbro, 2006).

Child Health Outcomes

Maternal Employment, Child Care Arrangements, and Child Developmental Outcomes

The increase in dual-working parents and single-parent families has led to young children spending increased time in nonparental care arrangements,

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which could have implications for children's health outcomes and cognitive and behavioral development. This section will only focus on children during their first two years of life.

Unlike Sweden and several other Western European countries, where child care is universal, government-sponsored and highly valued, most care arrangements in the U.S. are private and differ considerably in terms of cost and quality. Child care options in the U.S. vary from informal arrangements with relatives and neighbors to the more formal and highly-structured care found at some schools or day care centers.

There is general agreement in the literature that high quality out-of-home child care and early education for 2-4 year olds is beneficial for both developmental and health outcomes (Galtry, 2002). However, there is not a clear consensus about outcomes related to child care arrangements during the first year of a child's life. Some argue that among certain groups of children, full-time maternal employment can lead to negative cognitive and behavioral problems. Others counter that child-care does not have deleterious effects on children if it is of high quality (defined by the levels of sensitivity and responsiveness of a care-taker to a child's needs) (Waldfogel, 2007). Studies have found that maternal employment is not detrimental to cognitive developmental outcomes of 1-2 year olds, but that low-quality childcare can be associated with negative behavioral outcomes (Waldfogel, 2007). An evaluation of Head Start, a program providing high-quality care to a group of low-income children, showed a positive effect on cognitive and language skills of those in the program group compared to those in the control group (Love, Harrrison, et al., 2003).

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Infants in center-based child care are more likely to be exposed to communicable diseases such as upper respiratory tract infections, otitis media, and gastrointestinal problems than are children who are in home-based care (Galtry, 2002; Bradley & Vandell, 2007). Although young children in center-based care get infectious diseases more frequently, there do not appear to be any long-term health consequences.

Conclusion

Employment itself is not detrimental to women or their offspring; however, physically demanding work and certain chemical exposures have been associated with adverse health outcomes. Despite the dramatic increase in the number of women of reproductive age participating in the workforce, WFR policies in the U.S. have changed only minimally. While the evidence base is imperfect, there are consistent data that show that improving work-family benefits and work conditions can contribute to the public health.

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Part II: Work-family Policies in the U.S.—An Assessment of the National Landscape

Despite the dramatic changes in female employment patterns over the last several decades, U.S. public policies have not evolved in response to current realities. A majority of mothers are working outside the home in paid employment, yet work-family polices still reflect an anachronistic male breadwinner model (Orloff, 1993; Lewis, 1992), which assumes that men are engaged in paid work outside the home and are the sole family providers and that women are responsible for unpaid domestic duties such as housekeeping and caretaking within the home. The disequilibrium between these long-term changes in women's employment patterns and stagnant policies contributes to significant work-family conflict in the U.S.

The disequilibrium between… long-term changes in women's employment patterns and stagnant policies contributes to significant work-family conflict in the U.S.

The U.S. is an outlier when compared to other industrialized countries that offer extensive work-family policies. Whereas the national governments of European Union (E.U.) member nations drive their respective work-family policy structures, the U.S. federal government has done little to address the inherent difficulties involved in balancing family needs with work responsibilities. The federal social welfare policies that are in place are limited and not universal; they are need-based and target low-income groups and people with physical and mental disabilities. Some agencies/companies have implemented certain work-family policies, either as a result of union negotiations, organizational priorities, or statewide efforts, but those that benefit from such policies are in the minority. Instead, Americans have been left to find private solutions to address their work-family needs even though the public discourse proclaims thriving children to be a public good (Gornick & Meyers, 2003). In order to care for children and also maintain employment, parents either must sacrifice disposable income to pay for out-of-home care, or they must reduce work hours to provide care themselves while giving up income, career advancement opportunities, and economic security. This is also the case for employees who require sick leave or need to care for a sick family member.

The U.S. federal government has done little to address the inherent difficulties involved in balancing family needs with work responsibilities.

Therefore, certain Americans receive generous benefits while others have minimal or no access to any assistance. Sometimes people in different employee classifications have disparate benefits although they may work side-by-side. In the U.S., employees with the greatest need for benefits, specifically single parents, low-income workers, or those with minimal education, generally are the people least likely to work at jobs with generous benefits. Disparities in such benefits as maternity leave, flexible work arrangements, and paid sick days, may, in turn, aggravate associated disparate health outcomes.

In Sweden, France, and Denmark, work-family benefits are universal, supported by national funding systems, and generous both in terms of eligibility and amount. Policies such as maternity leave, cash allowances for

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child rearing, and subsidized child care are intended to assist employed parents with managing their dual responsibilities, and are viewed as entitlements rather than as privileges, as they are predicated on the notion that childrearing is a public investment whose costs should be distributed across society.

A lack of national policy means that innovations in U.S. work-family policy generally are developed at the state- and municipal-levels. In the following sections, we will describe examples of existing local and state policies and outline the public health rationale for legislation establishing paid sick days, flexible work arrangements, paid leave at birth/adoption of a child, employer-supported breastfeeding accommodations, child care, and policies that address delayed childbearing.

A lack of national policy means that innovations in U.S. work-family policy generally are developed at the state- and municipal-levels.

Paid Sick Days

Paid sick days enable workers to recuperate from illness or to care for ill family members, and also serve the important public health function of preventing sick employees from infecting others at work. Yet only half (51%) of all U.S. workers have paid sick days and less than one-third (30%) of employees are allowed to use these days to stay home from work to care for an ill child or family member (Institute for Women's Policy Research website, 2006).

Access to paid sick days is uneven, with those most in need least likely to have this benefit. Employees who work part-time (often women with caretaking responsibilities), workers at low-wage jobs, and those employed in the private-sector are less likely to have paid sick days than those working full-time, in high-wage jobs, and/or in the public sector (Lovell, 2004). Only one quarter of low wage workers in the U.S. have paid sick days (National Partnership for Women & Families, 2008). In NYC, nearly two-thirds (65%) of the working-poor (221,000 workers) report having no paid sick days; almost half of the near-poor (45%) and approximately one third (32%) of moderate-higher income workers are also without paid sick days (Community Service Society, 2007).

In many E.U. countries, workers are entitled to paid sick days on their own behalf as well as to care for a sick dependent. This short-term leave benefit is generally provided through national statutes or collective bargaining agreements. For example, in Sweden, parents can take up to 60 days per year to care for a sick child (Fagan & Walthery, 2007). In Belgium, Germany, and Norway parents are entitled to 10 days per year to care for a sick child; this can be extended if the child is seriously ill, disabled, or injured. In contrast, in the U.S., the Family and Medical Leave Act (FMLA) provides 12 weeks of

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unpaid leave to care for oneself or a dependent in case of a serious illness, but it does not cover routine, short-term sicknesses. (Gornick & Meyers, 2003).

Proponents of paid sick leave invoke the public health arguments that paid sick days are necessary to encourage sick employees to take time off to recover from an illness, to avoid infecting co-workers with a communicable disease, and to provide care to sick children that are likely to spread contagious diseases to others at school and in day care centers. Although certain workers—including those in child care centers, medical facilities, or restaurants—have frequent contact with the public, and associated significant risks of contagion, fewer than 15% of food service and hotel workers have paid sick days (Lovell, 2006). Paid sick days affect parents' ability to provide care during childhood illness. The Baltimore Parenthood Study of moderate and low-income parents found that those with paid sick days were 5.2 times more likely to care for a sick child themselves as compared to those without paid sick days (Heymann, Toomey, et al., 1999) and Palmer's review (1993) demonstrated that parental care helps sick children recover more quickly from illnesses and hospitalizations. Finally, parents of ill children may face the catch-22 situation of their child care center refusing to allow sick children to attend, a lack of alternative care arrangements, and jeopardizing their employment if they stay home from work.

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Paid sick days also can be beneficial for businesses. Many employers report that "presenteeism," or the attendance at work of sick employees, costs businesses money through lost productivity and ensuing absenteeism when many workers subsequently become ill (Lovell, 2004).

There are several legislative initiatives focused on paid sick leave under consideration at the national, state, and municipal levels. These bills focus on expanding paid sick leave coverage to allow more employees to take time off to recuperate from a personal illness, to care for sick children or other dependents, or to attend a medical appointment. At least eleven states are considering paid sick days legislation, including Massachusetts, Maine, Connecticut, and Minnesota. In March 2007, San Francisco became the first municipality in the U.S. to require employers to provide paid sick days to their employees; in March 2008, Washington, DC, became the second city in the U.S. to pass similar legislation (Appendix D). The Healthy Families, Healthy Workplaces Act passed in the California State Assembly in May 2008, but did not pass in the State Senate; in New York State (NYS), coalitions of advocates, labor unions, and policymakers are developing similar legislative proposals. The majority of states remain uninvolved in these efforts. One national bill has been introduced: the Healthy Families Act of 2007, sponsored by Senator Edward Kennedy (D-Massachusetts) and Representative Rosa DeLauro (D-Connecticut) (National Partnership for Women & Families, 2008) (Appendix E).

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Flexible Work Arrangements

An increasing number of children live in dual-earner families where both parents are working full-time, often for more than 40 hours per week. A national survey of approximately 3500 workers, the 2002 National Study of the Changing Workforce (NSCW), reported that combined work hours for dual-earner couples with children increased from 81 hours per week in 1977 to 91 hours in 2002 (Bond, Thompson, Galinsky, et al., 2002). Many other children in the U.S. (12.9 million in 2006) live in single-parent homes; 10.4 million children live in single-mother households and 2.5 million reside in single-father households (U.S. Census, 2007). Flexible time arrangements (Appendix F) allow parents to spend more time with their children, attend to medical needs, and assist with their educational needs, thus reducing some of the conflicts of balancing work and family concerns(Workplace Flexibility 2010 Georgetown University Law Center website).

Although the availability of flexible work arrangements has increased over time—from 24% of employers permitting at least some of their employees to change daily starting and quitting times in 1998 to 31% in 2005— the majority of U.S. workers still do not have this benefit (Bond, Galinsky, Kim, & Brownfield, 2005). Again, the same pattern prevails with those most in need being least likely to have this benefit; 56% of managers and other professionals have flextime benefits compared to only 36% of other employees (Galinsky, Bond, & Hill, 2004). Although women are somewhat less likely to have access to flexible work arrangements than men, the 2002 NSCW demonstrated that 79% of women with this benefit used their flextime compared to 68% of men. (Bureau of Labor Statistics, 2005; Galinsky, Bond, Hill, 2004). In the same study, 39% of employees reported concern that using flexible work arrangements would have a negative impact on their career advancement opportunities (Galinsky, Bond, Hill, 2004).

Although the availability of flexible work arrangements has increased over time… the majority of U.S. workers still do not have this benefit.

In the E.U., there are strict labor regulations limiting the amount of time that employees are mandated to be at work, whereas, in the U.S., these decisions are often made by individual employers and exacerbated by certain work structures such as inflexible and long weekly work hours, non-standard work schedules (e.g. weekends, evenings, and nights), and minimal paid time off (e.g. vacations) (Gornick & Meyers, 2003).

The multiple time demands of employment and family-related responsibilities can lead to adverse physical and mental health outcomes. Stress can be one consequence of work-family conflict which, if left untreated, is associated with cardiovascular disease, psychological disorders, workplace injury, and musculoskeletal disorders (Sauter, Murphy, Colligan, et al., 1999). The NSCW, using a nationally representative sample of working adults, found an inverse relationship between the number of employer-offered flexible work

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arrangements and reported symptoms of work-related stress, and a direct relationship with employee commitment to their jobs (Halpern, 2005). A longitudinal study of 3000 pharmaceutical employees found that workers with greater perceived job flexibility were more likely to engage in healthier personal behaviors including improved sleep and general lifestyle habits (Grzywacz et al., 2007). Finally, workplace inflexibility and resulting employee stress interferes with parental ability to attend routine well-child visits and parent-teacher conferences, or have meaningful daily conversations/interactions with their children (Heymann, 2000). A study of 504 low-income parents of chronically ill children reported that more than 25% of the participants had missed a child's doctor appointment because they were complying with Temporary Assistance for Needy Families (TANF) work requirements and could not take time off (Smith, Romero, et al., 2002).

Flexible work arrangements have been implemented by a number of states and organizations to improve the health and well-being of employees and their families, increase employee retention rates, and reduce absenteeism, as well as to reduce traffic congestion and pollution (Appendix G). States have passed legislation on flexible work arrangements which include requiring state agencies/organizations to permit flexible work arrangements, offering tax incentives to employers, and establishing job-protection laws for employees who use these benefits (Sloan Work and Family Research Network, 2005) (Appendix H). Some states including Virginia, New Jersey, and Hawaii have introduced flexible work legislation applying directly to employees who work for state agencies. In Oklahoma, Illinois, and Florida, bills concerning flexible work arrangements specifically refer to the issue of family responsibilities as their rationale. According to the 2002 NSCW, employees with access to flexible work arrangements are more likely to feel satisfied with their jobs, are more committed to their employers, and are less likely to leave their current employers (Bond, Thompson, Galinsky, et al., 2002).

Employees with access to flexible work arrangements are more likely to feel satisfied with their jobs, are more committed to their employers, and are less likely to leave their current employers.

Paid Leave at Birth/Adoption of Child

The U.S. lacks a comprehensive national leave policy at the time of birth or adoption. The federal FMLA provides both male and female employees up to twelve weeks of job-protected, unpaid leave to care for a newborn or adopted child, to recover from a personal sickness, or to care for a seriously ill relative (Asher & Lenhoff, 2001) (Appendix I). Because workplace size and job tenure affect eligibility, many U.S. employees do not qualify for this benefit. Specifically, a 2000 national survey of U.S. residents (n=2558) revealed that only 60% of employees worked in FMLA-covered organizations, and nearly 20% of these employees were ineligible to take their FMLA leave due to issues such as insufficient tenure on the job (Waldfogel, 2001). Access to paid leave is even more unlikely for most workers (Gornick & Meyers, 2003).

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Some private businesses offer paid leave to their employees and a small number of states have established temporary disability insurance (TDI) systems that cover leave time for mothers and, less frequently, for new fathers following the birth or adoption of a child.

There are several different categories of family leave benefits. Maternity leave originally was established to protect the physical health of the mother and/or her newborn following childbirth and subsequently to promote bonding between parents and newborns (Kamerman, 2000). This leave can be taken during the last few weeks of a pregnancy or, more commonly, during the period following delivery. Researchers from the Work, Family, and Equity Index reported that the U.S. was one of four countries that did not offer paid leave out of 173 countries studied (Heymann, Earle, & Hayes, 2007).

Paternity leave is a paid, job-protected benefit that is available to enable new fathers to bond with their children. Sixty-six countries provide fathers with paid paternity leave. The U.S. does not have any such national level legislation (Heymann, Earle, & Hayes, 2007).

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Parental leave is a benefit that commonly is available in many E.U. countries to both men and women and typically is taken in the time period following maternity leave. Parental leave policies were developed in order to promote greater gender equity in employment and childrearing responsibilities and to facilitate at-home childcare by parents while their children were still very young (Kamerman, 2000). Although it is a job-protected benefit, parental leave often is paid at a lower rate than maternity leave (Oun & Trujillo, 2005).

The International Labor Organization (ILO), the United Nation agency responsible for creating and monitoring international labor standards, recommended that its 181 member states (including the U.S.) should adopt the following national laws: (1) provide all new mothers with at least 14 weeks of paid maternity leave (18 weeks are recommended); (2) pay women on maternity leave no less than 2/3 of their previous earnings; and (3) fund payments through a social insurance system rather than by individual employers (2000 Maternity Protection Convention (No. 183), Oun & Trujillo, 2005). Although only 11 nations (excluding the U.S.) officially ratified this convention by 2005, 48% of all ILO member countries (79 nations) already had met its requirements regarding maternity leave on their own accord.

The E.U. countries generally have well-established systems of paid leave benefits for parents and the majority either meets or exceeds the ILO standards (Appendix J). In Sweden, new mothers may take seven weeks of paid maternity leave before delivery and an additional seven weeks following birth. Swedish parents then are entitled to 18 months of parental leave of which the father must take at least two months (OECD, 2005). A wide range of

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compensation systems exist in the E.U. including payment of a proportion of earnings, provision of a flat fee, or a combination. For example, in Sweden, the first 12 months of leave is paid at 80% of wages followed by three months at a flat rate, with the final three months unpaid (OECD, 2005). Most E.U. countries fund their leave benefits through national social insurance systems for which eligibility is broadly defined.

In contrast, the U.S. is one of only a few countries in the world that does not guarantee some paid maternity leave. U.S. employees who take leave from work following the arrival of a new child have limited options compared to their counterparts in Europe. Eligibility for FMLA benefits depends on the size of the organization (at least 50 workers) and the length of time an employee has worked for a particular organization (at least one year of working with the current employer and a minimum of 1,250 hours during the previous year). Some protections exist under the FMLA: employers covered by the FMLA must continue to provide their employees with benefits such as health insurance while they are on leave, and, at the conclusion of the 12 weeks of leave, must allow an employee to return to his or her previous job or an equivalent position (Asher & Lenhoff, 2001).

The U.S. is one of only a few countries in the world that does not guarantee some paid maternity leave.

Employers with many female employees are under increasing economic pressure to provide leave policies beyond those mandated by the FMLA in order to retain highly skilled workers who are often both difficult and expensive to replace. Low-income women are more easily replaced—and at a lower cost—and thus lack the leverage enjoyed by women whose jobs require more highly developed educational achievements or prior professional experience.

Paid maternity leave has important public health benefits for both new mothers and their babies. A set period of time following labor and delivery allows for physical recovery from childbirth and breastfeeding rates improve when mothers do not have to return to work immediately. Paid parental leave provides new parents with a level of economic security while they take time to bond and care for a new child and also may relieve some of the stress involved with the anticipation of the work-family conflict immediately following birth.

Paid maternity leave has important public health benefits for both new mothers and their babies.

Historically in the U.S., innovations in work-family policy development have been initiated by states and private businesses. Thirteen states and Washington, DC, had maternity leave laws in place prior to the FMLA's passage in 1993 (Waldfogel, 1999). There currently are five states (New York, New Jersey, Rhode Island, Hawaii, and California) that use existing TDI systems to provide employees with benefits for non-work-related illness, injury, and pregnancy leave funded entirely by employees through payroll deductions (Appendix K). Additionally, California and New Jersey are expanding their pre-existing TDI programs to provide paid leave.

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Because the infrastructure is already in place, the administrative costs are relatively low, employee contributions are affordable, and employers are not being asked to cover the expenses of this benefit (Appendix L).

Since California became the first state to pass paid leave legislation in 2002, several studies have examined how leave-taking behavior has changed in response to this law. A case-control study of 1214 pregnant women who had worked at least 20 hours/week during their first two trimesters, found that the majority of the sample (52%) did not take any antenatal leave; half of the one-third (32%) who took antenatal leave did so for medical reasons (Guendelman, Pearl, et al., 2006). In a state-level telephone survey asking 1,050 Californians about their use of leave benefits prior to 2002 (the year the paid leave law was passed), a nearly equal number of men and women reported they had taken medical or family leave in the past five years (Milkman & Appelbaum, 2004), although 7.9% of male respondents had taken eight or more weeks of leave compared to 35.8% of female respondents, presumably reflecting leave used for maternity. This same study found that only 20% Californians were aware of the new paid leave law and those in certain disadvantaged groups were even less familiar with it. A study investigating the association between length of paid leave and the duration of breastfeeding is underway in California (Guendelman et al., unpublished).

A national effort is underway to pass paid family leave legislation.

A national effort is underway to pass paid family leave legislation. The Family Leave Insurance Act, sponsored by Senator Chris Dodd (D-Connecticut) and Senator Ted Stevens (R-Alaska), will allow employees to take up to eight weeks of partially paid leave under the FMLA through the establishment of a family leave insurance fund, to be financed by employees, their employers, and the federal government (Appendix M). In NYS, a bill to expand the current TDI system and cover paid family leave passed the NYS Assembly in June 2007, but was subsequently stalled in the NYS Senate. The 2008 legislative session ended again without the passage of this legislation (Appendix N), although support is growing among a coalition of labor unions, NYC Council members, the Manhattan Borough President, and a diverse group of advocates and policymakers.

Many women confront logistical issues at the workplace that make continued breastfeeding difficult, including employers and co-workers who are unsupportive, career penalties…, as well as less tangible factors such as feeling personal discomfort or embarrassment about expressing breast milk while at work.

Breastfeeding

There are many potential barriers for employed women who want to breastfeed. As just described, new mothers have limited leave time following childbirth. Many women confront logistical issues at the workplace that make continued breastfeeding difficult, including employers and co-workers who are unsupportive, career penalties (dismissal, missed promotions), as well as less tangible factors such as feeling personal discomfort or embarrassment about expressing breast milk while at work (Johnston & Esposito, 2007).

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Legal protections and workplace accommodations to support breastfeeding include: granting at least two paid work breaks per day for a minimum of one year; supplying a private, hygienic space (not a restroom stall) where a woman can express milk; providing insurance coverage for lactation consultants or breastfeeding support groups; providing access to high-quality electric breast pumps or other necessary equipment; legally guaranteeing the right to breastfeed in public; and implementing/establishing antidiscrimination measures such as safeguards against dismissals for breastfeeding and penalties for employer non-compliance.

Since 1919, ILO convention proceedings have stated that employed women have the right to work breaks for the purpose of breastfeeding and/or expressing milk (Oun & Trujillo, 2005). There currently are more than 92 countries that provide female employees with breastfeeding breaks; in many places, this time is remunerated. In the U.S., legislation regarding breastfeeding has been left to the discretion of state governments, with the sole exception of the law giving women the right to breastfeed their children in federal buildings or on federal property (Weimer, 2006).

There are numerous maternal and child health benefits associated with breastfeeding. Studies have reported that exclusive breastfeeding is associated with reduced risk of infant gastroenteritis, allergies, diarrhea, respiratory tract infections, otitis media, diabetes mellitus, obesity, and sudden infant death syndrome (SIDS) (Ip, S., Chung, M., Raman, G., et al., 2007). Breastfeeding also provides health advantages to women, such as reduction in postpartum bleeding, and decreased risk of ovarian cancer and premenopausal breast cancer later in life (Ip, S., Chung, M., Raman, G., et al., 2007).

The majority of states now have laws which permit women to nurse their babies in any public space where she otherwise is authorized to be and provide protection from state indecency laws (Appendix O). Some states have included specific provisions regarding breastfeeding such as deferral from jury duty (Oregon, Idaho, Nebraska), fines or penalties for anybody who tries to restrict a woman from breastfeeding (New Jersey), anti-discrimination statutes (Hawaii, Louisiana, Montana), and prohibitions against municipalities from enacting restrictive laws (Alaska, Kansas, Kentucky). Other states take breastfeeding into account when making decisions in child custody hearings (Maine, Michigan, Utah). Colorado, Florida, and Georgia specifically have referred to the nutritional value and health benefits of breast milk for children when enacting breastfeeding legislation (La Leche League website, 2007).

The majority of states now have laws which permit women to nurse their babies in any public space.

High rates of maternal employment make legislation regarding breastfeeding in the workplace a priority. Several states have laws that encourage employers

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to make reasonable accommodations for breastfeeding employees such as sufficient break times and access to private and hygienic rooms for expressing breast milk (California, Rhode Island, Connecticut, Illinois, and Washington). Minnesota law requires employers to make "reasonable" accommodations for breastfeeding mothers in the workplace.

High rates of maternal employment make legislation regarding breastfeeding in the workplace a priority.

New York

New York was one of the first states to exempt breastfeeding from its criminal statute and affirm a woman's right to breastfeed in public, and is unique in stipulating that female prison inmates should be able to breastfeed their infants up to one year (La Leche League website, 2007). In 2007, NYS passed legislation that requires employers to allow nursing employees to take unpaid work breaks to express milk, stipulates that "reasonable" efforts should be made to provide employees with a private room to express milk for up to three years following childbirth, and protects against discrimination.

Representative Carolyn Maloney (D-New York) has proposed the Breastfeeding Promotion Act, which would include protection of breastfeeding under the Civil Rights Act of 1964 and provide tax incentives to businesses that establish lactation rooms in the workplace as well as allow breastfeeding equipment to be tax deductible (Congresswoman Maloney's website).

Subsidized Child Care

The lack of a national childcare system in the U.S. is a major factor contributing to work-family conflict. Private childcare typically is very expensive and many parents live far away from relatives who might have assisted with caregiving. The childcare dilemma in the U.S. is particularly problematic for low-income single mothers, as childcare center hours may not correspond to their working hours and they may not earn enough money to pay for quality childcare.

The lack of a national childcare system in the U.S. is a major factor contributing to work-family conflict…The childcare dilemma in the U.S. is particularly problematic for low-income single mothers.

Because the U.S. does not have a publicly funded, universal child care system such as those that exist in many other industrialized nations, most parents rely on private, market-based arrangements whose services vary greatly both in terms of cost and quality (Gornick & Meyers, 2003). Some governmental assistance is available in the form of tax breaks/credits, which is more advantageous for middle- and upper-income families because of their tax share. While, theoretically, state and federal childcare subsidies are available for low-income families, the supply of subsidies is limited. High quality child care has been recognized to be important for early childhood development and school readiness (Love, Harrison, et al., 2003). Children lacking access to a safe and enriching environment during their formative years are

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at increased risk for various educational disadvantages later on in life (Thompson, 2001).

While, theoretically, state and federal childcare subsidies are available for low-income families, the supply of subsidies is limited.

From a public health perspective, the first few years of life are a critical period for healthy development (Thompson, 2001). The child's early environment and the quality of the relationships formed with caretakers are important factors in determining the trajectory for normal physical and mental growth, making it a time of great potential but also one of vulnerability. High-quality childcare (low adult-to-child ratios and well-educated providers) has been demonstrated to improve children's cognitive development, social/emotional growth, and school readiness (Bradley & Vandell, 2007). Lower-quality care where providers lack relevant training and education, and/or are poorly compensated, can be detrimental for children's developmental outcomes (Phillips & Adams, 2001). Licensing requirements, provider qualifications, and regulations differ greatly among states, which raises important child health and safety concerns (Gornick & Meyers, 2003).

Many E.U. countries provide affordable, high-quality childcare that is widely available to parents of all income levels and, thus, is not stigmatized but well regarded (Appendix P). In Sweden, center-based childcare is an entitlement provided to all children from 18 months to the age of six when children enter school. It is publicly funded (aside from some minimal parental fees), the educational curriculum is regulated, and the providers are both highly trained and well-compensated (Gornick & Meyers, 2003). In France, preschool (école maternelle) is universally available for children older than two and publicly funded childcare (crèche for three months-three years old) exists for working parents who must pay some income-based fees.

There are two mechanisms that provide childcare assistance to American families: tax credits/breaks and federal/state subsidies (Appendix Q for NYS-specific child care information). Provisions in the federal tax code known as the Child and Dependent Care Tax Credit (CDCTC) provide credits for family childcare expenses. Dependent care assistance programs (DCAP) are offered by some employers and allow employees to use pre-tax dollars to cover certain child care or dependent care expenses. Both the CDCTC and DCAPs are less beneficial to low-wage employees who may earn too little to owe any taxes (National Women's Law Center website, 2000).

Low-income families receive federal assistance through the Child Care and Development Fund (CCDF), a program funded by state block grants, targeted at people with incomes below 85% of the state median income and intended to provide child care while parents are working or actively seeking employment. Eligible families can receive subsidized child care assistance through vouchers or by contracts made directly with child care providers. States also can provide child care assistance to low-income families through TANF.

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Both the CCDF and TANF funds are insufficient to meet the demand from families who need affordable child care options while they work. It is estimated that only one in seven eligible children receives CCDF assistance because of inadequate supply (Greenberg, 2007). Without outside assistance, families spend a large proportion of their incomes on child care costs, which reduces their available disposable income for other household necessities. Families with incomes between 100% and 200% of the federal poverty level spent approximately 14.6% of their incomes on child care while higher-income families only spent 5.8% of their incomes on child care (Heymann & Penrose, 2006).

Both the CCDF and TANF funds are insufficient to meet the demand from families who need affordable child care options while they work. It is estimated that only one in seven eligible children receives CCDF assistance because of inadequate supply.

A few states (Minnesota, Montana, and New Mexico) have piloted At-Home Infant Care Programs (AHIC) that provide low-income families with partial wage replacement to care for their infants at home (Appendix R). These programs are time-limited (usually one year) and generally are available for working parents with incomes between 100% and 175% of the federal poverty level (Democratic Leadership Council, 2007).

Delayed Childbearing/Use of ARTs

Many women in the U.S. are postponing childbearing until after they have completed their education and have established their careers. Fertility declines with age and many of these women are then turning to ARTs to conceive. The lack of any work-family policies to help women balance the competing demands of starting a family at an earlier age while also pursuing paid employment is associated with a number of adverse health outcomes for both women and children.

The lack of any work-family policies to help women balance the competing demands of starting a family at an earlier age while also pursuing paid employment is associated with a number of adverse health outcomes for both women and children.

The growing trend towards delayed childbearing and the subsequent use of ARTs has been associated with a dramatic increase in the multiple birth rates in the U.S. (Johnson & Chavkin, 2006). According to the CDC, 50% of infants born as a result of ART-use were multiples compared to only 3% of infants born to the general U.S. population (Wright, Chang, Jeng, et al., 2007). Multiple birth infants present a significant public health concern because they are at greater risk for a range of adverse health outcomes including preterm birth, perinatal morbidities, mortality, and long-term neurocognitive impairment.

The key contribution to the increased rate of multiple births is the elevated number of embryos transferred per treatment cycle. There have been many policy proposals in individual E.U. countries aimed at limiting the number of embryos transferred per cycle. In Europe, where fertility treatments are publicly funded, the state has much more discretion when it comes to regulating the number of embryos that can be transferred, the number of treatment cycles reimbursable by the national health care system, and the

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maximum age at which a woman can still undergo ART treatments. Many European countries have set strict limits on the use of ARTs (Soini, Ibarreta, Anastasiadou, et al., 2006).

Fertility specialists in the U.S generally have been opposed to any type of governmental intervention regulating their practices, preferring voluntary guidelines developed by their professional organizations. The American Society for Reproductive Medicine (ASRM) issued guidelines for its members in 2004 and 2006 recommending that only a single embryo be transferred in patients having a favorable prognosis. However, many practitioners are implanting more than one embryo, perhaps in part because of the high costs associated with a single cycle for treatment.

Conclusion

U.S. policies have not kept pace with the increase in women's labor force participation—especially among mothers of young children—and the growth of both dual-earner and single-parent families. These structural transformations in familial support systems and employment require parallel changes in policy to account for the constraints imposed on families by work and vice versa. The lack of a government response has exacerbated work-family conflict for American families trying to balance their responsibilities at work with those at home.

Structural transformations in familial support systems and employment require parallel changes in policy.

Most Americans have been left to find private solutions to reconcile the competing demands of work and family life. Families must either rely on employer-supported benefits or on their own resources to engage in caretaking responsibilities despite the many advantages that physically and developmentally healthy children provide to all of society. This disconnect contributes to significant disparities between those who can afford to provide their own supports or those who have employment benefits, and those without such access. Work-family benefits including paid sick days, flexible time arrangements, paid leave at birth/adoption of a child, employer-supported breastfeeding accommodations, and child care, and policies that address the ramifications of delayed childbearing can assist families to engage in paid employment, support dependent family members, and raise healthy children.

New York City can lead the way in developing work-family policy in the U.S. A commitment to New Yorkers to support their obligations to work and to family will attract high-quality workers, improve the health and welfare of the poor decreasing health disparities, reduce long-term societal health care costs, and improve health outcomes for women, children, and families.

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Part III: Recommendations

Based on a literature review examining the relationship between working conditions and reproductive, maternal, and infant/child health outcomes and on an analysis of work-family policies in the U.S. and in other industrialized nations, policy makers should consider the following work-family policy recommendations in order to improve health outcomes in New York City:

1. **Support the passage of paid sick days legislation for all NYC employees**

   - Require NYC employers to provide their employees (full-time, part-time, and temporary workers) with one hour of paid sick leave for every 30 hours worked. For organizations of 10 or more employees, there is a 72 hour cap of accrued paid leave per employee. For organizations with fewer than 10 employees, there is a 40 hour cap of accrued paid leave. Benefit to be used by an employee for either a personal illness, injury, to receive medical care, or to provide care for a sick family member or a designated person (See San Francisco Paid Sick Days legislation).

   - Provide tax incentives for employers who provide paid sick days.

   - Participate in a publicity campaign to raise awareness about the new paid sick days legislation and educate both employers and employees about their rights. Special attention to restaurants, hotels, child care centers, schools, nursing homes, and health care facilities is needed because public health concerns are often most acute if sick individuals remain on duty in these settings.

Support the passage of paid sick days legislation for all NYC employees.

2. **Support the passage of state legislation guaranteeing paid parental leave at the time of birth/adoption of a child, and protected leave for long-term illness (either personal or for a family member)**

   - Provide paid family leave through an expansion of the existing Temporary Disability Insurance (TDI) system in New York State (NYS).

   - Support raising TDI weekly benefit levels (50% of a claimant's average weekly wage) from their current maximum of $170 per week to an amount consistent with the present cost of living.

   - Assist small businesses with financial and/or placement assistance by providing temporary workers to replace employees on leave; funded jointly by employee/employer contributions.

Support the passage of state legislation guaranteeing paid parental leave at the time of birth/adoption of a child, and protected leave for long-term illness (either personal or for a family member).

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3. Support improved child care services in NYC

Support improved child care services in NYC.

- Expand access to child care for all eligible low-income families with the eventual goal of increased funding for Child Care and Development Fund (CCDF).
- Improve quality standards for all child care facilities and curricula.
- Increase salaries/benefits/training requirements for Early Childhood Education and Care (ECEC) providers.
- Give tax breaks/credits to employers who offer on-site child care/sick-child services.
- Make the Child and Dependent Care Tax Credit (CDCTC) fully refundable so that low-income families with little or no tax liability also benefit.

4. Encourage employers to make accommodations for breastfeeding at work sites

Encourage employers to make accommodations for breastfeeding at work sites

- Provide tax incentives for employers who make workplace accommodations including private, hygienic lactation rooms, milk storage facilities, referrals to lactation consultants and breastfeeding support groups.
- Provide women with paid work breaks to breastfeed/express milk.
- Provide tax incentives to employers who have on-site child care centers where women can breastfeed while at work.
- Enact penalties/fines for those obstructing/preventing a woman from breastfeeding in public areas where she has a legal right to do so.

5. Encourage flexible work arrangements

Encourage flexible work arrangements.

- Give tax incentives to employers who offer flexible work arrangements such as adjusted weekly working hours, restricted non-standard work hours, and restricted mandatory overtime.
- Expand eligibility for benefits, health insurance, and higher hourly wages (pay equity) to part-time workers.
- Increase availability of teleworking/telecommuting.

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- Increase availability of compressed work weeks and job sharing.
- Encourage or mandate pension accrual for employees while on leave.

6. Develop legislation to minimize adverse working conditions

Develop legislation to minimize adverse working conditions.

- Transfer pregnant or breastfeeding women from jobs involving physically demanding working conditions (e.g., heavy lifting, irregular working hours, prolonged standing, shift work, long working hours, and/or exposure to toxic materials) to lower-risk positions while protecting wages and seniority.
- Provide work task adaptations for pregnant/breastfeeding women in higher-risk jobs while protecting wages and seniority.

7. Support policies that enable earlier childbearing while supporting female education and career advancement

Support policies that enable earlier child-bearing while supporting female education and career advancement.

- Encourage or mandate employers to provide pension accrual for public employees while on paid leave.
- Extend tenure and partnership clocks for parents of small children (e.g. teachers, college professors, lawyers); start with public employees (e.g. City University of New York).
- Develop medical/public health standards concerning Assisted Reproductive Technologies (ART) such as limitations on maternal age and the number of embryos transferred.