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Dental Care for New Mothers in HUSKY A

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Key Findings

The prenatal and postnatal period represents a unique window of opportunity for addressing the health needs of new mothers, particularly risks to maternal health and risks for adverse birth outcomes such as low birthweight and preterm birth. Comprehensive risk assessment and screening during the “interconceptional period,” i.e. between pregnancies, can help identify risk factors that can be addressed prior to the next pregnancy. Preventive dental care and treatment are important for promoting maternal oral health and identifying those women in need of more extensive care. Dental care for expectant and new mothers is also important for decreasing the risk of dental disease in infants and young children. This study examined dental care during and after pregnancy among women who were enrolled in HUSKY A when they gave birth in 2005 and were continuously enrolled for the next 12 months. Key findings:

- New mothers were significantly less likely than other women in HUSKY A to have received any dental care during pregnancy or in the year after they gave birth.
- New mothers with adverse birth outcomes were not any more likely than other mothers to have received dental care following the birth of a low birthweight or preterm baby.

The research literature suggests that periodontal disease, a common chronic infection of the gums and tissue that support the teeth, may be associated with increased risk of poor birth outcomes. It makes good sense to include dental care in the interconceptional period, especially for women known to be at risk for another low birthweight or preterm birth. Dental care for new mothers may also be effective in reducing cavities in early childhood, especially among children in low-income families who are at increased risk for the disease.

INTRODUCTION

Maintaining good oral health is important for overall general health.¹ Despite the availability of effective treatments and preventive measures, oral diseases—e.g., dental caries, periodontal infection, and gingivitis—are highly prevalent in women of reproductive age. An estimated 40 percent of pregnant women may have experienced periodontal infection.² Further, there is evidence that many women who have periodontal and other oral diseases do not receive the treatment they need. For example, data from the 1998 Pregnancy Risk Assessment Monitoring System (PRAMS) survey indicate that just one-third of all pregnant women receive dental care.³

The consequences of unaddressed oral disease are significant, although not as well understood for pregnant women. Persons with periodontal disease, especially those in poor health, are at increased risk for diabetes,⁴ cardiovascular disease,⁵ and respiratory infections.⁶ Recent evidence shows that periodontal disease is associated with increased

risk of adverse pregnancy and birth outcomes⁷ such as preterm birth,⁸ low birthweight,⁹ small-for-gestational age,¹⁰ preeclampsia,¹¹ and gestational diabetes.¹² The presence of maternal oral flora is directly correlated with presence of oral flora in children, increasing the risk of childhood dental caries.^{13, 14, 15}

The interconceptional period represents a unique window of opportunity for addressing the health needs of new mothers, with particular attention to risks to maternal health and risks for adverse birth outcomes in subsequent pregnancies. Prenatal care alone is by definition time-limited and “too little too late to significantly alter the course or outcome of the pregnancy.”¹⁶ “Internatal care,” as proposed by Lu et al,¹⁷ is comprehensive health care and support services, beginning with the birth of a baby, delivered at regularly scheduled intervals until the next pregnancy. This pattern of care may be more effective than current practice for addressing known health risks and promoting maternal health for all women and especially for high-risk women. For example, the leading predictor of preterm birth is a history of preterm birth in an earlier pregnancy. During the interconceptional period, comprehensive risk assessment and screening can lead to identification of risk factors for preterm birth, such as infectious disease, depression, nutritional problems and tobacco dependence, that can be addressed prior to the next pregnancy. Preventive dental care and treatment as needed are important for promoting oral health and identifying those women in need of more extensive care, such as scaling and root planing for treatment of periodontal disease.¹⁸

Dental care for new mothers is also important for the health of infants and very young children. Research shows that bacteria associated with dental caries can be transmitted from mother to child, probably during ordinary everyday interactions like kissing and sharing food or eating utensils.¹⁹ Children are at greater risk when their mothers harbor high levels of bacteria. In the “Guide to Children’s Dental Care in Medicaid,” the federal Medicaid agency declares that because “tooth decay is an infectious, transmissible, destructive disease caused by acid-forming bacteria acquired by toddlers from their mothers shortly after their first teeth erupt...particular attention should be paid to the oral health of expectant and new mothers.”²⁰

Research shows that oral disease disproportionately affects adults and children of lower socioeconomic status.²¹ Women enrolled in Connecticut’s Medicaid managed care program (HUSKY A), by virtue of their social and economic vulnerability, are at high risk for oral diseases.²² Children and adults who are enrolled in HUSKY A are covered for preventive dental care and treatment. Periodontal care is not a covered benefit in HUSKY A. Under contracts with the Connecticut Department of Social Services, HUSKY A managed care plans are responsible for prenatal risk assessment and case management. In 2005-2006, HUSKY A health plans and their respective dental care subcontractors were also contractually responsible for maintaining adequate dental care provider networks and ensuring that no less than 80 percent of children and adults received at least one screening and dental cleaning each year.²³

This study examines patterns in dental care for new mothers in HUSKY A, especially those mothers with risk for adverse birth outcomes in a subsequent pregnancy. This report is the first in a series on maternal health in the HUSKY Program, issued by Connecticut Voices for Children.

PURPOSE

- To describe dental care for new mothers in HUSKY A in the year following the birth.
- To determine whether new mothers at increased risk for low birthweight or preterm birth received dental care in the interconceptional period.

METHODS

For this study, we used a retrospective cohort design. Birth and Medicaid managed care data were linked to identify mothers with HUSKY A coverage, then searched for dental care services received during pregnancy and during the year after giving birth. Dental care utilization rates for new mothers were compared to rates for all women enrolled

in HUSKY A during the study period. Care for new mothers with risk factors for poor birth outcomes in the next pregnancy was investigated.

Data

For the purpose of linking birth and HUSKY Program records, the 2005 birth data file was obtained from the Connecticut Department of Public Health with the approval of the agency's Human Investigations Committee. The birth data file contains identifying information for every mother and data on maternal health and prenatal care, as well as data on birth outcomes.

For ongoing performance monitoring, 2005 and 2006 HUSKY Program enrollment and encounter data were obtained from the Connecticut Department of Social Services. Enrollment records contain identifying information and sociodemographic descriptors for each HUSKY Program enrollee. Encounter records include information about each health care encounter, including identifiers for the patient and procedure codes for the care rendered. Note: Encounter records for dental care do not contain any information about diagnosis beyond what can be inferred by the procedure code.²⁴

Study sample

We conducted a three-way linkage of birth and HUSKY Program data. First, birth certificates and Medicaid managed care enrollment records were linked to identify mothers who were enrolled in HUSKY A when they gave birth in 2005.²⁵ We searched enrollment records for 2005 and 2006 to identify: 1) **“new mothers,”** that is, mothers who gave birth in 2005 and were continuously enrolled in HUSKY A for the twelve months following the birth²⁶ and 2) **“pregnant/new mothers,”** the subset who gave birth in the latter half of 2005 and were continuously enrolled in HUSKY A for at least 18 months, including six months during pregnancy in 2005 and twelve months in 2005 and 2006 after giving birth. For example, a mother who gave birth in August 2005 and was enrolled each month until at least July 2006 was included among the “new mothers.” If this same mother was enrolled for six months or more during the pregnancy (at least since February 2005), she was also included among the subset of “pregnant/new mothers.”

Data Analysis

We searched the encounter database for records corresponding to dental care, including periodontal care, received during pregnancy and the postpartum year.²⁷ We calculated utilization rates for new mothers and for pregnant/new mothers by type of dental care (any, preventive, treatment) received in the first year after giving birth. We report utilization rates for new mothers by maternal age, race/ethnicity, maternal health indicators and birth outcomes. For comparison, we determined the dental utilization rates for all women 15 to 39 who were continuously enrolled in HUSKY A for twelve months in 2005.

We calculated rate ratios for dental care in order to determine whether new mothers with a history of poor birth outcomes (low birthweight <2500 grams, very low birthweight <1500 grams, preterm birth <37 weeks gestation) were any more likely than other new mothers to have had any dental care in the year following that birth.

RESULTS

Enrollment

New mothers: In 2005, there were 11,007 babies born to 10,835 mothers who were enrolled in HUSKY A when they gave birth. Less than two out of three of these new mothers (63.2% or 6,851) were enrolled for the entire twelve months following the birth.²⁸ Mothers who were and were not enrolled for one year after the birth were

similarly distributed across age and racial/ethnic groupings. Prenatal care initiation and adequacy were remarkably comparable. Low birthweight and preterm birth rates were also similar.

Pregnant/new mothers: Mothers who gave birth in the latter half of 2005 (5,674 or 52.4% of the 10,835 mothers in HUSKY A who gave birth in 2005) were enrolled for an average of 5.1 months prior to the birth. Forty-one percent of these mothers (2,318) were continuously enrolled for 18 months, including six months prior to giving birth *and* twelve months postpartum.

All women: In calendar year 2005, there were 57,350 women ages 15 to 39 who were continuously enrolled in HUSKY A. Compared with mothers who gave birth in 2005 and were continuously enrolled for the first year postpartum, these women were similar in age (average age 25.7 for all women, compared with 25.0 for new mothers); however, they were less likely than new mothers to be Hispanic and more likely to be White non-Hispanic.

Dental Care Utilization

Dental care utilization rates for new mothers are shown in Table 1, along with utilization rates for the subset who were also enrolled during pregnancy (pregnant/new mothers), and for all women in HUSKY A in roughly the same time period. Overall, about 28 percent of new mothers had dental care in the year following pregnancy. The rate was similar for the subset of pregnant/new mothers who were continuously enrolled for 18 months, including six months prior to the birth.²⁹ Both rates were significantly less than the rate for all women who were in HUSKY A in 2005 (35.2%).³⁰ In every age and racial/ethnic groups, the preventive care and treatment rates were lower for new mothers (data not shown). None of the new mothers had periodontal scaling and root planing during the year postpartum; eleven other women in HUSKY A in 2005 did.

Table 1. Maternal Dental Care Utilization

	Total	Any dental care		Preventive dental care		Treatment	
		N	%	N	%	N	%
New mothers^a	6,851	1,931	28.2%	1,112	16.2%	1,102	16.1%
Pregnant/new mothers^b	2,318	691	29.8%	385	16.6%	380	16.4%
All women in HUSKY A^c (comparison group)	57,350	20,175	35.2%	13,035	22.7%	12,574	21.9%

^a Women who gave birth in 2005 and were continuously enrolled in HUSKY A for the following 12 months.

^b Women who gave birth between July and December 2005 and were continuously enrolled in HUSKY A for 18 months, including 6 months during pregnancy *and* 12 months after giving birth.

^c Women 15 to 39 who were continuously enrolled in HUSKY A in calendar year 2005.

Source: Analysis of birth data from the Connecticut Department of Public Health linked with HUSKY A enrollment and encounter data obtained from the Connecticut Department of Social Services.

Among new mothers, less than one in three had any dental care, including about one in six who had preventive care and one in six who had treatment (Table 2). Dental care utilization varied by age: most new mothers under 15 had dental care, but the age-specific rates dropped off quickly after that. The dental care rates for new mothers were similar for the various racial/ethnic groups.

Rates for dental care during the interconceptional period were examined by pregnancy characteristics and risk factors associated with preterm and low birthweight babies (Table 2). Those who were least likely to have had any dental care were those who did not have any prenatal care. The longer mothers delayed entry into prenatal care, the less likely they were to have had any dental care during the year postpartum.³¹

Table 2. Dental Care for New Mothers by Maternal and Pregnancy Characteristics

	<i>New Mothers</i>							
	Total		Any Dental		Preventive		Treatment	
	N	n	%	n	%	n	%	
Total	2,851	1,931	28.2%	1,112	16.2%	1,102	16.1%	
Maternal characteristics:								
Age								
Under 15	17	11	64.7%	8	47.1%	6	35.3%	
15-19	1,332	361	27.1%	221	16.6%	178	13.4%	
20-24	2,521	712	28.2%	385	15.3%	433	17.2%	
25-29	1,582	457	28.9%	256	16.2%	268	16.9%	
30-34	921	252	27.4%	151	16.4%	141	15.3%	
35-39	389	118	30.3%	80	20.6%	66	17.0%	
40 and over	89	20	22.5%	11	12.4%	10	11.2%	
Race/ethnicity								
White non-Hispanic	2,293	647	28.2%	393	17.1%	398	17.4%	
Black non-Hispanic	1,753	462	26.4%	236	13.5%	277	15.8%	
Other non-Hispanic	249	71	28.5%	44	17.7%	41	16.5%	
Hispanic	2,556	751	29.4%	439	17.2%	386	15.1%	
Maternal health:								
Parity								
0	2,526	697	27.6%	434	17.2%	371	14.7%	
1	2,133	636	29.8%	365	17.1%	357	16.7%	
2 - 4	2,051	565	27.5%	299	14.6%	353	17.2%	
5+	141	33	23.4%	14	9.9%	21	14.9%	
Smoked During Pregnancy								
Yes	1,063	293	27.6%	134	12.6%	189	17.8%	
No	5,784	1,637	28.3%	977	16.9%	912	15.8%	
Plurality								
Multiple	115	34	29.6%	24	20.9%	18	15.7%	
Singleton	6,736	1,897	28.2%	1,088	16.2%	1,084	16.1%	
Prenatal care:								
Prenatal care timing								
First trimester	5,231	1,523	29.1%	887	17.0%	879	16.8%	
Second trimester	1,388	356	25.6%	192	13.8%	196	14.1%	
Third trimester	152	34	22.4%	24	15.8%	15	9.9%	
No prenatal care	25	3	12.0%	3	12.0%	2	8.0%	
Prenatal care adequacy								
Adequate or better	4,958	1,434	28.9%	830	16.7%	815	16.4%	
Intermediate	950	271	28.5%	154	16.2%	156	16.4%	
Inadequate	850	200	23.5%	112	13.2%	115	13.5%	
Birth outcomes:								
Gestational Age								
Preterm (<37 weeks)	714	197	27.6%	112	15.7%	116	16.2%	
Normal (>=37 weeks)	6,100	1,728	28.3%	998	16.4%	982	16.1%	
Birthweight								
Normal (>=2500 gms)	6,237	1,784	28.6%	1,031	16.5%	1,022	16.4%	
Low birthweight (<2500 gms)	611	146	23.9%	80	13.1%	79	12.9%	
Very low birthweight (<1500 gms)	118	27	22.9%	15	12.7%	14	11.9%	

Source: Analysis of birth data from Connecticut Department of Public Health and HUSKY A enrollment and encounter data from the Connecticut Department of Social Services.

Dental Care for New Mothers with Previous Adverse Birth Outcomes

New mothers with poor birth outcomes did not get dental care at any higher rates than those with better birth outcomes. Compared to mothers with normal weight babies, those with low birthweight babies were in fact less likely to have had any dental care, despite their risk status.³² The smaller subset of new mothers who had had very low birthweight babies were no more or less likely to have had dental care following this adverse pregnancy outcome.³³ The dental care utilization rates were also about the same for mothers who did and did not have preterm births.³⁴

DISCUSSION

For many years, policy makers have invested in increasing access to and enhancing prenatal care, especially for women at risk for adverse birth outcomes. These efforts have included expansion of Medicaid eligibility in order to reduce or eliminate financial barriers to obtaining care. In Connecticut, these policies have resulted in Medicaid coverage for an increasing proportion of all births.³⁵ However, prenatal care alone is unlikely to prevent low birthweight or preterm births.³⁶ The antecedents of poor birth outcomes include health and socioeconomic conditions that predate the pregnancy, such as overweight/obesity, chronic untreated infections, untreated depression, and chronic stress. For some women, these conditions originated in childhood or adolescence.

Comprehensive, high quality health care, offered on a continuum throughout childhood, adolescence and young adulthood, is vitally important for detecting and treating conditions that can jeopardize maternal health and birth outcomes. The period of time after a pregnancy is a special window of opportunity for addressing known risks, some evident from the previous pregnancy outcome, and for promoting maternal health in anticipation of a subsequent pregnancy. Regularly scheduled visits during the first year postpartum should include risk assessment, health promotion, and interventions aimed at addressing medical, obstetrical and psychosocial risk factors.³⁷ Dental care in the interconceptional period is one aspect of comprehensive health assessment and treatment, if needed. Since the research literature suggests that periodontal disease, a common chronic infection, may be associated with increased risk of poor birth outcomes, it makes good sense to include dental care in the interconceptional period, especially for women known to be at risk for another low birthweight or preterm birth.³⁸ Dental care for new mothers may also be effective in reducing early childhood caries, especially among children in low-income families who are at increased risk for the disease.

We find, however, that utilization of dental care by new mothers in the HUSKY program is low, despite the increased risk for dental caries and other infectious oral diseases among these women. This rate (28.2%) is consistent with low rates reported by PRAMS respondents in four states (22.7% to 34.7% who said they had any dental care during pregnancy).³⁹ Among those PRAMS respondents who said that they had dental problems during pregnancy (12.1% to 25.4% of mothers), women with Medicaid coverage were far less likely than privately insured mothers to have had dental care during pregnancy.

We also find that new mothers are less likely than non-pregnant women to receive dental care. These results suggest that the demands of early motherhood may affect utilization, especially for those women coping with multiple medical and psychosocial risk factors associated with poor health. It is also possible that prenatal and interconceptional care providers did not recommend dental care during pregnancy or after the birth. Mothers seeking dental care may have encountered problems getting timely care.

From earlier research, we know that more than one in four mothers in HUSKY A is pregnant again within 18 months, so the postpartum period is an important window of opportunity for improving maternal health in the next pregnancy.⁴⁰ However, we find that new mothers with adverse birth outcomes were not any more likely than other

mothers to have received dental care following the birth of a low birthweight or preterm baby. This finding may be due to the fact that while current professional guidelines for perinatal care cite the increased risk for preterm birth associated with caries and periodontal disease, dental care is not specifically mentioned as an important component of health promotion and risk reduction during the preconception period.⁴¹ Further, despite evidence that mothers are the primary source of bacterial transmission to young children and that treatment of mothers can reduce colonization in their children, dental care during early motherhood is not stressed in the professional guidelines that were issued jointly by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists.⁴²

The results of this study should be interpreted with caution due to several methodological limitations. First, we could not determine from administrative data alone whether any of these women or any other new mothers needed dental or periodontal care during the study period. However, the rates for preventive care and treatment were about one-third less than the rates for non-pregnant women, suggesting that the need for care probably exceeded what these women actually received during pregnancy and the interconceptional period. Second, we do not have information with which to determine whether prenatal or postpartum care providers recommended dental care, and if so, what barriers to care were encountered by these women. Third, some of these women may have received periodontal care that was not billed separately from other procedures because periodontal care is not a reimbursable service in Connecticut's Medicaid program. Lastly, we are unable to compare utilization by new mothers with Medicaid coverage to utilization by new mothers with private dental insurance. Answers to all these questions would require a large scale examination survey of pregnant women and new mothers, a medical record review, or, at the very least, a survey of new mothers like that conducted several times in recent years by the Connecticut Department of Public Health (Pregnancy Risk Assessment Tracking Survey). The quality of interconceptional care and the effectiveness of dental care for new mothers with Medicaid coverage warrant further study.

Dental care access for new mothers and all others in the HUSKY Program may improve due to recent changes to the HUSKY program:

- Medicaid eligibility was expanded to cover parents in families with income up to 185 percent of the federal poverty level, effective July 1, 2007. This change means that more new mothers will qualify for ongoing coverage after giving birth.
- Medicaid eligibility was expanded to pregnant women with family income up to 250 percent of the federal poverty level, effective January 1, 2008. This change means that more pregnant women will receive coverage during pregnancy and the immediate postpartum period.
- HUSKY dental services were "carved-out" of managed care, effective September 1, 2008, and will be administered by an administrative services organization under a no-risk contract with the Department of Social Services. Dental services will be reimbursed fee-for-service, based on the Medicaid provider fee schedule. However, treatment for periodontal disease, the condition most strongly associated with poor birth outcomes, is not a covered service in the Medicaid program.
- Medicaid provider fees for pediatric dental services were increased significantly, effective April 1, 2008, as part of a settlement agreement between the State of Connecticut and plaintiffs in a lawsuit filed over eight years ago.⁴³ Adult dental fees were not changed, however, which may make reimbursement for some dentists lower than what they were able to negotiate with HUSKY managed care plans prior to the "carve-out" of dental services.

These sweeping policy and program changes will undoubtedly have an impact on access to dental care for HUSKY Program enrollees, including new mothers. Ongoing monitoring of dental care utilization is important for evaluation of the effect on access to care and maternal health.

CONCLUSIONS

- New mothers were significantly less likely than other women in HUSKY A to have received any dental care during pregnancy and in the year after they gave birth.
- New mothers with adverse birth outcomes were not any more likely than other mothers to have received dental care following the birth of a low birthweight or preterm baby.

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- ²¹ Gilbert GH, Duncan GP, Shelton BJ. Social determinants of tooth loss. *Health Serv Res* 2003; 38: 1843-1862.
- ²² Income eligibility levels in effect in 2005-2006: 185% FPL for children in HUSKY A, 150% FPL for parents of children in HUSKY A, and 185% FPL for pregnant women in HUSKY A. In 2005, the poverty level was \$12,830 for a family of 2, \$16,090 for a family of 3, and \$19,350 for a family of 4 (Source: <http://aspe.hhs.gov/poverty/05poverty.shtml>). For the purpose of determining eligibility for Medicaid, a pregnant woman is counted as two.
- ²³ Dental services were "carved-out" of risk-based managed care contracts, effective September 1, 2008, after the study period.
- ²⁴ For example, procedure codes for amalgam restorations (ADA codes 02110, 02120, 02130, 02131, 02140, 02150, 02160, 02161) indicate treatment of dental caries. Use of the code might also indicate that a filling was replaced, however.
- ²⁵ Methods for the data linkage have been described elsewhere: Connecticut Voices for Children. Births to mother with HUSKY Program and Medicaid coverage, 2006. New Haven, CT: Connecticut Voices, September 2008. Available at: www.ctkidslink.org.
- ²⁶ Under federal law, new mothers are entitled to Medicaid coverage for 60 days postpartum. Under income eligibility rules that were in effect in 2005, those who were enrolled for the twelve months following the birth were teen mothers living in households with income less than 185% FPL or adult mothers with household income less than 150% FPL whose children were in the program. Those who lost coverage were probably adult parents with household income between 150% and 185% FPL and other new mothers who inadvertently lost coverage at the end of an eligibility period in a non-pregnancy coverage group.
- ²⁷ Any dental care: ADA codes 00100-09999, HCFA Common Procedure Codes (HCPC) codes D100-D9999. Preventive care: ADA codes 01000-01999, HCPC codes D1000-D1999. Treatment: ADA codes 02000-09999, HCPC codes D2000-D9999. Periodontal scaling and root planing, per quadrant: ADA code 04341.
- ²⁸ In 2005, 10,835 mothers gave birth while enrolled in HUSKY A. After the birth, 4.7% were enrolled 2 months or less, 32.1% were enrolled at least 3 months but less than twelve months, and 63.2% were continuously enrolled for a one-year period. About 60% of births in 2005 (6,633 of 11,007 births) were babies born to mothers with Medicaid family coverage (F07) for families with income <150% FPL.
- ²⁹ Among those women who gave birth in the latter half of 2005 (5,674), only 440 women (7.88%) had any dental care during pregnancy. All of the pregnant women who had dental care during pregnancy were enrolled at least six months prior to the birth.
- ³⁰ Any dental care: $RR_{\text{new mothers: all women 15-39}} = 0.80 (0.77, 0.83)$; $RR_{\text{pregnant/new mothers: all women 15-39}} = 0.85 (0.80, 0.90)$
- ³¹ Any dental care: $RR_{\text{delayed prenatal care: early prenatal care}} = 0.87 (0.79, 0.96)$
- ³² Any dental care: $RR_{\text{low birthweight: normal birthweight}} = 0.84 (0.72, 0.97)$
- ³³ Any dental care: $RR_{\text{very low birthweight: normal birthweight}} = 0.80 (0.57, 1.12)$
- ³⁴ Any dental care: $RR_{\text{preterm birth: full term births}} = 0.97 (0.86, 1.10)$
- ³⁵ Connecticut Voices for Children. Births to mothers with HUSKY Program and Medicaid coverage, 2006. New Haven, CT: CT Voices, 2008. Available at: <http://www.ctkidslink.org>.
- ³⁶ Lu MC, Tache V, Alexander GR, Kotelchuck M, Halfon N. Preventing low birth weight: is prenatal care the answer? *Journal of Maternal-Fetal and Neonatal Medicine* 2003; 13(6): 362-380.
- ³⁷ Lu MD, Kotelchuck M, Cluhane JF, Hobel CJ, Klerman LV, Thorp JM, op. cit.
- ³⁸ Xiong X, Buekens P, Fraser WD, Beck J, Offenbacher S, op. cit.
- ³⁹ Gaffield ML, Gilbert BJC, Malvitz DM, Romaguera R, op. cit.
- ⁴⁰ Connecticut Voices for Children. Caring for mothers: pregnancy spacing and birth outcomes, 2005. New Haven, CT: Connecticut Voices, May 2008. Available at: www.ctkidslink.org.
- ⁴¹ American Academy of Pediatrics, American College of Obstetricians and Gynecologists. Guidelines for perinatal care (6th ed.). Elk Grove Village, IL: AAP, 2007; p. 123-24.
- ⁴² Douglass JM, Yihong L, Tinanoff N, op.cit.
- ⁴³ Carr v. Wilson-Coker, D. Conn., 3:00 CV 1050 (AVC)