Published in final edited form as:

Am J Obstet Gynecol. 2014 December ; 211(6): 660.e1–660.e8. doi:10.1016/j.ajog.2014.06.008.

The mortality risk of expectant management compared with delivery stratified by gestational age and race and ethnicity

Melissa G. ROSENSTEIN, MD, MAS¹, Jonathan M. SNOWDEN, PhD², Yvonne W. CHENG, MD, PhD³, and Aaron B. CAUGHEY, MD, PhD²

¹ University of California, San Francisco, Department of Obstetrics, Gynecology and Reproductive Sciences. San Francisco, CA.

² Oregon Health and Science University, Department of Obstetrics and Gynecology. Portland, OR.

³ California Pacific Medical Center, Department of Obstetrics and Gynecology, San Francisco, CA.

Abstract

Objective—To compare the mortality risk of expectant management with the risk of delivery at each week of term pregnancy in four racial/ethnic groups.

Study Design—Retrospective cohort study of all non-anomalous, term deliveries in California from 1997-2006 among white, black, Hispanic, and Asian women. In each racial/ethnic group, we compared the risk of infant death at each week with a composite risk representing the mortality risk of one week of expectant management.

Results—The risk of stillbirth and infant death is highest in black women (stillbirth risk: 18.0/10,000, infant death: 24.4/10,000, compared with 9.4/10,000 and 10.8/10,000 in white women, respectively; $p < 0.001$). Although absolute risks differ by race/ethnicity, the composite risk of expectant management does not surpass the risk of delivery until 39 weeks in any group. At 39 weeks these absolute risk differences are low, however, with a number needed to deliver to prevent one death ranging from 751 (among black women) to 2587 (among Asian women).

Conclusion—The mortality risk of expectant management exceeds the risk of delivery at 39 weeks in all racial/ethnic groups, despite variation in absolute risks.

© 2014 Mosby, Inc. All rights reserved.

Corresponding Author Melissa Rosenstein, MD, MAS Department of Obstetrics, Gynecology and Reproductive Sciences University of California, San Francisco 505 Parnassus Avenue, Box 0132 San Francisco, CA 94143 Ph: 415-476-5192, Fax: 476-1811, rosensteinm@obgyn.ucsf.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Disclosure: None of the authors have a conflict of interest.

This research was presented as a poster presentation at the 30th Annual Meeting of the Society for Maternal Fetal Medicine, February 1-6, 2010.

Introduction

Stillbirth and infant death are two adverse perinatal outcomes that have been shown to demonstrate substantial disparities among different racial/ethnic groups. In particular, non-Hispanic black women have elevated risks of both stillbirth and infant death, with rates of both more than double that seen in non-Hispanic whites (1-3). Hispanic and Asian women have rates of stillbirth similar to non-Hispanic white women with lower rates of infant death (2-5). Although complications of preterm delivery do play a large role in some of these disparities, 29% of all stillbirths after 24 weeks and 63% of infant deaths occur in term pregnancies, with similar rates of disparities seen. (2, 4, 5)

Risk factors for both stillbirth and infant death are similar and there are some causes of death that can result in either stillbirth or infant death, (e.g. congenital anomaly or hydrops) depending on the gestational age (GA) at delivery. Other causes are not similar. For example, infant death related to prematurity is less likely to occur if the pregnancy is prolonged, but the risks of placental insufficiency or cord accident increase as the gestation increases and disappear once delivery is achieved. Early delivery decreases the risk of stillbirth but neonatal complications are higher in babies born before 39 weeks, leading to efforts to decrease elective early term deliveries (5-10). Recently, an American College of Obstetricians and Gynecologists (ACOG) Committee Opinion restated that women should not be delivered without medical indication prior to 39 weeks' gestation. (11) However, there may be populations of women (for example, black women) whose increased risk of stillbirth merits a delivery earlier than 39 weeks' gestation. Determining the ideal time to deliver a pregnancy at term must consider the mortality risks to the fetus/infant in both the intrauterine and postnatal environment.

We have previously demonstrated that a composite metric of stillbirth and infant mortality rate can be useful for quantifying the mortality risks faced by pregnant women at each week of gestation at term in both low and high-risk groups (12-14). In this study, we compare the mortality risk of expectant management with the risk of infant death at term across four racial/ethnic groups.

Materials and Methods

We conducted a retrospective cohort study of California births that occurred between 1997 and 2006, using de-identified data from the California Vital Statistics Birth Certificate Data, California Patient Discharge Data, Vital Statistics Death Certificate Data and Vital Statistics Fetal Death File. The California Office of Statewide Health Planning and Development, as part of the California Health and Human Services Agency, maintains linked datasets that include maternal antepartum and postpartum hospital records as well as birth records and all infant admissions occurring within the first year of life.

The goal of this project was to compare the mortality risks between delivery at a particular gestational age with that of expectant management (i.e. continuing the pregnancy for another week and then delivering one week later) in four common racial/ethnic groups. More specifically, the mortality risk of delivery at a given week was defined as the infant

mortality rate among those infants born at that week of gestation. The mortality risk of a week of expectant management was defined as the risk of stillbirth during that week plus the mortality risk experienced by infants born in the subsequent week of gestation. This composite risk of expectant management beyond each given week of gestation was then compared to the risk of infant death for infants born in the given week of gestation. The “number needed to deliver” was calculated as an analogous measure to the “number needed to treat” by taking the reciprocal of the absolute risk difference between delivery and expectant management. When the 95% confidence interval of the absolute risk difference included zero, the 95% confidence interval of the number needed to deliver approaches infinity and is not well defined, thus was not reported. Infant death, rather than neonatal death, was chosen as the preferred metric to examine because neonatal death (death within the first 28 days of life) does not capture all of the mortality that can be attributed to management of term pregnancies. Specifically, gestational age has been associated with infant death in prior studies (15).

Women were divided into four major racial/ethnic categories based on their categorization on their infant's birth certificate: White (non-Hispanic), Black (non-Hispanic), Hispanic, and Asian. Women with other racial identities or missing information were excluded from this analysis. We compared the absolute risks of stillbirth and infant death among these four groups as well as the gestational age at which the overall mortality is the lowest.

The incidence of stillbirth at a given gestational age was calculated as the number of stillbirths at that GA per 10,000 ongoing pregnancies, minus half of the births in the given week. This correction factor (subtracting half of the deliveries during the week of investigation from the denominator of total ongoing pregnancies) was described by Smith as a way to correct for the censoring of pregnancies that are delivered during the week, assuming they occurred on average half-way through the week. (16) Infant mortality at each GA was calculated as the number of infants born at that gestational age who die within one year of life per 10,000 live births at that same GA.

These birth certificate data use last menstrual period (LMP) as the basis for gestational age dating; we included gestational ages between 37 weeks and 0 days to 42 weeks and 6 days. We excluded mother/infant pairs if the LMP was missing or nonsensical. Exclusion criteria included multiple gestations and complications such as diabetes mellitus (pre-existing or gestational), chronic hypertension, and congenital anomalies or genetic causes of death based on the International Statistical Classification of Diseases and Related Health Problems, revision 10 (ICD-10) codes.

Statistical calculations were performed with Excel and Stata (version 12, StataCorp, College Station, TX), including proportions, relative risks, and 95% confidence intervals (CI). Chi-squared tests were performed to compare proportions of categorical variables and analysis of variance (ANOVA) was performed to compare means. Statistical significance was reached with a p value of less than 0.05 or if 95% confidence intervals did not include one. We assumed that the binomial probability distributions of both mortality risks approximated the normal distribution and derived the confidence interval of the composite risk using the sum of the variances plus twice the covariance of the estimates of infant death and stillbirth. We

obtained Institutional Review Board approval from the Committee on Human Research at the University of California, San Francisco, and the California Committee for the Protection of Human Subjects. As the data are de-identified and part of the public record of vital statistics, informed consent was not required.

Results

Between 1997 and 2006, there were 5,396,680 deliveries available for analysis. Our cohort of term deliveries excluded 396,311 because of missing or nonsensical LMP and 653,961 deliveries that occurred before 37 weeks or after 42 weeks. We then excluded pregnancies complicated by congenital anomalies (n=238,879), multiple gestations (n=59,930) diabetes (n=202,211) and chronic hypertension (n=24,419), and women with race/ethnicity coded as “other” (n=56,878) or “missing” (n=4,611), leaving a final cohort for analysis of 3,759,300 deliveries. Hispanic women comprised the largest ethnic group, with 45% of all deliveries (N=1,689,195). The next most populous group is white non-Hispanic women (N=1,441,804; 38%), followed by Asian (N=424,383; N=11.2%) and black women (N=203,918; 5%). Demographic characteristics of these women varied among the racial/ethnic groups, and due to the large population size, even small differences were statistically significant. Compared with white and Asian women, black and Hispanic women were younger, less likely to have a college education, more likely to have Medicaid insurance, less likely to be nulliparous, and more likely to have preeclampsia. (Table 1).

Black women had the highest rate of stillbirth (18.0 per 10,000 deliveries), followed by Hispanic women (10.9 per 10,000) and then Asian and white women (9.6 and 9.4 per 10,000, respectively). When examined by gestational age, the risk of stillbirth increased with gestational age in all groups except for black women, who had a slight decrease in the risk at 40 weeks. (Table 2, Figure 1)

Infant death rates by gestational age at birth had an overall U-shaped curve, highest at 37 weeks, lowest at 39 weeks, and then increasing again until 42 weeks. (Table 2, Figure 2) Black infants had the highest overall infant mortality, with a rate of 24.4 deaths per 10,000 live births, which is 3 times the rate seen in Hispanic babies (8.1 per 10,000). Asian babies have the lowest risk of infant death, with a rate of 7.8 per 10,000 live births, and white infants have a risk of 10.8 per 10,000.

Although white and black mothers have very different absolute risks of stillbirth and infant death, the risks of expectant management and delivery at each gestational age follow a similar trajectory; the risk of expectant management is lower than that of delivery at 37 weeks, is approximately equal at 38 weeks, and exceeds the risk of delivery at 39, 40, and 41 weeks. (Table 3, Figure 3). In both Asian and Hispanic women, the risk of expectant management is similar to that of delivery at 37 weeks but then seems to diverge earlier, at 38 weeks, although a statistically significant difference between expectant management and delivery is not seen until 39 weeks in all groups.

We also calculated the unadjusted relative risk of expectant management compared with delivery at each gestational age. This calculated relative risk is close to 1 and the 95%

confidence interval includes 1 in all groups at 37 and 38 weeks, demonstrating that there is no statistically significant mortality difference between delivery and expectant management in these gestational ages. In all groups, the magnitude of the relative risk is largely similar among the groups at 39 weeks (Table 4). However, the absolute risk difference varies greatly at 39 weeks, from 3.9 per 10,000 in Asian women to 13.3 per 10,000 in black women (Table 5). This absolute risk difference can be used to calculate a “number needed to deliver” to illustrate how many women would need to be delivered at a given GA to prevent one fetal or infant death. At 39 weeks, this number is highest in Asian women at 2587 (95% CI 1629- 6274), while in black women it is 751 (95% CI 522 -1340) (Table 5). As the absolute risk difference between expectant management and delivery increases, this number needed to deliver decreases.

Comment

In keeping with prior studies, we demonstrated in this large cohort of births that the risk of stillbirth and infant death varies by gestational age and among racial/ethnic groups. Stillbirth tends to increase with GA in all groups, although the magnitude varies greatly, with the highest risk seen in black women and lowest in white women. We also see large variations in the risk of infant death with the greatest risk seen in black women.

We have previously demonstrated a novel way to investigate these mortality risks further using a composite metric to approximate the risk of expectant management of a week of continued pregnancy at term to determine the gestational age at delivery which minimizes overall mortality. When comparing the mortality risk of expectant management for one week with the mortality risk of delivery, despite absolute risk differences, white and black women have similar trends by gestational age. In both groups, the risk of infant death and expectant management are the same at 38 weeks, while expectant management is associated with a higher risk of mortality beginning at 39 weeks. This is likely due to the fact that the risk of infant death decreases substantially between 37 and 39 weeks, while the risk of stillbirth increases. In contrast to black and white women, for Asian and Hispanic women the risk of delivery never exceeds the risk of expectant management, though the risk of expectant management does exceed the risk of infant death at 39 weeks, similar to black and white women.

Given the recent attention to prevent elective delivery prior to 39 weeks, the current study supports these efforts for all racial/ethnic groups. One recent paper found an increased risk of stillbirth after a ‘hard stop’ on elective deliveries was instituted, and it has been theorized that perhaps subgroups of women with increased risk of stillbirth might benefit from earlier delivery (17). While it is true that the risk of stillbirth was increased in African-American women, the infant death rate was equally elevated leading to a similar optimal gestational age for delivery as white women at 39 weeks.

When investigating disparities in medicine, it is important not only to describe them but to also try to identify modifiable factors that could lead to improved outcomes (1). Compared with white women, black women are more likely to have public insurance, develop preeclampsia, have smaller babies and are less likely to have a college education, covariates

that may on the surface seem to explain the variation. However, these characteristics are not that different from the rates seen in Hispanic women, although they have much lower risks of stillbirth and infant death. We cannot identify the cause of these disparities from our current work but it is likely that a combination of factors is involved, including access to care (including prenatal care and ultrasound), social and economic factors, health behaviors, and to a lesser degree, biology. Our finding that the risk of expectant management exceeds that of delivery in all ethnic groups at the same gestational age suggests that the external forces that shape these disparities may impact both stillbirth and infant death rates equally. For example, while some might think that based on the stillbirth rate alone that black women should be delivered before 39 weeks, our research suggests that since black infants are also at greater risk of death in a GA-dependent manner, this policy would not be prudent. This demonstrates the complexity inherent in formulating clinical recommendations when considering multiple competing outcomes.

The strengths of our study include the large size of the cohort with a high number of Hispanic and Asian women, groups that have been under-studied in prior studies of racial disparities. The use of our composite metric to estimate the mortality risk associated with expectant management allows for a novel way to synthesize the changing rates of stillbirth and infant death at term, and allows for a new way to compare these risks among racial/ethnic groups.

Limitations of our study include the reliance on birth certificate data, which is limited in the number of variables included and the accuracy of these variables. For example, we could not stratify or control for obesity. Another concern is that our gestational age measurement was calculated by last menstrual period (LMP). We know that gestational ages that are calculated by LMP alone are more likely to be post-dates compared with those that incorporate information from ultrasound, but this would be the case in both women with infant death and with stillbirth, and so would tend to diminish the differences in risk across the gestational ages (18-20).

Another potential limitation of the study is that the stillbirths may have occurred one or more days before the actual delivery due to delay in diagnosis or in delivery. These delays would lead to our findings being biased towards lower rates of stillbirth at each gestational age as stillbirths would have been recorded at later gestational age.

Further, this study does not incorporate any information about maternal or neonatal morbidities, and as such should not be used solely to determine an individual's delivery plan. Indeed, because the absolute risks of mortality are low, the number needed to deliver at 39 weeks to prevent one death is quite high. We do not advocate a policy of induction of labor at 39 weeks based on this data alone, since the impact this policy would have on maternal and neonatal health, as well as impact on the health system, is not incorporated in this analysis.

Although the absolute risks of stillbirth and infant death do vary across racial/ethnic groups, our analysis demonstrates that in all groups, 39 weeks is the earliest gestational age at which the mortality risk of expectant management exceeds the risk of delivery in a statistically

significant way. Further research into other high-risk groups using this methodology may shed insight into the optimal time of delivery for these women since randomized trials investigating this question are scarce.

Acknowledgments

Financial Disclosure: M.G.R. is supported by the National Institute of Child Health and Human Development, Grant # K12 HD001262.

References

1. Bryant AS, Worjloh A, Caughey AB, Washington AE. Racial/ethnic disparities in obstetric outcomes and care: Prevalence and determinants. *Obstet Gynecol.* 2010; 202(4):335–43. 4.
2. MacDorman MF. Race and ethnic disparities in fetal mortality, preterm birth, and infant mortality in the United States: An overview. *Semin Perinatol.* Aug; 2011 35(4):200–8. [PubMed: 21798400]
3. Hessel NA, Fuentes-Afflick E. Ethnic differences in neonatal and postneonatal mortality. *Pediatrics.* Jan; 2005 115(1):e44–51. [PubMed: 15629965]
4. Reddy UM, Ko CW, Willinger M. Maternal age and the risk of stillbirth throughout pregnancy in the United States. *Am J Obstet Gynecol.* Sep; 2006 195(3):764–70. [PubMed: 16949411]
5. Reddy UM, Bettegowda VR, Dias T, Yamada-Kushnir T, Ko CW, Willinger M. Term pregnancy: A period of heterogeneous risk for infant mortality. *Obstet Gynecol.* Jun; 2011 117(6):1279–87. [PubMed: 21606738]
6. Lisonkova S, Sabr Y, Butler B, Joseph K. International comparisons of preterm birth: Higher rates of late preterm birth are associated with lower rates of stillbirth and neonatal death. *BJOG.* Dec; 2012 119(13):1630–9. [PubMed: 23164112]
7. Tita AT, Landon MB, Spong CY, Lai Y, Leveno KJ, Varner MW, et al. Timing of elective repeat cesarean delivery at term and neonatal outcomes. *N Engl J Med.* Jan 8; 2009 360(2):111–20. [PubMed: 19129525]
8. Cheng YW, Nicholson JM, Nakagawa S, Bruckner TA, Washington AE, Caughey AB. Perinatal outcomes in low-risk term pregnancies: Do they differ by week of gestation? *Am J Obstet Gynecol.* Oct; 2008 199(4):370.e1–370.e7. [PubMed: 18928977]
9. Ashton DM. Elective delivery at less than 39 weeks. *Curr Opin Obstet Gynecol.* Dec; 2010 22(6):506–10. [PubMed: 20978440]
10. Oshiro BT, Henry E, Wilson J, Branch DW, Varner MW. Women and Newborn Clinical Integration Program. Decreasing elective deliveries before 39 weeks of gestation in an integrated health care system. *Obstet Gynecol.* Apr; 2009 113(4):804–11. [PubMed: 19305323]
11. American College of Obstetricians and Gynecologists. ACOG committee opinion no. 561: Nonmedically indicated early-term deliveries. *Obstet Gynecol.* Apr; 2013 121(4):911–5. [PubMed: 23635710]
12. Rosenstein MG, Cheng YW, Snowden JM, Nicholson JM, Doss AE, Caughey AB. The risk of stillbirth and infant death stratified by gestational age in women with gestational diabetes. *Am J Obstet Gynecol.* Apr; 2012 206(4):309.e1–309.e7. [PubMed: 22464068]
13. Rosenstein MG, Cheng YW, Snowden JM, Nicholson JM, Caughey AB. Risk of stillbirth and infant death stratified by gestational age. *Obstet Gynecol.* Jul; 2012 120(1):76–82. [PubMed: 22914394]
14. Page JM, Snowden JM, Cheng YW, Doss AE, Rosenstein MG, Caughey AB. The risk of stillbirth and infant death by each additional week of expectant management stratified by maternal age. *Am J Obstet Gynecol.* Oct; 2013 209(4):375.e1–375.e7. [PubMed: 23707677]
15. Chen HY, Chauhan SP, Ward TC, Mori N, Gass ET, Cislser RA. Aberrant fetal growth and early, late, and postneonatal mortality: An analysis of Milwaukee births, 1996–2007. *Am J Obstet Gynecol.* Mar; 2011 204(3):261.e1–261.e10. [PubMed: 21256473]
16. Smith GC. Life-table analysis of the risk of perinatal death at term and post term in singleton pregnancies. *Am J Obstet Gynecol.* Feb; 2001 184(3):489–96. [PubMed: 11228508]

17. Ehrenthal DB, Hoffman MK, Jiang X, Ostrum G. Neonatal outcomes after implementation of guidelines limiting elective delivery before 39 weeks of gestation. *Obstet Gynecol.* Nov; 2011 118(5):1047–55. [PubMed: 22015872]
18. Dietz PM, England LJ, Callaghan WM, Pearl M, Wier ML, Kharrazi M. A comparison of LMP-based and ultrasound-based estimates of gestational age using linked California livebirth and prenatal screening records. *Paediatr Perinat Epidemiol.* Sep; 2007 21(Suppl 2):62–71. [PubMed: 17803619]
19. Pearl M, Wier ML, Kharrazi M. Assessing the quality of last menstrual period date on California birth records. *Paediatr Perinat Epidemiol.* Sep; 2007 21(Suppl 2):50–61. [PubMed: 17803618]
20. Savitz DA, Terry JW Jr, Dole N, Thorp JM Jr, Siega-Riz AM, Herring AH. Comparison of pregnancy dating by last menstrual period, ultrasound scanning, and their combination. *Am J Obstet Gynecol.* Dec; 2002 187(6):1660–6. [PubMed: 12501080]

Condensation

The mortality risk of expectant management exceeds the mortality risk of delivery at 39 weeks in all racial/ethnic groups, despite variation in absolute risks.

Figure 1. Stillbirth rates by race and ethnicity

This figure shows the risk of stillbirth at term in four racial/ethnic groups.

Figure 2. Infant death rates by race and ethnicity

This figure shows the risk of infant death in babies born at term in four racial/ethnic groups.

Figure 3. The risk of delivery compared with the risk of expectant management for one week, stratified by race/ethnicity

This figure shows a comparison between the mortality risk of expectant management compared with delivery, for four racial/ethnic groups

Table 1

Demographic characteristics of women who gave birth in California between 1997 and 2006, stratified by race/ethnicity

	White N = 1,441,804	Black N = 203, 918	Hispanic N = 1,689,195	Asian N = 424, 383	P value *
Maternal age, years	29.0 (±6.2)	26.1 (±6.3)	26.1 (±5.9)	30.1 (±5.4)	<0.001
More than 12 years of education	787,849 (61)	77,309 (43)	286,178 (19)	260,987 (70)	<0.001
Public insurance	257,267 (24)	82,930 (55)	891,506 (65)	74,249 (22)	<0.001
Nulliparous	616,408 (43)	79,875 (39)	602,464 (36)	200,697 (47)	<0.001
Preeclampsia	26,017 (1.8)	5,109 (2.5)	33,832 (2.0)	5, 444 (1.3)	<0.001
Gestational age, weeks	39.3 (±1.3)	39.2 (±1.3)	39.3 (±1.3)	39.2 (±1.3)	<0.001
Birth weight in grams	3494 (±466)	3300 (±480)	3425 (±459)	3304 (±437)	<0.001

All values are N (%) or mean (±standard deviation)

* one-way ANOVA or chi-square test

Table 2

Mortality risks at term stratified by race/ethnicity

GA	Stillbirth rate per 10,000 ongoing pregnancies (95% CI)				Infant death rate per 10,000 live births (95% CI)			
	White	Black	Hispanic	Asian	White	Black	Hispanic	Asian
37	2.0 (1.8 – 2.2)	3.9 (3.0 – 4.8)	2.3 (2.0 – 2.5)	2.2 (1.7 – 2.7)	16.2 (13.9 – 18.5)	36.5 (28.4 – 44.6)	10.3 (8.6 – 11.9)	9.2 (6.3 – 12.2)
38	2.7 (2.4 – 3.0)	6.2 (5.0 – 7.4)	3.1 (2.8 – 3.4)	3.0 (2.4 – 3.6)	10.9 (9.6 – 12.1)	27.0 (21.9 – 32.1)	8.5 (7.5 – 9.5)	7.9 (6.1 – 9.8)
39	3.8 (3.4 – 4.2)	8.2 (6.6 – 9.9)	4.6 (4.2 – 5.0)	3.8 (3.0 – 4.6)	9.5 (8.6 – 10.4)	18.7 (15.2 – 22.3)	7.3 (6.5 – 8.0)	6.8 (5.3 – 8.2)
40	4.9 (4.3 – 5.6)	8.1 (5.8 – 10.3)	6.6 (5.9 – 7.4)	6.5 (5.0 – 7.9)	10.1 (9.0 – 11.1)	23.9 (19.6 – 28.2)	7.6 (6.8 – 8.4)	6.8 (5.2 – 8.4)
41	8.5 (7.1 – 9.9)	15.5 (10.4 – 20.6)	10.4 (8.9 – 11.8)	10.0 (6.8 – 13.1)	10.5 (9.1 – 11.9)	23.3 (17.5 – 29.1)	8.7 (7.5 – 10.0)	10.8 (7.8 – 13.7)
42	22.0 (16.9 – 27.1)	32.4 (16.0 – 48.7)	20.2 (15.7 – 24.7)	22.1 (11.6 – 32.5)	13.5 (10.7 – 16.3)	24.9 (14.7 – 35.0)	8.1 (6.1 – 10.1)	9.1 (4.3 – 13.9)

Table 3

The mortality risk of delivery (infant death) compared with the risk of expectant management (stillbirth plus infant death one week hence) at term, stratified by race and ethnicity

GA	White		Black		Hispanic		Asian	
	Risk of infant death per 10,000 live births (95% CI)	Risk of Expectant management for 1 week (95% CI)	Risk of infant death per 10,000 live births (95% CI)	Risk of Expectant management for 1 week (95% CI)	Risk of infant death per 10,000 live births (95% CI)	Risk of Expectant management for 1 week (95% CI)	Risk of infant death per 10,000 live births (95% CI)	Risk of Expectant management for 1 week (95% CI)
37	16.2 (13.9 – 18.5)	12.9 (11.6 – 14.2)	36.5 (28.4 – 44.6)	30.9 (25.7 – 36.0)	10.3 (8.6 – 11.9)	10.7 (9.7 – 11.8)	9.2 (6.3 – 12.2)	10.1 (8.2 – 12.0)
38	10.9 (9.6 – 12.1)	12.2 (11.2 – 13.2)	27.0 (21.9 – 32.1)	24.9 (21.1 – 28.7)	8.5 (7.5 – 9.5)	10.4 (9.6 – 11.2)	7.9 (6.1 – 9.8)	9.8 (8.2 – 11.3)
39	9.5 (8.6 – 10.4)	13.8 (12.7 – 14.9)	18.7 (15.2 – 22.3)	32.1 (27.5 – 36.7)	7.3 (6.5 – 8.0)	12.2 (11.3 – 13.1)	6.8 (5.3 – 8.2)	10.6 (8.8 – 12.4)
40	10.1 (9.0–11.1)	15.4 (13.8 – 16.9)	23.9 (19.6 – 28.2)	31.4 (25.2 – 37.6)	7.6 (6.8 – 8.4)	15.4 (14.0 – 16.8)	6.8 (5.2 – 8.4)	17.2 (13.9 – 20.5)
41	10.5 (9.1 – 11.9)	22.0 (18.9 – 25.2)	23.3 (17.5 – 29.1)	40.4 (29.0 – 51.7)	8.7 (7.5 – 10.0)	18.5 (16.0 – 21.0)	10.8 (7.8 – 13.7)	19.1 (13.4 – 24.8)
42	13.5 (10.7 – 16.3)		24.9 (14.7 – 35.0)		8.1 (6.1 – 10.1)		9.1 (4.3 – 13.9)	

Table 4

The relative risk of expectant management for one week compared with the risk of delivery at each gestational age at term.

	Relative risk of expectant management compared with delivery (95% CI)			
GA	White	Black	Hispanic	Asian
37	0.8 (0.6 – 1.0)	0.8 (0.6 – 1.2)	1.1 (0.8 – 1.3)	1.1 (0.7 – 1.7)
38	1.1 (1.0 – 1.3)	0.9 (0.7 – 1.2)	1.2 (1.0 – 1.4)	1.2 (0.9 – 1.7)
39	1.5 (1.3 – 1.7)	1.7 (1.4 – 2.2)	1.7 (1.5 – 1.9)	1.6 (1.2 – 2.1)
40	1.5 (1.3 – 1.7)	1.3 (1.0 – 1.7)	2.0 (1.8 – 2.3)	2.5 (1.9 – 3.3)
41	2.1 (1.8 – 2.5)	1.7 (1.3 – 2.4)	2.1 (1.8 – 2.5)	1.8 (1.3 – 2.5)

Table 5

The absolute risk difference associated with expectant management compared with delivery and the number needed to deliver to minimize mortality at each gestational age, stratified by race and ethnicity

	White		Black		Hispanic		Asian	
	Absolute risk difference per 10,000 (95% CI)	Number needed to deliver to prevent one death (95% CI)	Absolute risk difference per 10,000 (95% CI)	Number needed to deliver to prevent one death (95% CI)	Absolute risk difference per 10,000 (95% CI)	Number needed to deliver to prevent one death (95% CI)	Absolute risk difference per 10,000 (95% CI)	Number needed to deliver to prevent one death (95% CI)
GA								
37	-3.3 (-6.4 – -0.3)	-	-5.7 (-16.6 – 5.3)	-	0.5 (-1.8 – 2.8)	1992*	1.0 (-3.3 – 5.3)	1027*
38	1.3 (-0.5 – 3.1)	7686*	-2.1 (-9.1 – 5.0)	-	1.9 (0.4 – 3.4)	5266 (2948 – 24,631)	1.8 (-1.0 – 4.5)	5634*
39	4.3 (2.8 – 5.7)	2324 (1732 – 3532)	13.3 (7.5 – 19.2)	751 (522 – 1340)	4.9 (3.7 – 6.2)	2026 (1619 – 2705)	3.9 (1.6 – 6.1)	2587 (1629 – 6274)
40	5.3 (3.7 – 6.9)	1879 (1443 – 2693)	7.4 (0.9 – 13.9)	1359 (722 – 11,587)	7.8 (6.3 – 9.2)	1291 (1090-1583)	10.4 (7.4 – 13.4)	964 (749 – 1355)
41	11.5 (9.0 – 14.0)	870 (716 – 1107)	16.8 (7.2 – 26.3)	596 (380 – 1381)	9.7 (7.6 – 11.9)	1029 (841 – 1324)	8.2 (3.3 – 13.1)	1222 (765 – 3039)

* In cases where the 95% confidence interval for the absolute risk crosses zero, the 95% CI for the number needed to delivery (NND) approaches infinity and thus is not reported.