
Women with a previous stillbirth are known to be at increased risk of stillbirth in subsequent pregnancies. However, few studies have addressed the association between other complications of pregnancy and the future risk of stillbirth. Using linkage of national pregnancy and perinatal death registries, the authors performed a retrospective cohort study of 133,163 women having a second birth in Scotland between 1992 and 2001 whose first infant was liveborn. The risk of unexplained stillbirth was increased among women with a previous preterm birth (adjusted hazard ratio (HR) = 2.04, 95% confidence interval (CI): 1.34, 3.11), previous delivery of a small for gestational age (SGA) infant (HR = 2.14, 95% CI: 1.59, 2.87), and previous preeclampsia (HR = 1.68, 95% CI: 1.07, 2.62). The associations were similar after adjustment for maternal age, height, marital and smoking status, and interpregnancy interval. There was a statistically significant positive interaction between previous delivery of a SGA infant and previous preeclampsia (p = 0.01): Women with this combination in their first pregnancy had an approximately fivefold risk of unexplained stillbirth in the second pregnancy (HR = 4.95, 95% CI: 2.63, 9.32). Associations were stronger with SGA unexplained stillbirths. The authors conclude that complicated first births of liveborn infants are associated with an increased risk of unexplained stillbirth in the next pregnancy.


Obstetric management of the next pregnancy after an unexplained stillbirth: an anonymous postal survey of Australian obstetricians.

BACKGROUND: Women who have an unexplained stillbirth are more likely to be delivered early, by induced labour or Caesarean section, in their next pregnancy. It is unclear whether these birth outcomes result from characteristics of the next pregnancy, or represent management strategies of obstetricians. AIM: To investigate obstetricians' management strategies in the next pregnancy after an unexplained stillbirth. METHODS: Anonymous postal survey of Australian obstetricians. Respondents were given a clinical scenario regarding a previous unexplained stillbirth and were asked about management.
RESULTS: The response rate was 69%. Tests of 'fetal well-being' were undertaken by the majority of respondents. Additional third trimester ultrasound surveillance was recommended by 87% of respondents, regular cardiotograph monitoring by 72% and formal fetal movement charting by 39%. Elective induction of labour (in the absence of any other obstetric indication) was recommended by 93% of respondents, and elective Caesarean delivery by 35%. CONCLUSIONS: The tendency for subsequent pregnancies after an unexplained stillbirth to be delivered earlier, and more often by Caesarean section, may be due in part to altered management strategies, not solely as a result of complications of the pregnancy itself.

Full-text available at: www.blackwell-synergy.com (not a U.S. Government site)

Eriksson AW, Fellman J.  
Factors influencing the stillbirth rates in single and multiple births in Sweden, 1869 to 1967.  

Temporal variations in the stillbirth rate among singletons, twins and triplets in Sweden between 1869 and 1967 were studied. Both among single and multiple births there were marked secular decreasing trends in the stillbirth rates. Based on our long time series since 1869, this study confirms that among twins and triplets the stillbirth rate was higher among same-sexed than among opposite-sexed sets. Comparisons between the stillbirth rates among twin births in urban and rural regions indicate higher stillbirth rates in rural areas. In addition, the stillbirth rates among twins of unmarried mothers were higher than those of twins of married mothers. These findings also hold for both same-sexed and opposite-sexed twin pairs. Analyses of the stillbirth rates for singletons and for different types of twins indicate that up to 1950 the risk of stillbirth among males was almost constantly between 15% to 20% higher than among females. After that the difference in the risk decreased. Comparisons with other populations were performed.

Full-text available at: www.ingentaconnect.com (not a U.S. Government site)

McClure EM, Nalubamba-Phiri M, Goldenberg RL.  
Stillbirth in developing countries.  

OBJECTIVE: To conduct a systematic review of the literature on stillbirths in developing countries. METHOD: Review of the English literature for all articles related to stillbirth in developing countries published from 1975 to 2005. RESULTS: Because almost half of the deliveries in developing countries occur at home, under-reporting of stillbirths is a huge problem, and reliable data about rates and causes are difficult to obtain. Hospital stillbirth data are often subject to substantial bias and the ability to generalize from these data is unknown. Nevertheless, at least 4 million stillbirths occur yearly, the vast majority in developing countries, with rates in many developing countries ten-fold higher than elsewhere. Prolonged and obstructed labor, preeclampsia and various infections, all without adequate treatment, account for the majority of stillbirths. CONCLUSION:
Despite the large number of stillbirths worldwide, the topic of stillbirths in developing countries has received very little research, programmatic or policy attention. Better access to appropriate obstetric care, especially during labor, should reduce developing country stillbirth rates dramatically.

Full-text available at: www.sciencedirect.com (not a U.S. Government site)

Fellman J, Eriksson AW.


The temporal variation in the stillbirth rates (SBR), measured as the number of stillborn per 1000 total births, among singletons, twins and triplets was studied on Swedish birth data for the period 1869 to 2001 and comparisons with data from other populations were made. Among both single and multiple births there were marked, almost monotonously decreasing trends in the stillbirth rates. Among singletons the stillbirth rate decreased from 29.5 per 1000 in the period 1869 to 1878 to 3.4 in the period 1991 to 2001. Among twins the stillbirth rate decreased from 94 per 1000 in 1869 to 1878 to a minimum of 8.2 in 1991 to 2001 and among triplets from 166 per 1000 to a minimum of 19.8. The relative declining pattern in the SBRs was almost the same, being 88% among singletons, 91% among twins and 88% among triplets. In the 1980s and 1990s the definition of the stillbirth rate was changed in many countries, including Finland, but no changes in the definition of stillbirths have been made in Sweden. The effect of the artificial reproduction techniques, including in vitro fertilization, on the rates of multiple maternities is also discussed. It was noted especially that they had a more marked effect on the triplet than on the twinning rate.

Full-text available at: www.ingentaconnect.com (not a U.S. Government site)

Gupta PC, Subramoney S.

Smokeless tobacco use and risk of stillbirth: a cohort study in Mumbai, India.

BACKGROUND: Maternal cigarette smoking has been causally associated with an increased risk for stillbirth. Preliminary reports suggest an increased risk for stillbirth with smokeless tobacco use during pregnancy. METHODS: We conducted a population-based prospective cohort study to investigate this association by using a house-to-house approach to recruit 1,217 women who were between 3 and 7 months' gestation. Of these, 96% were contacted after delivery to determine the pregnancy outcome. Demographic and maternal variables which were apparently associated either with stillbirth or with smokeless tobacco use (OR >or= 1.5) were included as potential confounders. Stillbirth was defined as any delivery of a dead fetus after 20 completed weeks of gestation. We used time-to-event methods to analyze the risk of stillbirth. RESULTS: Overall occurrence of stillbirth among singleton deliveries in this population was 4.1%. Smokeless tobacco use was reported by 17% of women; 8.9% of smokeless tobacco users had a stillbirth compared with 3.1% among nonusers (life-table adjusted hazard ratio =
3.1; 95% confidence interval = 1.7-5.6). After adjustment by the Cox proportional hazards procedure for age, educational and socioeconomic background, working status of mother, parity, prenatal care variables, and place of delivery, the risk for stillbirth in users was 2.6 (95% confidence interval: 1.4-4.8). Most women used mishri (a pyrolyzed tobacco product often used as dentifrice), and there was a dose-response relationship between the daily frequency of use and stillbirth risk. The risk of stillbirth associated with smokeless tobacco use was greater in earlier gestational periods. CONCLUSIONS: Smokeless tobacco use during pregnancy increases stillbirth risk, with a risk at least as great as that associated with maternal cigarette smoking.

Full-text available at: http://meta.wkhealth.com/ (not a U.S. Government site)


OBJECTIVE: To develop and test a new classification system for stillbirths to help improve understanding of the main causes and conditions associated with fetal death. DESIGN: Population based cohort study. SETTING: West Midlands region. SUBJECTS: 2625 stillbirths from 1997 to 2003. MAIN OUTCOME MEASURES: Categories of death according to conventional classification methods and a newly developed system (ReCoDe, relevant condition at death). RESULTS: By the conventional Wigglesworth classification, 66.2% of the stillbirths (1738 of 2625) were unexplained. The median gestational age of the unexplained group was 237 days, significantly higher than the stillbirths in the other categories (210 days; P < 0.001). The proportion of stillbirths that were unexplained was high regardless of whether a postmortem examination had been carried out or not (67% and 65%; P = 0.3). By the ReCoDe classification, the most common condition was fetal growth restriction (43.0%), and only 15.2% of stillbirths remained unexplained. ReCoDe identified 57.7% of the Wigglesworth unexplained stillbirths as growth restricted. The size of the category for intrapartum asphyxia was reduced from 11.7% (Wigglesworth) to 3.4% (ReCoDe) CONCLUSION: The new ReCoDe classification system reduces the predominance of stillbirths currently categorised as unexplained. Fetal growth restriction is a common antecedent of stillbirth, but its high prevalence is hidden by current classification systems. This finding has profound implications for maternity services, and raises the question whether some hitherto "unexplained" stillbirths may be avoidable.

Full-text available at: http://www.bmj.com/ (not a U.S. Government site)


A case control study was conducted to assess the risk factors of stillbirth among pregnant women in Jamaica. A total of 314 women participated (160 with stillborn babies
and 154 with live-born babies). A questionnaire designed to collect information on sociodemographic characteristics, antenatal care, medical and sexually transmitted disease (STD) history, method of delivery and infant birth and health status was administered to each woman. Medical records were reviewed to verify medical history. Six variables were found to be significant predictors of stillbirth by multivariate logistic regression. Low birth weight (OR = 4.3, CI = 2.4 - 7.7), complications during pregnancy or delivery (OR = .19, CI = 0.09 - 0.41), method of delivery (caesarean section; OR = 7.2, CI = 1.6 - 33.2), number of living children (OR = 0.54, CI = 0.40 - 0.73), number of antenatal visits (less than three; OR = 2.0, CI = 1.3 - 3.1), and presence of unfavourable and/or adverse fetal outcome (OR = 4.0, CI = 1.8 - 9.2) were found to be associated with stillbirth. These findings have important implications in establishing policies for prenatal care in Jamaica.


Säflund K, Sjögren B, Wredling R.  
The role of caregivers after a stillbirth: views and experiences of parents.  

BACKGROUND: The clinical role of the caregiver to parents in the event of a stillbirth has yet to be defined. The aim of this paper was to focus on the caregivers' support as revealed by the parents' experiences. METHOD: One or both parents of 31 stillborn infants (> or =28 weeks) were interviewed twice, for a total of 57 interviews. The data analysis was conducted using a qualitative approach. RESULTS: Parents identified the caregivers' behavior and handling of the stillbirth as important. Findings showed that caregivers should support parents in moments of chaos and at other difficult times. The parents needed assistance in both facing and separating from the baby. The six "qualities" that summarized the findings were "support in chaos,""support in the meeting with and separation from the baby,""support in bereavement,""explanation of the stillbirth,""organization of the care," and "understanding the nature of grief." Findings indicate that the hospital is under an obligation to organize the care and make it possible for parents to see the same caregivers again, and to offer extra ultrasound investigations and checkups without unnecessary bureaucracy. CONCLUSION: We suggest that the "qualities" identified by the study findings should be implemented in clinical care, and could facilitate active guidance and counseling for bereaved parents who have experienced a stillbirth.

Full-text available at: [www.blackwell-synergy.com](http://www.blackwell-synergy.com) (not a U.S. Government site)

Dodd JM, Robinson JS, Crowther CA, Chan A.  

OBJECTIVES: The purpose of this study was to determine the effect of maternal factors associated with impaired placental function on stillbirth and neonatal death rates in South Australia. STUDY DESIGN: From 1991 to 2000, the South Australian Pregnancy

7/27/07
Outcome Unit's population database was searched to identify stillbirths and neonatal deaths in women with maternal medical conditions during pregnancy and in twin and singleton pregnancies. RESULTS: Women with hypertension and carbohydrate intolerance and who smoked during pregnancy had an increased risk of stillbirth. Women with twin pregnancies had a significantly higher stillbirth rate than for singletons at each week of gestational age. An increase in stillbirth rate at later gestations was seen with singletons, with a similar trend in twins but rising from 36 weeks' gestation. CONCLUSION: There is a clinical correlation between maternal factors associated with impaired placental function and increased risk of stillbirth, suggesting that intrauterine fetal death represents the mortality end point in a spectrum of intrauterine hypoxia.

Full-text available at: www.sciencedirect.com (not a U.S. Government site)


The main objective of this article is to estimate stillbirth and neonatal mortality rates in Brazilian States based upon the country's Hospital Information System. Analysis of 1995 data reveals contrasting rates between the various regions of the country. In order to elucidate the States' different rates, we focused on the association between indicators of coverage, utilization, and access to the Unified Health System (SUS). The results for the neonatal period mostly showed higher early neonatal mortality rates when compared to late neonatal mortality rates, higher neonatal mortality rates in the States comprising the South and Southeast regions, less variable rates between those States, and extremely low rates in some States of the North, Central-West, and Northeast regions. The limited supply of SUS services and low access to same are relevant constraints on health care for the population in the North and Northeast. Aspects related to quality of childbirth and neonatal care are also reflected in the rates studied. The findings suggest that spatial and temporal monitoring of these rates could provide analytical support for organizing the Maternal and Child Health Program.

Full-text available at: www.scielo.org (not a U.S. Government site)


OBJECTIVE: Studies on the evolution of infant mortality rate are very relevant. Nevertheless, lack of vital statistics in Brazil limits the temporal and spatial analysis of this indicator. This study aims to investigate the possible use of the Brazilian Hospital Information System as an alternative information source for stillbirth and neonatal mortality rates by age group. METHODS: A new method to estimate the stillbirth and neonatal mortality rates is proposed. It was applied in a set of selected Brazilian states in
the year of 1995. For comparative purposes, the Brazilian Death Information System was assessed to estimate the mortality rates under study, after adjusting the registered number of live births by using a demographic tool. RESULTS: By assessing the Hospital Information System a larger number of fetal and early neonatal deaths were observed when compared to data given by the death information system of the Northeastern states. Besides, in the Southern and Southeastern states, where death records are more thorough, the mortality rates calculated using both information sources were very similar. CONCLUSIONS: The results suggest that the proposed methodology could greatly contribute to the analysis of the spatial-time evolution of stillbirth and neonatal death rates in recent years in Brazil, as data on death registration in the majority of the Brazilian states are less thorough than those from the hospital information system.

Full-text available at: [www.scielo.org](http://www.scielo.org) (not a U.S. Government site)

Tairou F, De Wals P, Bastide A. 
**Validity of death and stillbirth certificates and hospital discharge summaries for the identification of neural tube defects in Quebec City.**

The objectives of this study were 1) to assess the validity of different databases which identify neural tube defect (NTD) cases in the population, and 2) to examine the temporal trends in NTD rates and the impact of prenatal diagnoses among pregnancies referred to a tertiary care hospital in Quebec City, Canada, from 1993 to 2002. Infant death and stillbirth certificates were a highly reliable source for ascertaining NTD cases, but their overall sensitivity was poor (13 percent). Med-Echo had very good sensitivity (92 percent), but there were many coding errors in the database and some diagnostic categories were not specific for NTD. The average NTD prevalence proportion was 6.5/1,000 births during the entire study period, decreasing from 12.2/1,000 in 1993 to 3.9/1,000 in 2002. Overall, 78.6 percent of NTD cases were diagnosed prenatally and the pregnancy was terminated in 52.6 percent of these. These two proportions were stable over the study years. To conclude, the combination of hospital discharge summaries and infant death and stillbirth certificates is a highly sensitive method for the ascertainment of NTD cases, including terminations of pregnancies, but medical records must be reviewed to exclude coding errors and to clarify unspecific diagnostic categories.