Homebirth Safety Research

Outcomes of planned home birth with registered midwife versus planned hospital birth with midwife or physician
Janssen, Saxell, Page, Klein, Liston, & Lee, *Canadian Medical Association Journal*, September 2009
"Interpretation: Planned home birth attended by a registered midwife was associated with very low and comparable rates of perinatal death and reduced rates of obstetric interventions and other adverse perinatal outcomes compared with planned hospital birth attended by a midwife or physician."

Outcomes Associated with Planned Home and Planned Hospital Births in Low-Risk Women Attended by Midwives in Ontario, Canada, 2003–2006: A Retrospective Cohort Study
Hutton, Reitsma, & Kaufman, *Birth*, September 2009
"Conclusions: Midwives who were integrated into the health care system with good access to emergency services, consultation, and transfer of care provided care resulting in favorable outcomes for women planning both home or hospital births."

Perinatal mortality and morbidity in a nationwide cohort of 529 688 low-risk planned home and hospital births
de Jonge et al, *British Journal of Obstetrics & Gynaecology*, August 2009
"Conclusions: This study shows that planning a home birth does not increase the risks of perinatal mortality and severe perinatal morbidity among low-risk women, provided the maternity care system facilitates this choice through the availability of well-trained midwives and through a good transportation and referral system."

Outcomes of planned home births with certified professional midwives: large prospective study in North America
Johnson and Daviss, *British Medical Journal*, June 2005
"Conclusions: Planned home birth for low risk women in North America using certified professional midwives was associated with lower rates of medical intervention but similar intrapartum and neonatal mortality to that of low risk hospital births in the United States."

Outcomes of planned home births versus planned hospital births after regulation of midwifery in British Columbia
Janssen et al, *Canadian Medical Association Journal*, Feb. 2002
"Interpretation: There was no increased maternal or neonatal risk associated with planned home birth under the care of a regulated midwife."

Outcomes of intended home births in nurse-midwifery practice: a prospective descriptive study
Murphy and Fullerton, *Obstetrics and Gynecology*, Sept. 1998
"Conclusion: Home birth can be accomplished with good outcomes under the care of qualified practitioners and within a system that facilitates transfer to hospital care when necessary. Intrapartal mortality during intended home birth is concentrated in postdates pregnancies with evidence of meconium passage."

Home versus hospital birth
Olsen and Jewell, Cochrane Database System Review, July 1998
"Summary: No strong evidence about the benefits and safety of planned home birth compared to planned hospital birth for low-risk pregnant women. In some countries almost all births happen in hospital, whereas in other countries home birth is considered the first choice for healthy and otherwise low-risk women. The change to planned hospital birth for low-risk pregnant women in many countries during this century was not supported by good evidence. Planned hospital birth may even increase unnecessary interventions and complications without any benefit for low-risk women."

Home birth in New Zealand 1973-93: incidence and mortality
Gulbransen et al., *New Zealand Medical Journal*, March 1997
"Conclusion: Home birth was a safe and increasingly popular, though minor, option for New Zealand women from 1973-93."

Collaborative survey of perinatal loss in planned and unplanned home births
Northern Region Perinatal Mortality Survey Coordinating Group, *British Medical Journal*, Nov. 1996
"Conclusions: The perinatal hazard associated with planned home birth in the few women who exercised this option (<1%) was low and mostly unavoidable. Health authorities purchasing maternity care need to address the much greater hazard associated with unplanned delivery outside hospital." (*Note: While the perinatal mortality rate for home births in this study was less than half the average for all births, the sample size of women choosing home birth was too small to consider the outcomes a confident result.*)

Outcome of planned home and planned hospital births in low risk pregnancies: prospective study in midwifery practices in the Netherlands
Wiegers et al., *British Medical Journal*, Nov. 1996
"Results: There was no relation between the planned place of birth and perinatal outcome in primiparous women when

controlling for a favourable or less favourable background. In multiparous women, perinatal outcome was significantly better for planned home births than for planned hospital births, with or without control for background variables.
Conclusions: The outcome of planned home births is at least as good as that of planned hospital births in women at low risk receiving midwifery care in the Netherlands."

Home versus hospital deliveries: follow up study of matched pairs for procedures and outcome
Ackermann-Liebrich, et al., *British Medical Journal*, Sept. 1996
"Conclusion: Healthy low risk women who wish to deliver at home have no increased risk either to themselves or to their babies."

Outcomes of 11,788 planned home births attended by certified nurse-midwives: A retrospective descriptive study
Anderson and Murphy, *Journal of Nurse Midwifery*, Nov.-Dec. 1995
"This study supports previous research indicating that planned home birth with qualified care providers can be a safe alternative for healthy lower risk women."

Home birth in the United States, 1989-1992: A longitudinal descriptive report of national birth certificate data
Declercq, Paine, and Winter, *Journal of Nurse Midwifery*, Nov.-Dec. 1995
"The outcomes of newborns born at home compared favorably to the national average during the same period. Several findings varied considerably by race or ethnicity of the mother."

Licensed midwife-attended, out-of-hospital births in Washington state: are they safe?
Janssen, Holt, and Myers, Birth, Sept. 1994
"Results: The results of this study indicate that in Washington state the practice of licensed nonnurse-midwives, whose training meets standards set by international professional organizations, may be as safe as that of physicians in hospital and certified nurse-midwives in and out of hospital."

A matched cohort study of planned home and hospital births in Western Australia 1981-1987
Woodcock et al., *Midwifery*, Sept. 1994
"Conclusions: Planned home births in WA appear to be associated with less overall maternal and neonatal morbidity and less intervention than hospital births. Implications for practice: whether these observed differences in intervention and morbidity have any relationship to the small, non-significant increase in perinatal mortality could not be determined in this study. Continuing evaluation of home birth practice and outcome is essential."

Midwifery care and out-of-hospital birth settings: how do they reduce unnecessary cesarean section births?
Sakala, *Social Science & Medicine*, Nov. 1993
"Report: The present study - together with cohort studies documenting such a reduction, studies showing other benefits of such forms of care, and the increasing reluctance of physicians to provide obstetrical services - suggests that childbearing families would realize many benefits from greatly expanded use of midwives and out-of-hospital birth settings."

Simulated home delivery in hospital: a randomised controlled trial
MacVicar, et al., *British Journal of Obstetrics and Gynaecology*, Apr. 1993
"Results: There were few significant differences in antepartum, intrapartum and postpartum events between the two groups. There was no difference in the percentage of mothers and babies discharged home alive and well. Generally higher levels of satisfaction with care antenatally and during labour and delivery were shown in those women allocated to midwife care."
(*Note that this study examined the outcomes of simulated "home-like" settings inside the hospital, not actual home births.*)

The safety of home birth: the Farm study
Duran, *American Journal of Public Health*, March 1992
"Results: Based on rates of perinatal death, of low 5-minute Apgar scores, of a composite index of labor complications, and of use of assisted delivery, the results suggest that, under certain circumstances, home births attended by lay midwives can be accomplished as safely as, and with less intervention than, physician-attended hospital deliveries."

Outcome of planned home birth in an inner city practice
Ford, Iliffe, and Franklin, *British Medical Journal*, Dec. 1991
"Conclusions: Birth at home is practical and safe for a self selected population of multiparous women, but nulliparous women are more likely to require transfer to hospital during labour because of delay in labour. Close cooperation between the general practitioner and both community midwives and hospital obstetricians is important in minimising the risks of trial of labour at home."

Birth setting for low-risk pregnancies: an analysis of the current literature
Albers and Katz, *Journal of Nurse Midwifery*, July-Aug. 1991

"Despite the methodological limitations, nontraditional birth settings present advantages for low-risk women as compared with traditional hospital settings: lower costs for maternity care, and lower use of childbirth procedures, without significant differences in perinatal mortality."

A descriptive analysis of home births attended by CNMs in two nurse-midwifery services
Anderson and Greener, *Journal of Nurse Midwifery*, March-April 1991
"Results: Analgesia, episiotomy, and cesarean delivery were all found at lower rates than is reported when birth occurs in a hospital setting; complications occurred less frequently or at similar rates to those reported in the home birth literature and national statistics."

Outcomes of 1001 midwife-attended home births in Toronto, 1983-1988
Tyson, *Birth*, March 1991
"Summary: A retrospective descriptive study of 1001 midwife-attended home births in Toronto, Ontario, was carried out between January 1983 and July 1988. Interviews with 26 midwives and reviews of client records provided data on maternal age, socio-economic status, gestation, ruptured membranes, length of labor, episiotomies and perineal lacerations, transfer to hospital of mother or baby or both, infant resuscitation, and breastfeeding. Of 1001 planned home births, 361 involved primiparous women, of whom 245 (68%) remained at home and 116 (32%) required transfer of mother or baby to hospital during labor or the first four postpartum days. Of the 640 multiparous births, 591 (92%) women remained at home and 49 (8%) required transfer to hospital. Among women transferred, 91 had spontaneous vaginal births, 34 had forceps deliveries, and 35 had cesarean sections. Variables significantly associated with maternal transfer for both primiparas and multiparas were length of latent and active phases of the first stage of labor, length of the second stage of labor, and duration of ruptured membranes. Five neonates were transferred and two died, one each after birth at home and in hospital. There were no maternal deaths. The proportion of mothers breastfeeding without supplement at 28 days postpartum was 98.6 percent. *Since this study is descriptive, with no control group for comparison, conclusions about safety of home birth and generalizability of data cannot be made. However, the large sample size and inclusion of all known midwife-attended home births over the defined time period help to increase the validity of the findings*."

Patient selection and outcomes for out-of-hospital births in one family practice
Acheson et al., *Journal of Family Practice*, Aug. 1990
"This study provides greater detail about medical risk factors and outcomes than most previously published case series of OHB [out-of-hospital birth], allowing for control of obstetric risk scores in assessing outcomes. Few differences in outcome were detected across childbirth settings... The study suggests that adherence to screening guidelines or exceptions to the criteria may have been influenced by financial and other factors in the physician-patient relationship. Even with strict adherence to a risk-screening protocol, close backup and ability to transfer between levels of care are necessary for unexpected emergencies and especially for failure to progress in labor.*Several limitations of this study should be noted: First, since this is a descriptive, retrospective study, missing data and classification errors may be more common than in a prospective study... Most important, the patients choosing OHB are not comparable to those choosing hospital births, medically (except by controlling for prenatal risk score), demographically, or in less tangible ways such as motivation. It is expected that these differences would strongly influence the process and outcome of care.*"

Planned and unplanned home births and hospital births in Calgary, Alberta, 1984-87
Abernathy and Lentjes, *Public Health Reports*, July-Aug. 1989
"Based on the findings of this relatively small study, it appears that the planned home birth group did not represent mothers who received inadequate prenatal care, or who experienced poorer birth outcomes. Instead, these mothers were more likely to attend prenatal classes and have babies with a heavier birth weight than their counterparts who experienced hospital births, findings that are consistent with those cited by other researchers. They also made more physician visits than mothers in the unplanned group. It would seem that this group of mothers not only made a conscious, motivated, thoughtful decision but also obtained the prenatal care necessary to help ensure a healthy birth outcome. Findings in general show that planned and unplanned home births must be considered as separate groups in any comparison of risk factors and of birth outcome between home and hospital births."

Place of birth and perinatal mortality
Tew, *Journal of the Royal College of General Practitioners*, Aug. 1985
"Summary: Analyses of the published results of national surveys and specific studies, as well as of the official stillbirth statistics, consistently point to the conclusion that perinatal mortality is significantly higher in consultant obstetric hospitals than in general practitioner maternity units or at home, even after allowance has been made for the greater proportion of births in hospital at high pre-delivery risk. Unpubliched results of the British births 1970 survey, which have now become available, make possible a direct and authoritative analysis of data on the safest place of birth. Not only does this make the earlier conclusion more certain, but it confounds the doctrine that obstetric intranatal care is particularly beneficial for high pre-delivery risk births. There is no evidence from recent years that the findings of 1970 are not equally valid in the 1980s."

Neonatal outcome in planned versus unplanned out-of-hospital births in Kentucky
Hinds, Bergeisen, and Allen, *Journal of the American Medical Association*, March 1985
"Compared with planned births, unplanned births were associated with increased risk of LBW [low birth weight]. Furthermore, after adjusting for maternal age and parity, LBW births occurred at less than expected frequency among planned births, but at greater than expected frequency among unplanned births."
Outcomes of a rural Sonoma County home birth practice: 1976-1982
Koehler, Solomon, and Murphy, *Birth*, Sept. 1984
"Conclusion: The obstetrical literature is replete with anecdotal accounts of the presumed dangers of home births. However, this report, in addition to the work of others cited in the introduction, shows the safety of home birth in properly selected and motivated individuals. These results confirm that with intense prenatal care and education, and maximum support for the laboring woman, couples desiring a home birth can expect good outcomes."

Home births in England and Wales, 1979: perinatal mortality according to intended place of delivery
Campbell et al., *British Medical Journal*, Sept. 1984
"Women booking a delivery at home are clearly a selected group, and some may have been transferred to hospital during labour and were thus not included in the survey. Nevertheless, these data suggest that the perinatal mortality among births booked to occur at home is low, especially for parous women."

Out-of-hospital births, U.S., 1978: birth weight and Apgar scores as measures of outcome
Declercq, *Public Health Reports*, Jan.-Feb. 1984
"The incidence rate of low birth weight babies was lower for midwife-attended births in every category examined. Apgar scores for babies born both in and out of hospital were also studied but, because of inconsistent reporting, were given less attention. Excellent (9-10) Apgar scores were more common among babies born out of hospital than among those born in hospital (63 percent compared with 49 percent), particularly for out-of-hospital births attended by physicians. At least with respect to birth weight and Apgar scores, the claim that out-of-hospital births are inherently more dangerous than hospital births receives no support from these data... *It is important to keep in mind that birth weight and Apgar scores are not perfect measurers of outcomes and that emergencies can occur in any settings; however, the data presented here are based on almost every recorded out-of-hospital birth in the United States in 1978 and therefore cannot be easily dismissed.*"

Four years' experience with home birth by licensed midwives in Arizona
Sullivan and Beeman, *American Journal of Public Health*, June 1983
"Abstract: In 1978, Arizona began licensing lay midwives under regulations designed to maintain adequate standards of care for women desiring a home birth. During four years of this program, 3 per cent of home birth clients were hospitalized for complications and another 15 per cent received postnatal outpatient care, primarily for second degree lacerations. Five per cent of the newborns required medical care after delivery; half of these were hospitalized. Complications declined over the period due to increased experience, close supervision, and continuing education."

Out-of-hospital births in Michigan, 1972-79: trends and implications for the safety of planned home deliveries
Simmons and Bernstein, *Public Health Reports*, March 1983
"Conclusions: The substantial increase in birth weight for out-of-hospital births suggests that women who decided to have their babies at home tended to deliver infants with birth weights characteristic of normal, healthy infants. To the extent that birth weight is indicative of infants' health, we conclude that choosing a home birth is not necessarily associated with high risk. The small number of cases in this study makes it difficult to draw inferences about the safety of planned out-of-hospital birth from neonatal mortality trends. However, the statistically significant decrease in overall neonatal mortality and in neonatal mortality of high-birth-weight infants also points in the direction of greater safety. Using mortality data from vital records for several states, the Executive Board of the American College of Obstetrics and Gynecologists stated that home births are several times more dangerous than hospital births. Since birth certificates do not distinguish between planned and unplanned home deliveries, such mortality statistics reflect the dangers of both emergency and deliberate home births. Therefore, it is inappropriate to use such statistics as evidence about the risks of planning."

Home delivery and neonatal mortality in North Carolina
Burnett et al., *Journal of the American Medical Association*, Dec. 1980
"Neonatal mortality examined by place and circumstances of delivery in North Carolina during 1974 through 1976 with attention given to home delivery. Planned home deliveries by lay-midwives resulted in three neonatal deaths per 1,000 live births; planned home deliveries without a lay-midwife, 30 neonatal deaths per 1,000 live births; and unplanned home deliveries, 120 neonatal deaths per 1,000 live births. Planning, prenatal screening, and attendant-training were important in differentiating the risk of neonatal mortality in this uncontrolled, observational study." (*Note: This summary does not compare the incidence of neonatal mortality between home and hospital births, but does demonstrate the increased safety when home births are planned with skilled attendant.*)
Birthplace and Attendants: Oregon's Alternative Experience, 1977
Dingley, *Women and Health*, Nov. 1979

"Abstract: In October of 1977 an article entitled 'Birthplace Alternatives' appeared in the Oregon State Health Bulletin. This article presented a narrative based on facts taken from the data on birth certificates of all births occurring outside of a hospital in the State of Oregon in 1976. Tabulations were compiled to show where the infants were being born, who was delivering them, the educational level of the parents, and the prenatal care given. Insofar as was possible-from complications listed on the birth certificates, information from matched infant death reports, and full term fetal death reports-the outcome of these deliveries was explored. Due to the tremendous response to that article, this update of 1977 data on out-of-hospital births was prepared."
If you have access to the full text of this article, please email me.

Home birth in Salt Lake County, Utah
Cameron, Chase, and O'Neil, *American Journal of Public Health*, July 1979
"Most of the women electing home births do so responsibly yet their decision appears to have adversely influenced their ability to receive adequate prenatal, postpartum, and newborn health services. While there were no disastrous outcomes, some of the problems identifies placed some women and babies at high risk, and potentials for prevention and management of problems and needs were not realized. On the other hand, the potential for iatrogenic damage, a concern of a number of women, was minimal. The proper consumer/professional balance between the two extremes of a highly technolocial hospital delivery and an essentially unattendend home birth remains to be worked out". (*Note: While not a comparison of the outcomes of planned home births versus hospital births, this article highlights the problems and risks of restricting womens' access to trained home birth attendants. The article explains "the most frequent attendants listed on the birth certificates were a naturopathic physician or the husband", and that the 167 women studied, "eighty-four women were interviewed and reported hostility from health care professionals which may have placed them at unnecessary risk".*)

A home obstetric service with expert consultation and back-up
Estes, *Birth and the Family Journal*, Fall 1978
"Abstract: The medical literature comparing home and hospital obstetric outcomes is reviewed. A home obstetric service with hospital and obstetrician back-up is described, including screening, care during pregnancy and delivety and management of complications... In this well-selected low risk population, careful prenatal and intrapartum care resulted in outcomes which are comparable to those of hospital programs."

Outcomes of elective home birth: A series of 1146 cases
Mehl et. al, *Journal of Reproductive Medicine*, 1977
Neonatal Outcomes: In the hospital, 3.7 times as many babies required resuscitation. Infection rates of newborns were 4 times higher in the hospital. There was 2.5 times as many cases of meconium aspiration pneumonia in the hospital group. There were 6 cases of neonatal lungwater syndrome in the hospital and none at home. There were 30 birth injuries (mostly due to forceps) in the hospital group, and none at home. The incidence of respiratory distress among newborns was 17 times greater in the hospital than in the home. While neonatal and perinatal death rates were statistically the same for both groups, Apgar scores (a measure of physical well being of the newborn) were significantly worse in the hospital.
Complications of Home Birth
Mehl et al., *Birth*, Sept. 1975
"The results of this study have shown that neonatal mortality and morbidity are lower in an unanesthetized natural childbirth population than in the population as a whole. It is also suggested that selected women with benign prenatal courses can labor and deliver at home without a significant increase in neonatal and maternal risks. Certain complications of this series could have been reduced by making oxytocin available at home for the treatment of uterine inertia, by training midwives to perofrm episiotomies in those cases in which tears were inevitable, by providing appropriate drugs to prevent third stage hemorrhage and by having medical supervision immediately available. The incidence of post-partum infection seen at home is comparable to that seen in the hospital, and indicated that in the less pathogenic environment of the home, hospital asepsis was not necessary to prevent infection. This study, as in that of Levy, et al., confirms that utilization of midwives would benefit the public health of the state."
Results showing less-than-optimal outcomes with home birth

Complications of home delivery: a retrospective analysis
Tuladhar, Dali, and Pradhanang, *Journal of the Nepal Medical Association*, July 2005.
"Results and conclusions: This study showed that home deliveries [in Nepal] were associated with increased maternal morbidity especially the third stage complications. Studies done in developed countries have shown that home birth is safe for normal, low risk women, with adequate infrastructure and support i.e. given a well trained midwife and facilities to transfer to hospital if necessary. In our context, a community based obstetric service must be developed with emphasis on regular and quality antenatal care, health education to women and proper training of birth attendants." (*Note: This study was conducted in Nepal where pregnancies and home births often occur without the assistance of a trained professional. The authors themselves note that studies show that planned home births in developed countries are safe*.)

Outcomes of Planned Home Births in Washington State: 1989–1996

Pang et al., *Obstetrics and Gynecology*, August 2002

"Conclusion: This study suggests that planned home births in Washington State during 1989–1996 had greater infant and maternal risks than did hospital births." *Note: This study defined "planned home births" as births that took place at home and in which a practitioner signed a birth certificate, or were transferred to a hospital. The authors relied on data from birth certificates, which in addition to containing a possible high rate of error in reporting, does not note whether or not these home birth were actually planned. The authors themselves admit there is no way to accurately assess the number of planned home births contained in this data and that an unknown number of unplanned and unattended births may have been included. The parameters of the study also included births taking place as early as 34 weeks gestation which is not a low-risk situation nor a common or appropriate scenario for midwifery care. Further, the authors failed to demonstrate any causal relationship between neonatal mortality and the birth site.*

Perinatal death associated with planned home birth in Australia: population based study

Bastian, Keirse, and Lancaster, *British Medical Journal*, Aug. 1998

"Conclusions: Australian home births carried a high death rate compared with both all Australian births and home births elsewhere. The two largest contributors to the excess mortality were underestimation of the risks associated with post-term birth, twin pregnancy and breech presentation, and a lack of response to fetal distress. *The higher perinatal death rate in Australian home births was due to the inclusion of predictably high risk births and prolonged asphyxia during labour; while home birth for low risk women can compare favourably with hospital birth, high risk home birth is inadvisable.*"