A New Look at Maternal Mortality Around the World and at Home

Two recent reports focus on maternal mortality. Use of a sophisticated new model yielded updated time series estimates of maternal deaths worldwide and the global maternal mortality ratio (MMR) from 1980 to 2008.¹ The model uses new statistical methods and previously untapped data sources including traditional vital statistics and census data, as well as sibling surveys and verbal autopsy reports, to estimate trends in maternal mortality in 181 countries. The resulting estimates suggest that the number of maternal deaths has decreased significantly over the last few decades, providing affirmation of progress and momentum for redoubled efforts. The report estimated 342,900 maternal deaths in 2008, down from 526,300 in 1980 (an average annual decline of 1.5%). The analysis revealed wide variation in both maternal death rates and trends over time between countries. Of significance were increased rates of maternal mortality in the United States, Canada, and Norway. The authors attributed some of the observed increase to recent changes in data collection techniques: inclusion of late maternal deaths, not traditionally included in international MMR comparisons, within the ICD 10 code; and a new question to determine pregnancy status on the US death certificate. While the former change might result in over-estimation in countries whose estimates are drawn primarily from ICD codes, the latter potentially reveals a more accurate count of US maternal deaths. An unpublished maternal mortality review conducted by the Department of Public Health in the state of California suggests that not all of the observed increase in maternal deaths is attributable to changes in measurement but may also be associated with practice patterns including increased rates of elective induction and cesarean delivery.²

A second report on maternal mortality released by Amnesty International characterizes the increase in the US national MMR over the last few decades as a human rights crisis.³ This white paper from the prominent human rights advocacy group calls attention to unequal access, treatment, and risk of death from pregnancy-related causes in the United States, as well as profound health system failures in the areas of insurance coverage, workforce distribution, quality and continuity of care, and system accountability and oversight.

2. Johnson N. It’s now more dangerous to give birth in California than it is in Kuwait or Bosnia. California Watch 2010; February 2. [Online]. Available at: http://www.alternet.org/investigations/145524/df

From Cochrane Database of Systematic Reviews (CDSR), Issues 3–5, 2010

New Systematic Reviews
- Antiretroviral therapy (ART) for treating HIV infection in ART-eligible pregnant women
- Family therapy for anorexia nervosa
- Human chorionic gonadotrophin for threatened miscarriage
- Intrapartum fetal scalp lactate sampling for fetal assessment in the presence of a non-reassuring fetal heart rate trace
- Misoprostol for induction of labour to terminate pregnancy in the second or third trimester for
women with a fetal anomaly or after intrauterine fetal death
- Oral lactoferrin for the prevention of sepsis and necrotizing enterocolitis in preterm infants
- Paracetamol/acetaminophen (single administration) for perineal pain in the early postpartum period
- Planned early birth versus expectant management for women with preterm prelabour rupture of membranes prior to 37 weeks' gestation for improving pregnancy outcome
- Planned home versus hospital care for preterm prelabour rupture of the membranes (PPROM) prior to 37 weeks' gestation
- Vaginal preparation with antiseptic solution before cesarean section for preventing postoperative infections
- Ultrasound for fetal assessment in early pregnancy

**Updated Systematic Reviews**
- Advance provision of emergency contraception for pregnancy prevention
- Effects of restricted caffeine intake by mother on fetal, neonatal and pregnancy outcome
- Energy and protein intake in pregnancy
- Homeopathy for induction of labour
- Ibuprofen for the treatment of patent ductus arteriosus in preterm and/or low birth weight infants
- Immediate post-partum insertion of intrauterine devices
- Interventions to prevent hypothermia at birth in preterm and/or low birthweight infants
- Intravenous immunoglobulin for suspected or subsequently proven infection in neonates
- Late erythropoietin for preventing red blood cell transfusion in preterm and/or low birth weight infants
- Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases
- Magnesium sulfate for persistent pulmonary hypertension of the newborn
- Medical versus surgical methods for first trimester termination of pregnancy
- Progestogen for treating threatened miscarriage
- Prophylactic animal derived surfactant extract for preventing morbidity and mortality in preterm infants
- Skin patch and vaginal ring versus combined oral contraceptives for contraception

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**Recent Abstract Entries Assessing Quality of Systematic Reviews**
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- Acupuncture for treating menopausal hot flushes: a systematic review
- Antenatal magnesium sulfate for the prevention of cerebral palsy in preterm infants less than 34 weeks' gestation: a systematic review and metaanalysis
- Association between hormone replacement therapy and subsequent arterial and venous vascular events: a meta-analysis
- Can exercise treat eating disorders?
- Correction of nonvertex presentation with moxibustion: a systematic review and meta-analysis
- Early interventions involving parents to improve neurodevelopmental outcomes of premature infants: a meta-analysis
- Effect of periodontal disease treatment during pregnancy on preterm birth incidence: a meta-analysis of randomized trials
- Efficacy and tolerability of prostaglandin analogs: a meta-analysis of randomized controlled clinical trials
- Major malformations after first-trimester exposure to aspirin and NSAIDs
- Safety of ultrasonography in pregnancy: WHO systematic review of the literature and meta-analysis
- Sterile water injection for labour pain: a systematic review and meta-analysis of randomised controlled trials
- The safety of histamine 2 (H2) blockers in pregnancy: a meta-analysis
- Use of Lactobacillus probiotics for bacterial genitourinary infections in women: a review

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**Evidence-Based Reviews from Other Sources**

The authors systematically reviewed 203 studies to clarify available evidence on rates of vaginal birth after cesarean (VBAC), and short- and long-term benefits and harms to both mothers and babies associated with trial of labor (TOL) versus elective repeat cesarean delivery (ERCD). The research questions were assigned by the Agency for Healthcare Research and Quality for the National Institutes of Health Consensus Development Conference on VBAC. The review revealed wide variation in rates of TOL and VBAC, both higher in studies conducted outside of the United States and in high-volume, tertiary care, or teaching hospitals. While the TOL rate dropped significantly after 1996, the average rate of successful VBAC remained constant at 74% among women in US studies undertaking TOL. For mothers, short-term outcomes favoring TOL included lower rates of mortality, hysterectomy, transfusion or hemorrhage (when all gestational ages were evaluated), fever, and shorter hospital stays. Short-term outcomes favoring ERCD included lower rates of transfusion or hemorrhage in term deliveries only, infection, and uterine rupture (0.47% for TOL versus 0.026% for ERCD). Long-term maternal outcomes generally favored TOL and included decreased adhesions, and decreased odds of impaired fertility and early menopause. Furthermore, the review found a strong correlation between increasing number of previous cesarean deliveries and increased likelihood of experiencing numerous adverse outcomes, particularly adhesions, abnormal placentation, hemorrhage, transfusion, and hysterectomy. For babies, perinatal death was the only outcome for which sufficient evidence was available. Overall, the rate of perinatal death was higher in TOL compared to ERCD (1.3/1000 vs 0.5/1000). The authors note that the majority of studies reported outcomes by actual, not intended, route of delivery, resulting in non-differential misclassification and hampering efforts to construct effective predictive models to aid clinical decision making. Nevertheless, based on current evidence they called VBAC “a reasonable and safe choice for the majority of women with prior cesarean surgeries.”

Comment: While statistically significant, the differences in risk of uterine rupture and perinatal death are small enough that their clinical significance is questionable. Consideration of benefits and harms of VBAC must also take into account risks for numerous adverse outcomes associated with multiple cesarean surgeries.


Following emergence of new study data, a meta-analysis was undertaken to update an inconclusive 2007 Cochrane review and clarify effects of induced hypothermia on the risk of death or disability in newborns with hypoxic ischemic encephalopathy (HIE). The authors pooled data from 1320 infants in 10 randomized controlled trials to explore mortality rates, and analyzed a subset of data from 767 infants to determine effects of hypothermia on a composite measure of death and disability at 18 months, as well as secondary outcomes including rate of normal survival, rates of severe disability, cerebral palsy, severe neuromotor and neurodevelopmental delay, and blindness. The underlying studies demonstrated consistency in point estimates for primary and secondary outcomes, and when these data were pooled, moderate induced hypothermia was associated with significant reductions in death and neurological impairment at 18 months. The effects were highly consistent among studies, even though the various trials used different methods to induce hypothermia.

Comment: This review provides evidence of an effective intervention for reducing death and disability associated with HIE, which is among the most severe perinatal adverse outcomes and one for which to date no treatment has been available.


A systematic review with meta-analysis was conducted to explore the comparative effectiveness of core-needle breast biopsy versus open surgical biopsy, the current gold standard, for detecting breast cancer in women with an abnormality identified through screening. The review included 107 studies encompassing 57,088 breast lesions, and focused on accuracy and harms associated with the different methods of core-needle biopsy.
The authors rated the strength of the evidence low due to widespread poor reporting among studies that made assessing bias difficult, even though the quantity and robustness of studies was adequate. Both vacuum-assisted and automated gun core biopsies demonstrated high sensitivity that was improved when guided by imaging techniques. Stereotactically-guided vacuum-assisted core-needle biopsy demonstrated the highest sensitivity at 99.2%, but vacuum assistance was associated with a higher incidence of bleeding and hematomas. Still, severe complications occurred in less than 1% of procedures with any method of core-needle biopsy. Of significance, based on moderate strength evidence, women whose breast cancer was detected through open surgical biopsy were almost 14 times more likely to require more than one surgical procedure to treat their cancer when compared to women whose cancer was diagnosed with core-needle biopsy. The authors emphasize that while on average, only 20 to 30% of women undergoing breast biopsy are diagnosed with cancer, estimates of accuracy for any single woman must take into account her individual pre-biopsy risk. The report concluded that core-needle biopsies entail less harm and are nearly as accurate as open surgical biopsy.

Comment: Consistent with the recent updated guidelines for screening mammography issued by the US Preventive Services Task Force, this comparative effectiveness review seeks to provide information that balances both benefits and harms of different approaches to breast cancer detection.

Recent Evidence-Based Reviews

- Tahseen S, Griffiths M. Vaginal birth after two caesarean sections (VBAC-2)—A systematic review with meta-analysis of success rate and adverse outcomes of VBAC-2 versus VBAC-1 and repeat (third) caesarean sections. BJOG 2010; 117, 5–19.

JOGNN 2010; Vol. 39, Issue 5