



Working on Maternal, Newborn and Child Health

With an estimated 3.6 million newborn deaths and 343,000 maternal deaths each year worldwide, newborn and maternal survival remains unacceptably low, and childhood mortality adds substantially to this burden. LSHTM staff, with colleagues at WHO and elsewhere, produced the latest global estimates of stillbirths, suggesting that in 2009 a further 2.6 million babies were stillborn. Of these, more than 1 million stillbirths died during labour.

The School now has over 100 researchers across all three Faculties working on topics pertinent to maternal, newborn and child health (MNCH) who share information and ideas through MARCH, the Centre for Maternal, Reproductive & Child Health¹. Spanning a range of high-, middle- and low-income countries across the globe, some of this work is highlighted in this chapter.

BURDEN OF DISEASE AND OBSERVATIONAL STUDIES

Beyond producing the global stillbirth estimates, School staff are contributing to measuring the global burden of disease in women, newborns and children, often working with the WHO/UNICEF Child Health Epidemiology Reference Group. Maternal health researchers are producing global estimates of the prevalence of maternal haemorrhage, unsafe abortion, and obstetric fistulae, and have quantified the burden of infertility due to abortion and anaemia due to maternal haemorrhage. Others are quantifying the burden of disease amongst survivors of congenital and neonatal conditions and looking more generally at the contribution of certain

interventions to child health. Recent systematic reviews by the Environmental Health Group indicate for example that most of the burden of disease associated with inadequate water supply, sanitation and hygiene relates to child mortality. This has led to a reappraisal of the value of point-of-use water treatment, and increased awareness of the need for outcomes besides self-reported diarrhoea.

Observational studies have yielded important information on the risk factors for neonatal and child mortality, namely parental survival, maternal obesity, and prematurity and low birth weight. Work in rural Bangladesh showed the probability of child survival to age 10 years was 24% in children whose mothers died before their tenth birthday, compared with 89% in those whose mothers remained alive. The devastating



Right Volunteer in Tanzania measuring newborn foot length, a proxy for birthweight, in order to identify underweight or premature babies in need of extra care.

¹ <http://march.lshtm.ac.uk/>



effects of the mother's death on child survival were most probably due to the abrupt cessation of breastfeeding, but the persistence of the effects up to 10 years of age suggests that the absence of maternal care might be a crucial factor.

Another study estimated the risk of neonatal mortality associated with low birth weight and premature birth adjusting for weight-for-gestational age, using data from four East African studies. The 4% of births who were premature accounted for 31% of neonatal deaths. The high mortality risk experienced by very premature babies was not affected by weight-for-gestational age, but moderately premature babies were at higher risk of death if they were small-for-gestational age. Another study analysed birth weight and length data from 3 consecutive generations of the Uppsala Birth Cohort Multi-generational Study in Sweden to elucidate the inter-generational influences on size. Sizes at birth of parents and their children are known to be correlated, reflecting in part the influence of fetal and maternal genes. Socio-demographic factors, regarded as aspects of the shared environment across generations, would also be expected to contribute, but evidence was limited. School staff showed that the shared environment makes a moderate contribution to inter-generational correlations.

Work in the UK on the prevalence and consequences of obesity in pregnancy found nearly 40% of women in a South London survey to be overweight or obese at the start of their pregnancy. The study showed clear links between obesity in pregnancy and increased risk of poor health outcomes for both the mother and the child, and led to an intervention to increase activity and healthy eating during pregnancy.

Other staff have focused on the consequences of ill-health by using qualitative methods to interview British women who had suffered severe postpartum haemorrhage (PPH), and their partners. They demonstrated the stressful and emotional nature of this experience, with strong feelings of disempowerment and information deprivation, which were experienced differently for men and women. Severe PPH occurs in 4.6 per 1000 European deliveries and is one of the leading causes of maternal mortality and morbidity.

TRIALS

Expectations of high-quality evidence to inform interventions have risen in recent years and many researchers in the School are conducting randomized controlled trials to address interventions for MNCH.

Examples include the WOMAN trial of tranexamic acid to treat postpartum haemorrhage (*see also page 30*) and work on vitamin D and stunting in children.

In much of the world, most babies are born at home, out of reach of the formal health sector. LSHTM researchers are seeking to enhance newborn survival in southern Tanzania, with researchers from the Ifakara Health Institute, using a home-based counselling strategy to improve care practices by encouraging simple measures such as warmth, hygiene, and immediate and exclusive breastfeeding for newborn babies. A similar trial in Ghana (NEWHINTS) was completed this year.

By contrast, other trials seek to improve health via facility delivery services. One, conducted in Tanzania, sought to increase delivery in health facilities and found antenatal counselling significantly increased uptake of facility delivery.

Other trial research is targeted at child mortality. An ambitious randomized trial is under way to evaluate a sanitation intervention implemented by WaterAid in Orissa, India, as is an innovative trial to assess the impact of mass media health education.

IMPLEMENTATION RESEARCH

Research on better implementation of antenatal care services is being undertaken by several groups. Congenital syphilis is entirely preventable if syphilis is diagnosed in pregnancy and treated before the end of the second trimester. Only 30% of pregnant women in low-income countries are screened, largely because laboratory services are lacking. School researchers screened over 150,000 people in China, Uganda, Tanzania, Zambia, Brazil, Peru and Haiti to determine the feasibility and cost-effectiveness of using point-of-care tests (POCTs) to increase access to syphilis screening. POCTs were easy and affordable, providing results in 15 minutes and costing less than £1 per woman screened. All seven countries adopted point-of-care tests as policy as a result of this research evidence.

Other research includes work in Tanzania to improve antenatal counselling to get higher uptake of initiatives to prevent mother-to-child transmission of HIV (PMTCT). The operational performance of PMTCT and maternal syphilis screening and treatment programmes was measured in Mwanza and identified a number of missed implementation opportunities. Future work is planned to improve integration of PMTCT, family planning and adult HIV care and treatment programmes.

A member of the School's Brazilian project team taking blood from a Yanomani woman for syphilis and HIV screening. As a result of this project, screening for HIV and syphilis using point-of-care tests is now policy in many countries, including Brazil.



Malaria also remains a major health problem for women and children. Seasonal malaria chemoprevention in children, is a new approach to malaria control where transmission of the infection is limited to a few months each year. Trials in the Sahel and sub-Saharan Africa have shown approximately 80% reduction in incidence of uncomplicated and severe malaria, even in children sleeping under insecticide-treated bednets, and that community volunteers can achieve high coverage.

In other malaria-related research in children, the ACT Consortium² is improving both access to and targeting of antimalarial drugs. A web-based decision-support tool³ has been developed to help policy-makers assess whether intermittent preventive treatment in infants (IPTi) with sulphadoxine–pyrimethamine (SP) would be effective for local malaria control, taking into account IPTi coverage, levels of SP drug-resistance and health systems costs.

The Department of Global Health and Development has been examining the health impact of one of the world's largest demand-side financial incentive programmes – India's *Janani Suraksha Yojana*, which provides cash payments to women who give birth in

health facilities. The study is looking at the programme's effect on the use of maternal health care, neonatal mortality and a range of unintended consequences such as fertility.

To improve the evidence base for decision-making in maternal and newborn health for north-east Nigeria, Uttar Pradesh in India, and Ethiopia, the IDEAS project⁴ is evaluating the combined effect of selected grants from the Bill & Melinda Gates Foundation's maternal and newborn health grants portfolio. The project will study scale-up of innovative interventions across these areas and their impact on health and survival at scale.

POLICY DEVELOPMENT

School staff make many contributions to policy. For example, Professor Anne Mills (Professor of Health Economics & Policy) chaired the Working Group on Accountability and Resources, one of two working groups under the UN Secretary-General's Commission on Information and Accountability for Women's and Children's Health. The Commission's final report outlined a framework for reporting, oversight and accountability on women's and children's health⁵.

² <http://malaria.lshtm.ac.uk/research/projects/act>

³ <http://ipti.lshtm.ac.uk/>

⁴ www.lshtm.ac.uk/news/2010/newbornhealth.html

⁵ www.who.int/topics/millennium_development_goals/accountability_commission/Commission_Report_advance_copy.pdf