

London School of Hygiene and Tropical Medicine

Summary of Submission on Maternal Morbidity

Staff at the London School of Hygiene and Tropical Medicine conduct research into various aspects of maternal health, including maternal morbidity. Our submission is based on selected findings from our research, and features contributions by Dominique Behague, Oona Campbell, Daniel Chandramohan, John Cleland, Veronique Filippi, Sabine Gabrysch, Ivy Osei, Vikram Patel, Tim Powell-Jackson, and Carine Ronsmans.

The submission starts by clarifying where research on maternal morbidity and health systems fits overall. This is followed by contributions to measuring morbidity, particularly where it can be used for monitoring and evaluation. Specific issues or morbidities are then discussed in the order requested, although we group the acute conditions that kill most women in childbirth (obstructed labour, hypertensive diseases of pregnancy, and haemorrhage).

Context

In recent years, public health specialists have shown a growing commitment to tackling maternal ill-health through the strengthening of integrated health systems. However, disease-focused vertical programs based on measures of mortality often compete with one another for funds and professional recognition, thereby diverting attention from attempts to integrate health systems (Walt et al. 2004; Mills 2005; Lawn et al. 2006).

Factors relating to both the research process and the politics of internationally-driven development and public health action contribute to the over-riding focus on mortality. Notwithstanding some important exceptions, such as HIV-related complications, morbidity, being more clinically and socially variable, is context-specific and thus, harder to measure in a standardised fashion than mortality. Intervention studies based on measures of mortality (or relevant proxies) tend to be more compelling to donors and governments because they provide more conclusive messages about effectiveness and impact. They thus can be more successfully used to galvanize international support and funds (Béahgue and Storeng 2008).

As a result, demand for conclusive studies on how to reduce mortality has tended to grow at the expense of producing evidence which creatively responds to the more complex and context-specific determinants of morbidity. As several authors show, context-specific health systems research contradicts the need in public health for a globally-applicable, generalizable and "marketable" evidence-base of vertical programs that are easy to evaluate and monitor (Sackett et al. 1996; Klein 2000; Van Gool et al. 2002).

If policy-makers are to adequately address morbidity, they need to not only further the research-base on its determinants; they also need to openly debate and tackle political factors in the international donor-driven community that drive the predominant focus on mortality.

Methods for measuring morbidity

In contrast to pregnancy and mortality, maternal morbidity takes many forms. It can be acute or chronic, recognised and acknowledged as an illness, or is not apparent to the respondent. Each specific morbidity may have a whole spectrum of manifestations, and the perception of morbidity symptoms varies between cultures. Some morbidities are potentially lethal, while others are disabling, or simply discomforting. Morbidity events may be single episodes that resolve spontaneously, are treated, or have permanent incurable effects, while others may recur occasionally or frequently.

Initially, we hoped that maternal morbidity would be easier to measure than maternal mortality, because it was more common than maternal death, and because women who survive

complications or who are unwell can report on their own health status during interview surveys (Ronsmans and Filippi 2004). If morbidity could be captured with sufficient accuracy, it would greatly facilitate the monitoring and evaluation of safe motherhood programmes. Furthermore, it might even affect disease priority setting, as the causes of maternal mortality do not completely overlap with those causing a morbidity burden. (Pattinson et al 2003)

Most early work undertaken on morbidity focused on measuring the prevalence of direct obstetric complications (dystocia, haemorrhage, hypertensive disorders of pregnancy, sepsis) as proxies for maternal death, rather than morbidity as an entity in itself. LSHTM staff tested the validity of cross-sectional interview surveys for capturing these direct obstetric morbidities. The questionnaires were not sufficiently accurate to estimate the magnitude of direct obstetric complications and tended to overestimate complications (Ronsmans et al 1997; Filippi et al 2000). In this respect, prospective studies (in particular in areas with a very high use of services (MOMA study) or where trained Health Workers could observe and record complications (Bang et al 2004)) were superior for obtaining population-based information,

Interest turned to capturing severe (near miss) morbidity. Women with near-miss complications survive primarily through good medical care, and so can be captured at the facility level. The near-miss approach had been proposed to monitor UK health services because there are few maternal deaths in any one hospital (Stones et al 1991). Using near-miss, LSHTM staff have investigated:

- The utility of documenting numbers of near-misses, particularly the proportion that arrive in a critical stage, those who become near-miss in the hospital, and some basic characteristics such as referral etc. These can form the basis of multi-professional clinical audits to improve the quality of responses of the health systems and of the quality of care in the hospitals (Filippi and Ronsmans, 2005; Gohou et al 2004; Ghandi et al 2004; Adisasmita et al 2008)
- Whether women who have near-miss complications suffer long term health, social and economic consequences, and whether they may benefit from high-risk screening in postnatal care (Filippi et al 2007)
- The usefulness of monitoring Pregnancy-related illness and mortality (PRIAM) as an indicator of the success of Safe Motherhood Programmes. We measured PRIAM in West Java, Indonesia, and investigated the relationship between life-threatening morbidity and maternal mortality. The incidence of maternal mortality and life-threatening complications at the population level was 0.4 and 1.4 per 100 births, respectively, resulting in an overall ratio of PRIAM of 1.8 per 100. The approach is promising but needs further testing in populations with varied disease epidemiology and access to care. (Ronsmans et al in press; Adisasmita et al 2008)

In contrast to the difficulties of measuring acute maternal complications, there are some general questions on well being which perform well in surveys. Indeed the concept of quality of life, and self-perceived morbidity is now routinely used in trials of specific interventions. There are also good instruments to measure chronic aspects of ill-health which may place a considerable burden on women and their families, including for example postpartum depression, anaemia during and after pregnancy, hypertension, malnutrition, urinary infections, HIV and malaria. All these can be measured with simple tests or screening questionnaires during population based surveys.

Unwanted pregnancies

The benefits of family planning for the survival and health of mothers are fairly straightforward. Women who are not pregnant or recently delivered cannot by definition experience acute life-threatening maternal complications or die maternal deaths. Furthermore, women with unwanted pregnancies are much more likely to resort to induced abortions, which in many settings are unsafe.

In 2000, about 90% of global abortion-related mortality and morbidity and 20% of obstetric-related mortality and morbidity could have been averted by use of effective contraception by women wishing to postpone or avoid further childbearing. (Collumbien et al 2004) A total of 150 000 maternal deaths (representing 32% of all maternal deaths) could have been prevented, in a highly cost-effectiveness manner, with much of this benefit reaped in Africa and Asia (Cleland et al 2007).

The promotion of family planning in countries with high birth rates also has the potential to reduce poverty and hunger and to avert 10% of childhood deaths. Preventing unwanted pregnancy would also contribute substantially to women's empowerment, achievement of universal primary schooling, and long-term environmental sustainability.

In the past 40 years, contraceptive practice has increased from less than 10% to 60% and fertility in developing countries has reduced from six to about three births per woman (Cleland et al 2007). However, in half of the 75 larger low-income and lower-middle income countries (mainly in Africa), contraceptive practice remains low and unmet need for family planning are high (Cleland et al 2007). Greater investment in family planning in these countries compelling, yet international funding and promotion of family planning has waned in the past decade. A revitalised agenda is urgently needed. Historically, the USA has taken the lead but other governments or agencies are now needed as champions. Based on the sizeable experience of past decades, the key features of effective programmes are clearly established. Most governments of poor countries already have appropriate population and family-planning policies but are receiving too little international encouragement and funding to implement them with vigour.

Unsafe abortion

Unsafe abortions are a major, and imminently preventable cause of maternal deaths. They also lead to significant maternal morbidity, including anemia, chronic PID, infertility which affects women in their most economically productive years. Women who experience secondary infertility are often socially stigmatized and vulnerable to poverty. Managing complications of unsafe abortion can consume considerable health facility resources (Konje et al 1992).

Text Box Doctoral students are documenting abortion experiences in Ghana

Unintended pregnancies are common in Ghana, comprising 40% of all births (GDHS 2003). It is widely speculated that many end in induced abortions, yet this assertion is difficult to substantiate because data on the national incidence of abortion are limited. A few hospital based studies indicate 22% (Deganus 1993) or 30% of maternal deaths are due to unsafe abortions, the largest single contributor.

Induced abortion occurs among married and single women of all ages, although they are more likely to occur when women are younger and single. Induced abortion is reported extensively among women interviewed in an ongoing qualitative study in Accra as part of a multinational study assessing the acceptability and use of emergency contraceptives in West Africa (ECAAF). Here about a third of all pregnancy episodes reported (53/156) resulted in induced abortions. An earlier community-based study of women in southern Ghana showed 19 induced abortions per 100 pregnancies for all women (Ahiadeke, 2001).

Reasons for obtaining an abortion are multiple and complex and differ by pregnancy. These include the nature or type of the relationship, the desire to pursue an educational or career goal, lack of financial means to support a child, the partner's attitude towards the pregnancy, the religious disposition of the individual, intervention from relatives or other significant persons and medical reasons. Contraceptive use prior to induced abortion is either nonexistent or inconsistent. Most women perceive themselves as having a low pregnancy risk (ECAAF).

Women self-induce abortion using a variety of concoctions or resort to untrained abortionists (Afenyadu and Goparaju 2003). Death and disability from uterine perforation and sepsis are well documented (Obed et al 1999). The increasing number of chemical overdoses by women attempting to end unwanted pregnancies was a major prompt to establish poison control centres (Clarke 2004). In contrast recent qualitative studies in Accra indicate that most girls use clinics and hospitals for their abortions, thus obtaining "safe" services (Henry and Fayorsey 2002; ECAF).

There have been several initiatives to provide safe abortion services in Ghana. The national reproductive health policies and protocols aim to improve access to life-saving emergency post-abortion care (PAC) for women with abortion complications, and to improve safe abortion services. PAC has been offered in Ghana since 1994, with significant investments made in in-service training of providers and provision of logistics. However a recent national survey showed only 21% of eligible facilities and 11% of public sector facilities offered PAC (Ghana Statistical Service 2003). Another recent assessment indicates one quarter of public facilities offer PAC, treating an average caseload of 26 cases per month, however fewer than one in seven public facilities reported offering legal abortion services (14%). This is attributed to a lack of knowledge of the legal provisions among key service personnel Aboagye, et al 2007.

Many more women are seeking safe abortion services in health facilities however many facilities and providers are limited in the provision of legal abortion services due to knowledge gap in the legal provisions. The picture with respect of PAC, managing complications of unsafe induced abortion, is slightly better but is far from satisfactory. There is a need to intensify existing efforts to disseminate and implement of health policies and guidelines to improve access to essential abortion services.

Obstetric Morbidity and Long-term Consequences

A woman's ability to participate in economic spheres and enhance her livelihood strategies, is severely constrained by ill-health or morbidity associated with her reproductive role. Unsupported pregnancies, including lack of access to antenatal or postnatal care, and particularly lack of skilled attendance at delivery, contribute to morbidity and subsequent chronic poverty.

Many women suffer obstetric complications in developing countries, and these can be severe when routine services are not used or access to emergency care is delayed. The impact of severe obstetric complications (sometimes called near-miss complications) on the women's health and lives, and on their families is not well described.

A cohort study of 1000 women in Burkina Faso, involving several interviews and clinical assessments over a one year period documented that, despite emergency obstetric care and hospitalisation, women with near-miss complications continued to suffer up to one year postpartum, compared to women who had had an uncomplicated childbirth. They were significantly more likely to die up to one year postpartum as were their infants (Filippi et al 2007).

Many of these women also experienced intense economic and social suffering, as they and their families had paid high levels of user fees to access the services leading families to debt. Many were forced to reduce consumption of essential items. Psychological distress, including suicide ideation, was a common occurrence in some groups, in particular those women who did not have a live infant. These findings have been largely confirmed in another study in Benin.

We conclude that there is a need to move away from simply looking at acute episodes of ill-health and enlarge our understanding of maternal morbidity to longer period. Several papers have now document that maternal mortality continue to be high up to 6 months after delivery (Hurt et al 2008). Mortality is particularly high after a stillbirth abortion or near miss, (Filippi et al 2007). We also conclude that it may not be sufficient to save women in extremis with emergency obstetric care, but that there is a need to develop targeted postnatal interventions (as well as preventing the occurrence of complications through routine services such as those provided during antenatal care and intrapartum care). We continue documenting these findings with an extension of the cohort to 5 years postpartum and are discussing possible interventions.

In other work, we are examining women's access to delivery care. Many of the acute morbidities take place around the time of labour and delivery, to the 24 hours after. This is certainly the case for hemorrhage, hypertensive diseases of pregnancy (eclampsia and Pre-eclampsia) and obstructed labour. Ongoing work in Zambia finds that few facilities have a midwife, doctors or medical officer present and can manage the basic functions needed to treat morbidity; while even fewer can manage most life threatening morbidities including blood transfusions and caesarian sections (Gabrysch, ongoing).

Research into the economics of maternal health has highlighted the prohibitively high costs faced by households when seeking professional care at childbirth. Women who deliver at a health facility often face the prospect of high out-of-pocket payments which disrupt household living standards. Caesarean sections, in particular, place an enormous burden on the average household's budget. In Nepal, for example, over one in eight households incurred catastrophic expenditures at delivery and out-of-pocket payments were estimated to increase poverty by 25 percent among those seeking care. With the rising popularity of national programmes that aim to increase use of maternity services (such as conditional cash transfer programmes in India, Nepal and Bangladesh), mechanisms to protect households from the economic consequences of these high out-of-pocket payments must be an essential part of the programme's design.

Infections (Malaria)

Malaria infection during pregnancy (MiP) will affect the health of both mother and fetus - it can cause maternal anaemia, fetal loss, premature delivery, intrauterine growth retardation, and low birth weight. Women in their first and second pregnancies and women who are HIV-positive are particularly at a high risk of these adverse effects of MiP. In sub-Saharan Africa, MiP is estimated to cause 400,000 cases of severe maternal anaemia and 75,000-200,000 infant deaths annually. The World Health Organization currently recommends the following three interventions to reduce these adverse effects in Africa where there is a high transmission of *Plasmodium falciparum* malaria: (1) Intermittent preventive treatment (IPT) with sulphadoxine-pyrimethamine (SP); (2) Insecticide-treated bed nets; (3) early diagnosis and treatment of malaria in febrile illness during pregnancy. The coverage of these interventions in sub-Saharan Africa is very low. Furthermore the prevalence of malaria parasite resistant to sulphadoxine-pyrimethamine wide spread in Africa and an efficacious and safe drug to replace sulphadoxine-pyrimethamine for intermittent preventive treatment is yet to be identified.

The adverse effect of *Plasmodium vivax* malaria on maternal and fetal health has been recognized only recently. The burden of MiP in the South East Asia region (SEAR), including India in particular, is underestimated due to a lack of robust data. Estimating the burden of malaria in the SEAR and introducing appropriate interventions to reduce the burden of MiP in this region is another priority.

Postnatal depression

Postnatal depression is depressive disorder occurring in the postnatal period and is typically diagnosed about 4-12 weeks after childbirth. Recent studies in developing countries document substantial rates of postnatal depression (Chandran et al 2002) (Rahman et al 2003). For instance, a cohort study of women attending an antenatal clinic in Goa, India, reported a prevalence of 23%, (Patel et al 2002) A number of studies from sub-Saharan Africa also confirm that between 10 and 20% of mothers suffer from this condition, with significant levels of disability, and that more than half remain ill for at least six months.

Studies in wealthy countries provide compelling evidence that postnatal depression is associated with long-term emotional, cognitive, and behavioural problems in children.(Murray and Cooper 1997) Researchers at the LSHTM argue however that the impact on physical development of children has, however, received less attention. In low income countries, maternal competence in child care is likely to have a greater role in a child's physical wellbeing and survival, as the environment is often more hostile than in wealthy countries. Poverty, overcrowding, and poor sanitation are common, resulting in a greater risk to a child's physical health.(Rahman et al 2002)

Three recent studies provide new evidence of this. In a cohort of babies born in a district general hospital in Goa, India, babies who were under the fifth centile for weight at 6 months were 2.3 times more likely to have a mother who was postnatally depressed at six weeks. This association remained significant after adjusting other key variables.(Patel et al 2003) In a community based case-control study, mothers in Tamil Nadu, India with postnatal depression were 7.4 times more likely to have infants with malnutrition. This association remained significant after adjustment for maternal intelligence, birth weight, breast feeding, immunisation, and economic status.(Anoop et al In press) In an immunisation clinic based case-control study of infants aged 9 months below the third centile of weight for age from Rawalpindi, Pakistan, the odds ratio for high levels of maternal mental distress was 3.9. The association remained significant after adjustment for birth weight, economic status, maternal age and literacy, infant's sex, and family structure.(Adewuya et al 2008; Harpham et al 2005)

The prospect for improved interventions can be informed by the existing literature. Evidence from low-income countries shows that postnatal depression can be detected using a short screening questionnaire such as the Edinburgh postnatal depression scale.(Patel et al 2002; Regmi et al 2002; Baggaley et al 2007; Hanlan et al 2008). Recent randomised clinical trials from developing countries show antidepressants and brief psychological treatments are effective for non-puerperal depression(Patel, Chisholm et al 2003; Araya et al 2003; Bolton et al 2003). The evidence base for affordable community based treatment for postnatal depression is strong from wealthy countries (Holden et al 1989; Wickberg and Hwang 1996; Appleby et al 1997; Holden 1996). There are now at least two randomized controlled trials of interventions specifically for postnatal depression in low and middle income countries;(Rojas et al 2007; Rahman et al 2008) in the most recent study from rural Pakistan, a cognitive behaviour intervention delivered by community maternal and child health workers led to large and sustained improvements in maternal mental health, and showed benefits for other outcomes (such as improved immunization coverage).(Patel and Kirkwood 2008) "Women to women" programmes in Peru have increased maternal self esteem and empowerment.(Lanata 2001) A recent pilot study on the effectiveness of a mother-infant intervention on maternal mental health in an indigent shanty town in South Africa indicates that the intervention could improve mother infant interaction and infant growth.(Cooper et al 2002) The intervention, which was delivered by locally recruited community health workers, aimed to provide emotional support and to encourage mothers in sensitive responsive interactions with their infant. By contrast, attempts to show the efficacy of **preventive** interventions have so far either failed or been only partially successful. (Brugha et al 2000; Elliott et al 2000)

Above all, the new evidence we have reviewed emphatically shows that maternal mental health is a critical, and previously ignored, factor in the association between social adversity and infant failure to thrive in low income countries (Patel ref 2008; Prince et al 2007).