How to Help Poor Women Deliver Safely?

Ndola Prata, Alisha Graves, Maura Graff, and Malcolm Potts

Authors biodata

Ndola Prata*, MD, MSc is Assistant Adjunct Professor of Maternal and Child Health and International Health, and Scientific Director for the Bixby Program on Population, Family Planning and Maternal Health

Alisha Graves**, MPH is Assistant Specialist at the Bixby Program on Population, Family Planning and Maternal Health

Maura Graff**, is a MPH candidate in Maternal and Child Health and a graduate student researcher with the Bixby Program on Population, Family Planning and Maternal Health

Malcolm Potts***, MB, Bchir, PhD, FRCOG, is the Bixby Professor of Population Family Planning, and Maternal Health

Authors full addresses

* School of Public Health, University of California, Berkeley, 314 Warren Hall, Berkeley 94720-7360. Tel: 510-643-4284; fax:510-643-8236; email: ndola@berkeley.edu (corresponding author)

** * School of Public Health, University of California, Berkeley, 513 Warren Hall, Berkeley 94720-7360. Tel: 510-643-7627; fax:510-643-8236; email: alishagraves@Berkeley.edu; maura.graff@gmail.com

* School of Public Health, University of California, Berkeley, 506 Warren Hall, Berkeley 94720-7360. Tel: 510-642-4327; fax:510-643-8236; email:pottsmalcolm@yahoo.com

Abstract

The current paper examines the realities of women delivering in resource poor settings and recommends cost-effective, scalable strategies for making these deliveries safer. Ninety-nine percent of maternal deaths occur in poor settings and the largest proportion of these deaths are of women who deliver at home, far away from health care facilities, and without financial access to skilled providers. This situation will improve only when policymakers and program planners refocus their attention on service delivery and financing interventions with the potential to reach the largest portion of women living in places where mortality is highest. We suggest feasible interventions that can potentially minimize both demand and supply side problems of safe delivery. Financing safe delivery using vouchers, supporting community health funds (CHF) and community-based insurance are some options that can be implemented in poor settings and made attractive to the donor community through output based assistance (OBA). In addition to improving financing schemes, decision-makers must promote demedicalization of emergency obstetric care services and introduction of misoprostol for home births, an easy to use technology to reduce the main cause of maternal mortality – postpartum haemorrhage, before real improvements in maternal mortality and morbidity can be achieved in poor settings.

Introduction

Common sense suggests, and the limited data available confirms, that maternal mortality is highest among poor women who live in more remote areas.
The world's first Reproductive Age Mortality Study (RAMOS), conducted in Bali, Indonesia between 1980 and 1982 demonstrated that the more remote the community in which women lived, the higher her risk of death from pregnancy or delivery. Women who lived near the provincial capital of Denpasar had a maternal mortality rate of 36 per 100,000 women 15-49 years, while those who lived in a mountainous more remote part of the island had a 121/100,000 maternal mortality rate (1). Similarly, in rural areas of Guinea-Bissau, Hoj and colleagues conducted a prospective survey of women of reproductive age and analyzed demographic, environmental and obstetric risk factors for maternal death. In their adjusted model the maternal mortality ratio increased with increasing distance to the regional hospital (OR>25km =7.4 [95%CI:1.6-7.5]) (2). In their study, distance to health facility was the strongest predictor of maternal mortality, stronger than high parity and other risk factors depicting maternal conditions.

Little progress has been made in reducing the global burden of deaths since the 1987 Safe Motherhood Conference in Nairobi. In the least developed regions of the world trends in maternal mortality suggest that pregnancy is not getting safer for poor women (3). If this sad situation is to be reversed, then the focus must be on interventions that will reach these women, most of whom deliver at whom and without skilled attendants.

The purpose of this paper is to examine the evidence on what is feasible and effective in resource poor settings to help women deliver safely and thereby decrease maternal mortality and morbidity where it is most egregious. Our aim is to identify service delivery systems and financing mechanisms that can protect the poor and potentially be implemented on a large scale.

We reviewed available evidence by searching public databases using the terms: safe delivery; delivery complications; postpartum haemorrhage; developing countries; maternal health; maternal mortality; community-based maternal health interventions; financing reproductive health services; access to services; maternal health care in resource poor settings; output based assistance; vouchers, among others. We also searched the reference lists from the articles found using these key terms. In

addition, relevant documents and reports from World Health Organization and United Nations Population Fund (UNFPA) were hand searched. We used Demographic Health Survey (DHS) data from countries with available surveys in the last five years for data on delivery place, and type of delivery assistance by socio-economic status. Demographic data were extracted from the Population Reference Bureau (PRB) population data sheet, and maternal mortality ratios are estimates developed by WHO, UNICEF and UNFPA (3).

The reality

Poor and vulnerable women live in countries where the ratio of trained physicians and certified midwives to the population of pregnant women is low (4). Each year more than a half a million women die from pregnancy related complications, most of them in sub-Saharan Africa (3). Current realities of developing countries make it virtually impossible for the skilled workforce to the growing population of women of fertile age. This is especially true when we consider: the high number of skilled health workers, particularly in sub-Saharan Africa, who say they would like to emigrate (5); the fragile economies of some countries, such as most of sub-Saharan Africa; and increasing socio-political instability in others. Physicians want to work in cities where they can educate their children and certified midwives are often married to men who work or migrate to urban areas. In parts of Africa, deaths from HIV/AIDS are decimating the health professional workforce (6).

Any achievable strategies to reduce maternal mortality among poor and vulnerable women must overcome two harsh realities. First, poorer people are more likely to get no medical care or to go to the private informal sector (7). Second, poor people spend a higher proportion of their meagre disposable income on health care, even though they rarely get value for money (8). DHS data on place of delivery provides evidence that poor women are less likely to deliver their babies in a health facility with a skilled provider (Fig 1). In Nigeria for example, a country with high maternal mortality accounting for approximately 10% of global maternal deaths, 80% of the women in the 3 lowest socio-economic groups deliver without the assistance of a skilled provider. These data indicate that unless programs are targeted to reach these disadvantaged groups, progress in safe delivery is compromised (Fig.2). In addition, Nigerian women identified the following problems (in order of importance) to accessing health care for themselves: lack of money to pay for health expenditures (30%), distance to health facility (24%), and having to pay for transport (24%).

Among the poorest quintile these reasons amount to 48%, 48% and 49% respectively (9).

Paradoxically, even in resource poor areas, existing facilities and trained personnel are not always fully utilized. Faith-based hospitals and maternity homes run by private midwives in small provincial towns often have empty beds. In Kenya 88% of women go to at least one ante-natal care visit, but only 42% are delivered by a skilled provider (10). The reason for this discrepancy is simple: women cannot afford the private fees or even the cost of public services. In many parts of Africa, in addition to travel costs (11), women must buy all drugs, pay for X-rays, and even for operating room supplies. Those who can physically reach a public maternity ward may be deterred by the requirements to deliver in the lithotomic position, by lack of family support during labour, or the shame that their families are too poor to afford cloths and other necessities that are needed in the labour ward.

The WHO, FIGO and ICM all support policies that endorse delivery by a skilled provider. In less developed countries (excluding China), where 59% of the population lives on less than $2/day (12), an outside source must subsidize a poor woman's delivery. Even if the international community is willing and able to support safe motherhood, as Fig. 3 shows, increasing resources to public facilities alone may not always help those who belong to the lowest economic quintiles. Thus, strategies involving the private sector would result in increased access to services, in addition to mitigating the demands on the already overburdened human resources of the public sector.

Evidence from National Health Accounts research, economic studies of health seeking behaviour, and analysis of DHS data suggest that an increase in government services, when and if it comes, will not be sufficient to expand access to public health care services at the rates necessary to meet the maternal mortality levels set by the Millennium Development Goals (13-15).

In short, in most countries with high maternal mortality, government health services do not reach, and may not reach for many decades, those at greatest risk of death from childbirth. Loans from international banks or sector wide support from donor nations will not help large numbers of vulnerable women unless they reach beyond the facilities managed by ministries of health.

Achievable strategies

1. Extend the reach of emergency obstetric care (*EmOC)*

Comprehensive EmOC (offering injectable drugs, blood transfusions, and caesarean sections) has a limited but important role in reducing maternal mortality in resource-poor settings (16, 17). In rural Tanzania, Mbaruku & Bergstrom, 1995 have shown how a holistic approach in EmOC, attention to detail and establishing good relations with local traditional birth attendants (TBAs), can reduce maternal mortality in a region served by a single hospital and a few satellite health care centres (18). The anti-shock garment is a new and underused technology (19) that can be life saving. However, there is an urgent need to reduce the cost of this simple, life-saving technology and make it available on a wide scale (20, 21).

One of the challenges in EmOC is to train non-physicians to undertake some of the roles traditionally reserved to physicians, such as caesarean operations. Demedicalization refers to the process of making health service delivery as least restrictive as possible while maintaining safety and efficacy. It is a necessary condition to reach the rural poor in countries with human resource capacity problems. Given the enormous discrepancy between unmet need for services and available providers, a re-examination of policies dictating the level of qualification necessary for performing comprehensive obstetric care services should be considered.

Delegating responsibilities to lower-level health care providers has been documented since the 1980s. Mozambique reports successful practice of training assistant medical officers to perform fairly advanced surgical procedures in remote rural areas where services of consultants are virtually unobtainable. Their training program focuses on three main areas: pregnancy-related complications, trauma, and emergency inflammatory conditions. A review of data from Mozambique from the 1990's shows extremely low levels of complications and low post-operative mortality for all of the surgical areas (22). Moreover, Pereira et al. (1996) compared caesarean deliveries' post-operative complication rates and patient hospital stays between operations performed by assistant medical officers and obstetricians (23). Results from their study showed that there was no significant difference between performance and outcome of high-level and mid-level providers. Similar results were reported from north-western rural Zaire, where there was no significant difference in maternal and neonatal outcomes for caesarean sections performed by nurses and

physicians (24, 25). In summary, there is substantial evidence that with appropriate training, obstetric operations can be safely performed by mid-level providers in rural areas of developing countries.

While we recommend demedicalization of certain functions of EmOC in order to contend with the human resources shortage, perhaps the next greatest challenge of expanding access to these services is maintaining adequate functioning of these facilities in poor settings (26). A needs assessment of EmOC facilities in West Africa revealed not only low ratios facility per population, but also unacceptable levels of service delivery performance in existing facilities (27).

2. Promote a life-saving technology: misoprostol for home births

The vast majority of poor women deliver at home. Postpartum haemorrhage (PPH) is the leading cause of maternal deaths in Africa and Asia, accounting for more than 30% of maternal mortality (Table 1). Whether or not PPH is correctly diagnosed and managed in a timely manner will determine the level of maternal deaths in poor settings. Fortunately, recent advances in the use of misoprostol offer promising ways to reduce the current intolerable and unacceptable burden of maternal mortality (28-31). Misoprostol is an effective uterotonic agent for prevention and treatment of PPH (32, 33). It is the first appropriate technology with the potential to save lives in remote villages where most women are illiterate. It is an off-patent, low cost, heat-stable oral (or rectal) medication, which can be administered at the community level in effective, responsible ways (34, 35). Among feasible strategies ready for widespread implementation and scale up, misoprostol would likely have the greatest potential impact on maternal mortality in remote areas. Data from India shows, for example, in absence of active management of the third stage of labour, that the use of misoprostol alone has the potential to reduce PPH by half (36).

Several decades of training TBAs has made little or no significant impact on maternal mortality (37, 38). It is a policy which the WHO, UNICEF, and UNFPA no longer support (16, 39). The reason for this disappointing result is not that TBAs are incompetent or disinterested, but that until recently there was no appropriate technology which could be delegated to illiterate village women. Moreover, most of the TBA programs are not effectively linked to a functioning referral system (39), which makes it even more difficult to attain positive outcomes.

The risk factors for the lethal complications of pregnancy are highly non-specific (40) and difficult to predict. Most PPH for example, occurs in women whose age or parity does not fall into the high-risk pregnancy category. Washing one's hands before delivery or cutting the cord with a clean razor blade instead of a piece of split bamboo are good ideas, but it is difficult to demonstrate an epidemiological impact with these strategies (41). However, overall beneficial outcomes of TBA training are also documented (42). For example, in north-eastern Brazil, collaboration between health care providers and TBAs proved to be important in improving safe delivery for rural women. The collaboration included basic training for TBAs and assistance of deliveries in small maternity centres provided by the local communities, instead of the expectant mother's home (43). In this way, rural women had the social and cultural support provided by TBAs; TBAs were trained to identify and refer patients with complications; and the delivery occurred in a specified place with easy access to transportation and communication capacity.

Prata, Mbaruku et al, using community level control, have shown that TBAs can use misoprostol to treat PPH (35). In this study, East African TBAs diagnosed PPH using a folded *kanga* placed beneath the buttocks. It is a universal tradition in the area and as all *kangas* are the same size, it is an easy to calibrate method of measuring blood loss (44). Using misoprostol to treat PPH (5x200mcg tablets placed rectally) is low cost and effective where (a) TBAs attend many deliveries and (b) a culturally appropriate way of measuring blood loss exists. In addition, treatment of PPH at the household level seems is a cost-effective intervention (45). Where one or neither of these criteria is present, then PPH prevention using 3x200mg of misoprostol soon after the baby is delivered is recommended. Operations research in Indonesia, Afghanistan and Nepal, show that women, following counselling from a community volunteer during pregnancy, can self-administer misoprostol with gratifying results (46).

In 2006 Nigeria became the first country in the world to approve the distribution of misoprostol for PPH, followed later that year by India. Several other African and Asian countries are poised for approval in the coming year.

3. <u>Financing safe motherhood: Vouchers for safe delivery</u>

A voucher scheme is a financing mechanism that delivers a specified service to a population or group identified as a priority by health policymakers. A government or

donor agency provides funding for a payment organization/ voucher agency that provides the vouchers for potential clients. Redeeming the vouchers with the payment organization/ voucher agency provides output-based assistance for the provider. Output based assistance (OBA) voucher schemes can be used to contain costs, improve provider quality, stimulate utilization of selected services, and target services to high-priority populations. OBA involves making an item of service payment for selected, needed interventions. It is a way of reimbursing health care used successfully in many developed countries. Germany has financed its health care systems with OBA since the 1950's (47).

In poor villages, the earning potential for midwives is often too low to enable a private practice. In 1997 the National Family Planning Coordinating Board (BKKBN) and the Ministry of Health in Indonesia launched a project to engage contracted midwives to provide quality services to poor villagers. Targeted performance-based contracts (TPC) compensate private midwives for providing a package of services to the poor in addition to assisting the village-level health program with family planning and public health services. District health authorities also provide vouchers for a basic package of mother and child care and family planning services to poor women who are either pregnant or who have children under one year of age. Village leaders and representatives of village organizations distribute these to the women. Coupons are used to purchase services from the contracted midwives. The midwives then present the coupons to the district authorities for reimbursement at rates that are fixed in the contract. Evidence suggests that the pilots have stimulated the use of reproductive health services by those who received the vouchers and that the distribution of the vouchers has benefited mostly the poor. Client contacts created by the voucher scheme has enabled private midwives to establish their practices more quickly as a result of this demand-side intervention (48).

OBA was used with great success for family planning services in South Korea and Taiwan (47, 49). It has been used to deliver STI treatment, cervical cancer screening, and adolescent reproductive health in Nicaragua (50). Vouchers have been used for maternal and child health services in rural Yunnan, China (51). Several OBA through voucher schemes initiatives are currently under way in Africa. A project to subsidize maternal health was launched in 2006 in parts of Kenya with the support from KFW, the German Credit Bank (http://www.output-based-aid.net/index_eng.html). In Kenya, an autonomous management agency negotiates the fee to be reimbursed for ante-natal care (including diagnosis and treatment of

malaria) and safe delivery. Women then buy safe delivery vouchers at a highly subsidized price. They can take the vouchers to a governmental hospital, a faith-based hospital, an accredited private physician, or a certified midwife. In this way, a poor woman can be given the chance for a safe delivery by a trained provider. A similar project is being carried out in Uganda for treatment of sexually transmitted infections (http://www.oba-uganda.net/publish.html).

The advantages of OBA for safe motherhood are numerous. Vouchers can be used to target vulnerable groups, such as rural or slum dwelling women. By giving poor women a choice of provider, vouchers improve quality of care, from the bottom up, rather than the top down. Subsidies can go both to the public or the private sector, ensuring existing capacity is used cost-effectively. Once providers establish a consistent cash flow, by working hard and offering a quality service, they are empowered to make their own decisions about further investments in buildings and equipment. In Kenya, for example, the money generated in public hospitals will stay in the front line facility, rather than being passed to the MoH, and local staff will allocate the money according to the needs that they know best. OBA provides quick and clear feedback on success or failure; it is easy to administer; and can be expanded rapidly as resources permit. Over time it could morph into a more comprehensive health insurance system. By increasing the income of qualified private providers, OBA has the potential to partially counter the skill drain discussed earlier.

The downside of OBA is possible “fraud and abuse”. Dishonest providers might claim reimbursement for fictitious patients, and or not provide the required quality of services for the price paid. However, good risk management practices and audit systems can be put in place at a reasonable cost to the program.

Other innovative financing mechanisms that have been piloted are Community Health Funds (CHF) and Community-Based Health Insurance (CBHI)(52-57). Although relatively recent and fewer in number, their aim is to contribute to the performance of health care financing systems. Careful evaluation of such schemes is imperative to explore how CBHI and the broader health care financing system interact. Available literature suggests that under certain circumstances CBHI can be an attractive strategy to improve access to health services, quality of health services, and potentially empower consumers.

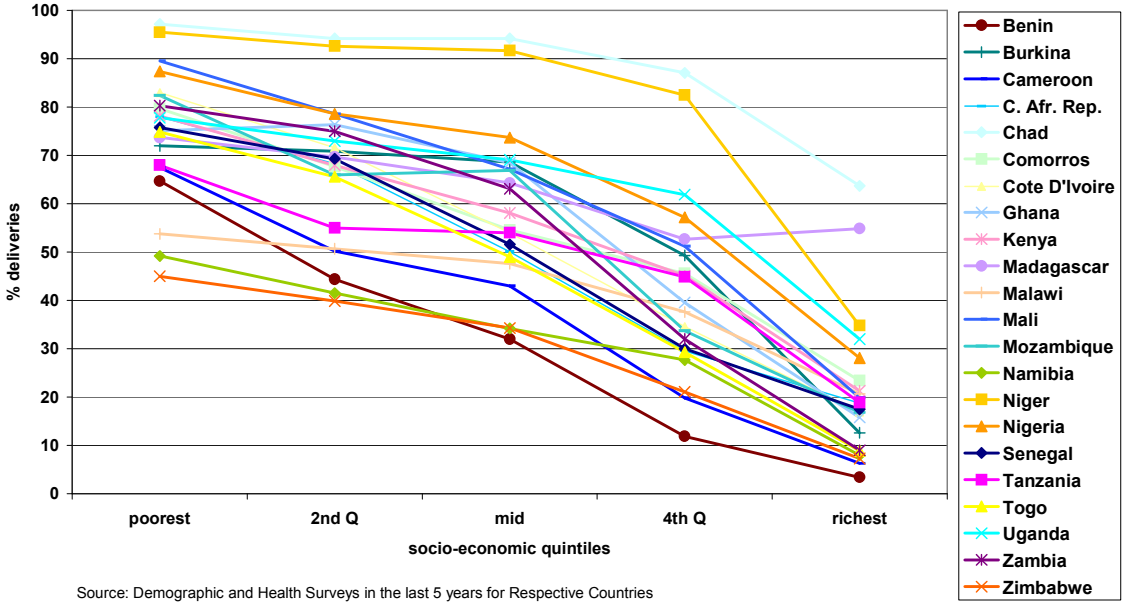
Conclusion

In the decade, from 2005 to 2015, the number of fertile women will grow by roughly 159 million, and 99% of this increase will occur in low-income countries (58). Inevitably, the goal of ensuring every woman receives skilled assistance at birth will take time to achieve (6). It is not contradictory to advocate for greater resources for safe motherhood, while also ensuring that the funds available today are used as cost-effectively as possible. There is nothing insincere about recommending to pregnant women that they deliver in a facility while simultaneously making misoprostol available to be used at the household level. It is somewhat disingenuous to insist poor rural women deliver at a facility when – as is often the case – she can't afford the fees, has no transportation, lives several hours walking distance from the nearest facility, and may not be allowed to travel. While empowerment, economic reform, improvement of roads, and building medical facilities are good and noble pursuits, they are all expensive, long-term strategies. On the other hand there are inexpensive, proven ways to reach women until universal access to skilled assistance at delivery is realized.

It is possible that more women will die of maternal causes in the coming decade than in any ten years of human history. If we are serious about maternal health, one of the most pressing questions is "how to help poor women deliver safely?" The answer relies on policymakers and the safe motherhood community taking bold and innovative steps to reach the poor on a large scale. Such initiatives should include financing safe delivery, promoting life-saving technologies, such as misoprostol for PPH to the communities and demedicalizing EmOC. Donors, policymakers, program planners, and implementation researchers must review evidence and accept the challenge of helping poor women in vulnerable situations whom we know have suffered greatly, and who will continue to suffer unless major changes are made as expeditiously as possible.

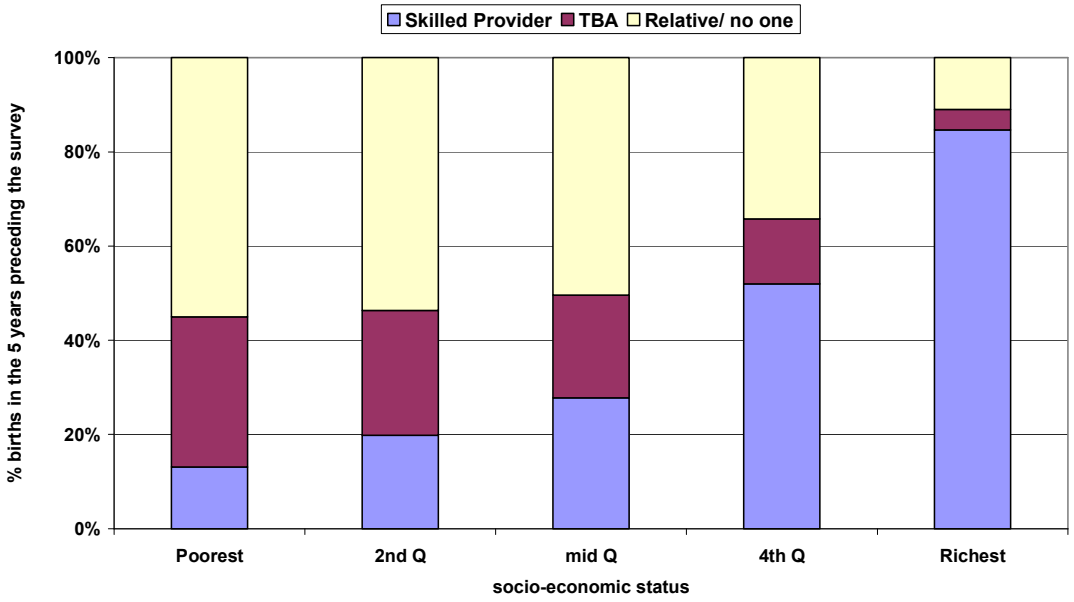
Figures and Tables:

Fig 1: Home deliveries by socio-economic status



Source: Demographic and Health Surveys in the last 5 years for Respective Countries

Fig 2: Type of person providing assistance during delivery, according to socio-economic status. Nigeria 2003 DHS.



Note: skilled provider includes Doctors, nurses, midwives, auxiliary midwife, and other trained community health extension

Fig 3: Delivery place and socio-economic status. Nigeria 2003 DHS

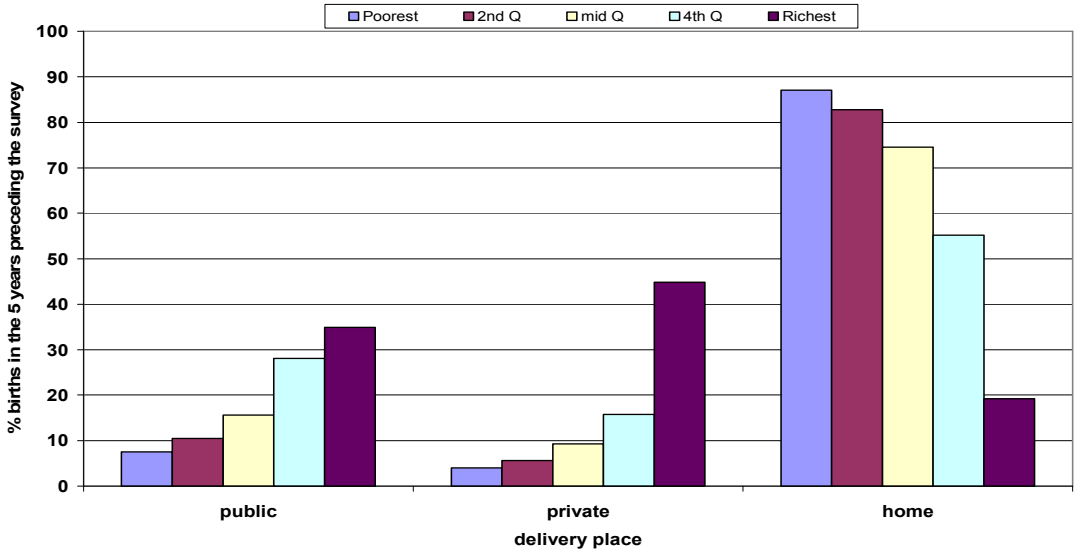


Table 1: Distribution of causes of maternal deaths by region and available priority interventions.

	(59)Average percent distribution			
	Africa	Asia	Latin America, the Caribbean	(19, 60-62)Intervention
Haemorrhage	33.9	30.8	20.8	AMTSL* Uterotonics agents: Oxytocin, Ergometrine, Misoprostol Blood and IV fluids Anti-shock garment Balloon catheter Surgical procedures
Hypertensive disorders	9.1	9.1	25.7	Blood pressure monitoring Antihypertensive Magnesium sulphate Supportive air management
Infections/ sepsis	9.7	11.6	7.7	STD treatment Clean delivery Antibiotics Vitamin A supplementation
Unsafe abortion	3.9	5.7	12.0	Family planning Safe abortion care Post-abortion care
Obstructed labour	4.1	9.4	13.4	Partograph Misoprostol for induction Instrumental delivery Caesarean section
Other direct	7.4	2.1	4.9	
Indirect[†]	32.0	31.4	15.7	

*AMTSL: Active management of third stage of labour (oxytocin; cord traction; uterine massage)
[†]Including anaemia, HIV/AIDS, and unclassified deaths

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