

# Maternity referral systems in developing countries: Current knowledge and future research needs

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## Abstract

A functioning referral system is generally considered to be a necessary element of successful Safe Motherhood programmes. This paper draws on a scoping review of available literature to identify key requisites for successful maternity referral systems in developing countries, to highlight knowledge gaps, and to suggest items for a future research agenda.

Key online social science, medical and health system bibliographic databases, and websites were searched in July 2004 for evidence relating to referral systems for maternity care. Documentary evidence on implementation is scarce, but it suggests that many healthcare systems in developing countries are failing to optimise women's rapid access to emergency obstetric care, and that the poor and marginalised are affected disproportionately. Likely requisites for successful maternity referral systems include: a referral strategy informed by the assessment of population needs and health system capabilities; an adequately resourced referral centre; active collaboration between referral levels and across sectors; formalised communication and transport arrangements; agreed setting-specific protocols for referrer and receiver; supervision and accountability for providers' performance; affordable service costs; the capacity to monitor effectiveness; and underpinning all of these, policy support.

Theoretically informed social and organisational research is required on the referral care needs of the poor and marginalised, on the maternity workforce and organisation, and on the implications of the mixed economy of healthcare for referral networks. Clinical research is required to determine how maternity referral fits within newborn health priorities and where the needs are different. Finally, research is required to determine how and whether a more integrated approach to emergency care systems may benefit women and their communities.

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## Introduction

Almost three-quarters of the current maternal deaths might be averted if full provision of the key

maternal mortality interventions were to be achieved in developing countries (Wagstaff & Claeson, 2004). Estimates suggest that essential obstetric care for haemorrhage, sepsis, eclampsia, and obstructed labour alone would have the capacity to avert around half of these deaths. The processes of access to such care are, therefore, a key dimension in saving mothers' lives. This paper reports principle findings from a scoping review of

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the literature which aimed to synthesise current thinking and evidence about maternity referral systems in the resource-poor settings of developing countries. It highlights important knowledge gaps, tentatively identifies key requisites for well-functioning maternity referral systems, and flags up areas for a future research and evaluation agenda.

## Methods

PubMed, POPLINE, Web of Science, IndMed, and three WHO Regional Databases (LILACS Latin America & Caribbean, East Mediterranean, and HELLIS south-east Asia), together indexing a wide range of medical, health, and social science journals, reports, and unpublished papers were searched in July 2004. Keyword indexing systems, Boolean terms, word truncation and wildcards were used to increase search effectiveness. No restrictions were placed on the date, language or type of publication. Search phrases had to appear in a reference title, abstract or keywords only, and included the keyword 'referral' and phrases related to aspects of the referral system ('continuity of care', 'emergency', 'transportation', 'medical records', and so on). A maternity care filter using relevant keywords was then applied. Details and abstracts of the references were managed using 'Reference Manager' software.

Of the 12,400 references resulting from the bibliographic databases searches, 607 were identified as potentially relevant and full-text versions were obtained. Additional searches in 30 websites and enquiries to international experts produced further material. Quantitative and qualitative forms of evidence were included in this broad sweep along with secondary sources such as systematic reviews. References were selected for the narrative summary on the basis of their relevance and their contribution either to the evidence base or to conceptual understanding of the topic. The parameters of the referral system were taken to be those structures and processes pertaining to the healthcare delivery organisations and any frontline informal sector healthcarers with whom a woman has a care-focused interaction.

## Findings

### *"Referral" and its function within maternity care systems in developing countries*

"Referral" of patients from basic to more sophisticated levels of care is considered to be an

integral part of allopathic health systems (World Health Organization & UNICEF, 1978). The origins of the notion of a formalised maternity referral system lie within the previously espoused strategy of risk screening in the antenatal period, in which frontline health workers would attempt to identify those women at high risk of obstetric complications and refer them on for specialised antenatal and delivery care at a higher (typically hospital) level. The effectiveness of this approach came under scrutiny when the lacks of sensitivity and specificity of available risk-screening tools, combined with the low adherence to referral advice, were highlighted (Akalin & Maine, 1995; McDonagh, 1996). Alongside some focused antenatal care activities to ameliorate specific maternal or perinatal conditions (Villar & Bergsjö, 1997), current Safe Motherhood strategies now emphasise the centrality of early identification of obstetric complications and local provision of appropriate medical and surgical care to respond to these. Recognition of obstetric complications and instigation of appropriate emergency referral procedures are, therefore, key skills required of frontline maternity care providers.

### *Referral-level facilities*

Considerable evidence suggests that hospital-based management of obstetric emergencies can contribute substantially to the reduction of maternal mortality (Van Lerberghe & De Brouwere, 2001; World Health Organization, 1994). However, extensive pyramidal structures with multiple district/regional/national tiers of facilities would seem to offer little benefit for most maternity cases, and may simply delay treatment if healthcare providers fail to assume responsibility and to take action (Ganatra, Coyaji, & Rao, 1998).

For most common emergencies in maternity care, therefore, a decentralised provision of 24-h comprehensive emergency obstetric care (EmOC) at the district hospital is recommended. However, the current picture suggests that referral systems are often far from optimal and that the number of complicated deliveries handled at referral facilities falls well below the estimated need of around 15% of pregnancies (Belghiti, De Brouwere, Kegels, & Van Lerberghe, 1998; De Groof, Harouna, & Bossyns, 2003; Jahn, Dar Iang, Shah, & Diesfeld, 2000).

On the other hand, concentration of almost all births into "referral-level" hospitals does not guarantee a low maternal mortality ratio (MMR).

Evidence from the Dominican Republic, for example, indicates that the MMR can be well over 100 deaths per 100,000 live births in settings with very high levels of hospital delivery, if overcrowding and poor technical ability result in poor quality of care (Miller, Tekur, & Murgueytio, 2002).

### *The referrers*

In contexts in which hospitals are overburdened, it seems logical that filtering patients through closer, lower technology health services should improve the effectiveness of the entire maternity system. However, the supporting research evidence is slight, and studies in a variety of settings such as rural Uttar Pradesh, India (RamaRao, Caleb, Khan, & Townsend, 2001), Soroti District, Uganda (Kaye, 2000), and South Kalimantan, Indonesia (McDermott, Beck, Buffington, Anna, & Supratikto, 2001) indicate that efficient referral can be impeded by a lack of basic equipment, up-to-date knowledge, and readiness to act on obstetric complications at frontline facilities. One successful example comes from Lusaka, Zambia (Murray, Davies, Phiri, & Ahmed, 2001), an urban setting without topographical obstacles. Here, a refurbished and extended nurse–midwife run satellite clinic network successfully reduced the overload on the referral hospital (halving its deliveries from around 24,000 in 1982 to 10,500 in 1998) and increasing professional attendance at delivery to 90%.

While most countries share a long-term aim of greatly increased coverage of professional attendant at deliveries, this is unlikely to be immediately attainable for many (Buttiëns, Marchal, & De Brouwere, 2004). Viable interim scenarios are, therefore, important. There is some evidence from case studies that the level of trained attendant needed at the peripheral level depends upon the accessibility and acceptance of referral care. Case studies from Fortaleza, Brazil in the early 1980s (Janowitz, Wallace, Araujo, & Araujo, 1985), Yunnan, rural China in the early 1990s (Institute for Health Science, 2003), and a recent cluster Randomised Controlled Trial in Pakistan (Jokhio, Winter, & Cheng, 2005) all suggest that, if the health system provides adequate outreach and referral support to non-professional home birth attendants then a substantial reduction in maternal mortality may be possible. The evidence to support specific traditional birth attendant (TBA) training interventions to increase emergency obstetric refer-

ral, however, is weak overall (Sibley, Sipe, & Koblinsky, 2004).

### *The “bypassing” of referral structures*

Deviations from the “textbook” referral system pyramids are common. Existing studies suggest that there is widespread “non-compliance” with referral “advice” on the one hand (Gupta & Gupta, 2000; Koenig, Saha, Streatfield, & Haque, 2004; Swain & Prakash, 1992) and “bypassing” of lower-level care on the other. Such bypassing is often initiated by the user, but sometimes by a lower-level healthcare provider (Omaha, Melendez, Uehara, & Ohi, 1998).

African studies have found that the majority (61–82%) of users of hospital childbirth facilities are not referred by a healthcare provider but are “self-referrals” (Akalın & Maine, 1995; Dujardin, Clarysse, Criel, De Brouwere, & Wangata, 1995; Jahn, Kowalewski, & Kimatta, 1998; Nkyekyer, 2000). Similar bypassing of lower-level facilities has been reported in terai and hill districts in Nepal (Department of Community Medicine and Family Health, 2004). “Self-referral” can result in under-utilisation of lower-level facilities, and congestion of hospitals. However, the literature also suggests that it reflects justifiable lack of confidence in the quality of care available or in the efficiency of subsequent referral-on processes. In remote settings where transportation is difficult and health systems are already weak, self-referral to hospital may be the most realistic and the speediest option if obstetric complications are suspected.

Incentive strategies such as bypass fees designed to “correct” the patient flow to the ideal model are unlikely to succeed without improved provision at the lower level. An alternative approach taken in Namibia used a survey of patients and focus groups with communities to investigate the extent to which the existing referral system was being bypassed, and the reasons for bypass (Low, de Coeyere, Shivute, & Brandt, 2001). Facilities were then upgraded or downgraded according to actual utilisation patterns.

Overloading of hospitals may be effectively addressed in the urban setting by the satellite clinic network model such as that in Lusaka, Zambia, or by upgrading human and infrastructural resources sufficiently to start offering additional 24-h comprehensive EmOC more locally (Nyambo, Masawe, Thomas, Kessy, & Sanga, 2003). An approach widely used in countries like the United Kingdom (Hundley et al., 1994), but less common in

developing countries, is to create “functional splits” within the referral hospitals themselves. Low-technology birth centres focus on providing good-quality care for physiological labour and birth for women without complications, and separate wards provide specialised care for women with complications. One example of this approach is the Patan Hospital Birthing Centre in Lalitpur, Nepal (Rana, Rajopadhyaya, Bajracharya, Karmacharya, & Osrin, 2003).

#### *Requisites for well-functioning maternity care referral systems*

Stefanini (1994) suggested the general goal of a “well-functioning” referral system is to ensure provision of effective treatment at the minimum of cost. An additional important consideration in effective treatment for the major obstetric complications is the reduction of unnecessary delays (Maine, 1991).

Koblinsky and Campbell (2003) have drawn attention to the lack of data on various functional aspects of maternity care systems in many countries. In the absence of a more comprehensive literature, any conclusions on what is required for maternity referral systems to function well can only be tentative. The nine requisites identified are derived as much from evidence on what has contributed to referral failures as from evaluations of successful interventions. There is also a risk that extrapolation from specific social and political contexts may neglect key contextual features. With those caveats stated, the next section draws together the existing literature to identify and illustrate a range of nine priority areas—organisational, technical, and social-relational—which seem to be important for optimising the capacity of maternity referral systems in developing countries.

#### *A referral strategy informed by the assessment of population needs and of health system capabilities*

Planning and managing a referral system require an understanding of the needs of the population at risk, and the capability of community and health system resources to meet those needs. Estimates of the proportion of pregnant women that will experience life-threatening complications allow forecasting of the likely need for emergency and elective referral, but these need to be informed by locally changing disease patterns. In some settings, for example, non-obstetric causes of maternal death

such as malaria and tuberculosis and chronic respiratory tract infection linked to HIV/AIDS are beginning to outstrip those due to direct obstetric causes (Ahmed et al., 1999). High prevalence of HIV/AIDS has implications for the types and causes of referrals to hospital-level services during pregnancy and post-partum. It also may require specific protocols to ensure that any recommended antiretroviral and breastfeeding regimens are maintained without interruption during transfer (World Health Organization, 2004).

Assessment of population needs should include cultural and ethnic diversity. Analysis of the use of EmOC services by caste in three districts in Nepal indicated that lower castes have lower utilisation rates than higher castes (Department of Community Medicine and Family Health, 2004). Qualitative studies reveal the problems created by differences in language, behaviour, and expectations between the consumers of healthcare and its providers (Prevention of Maternal Mortality Network, 1992), which can contribute to a lack of referral system responsiveness.

Assessments of health system capability should encompass the full range of providers and facilities providing relevant care. Government provision almost always is arranged as a hierarchy, although in reality the pathways to EmOC may be multiple. Non-profit facilities may often mirror this, providing similar care at different levels and sometimes substituting for government provision. Where there is an active for-profit formal and informal private sector, however, neat hierarchical structures no longer apply. Surveying of facilities’ capacity to perform certain clinical tasks for tracer maternity care situations can inform cross-sectoral training and feed into modifications of regulation and accreditation systems.

Provision needs to be based on the realities of care-seeking behaviour. Pregnant women may move between the public and private sectors, and move geographical areas either while seeking care (to birth in the natal home, for example) or for other social or economic imperatives. Local studies of patient journeys to and through maternity care are illuminating, for example, McCord, Premkumar, Arole, and Arole’s (2001) study drawing on Village Health Workers’ records for nearly 3000 births in rural Maharashtra, India. Analyses of “self-referrals” may help institutions to discriminate between inappropriate and appropriate accessing of referral hospital care, and to react accordingly.

### *An adequately resourced referral centre*

The case for decentralisation of basic EmOC to local facilities, with additional reachable 24-h provision of comprehensive EmOC, has been convincingly made (Berardi, Richard, Djanhan, & Papiernik, 1989; Maine et al., 1997). The Averting Maternal Death and Disability (AMDD) Network has documented the success of upgrading EmOC facilities at district hospitals in a variety of settings and countries. Between 2000 and 2003, the individual projects saw average increases of 144% in the number of women with obstetric complications treated, and an average decrease of 50% in the case fatality rate at the referral facilities (AMDD data, University of Columbia).

The extent to which the referral process should focus on referral of emergencies, or also encompass women considered to be more vulnerable to complications, or women with emerging complications such as pregnancy-induced hypertension (McCaw-Binns, 2003), is an ongoing debate. Capacity at the receiving facilities and the acceptability to communities of elective referrals need to inform programming. Maternity waiting homes near hospitals, for example, while no substitute for population-wide access to EmOC, have been used to good effect for dispersed populations in Mongolia, Cuba, Ethiopia, Zimbabwe, and Chile (Figa-Talamanca, 1996; World Health Organization, 1996).

### *Active collaboration between referral levels and across sectors*

Many maternal mortality studies highlight the human costs of failures in coordination between different levels of care provision and across the government, not-for-profit and non-government sectors. Few examples of good collaborative working have been documented as yet. Yunnan Province, China, gives one example—of a hierarchical model of performance management: each lower-level meeting organised by the immediate higher-level institution to discuss the monthly statistics, problems, training, and planning (Institute for Health Science, 2003).

An increasingly mixed economy of healthcare and a proliferation of different types of non-government maternity care provision pose new challenges for collaborative referral networks. Small-scale private-for-profit providers may be reliant upon public sector facilities when emergencies arise. Little has been documented on the referral mechanisms used by the private-for-profit sector in general, but

barriers to effective referral caused by distrust have been identified between TBAs and midwives in rural Nigeria (Okafor & Rizzuto, 1994) and between private midwives and government providers in Accra, Ghana (Obuobi, Pappoe, Ofofu-Amaah, & Boni, 1999).

### *Formalised communication and transport arrangements*

The urgency of many obstetric emergencies suggests that communication and transport arrangements need to be prioritised. Referral communications have the potential to embrace increasingly sophisticated technologies. The use of radio-telephones in health centres in the Mother-Care project in Malawi reduced average transport delays from 6 to 3 h (Africa Initiatives, 1998), and the RESCUER project in Uganda used a solar-powered VHF radio communications system with a fixed base station at health centres and walkie-talkies for TBAs (Musoke, 2002). There are as yet few examples of the use of telemedicine (telephone, video, email, or website-based consultations) to reduce barriers of distance and time in obstetric referral, but an example in rural India shows some success in making neonatal referrals more appropriate (Deodhar, 2002).

Krasovec (2004) highlights the scarcity of good research evidence on referral transportation, but concludes that motorised transport is likely to be the most effective option. In poorly resourced systems, the emphasis may have to be upon coordinating use of locally available commercial transport. Nkyekyer's (2000) review of peri-partum referrals to a Ghanaian teaching hospital found the majority of these (59%) came by taxi. Importantly, 90% of the referred women arriving at the receiving hospital in "good condition" and only 1% in "poor condition". The Prevention of Maternal Mortality Network in West Africa has several examples of successful small local-level interventions to improve transportation and communication (Samai & Sengeh, 1997).

On the other hand, organised ambulance services have been identified as integral to successful national maternal mortality programmes in Honduras, Sri Lanka, and Malaysia (Koblinsky & Campbell, 2003). Paudel's (2002) analysis of the characteristics of 31 ambulance-operating organisations in Nepal is one of few detailed studies. Here, ambulances run by smaller local, often ideologically based, organisations were found to be more flexible

than those managed by public organisations and large NGOs, and less likely to be misused for personal interests. The potential for “recruiting citizens as volunteers helping to provide their own emergency care” (Razzak & Kellermann, 2002, p. 903) is also suggested by organisations such as the Edhi Ambulance Service in Pakistan, services run by local Lions and Rotary Clubs and the Dharmodaya in Nepal (Paudel, 2002), and the activities of the Red Cross and Red Crescent societies elsewhere. In some settings, out-contracting to the private sector for ambulance services may also be an option to explore, as has been implemented by Benoni City Council in South Africa (Brynard, 1995).

*Agreed setting-specific protocols for referrer and receiver*

Providers need protocols to guide them in determining at what point in the course of a complication, or at what level of risk, they should refer a woman to a higher level of care (Jahn & De Brouwere, 2001). Such referral guidelines need to reflect local epidemiological conditions, organisational capacity, and community preferences. The partograph is widely recommended as one such decision-making tool for progress of labour and well-being of mother and foetus. However, although it has been successfully integrated into routine practise in a number of settings (De Groof, Vangeenderhuysen, Juncker, & Favi, 1995; Lennox & Kwast, 1995), the link between “use”, decision-making, and successful referral action can still require attention (Pettersson, Svensson, & Christensson, 2000).

Alongside such protocols, unified records systems may contribute to good inter-level communications. Staff training and monitoring visits were shown to be effective in improving record keeping in Ghana (Allotey & Reidpath, 2000). In Delhi, India, however, success of a new antenatal card aiming to facilitate upward and downward antenatal referrals was undermined by lack of defined referral linkages between facilities (Bansal, Tandon, & Prateek, 2003).

Recommendations often focus on protocols for the referrer, but protocols at the receiving facility may also need attention. Absence of such emergency referrals procedures can result in referred patients having to queue alongside other out-patients (Nordberg, Holmberg, & Kiugu, 1996), or in the exclusion of accompanying frontline health

workers from hospital premises because they lacked hospital identification (Options Consultancy, 2004).

*Accountability for providers’ performance and supportive supervision*

Brinkerhoff (2003) defines the essence of accountability as being answerability for decisions and/or actions. For individual providers, the organisations in which they operate create the immediate context for accountability through procedures, routines, and hierarchical relationships. These, he suggests, shape the pressures and sanctions that hold them to account and influence behaviours. Reward and salary structures, employment status, staff supervision, and reporting can all have impacts on accountability. Yunnan Province, China, used performance-based contracts and supervision meetings. Promotion of managers was also closely tied to overall appraisal of the MCH services and the scores achieved on indicators that include adherence to referral standards (Institute for Health Science, 2003).

Bossyns and Van Lerberghe (2004) studied isolated facilities in rural Niger, and suggest that the failure to adequately refer patients can be partly attributed to frontline providers’ poor capacity to deal with relational aspects of the situation. When patients were reluctant to be referred, these nurses lacked the communication skills to overcome that reluctance. They also displayed authoritarian attitudes, overconfidence in their own capabilities, and a fear of losing credibility with onward referral. Punitive inspectorial supervision activities are unlikely to resolve such deficits. Supportive methods of collective quality improvement such as those of EngenderHealth’s client-oriented, provider-efficient (COPE), for example, show more promise. These encourage service providers to assess the services they provide jointly with peers and supervisors, to identify problems, and develop effective solutions (Dohlie et al., 1999).

Other studies have located poor provider performance within the dynamics of the broader health-care organisation and the societal norms. The work of Mumtaz, Salway, Waseem, and Umer (2004), for example, shows how gender and class hierarchies undermined the effectiveness of lady health workers (LHWs) in Punjab, Pakistan. Uniformly, male management structures disadvantaged these female community workers. Managers were routinely un-supportive, even abusive, and when such LHWs referred women to the hospital, their patients were

ignored. Such studies raise important questions about what it is reasonable to expect without additional supportive interventions around gender issues. They also highlight the “inherently relational” nature of health systems (Gilson, 2003, p. 1453).

#### *Pro-poor protection against the costs of emergency referral*

The social structures, power dynamics, and underlying injustices that maintain inequities in access to healthcare form the backdrop to this paper (Hawkins, Newman, Thomas, & Carlson, 2005). Significant negative associations between women’s poverty status (as proxied by educational level, source of water, and type of toilet and floor) and maternal survival have been shown through analysis of Demographic and Health Survey data from 10 diverse developing countries (Graham, Fitzmaurice, Bell, & Cairns, 2004). With increasing poverty, the proportion dying of maternal causes increased consistently. In Indonesia, risk of maternal death was four-fold in the poorest than in the richest group.

The 2001 Bangladesh Maternal Health Services and Maternal Mortality Survey indicates that half (49%) of the women belonging to the lowest wealth quintile who reported experiencing a potentially life-threatening complication did *not* seek care, in contrast to the 22% of women in a similar situation in the highest wealth quintile (Koenig et al., 2004). The most common reason for not seeking care was cost (mentioned by 44%). Smaller local studies reflect the same social inequities (Ahmed, Islam, Mitra, Khanum, & Barkat-e-Khuda, 1999; Ekwempu, Maine, Olorukoba, Essien, & Kisseka, 1990; Jafarey & Korejo, 1993).

The economic costs to families of obstetric emergency can be severe. An eight-district study in Nepal found that over half of the families of women who delivered in hospital borrowed money to pay the high cost of transportation and facility-based EmOC (Borghi, Ensor, Neupane, & Tiwari, 2004). In the lowest income quintile, land or livestock were often sold. The literature search revealed few examples of schemes to protect the poor from maternity care-induced hardship. One example, a voucher scheme for the very poor in Yunnan Province, China, did include first aid for severe obstetric complications as well as routine maternity services (Kelin, Kaining, & Songuan, 2001). Fee exemption arrangements at facilities may have a

role to play, but the Indonesian experience suggests that these may not be sufficient by themselves in times of economic hardship (Koblinsky, 2003). Universal social insurance, combined with a specification of entitlements that includes obstetric care, and provision through franchising or accreditation of public and private facilities, may be the best package to avoid actively excluding the poorest sectors of society (World Health Organization, 2005).

#### *Capacity to monitor effectiveness*

Little research has been conducted on how to measure the effectiveness of maternity referral systems (Murray et al., 2001). Referral systems are multi-factorial, and approaches to measurement of effectiveness at the local-level benefit from using a range of indicators to measure key aspects. A system analysis approach is recommended by Siddiqi et al. (2001, p.193), in which “all components essential to the functioning of the referral system are identified, followed by the selection of relevant, valid and objective assessment indicators which are then measured in the course of appropriate surveys”. District management teams can develop their own set of indicators to monitor available resources emergency preparedness, local life-saving skills, EmOC resources, and availability of urgent communication and transportation, across the public and private sectors. One of the more comprehensive studies along these lines comes from Lusaka, Zambia, where data for baseline evaluation and future monitoring of the maternity referral system were collated on five dimensions (Murray et al., 2001). The value of monitoring the effectiveness of referral systems is shown in the Namibian example cited previously (Low et al., 2001).

#### *Policy support*

The final and underpinning requisite for well-functioning maternity referral systems is government support. Effective systemic change and prioritisation of maternal health rights within policy and national resource allocation requires skilful engagement of political processes, as analyses of successful Safe Motherhood initiatives have shown (Shiffman, 2003). More specifically, Koblinsky and Campbell (2003) found in their case studies that strong government policy helped to ensure that a referral and supervisory function was prioritised within the healthcare delivery system, linking the levels so that

complicated obstetric cases were efficiently referred. Lessons from other countries also indicate how central policy decisions can have unintended detrimental impacts upon referral linkages. Decentralisation of health system funding and management, for example, may result in weakened technical links between rural health units and higher-level facilities, as reported in the Philippines (Lakshminarayanan, 2003).

### *The knowledge gaps*

Many knowledge gaps were identified in the course of this wide-ranging review and some have been alluded to in the preceding sections. Five diverse areas particularly stand out as requiring research attention in the future.

Firstly, there is a need for better understanding of what the ways in which maternity referral set-ups impact upon the poorest and most socially excluded. Some of the most innovative developments—such as involvement of commercial drivers in providing emergency transport—can be understood as the creation and use of what MacKian, Bedri, and Lovel (2004) refer to as “bridging” social capital which links across groups in new ways. In order to understand the extent of poor and marginalised women’s access to EmOC, it may be important to understand the relative positions that such individuals or families inhabit, if or how they draw on their communities to address healthcare needs, and how they may benefit from (or miss out on) locally constituted social capital.

Secondly, the existing “referral literature” has rarely made its assumptions about social life explicit. Health systems, however, reflect the societies and cultures in which they are located, and the agency of individuals within these structures. Findings from social science research on the processes and dynamics of workforces and large bureaucracies in industrialised countries can usefully be tested for their utility in relation to healthcare systems in developing countries. Examples include Walker and Gilson’s (2004) application of Lipsky’s notion of “street-level bureaucrats” to enable a better understanding of how public policy becomes mediated and enacted through the informal routines of frontline healthcare providers in South Africa, and Leonard’s (2000) use of Blau’s theory of organisational behaviour to analyse the reasons why little professional co-production of knowledge seems to occur in current referral chains. Such work

is valuable because it surpasses rather static “technical fix” notions of what *ought* to happen, and provides a more elaborated understanding of the human constraints and potentials.

Third, a far better understanding is needed of the consequences of the proliferation of non-government sector maternity care provision for a meaningful referral *system*. As Bloom and Standing (2004) have argued, the view of discrete public and private health sectors in most low-income countries is increasingly unsupportable. Approaches to forging new referral chains will need to take account of all the routes by which women may arrive at EmOC. Furthermore, there is a need for theoretically informed studies of governance and of relationships between healthcare organisations in mixed economies of healthcare (Ferlie & McGivern, 2003).

A fourth research need is one for further clinical studies and reviews concerning how maternity referral systems impact upon neonatal health and survival in developing countries, and what are the programmatic implications. Estimates suggest that EmOC could contribute up to 10–15% reduction in all-cause neonatal mortality, and 20–60% reduction in mortality due to birth asphyxia (Darmstadt et al., 2005). However, there are also indications that neonatal mortality can also be reduced through programmes of home- or community-based care (Bang, 2003).

Lastly, research attention is needed to inform upon where urgent obstetric referral best fits within local-area and national health systems. Vertical Safe Motherhood initiatives have led the field in raising the profile of emergency referral, but the cost-effectiveness and sustainability of self-standing emergency obstetric referral is problematic because of the relative infrequency of complicated obstetric events. Interest is being shown in the development of national emergency medical care plans (Razzak & Kellermann, 2002), and this confluence of interests needs to be explored strategically. Locally, communication and transport initiatives initiated in maternity care have tended to also be utilised for other health emergencies (Bossyns, Van Lerberghe, Abache, & Abdoulaye, 2004). What has not yet occurred is evaluation and testing of generic emergency referral plans (covering obstetric emergencies, severe childhood illness, and trauma, for example). A gender dimension will be crucial, to clarify any benefits and costs to women of integrated approaches to emergencies.

## Conclusion

“Referral systems” have been considered to be an important component of health systems in developing countries since the emergence of primary healthcare. This paper’s tentative delineation of key requisites for successful maternity referral systems has highlighted some complex organisational and relational facets of healthcare delivery, and here, maternity referral may be considered a useful ‘tracer’ for analysis of healthcare systems.

There is evidence that great gains can be made in maternal health by ensuring that women with pregnancy complications can quickly reach a facility where they can receive high-quality obstetric care. Despite the widespread acceptance of this point, maternity referral systems have been under-documented, under-researched, and under-theorised. There is a pressing need for social and clinical research to fill the gaps and silences in the current literature. What the available evidence does indicate is that, firstly, there is considerable disparity between the hierarchical “referral pyramid” to be found in policy documents and the realities for many women attempting to access and traverse maternity care “systems” in many urban and rural settings in developing countries.

Secondly, the broad aims of a maternity referral system may be universal (e.g., timely treatment of obstetric complications), but specific programme elements need to be based upon an assessment of local priorities and capabilities. The diversity of cultural, geographical and transport settings, population characteristics and needs, and structures and providers of healthcare suggest that one universal model will not rigidly fit all contexts. Healthcare provision in developing countries is dynamic, with rapid changes occurring around healthcare financing, human resources, sector provision, and use of new medical and communications technology. Some of these changes present challenges to efficient maternity referral systems, but others present exciting new opportunities.

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