Using a Birth Center Model of Care to Improve Reproductive Outcomes in Informal Settlements—a Case Study

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Abstract The world is becoming increasingly urban. For the first time in history, more than 50% of human beings live in cities (United Nations, Department of Economic and Social Affairs, Population Division, ed. (2015)). Rapid urbanization is often chaotic and unstructured, leading to the formation of informal settlements or slums. Informal settlements are frequently located in environmentally hazardous areas and typically lack adequate sanitation and clean water, leading to poor health outcomes for residents. In these difficult circumstances women and children fair the worst, and reproductive outcomes for women living in informal settlements are grim. Insufficient uptake of antenatal care, lack of skilled birth attendants and poor-quality care contribute to maternal mortality rates in informal settlements that far outpace wealthier urban neighborhoods (Chant and McIlwaine (2016)). In response, a birth center model of maternity care is proposed for informal settlements. Birth centers have been shown to provide high quality, respectful, culturally appropriate care in high resource settings (Stapleton et al. *J Midwifery Women's Health* 58(1):3–14, 2013; Hodnett et al. *Cochrane Database Syst Rev* CD000012, 2012; Brocklehurst et al. *BMJ* 343:d7400, 2011). In this paper, three case studies are described that support the use of this model in low resource, urban settings.

Keywords birth center · birth centers · birth center, free standing · maternal health · maternal health services · slum · slums · informal settlement · informal settlements

Introduction

The world is undergoing a radical transformation. For the first time in history, more than 50% of the world's population live in urban areas, and it is estimated that by the year 2050 two thirds of human beings will live in cities [1]. This trend is not occurring evenly, with the highest rates of urbanization occurring in Africa and Asia. Nearly 90% of new urban growth is expected to occur in the least developed nations [1, 6], and the urban population there is expected to double every 35 years [7].

Not surprisingly, such rapid growth is often unmanageable. Concentrated settlements of impoverished residents create chaotic, dangerous communities, often referred to as slums or informal settlements. As defined by UN-Habitat, the United Nations program for human settlements, a slum is a settlement that lacks one or more of the following: access to clean water, access to improved sanitation, sufficient living area that is not overcrowded, durable housing and secure tenure [8]. However, there is considerable variation in the definition of “slum”, and some cities and countries have no formal definition at all [9, 10]. To some, the terms informal settlement and slum are interchangeable, yet to others the term “slum” is offensive, having a negative or pejorative connotation [10, 11]. In addition, there is marked heterogeneity between informal settlements of different

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countries, cities, and even within the same city; not every resident of an informal settlement is poor, nor does every poor urbanite live in an informal settlement [10, 11]. Regardless of one's chosen definition, informal settlements around the world are united in their poor living conditions. Hastily constructed, these informal settlements are overcrowded and insecure, with inadequate clean water and scarce or absent sanitation. Informal settlements are typically not formally recognized by local or national governments, and there are few, if any, social and health services provided there. These settlements teeter on the margins, often in environmentally dangerous locations, their residents at constant risk of eviction [12, 13].

Korail Informal Settlement
Dhaka, Bangladesh

Health in Informal Settlements

These chaotic, dangerous living conditions cause the residents of informal settlements to suffer disproportionately from poor health [14]. For some city residents, there is an “urban advantage” created by the increased availability of services typically present in cities. This urban advantage is largely absent for residents of informal settlements. Poverty, discrimination, lack of knowledge and cultural practices lead to large health inequities between the urban rich and poor. The extent of the health inequity is difficult to assess as most urban health

data are reported in aggregate; moreover, informal settlements are often not included in surveys [14]. Yet the limited data available indicate that in many regions of the world, health indicators of the urban poor are now worse than those of the rural poor [13, 15]. Residents of informal settlements are at greater risk of infectious disease due to overcrowding [16], poor sanitation and contaminated water [17]. Urban lifestyles and a lack of access to healthy food lead to an increased risk of non-communicable diseases, and poor infrastructure increases the risk of environmental hazard exposure and injury [14, 18, 19]. Chronic malnutrition and the chronic stress of poverty further aggravate the health of those living in informal settlements [16, 17]. Women and children in informal settlements are even further disadvantaged, as they face additional discrimination deeply rooted in the sociocultural environment. Compared to men, women living in informal settlements have lower levels of education, lower paying jobs [14, 20], and are often excluded from home and land ownership [18, 21, 22]. With up to one third of households headed by a woman [18], financial stress pushes women and their children even further out on the margins of society. Women living in informal settlements are at greater risk of physical, sexual, and intimate partner violence [23, 24]. They have increased rates of sexually transmitted infections, increased rates of unintended pregnancies and increased rates of maternal and child mortality [12, 25, 26].

Reproductive Health in Informal Settlements

There is a great need for quality data regarding health and well-being in informal settlements in general [6, 27], and more specifically about reproductive health care services and outcomes [25, 28, 29]. The data available support a trend of worse reproductive outcomes for women in informal settlements.

With one of the largest and fastest growing urban populations in the world, India is a valuable source of information on reproductive health in informal settlements. One survey conducted in the informal settlements of Delhi found that only 42% of recently delivered women reported four antenatal care visits, while 30% of the women interviewed did not visit a hospital at all during their pregnancy [30]. An evaluation of national data collected during the National Family Health Survey found that almost 100% of women- all

locations- had knowledge of contraceptives. However, fewer than 50% of women living in informal settlements used contraceptives, compared to a usage rate of almost two thirds in other urban women. The same survey found that women in India's informal settlements had lower rates of adequate antenatal care, used skilled birth attendants less frequently, and gave birth at home more often [20].

In Kenya, the African Population and Health Research Center maintains a surveillance system in two of Nairobi's informal settlements, the Nairobi Urban Health and Demographic Surveillance System (NUHDSS). The NUHDSS determined the maternal mortality ratio in Nairobi's informal settlements to be 706 per 100,000 live births, a number 45% higher than the national average [31], and the rate of infant mortality in informal settlements to be almost double the national average [32]. Nearly one third of women living in Nairobi's informal settlements give birth outside of a health care facility, and more than one third deliver without a skilled birth attendant. Of the maternal deaths identified in the survey, 80% delivered without a skilled birth attendant [31].

The global strategy of encouraging facility delivery for all women has resulted in a large increase in facility deliveries around the world, yet there has not always been an associated improvement in maternal morbidity and mortality [33, 34]. When women of informal settlements do seek care at a facility, quality is often lacking. Healthcare in and around informal settlements is provided by a complex mix of public, private, not-for-profit and for-profit facilities, often unlicensed. One survey in Nairobi found that women generally perceive these facilities as providing good quality care [35], however, an in-depth investigation of these facilities found them overwhelmingly substandard, typically lacking essential supplies, trained personnel and proper regulatory oversight [36]. In the informal settlements of India, the vast majority of women obtain care from private facilities, which are largely unregulated and typically staffed by underqualified practitioners, some without any formal training at all [20, 37]. This trend was also found in Lagos, Nigeria. One survey of two of the most vulnerable informal settlements found that although 64% of women chose a facility birth, the maternal mortality rate was nearly double that of Lagos state. Over half of the women surveyed delivered in a private facility [26].

There are well established interventions that improve maternal morbidity and mortality, however there is little

data on successful programs or service delivery models specifically for the urban poor and those living in informal settlements [25, 28]. As noted above, large numbers of women in informal settlements are delivering without a skilled birth attendant, and those that do chose a facility birth often receive substandard care in ill-equipped facilities. There is a great need to explore other service delivery options for the women of informal settlements. In response to this multi-layered problem, I propose a midwifery-led birth center model of care as a viable strategy to provide quality maternity care in informal settlements. The case studies presented here support this model of service delivery as an evidence-based, effective and acceptable model of care for this marginalized population of women.

A Birth Center Model of Care

It is generally accepted that midwifery care can and should play a prominent role in the global strategy to improve maternal and neonatal health [38, 39, 41]. As countries struggle to improve access to quality care, the addition of properly trained and regulated midwives has been shown to rapidly reduce maternal morbidity and mortality [39]. In addition, the midwife philosophy of honoring normal physiologic birth without unnecessary interventions can help reduce the burden of "too much too soon" [34], or the growing overmedicalization of birth that leads to a different set of perinatal complications [40].

The discussion of midwifery care and its outcomes has been hampered by inconsistent and ambiguous definitions, with the term "midwife" being applied to health workers with wildly different training and skills- from traditional birth attendants with some additional training to midwives formally educated to international standards [39]. When midwifery care is provided by appropriately trained and regulated practitioners who are integrated into a functioning health system, it results in improved outcomes [41] and a more efficient use of resources [39]. Typically a midwife is a professional who provides reproductive health care, including pre-pregnancy, antenatal, intrapartum and postnatal care. A midwife also provides preventive services, such as cancer screening, family planning, and health education [47]. As described by the International Confederation of Midwives, the core of midwife philosophy is to work in partnership with women in providing woman- and family- centered care. The midwifery model of care

emphasizes autonomy, respect, and cultural sensitivity. Although trained to diagnose and manage labor complications, midwives try to avoid medical interventions if possible. Midwifery practice believes in the normalcy of labor and birth and sees birth as a natural process, not a pathology [42, 43].

Consistent with the philosophy of the normalcy of birth, midwives favor a birthing environment that is non-medicalized and home-like. Contrary to typical practices on the hospital labor ward, the midwifery model of care encourages freedom of movement and position, eating and drinking, and the presence of loved ones during labor [44]. This type of care can be provided in many different settings- on specialized “sub-units” of hospital labor wards, in free-standing birthing centers, and in women’s homes [3, 45].

There is strong evidence that a midwifery model of care, and a birth center setting, are safe for mother and baby when provided by fully trained practitioners. While the majority of data come from high income settings with formally trained midwives, multiple studies of low risk women indicate that women who give birth in a birth center setting are more likely to undergo a vaginal birth and have no increase in adverse perinatal events. These women experience lower rates of interventions, including fewer episiotomies, fewer operative deliveries (vacuum and forceps), fewer epidurals and fewer cesarean sections. Breastfeeding rates at two months postpartum are increased, and maternal satisfaction is higher in these alternative settings compared to conventional institutional locations [3–5, 46, 47].

An integral part of the birth center model is a strong referral network. Because antenatal and intrapartum complications can be difficult to predict, birth centers must recognize their limitations, and must have a clear understanding of the capabilities of their referral centers. In order to prevent delays in care, there must be clear, timely communication between birth center and referral center staff, ideally a dedicated phone line or designated contact person to receive information. There must also be reliable transportation; possible delays in transport, such as severe traffic congestion or poor infrastructure, need to be taken into account [48, 49].

The Birth Center Model in Low Resource Settings

A birth center model of care offers many advantages to women of informal settlements, including the benefits

of proximity and quality. In addition, a midwifery-led center has an underlying philosophy of culturally appropriate care [47], which is a critical component of respectful maternity care. Most importantly, with properly trained and supervised staff, a birth center model of care promotes better outcomes [41].

Labor presents a unique conundrum in that the best possible outcomes occur when normal physiologic birth is allowed to occur without unnecessary medical interventions [5, 47]. However, because approximately 15% of laboring women will encounter complications [50], it is imperative that women are under the care of a trained attendant who can act when complications do occur. The birth center model of care provides women with a birth attendant whose underlying philosophy is that of non-intervention and who is trained to act quickly and appropriately to manage complications if they arise.

Birth Centers in low resource settings can provide women access to care that might otherwise be unavailable. The less medicalized environment means a birth center requires a smaller physical space and less equipment than a hospital, and so can be located in close proximity to its target population. Poor infrastructure and fear of violence lead many women in informal settlements to stay at home after dark [13], a time when most labor occurs. As one female opinion leader in Nairobi stated:

“If you get complications late in the night traveling from here...is far and risky. There are many thugs on the way. The road is bad and there is no way you can get a vehicle to come this far in the community to carry your patient.”[51]

Typically comprised of only a few rooms, a birth center can be located within the informal community it serves. Several researchers have found that proximity is one of the most important factors considered by women and their families when choosing a facility delivery [26, 52]. Having a quality birthing facility within the community may sway the balance in favor of facility births.

In addition to proximity, another important factor women consider when deciding where to deliver is the possibility of facing abuse and disrespect. There is a growing body of evidence that many women face abuse and disrespect during facility births [34]. A recent review of qualitative data from 17 low- and middle-income countries found that multiple layers of barriers prevent facility deliveries. However, one theme noted in

numerous studies over many different settings was fear of abuse and maltreatment at the hands of facility health workers [53]. All levels of providers, including midwives, have been implicated as perpetrators of abuse [54–56]. There is no panacea for this abuse of human rights; tackling the problem of abuse and disrespect during childbirth will require effort at the interpersonal, facility and health system level [57]. However, there are core principals of midwifery practice that support respectful maternity care and can be used to combat disrespect and abuse.

Importantly, a core tenet of midwifery care is cultural sensitivity. The International Code of Ethics for Midwives calls for shared decision making, empowerment of women and respect for cultural diversity [58]. This is particularly important in informal settlements, where poor women face high levels of marginalization and discrimination [2]. The Mother and Baby Friendly Birthing Facilities Initiative (MBFBF) is an international human rights centered initiative to decrease disrespect and abuse in maternity care [59]. This initiative proposes ten criteria that certify a facility as mother and baby friendly. Of the ten criteria, six are integral parts of a midwifery philosophy [44, 58]. Thus fundamentally, a birth center has the potential to offer respectful maternity care, free of disrespect and abuse. (See Table 1).

Table 1. Summary of criteria for qualifying as mother and newborn friendly

Criteria	Core tenet of midwifery care
Adopt preferred positions for labor, allow food and drink	Yes
Non-discriminatory policy for HIV-positive women, family planning and youth services	
Privacy in labor/delivery	
Choice of birthing partner	Yes
Culturally competent care	Yes
No physical, verbal, emotional or financial abuse	
Affordable cost, free maternity care	
No routine practice or procedures, such as routine episiotomy	Yes
Nonpharmacological and pharmacological pain relief	Yes
Skin-to-skin mother-baby care, breastfeeding	Yes

Adapted from Miller S, Lalonde A. *The global epidemic of abuse and disrespect during childbirth: History, evidence, interventions, and FIGO's mother-baby friendly birthing facilities initiative.*

Community birth center may also offer needed relief to overcrowded secondary and tertiary care centers. With the global emphasis on facility delivery, many facilities have become dangerously overcrowded, lacking sufficient staff and supplies to handle the influx of births [13, 60–62]. While a small proportion of women will encounter complications during labor, the majority will not; data from several large studies in high resource countries indicate peripartum transfer rates from birth center to hospital to be 15%–20%, with fewer than 2% deemed emergency transfers [43, 46]. While it is difficult to extrapolate those numbers to an informal settlement population given the distinct differences in patient population, it is still likely that a large number of women living in informal settlements would be able to safely deliver in a birth center setting with appropriately trained attendants. The limited data available regarding complication rates for out-of-hospital births in low resource settings indicate rates ranging from 17% to 42% [63–65]. Current examples of birth centers in informal settlements demonstrate that many complications can be managed without transfer to a higher level facility [66], even with less trained health workers taking on the role of midwife [67]. By working collaboratively, midwives and physicians can provide women with appropriate, high-quality care that will improve outcomes in all settings, with birth centers managing the low risk births, and tertiary centers, no longer so crowded, now able to manage high risk situations with proper respect and attention. The following case studies describe three examples of the successful use of a birth center model of care within urban informal settlements

Case Studies

The Manoshi Program

Bangladesh offers the largest, most comprehensive example of a birth center program within informal settlements. In 2007 the international non-governmental organization BRAC recognized the urgent need for maternal health services in the informal settlements of Bangladesh. Since its founding in 1972, BRAC has attained great success in improving rural health through its Essential Health Care (EHC) strategy, which provides basic health care to rural communities through a cadre of community health workers. Building on that success, BRAC adapted the program to an urban context and created The Manoshi Program. The main goal of Manoshi is to improve

maternal and neonatal outcomes in informal settlements by increasing the knowledge base of formal and informal health workers, and by improving access to facility birth for women of informal settlements [68]. Community empowerment, health education and health services are provided by a tiered cadre of community health workers (CHW). Improved access to facilities is made available in BRAC birth centers.

The first iteration of BRAC birth centers was the BRAC Delivery Center (BDC). The BDC are small birth centers located within the informal settlement itself that offer women a clean, private place for delivery. No medical services are available in the Delivery Centers, although women in labor receive support from a BRAC Urban Birth Attendant (UBA). The UBA is trained to recognize obstetric complications, and to provide timely referral to a medical facility if necessary. The UBAs are themselves members of the community, as they are recruited from the traditional birth attendants, or dai, who are already practicing within the catchment area of the Delivery Center. Those traditional birth attendants hired by Manoshi receive initial training and monthly refresher courses in maternity care [69].

Two years after its initiation, a qualitative evaluation of the program found that the communities overwhelming felt that medical services should be provided at the BRAC Delivery Centers. Although most of those surveyed were happy with the care provided by the UBAs, there was dissatisfaction about the lack of doctors and medical supplies [68]. Thus BRAC proceeded to adapt the Delivery Centers to community expectations, expanding and improving services by creating the BRAC Maternity Center (BMC).

The expanded birth centers are larger, and include a large waiting/meeting room, a triage/recovery room, a birth room and an outpatient GYN exam room. The first BMC opened in October 2011, and the program continues to expand, while the BDC are being phased out. The BMC are staffed 24/7, and maternity care is provided by Manoshi Midwives (MMW). MMW are nurses or EMTs who receive 8 weeks of additional training in maternity care from a partner maternity hospital. Refresher training occurs every month, and MMW are supervised by BRAC medical staff. The UBAs function as doulas, providing assistance to the MMW and support to laboring women and their families. Expanded services offered at BMC include IV fluids, management of some obstetric complications such as hemorrhage, and repair of obstetric tears. On a rotating basis, a physician

holds office hours at the Center, providing GYN and family planning services [67].

Integral to the program's success is the Manoshi referral system. Although BMC offer some emergency obstetric care, the scope of practice of MMWs is limited [67]. The need for referral facilities remains, and BRAC has continued its close partnerships with local tertiary care facilities. By having a memorandum of understanding with these higher-level facilities, BRAC ensures that Manoshi patients will have round-the-clock access to blood transfusions, surgical services and physician care, if needed. A large number of maternal complications get referred to Dhaka Medical College Hospital (DMCH), so BRAC Referral Program Organizers (PO) are stationed at the hospital intake desk, [70] working rotating shifts to ensure a twenty-four-hour presence. The POs assist Manoshi patients in registering for care, provide support to families, and facilitate procurement of medications and supplies. The POs also track outcomes, providing BMC staff with important feedback on their patients. (Hanfi, Tamjida Sohni, personal communication August 2015)

Now present in every major city of Bangladesh and reaching 7 million slum dwellers, [29] Manoshi is the largest program of its kind in the world. An impact evaluation conducted in 2011 found that Manoshi has had a significant effect on maternal health knowledge and outcomes; between 2007 and 2011, the percent of women receiving 4 antenatal care visits in the project area increased from 27% to 52%, while in comparison non-project areas the rates of adequate antenatal care remained flat at approximately 36%. Institutional delivery increased in the project area from 15% to 59%; in non-project areas the rate of institutional deliveries increased from 25% to 28% [71]. Performance data from 2015 indicate that only 18% of laboring women admitted to Dhaka BMC required transfer to a higher-level facility- thus over 80% of women were able to safely deliver in their community under Manoshi midwives' care. (Wallace, J., unpublished) A 2017 cross-sectional community survey of ten Manoshi branch offices in Dhaka, Chittagong and Sylhet found that BMC staff were able to successfully manage 54% of complications encountered [67].

The Philippines

There are two examples of a birth center model being used in informal settlements in the Philippines, PAANAKAN Birthing Facility in Paranaque City, and Mercy in Action. PAANAKAN Birthing Facility was

opened in October 2008 by the government of Paranaque City, after an evaluation revealed that different neighborhoods across the city were markedly different in their levels of crime, access to water, and rates of facility-based births [14]. Data was gathered using a WHO tool (Urban HEART) that was designed to guide local governments in evaluating health inequities within cities, and in deciding best options for solving these inequities [72]. Disaggregating the data revealed that in the poorest area of the city, San Martin de Porres, 92% of births occurred at home, compared to a city-wide average of 50% [14]. Using the Urban HEART tool with key informants and focus groups, potential interventions were defined and prioritized. Local leaders determined that one high impact intervention would be to open a birth facility in the district [72]. The working group initiated a number of activities in addition to building the physical birth center, including installing signage to inform residents of the center, conducting lectures to educate the community about the benefits of facility delivery and educating the staff of the health facility to prepare them to provide maternity services [72]. In the months that followed, the number of women using the facility grew steadily, and the number of home births dropped [14].

A 2010 qualitative survey of PAANAKAN clients determined that the greatest motivating factor for women to use the facility was its location within the community, followed closely by financial considerations. Clients ranked the skill of the health workers highly, and overwhelmingly decided not to birth at home for safety reasons [73]. The PAANAKAN birth center has been so successful that leaders in the five other districts of the city are establishing their own birth centers, which were scheduled to open in 2010 [14].

In another example, the NGO Mercy in Action has been successfully using a birth center model to provide Filipino women with quality maternity care since 1996. Founded by an American midwife, this faith-based organization currently has five birth centers operating on three of the largest islands of the country, several located in urban informal settlements [74]. Mercy in Action is fully committed to a humanistic model of birth, and compassionate, respectful care is provided to all women, all the time. Care at these birth centers is completely free, as Mercy in Action relies on donations and tuition from midwifery students to cover all operating costs. Through the years, the organization has emphasized building local capacity; each birth center is staffed with local midwives trained to national standards, as well as foreign midwife

volunteers [75]. Mercy in Action provides skills training for local providers, and offers scholarships to local midwives so they can complete their training [74].

As a member of the International MotherBaby Child-birth Initiative (IMBCI), Mercy in Action is committed to providing respectful maternity care. IMBCI, an international initiative similar to MBFBF, was created in 2008 with the goal of improving maternity care through a human rights approach [76]. Because of their strong adherence to the tenants of respectful maternity care, Mercy in Action has been chosen to teach the IMBCI model to professional associations and maternity hospitals across the Philippines [74].

An evaluation of more than 7000 Mercy in Action births revealed that 94% of women presenting for delivery received prenatal care, with more than half having more than four visits. Ninety five percent of women experienced a vaginal birth, and only 2% of neonates required transfer to a higher-level facility due to complications. Almost 30% of women experienced obstetric complications such as hemorrhage or hypertension, yet the majority of those complications were handled at the birth center, as the maternal transfer rate (intra- and post-partum) was noted to be only 5% [75].

Conclusion

The need to improve reproductive outcomes in informal settlements is great, and the problem will continue to grow dramatically in the coming decades if current trends hold true. As a strategy to address the problem, birth centers offer important advantages, but will also face significant challenges. Most notably, weak health systems in low and middle income countries threaten to block progress in reducing maternal morbidity and mortality [77]. A critical component of the birth center model of care is having a team approach and a strong referral network [3, 48, 49]. As seen in the Manoshi program, a referral network can be successful, [67, 70, 71] but it requires ongoing communication and up to date knowledge regarding the staffing and supplies available at referral facilities. Investment will be needed in all levels of the health system, not just at the birth center level, to adequately cover all maternal health services [78].

In addition to adequate infrastructure, a birth center model of care will face the challenge of adequate human resources. There is a well described health workforce shortage around the globe, with the shortage most severe

in areas where the maternal morbidity and mortality burden is the greatest [78]. Significant training and workforce development will be needed to adequately staff urban birth centers. As seen in the case studies above, the term “midwife” is used to describe practitioners of vastly different backgrounds, making it unclear what level of training is actually needed to ensure positive outcomes. More research is needed to describe and standardize best practices in midwifery training in these low resource settings.

Although there will be challenges, there are also advantages to using a birth center model of care in informal settlements, including the potential for improved accessibility, acceptability and outcomes. A birth center is a relatively small structure, which allows it to be located close to its target community. Proximity is an important factor when families are deciding place of delivery, [26, 52], so a close location may make the difference between a home versus facility birth. In addition, the low-tech environment of a birth center requires little equipment and infrastructure, making it financially feasible in low resource settings.

A midwifery-led birth center may be more culturally acceptable and has the potential to decrease abuse and disrespect during childbirth. Several principles that can decrease abuse and disrespect in childbirth, including woman-centered care, autonomy and cultural competence, [57] are core tenets of midwifery-led care [58]. A recent synthesis of global qualitative data found that midwife support during labor allowed women to feel safe, a central principle of respectful care [79]. Birth centers in informal settlements can capitalize on the traditional birth attendants already in the community, using their deep understanding of the local culture, language and practices to improve service utilization [80]. The use of local traditional birth attendants as doulas, as seen in Bangladesh, can increase maternal satisfaction, and has been shown to increase utilization of antenatal care and facility deliveries [81].

While the best strategy to end abuse and disrespect during childbirth has yet to be determined, there is some evidence that having a multi-component policy that addresses disrespect and abuse at all levels- health system, facility and interpersonal- is effective in decreasing abuse [82]. At the birth center level, respectful maternity care can be fostered by taking care to provide an adequate physical facility, including curtains or doors to provide patient privacy, and, ideally, running water with working toilets [57, 83]. Some disrespect and abuse is

thought to be the result of highly stressed staff, who are often deeply frustrated by their own experiences of abuse and devaluation by their managers [84]. Inadequate staffing and supplies, poor working conditions and erratic payment of wages are barriers to quality midwifery care [85] that can foster a culture of disrespect and abuse of both staff and clients. In light of this, it is critical that birth centers pay proper attention to training and staffing. Respectful maternity care is now recognized globally as essential for a positive intrapartum experience, [57] and birth centers in informal settlements will need to put policies and procedures in place from the outset to reduce abuse and disrespect.

Perhaps the most important benefit of a birth center model is that it embraces a physiologic, non-medicalized view of childbirth that increases satisfaction, decreases interventions and promotes better outcomes [39]. It offers a practical solution that can be adapted into already existing health systems. The birth center model places a nurturing, woman-centered environment at the center of maternity care, allowing the normal physiology of birth to take precedence. As an integrated part of a larger health system, a birth center fits well into the philosophy of levels of care, where resources and interventions are used only when necessary [48, 49]. As seen in the case studies discussed in this paper, a birth center model can be successful in an informal settlement setting. In a post-MDG era, where outcomes are becoming ever more divergent, and the poor are falling further and further behind [86], the birth center model of care offers a means to improve outcomes for the most marginalized women by bringing quality, respectful care to their very doorstep.

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