White Paper

COUNTING STILL BIRTHS AROUND THE GLOBE

A Thematic Review

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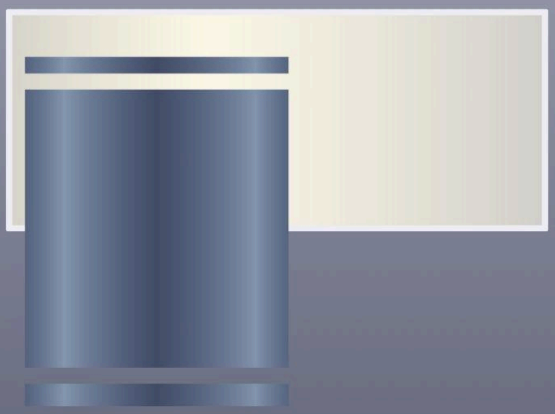

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Introduction

Stillbirths have largely been sidelined by NGOs and Global Health Organizations over the last two decades. The fourth Millennium Development Goal (MDG) targets a reduction in child mortality: Despite being an indirect poverty reduction measure, child mortality reduction "remains an essential component in terms of solidifying healthcare advancements that can address health-related poverty traps" (Arowolo, 2016, p. 11). The misclassification of stillbirths ignores the issue of neonatal deaths, and this, by extension, ignores the health and economic ramifications that accompany still born babies. This paper presents a thematic review on the status of global stillbirths by shedding light on current limitations to data availability and quality (how still births are counted, classified, and misclassified), and suggests action and research interventions to redress these discrepancies. At the center of the issue of stillbirths is poverty, as impoverished communities have the highest rate of neonatal deaths.

Defining Poverty

Lack of income breeds poverty. According to Anand and Ravallion (1993), the ability to command commodities is often equated with a person's well-being, however, the non-income dimensions of poverty are significant in terms of measuring poverty and providing interventions (as cited in Arowolo, 2016, p. 10). The concept of the development trap, as illustrated by world renown development economist, Jeffery Sachs, focuses on addressing issues that keep the disenfranchised trapped in poverty -- such as the lack of agricultural support (subsidies that could help poor farmers buy fertilizer, etc); malnutrition; access to medicine; functioning medical facilities; running water; infrastructure (lack of roads often leading to isolation); transportation; income; food; electricity; and communications -- to name a few (Arowolo, 2016; Sachs, 2005; Collier, 2007, p. 5). "Most poor people do not have access to more than one, if not all, of these inputs, keeping them trapped in a cycle of need" (Arowolo, 2016, p. 11). Inadequate health care has been identified as a major contributor to poverty in developing countries.

Stillbirths: The Poverty Connection

Maternal and infant mortality find parallels with the quality of available health care. Infant mortality rates are frequently used to indicate the social, environmental and medical status of a nation (Garrett, Galley, & Shelton, 2007). Records also show that child mortality is highest and most widespread in developing nations (Likens, Singh, Ndukwe, & Bae, 2009). According to Lawn and colleagues (2011), "ten densely populated countries (India, Pakistan, Nigeria, China, Bangladesh, Democratic Republic of the Congo, Ethiopia, Indonesia, Tanzania, and Afghanistan) account for nearly two-thirds of global third-trimester stillbirths; more than one half of all stillbirths, maternal and neonatal deaths occur in five of these countries -- redressing the stillbirth challenges in these countries would equal crucial gains in worldwide mortality reduction goals (as cited in Arowolo, 2016, pp. 11-12). Stillbirths, maternal and neonatal mortality rates are significant measures of the condition of a nation's health care system (Arowolo, 2015, p. 8).

Both mother and child critically depend on cesarean sections (C-section) – oftentimes, a C–section represents the difference between life and death (Arowolo, 2016, p. 11). According to Arowolo, when considering a global count, c-section have contributed to the increase in the number of babies born alive:

> *For example, in 2010, an estimated 25% of all births were by cesarean section, as compared to a mere 2% in 1950 (O'Neill, 2014). The difference in the number of caesarean sections is also greater between urban and rural areas -- for instance, urban areas in South Asia record a c-section rate of 14% versus 5% in rural areas; Africa records a c-section rate of 5% in urban areas versus 1% in rural areas; "Burkina Faso, Chad, Ethiopia, and Niger all have rural caesarean section rates of almost zero" (Lawn et al., 2011, p. 5)... In Latin America, and in high-income countries, most still births are recorded in urban areas; whilst in south Asia and sub-Saharan Africa, more than two-thirds of all stillbirths are in rural areas -- these figures are consistent with low skilled birth attendance numbers (Lawn et al., 2011) in the same geographical areas. Unskilled birth attendants and little-to-no caesarian section services contribute to high stillbirth rates in developing countries* (pp. 11, 13).

Arowolo (2016) posits that:

> *The human development approach prompts an evaluation of the well-being of people in developing countries, based on the following questions: "Do they live long? Do they escape preventable morbidity? Do they avoid mortality during infancy and childhood? (Anand & Ravallion, 1993). The answers to these questions reflect a bleak reality in developing nations, and spurred the creation of Millennium Development Goals (MDG) to redress inequalities that keep many in developing countries disenfranchised (p. 5).*

High on the MDG agenda is the need to account for infant mortality (IM) and birth outcomes – both measures are key population health indicators that carry significant socioeconomic and health status implications for individuals (Kim & Saada, 2013, as cited in Arowolo, 2016, p. 5). Infants being entirely dependent on their care-takers for survival highlights a level of vulnerability that is both parallel and paramount to their rate of survival – in other words, the rate at which infants die is a critical measure of a society's well-being (Garrett, Galley, & Shelton, 2007; Arowolo, 2016). The capacity that sovereign nations have, in terms of providing "up-to-date health care for [their] citizens has socioeconomic implications that defy development odds in terms of poverty reduction and the overall well being of the society in question" (Arowolo, 2016, p. 5).

Counting Stillbirths

The first day of life for a newborn is the most dangerous, and the first month is equally critical. During the first 4 weeks of life (the neonatal period), approximately 4 million babies die per annum (Lawn, Cousens, & Zupan, 2005), 3.2 million are stillborn, whilst an estimated 3.6 million die within the first month (Vergnano, 2012). On a global scale, 1.2 million stillbirths take place during labor (intrapartum) and around 1.4 million stillbirths happen before labor (antepartum); antepartum stillbirths account for more than half of all stillbirths (Lawn & Kinney, 2011). Worldwide, in 2004, stillbirths accounted for over half of the 5.9 million perinatal deaths recorded, almost all of which occurred in developing countries, 30% of which were in the least developed countries (WHO, 2006). Inadequate health care and neonatal services are the root cause of many of these unnecessary deaths.

Low-and-middle income countries lacking the capacity to finance health care costs pay the price, on an annual basis, in intrapartum and antepartum deaths by the numbers (Arowolo, 2016, p. 13). Approximately 99% of stillbirth and neonatal deaths occur in low- and middle-income countries – with nearly half occurring in homes where they go uncounted (Lawn, Cousens, & Zupan, 2005), and in regions with inadequate or non-existent vital registration systems (Vergnano, 2012, as cited in Arowolo, 2016). Despite these figures, current data does not provide an accurate count of the true burden of perinatal deaths worldwide, especially in "less developed countries where stillbirth data remain incomplete and estimates are less reliable than neonatal mortality estimates; surveys continue reporting unrealistic low stillbirth rates that are reflected in these estimates" (WHO, 2006, p. 6).

The lack of data on these deaths hinder program and policy interventions, and contribute to continued social invisibility about this issue (Lawn, Osrin, Adler, & Cousens, 2008). The 1% of deaths in developed countries are often the focus of most publications about neonatal survival (Lawn, Osrin, Adler, & Cousens, 2008). Underserved communities with the highest stillbirths and neonatal deaths are the least informed and have little-to-no access to cost-effective interventions (Lawn, Osrin, Adler, & Cousens, 2008). From a public health standpoint, information on the timing, circumstances, associated conditions and underlying causes of death is crucial to determining the quality of care, which will in turn guide prevention efforts and ultimately improve quality of care (Foren, 2009). In 2010, a worldwide count revealed that 7.6 million children under the age of five died from varying causes, and estimates suggest that most of these deaths could have been averted through proven, low-cost interventions (Chopra, Sharkey, Dalmiya, Anthony, & Binkin, 2012). Establishing a clear method of identifying and classifying a stillbirth is crucial to structuring solutions that will protect both mother and child from birth complications.

Misclassification

When stillbirths are not counted or are simply ignored, it results in the misclassification of neonatal deaths. Frøen et al. argue that in global burden disease reports authored by the WHO, stillbirths have remained largely invisible and that the same can be said for the United Nations Millennium Development Goals and targets (2009).

According to Lawn et al. (2011), stillbirths are ignored — they are not included in the Millennium Development Goals, they are not monitored by the UN, and are not included in the Global Burden of Disease metrics. When still births are mentioned in surveys, they are counted with early neonatal mortality figures and reported as perinatal mortality, which confounds essential differences, contributes to systematic misclassifications, masks trend variations, muddies possible solutions for the varying causes and further reduces visibility for the issue (Lawn et al., 2011). A standard classification method is needed for clarification purposes, so that global disease metrics can provide accurate information for targeted interventions.

The complexities associated with inaccurate stillbirth and neonatal cause of death metrics in the developing world have contributed to the sideline status of these issues in the global health policy agenda. Stillbirths may be at the background of many country policies and worldwide agendas, but they are at forefront for the families experiencing it (Lawn et al., 2011). The global focus has been on survival after live births; stillbirths have been largely ignored both nationally and internationally (Lawn et al., 2011). Although stillbirths are more prevalent than sudden infant death syndrome (by a factor of ten) in high income countries, and despite the fact that neonatal deaths exceed the number of deaths caused by HIV/AIDS, stillbirths receive less policy attention and research funding (Lawn et al., 2011). “This paradox of low policy attention despite the high burden, and irrespective of close links to other factors with policy momentum, raises an unaddressed question. Do the data deficits, absence of consensus for programme priorities, or paucity of advocates explain the attention gap, or are there other specific factors that limit attention to stillbirths?” (Lawn et al., 2011, p. 1-2). Stillbirths are ignored for reasons that are multi-factoral in nature, and these reasons must be addressed on every level if significant progress is to be made.

The most recent WHO reports on perinatal mortality show that 90 countries worldwide have no data on stillbirths, which may explain the seeming invisibility of stillbirths in the reports. Stanton et al. propose that the need to improve upon stillbirth registration methods is both plausible and critical (as cited in Frøen et al., 2009). "Stillbirths need to count…being counted is essential” (Frøen et al., 2009, p. 1-2). Effective situational analyses and prevention measures must first begin with a correct count (Frøen, 2009). An accurate stillbirth count will allow for equally accurate and specific goals to be set in order to remedy and improve the situation (Frøen et al., 2009). When considering the world’s number of perinatal deaths (i.e., time, or the number of weeks before death) stillbirths constitute the majority and yet, they are largely ignored; more than half of the world’s perinatal deaths are stillbirths, yet only a fraction are accurately registered in any health information system (WHO, 2006, Froen et. al, 2009).

A study examining “Stillbirths rates in high-income countries” was reviewed by Cousens, Lawn, Blencowe, Chou, and Say (2011). The study evaluated data from 129 different countries and the UK was found to have the highest stillbirth rate out of 14 high income countries, a result the reviewers found contentious.

Cousens, Lawn, Blencowe, Chou, and Say argued that this finding raises concerns based on the data used for the study -- they questioned the “quality, veracity and comparability of the data used, [with their main] point[s] of contention [being]: the use of different limits for birth weight and gestation, … the differential inclusion of pregnancy terminations and cases affected by congenital malformations" (Cousens, Lawn, Blencowe, Chou, & Say, 2011, p. 875). In other words, the reviewers contended that data in the study excluded infants that were born before 28 weeks of gestation, and failed to use standardized methods of determining birth weight limits; also, the study did not use congenital malformations and terminations of pregnancy.

To redress these issues, data from the UK Center for Maternal and Child Inquiries were reanalyzed in order to fully examine the relative effects that these factors had on UK stillbirth rates (Cousens, Lawn, Blencowe, Chou, & Say, 2011, p. 874). Applying a birth weight limit between 500 g and 1000 g, and excluding congenital malfunctions and terminations, decreased the UK stillbirth rate by about 1 per 1000 births, bringing the new rate to around 3 per 1000 births, putting the UK more into line with other western nations. The reviewers suggested that changes in the data set may not completely explain the high stillbirth rate in the United Kingdom (Cousens, Lawn, Blencowe, Chou, & Say, 2011). Higher stillbirth rates in the UK could also have been partially explained by differences in population risk profiles and care standards, “however ...different definitions of stillbirth ...render valid comparisons of stillbirth rates virtually impossible" (Cousens, Lawn, Blencowe, Chou, & Say, 2011, p. 875). Variations in data definitions, and also in the method of calculating reported still birthrates, “makes meaningful international comparisons difficult” (Cousens, Lawn, Blencowe, Chou, & Say, 2011, p. 875).

The use of terminology regarding stillbirths has not been consistent over time and there is a significant amount of variation between high-and-low income countries, despite clear global guidelines, and these inconsistencies in the use of terminology have “contributed to confusion about stillbirths” , for example, the International Classification of Diseases (ICD) uses the term “fetal deaths” in place of stillbirths, and defines fetal death as “death prior to the complete expulsion or extraction from its mother of a product of conception...the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles” (Lawn et al., 2011, p. 2).

ICD measurements focus on fetal deaths that take place in the second (4.5 - 6 months) and third (6-9 months) trimester, defined by a birthweight of 500g (1lb=453.5g) or greater, or if the birthweight cannot be determined, a gestational (carrying of an embryo or fetus) age of 22 completed weeks or more (i.e., second or third trimester); and if both these criteria are not known, then a crown-to-heel length of 25cm, or greater, is the standard (Lawn et al., 2011, p. 3). “If gestational age (≥22 weeks) is used rather than birthweight (≥500 g), the stillbirth rate is higher” (Lawn et al., 2011, p. 3). Lawn et al. defined stillbirth as fetal deaths that occur at a “birthweight of at least 500 g or at 22 weeks of gestation or later,” and report stillbirth rates based on the third-trimester stillbirth definition established by the ICD (≥1000 g birthweight or ≥28 weeks of gestation) (2011, p. 4).

In many low-income countries, the gestational age (beginning from the last menstrual period) is used. The WHO standards require late fetal reporting: third term deaths at a birthweight of 1000g (~2lbs) or more, 28 (or more) completed weeks of gestation, or 35cm or more in body length (Lawn et al., 2011, p. 3). In countries where neonatal intensive care is not readily available, few births before 28 weeks of gestation survive and 98% of neonatal deaths occur in these countries. Most babies born alive survive by 25 weeks, in high-income countries (Lawn et al., 2011). Some studies on bioethics have found that before 22 weeks of gestation, resuscitation should not be attempted, despite signs of life (Lawn et al., 2011, p. 3). As such, in high-income countries, the gestational age affects the cutoff for reporting stillbirths as thresholds vary from 18 to 28 weeks, and these variations affect the number of reported stillbirths (Lawn et al., 2011, p. 4).

The incentive for live births to be counted are connected to perceived benefits, which may not take precedence and communities where healthcare advances are limited (Frøen et al., 2009). In South Africa, for example, the cost of burial is a disincentive to registering a stillbirth, as stillborn babies require formal burials, which come with large financial burdens for the bereaved family (Frøen et al., 2009, p. 15). Some in-hospital stillbirths of borderline weight are recorded as a miscarriage by hospital staff sympathize with grieving families and try to help them avoid the cost of burial (Frøen et al., 2009, p. 15).

Scholars have raised issues with the level of impersonal service delivered by perinatal pathologists (Cousens, Lawn, Blencowe, Chou, & Say, 2011) post autopsy procedures, which causes many family members to refuse the service. Some studies show that with the appropriate level of counseling, autopsy rates can be improved significantly, which in turn can contribute to more accurate post-mortem counts and provide crucial epidemiological data. In situations where a fetal or neonatal death must be counted, autopsies provide cause of death or an explanation of any congenital abnormalities, which can help health service providers outline or illuminate the recurrence risk (Cousens, Lawn, Blencowe, Chou, & Say, 2011). Several studies on perinatal death offer clear illustrations concerning the growing need of alternative methods of autopsy, through a method called the ‘virtual autopsy project’, a minimally invasive method of radiological imaging implemented in an attempt to reevaluate and revise the technical procedures for a standard autopsy (Cousens, Lawn, Blencowe, Chou, & Say, 2011). The virtual autopsy project provides an alternative in situations where family members resist traditional autopsies.

Counting Stillbirths and Neonatal Deaths

Comparison between Developing Countries and the West Analytical reports of the UN MDGs show that 97% of neonatal deaths are highly concentrated in 68 countries, found in sub-Saharan Africa, East Asia and South America (Likens, Singh, Ndukwe & Bae, 2009). In 2004, 133 million live births were recorded, 98% of these deaths occurred in the developing world, 3.7 million of which were neonatal deaths; 3 million were stillborn (WHO, 2006). These WHO estimates also reveal that neonatal mortality in developing countries was 31/1000 live births and of those deaths, 76%, or 3 million, took place in the early neonatal stage (2006).

In 2008, the global total of stillbirths reported amounted to 2·65 million, with uncertainty ranging between 2.08 million and 3.79 million; 98% of the reported third-term stillbirths were in low-income and middle-income countries, with more than three-quarters occurring in south Asian and sub-Saharan African countries (Lawn et al., 2011, p. 4).

Africa showed the highest risk of neonatal deaths with 40 deaths per 1000 live births; in the sub-Saharan regions of east, west and central Africa, around 40 to 46 neonatal deaths per 1000 live births were recorded (WHO, 2006). Over 40% of global neonatal deaths took place in South-central Asia, where neonatal death rates were as high as 40 per 1000 live births, showing rates similar to those in sub-Saharan Africa; in Latin America and the Caribbean, neonatal death rates were 13 per 1000 live births (WHO, 2006). In South-central Asia, nearly 30% of stillbirths take place in India (WHO, 2006).

In 2008, approximately 2.65 million (uncertainty between 2.08 million and 3.79 million) stillbirths (≥1000g birthweight or ≥28 weeks of gestation) occurred worldwide (Lawn et al., 2011). In Finland, 2 per 1000 births are stillborn babies, as compared with Nigeria and Pakistan, where the rate is much higher at 40 per 1000 (Lawn et al., 2011). Low-income and middle-income countries see 98% of all stillbirths -- 67% occur in rural families, and 55% occur in rural sub-Saharan Africa and south Asia, where skilled birth attendance and caesarean sections are less frequent than urban births (Lawn et al., 2011). However, stillbirths are not isolated to low-income countries, rates in the USA and UK have seen a meager 1% decrease per annum over a 15 year period, and in the UK, two-thirds of all perinatal deaths are stillbirths (Lawn et al., 2011).

Infant mortality rates remain high in third world countries, however, there is disagreement among scholars about the status of infant mortality in the western world because, although nations of the west have seen a decline in infant mortality figures, preterm deaths still pose a problem. “Investment in stillbirth research, even in high-income countries, is low compared with the burden of stillbirths and is almost entirely absent in low-income countries, even in studies that examine maternal or neonatal outcomes” (Lawn et al., 2011, p. 14). Birth outcomes and infant mortality rates are unequally distributed globally; deeply contrasting cross-country and within-country patterns exist, even among western industrialized nations (Kim & Saada, 2013). Although western nations have made gains in terms of reducing child mortality rates, the issue still persists in many industrialized countries and is often accompanied with misclassifications.

Research shows that income disparities and variations in social policies (e.g., maternal leave policies) are associated with cross-country differences in IM/birth outcomes; and intra-country evidence shows that neighborhood socioeconomic status (USA, Western Europe) and income inequality (USA) are key social determinants (Kim & Saada, 2005). A study on the national and social causes of infant mortality in England paid special attention to infant fatalities that resulted from epidemic diarrhea and other social factors, e.g., mother’s occupation, domestic conditions, and infant care. Environmental preventative measures relating to both mother and child were found to have been capable of reducing high infant mortality rates and infant mortality was ruled a social (not a medical) problem, with much of the blame placed on the mother’s behavior (Garrett, Galley, & Shelton, 2007).

Controversial as this finding may be, the causes of infant death and preventative interventions remain relevant in the wide, contextual framework of infant mortality (Garrett, Galley, & Shelton, 2007).

Preston and Haines (1991) evaluated changes in child mortality in the US around the end of the 19th century and found that between ages 0 and 4, gastro-intestinal and respiratory tract diseases were responsible for 45% of all deaths, with premature birth, malformation, and childhood diseases culpable for an additional 30% (Soares, 2007). This period saw health care improvements driven by practices that recognized the germ theory of disease, including boiling milk, sterilizing bottles, hand-washing prior to handling food, isolating the sick, etc, all of which spearheaded the evolution towards the increase in life expectancy that began during the 20th century (Soares, 2007). Clean water also played a key role and is estimated to have reduced infant deaths by about 74% (Soares, 2007).

Flenady et al. (2011), contend that stillbirth rates in high-income countries have shown little or no improvement over the past two decades. Out of 6963 population-based studies that evaluated stillbirth risk factors, overweight expectant mothers and obesity (body-mass index >25 kg/m^2) were listed as the highest ranking modifiable risk factors in five high-income countries, contributing to nearly 8000 stillbirths (≥22 weeks' gestation) per year; advanced maternal age (>35 years) contributed to nearly 4200 stillbirths and maternal smoking contributed to more than 2800 neonatal deaths (Flenady et al, 2011). In high-income countries, raising awareness and implementing effective interventions for modifiable high-risk causes, such as smoking, overweight, obesity, and maternal age are priorities for stillbirth prevention (Flenady et al, 2011).

The same population-based study by Flenady et al (2011) found that in disadvantaged populations of high-income countries, maternal smoking contributed to 20% of stillbirths. Primiparity was responsible for nearly 15% of stillbirths, and in terms of pregnancy disorders, small size for gestational age and abruption contributed to 23% and 15%, respectively, illustrating the notable role of placental pathology in stillbirth (Flenady et al, 2011). Also, in high-income countries, pre-existing diabetes and hypertension remain important contributors to stillbirth among the disadvantaged (Flenady et al, 2011). Women from disadvantaged populations in high income countries have stillbirth rates that exceed rates of women who are relatively more advantaged (Flenady et al, 2011).

Programs that encourage the cessation of smoking during pregnancy, improved access to appropriate antenatal care, increased clinical and community awareness of the risks associated with common pregestational and gestational medical disorders (eg, diabetes and hypertension) and implementation of best practice guidelines could serve to decrease the associated stillbirth rates. (Flenady et al, 2011). In 2011, the percentage of pregnant women who received sufficient prenatal care in Texas ranged between 55% and 75%; in Dallas County, this average was recorded at 55.7%, which is well below the 70% national average (Children's Medical Center, 2013). Mothers who do not receive prenatal care are three times more likely to give birth to babies with low birth weights, and are five times more likely to have stillbirths (Children's Medical Center, 2013). Early prenatal care is vital to the important developmental phase that takes place during the first trimester of pregnancy (Children's Medical Center, 2013).

Prenatal screenings offer a life-line for mothers and babies at risk of complications; these screenings also give healthcare providers room to educate pregnant women in order to increase their chances of a healthy delivery (Children's Medical Center, 2013).

In 2012, only 55.7% of pregnant women in Dallas County received adequate prenatal care, and the infant mortality rate was recorded at 6.5%, in the same year (Children's Medical Center, 2013). Serious birth defects, preterm birth or low birth weight, sudden infant death syndrome (SIDS), maternal complications during pregnancy, and unintended accidents or injuries were listed among the top five causes of newborn deaths in Dallas County (Children's Medical Center, 2013). "The mortality rate for black infants is more than twice that of Hispanic and white infants" (Children's Medical Center, 2013, p. 31). Sixty percent of newborn deaths in the United States occur on the first day of life; for premature and low birth weight babies, in particular, the first day of life is reported to be the most critical (Children's Medical Center, 2013). The United States ranks 30th in the world, according to Save the Children's 2013 list of "best and worst places to be a mother," whilst both mothers and infants living in sub-Saharan Africa face the greatest risk (Children's Medical Center, 2013).

According to the WHO, neonatal deaths in developed countries are rare events -- around 4 deaths per 1000 live births -- stillbirth rates are also lower (4/1000 total births) (2006). Much progress in declining childhood mortality and undernutrition rates can be attributed to the highly effective evidence-based interventions that have been implemented over the past decades (Carrera et al., 2012, p. 1). Once the spatial variations in child deaths have been narrowed down, evidence suggests that a large number of infant deaths are preventable, and with the decline in birth rates in recent years, preventing infant mortality is all the more vital (Garrett, Galley, & Shelton, 2007). A large percentage of the gains made in improving childhood mortality and undernutrition rates can be attributed to the identification and implementation of practical, evidence based interventions -- if marginalized communities are unable to benefit from these improvements in knowledge and interventions, achieving the fourth Millennium Development Goal (MDG), which aims to reduce childhood mortality, will be further out of reach (Carrera et al., 2012). The most deprived and underserved populations within countries bear the global burden of childhood mortality, morbidity, and undernutrition, partly because major maternal and child health coverage and nutrition interventions are unavailable to them (Carrera et al., 2012). Failing to ensure that marginalized communities are able to benefit from improvements in knowledge threatens the achievement of the fourth Millennium Development Goal (MDG) (p. 1).

Proposed Interventions

A study by Carrera et al. compared two strategic approaches to reducing under-5 mortality and malnutrition across 14 countries and one province -- 11 in sub-Saharan Africa and the rest in South East Asia -- all showed high levels of deprivation (low service coverage) (2012). The study found that "focusing on the most deprived population is the most cost-effective way to deliver services to both narrow the gaps in access to services and health status between the most and least deprived population groups and accelerate progress towards health-related MDGs" (Carrera et al., 2012, p. 9).

The study also found that focusing interventions on the most deprived populations saves more lives, prevents stunting and decreases health inequities within countries (Carrera et al., 2012). For example, a strategic intervention approach targeting deprived populations and proved successful was the increased coverage of measles vaccinations in sub-Saharan Africa, the most heavily affected region in the world between 2000 and 2008, the vaccinations led to an almost 92% reduction in measles mortality (Chopra et al., 2012). The growing coverage of highly cost-effective, preventive and curative interventions can also be attributed to this reduction (Chopra et al., 2012).

Studies show that many of the 7.6 million children, aged 5 and under, who died in 2010, could have been saved if low-cost interventions had been administered (Chopra et al., 2012). "Improving access to and use of these interventions, especially in the world's poorest people, requires identification and overcoming of entrenched bottlenecks" (Chopra et al., 2012, p. 1). In poor settings and among the most marginalized, bottlenecks or weak health systems are often characterized by inadequate health worker staffing, poorly structured supply chains, low-quality of care, accompanied with financial, social, structural, and cultural barriers to services and interventions are the norm (Chopra et al., 2012).

In a study by Chopra et al., a mathematical meta-review of both published and unpublished health reviews was used to examine the evidence for a range of strategies designed to overcome supply and demand bottlenecks that prevent effective coverage of interventions that could improve child survival, health, and nutrition (2012). In spite of knowledge gaps, they found that there are many strategies that have the potential to improve the coverage of effective interventions, which could in turn improve health outcomes and stillbirth rates (Chopra et al., 2012). Policy makers and planners seeking strategies that will maximize their scarce resources can benefit from implementing these strategies (Chopra et al., 2012), which could help eradicate bottlenecks over time.

UNICEF, the World Bank and their partners have been working on several different approaches developed to rectify these coverage impediments through systematic and systemic assessments of bottlenecks in underserved regions (Chopra et al., 2012). The gap between the efficacy and effectiveness of public health interventions was recognized, by these NGOs, as the result of bottlenecks that have cost millions of lives (Chopra et al., 2012). The current structure of most national health systems redirects most resources away from the poor, in spite of evidence showing that "pro-poor strategies can have important effects on coverage in underserved populations and equity in use across income groups" (Chopra et al., 2012, p. 8).

Identifying and Eliminating Bottlenecks

The first step in identifying bottlenecks involves outlining the main ways in which health interventions are delivered. Previous research reviewed nearly 190 essential maternal and child health interventions and the findings show that health interventions "can be packaged into eight sets and delivered through three main channels: clinical and curative services, outreach services, and community-based preventive and health promotion services" (Chopra et al., 2012, p.1). Legislative mechanisms and mass media could also serve as alternative intervention delivery channels (Chopra et al., 2012).

These delivery channels, and the distribution of interventions across them, rely on discretionary action, in other words “the extent to which the response can be carried out at a population versus an individual level [required a range of action] from very low (e.g., for legislation and mass media) to high (clinical and curative channels)” (Chopra et al., 2012, p. 1). Immunizations and supplement distributions are methods of interventions that need little discretionary action, require less specific information and have no major variations in their delivery method (Chopra et al., 2012). These interventions can be delivered through established channels, like mass campaigns or non-state suppliers (subject to quality control) (Chopra et al., 2012). If the bottlenecks that the poor must overcome before they can access health interventions and services are not explicitly addressed, inequities will deepen as more expensive and elaborate interventions continue to be introduced (Chopra et al., 2012).

Regarding the issue of bottle necks, Carrera et al. (2012) contend that recent process and technological innovations have created effective and efficient means for reaching the most deprived populations, which raises the possibility that the trade-off between equity and efficiency is no longer relevant to child health. To this end, making services for the poor a priority is now both “more effective and cost effective than mainstream approaches” (Carrera et al., 2012, p. 1). This hypothesis was tested by Carrera et al. (2012) using “a mathematical modeling approach that compared cost-effectiveness in terms of child deaths and stunting events averted between two approaches (from 2011–15 in 14 countries and one province): an equity-focused approach that prioritized the most deprived communities, and a mainstream approach that is representative of current strategies” (Carrera et al., 2012, p. 1).

Analyses showed that, with the same level of investment, disproportionately higher effects are possible if the poorest are prioritized for averting both child mortality and stunting, which suggests that an approach that focuses on equalizing the distribution of interventions could lead to more acute declines in child deaths and stunting and an increased cost-effectiveness than current approaches, “while reducing inequities in effective intervention coverage, health outcomes, and out-of-pocket spending between the most and least deprived groups and geographic areas within countries” (Carrera et al., 2012, p. 1). Recent global gains in the reduction of childhood mortality and undernutrition have been accompanied by increasing within-country inequities, for example, 18 of 26 countries with the largest decreases in mortality rates of children under-5, simultaneously show a growing “mortality gap between the least and most deprived wealth quintiles” (Carrera et al., 2012, p. 1).

Countries as diverse as Brazil, Chile, Mozambique, Niger, and Thailand have seen reductions in both overall child mortality and inequities through advances in technology and community based outreaches that serve the underserved cost effectively (Carrera et al., 2012, p. 1). These outcomes provide further support for the stance made by Carrera et al. the perceived trade-offs between equity and efficiency no longer apply to issues of child nutrition and survival, and that equity-focused approaches that prioritize health care services for the poor and underserved “can be more effective and more cost-effective than mainstream approaches that incrementally increase coverage from the easier to the more difficult to reach populations” (Carrera et al., 2012, p. 1).

In their effort to predict the effect and cost-effectiveness of several maternal and child-health strategies through modeling methods, Carrera et al. measured the specific bottlenecks faced by different segments of underserved populations; they estimated the differential effectiveness of strategies that could overcome bottlenecks that were specific to these populations and translated the data from their estimates into increases in coverage and corresponding mortality and the number of stunting events averted. They authors found that "even though substantial gains in survival can be made through increased investments with existing delivery strategies, [their] model supports the contention that across a wide range of countries, a focus on reaching the most deprived populations will save more lives and avert more episodes of stunting and decrease health inequities within countries" (Carrera et al., 2012, p. 9). Also, the model showed that concentrating "on the most deprived is the most cost-effective way to deliver services to both narrow the gaps in access to services and health status between the most and least deprived population groups and accelerate progress towards health-related MDGs" (Carrera et al., 2012, p. 9).

The results of this model suggest that a greater burden ought to be placed on prioritizing service delivery to deprived communities, coupled with an increase in the use of community-based interventions (Carrera et al., 2012). From this study, the new issue that emerges is not whether underserved populations should be prioritized when designing health and nutrition policies, programmes, and projects, but whether means of reaching the in the most effective and efficient way, in specific contexts, can be explored (Carrera et al., 2012). A more comprehensive understanding of inequity is needed to help analyze situations, design policies and implement programs that can integrate disparities based geographical location with other factors like wealth, gender, and ethnic origin; this would aid in identifying the most deprived children and communities, at their most decentralized state (Carrera et al., 2012).

Oftentimes, grieving parents refuse conventional autopsies, and in these situations, post-mortem MRIs by a pediatric radiologist, external examination by a specialist perinatal pathologist, and investigations, including, placenta histology, CT scans, radiographical skeletal survey, and cytogenetics can offer useful, equivalent information that would otherwise have been retrieved from a traditional autopsy (Cousens, Lawn, Blencowe, Chou, & Say, 2011). Parents have also been found to refuse autopsies owing to inappropriate counseling and the lack of skilled perinatal pathologists to provide quality post-mortem service (Cousens, Lawn, Blencowe, Chou, & Say, 2011). Poor counseling skills and negative reports on the poor quality of perinatal autopsies also feed into the thought process that causes parents to resist autopsies, when information obtained, and the process through which said information is obtained might be less than optimal. (Cousens, Lawn, Blencowe, Chou, and Say suggest that complex legal postmortem forms be replaced with more appropriate, simpler forms that do not take away the rights of parents (2011).

Alternate means of post-mortem investigations, like post-mortem MRIs, give parents a choice, however, the accuracy of post-mortem MRsI remain to be assessed (Cousens, Lawn, Blencowe, Chou, & Say, 2011).

One study revealed that if MRIs had been the only investigative tool used post-mortem, "essential information would have been lost in about 71% of cases" (Cousens, Lawn, Blencowe, Chou, & Say, p. 875). As such, there is agreement that a challenge exists in attempting to identify cases where MRIs offer superior quality and can replace traditional autopsies (Cousens, Lawn, Blencowe, Chou, & Say, 2011). The reviewers stressed the need to improve stillbirth data collection methods with a standardized approach to defining stillbirth and reporting stillbirth in order to better inform prevention strategies (Cousens, Lawn, Blencowe, Chou, & Say, 2011). Over the past 20 years, improvements have been made in the way data has been gathered, and Europeristats has attempted to standardize the means through which reporting is facilitated in order to provide meaningful and valuable standards that can be viewed as direct and equitable between cross-country comparisons (Cousens, Lawn, Blencowe, Chou, & Say, 2011, p. 875). This underscores the need for and importance of "high-quality national systems for case ascertainment data collection and analysis" (p. 875).

Mullan and Horton (2011) explain that it is essential to know what causes stillbirths in order to design effective interventions. Currently, there are 35 published stillbirth classification systems that can be used to analyze and explain neonatal deaths, however, cross comparisons between these systems are almost impossible (Mullan & Horton, 2011). The differences in definitions and classifications limit how data is both captured and registered, which presents specific challenges with intervention implementation (Frøen et al., 2009). The classification system widely used in low-income and middle-income countries is inadequate for relative usefulness analyses; the systems that do meet the standard of reliability and usefulness have been adapted for high-income countries and rely on advanced diagnostics that cannot be used in low-income settings (Mullan & Horton, 2011). Mullan and Horton (2011) make “a strong case for a single universal classification system that will minimize the outcomes of detailed cause-of-death analyses in high-income countries into simple categories more relevant and feasible for low-income settings, beginning with antepartum versus intrapartum deaths" (p. 2).

An estimated 1.19 million intrapartum stillbirths occur yearly, and most are associated with obstetric emergencies; whilst antepartum stillbirths result from maternal infections and fetal growth restriction (Lawn et al. 2011). African women are 24 times more likely to experience intrapartum stillbirths than women in high-income countries (Lawn & Kinney, 2011). Stillbirths before labour (antepartum) account for more than half (1·4 million) of all stillbirths. “National estimates of causes of stillbirths are scarce, and multiple (>35) classification systems impede international comparison” (Lawn et al., 2011, p. 1). In the short-term, household surveys and facility audits can provide data improvements via “improvements in vital registration, including specific perinatal certificates and revised International Classification of Disease codes, are needed” (Lawn et al., 2011, p. 1).

Counting stillbirths is only the first step in analysis and is crucial for prevention (Frøen et al., 2009). A large percentage of stillbirths are preventable and the most basic intervention can raise the number of healthy live births, which could help reduce a major health problem and could lead to future return on health program investments in terms of human capital gains (Frøen et al., 2009, p. 2).

WHO reports reveal that 90 countries worldwide do not have any kind of data on stillbirths, making the need for a basic method of registering stillbirths all the more urgent, as a systematic and reliable method of registering stillbirth is an essential component in planning any national healthcare program -- analyses of data provided from stillbirth registrations could provide information to help sustain program accountability and funding (Frøen et al., 2009). For example, when the millennium development goals included neonatal deaths, significant gains were made in the global effort for prevention (Frøen et al., 2009). An accurate count of stillbirth numbers will aid in establishing specific goals in remedying this crucial health care issue, and is the first step towards improvements in standard and provision of healthcare (Frøen et al., 2009). Additional resources and political commitments are also essential in order to improve basic healthcare services and overcome the influences of limited governance, infrastructure, and workforce (Frøen et al., 2009, p. 2). Counting stillbirths is only a piece of the puzzle.

Improving the Accuracy of Stillbirth Counts

A verbal autopsy is done right after death and could offer some useful information, if performed correctly. Currently, the method used for a verbal autopsy does provide enough cause of death information, and still presents a hindrance for stillbirths (Frøen et al., 2009). In developing countries where inadequate or non-existent vital registration systems are the norm, data on cause of death is hard to find and is mostly obtained from verbal autopsies (Vergnano, 2012). Improving the value of verbal autopsies can provide an immediate intervention for stillbirth discrepancies; ideally, this would involve skilled postmortem investigation, with at least an external macroscopic examination (Frøen et al., 2009). Presently, international verbal autopsy standards for recording stillbirths that result from unattended home deliveries do not exist; this can be remedied using illustrated maps that trained birth attendants can be trained to evaluate the level of maceration, and determine an approximate time of fetal death (Baiden et al., 2007).

Also in need of development are tools that can help birth attendants determine placenta pathologies in areas where resource availability is low; these tools would help birth attendants gather basic, but essential, bits of information like: “placental-fetal birth weight ratio, gross description of placental dimensions and shape and umbilical cord insertion, color and smell indicating infections, detection of clots and sign of abruption, large infarcts, and widespread fibrosis” (Frøen et al., 2009, p. 8). In situations wherein autopsies are overlooked, established placental examination protocols can be a valuable source for gathering cause of death data (Chibber, 2005). As with other existing methods of stillbirth classifications, there are different ways of interpreting verbal autopsies. An international standard of procedure is necessary for the sake of cross-country data comparison.

Unfortunately, placenta examination is oftentimes excluded from cause of death investigations because of limited resources, lack of training, inadequate protection against contaminated blood, and little understanding of its clinical significance (Frøen et al., 2009, p. 8). Additionally, cultural beliefs often prohibit placenta examinations, for example, in China, Pacific Islands and some West African regions, the placenta represents high symbolic and spiritual significance, and it is either eaten or buried in specified locations (Frøen et al., 2009, p. 8).

A well organized stillbirth definition and classification system that works in tandem with verbal autopsies can establish a solid foundation for comparable national and international estimates (Lawn et al., 2011).

A research gap exists in the low income countries, where the burden of stillbirths is exceptionally high (Frøen et al., 2009). There is a significant gap in translating knowledge into proven strategies to reduce fetal mortality, thus the need for better data is a pressing issue in stillbirth prevention, as better data on stillbirths are also needed for basic research, which has been neglected (Frøen et al., 2009). “The general lack of data and of research to understand and prevent stillbirths in low-income countries adds to the "10/90 gap"--the fact that less than 10% of research resources address conditions affecting more than 90% of the world's population [and] of all publications on stillbirth in PubMed, only about 3% relate to low-income countries” (Frøen et al., 2009, p. 2). Not only does data on stillbirth give information that may convey benefits for both maternal and child health, antepartum and intrapartum stillbirths are strong and direct indicators of the quality of prenatal and obstetric care (Frøen et al., 2009). For instance, reports of early stillbirths often reveal higher rates of congenital defects, infections, and placental abruptions -- all requiring a different health care plan than areas where only third-trimester stillbirths are predominant (Frøen et al., 2009, p. 4). Accurate stillbirth data will help inform interventions and strengthen the quality of care provided.

A well-standardized international method of counting stillbirths is the second step towards ensuring that stillbirths are counted properly and accurately. “Besides the ICD system, there is no international consensus on a classification system for stillbirths” (Frøen et al., 2009, p. 8). The WHO/ICD have established that a stillbirth refers to a fetus with a birth weight of 500g, or if birth weight cannot be used, a “gestational age of 22 weeks or crown-to-heel length of 25 cm, [and for international comparisons] a higher limit (1000 g/28 weeks/35 cm) of third-trimester stillbirths for [is used]” (Frøen et al., 2009, p. 4). Deviating from these WHO standard definitions affects stillbirth epidemiology, for instance, a hospital in East London, South Africa “uses the stillbirth definition ≥500 g (weight only, no gestational age or length) for registration, and the stillbirth rate ≥ 1000 g is 23/1000” (Frøen et al., 2009, p. 15). This means that there will be discrepancies in stillbirth records if, for any reason, weight is not available, as gestational period and length are inconsequential, in this instance. In the USA alone, individual states determine reporting requirements and nine different definitions are in place, with similar inconsistencies in Europe (Frøen et al., 2009, p. 4).

An adjustment of demography and health surveys to include the registration of stillbirths and verbal autopsy tools, revised to improve the inclusion of causes and events related to stillbirths, can go a long way in ensuring the accuracy of counts (Frøen et al., 2009). Global adherence to WHO standards and definitions for reporting stillbirths could capture stillbirths of lower weight and gestation that alternate reporting limits would have missed; failure to adhere to WHO standards interferes with stillbirth epidemiology (Frøen et al., 2009, p.14). Registering pregnancies prior to the perinatal period could ameliorate stillbirth registration issues and provide antenatal care and support, which in turn, could minimize stillbirth risks (Frøen et al., 2009, p. 14).

Research on stillbirth issues weighs heavily on constantly monitoring cause of death in stillbirths, more accurate detection methods for the most common causes, e.g., infections and placental pathologies ; and, additional weight is placed on establishing a universal stillbirth classification method “as several known causes of preventable stillbirths cannot be remedied without data” (Frøen et al., 2009, p. 14).

Other suggested criteria for collecting and reporting stillbirth data include: adhering to a standard of definitions between institutions; a well-structured method of monitoring pregnancies and capturing out-of- hospital stillbirths; capacity-building and skills training in examinations and testing procedures necessary for identifying cause of death; easily accessible electronic files for registering stillbirths; training in stillbirth registration and classification; dedicated and motivated staff for registrations; staff feedback and incentive programs that will motivate workers and help keep program alive; local adaptation to cultural sensitivities to maintain a sustainable system for registering and reporting stillbirths; effective indicators developed for and adaptable to local needs; and regional or national methods of data collection and analysis (Frøen et al., 2009).Stillbirth intervention efforts require all neonatal deaths to be accurately registered; a record of the characteristics associated with the affected pregnancies; an accurate time of death record; a listing of the underlying causes; and an account of the quality and availability of care per individual -- “stillbirths need to count” (Frøen et al., 2009, p. 14).

Global Policy Agendas and Public Expenditure

The Millennium Development Goals and the growth in the number of child deaths between 2000 and 2008 have redirected worldwide policy agenda towards neonatal deaths (Lawn et al., 2011). A study on the factors contributing to low visibility and political priority for stillbirths found that data on and solutions for stillbirths need organization and a level of communication that will allow the issue to receive the necessary amount of attention (Lawn et al., 2011). “Investment in stillbirth research, even in high-income countries, is low compared with the burden of stillbirths and is almost entirely absent in low-income countries, even in studies that examine maternal or neonatal outcomes” (Lawn et al., 2011, p. 14). Lawn et al. conclude that understanding the influence of epidemiology of stillbirths will help prioritize interventions that will benefit maternal and neonatal health and prevent stillbirths (Lawn et al., 2011, p. 14). As a result of the wide-ranging variations in current data tracking and measurement systems, current stillbirth measures are inadequate -- a global standard in gathering stillbirth estimates would help guide “programmatic priorities” that can lead to improvement in the quality of care and thus contribute to successful live births (Lawn et al., 2011, p. 14).

If public spending on health, and more particularly, primary health care is effective, it should promote greater health care in the sense that greater access to primary health care services should be associated with lower aggregate mortality at the national level; additionally, at the local level (village, household, individual) greater access to primary health care facilities ought to reduce mortality rates (Filmer, Hammer & Pritchett, 1998).

None of these standards are evident in development data, partly because most program evaluations do not have the required expertise to evaluate methodologies being applied to primary health care, but also because, the empirical evaluation of the term “health status,” is hard to measure; the World Health Organization (WHO) classifies health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity (WHO, 1988)” (Filmer, Hammer & Pritchett, 1998, p. 6). This definition is innately hard to maneuver because mortality can be measured with ease, but morbidity is more difficult to assess; as a result, empirical studies concentrate on infant or child mortality, and use the data as health status proxies, and for comparisons, aggregate (district, province, and country) mortality or life expectancy figures are used (Filmer, Hammer & Pritchett, 1998).

Filmer, Hammer & Pritchett (1998) report on cross-national health research, which found that: Socioeconomic characteristics can be used to explain almost all variations in mortality rates across countries using six variables: “average GDP per capita; a measure of the distribution of income; the level of female education; a dummy variable for Muslim countries; an index of ethnolinguistic diversity; and a set of five dummy variables for regions” (p. 6).

Total public spending on health has less impact than expected on average health status.
There are some exceptions to these two findings. For instance, average income affects health status only to the extent that it affects the level of poverty, which suggests that increasing the income of the poor is the most effective variable in improving health (Filmer, Hammer & Pritchett, 1998). Anand and Ravallion (1993) explain that average income affects health status, but only to the extent that it affects the level of poverty; they emphasize increasing the income of the poor is the most effective method of improving their health status. According to the World Bank, only 80% of the variation in mortality figures can be “explained” by GDP per capita alone – the inclusion of other variables raises this percentage to 95 (as cited in Filmer, Hammer & Pritchett, 1998).

Also, according to Preston, an important study conducted between 1940 and 1970 found that socioeconomic variables have low explanatory power; however other studies have been unanimous is explaining that socioeconomic basics, such as, average income and female education, have high explanatory power (as cited in Filmer, Hammer & Pritchett, 1998). A different study by Filmer and Pritchett (1999) found that public spending on health as a portion of GDP is minute and statistically insignificant in explaining child mortality rates.

Some estimates show that increasing public expenditure by a factor of 2, from 3% to 6% of GDP improved mortality rates by about 9-13%; similarly, Bidani and Ravallion (1997) show that public expenditures have a significant impact on the health status of the underserved, but suggest that the overall effect of public expenditure on the aggregate health status (poor and non-poor together) is minimal (as cited in Filmer, Hammer & Pritchett, 1998). Cross-national evidence remains ambivalent as to whether or not health status is improved through greater commitment or increased spending on primary health care (or both) (p. 7).

Governments in underserved nations can find practical ways to decrease high mortality rates from preventable diseases. Large-scale partial reforms, like many structural adjustments plans proposed by the International Monetary Fund (IMF), have failed on an equally large scale because many countries are not able to implement all the policy changes that should accompany a single policy push at once (Sachs, 2005). In this scenario, for a developing country, fast-paced, large-scale projects can cause account deficits to become so large as to seriously jeopardize the implementation of, not only current investment programs, but future plans as well (Easterly, 2003).

A large-scale health reform agenda could meet a similar fate. “Small moves can accumulate into bigger benefits” (Easterly, 2006, p15). Gradualism and incremental reform is slowly replacing “Big Push” economics based on the failures and lessons-learned from structural adjustment programs (SAPs) that provided large amounts of foreign aid money to poor countries; in wealthy countries, partial reforms have been a winning strategy and the source of progress over time (Easterly, 2006). Economists studying rich economies report processes of marginal improvements vs. big reforms (Easterly, 2006). Influential developmental economist, Jeffery Sachs, takes a contrary view to the idea of gradualism, believing instead in “Big Push” economics. “Africa’s problems … are … solvable with practical and proven technologies.” (Sachs, 2005, p. 208).

Sachs contends large-scale capital investments of foreign aid can take capital stock beyond the threshold to a level where: “if the foreign assistance is substantial enough, and lasts long enough, the capital stock rises sufficiently to lift households above subsistence” (2005, p. 246). Sachs applies this point of view to other specific areas where under-investment has caused critical issues, for example health care, supporting the notion that interventions should be applied simultaneously as they “strongly reinforce one another” and “success in any single area, whether in health, or education, or farm productivity, depends on investments across the board” (p. 208, 256). Although the debate on structural investment methods remains unsettled, consensus exists on the need to invest in health care as a means of facilitating interventions to aid in reducing stillbirth and neonatal mortality.

A careful re-evaluation of market failure culprits provides an alternate method of addressing health policy because market failure will have a direct influence on the amount of benefits and services a country’s government is able to provide the poor. In order to improve the quality of state-funded health care, citizen-imposed pressure is needed and may involve a push for: 1) public health activities stressing the need to control infectious diseases, mainly through environmental changes; 2) public health programs that include demand-side mechanisms that ameliorate regular clinical services; 3) policymakers to reevaluate the function of hospital services as a direct method for government to rectify insurance markets inefficiencies (Filmer, Hammer & Pritchett, 1998, p. 20). Public health care must find a strategic balance with private health care to eliminate bottlenecks and gain effective control over preventable stillbirths.

Maternal, newborn, and child health ranks high on the MDG agenda, and owing to the high-level of political and financial stakeholders these health issues have attracted, official development assistance (ODA) towards interventions is projected to continue beyond the 2015 MDG deadline (Hsu, Pitt, Greco, Berman, & Mills, 2012).

Financial challenges in donor home countries have reduced implementation expenditure, as donors find it increasingly difficult to offer additional funding to support health, in general; and, maternal, newborn, and child health, in particular (Hsu, Pitt, Greco, Berman, & Mills, 2012, p. 1). In 2009, it was estimated that an additional annual contribution level of approximately $10 billion would yield the expected MDG maternal and child health goals in 49 low-income countries; however, other estimates project a much a higher funding cost of about $33.9 billion a year (Hsu, Pitt, Greco, Berman, & Mills, 2012, p. 1). As aid commitments and disbursements flow towards maternal, newborn, and child health programs in developing countries, transparency and mutual donor-recipient donor accountability will determine the success of interventions (Hsu, Pitt, Greco, Berman, & Mills, 2012, p. 1). Also necessary is the need to target countries that have the greatest ODA need as reports show that "donors collectively improved targeting of their aid to countries with the highest rates of maternal mortality from 2005 to 2010, however, the trend in targeting of aid to child mortality was less clear" (Hsu, Pitt, Greco, Berman, & Mills, 2012, p. 10).

Conclusion

This paper sought to assess whether inequalities in life are present at the time of death by comparing stillbirth and neonatal mortality rates in developing nations with similar figures in developed countries. Cross-country comparisons present a challenge as there is currently no standardized international method for comparisons; neither is there a standardized international method of stillbirth and neonatal mortality classification and definition. Verbal autopsies worldwide highlight a similar challenge.

With these challenges in the background of the global stage, the more sophisticated health care systems in developed countries base their data on “differentials in odds or rates of death (including differentials over time), the immediate determinants of death (age and medical cause), and their more distant proximate or background determinants that can include a wide range of possible demographic, social, technological, behavioral, biological, genetic and other factors throughout life and even prenatal” (Eberstein, 2009, p. 1), gathered with the help of advanced medical equipment that allow for the analyses of placenta histology, CT scans, radiographical skeletal survey (Cousens, Lawn, Blencowe, Chou, & Say, 2011). In developing countries, where medical technology is lagging, verbal autopsies are the next best thing.

Placenta examination, another possible alternative in developing countries, poses its own set of challenges because of limited resources, lack of training, inadequate protection against contaminated blood, and little understanding of its clinical significance (Frøen et al., 2009, p. 8).

Additionally, cultural beliefs often prohibit placenta examinations, for example, in China, Pacific Islands and some West African regions, the placenta represents high symbolic and spiritual significance, and it is either eaten or buried in specified locations (Frøen et al., 2009, p. 8). Eberstein (2009) proposes that "inequality in death is a reflection of inequality in life" and that at the core of these inequalities lay fundamental social differences. Said differently, social forces are at the root of the "fundamental causes" of differential mortality, in spite of the biological variations that exist between groups (Eberstein, 2009). Eberstein does not contend that social processes are multi-factorial and work in tandem with biological, epidemiological, demographic, technological, behavioral, environmental and other factors.

The poor and underserved bear the brunt of the global burden of child mortality, morbidity, and undernutrition because of either unequal or inadequate coverage of key maternal and child health and nutrition interventions (Carrera et al., 2012). In the United States, trends in child death rates show differences based on cause of death, age, and race, with the sizable mortality rate gap between black and non-black children narrowing only in the last two decades of the twentieth century (Currie & Hotz, 2003). There are identifiable relationships between maternal and neonatal mortality and overall health-system indicators (Lawn et al., 2011). There is research consensus that stillbirths and neonatal mortality must remain at the forefront of all pertinent international health reports, and maternal and neonatal health initiatives (Lawn & Kinney, 2011) in order to bring heightened visibility to the plight of mothers and newborns in underserved regions.

The wide range of variations in current data, monitoring systems, calibration methods, and current stillbirth measures lead to intervention inconsistencies and are inadequate in terms of health care policy planning -- a global standard in gathering stillbirth estimates would help guide "programmatic priorities" that can lead to improvement in the quality of care and thus contribute to successful live births (Lawn et al., p. 14). Understanding the influence of epidemiology of stillbirths will help prioritize interventions that will benefit maternal and neonatal health and prevent stillbirths (Lawn et al., p. 14). In other words, a coherent international definition and classification system will provide a foundation for cause of death audits that inform and enable more streamlined interventions. Bridging the current health care knowledge gap in low income countries through policy intervention and continued official developmental assistance, will contribute significant gains to interventions.

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