OXFORD GLOBAL CHALLENGE

Saving Mothers

Poor Maternal Health Amongst Impoverished Communities in Rural South Africa

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WORD COUNT: 1985

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List of Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
KZN	KwaZulu-Natal
MMR	Maternal Mortality Rate
MPI	Multidimensional Poverty Index
NGO	Non-Governmental Organisation
STI	Sexually transmitted infections
UMIC	Upper middle income country
ZA	South Africa

Introduction

Health[1] is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" [2]. Maternal health is well-being during pregnancy, childbirth and postpartum[2] [3]. The global maternal mortality rate (MMR)[3], a proxy indicator for maternal health, has improved by 44% since 1990 [4]. Despite this achievement, it fell short of the Millennium Development Goal of 75% reduction[4].

The developing world bears a disproportionate 99% of the 830 daily global maternal deaths [4]. In 2015, South Africa's (ZA) MMR is 138 deaths per 100 000 live births, far above the average for upper middle income countries (UMIC) of 54 [5]. ZA is a unique case study, with issues of a developing and developed world resulting in the quadruple burden of disease: poor maternal and child health, HIV/AIDS and tuberculosis, injury and an increasing burden of non-communicable diseases [6]. ZA's distinctiveness is exemplified by a comparison of average life expectancy to GDP (Fig. 1) – ZA is a clear outlier with a significant "health lag" of unexpectedly poor health outcomes for its GDP.

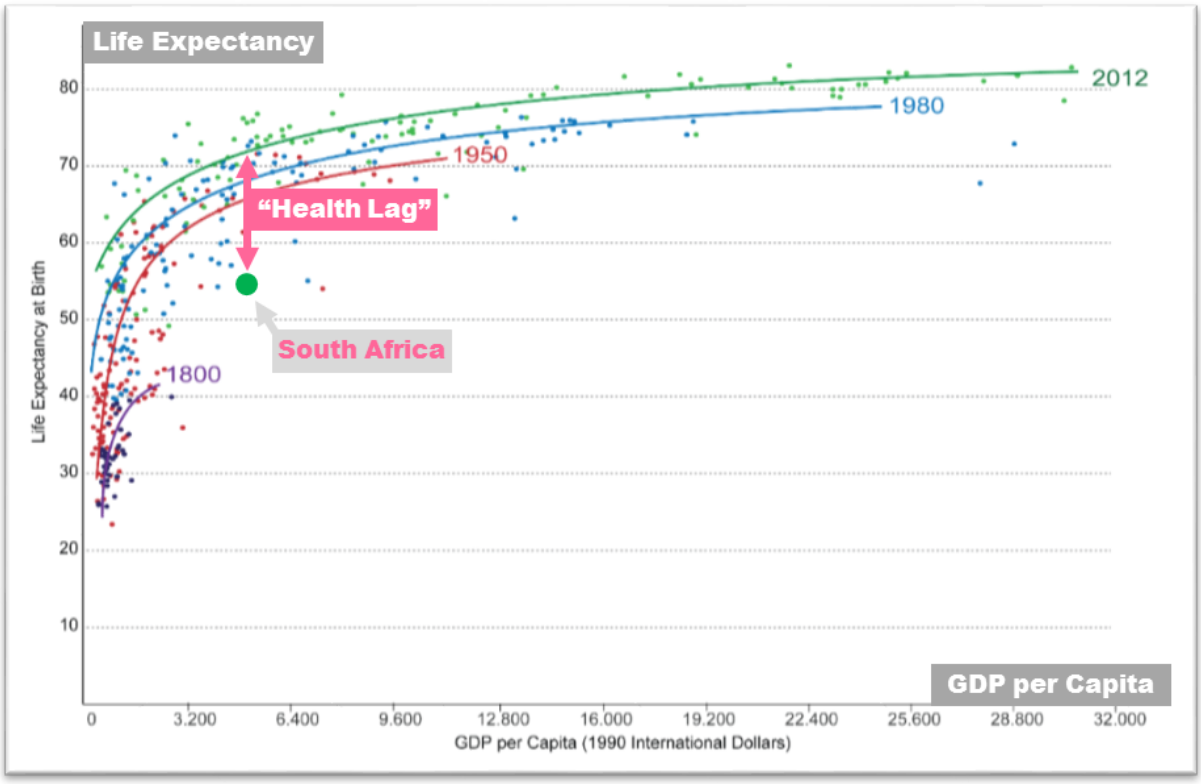


Figure 1. Preston Curve Illustrating Life Expectancy vs GDP per Capita from 1800 to 2012 [28]

Within ZA, there are stark contrasts between rural and urban populations. 72% of all impoverished people live in rural areas [7], and KwaZulu-Natal (KZN) has a quarter of ZA's poverty[5]. It also has the greatest burden of HIV in the world, with prevalence up to 41% in the Umkhanyakude district [8], and the highest MMR of the nine ZA provinces [9].

[1] As defined by the World Health Organisation
[2] Postpartum refers to the period immediately after delivery of the baby; the initial phase being the first 24 hours, but then extending to a total 42 days after the birth or termination of pregnancy
[3] MMR is the number of maternal deaths (during pregnancy, birth and postpartum) per 100, 000 live births per year.
[4] The MDGs were 8 goals to reach by 2015, compiled by the United Nations and accepted by all 189 member states in 2000. MDG 5 was to improve maternal health, with the goal of reducing MMR by 75% from 1990 levels [27].
[5] In terms of population living below the upper bound poverty line.

Apartheid's legacy meant many rural communities were neglected, from a lack of infrastructure to education and development of local economies. This neglect propagated the poverty cycle. Now with the KZN Department of Health in financial crisis, staffing posts in moratorium and facilities under-resourced, the public healthcare system is under severe strain [10] [11].

Poverty encompasses many human factors, and brandishing it as an umbrella problem loses the nuances of impoverishment. Not all poor people are equally poor nor are they all poor in the same ways. The Multidimensional Poverty Index (MPI) [12] illustrates experienced poverty by assessing deprivation in education, living standards and health indicators (see appendix), giving a more holistic view of what makes people poor. The MPI metric is calculated by multiplying the number of people who meet the definition of poverty (deprived in 30% of indicators or more) by the average intensity of the deprivation [12].

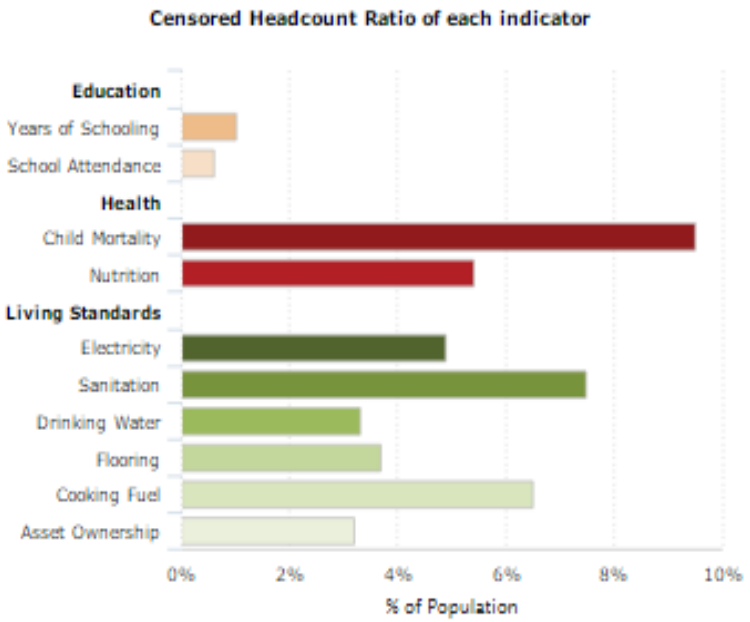
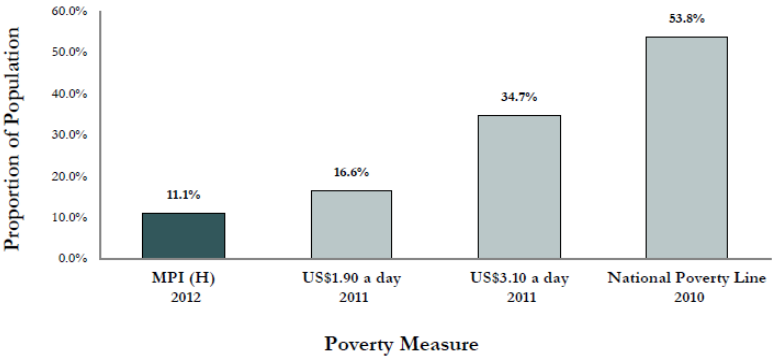


Figure 2. Censored Headcount Ratio of each indicator contributing to the MPI for South Africa [12].



Multidimensional Poverty Index	0.044
Percentage of MPI Poor (H)	11.1%
Average Intensity Across the Poor (A)	39.5%
Percentage of Income Poor ($1.90 a day)‡	16.6%
Percentage of Income Poor ($3.10 a day)‡	34.7%
Percentage of Poor (National Poverty Line)‡	53.8%
Income Inequality (Gini index)‡	0.634

‡ The World Bank (2016). "The World DataBank". Washington, DC. [available at http://databank.worldbank.org/data/home.aspx, accessed 24 Apr 2016]

Figure 3. Comparison of Poverty Measures for South Africa. Indicates SA is less impoverished than expected from monetary measures alone – further highlighting the effect poor health has on poverty through the MPI. **[12]**. *National Poverty Line is R354 per month, or $2.34 a day* **[25]**

Assessing the MPI provides three insights. Firstly, fewer people experience poverty as defined by deprivation in tangible aspects of their lives than those living below the income-defined poverty line, suggesting that poor South Africans have more resources to live well than is supported by income.

However, assessing Indonesia's maternal health (another UMIC with a similar proportion of people living under the $1.90 income level and a similar MPI[6]), the MMR is 126 deaths per 100 000 births[7] [5]. Despite

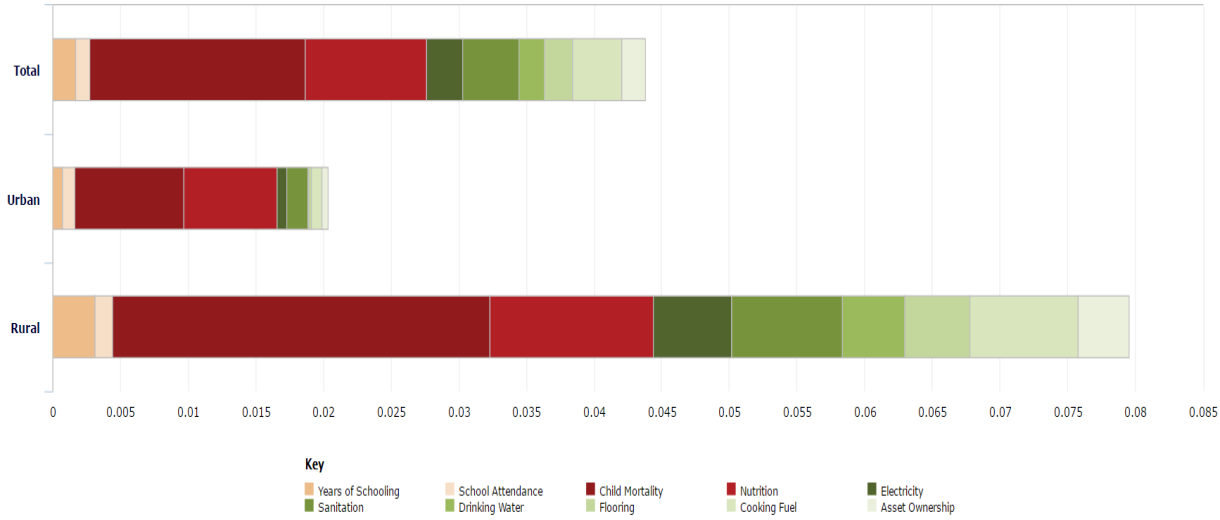


Figure 4. Contribution of Indicators to Poverty in MPI in Urban vs. Rural Areas of SA. Illustrates disproportionate effect of health on poverty status, and marked impact in rural regions **[12]**

comparable resources, maternal outcomes in ZA are worse than some similar developing countries,[8] [5]. Thus, secondly, resources do not automatically translate into good health outcomes.

Thirdly, in ZA, the greatest contributor to multidimensional poverty is poor health (Fig. 4). Rural areas have a greater proportion of impoverished people, and a higher absolute level of poor health as measured by the MPI. Health is both a contributor to poverty and a consequence [13], making health in rural areas an important dimension to analyse to understand the challenges facing rural populations.

Given the unique "health lag", the disproportionate role that health plays in poverty, and the revitalised focus on maternal health following the release of the Sustainable Development Goals[9], we chose to map the landscape surrounding maternal health in impoverished communities in rural regions of ZA. We combined extensive research, desktop analysis, and

Interviewees

V. Shaw – CEO HISP-SA, ZA
L. de Gouveia – Doctor at Manguzi Hospital, KZN
P. Ellingstad – Former Director of Health in HP's Social Innovation team
O. Mazibuko – Operations Manager at the Transnet Foundation Health Portfolio and former manager of the Phelophepa Train, ZA
M. Loate – Nurse involved in ARV Rollouts in ZA
N. Fonso Amiodou – Founder of a rural hospital in Cameroon
A. Abu Bakr – Co-founder of Jeeon Bangladesh
N. Fine – Doctor in rural Eastern Cape, ZA
S. Naicker – Obstetrician in KZN
K. le Roux – NGO Philani Mentor Mother Programme, ZA

[6] The proportion of Indonesians living below the $1.90 income level is 16.2%, compared to ZA's 16.6%. the MPI is 15.47% of people are multidimensionally poor compared to ZA's 11.1% [24].
[7] Compared to ZA's 138 maternal deaths per 100 000 births. The Indonesian MMR was reduced from 446 deaths per 100 000 births in 1990, as opposed to ZA which actually increased from 108 deaths per 100 000 births in 1990 [5].
[8] From 108 deaths/100 000 live births in 1990 to 138 deaths/100 000 live births
[9] After the success that the Millennium Development Goals brought in reducing poverty and improving health in many countries up to 2015, the Sustainable Development Goals are the next set of goals compiled by the United Nations, and adopted worldwide in 2015. The targets are to end poverty, protect the planet and ensure prosperity for all by 2030. The 3rd goal is ensuring healthy lives and promoting well-being for all ages. The goal is to reduce the global MMR to less than 70 per 100 000 live births by 2030 [26].

numerous interviews with first-hand experience of the authors, two of whom are doctors from South Africa with experience in maternal health in KZN.

Context – Who Are These Women?

Men often work in urban areas, leaving more than half of rural households headed by women [14] surviving on an average of R250 a month[10] [15]. These women are responsible for the family welfare with minimal resources at their disposal, while also relying on their absent partners for financial security (remittances from urban family make up 48.8% of women's income [16]).

> "When I think deeply I feel scared and then become depressed—I think about the issue that I am still young but faced with challenges of heading the household now my father has died, there is no one but me (S)" [14]

These women are vulnerable across multiple fronts. 45% of women have no formal education [14] and more women than men are unemployed [1]. Patriarchal communities produce gender inequities that restrict women's freedoms [14]. Additionally, gender based violence is highly prevalent, influencing women's decision making capacity and directly affecting their health through physical harm. Their inability to negotiate means women are vulnerable to their partner's discretion in using intercourse protection, increasing risk for STIs [14]. In fact, these women have up to 13% higher HIV rates [1].

> "I told them [nurses] that my husband is sometimes OK with the condom and sometimes he does not like to use condoms and I could not stop falling pregnant."
>
> *A mother of four, speaking to Amnesty International in KwaZulu-Natal* [1]

However, examining vulnerability involves assessing women's capabilities; many of these women have strong community support structures, which buffer stress through coping mechanisms.

When problems arise, communities mobilise pooled resources and provide mutual assistance [14]. Advice from other women and the church helps reframe negative situations to enable acceptance: women reported relying on the faith and hope from religion to enable them to better cope with the constant threats to their security [14].

Lack of formal employment means women are often assumed to be economically inactive. However, rural women generate income informally through selling fruit, or social welfare grants [14]. These women have resilience and some measure of agency.

Problem Landscape

Women are vulnerable to medical, psychological, financial and social harms throughout their lifetime, specific to the phase of life wherein they are [17]: from adolescence, through pregnancy, birth and the postpartum period (figure 5). In addition, teenagers and women over 35 are at risk of age-particular complications. By examining risk profiles in this way we can ensure thoroughness

PMNCH (2011). Adapted from WHO (2005) - Make every mother and child count.

Figure 5. Life Continuum **[17]** *– A way to categorise challenges to Maternal Health*

[10] Equivalent of £15 or $18.

in assessing all vulnerabilities as well as identifying the gaps in what women require to be healthy. (See appendix and infographic)

Solution Landscape

We analysed the potential solutions by dividing them into those that affected maternal health and those that impacted on female reproductive and general health, and further into those present in our context and those elsewhere in the world. By doing this we could identify solutions for maternal health currently available(A), ideas used elsewhere that could be replicated in our setting(B and D), and the infrastructure in our location that could be leveraged to implement these ideas(C) (see infographic).

Solutions In **To**	**Our Context**	**Elsewhere or Globally**
Maternal Health	*A: "Solutions to improving maternal health in South Africa"*	*B: "Solutions to improving maternal health globally"*
Female Reproductive & General Health	*C: "Solutions to improving health in South Africa"*	*D: "Solutions to improving health globally"*

In assessing *A*, we found that there was fragmentation between the different service providers, including NGOs[11], government sectors, private facilities, traditional medicine practices and community projects. This leads to duplication of efforts, contradictory messages and some problems being missed altogether.

"I*n translating these interventions to our context, we must be aware so that interventions are culturally and geographically appropriate"* [18] – a consideration exemplified by a KZN contraception campaign. Contraceptive subdermal implants were inserted, but thousands of women shortly returned to have them removed. While the women were appreciative of the convenient contraceptive, their partners were not. A foreign body conflicts with Zulu culture, and men demanded the removal of the implants [19].

Key Insights & Gaps Identified

Women in rural KZN have poor health outcomes. However, the MPI suggests that their deprivation is less than proposed by income-defined poverty levels. The interviews we conducted illustrated that clinics are present in the area (usually within 5km of a woman's home), staff are motivated to provide good services, antenatal services are available and contraception is offered in clinics. One study in a neighbouring district of KZN found that women preferred to deliver in hospital [20] (in contrast to many regions of the developing world [18]) and interviews suggested that births outside the clinics were not due to lack of facilities but rather to some barrier to reaching the hospital in time.

Our initial perception of their needs was that while facilities were not ideal, many required resources were actually available and comparable to settings with similar levels of poverty[12]. Why then do these women have poorer health outcomes? In attempting to understand what caused this

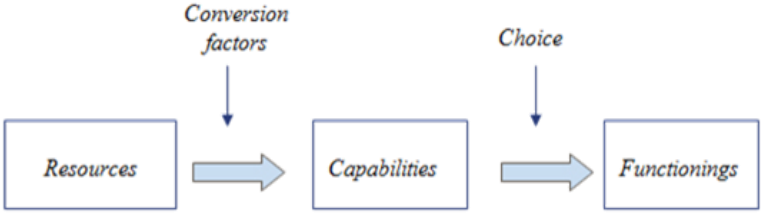


Figure 6. Sen's Capability Approach **[29]**

[11] Non-Governmental Organisations
[12] Defined by income and MPI

discrepancy, we applied Sen's Capability Approach[13]. To build conducive options for good health the provided resources need to be converted to usable options[14] [21]. Amnesty International found "gender, economic and social inequalities [are] barriers to health care" in rural HIV positive women in ZA [1, p. 11] and that lack of reliable and safe transportation and the prohibitive cost of acquiring transport were significant barriers in accessing antenatal care [1].

Health outcomes and behaviours depend on the capability sets available to an individual, but also on the choice that is made between the options[15] [22]. For example through interviews we found that in an emergency, communities pool resources to ensure a woman reaches the hospital but do not attend antenatal care [19]. Without urgent need, spending limited finances on transport to clinic instead of food or other necessities is not justified, as antenatal visits are undervalued and do not outweigh the associated opportunity costs. The poor perception of value is influenced by low education levels or lack of information [20]. The paradox is that the information required is only available at the clinics [1].

> "It is very important that preconceptions about what the poor do, what their livelihood strategies are, should be put aside. It has been common in the past to make untested assumptions about the poor, and as a consequence, to misdirect support" [13]

Stigma associated with teenage pregnancies or unmarried pregnant women has also been found to prevent health care attendance [1]. The numerous barriers prevent conversion of the available facilities into genuine opportunities to improve health.

Most health initiatives focus solely on eliminating illness; neglecting the holistic merits of the biopsychosocial approach and the influence that context and individual factors have in what health outcomes are achieved. Examining health in this systematic way reveals a recurrent trend – a complex lack of access, with multifaceted causality including physical barriers, social barriers and educational or information barriers, a concept we define as *multidimensional access*.

Way Forward

> "Be careful in creating too much demand, without ensuring there is enough supply to meet it" [31]

In order to improve the system, we propose bridging the gap in two ways. Firstly, by bringing patients to the available healthcare by improving agency to utilise the services, increasing awareness and knowledge, improving socioeconomic circumstances and empowerment. This increased demand on services must be balanced by reducing fragmentation and increasing health system capacity, connecting the stakeholders and providers, strengthening the existing systems and introducing new solutions.

To apply effective solutions, the barriers preventing women from accessing provided resources must be addressed. Having identified the concept of *multidimensional access* as this barrier, the next step would be to generate a hypothesis for why these women cannot convert the inputs provided by the countless stakeholders into

[13] Amartya Sen's Capability Approach evaluates the relationships between portions of a system. It frames the way that inputs enter this system, what affects their conversion into capabilities, and how individual choice converts these potential capabilities into achieved outcomes [21]. Individuals may also have poor outcomes based on their choices and not on lack of options [30]

[14] Conversion is through education, information, agency to make decisions, social support, psychological wellbeing and factors like transport availability [21].

[15] Choice depends on personal preferences, priorities, value of outcomes, social norms, religion, gender relationships and the opportunity costs of different options [21].

better health outcomes. There is a paucity of research on this topic, the most comprehensive that we found being from a human rights perspective rather than with a view to provide tangible solutions for health [1], and we propose further investigation.

Generating a hypothesis requires qualitative research, through interviews, focus groups and on-the-ground experiences, ideally sampling the women that are at the heart of the decision around the use of facilities and resources. Maximal variation in factors that may influence these decisions, such as age, income and number of children, would help generate broad themes on perceptions of health care and what is valued, identify the barriers (from the women's perspective) in converting inputs to options and what is needed to overcome these barriers. Interviews could also explore what factors are weighed in considering options and what influences choices.

Individuals who influence women in this process could also be interviewed, such as their partners, parents and community or religious leaders. From this we could generate themes of what conversion factors are lacking, what factors affect their personal choices and what interventions could assist women to achieve better health.

Investigating the problem at the grassroots level, from the women who experience the issues themselves, is a task that needs to be expanded broadly. Only in so doing, and thus by truly understanding the barriers preventing the current solutions from working effectively, will we be able to implement interventions that will aid us in *saving mothers* in South Africa and around the world.

> **"A Nation thrives when mothers survive; we must strive to keep them alive"**
>
> ELLEN JOHNSON SIRLEAF [9, p. i]

Appendix

Challenges Facing Rural Women

Life Cycle Continuum – VULNERABLE TO			
Adolescence & Before Pregnancy	**Pregnancy**	**Birth**	**Motherhood & Infant Care**
Poor health	Poor health including anaemia, which increases the risk of death	Inability to access the hospital once labour begins - Poor road quality - Lack of transport - Lack of finances	Postpartum depression - Risk of suicide - Decreased bonding with infant
Gender inequality	Inability to attend Ante-Natal Care visits	Obstetric causes of death - Haemorrhage - Hypertension - Sepsis - Anaesthetic causes - Acute collapse - Embolism	Increased demands on time and finances looking after children
Poverty	HIV – acquisition and worsening of existing disease		Gender based violence
Poor social support	Miscarriage mortality higher in KZN than national average		
HIV/AIDS and other STIs	Ectopic pregnancy		
Gender-based violence	Illegal termination of pregnancy and the complications		
	Non-pregnancy related infections (e.g. STIs, pneumonia, TB). KZN has a higher rate of infections in pregnant women than the rest of the country		
Special groups: Teenagers			
Teenage pregnancy	Stigma	Increased obstetrical complications	Higher risk for death and illness of her child
	School drop out	Higher risk for anaesthetic complications	
Special groups: Advanced Maternal Age			
Poor baseline health	Higher risk of gestational diabetes and hypertension	Higher risk of breech and complicated deliveries	Higher risk of low birthweight babies, multiple births and syndromic abnormalities such as Down's Syndrome – these children have higher needs for care

MPI Indices

Table 1: The dimensions, indicators, deprivation thresholds and weights of the MPI[2]

Dimension	Indicator	Deprived if...	Relative Weight
Education	Years of Schooling	No household member has completed five years of schooling.	1/6
	Child School Attendance	Any school-aged child is not attending school up to the age at which they would complete class 8.	1/6
Health	Child Mortality	Any child has died in the household.	1/6
	Nutrition	Any adult or child for whom there is nutritional information is malnourished.	1/6
Living Standard	Electricity	The household has no electricity.	1/18
	Improved Sanitation	The household's sanitation facility is not improved (according to MDG guidelines), or it is improved but shared with other households.	1/18
	Safe Drinking Water	The household does not have access to safe drinking water (according to MDG guidelines) or safe drinking water is more than a 30-minute walk from home, roundtrip.	1/18
	Flooring	The household has a dirt, sand or dung floor.	1/18
	Cooking Fuel	The household cooks with dung, wood or charcoal.	1/18
	Assets	The household does not own more than one radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck.	1/18

[23]

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3. Ellingstad, P. (Former Director of Health in HP's Social Innovation team) Interviewed by Mathew, C. G. (3 February 2017).
4. Le Roux, K (Philani Mentor Mother NGO) Interviewed by Keene, C (2 February 2017)
5. Fine, N. (Doctor in rural Easter Cape, ZA) Interviewed by Keene, C. (3 February 2017).
6. Fonso Amiodou, N. (Founder of rural hospital in Cameroon) Interviewed by Mathew, C. G. (13 February 2017).
7. Loate, M. (Nurse involved in ARV Rollouts in South Africa, based in Germiston Hospital, Johannesburg) Interviewed by Soobedaar, N. (23 February 2017).
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