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Abstract

Background: Little is known about the interconnectedness of maternal deaths and impacts on children, beyond infants, or the mechanisms through which this interconnectedness is established. A study was conducted in rural Tanzania to provide qualitative insight regarding how maternal mortality affects index as well as other living children and to identify shared structural and social factors that foster high levels of maternal mortality and child vulnerabilities.

Methods and Findings: Adult family members of women who died due to maternal causes (N = 45) and key stakeholders (N = 35) participated in in-depth interviews. Twelve focus group discussions were also conducted (N = 83) among community leaders in three rural regions of Tanzania. Findings highlight the widespread impact of a woman’s death on her children’s health, education, and economic status, and, by inference, the roles that women play within their families in rural Tanzanian communities.

Conclusions: The full costs of failing to address preventable maternal mortality include intergenerational impacts on the nutritional status, health, and education of children, as well as the economic capacity of families. When setting priorities in a resource-poor, high maternal mortality country, such as Tanzania, the far-reaching effects that reducing maternal deaths can have on families and communities, as well as women’s own lives, should be considered.

Introduction

Globally, an estimated 287,000 women die each year due to maternal causes [1], despite maternal mortality being an overwhelmingly preventable cause of death [2]. Women in sub-Saharan Africa are disproportionally at risk of maternal death, including those in Tanzania where the estimated maternal mortality ratio (MMR) in 2010 stood at 454 deaths per 100,000 live births [1,3]. A woman dies almost every hour from maternal causes in Tanzania [1]. These figures alone, however, fail to capture the far-reaching repercussions of these maternal deaths on a woman’s family and children.

Maternal death in Tanzania, as elsewhere, is most often the end result of compounded discrimination and deprivations that women face across their lives, which affect their health and human rights more broadly [4]. For instance, low educational attainment for women has been associated with reduced reproductive autonomy regarding family planning utilization and increased parity [3], and has been directly linked to increased risk of maternal mortality as it relates to reduced knowledge of obstetric warning signs [6]. Low status of women within partnerships and extended families is reflected in the lack of women’s decision-making power, including their ability to seek care during pregnancy [7], or to choose a facility-based delivery [8]. Poverty intersects with gender subordination, as the lack of financial means for transport and health care fees has been found to be a key barrier to receiving obstetric care in Tanzania [7–9]. Such economic barriers are exacerbated for women who have limited economic opportunities and control over household financial resources, even when their lives hang in the balance.

Undeniably, the presence of a mother is a critical protective factor for the survival of young children, particularly in terms of breastfeeding or accessing healthcare, even though extended families and communities attempt to support the children of mothers who die in a range of contextually-specific ways [10]. Most maternal deaths, however, occur in communities of desperate poverty, where the precariousness of life conditions for everyone often impedes robust community-level support initiatives.
study will also include quantitative estimates of elevated child mortality and related outcomes and associations with maternal mortality utilizing longitudinal Demographic Surveillance Site (DSS) data in Tanzania and Ethiopia; analyses are currently underway. Three regions in Tanzania (Rufiji, Kilombero, and Uluguru) were selected for inclusion into the study, based on high regional rates of maternal mortality, a diversity of ethnicities and religions, and alignment with DSS coverage for the quantitative component of the parent study. Key stakeholders based at national organizations or orphanages were also interviewed in Dar es Salaam (N = 21). In-depth interviews included guardians of orphaned children and adult family members of women who died due to maternal causes (N = 45), in addition to local stakeholders including community development officials, social workers, community health workers, etc. (N = 14). Twelve sex-stratified focus groups were also conducted among 83 participants, which included local leaders such as teachers and religious advisors. Adult family members were identified and recruited through partnerships with local health facilities, civil society organizations, or through snowball sampling. A Tanzanian research coordinator also worked in partnership with community health workers to confirm that female deaths were due to maternal causes through an examination of medical records. Stakeholder key informants and focus group participants were identified via local community leaders, a desktop review of existing programs, and snowball sampling. Data collection occurred between April 2012 and April 2013.

Semi-structured in-depth interviews were conducted via research staff with English-Kiswahili translation performed by the research coordinator. All in-depth interviews were conducted in a private location of the participant’s choosing and were digitally recorded. Interviews with adult family members included topics within three key areas: (1) general characteristics of the family to provide socioeconomic context; (2) circumstances that led to maternal mortality and the impacts on the children and family; and (3) availability and accessibility of services for maternal orphans. In the case of multiple maternal orphans in a family, the impacts of the mother’s death on each child were discussed for each respective orphan. Focus group topics included general community perceptions of orphans and services available. Participants were also probed about community perceptions of maternal orphans at different ages, including infants and young children, school age children, and adolescents, and how the impacts of a maternal death may manifest differently in boy and girl children. Focus group participants were also asked about how the community provides informal social support, as well as the availability of formal government services for orphans. Stakeholder interviews included topics such as availability of programs for orphans and challenges for implementing such programs and policies, including financial issues and political will for such programs. Each in-depth interview and focus group took between 1.5 and two hours to complete. Family members and focus group participants also received 2,000 Tanzanian Shillings ($6.25 USD) for their participation.

All interviews and focus group discussions were transcribed from the digital recording and translated into English by the transcription coordinator. All digital recordings were erased upon transcription. Utilizing an inductive approach to coding, two research staff then coded the transcripts, discussing and editing themes as they emerged. All analyses were conducted in NVivo 10.
Results

Background Characteristics of Guardians, Key Informants, and the Women Who Died from Maternal Causes

Forty-five key informant interviews were conducted in Rufiji, Kilombero, and Ulanga with guardians of maternal orphans. Twenty-six percent of the interviews were with husbands of the deceased, 24% were with a sister of the deceased, and 20% were with a grandmother of the orphan. Stakeholder interviews were conducted with medical personnel, district health administrators, heads of orphanages, and representatives from non-governmental organizations (N = 14) and with representatives at national organizations in Dar es Salaam (N = 21). Focus group participants were a mix of teachers, religious leaders, community health workers, village chairs, small business owners, and leaders of local women’s groups.

This specific analysis focuses on the effects of a maternal death on orphans, families, and communities in rural Tanzania looking specifically at the far reaching, interconnected consequences of a maternal death on family dissolution, guardianship, socio-economics, health, nutrition, education, and community programming for maternal orphans. Drawing from the key themes of the semi-structured interview guide, we analyzed the qualitative findings looking for disparities among orphans by age and gender, as well as issues relating to access to education and healthcare, and psycho-social outcomes.

Of our study population, most maternal deaths occurred amongst women in formal or informal unions (71%), 18–35 years old, with a standard 7 level of education (US equivalent of completion of primary school) (54%). None of the women who experienced maternal deaths had any secondary education (Table 1).

Implications of a Maternal Death on Maternal Orphans

Health Care. Tanzania’s National Health Policy provides free care for pregnant women and children under five [21] at government run facilities, though in practice it is common for both women and children to face fees when seeking care. Many informants in our sample (27%) mentioned their struggle to pay for indirect costs associated with delivering in a facility, including transportation, fuel, and ambulance costs, and the financial and logistical arrangements of residing near a hospital in the weeks leading up to delivery, as a significant barrier to seeking care. Substantial out-of-pocket payments for child health care also affected the families in our sample; direct health care fees and additional ‘unofficial’ costs associated with medicine, medical treatment, and supplies, particularly for recurring or chronic health conditions, were frequently cited as posing a major obstacle to accessing care. As one stakeholder explained:

‘From 0–7 years, they [orphans] face frequent diseases. Although the government policy says all children under 5 get free health care, that is not the case because the doctor will prescribe medication which the family will have to go and buy. So the burden of hospital costs will fall to the guardian.’

Delays in seeking care for these reasons often exacerbate health conditions and place children, especially orphaned children who may not be given priority within the family, at increased risk of serious morbidity and mortality [13].

Nutrition. The majority of maternal orphans are not breastfed; in our sample only 14.6% (6 infants) were ever breastfed and 4.9% (2 infants) were breastfed for longer than one month. As was mentioned in focus group discussions in each of the three districts, the cost of formula is too high for nearly all families, further straining household budgets. As a result, maternal orphans are given cow’s milk instead, which often causes gastric distress. As depending on how children are prioritized within the home, orphaned children may be at higher risk of under nutrition and increased limitation in terms of food quantity and quality. Under nutrition in infancy is especially critical, as it can result in stunting [22].

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While nutrition is essential for health, it is also important for educational performance. Mothers’ roles in rural Tanzania include ensuring that meals are prepared for their children, and, in their absence, guardians and teachers who participated in our
focus groups explained that orphaned children will often return home from school during lunch break to find no food. If they return to school without having eaten, teachers report a noticeable decrease in concentration and attention span. As one female focus group participant explained,

‘Children who have lost mothers, their level of education is low. For instance, in the afternoon children usually go home for lunch...if there is no mother to cook and give children food, they will come back to school hungry and will not be able to concentrate...’

Education. A common theme in our research findings was the important role mothers have in prioritizing and supervising education within the family. As stated by one father,

‘Whenever their mother was around she would make sure that [the] kids stay in the house when they are home from school. She would help them with school work and so forth. Right now when they come back from school, they just go wander around [the neighborhood]. And I think the school progress of my first-born girl has gone down because my wife is not around to help her with school homework.’

Decreased concentration and lower educational performance following a mother’s death and the need for supervision and assistance in order to complete homework and other school-related tasks were mentioned by focus group participants in each of the three districts in our study as a consistent struggle for guardians of orphaned children. In addition, focus group participants from each district cited the financial burden of paying for school fees, contributions, and supplies as a significant challenge, which in some cases results in delays in the timing and completion of school for orphaned children.

Exacerbated risks for girl orphans. The underlying power structures and gender inequalities that drive high maternal mortality are also reflected in the differential impacts on the children who are left behind after a maternal death [23]. At the household level, girl children are often responsible for caring for younger children and are pressured to complete household chores, which often results in significant interruptions in schooling and early school drop-outs [24]. For instance, one stakeholder explained,

‘For girls when they reach an age where they are able to work it really affect[s] them in their performance at school because most of the time they will be doing home activities – washing dishes, cooking for their siblings etc. So a girl child becomes like a mother.’

Early marriage was a common theme in our study sample for both boy and girl orphans. Early school drop-out and an increase in educational attainment, and fewer economic opportunities for girls may result in increased engagement in high-risk sexual behaviors, particularly transactional sex, in order to meet basic needs [25]. As one stakeholder stated,

‘In most cases when a girl gets pregnant she is all by herself and sometimes she doesn’t know who the father is, so she thinks that in order to keep [and care for] this child, a solution is to go out with another man. In the end, she will become pregnant again. Eventually, she finds that she has 6 children who belong to different fathers and no one [father] is responsible for them...so one problem multiplies into another.’

Implications of a Maternal Death on the Family

Family dissolution. After a maternal death in Tanzania, it is customary for families to hold a meeting with extended family members, where critical decisions are made about the care, placement, and guardianship of orphaned children. Depending on the age of the orphan, the biological father, and the number of children in the family, it is common for siblings to be separated and placed in different homes, most often under the care of a maternal aunt or female elder. Thus, children who are grieving the loss of their mother are often immediately forced to transition away from their home, their father, and their siblings. The resulting level of care that the orphan receives is relatively arbitrary and dependent upon the level of involvement from the new guardian, as well as the family’s resources.

The role of the father and guardian. While some fathers do continue to care for their biological children, our data indicated that fathers rarely care for non-biological children of the deceased who share the same household. As was explained in a focus group discussion, after a maternal death, if a woman has children with multiple partners,

‘…usually each father will come and take their [own] children and look after them because this [male] partner who is left behind, will be like a step father to these [other] children and he is not willing to take care of another man’s child after his wife has passed on.’

Moreover, in rural Tanzania, it is not common for fathers to offer sustained financial support for their children when they are not one of the primary caretakers. Stakeholders asserted that the erosion of collective social support systems, as was emphasized in Tanzania under Julius Nyerere’s ‘Ujamaa’ immediately after the country achieved independence [26], has left fathers disinclined to assume individual responsibility for the care and support of their children, especially infants.

As is supported in the literature, when a father does continue to care for his children, our findings suggest it is likely that he will remarry [27] in order to have help in the home. Additionally, our findings indicate that though some maternal orphans are cared for equally, as though they are biologically related, others face differential treatment in the home depending on the quality of care provided by the guardian. Households in rural Tanzania operate under extremely precarious socio-economic circumstances and a scarcity of basic resources, forcing families to make difficult decisions regarding resource-allocation within the home, which are often determined by gender and other social norms. As one male focus group participant noted:
supplies.

orphans and schools being unable to provide uniforms and lack of programming translates into health facilities being unable to provide support for orphans [30]. Nutritional challenges were cited by over a third (34%) of the caregivers in our sample, with especially acute consequences among infants as the cost of formula was prohibitively high for families. Children were also faced with additional challenges for educational attainment and access to timely health care in the already impoverished and precarious environments found in rural Tanzania. Future studies should assess whether certain programs, such as conditional cash transfers, payments for school fees and associated costs, etc. are able to mitigate these observed challenges among maternal orphans [31–33].

Our study demonstrates that gender inequalities that affect women’s health across their lifespans and drive high levels of maternal mortality also affect maternal orphans. Within families in our study, for instance, many women who died due to maternal causes were at high parity (54% had 3 or more children). Indeed, within rural regions of Tanzania, the total fertility rate is 6.1 children and women at the lowest socioeconomic levels with no education have the highest fertility rates [3]. Therefore, efforts to improve reproductive autonomy and contraceptive use would reduce the number of pregnancies and maternal deaths due to pregnancy complications [34] and ultimately promote well-being among living children. As one stakeholder stated:

‘In the community, there should be [a] sustainable program that can first empower women … For instance she should have her own money and power to decide when to go to the hospital when she gets a problem. I hope this will minimize orphans because other women die because of delay to reach to the health facility.’

In addition, social norms that prescribe rigid gender roles and de-emphasize fathers’ roles in child rearing [26] exacerbate the potential effect of a mother’s death on a child’s life, as fathers often do not take responsibility for guardianship of their own children after a maternal death. These norms also contribute to family dissolution, as orphans are commonly separated among other female care-takers in the extended family.

Few families (27%) were aware of services or programs for orphans, in which they may be eligible. In addition, existing programs do not systematically address the urgent nutritional needs of infants who survive after a maternal death, including the prohibitive costs of formula, which thus places maternal orphans at a higher risk of under nutrition, stunting [35], and poor development during this critical period [36]. Stakeholders also detailed the lack of human and financial resources available to successfully implement programs in rural villages, in addition to challenges related to sustainable budgeting, as Tanzania does not have a sufficient budget to provide support for most vulnerable children. Coordination across sectors, including health, community development, and education, as well as across levels of government is urgently needed to create a comprehensive response to families affected by maternal mortality.

These findings should be interpreted with limitations in mind. Although the study provides in-depth qualitative insight into the mechanisms linking maternal mortality and child outcomes, the linkages cannot be assumed to be causal and the results cannot be generalized beyond the study population. In addition, women whose deaths were never recorded or known by community health
workers are not included in this sample; experiences of their
care may be different than those included in the study.

Despite these limitations, the study illuminates the high costs to
surviving children and their families of failing to reduce maternal
mortality in this region and highlights potential pathways through
which maternal mortality and maternal orphan morbidity are
linked. Our findings are consistent with the existing literature on
vulnerable children, but highlight the specific health and social
impacts that a maternal death can have throughout the course of a
child's life and the all too frequent cycle of poverty and suffering
that stems from the high cost of failing to prevent a maternal death
and subsequent inaction to protect and support maternal orphans.

Efforts to mitigate these negative outcomes should include the
implementation of a comprehensive, multi-sectoral approach to
providing care for maternal orphans and other MVCs, as called for in Tanzania's National Costed Plan of Action 2, and for a
more effective, efficient, and sustainable child protection system
in general [37]. This study in rural Tanzania provides a fresh
empirical and intergenerational perspective supporting what is
already known about the underlying factors that make maternal
mortality a persistent issue in areas where inequitable gender and
social norms undermine the status of women [38]. Until these root
causes are addressed, women will continue to die in pregnancy
and childbirth and the children and families that are left behind will
remain in a cycle of poverty and suffering.

Author Contributions
Conceived and designed the experiments: AEY KLJF JL. Performed the
experiments: AEY VMB KLF JS. Analyzed the data: VMB KLF. Wrote
the paper: AEY VMB KLF JS JL.

References
webdav/site/global/shared/documents/publications/2012/Trends_in_
2. Campbell OM, Graham W, Lancet Maternal Survival Series Steering Group
demographic and health survey: key findings. Calverton, Maryland, USA: NBS
approach to fulfil maternal health obligations. SUR 7: 95–121.
the Pare of Kilimanjaro region, Northern Tanzania. Soc Sci Med 57: 1099–
1115.
on maternal referrals in rural Tanzania: decision making and acceptance of
Factors affecting home delivery in rural Tanzania. Trop Med Int Health 12:
802–872.
effective: out-of-pocket payments for 'free' delivery services in rural Tanzania.
375: 1944–1946.
factors for early infant mortality in Sarlahi district, Nepal. Bull World Health
Effect of parental death on child survival in rural Bangladesh: a cohort study.
among motherless children in rural and urban areas in Guinea-Bissau. Acta
complications may be the most important risk factors for perinatal mortality in
the consequences on infant and child survival in rural Haiti. Matern Child
orphanned children: a study in sub-Saharan Africa. Evidence from Malawi.
research/seminars/files/shimamura-carter-the-dynamics-of-educational-
high HIV prevalence countries in sub-Saharan Africa. Calverton, Maryland:
of orphanhood on underweight prevalence in sub-Saharan Africa. Food Nutr Bull
29: 32–42.
adolescents: is country-level HIV prevalence an important factor? AIDS Care
22: 927–938.
overall psychosocial circumstances of Australian Aboriginal children and young
Child development: risk factors for adverse outcomes in developing countries.
23. Presern C (2013) Interactive expert panel. Challenges and achievements in the
implementation of the Millennium Development Goals for women and girls.
csw/csw57/panels/preparatory_panel_presern_paper.pdf. Accessed 16 April
2013.
their siblings in Tanzania and Uganda. Reading, UK: University of Reading.
Available: http://centaur.reading.ac.uk/6609/1/Young_people_who_care_
Accessed 16 April 2013.
Effect of economic assets on sexual risk-taking intentions among orphaned
adolescents in Uganda. AJPH 100: 483–488.
Nyerere in the quest for social and economic development in Africa. Afr J Polit
Vulnerable Children: a human capacity needs assessment. USAID and The
vulnerable children: a comparison of cash transfer beneficiaries and non
32. Bryant JH (2009) Kenya's cash transfer program: protecting the health and
76.
unconditional and conditional cash transfers on child health and development in
34. Stover J, Ross J (2010) How increased contraceptive use has reduced maternal
Determinants of linear growth and predictors of severe stunting during infancy
of Tanzania.
and infant mortality globally: an integrated action agenda. Int J Gynaecol Obstet
119: s13–17.