

Has Fertility Decline Contributed to Improvements in Women's Lives?

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THE FERTILITY & EMPOWERMENT NETWORK

The Fertility & Empowerment (F&E) Network is a group of academic and applied researchers committed to reinvigorating the connection between gender, fertility decline and development through both theoretical and applied research. The F&E Network is housed at the International Center for Research on Women and funded by The William and Flora Hewlett Foundation. The F&E Network aims to advance a research agenda on issues intersecting these three themes that is of interest to researchers and policymakers alike, and to support the professional development of experienced and emerging scholars with an interest in gender and population.

Fertility & Empowerment Network members have conducted a series of case studies addressing whether and to what extent fertility declines in lower and middle income countries have led to gains in women's well-being, women's empowerment or transformations to gender equality. The F&E Working Paper Series serves as a platform for the collective presentation of this rich body of work.

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ABSTRACT

In this paper we summarize work to date addressing the following research question and gap in the literature: Whether and to what extent have fertility declines experienced in lower and middle income countries in the last forty years benefitted women in those countries? We argue fertility decline should be expected to benefit women's lives through two demographic processes : increased lifespan and increased time spent outside of childbearing; as well as accompanying socio-cultural processes, namely shifts in the value placed on large families and therefore on controlling women's reproduction. Such shifts would be expected to trigger changes to the roles that women play in their families, societies and communities. We conceptualize three levels of benefits to women's lives that may result from fertility decline: improvements to women and girls' *well-being*; increases in women's *empowerment*; and ultimately, to *gender transformation* at the community and societal level. We find evidence for improvements in women's lives within four key domains: health and survival; education; labor force participation or employment; and the role and value of daughters in the household. This evidence suggests that the overall well-being of women and girls improves as fertility declines, particularly as it relates to their maternal health, educational attainment and workforce participation. The findings also suggest that in many contexts fertility decline has contributed to the empowerment of women and girls. However, the evidence is less conclusive in demonstrating that fertility decline has led to improved gender relations and gender equality at the societal level indicative of any transformation to gender systems. The evidence also points to more rapid improvements to women's lives in the public sphere than the private or domestic sphere. While the growing body of evidence points to an important role played by fertility decline in the improvement of women's lives, we caution that benefits to women's lives may continue to be constrained unless policies can catalyze changes in gender norms and systems both outside of and within the domestic sphere.

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INTRODUCTION

In this paper, we invert the traditional question of whether and how changes in women's lives and empowerment can trigger fertility decline to analyze, instead, whether and how fertility decline can trigger improvements in women's lives and empowerment. These are critical demographic and social questions at this juncture in history. Fertility has been declining rapidly across the developing world. It has done so at a time when the cohorts most likely to experience the consequences of this decline – namely young women in the family-building stage of their lives – make up a large share of the population of developing countries. Whether and how fertility decline triggers changes in the roles these women play in their families, communities and societies is thus likely to have notable repercussions for economic and social development, and for gender relations and equality. However, these questions have been largely neglected in demographic and other social science research. Our paper addresses this gap.

THE THEORETICAL BASIS

The literature from the varied fields of demography, anthropology and women and gender studies provides several reasons why we might expect fertility decline to have an impact on women's lives and empowerment, as well as on gender relations themselves.

The reproductive and public health literature provides the most straightforward explanations for how fertility decline changes women's lives. Fertility decline, by definition, reduces women's morbidity and mortality risks that are associated with pregnancy and childbirth. This, in itself, improves women's well-being. Also, fertility decline has typically been part of a demographic transition that incorporates rising life expectancy. Taken together, then, these demographic declines in fertility and mortality should mean that women increasingly would spend a larger proportion of their lives outside of childbearing, allowing for the adoption of alternative roles that presumably would enrich their lives further. This is likely to be particularly true when demographic transition is accompanied by other economic and social changes such as modernization, economic growth, political change, or increases to education and employment.

Once a "critical mass" is reached of women in alternative roles, one could expect societal gender relations and gender systems to shift. Huber (1991) and Rosaldo (1974) argue, for instance, that fertility and mortality declines facilitate a shift in gender relations by the fact that freeing a large

portion of women's lives from childbearing and childrearing allows them to participate in social and political change and in public spaces more generally.

Anthropologists and demographers alike point to yet another way in which fertility decline can be expected to influence women's lives and gender relations, specifically, through changing the historical relationship between reproduction and the subordination of women. For example, Ortner (1974) suggests that women's role as bearers of children, when given cultural and social primacy, provides the basis for their subordination everywhere since women bear and rear children in every society. Rubin (1975) points to patriarchal kinship systems as the mechanism through which women's reproductive role is used to place women in an asymmetric power relationship with men. If fertility decline is accompanied by a diminution of the significance of women's reproductive role, one could expect the accompanying subordination to eventually lose its primary rationale as well.

Later anthropological literature refined these arguments by noting that the degree to which a power asymmetry exists and women are subordinated varies across societies by the meanings and value assigned to reproduction and motherhood, and by the social norms for controlling sexuality. For instance, Davis (Davis, 1984) argues that lower fertility and longer life expectancy in the industrialized world influenced "sex roles" in industrialized societies by reducing the importance of marriage and motherhood for women. These demographic changes coalesced with simultaneous social changes such as later marriage, a greater acceptance of and rise in divorce, and favorable labor force conditions to contribute to the shrinking of women's domestic role and a rising emphasis on jobs, careers and self-fulfillment (Davis & van den Oever, 1982).

Fertility decline can also affect women's roles via a change in the value of children. Caldwell (1982) describes how modernization can contribute to children becoming a net cost to their parents instead of a net social and economic resource. This not only results in fertility decline, but also can fundamentally alter the nature of women's roles in the family and society. If in pre-industrial societies children held enormous economic and social value, then there was a powerful incentive to control women as the reproducers of this "asset," through individual behavior, social norms, and societal and cultural institutions and ideologies. If children cease to be central in determining a household's economic and social value, then the rationale and motivation for subjugating women should also decrease.

Feminist and other scholars take the above argument a step further, bringing in the control of reproduction as yet another aspect of fertility decline that shifts gender relations. Specifically, it is argued that women's control over contraception and abortion, or the means of reproduction, is essential to overcome patriarchal social and economic systems. Reproductive health advocates have echoed this theme of effective control of contraception by women as a necessary prerequisite for shifts in patriarchal social systems toward greater gender equality (Dixon-Mueller, 1993; Germain, 1987; Freedman & Isaacs, 1993).¹

Thus, fertility decline can theoretically influence women's lives, alter the roles of women in society, and shift gender systems toward greater gender equality through a variety of pathways: by improving women's health and reducing their mortality risks, by increasing the lifespan available to them to explore non-reproductive opportunities, and by catalyzing shifts in how women's roles are valued and viewed in society.

FRAMING BENEFITS TO WOMEN'S LIVES

We conceptualize and analyze three broad types of gender-related outcomes that could be influenced by fertility decline. The most immediate and the most visible consequences of fertility decline for women's lives can be termed *welfare enhancing*. These are the initial "mechanistic" changes, such as lower risks of maternal death, that fertility decline triggers. Such changes improve health and welfare for those cohorts of individual women who are undergoing fertility decline, and subsequent cohorts as well. Rising life expectancy following from this improved health and welfare, and lower maternal mortality, combines with fertility decline to contribute further to the length of women's lifespan spent outside of childbearing. This, in turn, increases the time women could have to explore and adopt other roles.

The second type of consequence is what we term *empowerment outcomes*. We examine whether fertility decline contributes to enhancing women's "empowerment", either directly or indirectly via improvements in women's life choices and options. A vast literature documents different meanings and connotations of empowerment. Borrowing from Kabeer, we define women's

¹The relationship between reproductive control and women's lives in lower and middle-income countries merits, and has received, individual attention (Hardee, Ulin, Pfannenschmidt, & Visness C., 1996). Here we focus instead on the extent to which fertility decline per se results in changes to women's lives. That is, we direct our attention to how changes in population dynamics may impact women's lives; leaving aside, for the most part, the ways in which reproductive control may mediate this relationship.

empowerment as “...the expansion in [women’s] ability to make strategic life choices in a context where this ability was previously denied to them” (Kabeer, 1999).

Women’s empowerment often entails overcoming or challenging patriarchal norms that systematically disempower women. Empowerment is also a *process* of change, and one wherein the notion of agency is critical; that is, processes that lead to improved life conditions are considered empowering for women if they themselves are ‘significant actors’ in these processes (Kabeer, 1999; Malhotra & Schuler, 2005). Finally, empowerment is multi-dimensional. Women may be empowered in one dimension of their lives (e.g., decision-making on household finances) without being necessarily or simultaneously empowered in other dimensions of their lives (e.g., control over sexuality).

Some of the potentially empowering changes in women’s roles that fertility decline may trigger include higher educational attainment, greater flexibility in joining the labor force, greater control over resources, and enhanced decision-making power in the private or public spheres. However, whether and to what extent these changes in women’s lives and options can be described as empowering will vary by context, a point we elaborate on below.

We are conceptualizing both these types of consequences at the individual level. However these measures of women’s lives can also be aggregated to or assessed at the community or societal level, and can be analyzed in comparison to men to identify changes in gender inequality, that is, reductions in gaps in health status or opportunity for women and girls as compared to men and boys at the meso or macro-level. Examples are changes in sex ratios at birth, or changes in the gender gap in education or employment.

The final type of consequence we analyze is macro-level *societal transformation in gender relations*. Fertility decline may eventually lead to gender transformation in economic, political, social and cultural systems such that there is more gender equality (Malhotra, 2012). Gender transformation differs from welfare or empowerment in that it is a societal process that captures *shifts* in societal norms, systems, or socially sanctioned roles for women vis-à-vis men. Such shifts could include changes in marital systems; changes in the relative value of sons and daughters such that daughters are increasingly valued; changes in political systems with greater participation of women and/or more gender equitable public policy; shifts in economic structures and increases in opportunities or reduction of barriers for women; and other overall shifts in gendered norms or systems.

Relationship between welfare-enhancing, empowering and transformative consequences

A change in women's lives can be welfare-enhancing, empowering, or transformative, depending on the context in which it occurs. On the whole, however, empowering and transformative consequences are likely to be more tenuous to measure and to attribute to fertility decline than welfare-enhancing consequences or many measures of gender inequality, for multiple reasons.

First, welfare-enhancing changes such as declines in maternal mortality or certain gender inequality measures such as sex ratios at birth or gender gaps in education are among the most easily measured gender outcomes and those for which data are most readily available. In contrast, empowerment variables are notoriously complicated to measure, and definitions and measurements vary tremendously across authors and location (Malhotra & Schuler, 2005). Measuring the role of fertility decline in gender transformative change is at least equally challenging. Such analysis ideally requires longitudinal data over a fairly long period of time, which is rare. It also requires such data to include measures not often captured adequately or accurately in surveys, such as women's political participation, or the value of daughters versus sons.

Second, while welfare-enhancing consequences of fertility decline occur almost certainly (such as in the case of lower maternal mortality), for a change to be empowering, certain favorable contextual conditions have to exist or be created. These relate to the gendered social, economic and political context in which fertility decline takes place. We argue that a change in women's lives is more likely to be empowering if it creates a "new" opportunity that was rare for prior cohorts of women, if it causes changes in women's customary roles and responsibilities, and if women themselves are involved in creating these dynamics. Otherwise, the change is likely to be welfare-enhancing but not necessarily empowering. Similarly, a change in women's lives may decrease gender inequality. However, we would expect it to trigger transformations in gendered social systems or norms only once a critical mass of cohorts of women are exposed to the opportunities created by this change, and, as a result, catalyze such a transformation.

A good example is the case of higher education, which could theoretically be empowering or simply welfare enhancing. Many countries in the developing world have seen rising rates of female post-primary education in the last couple of decades; several have also seen a shrinking of the gender gap in higher education. Higher education could be empowering in a context where post-primary education is considered revolutionary because few – if any – women were able to access such education in prior cohorts, or in a context where higher education affords women greater access to

better and more remunerative careers. In contrast, higher education and more gender-equitable education opportunities may be welfare-enhancing in critical ways but may still not be empowering in a context where this change does not foster extra-domestic roles and opportunities. Over time, however, especially if it is empowering, female post-primary schooling may trigger broader societal change as larger proportions of successive cohorts of women are highly educated and attain roles alternative to traditional patriarchal expectations. To add to the complexity of these dynamics, the pathway from context to fertility decline to women's lives is multi-directional: certain contextual conditions trigger fertility decline and empowering consequences, which in turn modify contextual conditions.

Welfare-enhancing and empowering changes are often experienced, and can be measured, at the individual level. In contrast, changes in gender inequality and transformative change are societal or macro-level processes. In addition, transformative change is likely to be a longer-term process than changes in gender inequality, as improvements in gender inequality can occur long before, or even without, transformative change, at least up to a point. Eventually, however, there may be a threshold beyond which further reduction or reversal in gender gaps likely occurs only in tandem with or following transformative shifts in gendered norms and systems. Overall, a fair amount of time likely has to elapse following fertility decline before such transformative changes in gender equality and systems can be observed. As one example, a narrowing of the gender gap in under-five mortality may result from improved nutrition and better access to preventative healthcare for all children, as fertility declines alongside economic development and improvements in health care. However, reaching and then maintaining gender parity in under 5 mortality likely suggests a change in the relative value of daughters and sons.

Our review uses this framework to not only address *whether* the empirical evidence supports a role for fertility decline in changing women's lives and gender outcomes, but, in addition, the *extent to which* it influences women's lives or gender outcomes. In the next section we review the empirical evidence and theoretical models used to establish whether fertility decline has influenced women's lives. We then return to our typology of gender-related outcomes in the Discussion to analyze the ways in which, and the circumstances under which, the identified changes in women's lives following fertility decline have been welfare-enhancing, empowering, or transformative.

METHODS

We draw from a number of sources for our review. First and foremost the foundation of our empirical evidence emerged from a series of case studies conducted for the Fertility & Empowerment Network led by the International Center for Research on Women (ICRW). These case studies were based on a central question: *Whether and to what extent have fertility declines experienced in lower and middle income countries in the last forty years benefitted women in those countries?* The studies use a variety of methods and approaches in a number of contexts (Asia, sub-Saharan Africa, and the Middle East) to empirically examine the fertility-gender relationship.² Specifically, these studies included three macro-level, multi-country analyses (Hindin, 2013; Yount, Zureick-Brown, Halim, & LaVilla, 2014); country-level case studies from China (Wu, Hua & He, 2012), Bangladesh (Amin & Mahmud, 2013), and South Africa (Stoebenau, Ansara, & Casale, 2012), and within country studies from Darjeeling, India (Allendorf, 2012), Tamil Nadu, India (Pande, Malhotra, & Namy, 2012), Tehran, Iran (Erfani, 2012), and Cebu, Philippines (Gipson & Hindin, 2013).

We also draw from an extensive literature review of peer-reviewed articles, grey literature, working papers and conference proceedings and papers. Given the breadth of literature from the 1990s that examines the role of women's position and empowerment in contributing to fertility outcomes or decline, standard topical searches often yielded results that described this causal direction. Therefore, while we relied heavily on standard search methods, we also carefully identified any literature that had cited books or published manuscripts that we knew examined the impact of fertility decline on women's lives. For our standard literature review we relied on a number of databases (Popline, Scopus, Google Scholar, Anthropology Plus, Web of Science) and a combination of the following search terms ([“fertility decline” OR “demographic transition” OR “population dynamics”] AND [women OR gender] AND) together with a series of terms relevant to the following domains: women's and children's health, education, work, political participation, women's position in the domestic sphere, and gender roles and norms (or broadly, gender systems). Using this approach, we accessed a total of over 700 articles and papers. Based on title and then abstract search we identified only about 90 which fit our criteria (of examining the influence of fertility decline on women's outcomes) and were appropriate for inclusion in this review.

² We are using the phrasing 'fertility-gender' relationship to summarize the influence of fertility decline on women's lives, empowerment or gender relations.

FINDINGS: HAS FERTILITY DECLINE CONTRIBUTED TO IMPROVEMENTS IN WOMEN'S LIVES?

Research has begun to address the consequences of fertility decline in lower and middle income countries, with a focus on the implications for health, public policy, and economic growth and development (Sinding, 2000; Schultz, 2009; Dyson, 2010). However, the consequences of fertility decline on women's lives have yet to receive deserved attention. That said, there is a growing, albeit small, body of literature that has begun to address this important omission. Below we present this work on the fertility-gender connection for the following themes which emerged in the literature: maternal and child health, education, labor force participation, and gender norms and roles. We present the evidence for the relationship between fertility decline and these outcomes; and then discuss whether, to what extent, and under what circumstances these relationships are suggestive of changes to women's basic welfare, empowerment, or transformations to gender systems.

Relationship between Fertility Decline and Women's and Children's Health

Maternal health and mortality

Fertility decline could theoretically improve women's health by reducing the level of "reproductive stress" that women have to undergo with repeat pregnancies, and thus lowering the risk of maternal nutritional depletion (Yount et al., 2014). It has long been argued that poor nutritional status among women of reproductive age is more likely due to frequent childbearing than to limited access to nutritious food (Winkvist et al., 1992). Some studies in environments where poverty is not a concern find that frequent childbearing is not associated with poor nutritional status (Nenko & Jasienska, 2009). However, others find that in the developing world frequent childbearing is likely to be associated with poor nutrition (Merchant and Martorell, 1988; Rah et al., 2008). Yount (Yount et al., 2014) finds, in an analysis of a range of developing countries across a multi-decade period that lower fertility is significantly associated with improved maternal nutrition. Rapid fertility decline has also been found to be associated with improvements in female life expectancy (Wickrama & Lorenz, 2002).

Researchers have used multiple indicators to measure maternal mortality when analyzing the role of fertility decline in maternal mortality (Jain, 2011). These include the maternal mortality ratio (the number of maternal deaths per 100,000 live births); the annual number of maternal deaths; a woman's lifetime risk of death due to pregnancy; and the maternal mortality rate (the number of maternal deaths per 1,000 women of reproductive age). Fertility decline contributes to a decline in

the lifetime risk of maternal death because women who have fewer pregnancies are less likely to be exposed to maternal death (Zureick-Brown et al., 2013). The maternal mortality ratio can also decrease with fertility decline because fertility decline is often accompanied by a decrease in high-risk births, namely, first births among adolescents, high-parity births, and births to older women; women with fewer births may also have the strength and health to withstand complications of pregnancy that women with many births may not (Jain, 2011).

Hogan et al. (Hogan et al., 2010) in a global study of factors associated with maternal mortality find that the total fertility rate (TFR) shows the strongest relationship with maternal mortality of all variables in their linear analysis. In Tamil Nadu, India, Pande et al (2012) demonstrate how rapid declines in maternal mortality followed close on the heels of a fast drop in fertility. However, both studies note that this association does not establish the extent to which fertility decline *alone* may have contributed to the observed declines in maternal mortality.

Other studies consistently show that a significant share of maternal mortality declines over the last several decades can be *attributed to* fertility decline. Ross and Blanc (2012) find that in the developing world as a whole, fertility decline *alone* was responsible for averting approximately 1.7 million maternal deaths between 1990-2008. Jain (2011) estimated that 38-50% of maternal lives saved in 2008 in India, Pakistan and Bangladesh could be attributed to fertility decline in these countries between 1990 and 2008. Other studies in South Asia echo these findings. In Bangladesh, Chowdhury et al. (Chowdhury, Ahmed, Kalim, & Koblinsky, 2009) found that fertility decline contributed to a decline in maternal mortality in both the area under an intensive MCH-FP program (the Matlab program area) as well as the area under government health programs. Recent declines in maternal mortality in Nepal appear to be related to fertility declines as well (Hussein et al., 2011).

Ross and Blanc (2012) note in their global analysis that South Asia, with rapid declines in fertility and in maternal mortality risks, experienced a much greater decline in the numbers of maternal deaths than did countries in sub-Saharan Africa, which has experienced very slow fertility declines. Other analyses also conclude that continued high fertility has played a significant role in persistently high maternal mortality in much of sub-Saharan Africa (DerSarkissian, Thompson, & Arah, 2013).

Child health and mortality

Fertility decline can influence child health and mortality by increasing investments in children; and fewer high-risk births characteristic of fertility decline (Jain 2011) also contribute to improved neonatal, infant and child health and reduced mortality risks in these age groups.

Becker (Becker, Duesenberry, & Okun, 1960) and others have observed that a decline in fertility can be associated with a shift from an emphasis on the quantity of children to a focus on “quality” of children, with parents investing more in the human capital formation of each child. Yount (Yount et al., 2014) argues further that such increased investments should contribute to better health, nutrition and overall well-being of children in smaller families. At the same time, it is difficult to tease out the independent effect of fertility decline on child health and mortality because of other, concurrent influences such as changes in women’s schooling, health facilities or public health policies that may also simultaneously influence child health.

Studies in Bangladesh (Legrand & Phillips, 1996), India (Arokiasamy, Goli, & Shannawaz, 2013), China (Feng et al., 2012) and Kenya (Kabubo-Mariara, Mwabu, & Ndeng'e, 2009) that directly examine the influence of fertility on child mortality find strong evidence that fertility has a significant causal relationship with different measures of neonatal, infant and child mortality. Hanf et al. (Hanf, Nacher, Guihenneuc, Tubert-Bitter, & Chavance, 2013) in their cross-country analysis find that a decline in adolescent fertility has a particularly strong association with reductions in under-5 mortality. A large body of literature has also established that very small birth intervals – associated typically with high fertility -- contribute to poor birth outcomes and subsequent poor health, nutrition and survival for newborns, infants and children; conversely, the evidence suggests that longer birth-intervals – often a characteristic of fertility decline – contribute to improved health and survival for children under age 5 (Cleland, Conde-Agudelo, Peterson, Ross, & Tsui, 2012; Conde-Agudelo, Rosas-Bermúdez, & Kafury-Goeta, 2006; DaVanzo, Hale, Razzaque, & Rahman, 2008). Other studies in sub-Saharan Africa find that the decline in the numbers of children residing in households that accompanies fertility decline can be expected to contribute to declines in child stunting (Giroux, 2008). However, the converse is not necessarily true; evidence is weak on the role of high fertility in worsening child stunting (Kravdal & Kodzi, 2011). In his review of literature on the effects of fertility decline on family well-being, Schultz (Schultz, 2005) comes to similar conclusions regarding the relationship between fertility and child stunting.

Child health and mortality for girls, and gender differentials

For this paper, what is of specific interest is whether fertility decline has a particularly beneficial impact for *girls'* health and mortality, in absolute terms and relative to boys. Yount et al. (Yount et al., 2014), in a panel analysis of DHS data from several countries, find that fertility decline is significantly associated with *absolute* improvements in girls' health and well-being. At the same time, the *relative* distribution between daughters and sons of a presumed increased investment in children with the shift from quantity to quality that emerges from declining fertility will depend on gender norms. In populations that display no particular preference toward sons or daughters, we could expect that there should be no gendered inequality in the benefits to child health and mortality that accrue from fertility decline. In fact, there was minimal gender inequality in countries without strong son preference (Yount et al., 2014).

In contrast, in populations – such as in India and China – with a strong preference for sons, however, fertility decline may influence gender gaps in child well-being and survival in two ways (Yount et al., 2014). First, a large body of evidence from South Asia suggests that higher birth order girls are particularly disadvantaged in both health and mortality terms (Das Gupta, 1987; Muhuri & Preston, 1991; Pebley & Amin, 1991; Pande, 2003). In this case, smaller family size and therefore fewer higher birth order children with fertility decline should improve girls' well-being, all else being equal, which Yount et al. (Yount et al., 2014) term a “gendered parity effect.” In such populations there could also be an opposite, “intensification effect” (Das Gupta & Bhat, 1997) of fertility decline. If fertility declines faster than does son preference, then the pressure to have a son in a smaller family may compel parents to discriminate more against daughters. In the extreme case, it may fuel sex-selective abortion of female fetuses or female infanticide, resulting in the much-researched phenomenon of ‘missing girls’ (Sen, 1992), particularly apparent in both India and China. Thus, the eventual impact of fertility decline on gender inequality in child health and mortality will depend on the balance of the gendered parity effect and the intensification effect.

We found no research on the impact of fertility decline on gender inequality in child health and mortality for sub-Saharan African countries or other parts of the world where son preference is not a concern. Research on South and East Asia, however, suggests that, at least for some time following fertility decline, gender differentials in child health and mortality may worsen. Specifically, Yount et al. (Yount et al., 2014) in their cross-country analysis find that in countries with strong son preference the intensification effect is stronger than the gender parity effect in the initial stages of fertility decline, resulting in greater inequality (worse for girls) for both child

mortality and nutritional status. As fertility declines intensify, gender differentials narrow. Yount and colleagues suggest that this may signify a shift in gender norms in the later stages of fertility decline.

Studies across India (Pande et al., 2012), China, Vietnam (Guilmoto, Hoáng, & Van, 2009) and Korea illustrate this dynamic. In the initial years following fertility decline, these countries exhibited an intensification effect with fertility decline, with sex ratios at birth becoming increasingly masculine. In recent years, however, the sex ratios at birth have started to level off or even reverse in some parts of China and India, and in Korea (Das Gupta, Chung, & Shuzhuo, 2009). Scholars speculate that this may reflect shifts in gender norms that are more favorable to women, effectiveness of policy changes to make sons less critical for family well-being and inheritance, patterns of schooling and economic development that increase opportunities for women and girls to get higher education and better jobs, or a combination of these factors (Guilmoto, 2009; Chung & Das Gupta, 2007).

Gender inequality in child sex ratios are also narrowing across these countries, suggesting that gender discrimination against living girls under the age of 5 may be diminishing, possibly because of the same types of changes in gender norms, value of girls, and economic opportunities³ (Das Gupta et al., 2009).

Bangladesh provides an interesting counter-example. Historically, son preference has decreased and gender differentials in sex ratios, childhood nutrition and child mortality have narrowed with fertility decline (Amin & Mahmud, 2013). Kabeer and colleagues (Kabeer, Huq, & Mahmud, 2013) analyze quantitative and qualitative data to conclude that this pattern reflects the particular situation of Bangladesh, wherein the same factors that led to fertility decline – rising levels of female education, increase in employment opportunities, NGO participation and micro-credit expansion for women – also led to a drastic re-evaluation of the worth of daughters.

Fertility Decline and Women's Labor Force Participation

The extent to which fertility decline can be considered as an influence on women's labor force participation or gainful employment is of great interest to economists and policymakers. In particular, there is a growing interest, within the context of research on the 'demographic dividend,'

³ Though India's census sex ratios for 2011 were the highest ever, still Das Gupta et al. (2009) argue that the rate of increase in the child sex ratio in several (albeit not all) Indian states has declined since the 1990s.

to assess whether and how fertility decline might lead to greater female participation in the labor force and thereby significantly contribute to economic growth (Schultz, 2005; 2009).

A wealth of studies has explored the association between fertility or childbearing and female labor force participation (FLFP) or employment. Yet, understanding of the causal pathways remains decidedly messy in both low fertility, high-income countries as well as in low to middle income countries where demographic transition is underway, or where fertility has only recently reached replacement levels (Lloyd, 1991). For instance, at the macro-level, there has been an undeniable rise in FLFP that has coincided or followed fertility decline and uptake of contraceptive use, but it is unclear whether the rise in FLFP is *because* of fertility decline (Rindfuss, Guzzo, & Morgan, 2003). That said, recent literature discussed below provides some macro-level evidence that fertility decline may lead to increases in FLFP (Bloom, Canning, Fink, & Finlay, 2009; Caceres-Delpiano, 2012). At the micro-level, however, debate concerning work-life balance, role incompatibility, and the direction of the relationship between women's decisions concerning childbearing as compared to employment continue to this day in every context around the world.

Studies that consider the role of fertility decline in women's work are rooted in a few conceptual models, the primary one being the mechanical association between women's time allocations and availability to work. In other words, with less time spent childbearing and childrearing, women are increasingly available to work outside of the home (Bloom et al., 2009; Schultz, 2005); as fertility declines and women, on average, have fewer children, they are afforded more time for other activities. Another related conceptualization recently tested by Soares & Falco (2009) is the influence of declines in adult mortality that often precede fertility decline within the context of demographic transition. This conceptualization makes the case that more important than fertility change is increased longevity; with longer lifespans women have more time to contribute to the labor force. It is important to add that these mechanisms undoubtedly operate alongside other socio-cultural factors that will also play a role in determining whether and how women are in fact able to use this increased time for pursuing and securing gainful employment. We address this issue in greater detail below.

Macro-level trends in fertility and women's work

Very few studies have taken a country-level analytic approach to examining the relationship between fertility decline and women's labor force participation, over time. Lee-Rife et al (Lee-Rife et al., 2012) conducted a descriptive analysis, examining the timing of trends in fertility (using UN

World Population Prospects data) to the timing of changes in women's labor force participation (from ILO Labor Market database) in 31 countries. They find that in most countries the gains to FLFP took place concurrent to fertility decline. When they examined gains in FLFP for the cohort of women most likely to be balancing motherhood and work (25-34 year olds), they find more evidence that gains within this cohort *followed* fertility decline

Bloom et al. (Bloom et al., 2009) used a unique approach to attempt to demonstrate a causal relationship as well as model the magnitude of the effect of fertility decline on not just FLFP but economic growth more broadly. They use abortion legislation as an instrument for fertility in panel data from 97 countries from 1960-2000 in order to examine the relationship between decline in fertility and women's labor supply (availability to work, but not presence in paid labor) over that time frame. They find a strong negative association between fertility levels and women's labor supply amounting to about 1.9 years of work lost for every additional child, on average, using this instrumentation. Their model further suggests that over this time period, if a country went from typical pre-transition TFR of about 6 to post-transition replacement TFR, this would result in about an 18% increase in FLFP, and gains in income per capita of about 7%. Schultz (2005) mapped out a similar estimated effect of fertility on women's labor supply and ultimately economic growth based on data from a case study of Singapore's fertility transition.

Micro-level studies of fertility, childbearing, and women's work

A larger body of literature has tried to assess the relationship between fertility or family size and women's work or LFP drawing from multi-level or individual-level data. Some studies use cross-country large datasets and rely on different instrumental variables to assess an exogenous effect of fertility on women's work in different contexts, with mixed results. While in some cases a negative relationship is found between childbearing and women's engagement in the workforce (Caceres-Delpiano, 2012; Cristia, 2007), in other cases the effects are negligible (Aguero and Marks, 2011). The findings from these papers also suggest important heterogeneity in this relationship depending on women's life situation. For example, Aguero et al. (Aguero & Marks, 2011), analyzing individual-level DHS data from 26 countries with infertility as an instrumental variable to assess the influence of childbearing on employment, find that on the whole childbearing has very little effect on employment. However, they do note small but significant effects of childbearing on the chances of younger women, in particular, being employed; as well as small, but significant effects if they narrow the sample to women in low-income countries. Caceres-Delpiano (2012) analyzes individual-level DHS data from 40 countries, using multiple births (e.g. twins) as an instrument to

assess the influence of childbearing on different types of employment for women and finds a significant effect, particularly at lower and higher parities. For lower parities, the effects were restricted to certain forms of employment, but at higher parities the effects cut across all forms of employment. They conclude that family size has a significant effect on women's engagement in the workforce.

Rich case study data have contributed to this understanding as well. Certainly the most well-known is the case of the cluster randomized intensive family planning program that ran from 1977 until 1996 in Matlab Thana, Bangladesh. Longitudinal data comparing the program and control communities have indicated that fertility levels were 15% lower in program communities as compared to controls by 1996. Alongside significant improvements in the health status and educational attainment of the children in program communities were findings concerning the implications for women's work (Schultz, 2009; Joshi & Schultz, 2007). The women likely to have been impacted by the program (women ages 25-54) had wages 40% higher than those of women residing in control communities. Interestingly, however, while women ages 25-54 had higher wages, they were not necessarily more likely to be employed in wage labor (Schultz, 2009). Evidence suggests that poverty drove an increase in women's wage labor in Bangladesh overall, and the percent of women in wage labor continued to increase as fertility declined (Amin & Mahmud, 2013).

Pande et al's (Pande et al., 2012) case study of fertility decline and women's lives in Tamil Nadu, India found similar paradoxes. While overall the data suggest that fertility decline was accompanied by women shifting out of low-skill low-paying agricultural to higher-skilled higher-paying non-agricultural sectors, younger or urban-residing women made only modest contributions to the percent employed, while older, rural and less educated women continued to make up the majority of women employed in non-agricultural work. A study from South Africa shows a nice contrast, but also comes with its own set of caveats. Stoebenau et al. (Stoebenau et al., 2012) examine the role of community-level fertility (measured as aggregate fertility levels from older women's completed fertility) in younger women's participation in the labor force among African South Africans. They find that controlling for a range of community, household and individual level socio-economic factors, community fertility levels are negatively associated with the likelihood that a woman participates in the labor force. That is, living in lower fertility communities is associated with women being available to work. African women's labor force participation has seen dramatic increases alongside fertility decline in South Africa (Moultrie & Timaeus, 2003). However, increases

in labor force participation do not equate to increases in gainful, let alone, well-remunerated employment, a point particularly pertinent in South Africa where unemployment rates are staggeringly high. It is therefore unclear if the findings in South Africa point to increased well-being or empowerment for women. We will consider the interpretation of the results of the relationship between fertility and women's work more below.

Associations between Fertility Decline and Girls' Education

A large body of evidence analyzes the relationship between fertility decline and education (Martin, 1995; Weinberger, Lloyd, & Blanc, 1989; London, 1992; Adamchak & Ntseane, 1992). Despite some caveats, by and large this literature strongly supports expectations from Demographic Transition Theory (DTT) that with economic development, urbanization, and a rise in the demand for and access to education, fertility will fall. There is far less evidence, however, that examines whether fertility decline, in turn, may further impact educational attainment, in general, or specifically for women. In terms of investment in girls' education specifically, recent work suggests that the causal pathway may reverse as fertility declines, that is, that increased women's educational attainment may influence initial fertility decline; while after fertility has begun to decline, smaller family sizes may then influence a further investment in daughters' education, in particular (Bhat, 2002).

In a cross-national analysis of the relationship between female labor force participation (FLFP) and fertility, Bloom and colleagues (Bloom et al., 2009) suggest that FLFP may play an intervening role between fertility and impacts on girls' education: fertility declines should be expected to lead to increases in FLFP, which would in turn be expected to increase the demand for women's education. Amin and Mahmud (2013) suggest this was likely the case in Bangladesh as well, as women increasingly entered the labor force, investing in daughters' education toward eventual wage earning seemed a more promising investment. Stoebenau and colleagues draw on this assertion in their study examining the role of aggregated completed fertility on African South African women's labor force participation and educational attainment; modeling these relationships with the assumption that the impacts on LFP will be more immediate than they will for education (Stoebenau et al., 2012).

Macro-level studies provide additional evidence for a narrowing of the gender gaps in schooling as fertility declines. In a recent exploratory study, Lee-Rife and colleagues map out the macro-level trends in fertility and women's post-primary education, as well as the gendered gaps in post-primary educational attainment over time for 33 countries using UN population prospects and

Barro and Lee data sources, from 1980 – 2010. In this descriptive analysis, they find that women's education rose concurrent to fertility decline in most countries where fertility had declined substantially in the last 40 years. They also found that the gender gap in schooling was narrowing in most contexts, and had reached parity in 12 of 33 countries (Lee-Rife et al, 2012). While not attributing change to fertility decline, Grant and Behrman used DHS data from 39 countries, and found a narrowing of gender gaps in education over time, by age and school progression, and that in some cases girls were in fact more likely to be educated than were boys (Grant & Behrman, 2010).

Effects on education via family size

Fertility decline may also influence children's schooling and girls' education and gender gaps in schooling in particular, via changes in family size. The Wealth Flows Theory developed by Caldwell, (Caldwell, 1982) suggests parents respond to modernization and changes in the economic value of children by shifting their investments from high quantity to high quality children. Dyson contends that, in many respects, the Wealth Flows Theory is better suited to describing the consequences rather than causes of fertility decline. As Dyson explains, in the context of demographic transition, "Increased attention is given to raising the 'quality' of the fewer children that are had. This focus on improving child 'quality' is not simply a reason for why people decide to have fewer children – it is actually more an *outcome* of both mortality and fertility decline" (page 164, emphasis in original, Dyson, 2010).

In addition to wealth flows, other theoretical frameworks help to explain a hypothesized causal relationship between family size (interchangeable with sibship size; number of siblings) and education. The 'resource dilution' theory simply suggests that families have a set amount of resources to divide among offspring, and within larger families, these resources will be spread thinly (Blake, 1989). This simplified perspective does not, however, adequately account for differences in resource allocation by the sex composition or birth order of children. Allendorf (Allendorf, 2012) suggests that through fertility decline (and in the absence of sex-selective abortion) the probability of having a boy declines, and that this shift in sex composition of the family might influence changes not only in children's educational attainment resulting from resource dilution, but also in girls' education, in particular, resulting from changes to both family size and the sex composition of siblings within individual families, which may in turn lead to changes in how girls are valued.

A number of studies have examined the relationship between family size and education (Knodel & Wongsith, 1991; Lloyd, 1991; Wu et al., 2012; Marteleto & de Souza, 2013; Razzaque, Streatfield, & Evans, 2007; Allendorf, 2012; DeGraff, Bilborrow, & Herrin, 1996; Sudha, 1997; Marteleto & Souza, 2012). Findings are mixed, perhaps in part because some studies are unable to account for the endogeneity of decisions about family size and children's schooling (Marteleto & Souza, 2012). What has become apparent in more recent studies is a potentially important shift in the relationship between family size and children's schooling depending on the stage of demographic transition, as well as other social contextual factors. These studies suggest that the relationship between family size and children's education is negligible or even positive in the context of overall high fertility; while it becomes either negligible or negative in the context of low fertility regimes (Marteleto & Souza, 2012; Razzaque et al., 2007).

In the context of lower fertility, the benefits of reductions in family size appear to disproportionately benefit girls' education (DeGraff et al., 1996; Marteleto & de Souza, 2013; Bhat, 2002; Allendorf, 2012; Razzaque et al., 2007; Wu et al., 2012; Gipson & Hindin, 2013). In some cases, the result of this is a reverse gender gap in schooling, such as in the Philippines. In a study examining the role of family size, birth order and sex composition on education, the strongest negative effect was on higher birth order boys (DeGraff et al., 1996). In a more recent intergenerational study of the relationship between maternal aspirations, fertility and schooling in the Philippines, findings suggested that while there was an inverse relationship between maternal aspirations for schooling and family size, the effects were no worse for girls, who overall had higher educational attainment levels than their male counterparts (Gipson & Hindin, 2013). Similarly, in Iran, where fertility declined from a TFR of 7.0 in the early 1980s to a remarkable TFR of 1.8 children by 2006, women's admission to post-secondary education surpassed men's by 1998 and gender gaps in literacy had all but closed by 2006 (Erfani, 2012). Moreover, married women using modern contraception to delay childbearing were more likely to continue their studies following marriage than those who did not use contraception, suggesting that delayed childbearing within the context of lower fertility has afforded women an opportunity for continuing education even after marriage (Erfani, 2012).

In other contexts, the gender gap in schooling has narrowed but not yet reached parity. Wu and colleagues examine the relationship between sibship size and education in one such case, China, arguing that fertility decline and family size is to a large extent exogenous to decisions about schooling given the State-led One Child policy. They use data from 2006, disaggregated by birth

cohort and sibship size at age 10, to predict schooling attainment, assessing the influence of gender, sibship size and the gendered effects of sibship size over time. While overall girls were more disadvantaged in schooling than boys, the gendered effects attenuated over time, and were both much smaller (from 1.3 years less school to only 0.3 years less school) and no longer significant in the youngest birth cohort. In addition, while overall, the effect of sibship size on educational attainment became more significant over time (reflecting at least in part that disadvantaged households were often more likely to be permitted to have more than one child) the effect of sibship size on girls' education decreased over time, and was no longer significant in the youngest cohort. Wu and colleagues suggest that with the One Child policy in place parents are likely to invest in education, regardless of the sex (Wu et al., 2012). This supports Allendorf's conceptualization of the relationship between sibship size and sex composition. In her work, drawing from in-depth interviews and ethnographic research in a small village in Darjeeling, India she described a series of shifts in the value of daughters within the household in a post fertility transition context. Among other findings explored below, Allendorf observed a shift in emphasis placed on human capital investments in daughters, explained in part by the benefits that daughters increasingly bring to parents in their old age, where this was once anticipated only from sons.

Fertility Decline and Shifts in Gender Roles and Norms in the Domestic Sphere

In this section we review the limited literature that delineates pathways between fertility decline and women's lives within the domestic sphere, that is, the family and household. We focus on the relative position, status and roles of daughters as compared to sons within the family, as well as the community or societal-level norms that shape gender roles and power in the domestic sphere.

Work at the intersection of gender and demography suggests that women's empowerment or gender equality may move in different directions in the 'public sphere' as measured by changes in women's employment and education, versus the 'domestic sphere' as measured by women's roles and power within household relations. Also, post-fertility decline gains for women in their lives outside of the domestic sphere do not presuppose improvement in all domains. In fact, there are important differences between gains to women's lives in the public sphere as compared to the private or domestic sphere and how these may be influenced by changes in fertility behaviors (Lappegard & Thomson, 2012). Specifically, women's position may improve in the public sphere long before entrenched gendered norms at the household level and within marital systems change.

In addition to the difference between women's roles in the domestic and public realms, our emphasis on examining separately the effect of fertility decline on different domains of women's lives and gender equality recognizes the multi-dimensionality of gender equality and empowerment (Basu, 1999; Malhotra, Vanneman, & Kishor, 1995). To analyze fully this multi-dimensionality, we would need to also examine the temporality and sequence of change in different domains, since some aspects of gender equality (such as greater access to education and employment) may well improve much earlier than others (such as changes in the value of daughters as compared to sons; or wives' household bargaining-power). However, a longstanding limitation of analyses of the relationship between gender and demographic change is the lack of longitudinal data available to fully measure changes in gender systems or related indicators, such as gender roles, power or norms (Mason & International Union for the Scientific Study of Population, 1995).

Also, very few surveys that allow for a rigorous analysis of demographic change use validated measures of women's agency or autonomy; and fewer still do so over time in a reliable fashion that can facilitate time-series analyses. While the ICRW Fertility & Empowerment Network case study project set out to examine the effects of fertility decline on empowerment measures including women's agency, or household bargaining power, many of the case studies had to turn to measures of education or labor force participation and assess these relationships instead due to these data limitations. Below we provide a review of the studies that have addressed any changes to women's position in the domestic sphere that may have resulted from demographic change.

Some of the earliest work examining the influence of fertility decline on women's position within the domestic sphere did not illustrate positive findings, but rather the possibility that fertility decline could exacerbate existing gender inequalities, as noted above with respect to increasingly male-skewed sex ratios at birth. This work also illustrates the multi-dimensionality of women's position as well as the importance of time since transition when drawing conclusions about the effects of fertility transition on women's lives.

There are also promising findings that have begun to emerge. In her case study of Darjeeling, India, Keera Allendorf relied mainly on an observational study alongside 30 semi-structured interviews and supplemental secondary data analysis to examine the consequences of fertility decline on the family in this region (Allendorf, 2012). As described above, Allendorf explains that one effect of fertility decline will be a change to the sex composition of many families, namely, and most

importantly, the likelihood that there will be more families with only daughters and no sons. She purports that this change in sex composition could arguably prompt a series of changes in the roles of girls as compared to boys in the household, or in the roles that girls are invited to play. Through conversations with three generations, she finds in Darjeeling that the value of daughters has increased over time, and secondary data supports her assertions. A pathway from fertility decline-mediated by a change in the sex composition of children- to increased investment in and value of daughters, emerges. Daughters are sent to school, and daughters have become increasingly relied upon, and appreciated, for their care of their parents in old age; a trend not expected or structured in patrilineal and patrilocal societies where sons would remain in the home and care for their parents while daughters would leave to marry and be expected to care for their in-laws.

A similar study from Bangladesh relying on secondary quantitative data and two waves of qualitative data, separated by over two decades, but in the same regions, offers similar findings (Amin & Mahmud, 2013). Amin and Mahmud found that while mothers expressed some daughter aversion in the earlier wave of data collection, this had largely dissipated in more recent data collection (2013). One issue mothers raised was the changing expectations around old age support from daughters as compared to sons. Mothers expressed a growing concern in how reliable and trustworthy their sons would be in providing for them. Amin and Mahmud trace a series of pathways from fertility decline to this change in the value of daughters that operate through changes in expectations of women as wage earners, increased investments therefore being made in daughters' education (as well as significant public investments in girls education), and finally shifting expectations in marriage systems and old age support. These findings together with the reduction in gender gaps in early child survival indicate very positive changes to women's lives in Bangladesh; however, Amin and Mahmud caution these positive changes are not universal- violence, early age of marriage and dowry practices have not improved over time (2013).

The findings from a historical case study of the southern state of Tamil Nadu, India are more mixed with respect to any changes in marital and gender systems in the wake of steep fertility decline. In this study drawing from multiple sources of data, the authors found that while there were improvements to girls' education over time, and a closing of the gender gap in post-secondary education, these public gains were not matched with private or domestic ones that were as clear. The anticipated shift from quantity to quality of children with fertility decline as per the Wealth Flows theory was emphasized among key informants, but the burden to produce such high quality children fell on women, who were expected to invest time in their children's education at home.

Demands on their childrearing time thus became qualitatively, but not necessarily quantitatively different. This pattern may contribute to the relatively small gains, especially for urban, educated women, in women's employment. The authors also found that marital systems have shifted in ways that carry mixed results for women. While there has been a rise in companionate, love marriages, there has been an accompanying rise in dowry, as marriage moved from an emphasis on kinship as a criterion for suitable marriage to an emphasis on higher education and employability of a spouse, where dowry helps to secure the union. Finally, these unions seem to have no less likelihood of domestic violence than they did in the past (Pande et al., 2012).

The case of China is again compelling given the external forces impacting on fertility levels. Unfortunately, there remains little research that explicitly examines the gendered impact of fertility decline (apart from the issue of sex ratios). A study of the relationship between women's status and fertility behavior in China conducted in the late 1990s led to mixed findings suggesting that in some regions access to contraception and reduced fertility levels may have impacted on women's autonomy and lowered preference for sons; however this varied by region, and corresponding economic and socio-cultural background (Hardee, Xie, & Gu, 2004). One more recent ethnographic study addressed the unprecedented gains made by urban-dwelling singleton daughters within the context of the One Child Policy; and provides strong support for how such daughters have begun to shake the foundations of patriarchal gender systems- largely through higher education, access to high paying positions and provision of old age support to their parents (Fong, 2002). Like the Darjeeling and Bangladesh case, this suggests the prospect for shifts in assumptions around gender and post-marital filiality to parents, and holds promise for continued increases in the value of daughters. Of course these studies do not address the demographic evidence for continued son preference at a societal level, measured in the perverse sex ratio at birth of 121.5 in as recent as 2010 (Kabeer et al., 2013). Therefore, the caveat must be stated that these promising changes exist thus far for those parents who are willing to birth and raise a girl.

DISCUSSION

Our review provides a fairly robust assessment of the relationship between fertility decline and women's and children's health; women and girls' education; and women's participation in the labor force. Due to a dearth of data, however, we have not been able to present as strong an assessment of the effects of fertility decline on women's political participation or engagement; women's position within the home; gendered norms and roles; or the value of daughters as compared to sons within the family. These data limitations are a big concern. While DHS studies occasionally include

modules on issues such as gendered attitude scales, or women's autonomy, the data from these studies are arguably not conducive to measuring women's agency in every context around the world (e.g. arguably poor measures for sub-Saharan African context (Upadhyay & Karasek, 2012), nor are they often measured in a consistent manner over time, rendering any time-series analyses all but impossible. These limitations further constrain forward movement of the field of gender and population, limiting us from better and more completely understanding the relationship and pathways between these processes. That said, in order to grasp an adequately complex understanding of how gender roles and norms have shifted over time, qualitative data collection is absolutely crucial. The studies featured in this review all provide rich detail.

In addition, the use of data on health, education and work to assess any changes in women's lives resulting from fertility decline has still been highly informative. However, these findings do necessitate further consideration and interpretation toward understanding in what ways and to what extent they have benefitted women's lives. We turn to assessing the specific meaning of our findings by outcome category below.

Are Changes to Women's Lives Welfare Enhancing, Empowering or Transformative?

Health

There is significant evidence that fertility decline has indeed contributed to improved maternal health and decreased maternal mortality across countries in the developing world. Studies also suggest that fertility decline has contributed to girls' absolute health and well-being. The mechanisms whereby these relationships occurred reflect the mechanistic or welfare-enhancing role of fertility decline, rather than empowering or transformative roles.

Our review of the literature from South and East Asia, however, shows that a more complex and less equitable gender dynamic is at play with regard to fertility decline and gender differentials in health and mortality. In these countries, at a societal level, fertility decline may actually exacerbate gender inequality in child health and survival, resulting in sex ratios at birth and in early childhood that are skewed against girls. The mechanism for this is far from mechanistic; rather, it reflects the inability of fertility decline in its initial stages to change gender norms. Persistent son preference pressures parents to realize their desire for one son within a smaller family by intensifying their anti-daughter efforts. As these countries progress towards the later stages of fertility decline, however, studies find that sex ratios at birth and in early childhood have begun to reverse (Kabeer et al., 2013); (Das Gupta et al., 2009). The mechanism here is one of transformation, via

intermediate factors such as female education, changes in girls' and women's employment opportunities and resultant shifts in the value of girls. In other words, as fertility declines intensify, the very contextual factors that contributed to this drop in fertility mediate the fertility-gender inequality relationship by facilitating an environment where gender norms can shift.

Employment and Education

Despite the conflicted relationship between fertility or childbearing and work, the results of our review of the literature point to a growing number of large, multi-country rigorous studies indicating that fertility decline has impacted positively on women's labor supply or employment at the macro-level and at the micro- or individual-level. That said, heterogeneity in these findings remains in part due to variations in the specific outcome being tested (e.g. employment vs LFP) and in part (where relevant) due to differences in the instrument being used to exogenously measure fertility effects.

What do these findings actually mean for women's lives? For that we must rely on smaller case studies that can examine this relationship in context. Case study findings are especially revealing when viewed alongside educational achievements for women in the same context. For example, the case of Tamil Nadu is rather paradoxical. Education levels have increased for women within the context of fertility decline, both in urban and rural areas, but older, more rural women have seen more gains in employment than have young, urban women. Similarly, the Tehran case study examining 'educational improvement' after marriage is interpreted quite differently once learning that women's LFP in that context has hardly moved during the same time in which educational achievements have seen very steep gains. Both these examples illustrate how a rise in education does not automatically move alongside a rise in employment for educated young women. These studies underline that the gendered normative context that preceded and may endure throughout fertility decline matters in assessing the role that fertility decline can play in women's lives. Another example of this is from Southern Europe, where some have argued that persistent gendered norms and divisions of labor in the home have led to very low fertility levels, as women struggle with double standards that expect them to work but also continue their responsibilities in the home, or exist within contexts that negatively socially sanction mothers who work (Rindfuss et al., 2003).

However, the case of Bangladesh offers a different perspective, where transformations to education and labor force participation for women alongside fertility decline seem to have resulted in real

transformation to the value of daughters within the home. As described in (Amin & Mahmud, 2013), despite a strong patriarchal system structured against women's work outside the domestic sphere, women began to engage in wage labor (arguably by driven poverty). As fertility declined and women had more time to invest in wage labor, they continued to gain autonomy, mobility and economic independence unheard of only decades before. The result of sustained fertility decline, women's increased participation in the paid labor force, alongside significant public sector investments in girls (and boys) education, have together begun to transform gender relations in Bangladesh (Amin & Mahmud, 2013).

It is important to also interrogate what we mean by labor supply or labor force participation (LFP) and therefore what increases in these measures might mean for women. As described above, the case study from South Africa finds a significant relationship between community fertility levels and women's LFP. However, as the authors note, LFP does not equate with employment, as it does in Bangladesh, let alone formal, stable, well-remunerated employment. Pande et al's Tamil Nadu study also notes that as employment possibilities have risen for women following fertility decline (and economic development), perhaps rather than empowering them, this shift has created a double burden of productive and continued reproductive responsibilities. Observing an increase in women's LFP does not automatically imply an empowering process. It may very well, rather, indicate that women are being stretched both in and out of the home, and are struggling to make ends meet through informal, part-time and low-paid jobs. Studies reporting on gains to women's labor force participation need to consider more closely the meaning of such findings for women's lives, particularly in low-income settings where unemployment for full-time, permanent positions is often high. Data that carefully assess different types of employment or occupational categories alongside fertility would be a welcome addition to this subject area in order to provide a clearer understanding of these relationships. The need for better employment measures alongside demographic ones has been noted for some time (Lloyd, 1991).

The findings on education suggest that as fertility declines, the causal relationship between fertility and women's education reverses; namely, at the beginning of fertility transition, education levels predict the timing and extent of childbearing, while within a lowered fertility regime, fertility levels (measured through family size) predict girls' education. There is now a substantial body of literature that provides fairly strong evidence for a negative relationship between family size and girls' schooling, particularly within the context of low fertility regimes. These findings support the

assertion that fertility declines may disproportionately benefit girls' as compared to boys' schooling. This then begs the question as to the significance of this finding for women's lives.

Overall, the findings suggest that gains to women's education alone will not result in transformations to gender systems, but such gains are likely prerequisites for any radical transformation to take place. As has been very clearly established, women's education is associated with a number of critical improvements in women's lives and the lives of their children; and is probably the most important determinant of women's empowerment in a number of dimensions and domains. However, our findings here suggest that education – particularly post-primary education - is more likely to be empowering if it is accompanied by expanded choices for women in terms of quality employment and a more gender equitable distribution of responsibility in the home. That is, when education is accompanied by other changes that increase a woman's ability to control her own destiny, education can indeed play a powerful empowering role (Kabeer 2005; [Malhotra, Pande, & Grown, 2003]). Many of the studies reviewed here, including case studies from South Africa; Darjeeling, India; Bangladesh; China; and the Philippines, suggest that such processes are at work in these contexts.

However, education does not always equate with empowerment, particularly in contexts where gendered expectations continue to hinder women's progress in accessing positions within the formal labor market (e.g. Tehran, Iran; or Egypt and other MENA states), or when pressures around the domestic sphere continue to weigh heavily on women (e.g. the Tamil Nadu case).

The family system and gender roles and norms in the household

Given limited data allow for an examination of the relationship between fertility and gender norms and roles in the domestic sphere, there is thus far only weak evidence on this relationship. Given the outcomes of interest reflect value systems, these data are highly contextual and at times difficult to quantify. Studies that do assess the relationship between fertility and gender norms and roles likely require multiple forms of data collection, such as the mixed-method Darjeeling, India case study (Allendorf, 2012), or the Bangladesh case study (Amin & Mahmud, 2013) in order to adequately assess value systems and changes in those systems. This set of topics would also benefit tremendously from inclusion of the male experience and perspective.

The gap in our knowledge of the influence of fertility decline on gender systems in the domestic sphere is quite wide, and begs further in-depth research. What our small sample of studies that try

to address this gap show is that fertility decline may trigger improvements in education, health, and employment much sooner and more quickly than for more entrenched gender systems. In other words, women's opportunities in the public spheres of their lives change more easily with fertility decline than do women's roles in the private realm of marriage and family. Over the long run, women's lives are likely to be further improved and transformed only when changes in the public sphere (e.g. education, employment or political participation) are matched by changes in the private sphere (e.g. household roles and responsibilities, marital systems). As Malhotra (2012) notes, perhaps the lack of observed transformations in the private or domestic realm reflect the fact that not enough time has elapsed after fertility decline, and that these changes may well occur as time goes on. In addition, our findings underline the importance of the pre-existing gender system in determining outcomes for women's lives (Basu, 1999; Kabeer et al., 2013). In other words, the extent to which fertility may be impacted by (or impact upon) women's status is highly dependent upon the gender system in place in a given context prior to fertility decline and if, in what ways, and to what extent it shifts with decline (Basu, 1999; Mason, 2001).

CONCLUSION

Throughout many low and middle-income countries, fertility has declined substantially over the last forty years. In addition, women's educational levels, insertion in the labor force and status as measured through a range of empowerment indicators (e.g. Gender Development Index, Gender Empowerment Measure) (Alexander & Welzel, 2011) have also improved. In this paper, we summarized the literature examining the extent to which fertility declines experienced in the last four decades have benefitted women's lives, a review grounded by studies conducted for the Fertility & Empowerment Network Case study project. We conceptualized three ways in which fertility decline might benefit women: through improving women's and girls' well-being; through empowering women; and through transforming gender systems. We also suggested that improvements in well-being, measured either through changes for women's lives or changes in gender inequalities, will likely occur earlier in the fertility transition than transformations to gender systems which would occur later in the transition.

Our findings suggest that women and girls' well-being have been improved as a result of fertility decline in important ways, including reductions in maternal morbidity and mortality, and improvements in girls' nutrition and survival. These changes are mainly mechanistic improvements in well-being. An exception is gender equality in child mortality, which first worsened with fertility decline, but now appears to be improving, perhaps indicative of gender

transformation in progress. Also, a set of recent studies have begun to build a strong evidence base indicating that fertility declines influence increases in women's labor supply (Lee-Rife et al., 2012; Bloom et al., 2009; Stoebenau et al., 2012) and employment (Schultz, 2009). While on the whole, these findings likely contribute positively to women's lives, still, the extent to which women's increased entry into the labor force may be empowering, or even, arguably, improve their well-being, depends on the context, the reasons for women's insertion in the labor force, and the type and conditions of employment.

In addition, a growing body of literature supports the assertion that fertility decline - via reductions in family size and changes in the sex composition of children - has led to increases in girls' education in absolute terms and relative to boys' education. These findings are important and speak to broader improvements in gender equality in the last few decades in much of the world. These findings should, however, be interpreted both alongside family systems and the role that girls' education plays in these, as well as alongside an understanding of the extent to which and level at which women can participate in the labor force. While women's increased labor supply may be among the first consequences of fertility decline, it may be only in the following generations, through investments in girl child education that we observe meaningful changes in the kinds of work women can and do pursue.

There is less evidence to support an impact of fertility decline on changes in women's status within the private sphere. While a few studies have used in-depth analyses and unique approaches to reflect on these relationships (Allendorf, 2012; Pande et al., 2012; Yong, 2002), the field is limited by a lack of appropriate data. It is therefore difficult to make claims about the extent to which fertility decline has played a role in any observed changes in gender roles at home. In addition, changes in women's lives in the domestic sphere, and in related gender systems (i.e. marriage, kinship systems, status within the household) are tied up with deeply entrenched gender social norms that may take longer to shift than opportunities outside the home. More research is needed that draws from multi-method study designs, or where feasible longitudinal study designs; that can contribute to our understanding of the relationship between fertility decline and changes to family systems over time; can capture men's perspective on this relationship; and can add to the body of work from regions outside of South and East Asia.

Overall, our findings suggest that as fertility rates continue to fall, benefits to women's lives may be constrained unless policies can catalyze changes in gender norms and systems within and outside

the domestic sphere. Shifting gendered norms and systems is complex, but by starting with changes in policies related to family laws, property rights, inheritance rules and child care policies, for example, it can take place. The seeds for change exist. Political will and smartly-designed gender-sensitive programs can help ensure a transformation of gender roles and norms that will enable societies to reap the full benefits of fertility decline, including the empowerment of women.

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