

Preventing More “Missing Girls”

A Review of Policies to Tackle Son Preference

Sneha Kumar

Nistha Sinha



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Abstract

In parts of Asia, South Caucasus, and the Balkans, son preference is strong enough to trigger significant levels of sex selection, result in the excess mortality of girls, and skew child sex ratios in favor of boys. Every year, 1.8 million girls under the age of five go “missing” because of the widespread use of sex selective practices in these regions. The pervasive use of such practices is reflective of the striking inequities girls face today, and it also has negative implications for efforts to improve women’s status in the long term. Consequently, governments of countries in these regions have employed direct measures, such as banning the use of prenatal sex selection technology and providing financial incentives to families that have girls. This paper takes stock of the direct measures used across countries grappling with

skewed child sex ratios and compares the efficacy of direct measures with measures that indirectly raise the value of daughters. The stocktaking suggests that there is no conclusive evidence that direct approaches reduce the higher mortality risk for girls. Bans on the use of sex selection technology may inadvertently worsen the status of the very individuals they intend to protect, and financial incentives to families with girls offer short-term benefits at most. Alternatively, indirect measures, such as legal reform to promote gender equity and advocacy efforts, offer more promise by bringing about permanent shifts in the relative value of daughters. The stocktaking also underscores the paucity of causal studies in this literature.

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Preventing More “Missing Girls”: A Review of Policies to Tackle Son Preference

*Sneha Kumar*¹

*Nistha Sinha*²

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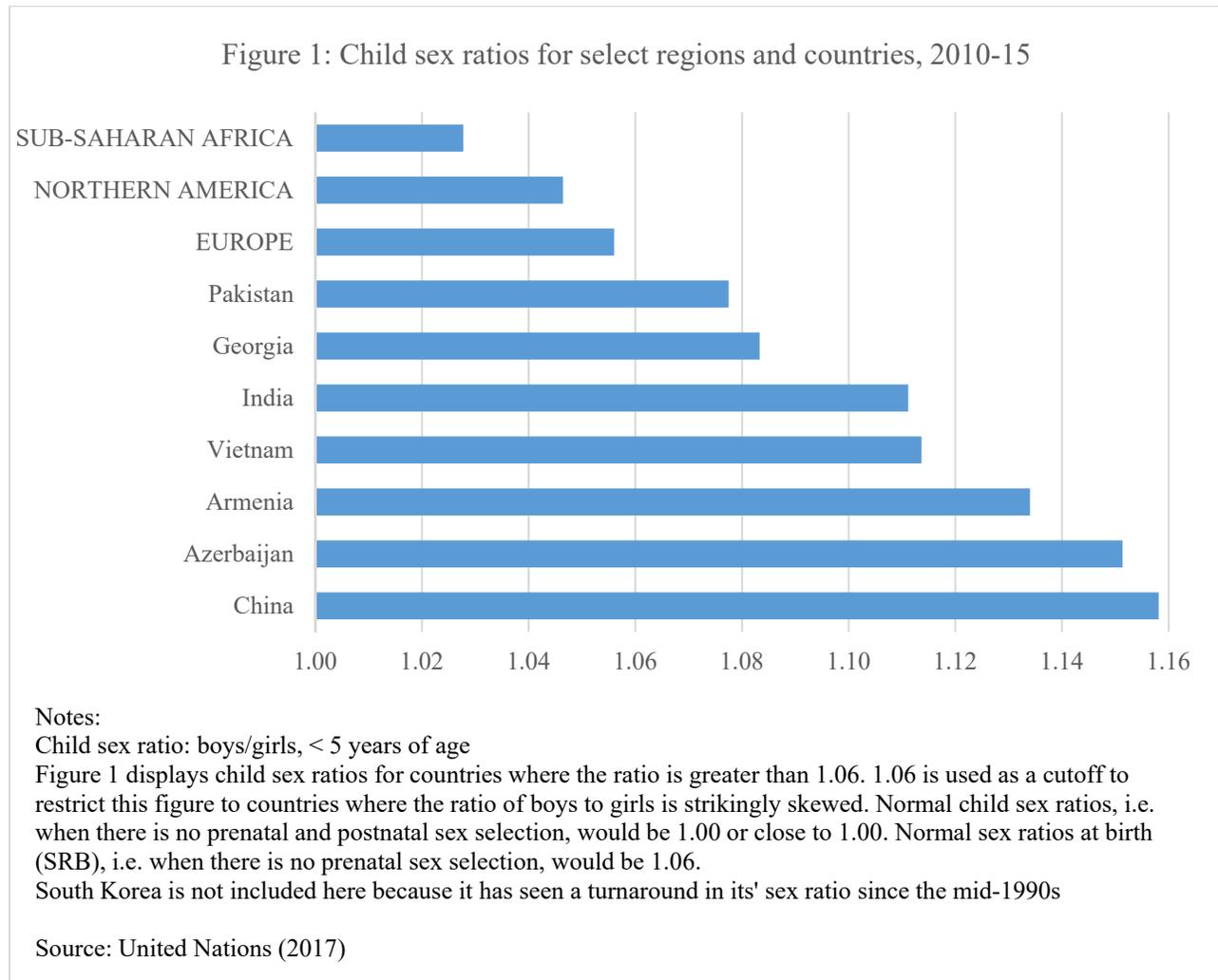
¹ PhD Candidate, Department of Development Sociology, Cornell University (Email: sk2586@cornell.edu)

² Senior Economist, Poverty and Equity Global Practice, World Bank (Email: nsinha@worldbank.org)

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1. Introduction

In parts of Asia, South Caucasus, and the Balkans, son preference is strong enough to trigger substantial levels of prenatal and postnatal sex selection, result in the excess mortality of girls, and skew child sex ratios in favor of boys (see Figure 1). Every year, an estimated 1.8 million girls under the age of five go “missing” because of sex selective practices widely adopted in these regions (The World Bank 2012).³ This is almost as if the entire female population of Los Angeles, California, vanishes annually.



While excess girl mortality has been documented in countries like China; Taiwan, China; India; and Pakistan since the early twentieth century (Visaria 1971; DasGupta & Li 1999), it is a more recent phenomenon in countries like Albania, Armenia, Azerbaijan, Georgia, Vietnam, and Nepal. In Albania, it has been noted since the 1970s. In the South Caucasus, it has been noted since the 1990s, following the collapse of the Soviet Union. In Vietnam and Nepal, it has been noted since

³ Across all regions in the world, 2.04 million girls go “missing” annually.

the late 1990s and early 2000s (United Nations, 2017). The Republic of Korea, like some of its Asian counterparts, witnessed an excess of boys over girls for several years as well; however, since the mid-1990s, they have managed a turnaround on this front (Chung & DasGupta 2007; Guilmoto 2012a).

In the last four decades, the availability of prenatal sex diagnosis, coupled with access to abortion methods, has allowed couples with strong son preference to sex select before birth, and more effectively achieve their desired sex composition of children (Bongaarts & Guilmoto 2015; The World Bank 2012; Guilmoto 2012a). Between 1980 and 2015, the sex ratio at birth (SRB) – number of male births per female birth – in some countries increased from 1.07 to over 1.15 (United Nations 2017), representing a stark departure from the biological norm of 1.06 that would be seen without prenatal sex selection. Prenatal sex selection also accounted for an increasingly significant portion of the total missing girls during this period (Bongaarts & Guilmoto 2015).

Not surprisingly, bans on prenatal sex selection technology have been one of the most widely used measures by countries trying to curb the excess mortality of girls. Bans are a common legal tool used by governments to restrict socially “undesirable” behavior, and promote social equality (Sunstein 1994). Bans against child labor, discriminatory hiring, and underage drug-use are all examples of prohibitive legal measures that seek to protect vulnerable and/or discriminated groups, much like bans against the use of prenatal sex selection technology.

It is important to note, however, that prenatal sex selection is only one of the pernicious ways in which son preference manifests. Son preference can also trigger a range of postnatal sex discrimination strategies from infanticide, to abandonment, to differential care during infancy and early childhood. These strategies were the primary cause for the excess mortality of girls before the 1980s, and they continue to be used by parents who prefer sons, but do not have the financial means to access prenatal sex selection methods. Estimates by the United Nations (2011) suggest that in China and India in the 1990s and 2000s, infant mortality (probability of dying between birth and age 1 year) and child mortality (probability of dying between age 1 and age 5 years) was higher for girls than for boys, contrary to the biological norm.⁴

From a policy perspective, sex selection – before or after birth – is cause for concern. While restrictions on prenatal sex selection particularly raise ethical concerns surrounding reproductive choice and abortion, what is strikingly clear is that prenatal (and postnatal) sex selection are stark indicators of the dismal status and systematic devaluation of girls and women today. In the long-run, as the excess of boys translates into the excess of men, these gender inequities are likely to be reproduced. Natural experimental evidence from Grosjean and Khattar (2015) suggests that today, in communities that were historically male-biased, people are less likely to favor women’s economic independence and empowerment. Marriage homogamy (on cultural grounds), and the

⁴ When boys and girls have similar access to resources and care, girls have a survival advantage over boys. As overall mortality declines during the epidemiological transition, this female survival advantage during childhood increases. In the case of India and China, however, the male to female ratio of child mortality (probability of dying between ages 1-4) is less than 100, indicating excess female child mortality. In countries without documented son preference, the sex ratio of child mortality is more than 100 (see United Nations 2011).

intergenerational transfer of gender norms resulted in the persistence of gender inequity in these communities.

Some could argue that prenatal sex selection is preferable, because when available and accessible, it can substitute for postnatal discrimination, and thereby improve the welfare of girls born (see Table 1 for overview; also see Goodkind (1999)). Yet, estimates suggest that this substitution is not perfect: Anukriti et al. (2016, p.22) find that for “every girl that survived due to ultrasound technology, five girls were aborted before birth.” Furthermore, given that families with higher socioeconomic status (SES) are more likely to use prenatal sex selection, the “average girl born post-ultrasound (relative to pre-ultrasound) is more likely to be born into lower SES families” (ibid, p.4; also see Bhalotra and Cochrane (2010)). This distributional pattern lowers the probability of convergence in outcomes for boys and girls in the long-run.

The other problem associated with the excess mortality of girls is the “marriage squeeze”. A shortage of girls can lead to a decline in the number of potential marriage partners for men in the future, particularly in countries with low fertility (Park & Cho 1995; Guilamoto 2012b). This demographic scenario can have various negative ramifications. Violence against women can increase as they can be abducted and forced into marriage (Banister 2004; Chao 2005), or trafficked from other countries to meet the local shortage of brides (Duong et al. 2007; Prakash & Vadlamannati 2014; Blanchet 2005). Brides who are consensually bought from other countries can also face difficulties as they are at higher risk of isolation, marital discord, and domestic violence (Kim 2010; Williams & Yu 2006; Chowdhry 2005; Kaur 2013). Men can be vulnerable in this scenario too. With the shortage of brides, and hypergamic marriage patterns, young males living in rural areas and poorer provinces are likely to remain bachelors, and go on to lack spousal support during old-age (DasGupta et al. 2010; Edlund 1999). Some causal evidence suggests that as competition for brides increases, households with sons are likely to increase savings and men are likely to take on entrepreneurial activities to improve prospects in the marriage market (Wei & Zhang 2012; Chang & Zhang 2012). These shifts in household and individual behavior, while encouraging from an economic perspective, entail competitive processes to secure a bride that further marginalize and exclude men with lower SES. The negative ramifications spill over to broader society as well. For instance, Edlund et al. (2013) estimate that masculine sex ratios and adverse marriage market conditions are responsible for one-seventh of the rise in violent and property crime in China between 1988 and 2004.

To be sure, there is a growing body of literature that argues that the marriage squeeze can have positive implications for females. It can result in an increase in bride price relative to the dowry (Francis 2011), improve certain dimensions of women’s bargaining power (Porter 2007; Edlund et al. 2013), and improve the welfare of male and female children born (Porter 2007; Francis 2011). Yet, this does not negate the importance of policies to tackle skewed child sex ratios and son preference today. The evidence on the impact of the marriage squeeze is mixed at best, so “the hope for an eventual, demographically induced evening of gender relations should not divert attention from the injuries of gender that are being inflicted today” (Greenhalgh & Li 1995, p.637).

Given these concerns, governments face a strong impetus to act. As highlighted above, most countries with an excess of boys over girls have already banned the use of prenatal sex selection technology. Another direct approach that has been tried in some countries is to provide financial incentives to families to discourage preferential treatment of sons and increase investments in daughters. The question that follows is whether these direct measures are easy to implement and

effective in reducing the overall number of missing girls. Or are indirect measures that target the root cause of sex selection – son preference – more effective in improving girls’ survival prospects and life chances?

This paper seeks to answer these questions by reviewing governmental and non-governmental interventions that have been used to resolve the problem of missing girls. The purpose is to leverage cross-country experiences (especially from China, India, and Korea, which have been grappling with this problem for decades) to strengthen the evidence base of measures aimed at reducing sex selection and son preference, and identify which measures have worked/not worked and why. The stocktaking draws on experimental and quasi-experimental studies where available; in lieu of causal studies, it draws on qualitative and correlation-based studies.

Many of the countries that have substantial sex selection are starting to see reduced levels of it. However, they have not reached the normal SRB and child sex ratio yet. This review provides an overview of the measures that can be used to accelerate normalization of these ratios and improve parents’ investments in girls.

The structure of this paper is as follows:

Section 2 looks at the underlying cause and mechanisms of sex selection, i.e. it outlines the demand-side and supply-side factors driving sex selection;

Section 3 assesses the direct measures that have been taken to reduce sex selection – namely the ban on prenatal sex selection, and the conditional cash transfer programs to induce families to have girls, and invest in girls;

Section 4 assesses the indirect measures (legislative reforms to dismantle patriarchal practices, and advocacy efforts) that can be used to tackle the underlying cause of sex selection: son preference;

Section 5 is a case study of Korea’s success story;

Section 6 concludes with a summary of the most promising approaches that can be used to reduce sex selection, and son preference more broadly.

2. Sex Selection: Causes and Mechanisms

2.1 Causes

The entrenched preference for sons over daughters is the root cause of sex selection. Countries that do not have strong son preference, do not practice sex discrimination, even if they have access to sex selection technology. Therefore, long-term success in normalizing SRB and child sex ratios is only possible when the cause(s) of son preference are understood and eradicated.

Son preference can arise because daughters provide lower economic returns than sons, making the relative cost of investing in girls higher, or it can arise due to cultural practices that raise the

perceived value of sons, irrespective of their economic value to parents. Across contexts, the common practices associated with son preference are patrilineal inheritance (inheritance through the male line) and patrilocal residence (co-residence with husband's family after marriage). The more rigid these traditional kinship systems are, the less opportunity there is for girls to be valuable to parents. In these systems, sons cultivate the land, serve as primary care-givers for aging parents, and eventually inherit the land. Alternatively, daughters care for their in-laws after marriage. A daughter's productivity is perceived as belonging to her husband's household, and she is therefore deemed to be of little/no value to her parents (DasGupta et al. 2003; DasGupta 2010; Dyson & Moore 1983).⁵

Traditional kinship systems that undermine the value of daughters versus sons are seen in all countries that have substantial sex selection. China, India, Korea, Albania, Vietnam, and the South Caucasus countries all have pre-industrial kinship systems that value sons more. As a reference, there are plenty of English language ethnographies of Asian kinship patterns (for China, India, Korea, see DasGupta et al. (2003); for Vietnam, see Guilmoto (2012c)). While English language ethnographies for South Caucasus are limited, the few studies that exist clearly document the predominance of male kin (Hayet 2002; Dragadze 1988; Ishkanian 2003). Moreover, recent qualitative studies in the South Caucasus region also illustrate the persistence of rigid patrilineal kinship systems. These studies find that for families in South Caucasus countries, sons have economic and symbolic value, that having a son is a source of security for mothers and a source of masculine affirmation for fathers, and that daughters, while helpful, are not as beneficial in the long-term as they prioritize their in-laws after marriage. While younger women in these countries are more likely to assert their desire to be economically productive, support parents after marriage, and inherit family property from their parents, there is still an overriding preference for sons (Yüksel-kaptanoğlu et al. 2014; Dudwick 2015).

The specific regions of the referenced countries above that have relatively higher levels of co-residence with sons are more likely to have higher levels of sex selection as well. For example, parts of north Vietnam have higher rates of co-residence with sons than south Vietnam, and correspondingly, north Vietnam has higher levels of sex selection than south Vietnam (UNFPA Vietnam 2011; Guilmoto 2012c). The persistence of these cultural norms could also explain why first-generation Chinese and South Asian immigrants in the West also tend to practice prenatal sex selection (Almond et al. 2013).

Comparisons with societies that have family structures that allow daughters more opportunities to contribute to parental households is also illustrative. For example, parts of Southeast Asia that have bilateral kinship systems also have normal child sex ratios. In bilateral kinship systems, sons

⁵ A recent study by Bhalotra et al. (2016) finds further support for the relationship between male-biased inheritance rights and sex selection as they examine how *changes* in land rights impact child sex ratios. By exploiting variation in the creation of land rights by Operation Barga in the Indian state of West Bengal, Bhalotra et al. (2016) find that an increase in rates of tenant registration was associated with relatively higher survival prospects for boys particularly in families where the first-born was a girl. They argue when land rights are inheritable and primarily inherited by sons, there is an increased motive to sex select and ensure the survival of sons (because sons cultivate the land and provide support during old-age).

and daughters have equal rights to inherit family property, and equal responsibility in caring for elderly parents. The system does not exclude daughters from being of value to parents, so there is no reason for parents to sex select (DasGupta et al. 2003; DasGupta et al. 2017; Guilmoto 2012c).

While son preference is the root cause for sex selection, there are several factors that can increase the pressure to sex select among those who have a deep-seated preference for sons. One such factor is the number and sex composition of existing children in the family. The probability that girls will be aborted or die in the initial years of life increases if they are of a higher birth order, and if none of the previous children were of the preferred male sex. This is particularly the case if the child is expected to be the last birth, and was intended to fulfill the desired sex composition of children (DasGupta 1987; Park & Cho 1995; Duthé et al. 2012).

Another factor that raises pressure to sex select is the small family size norm. In a high fertility context, it is unlikely that couples will end up sonless. However, as fertility declines, the probability of ending up sonless increases. Each additional child has a greater marginal cost, so couples who prefer sons must rely on sex selection (Guilmoto 2009; Jayachandran 2017). Fertility decline increases the pressure to sex select only in contexts where there is an active preference for sons. There are many countries that have adopted the low fertility norm, but have not seen an increase in sex selection.

Economic stress is also cited as a reason for increased levels of sex selection. For example, in China, female child mortality rose above the biological normal during the 1930s wars and 1950s famine (DasGupta & Li 1999). Similar trends can be observed in the South Caucasus countries as well. Under the USSR, there was social and economic protection, high rates of urbanization (undermines importance of male kin groups), and broader measures to promote gender equality. Following the collapse of the Soviet Union, unemployment increased, social protections were withdrawn, and Armenia and Azerbaijan were caught in ethnic conflict. All these sources of instability forced people to ensure the birth of a son for security (DasGupta 2015; Dudwick 2015). The Armenia-Azerbaijan conflict also compounded the need for sons as sons could serve the nation as soldiers (Pinar 2016; Duthé et al. 2012).

Broadly, the cases cited illustrate that economic conditions can force people to sex select because having a son is a means of gaining security. However, it is important to highlight that economic stress forces people to sex select only in contexts where the kinship system reinforces the higher value of sons. As a case in point, while all countries in the Commonwealth of Independent States (CIS) experienced economic disruption following the dissolution of the USSR, only countries in the South Caucasus region experienced rising levels of sex selection following the crisis. This indicates that in the South Caucasus countries, unlike the other CIS countries, male children are the primary source of economic and social support particularly in times when government support cannot be counted on (DasGupta 2015).

2.2 Mechanisms of sex selection

Postnatal sex selection

The more deliberate forms of postnatal sex selection – female infanticide, and abandonment of female children soon after birth – have a long history in parts of India and China (Caldwell & Caldwell 2005; George et al. 1992; Sudha & Rajan 1999). Active efforts on the part of local authorities, non-governmental organizations and civil society to curb these practices, and the availability of prenatal sex selection as an alternative to those who can afford it, have reduced the prevalence of infanticide/abandonment over time (Guilmoto 2012a). However, claims that these practices are disappearing altogether are dubious. Cases of female infanticide or abandonment might not get registered, particularly if the birth and/or death of the infant occurred at home. Li et al. (2004) report that in Shaanxi province, China, excess female infant deaths were noted among those who were born at home and those who died at home, and nearly two-thirds of these deaths occurred within a day of birth. Given the short window of time in which these deaths occurred, it is likely that the birth of the infant was not recorded, let alone the death of the infant. These missing girls, who died within 24 hours of birth, are possibly subsumed in counts of missing girls at birth (DasGupta et al. 2017).

Mortality estimates for the South Caucasus countries also suggest the continued importance of postnatal selection as a form of discrimination. Since the 1990s, estimated mortality at ages 1-11 months has been higher for girls than for boys, contrary to the biological norm, in Armenia and Azerbaijan. In Georgia, the mortality at ages 1-11 months was higher for girls than for boys for children born between 1995 and 2004, but lower for girls than for boys for children born between 2000 and 2009 (DasGupta 2015).

Postnatal sex selection can occur in relatively passive forms as well. This refers to discriminatory attitudes towards female children in various aspects of child care: breastfeeding, immunization, health care access, quantity and quality of food provided, quality of clothing provided, educational investments etc. These forms of neglect do not require much effort on the part of parents, but if practiced in a continual manner, they can result in the excess mortality of girls, and alter the gender composition of children who remain alive (Chen et al. 1981; DasGupta 1987). Li et al.'s (2004) study of excess female infant deaths within one day of birth in Shaanxi is an example of how severe neglect can result in the almost immediate death of an unwanted child. In less extreme cases, continued neglect can result in female children having poorer quality of life than their male siblings and peers (Mu & Zhang 2008).

The most striking differential between girls and boys is seen in health care access (DasGupta et al. 2017). In the cases of India and China, gender differences are observed in the probability that the child is immunized (Pande 2003; Li et al. 2004). In a variety of other contexts, gender differences are observed in effective use of curative health care. That is, parents are less likely to consult a doctor and spend money on treatment when a girl child falls ill (Pokhrel et al. 2005; Hazarika 2000).

Here, it is important to note the selection of girls into the sample for studies on neglect. These girls are likely to have been less unwanted and uncared for than the ones who do not remain alive. The girls who were the most unwanted and neglected would have probably died and exited the sample – we cannot estimate the nature and extent of neglect suffered by these girls without panel data.

Another form of passive postnatal sex selection is differential fertility stopping behavior (DSB). DSB is where couples with son preference continue having children until the desired sex composition is achieved. It is more prevalent in contexts where more than two children per woman is the norm (so couples can afford an additional birth to reach the desired number of sons), and prenatal selection methods are not accessible. With this practice, families that have only girls are more likely to continue childbearing. This can result in girls, on average, being disadvantaged as they would have more siblings to compete with for parental resources (Filmer et al. 2008). Empirical evidence from Rosenblum (2013) and Altindag (2016) suggests that families that practice DSB allocate more resources to sons than daughters once the son is born.

Prenatal sex selection

Medical diagnostic technology, aimed at detecting fetal abnormalities, has inadvertently been used by parents in societies with entrenched son preference for pre-natal sex selection. If available and accessible, prenatal sex selection is a convenient alternative to postnatal sex selection. Prenatal sex identification technology is easy to use (for doctors) and non-invasive (for the mother), especially as it is bundled with modern antenatal health care services. Coupled with abortion methods, prenatal sex identification technology ensures that the desired sex composition of children is met as unwanted female pregnancies can be terminated within the first two trimesters. These methods also provide couples the luxury of making sex selection decisions privately.

Technology to identify the sex of the fetus has evolved rapidly over the last three decades. The initial methods for sex determination – amniocentesis and chorionic villus sampling – required trained medical personnel and involved some degree of risk to the fetus. Since then, however, sex determination technology has become more accurate, accessible, affordable, and less medically invasive. The ultrasound, which became prevalent in developing countries around the 1980s, allowed accurate identification of the sex of the fetus at 12-16 weeks of pregnancy, and was less invasive than previous sex determination methods (Gilles & Feldman-Jacobs 2012; Bongaarts 2013).

The initial users of ultrasonography for fetal sex determination were from the upper and middle class. The rapid diffusion of this technology across socioeconomic groups, and to rural areas, was aided by several factors. Since the technology was less demanding and risky than previous detection methods, it could be used by non-medical personnel in small health units at a relatively low cost. The declining cost of manufacturing the equipment, and the increasing portability of the equipment further reduced the cost of providing ultrasonography services. Entrepreneurial doctors and health care personnel also played important roles in the diffusion of this technology. With the growing density of private clinics across space, these doctors came to recognize opportunities to tap into the latent demand for prenatal sex determination (Guilmoto 2012a).

In recent years, even more effective methods to determine the sex of the fetus have emerged. One of the main drawbacks of using ultrasonography to determine fetal sex is that it requires the mother to wait until the second trimester. However, blood tests that analyze fetal DNA in the mother's blood as early as the seventh week of pregnancy have lately been available. These tests have been found to be 98% reliable and are minimally invasive in that they only require a drop of blood from

the mother. The cost of acquiring the test kits is also low. Test kits can usually be ordered online, or women can take a blood sample at home, and have it processed by qualified labs elsewhere (Devaney et al. 2011; Gilles & Feldman-Jacobs 2012).

While prenatal sex diagnosis is necessary to identify the sex of the fetus, abortion methods must also be available for couples to sex select. In most countries with strong son preference, the availability of abortion services preceded the availability of sex determination technology. However, the use of these abortion services was/is typically restricted for purposes such as when the mother's life is at risk, the case of rape, or fetal abnormalities (Ganatra 2008).

Surgical abortions are the most commonly used abortion method, but they require medical doctors and expensive equipment. Pharmaceutical drugs to induce abortion are available as well, and their use in recent years has increased rapidly. Some of these drugs (e.g. mifepristone-misoprostol) are more effective than others, and there is increasing evidence of their success in inducing second trimester abortions (Gemzell-Danielsson & Lalitkumar 2008; Esteve et al. 2008). However, their availability is restricted in most countries (Bongaarts 2013).

More recent developments in reproductive technology – namely preconception and preimplantation methods – do not require the use of abortion methods to prenatally sex select. Preconception methods involve the sorting of sperm before artificial insemination or in-vitro fertilization. Preimplantation methods involve determining the sex of the embryo before implantation (Bongaarts 2013). Evaluations of preconception sex selection methods by Karabinus et al. (2014) suggest fairly high rates of effectiveness.

3. Direct Measures

3.1 Regulating the Use of Prenatal Sex Selection Technology

Since the late 1980s, several countries have banned prenatal sex determination, and sex selective abortions. Such bans are the most direct policy response to counter skewed SRB. They seek to regulate access to methods that could be used to realize son preference; they do not address son preference itself.

Section A1 in the Appendix outlines the regulations against prenatal sex determination and sex selective abortions in different countries. More broadly, the conditions outlined under these laws can be summarized as follows:

- (1) Health care personnel are prohibited from informing parents of the sex of the fetus (using words or signals), and from performing abortions for sex selection;
- (2) Hospitals and health care units that provide prenatal diagnostic procedures, and abortion services must be registered with public health authorities;

- (3) Prenatal diagnostic equipment used by these health care units, and the medical practitioners who perform diagnostic and abortion procedures must be registered with public health authorities;
- (4) Health care facilities and medical practitioners are required to thoroughly document the use of these technologies, and the medical histories of the patients who require the use of these technologies;
- (5) Advertisement of these technologies on any platform is prohibited.

Penalties for breaking these regulations are imposed on the offending medical practitioners, and at times, on the women or the family members who coerce women into these practices. The penalties typically involve fines, confiscation of ultrasound machines, temporary suspension or possible revocation of medical licenses, and imprisonment. Penalties are higher for repeat offenders. Community members are often offered financial incentives to act as whistle-blowers. Awareness raising campaigns are also conducted to inform and educate individuals and families about the law.

In theory, such interventions can seem effective in tackling sex imbalances as they would make access to and provision of prenatal sex selection methods prohibitively costly. However, when implemented, these interventions draw their fair share of criticisms. From an ethical perspective, there are concerns about whether the implementation of a ban on prenatal sex selection impinges on women's reproductive freedoms. On the one hand, it can be argued that a ban on prenatal sex selection puts legislators on a slippery slope as it personifies the fetus, and this can be particularly dangerous in settings where abortion rights are contested to begin with. On the other hand, it can also be argued that sex selective abortions are notably different from abortions for other purposes because in the former case the pregnancy is wanted until parents realize it will not result in the birth of the desired male child. From this perspective, sex selective abortions are a function of the inequitable status of women, and a ban on the practice is a means (or even a symbolic gesture by the government) to protect a group that has been and continues to be discriminated against (Balakrishnan 1994).⁶ Moreover, when claiming that a ban on prenatal sex selection restricts women's reproductive choices, the context in which women make the "choice" to prenatally sex select must be considered. In a rigid patriarchal setting, where the sex of a child has economic and social consequences for women, prenatal sex selection is not necessarily an act borne out of free will, rather an act resulting from the pressure to bear sons (Oomman & Ganatra 2002).

But even if one were to abstract from the ethical ambiguities associated with its implementation, bans are criticized for failing to achieve their stated goals. There is limited evidence to suggest that they are effective in normalizing SRB; in fact, the existing literature suggests that they are counter-productive to improving the status of girls and women. Bans have also proven difficult to implement. These criticisms are discussed further in the following subsections.

⁶ One could argue that protection for females in the prenatal realm would justify demands for similar protection by other discriminated groups that have been the target of prenatal sex selection, such as those with congenital disabilities (Goodkind 1999). However, this argument ignores the fact that sex does not impose the same limitations on daily life that certain disabilities would. This is not to suggest that extensive social support cannot improve the lives of those with disabilities as it can for girls. Rather, this is to suggest that some of the limitations imposed by disabilities or genetic disorders cannot be ameliorated by societal change or support (Wertz & Fletcher 1998).

3.1.1 Challenges with Implementation

One of the primary reasons why enforcement of these bans is challenging is because of the difficulty in procuring evidence of the “crime”. Collecting evidence of prenatal sex selection practices is difficult because of collusion between both parties involved in the transaction. The couple who seek out the service, and the service provider are invariably working together to achieve a mutually beneficial outcome. The individual gets to abort the unwanted fetus, while the doctor benefits financially (Guilmoto 2012a).

Furthermore, in contexts where using prenatal diagnostic methods and abortion for other reasons is legal, it can be difficult to prove that the technology was used for sex selection. The ultrasound, for example, is often used as part of routine antenatal checkups, and for the diagnosis of genetic defects and abnormalities in the fetus. While doing routine ultrasound scans, it is possible for doctors to break the law, and discretely signal the sex of the fetus to the parents. Women, and their health practitioners, can cite other socioeconomic or medical reasons to abort the unwanted female fetus. Couples may also be able to detect the sex of the fetus in one hospital, and have the abortion performed in another hospital. Offenses, when they occur in this manner, become very hard to detect, let alone prosecute. It comes as no surprise, therefore, that authorities who are under pressure to catch offenders have to resort to sting operations (Guilmoto 2012a; DasGupta 2016; Rahm 2012; Ganatra 2008).

Enforcement is challenging also because it requires the convergence of different factors. Successful enforcement requires careful monitoring of different interventions and their associated performance indicators, capacity development targeted at medical personnel, local authorities, and the public at large, and coordinated efforts by different stakeholders. See, for example, the case of the widely praised “Nawanshahr Model”:

In 2001, Nawanshahr District in Punjab India had the worst sex ratio in the country. In response to this, local authorities launched an aggressive campaign in 2005, which combined monitoring and awareness building efforts. Personal details of all pregnant women in the district were electronically registered, and these women were followed up with phone calls on a weekly basis. The use of ultrasound machines and abortion services in local clinics was also strictly documented and monitored. To aid local authorities in catching offenders, monetary rewards were offered to community members who acted as “informers”. For the awareness building effort, local NGOs were roped in, and teachers and students were recruited as “ambassadors of the drive against female feticide”. One of the unique and controversial approaches used as part of the awareness raising drive was to publicly shame couples considering sex selection by “mourning the death of unborn girls” in front of clinics. When the sex ratio at birth started to normalize in the following year, the model was hailed for its success. However, with a new district collector in 2007, the monitoring efforts and related schemes retracted, and the sex ratio rose again (Ganatra 2008).

This example underscores the financial and logistical challenges involved in sustaining or replicating successful programs. Li (2007) highlights similar implementation problems for China’s

monitoring and evaluation program, particularly given the lack of coordination between different departments in specific geographic areas, and difficulties tracking the country's floating population. These efforts also raise ethical dilemmas about excessive intrusion required into women's lives for such monitoring exercises to work. Even simple monitoring efforts to calculate the SRB at the regional level and estimate the severity of the practice are challenging due to poor vital registration systems, particularly in economically disadvantaged areas (Guilmoto 2012a; WHO 2011).

Unnecessarily harsh measures can also alienate some of the key stakeholders in countering sex imbalances. For example, the Indian Radiological and Imaging Association has repeatedly complained against the enforcement of the PC PNDT Act. Doctors and medical practitioners argue that they are being harassed by local authorities for minor clerical errors, their equipment has been unfairly seized, and in some extreme cases, their licenses revoked for paper-work discrepancies. In 2016, members of the association even held a nation-wide strike to protest the implementation of the PC PNDT Act (The Indian Express 2016).

The ability of keep up with the pace of development in sex determination technology is another concern. For example, in 2015, the Chinese government had to enforce a new ban preventing the smuggling of mothers' blood samples to Hong Kong SAR, China, for fetal DNA tests (Global Times 2012; MarketWatch 2015). Moreover, even if countries manage to ban the specific technologies, affluent individuals who actively want sons can travel to regions that have legal access to these methods. This is evidenced in the case of affluent Asians who travel to Europe or Thailand for prenatal sex selection (Guilmoto 2012a).

3.1.2 Unintended Consequences of the Ban

Bans are a common legal tool used by societies to restrict social "wrongs". But if underlying preferences do not change, bans are particularly likely to be self-defeating. Bans push individuals to circumvent the law and seek alternatives that can pose greater risks for the very individuals bans seek to protect (Sunstein 1994). Bans against child labor exemplify this. In a perfect world, such bans can force employers to stop using child labor. But in reality, they simply lower the wages children are paid, and consequently, compel poorer families to supply more child labor at the cost of the child's education (Bharadwaj et al. 2013; Edmonds & Shrestha 2012). Similarly, policies that prohibit employers from asking about job applicants' criminal histories as a way of reducing racial disparities in employment are found to be counterproductive. Agan and Starr (2018) examine the effectiveness of "Ban the Box" policies in the U.S., and their results suggest that these policies actually encourage racial discrimination as applicants with distinctly black names received fewer call-backs than applicants with distinctly white names.

Bans against the use of prenatal sex selection technology are no different. They can result in unintended consequences for the women and girls they intend to protect. First, strict enforcement of bans could mean that women who want to abort unwanted female fetuses would seek clandestine services, and risk unsafe abortion procedures (Nie 2010). In-depth interviews with health care providers in Nepal suggest that medical personnel are aware that their patients may seek illegal

abortion services in India if they are not available locally. These health care workers note feeling caught between respecting the law and ensuring that their patients receive safe health care services (Lamichhane et al. 2011).

Strict enforcement could also make medical practitioners reluctant to provide legal reproductive health services that require the use of restricted technology. Access to ultrasound scans for antenatal checks, and access to safe abortion for reasons other than sex-selective purposes could potentially be limited. The case of Korea illustrates how strict enforcements can restrict women's access to legal health care services altogether. In 2010, the Korean government introduced an action plan to crack down on illegal abortions (arguably in a bid to raise the low birth rate in the country). The prosecution of the arrested doctors following this crackdown was widely publicized, and in response, many obstetricians reportedly became fearful of offering abortion services even for legal reasons (Korean Women's Association United 2011).

Second, having unwanted girls could affect how the woman is treated in the household and in the community at large. In patrilineal societies, bearing a son matters for women as it allows them to improve their position within the household. For example, Li and Wu (2011) use pooled data from the China Health and Nutrition Survey (CHNS) and multi-variate regression to find that women whose first-borns were sons had more decision-making power, and better nutritional intake. More starkly, Milazzo (2014), using pooled data from the Indian National Family Health Survey (NFHS) and exploiting the randomness in the sex of the first-born child, finds that women whose first-borns were girls were more likely to suffer maternal and adult mortality. These studies are backed by the findings of ethnographic studies as well (DasGupta et al. 2003). In recognition of the lower status and heightened vulnerability of sonless women, the Chinese government in 2002, prohibited ill-treatment of women who give birth to girls or who are infertile (Li 2007).

There is also evidence to suggest that the adoption of ultrasound technology – a key innovation in helping those with son preference prenatally select the sex of their baby and avoid unwanted daughters – improves women's welfare. Ebenstein et al. (2013) combine data from various Chinese surveys and the Local Chronicles, and exploit the timing of ultrasound diffusion across counties to find causal evidence that the adoption of ultrasound technology increases the probability of having a son at second parity, and this in turn leads to lower family size, an increase in labor market employment outside agriculture, an increase in intra-household bargaining power, and decrease in suicide rates for women in rural China. While we do not view such improvements in women's welfare – that are conditional on having a male child – as related to improvements in women's status overall, we do argue that ultrasound bans are likely to worsen women's outcomes in the absence of interventions that change the intrinsic value of females.

Having a son improves a women's circumstances during old-age too. For example, Cain (1986) draws on survey data from rural Bangladesh and India, and uses a correlation-based approach, to find that older women without sons in these contexts were at a higher risk of economic uncertainty and mortality. Similarly, Rahman et al. (1992) use data from the Matlab, Bangladesh and a discrete time hazard model (correlation-based approach) to find that women ages 45 or more who had an adult son living with them faced a lower mortality risk. Vlassoff (1990) finds similar results from descriptive survey data analysis for widowed women in a rural village in Maharashtra, India. In the absence of any other substitute, those women who would rely on sons for old-age security are likely to be worse off due to ultrasound bans.

Third, since bans do not change the underlying preference for sons, couples who actively want sons will use postnatal discrimination as a substitute if prenatal sex selection methods cannot be accessed. Table 1 (next page) provides a summary of studies that examine how the postnatal welfare of girls (versus boys) changes when prenatal sex selection becomes accessible. Broadly, the studies cited in Table 1 suggest that the postnatal survival of girls improves, and investment in girl children increases when prenatal sex selection increases.⁷ The use of prenatal sex selection results in fewer unwanted daughters being born, and this improves postnatal investments in girls. This of course is not to suggest that governments should ignore sex selective abortion. The practice remains blatantly discriminatory irrespective of the positive outcomes, and as Anukriti et al. (2016) highlight, the substitution effect is not perfect (ultrasound access improves the postnatal survival of girls, but also increases the total number of missing girls) and the SES distribution of female versus male births lowers the probability of convergence in outcomes in the long-run (see Table 1). Instead, this evidence suggests that bans, as they are currently being implemented, may not be the ideal means of improving female child welfare.

⁷ Hu and Schlosser (2015) find that health investment in female children improves, but that female child survival does not change. Anukriti et al. (2016, p. 5) provide an explanation for why Hu and Schlosser's empirical strategy results in this divergent conclusion.

Table 1. Summary of studies that examine the impact of prenatal sex selection on postnatal outcomes for girls

Author (Date)	Type of intervention examined	Outcome of interest	Data	Empirical strategy	Observed impact on female child survival	Observed impact on other female child outcomes
Goodkind (1996)	Rising SRB (indicator of rising prenatal sex selection)	Postnatal survival of girls	Vital registration data, census data, and other secondary data sources. Countries: China, Hong Kong, Japan, Korea, Malaysia, Singapore, Taiwan	Correlation study: Examine how changes in the male-female sex ratio of infant and child mortality correlate with changes in SRB before and after the 1980s across different Asian countries (with and without documented son preference)	Female infant and child survival improved after the 1980s in countries or sub-populations with documented son preference	N/A
Hu and Schlosser (2012)	Higher and increasing SRB (indicator of higher and increasing prenatal sex selection)	Girls' nutritional outcomes	Pooled individual data from 1992-93, 1998-99, and 2005-06 Indian National Family Health Survey (NFHS)	Quasi-experimental study: Triple difference-in-difference that exploits geographic variation in the prevalence of prenatal sex selection over time, and changes in outcomes for boys v/s girls across states over time	N/A	Larger reduction in % of malnourished (wasted, stunted, underweight) girls in states with increasing prenatal sex selection. This result is not explained by changes in mortality
Lin et al. (2014)	Access to sex-selective abortion in 1985	SRB and girls' neonatal mortality	Individual-level data from national birth and death registries, Taiwan (1980 – 1996)	Quasi-experimental study: Uses timing of legalization of abortion, and cross-sectional variation in cost of having more children (variation in cost across birth-order and mother's age) to isolate treatment effect	Reduced female neonatal mortality for higher-order births, and no change in post neonatal mortality for girls	N/A

Hu and Schlosser (2015)	Higher and increasing SRB (indicator of higher and increasing prenatal sex selection)	Girls' mortality and nutritional outcomes	Indian census and pooled individual data from NFHS (1992-93, 1998-99, 2005-06)	Quasi-experimental study: Triple difference-in-difference that exploits geographic variation in the prevalence of prenatal sex selection over time, and changes in outcomes for boys v/s girls across states over time	No reduction in girls' mortality or reduction in son preference in states with increasing prenatal sex selection	Reduction in surviving girls' malnutrition (underweight and wasting). Prenatal sex selection does not lead to a selection of girls into households with more resources, but girls are more likely to be born into families with weaker son preference. Also, rising SRB leads to larger reduction in family size and increase in breastfeeding duration for girls
Kalsi (2015)	Access to sex selective abortion in 1985	Girls' university attendance	Individual level data from 1991-2010 Taiwan Family Income/Expenditure Survey (children of college-age born between 1978 and 1992)	Quasi-experimental study: Difference-in-difference that exploits timing of legalization of abortion, birth-order of the child (order 2 or higher), and sex of the child	N/A	After abortion legalization, the average rate of university attendance for birth order 2 or higher girls increased by approximately 4.5 percentage points

Anukriti et al. (2016)	Availability of ultrasound technology	Girls' post-neonatal mortality, breastfeeding, and immunization status	Pooled individual data from NFHS (1992-93, 1998-99, 2005-06)	Quasi-experimental study: Triple difference-in-difference that combines variation in supply of ultrasound scanners, a family's incentive to sex select (using sex of first-born child as an indicator), and sex of the child being observed	Decline in female post neonatal mortality (and neonatal mortality). But for every additional girl that survives until age 5 in the post-ultrasound era (relative to pre-ultrasound), five girls are aborted	Reduced family size, and increased breastfeeding duration and immunization investments for girls. Families with higher socioeconomic status (SES) were more likely to abort girls (and state son preference), so the average girl born post ultrasound (versus pre-ultrasound) was more likely to be born into a low SES family
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3.1.3 Are the Bans Effective in Normalizing Sex Ratios at Birth?

It is difficult to evaluate the effectiveness of bans in normalizing SRBs since the bans are not randomly assigned and enforced. The non-randomness in the assignment of the “treatment” (the ban in this case) makes the construction of the counterfactual scenario of what might have happened in the absence of the ban difficult. The country-specific studies below outline some of the attempts at estimating this treatment effect (for an overview, see Table 2).

Table 2. Summary of studies that examine the impact of a ban on prenatal sex selection on SRB

Author (Date)	Ban (details)	Data	Type of study	Observed impact on SRB
Nandi and Deolalikar (2013)	Prenatal Diagnostic Techniques Act, India, 1994	Village and town level Indian census data, 1991 and 2001	Quasi-experimental (difference-in-difference)	Less imbalanced child sex ratio, but can't discern impact on SRB
Park and Cho (1995)	Ban against prenatal sex selection, Korea, 1987 (suspension of medical licenses of miscreant doctors in 1990)	Vital statistics and World Fertility Survey	Correlation-based/Trend analysis	Drop in SRB in 1991, but this was more likely due to parents' adherence to the Lunar calendar
Guo et al. (2016)	Care for Girls Program, China (cracking down on prenatal sex selection by monitoring second birth-order pregnancies)	2000 and 2010 Chinese census	Correlation-based/Trend analysis	Less imbalanced SRB for second-order births, but more imbalanced SRB for first-order births

India

The Indian government, concerned with the implications of increasing accessibility of prenatal sex diagnostics in the 1980s and 1990s, passed the Prenatal Diagnostic Techniques Act (PNDT) in 1994. The Act went into operation in 1996. It prohibited medical professional from using prenatal diagnostic techniques for sex selection; these techniques could only be used for detecting genetic or sex-linked disorders, or congenital malformations. The Act was amended in 2003 to prohibit the use of pre-conception sex selection techniques as well (Ministry of Health and Family Welfare 1994).

Nandi and Deolalikar (2013) conduct a rigorous ex-post examination of the impact of the PNDT Act. They measure changes to the child sex ratio following the PNDT Act by exploiting spatial variation in the timing of the ban across Indian states. For the state of Maharashtra, the ban on prenatal sex selection was implemented in 1988, nearly a decade before the passage of the national PNDT Act. This allows Nandi and Deolalikar (2013) to use Maharashtra as the pre-treated or control state that is not affected by the national ban. They conduct a difference-in-difference

analysis that compares the difference in child sex ratios between Maharashtra and its neighboring states before and after the passage of the PNDT Act.

The key assumptions of this empirical strategy are that (a) Maharashtra and its neighboring states were on similar trajectories before 1988, i.e. they had parallel trends in child sex ratios before 1988; (b) couples in Maharashtra did not go to villages in neighboring states seeking sex selective abortions between 1988 and 1994, i.e. there were no spillover effects; (c) the national ban did not affect enforcement in Maharashtra; and (d) the ban was similarly implemented in Maharashtra and its neighboring states.

The data for this study came from village and town level longitudinal data from the 1991 and 2001 Indian censuses. To account for spillover effects, the authors compare villages in Maharashtra to villages in neighboring states that are not located along the border of Maharashtra. This way, the newly treated villages are culturally similar to Maharashtrian villages but are geographically distant enough to prevent spillovers. The evaluation results suggest that after controlling for individual and community level factors, and spillover possibilities, there was a 14 to 26 percentage point increase in the female-to-male child sex ratio. The ban resulted in 106,000 more surviving girls in the 0-6 age groups in the newly treated rural areas.

While these results suggest that the ban was effective in achieving a less imbalanced sex ratio, caution must be used when interpreting them. First, the outcome variable in this study is the child sex ratio (which is affected by prenatal and postnatal sex discrimination), so the authors cannot isolate the effect of the ban on prenatal sex selection or SRB. Second, as the authors argue themselves, evidence on parallel trends in sex ratios before 1988 is not conclusive. Third, the available data do not allow the authors to test the assumption that the Maharashtra ban and the national ban were similarly implemented, or that the national ban did not affect enforcement in Maharashtra.

Republic of Korea

In Korea, prenatal sex determination technology was introduced in the mid-1980s. Following the introduction of this technology, the country saw an increase in its SRB that continued until the mid-1990s. In response to the growing sex imbalances, the government enforced a ban on the use of prenatal sex identification in 1987. This ban, in combination with the restrictions on the use of abortion services, was expected to curb the practice of prenatal sex selection. In 1994, the government strengthened the provisions of the 1987 Act by imposing stricter penalties on medical professionals who broke the law. There is no specific information on how strong the enforcement of the ban was. Reports suggest that in 1990, the licenses of eight physicians were suspended on grounds that they had performed sex-determination tests. These arrests were widely reported in the media as well (Park & Cho 1995; Boer & Hudson 2017; Ganatra 2008).

Some observers claim that the momentary drop in SRB in 1991 could be attributed to the suspension of miscreant physicians in 1990. However, Park and Cho (1995) argue that this interpretation is flawed as it does not account for parents' adherence to the Chinese lunar calendar. The year 1990 was the Year of the Horse (a zodiac sign deemed unfavorable for girls), so the greater number of girls registered in 1991 may have simply been 1990 female births that were registered a year later to ensure that the girls born could avoid the stigma of being born under the Horse sign. Further, they argue that the 1992 sex ratio lies between the rates of 1990 and 1991. In fact, SRB in Korea did not reach biologically normal levels until the late 2000s, i.e. nearly 20 years

after the ban of prenatal sex determination. Up until 2002, the sex ratio for birth order three or higher was 141 girls per 100 boys - suggesting that the technology to exercise son preference was available for couples who actively wanted to use it (DasGupta 2016).

Beyond this, there are no evaluations of the ban; it is difficult to isolate the treatment effect because of the simultaneity of other socioeconomic and legal developments. Yet, an examination of trends strongly suggests that the decline in Korean SRB was the result of normative change that followed years of urbanization and industrialization. Notably, legal amendments to promote gender equality followed these normative shifts. Section 5 discusses the Korean case study in further detail.

China

Under the “Care for Girls” program (see Section A2 in the Appendix), the Government of China made one of the most vigorous attempts to implement the ban on sex selection practices in the 2000s. Women whose first child was female, and who were pregnant with their second child, were regularly monitored by local family planning workers and Women’s Federation workers. This group was targeted as it was believed that they were under the most pressure to ensure the second child was a boy. Strict penalties were imposed if an individual was found to be practicing sex selection. Doctors would lose their licenses, clinics would be fined, scan equipment would be confiscated, and whistle-blowers would be rewarded. In areas where a second child was permitted, target couples who were found to be practicing sex selection would not be allowed to try for a second child again. Between 2011 and 2012 alone, as many as 6,700 cases were investigated, of which 2,400 individuals were punished (Guo et al. 2016).

To assess the impact of this effort, Guo et al. (2016) observe changes in the sex ratio at birth between the 2000 and 2010 censuses. They note that while there was a sharp decline in the sex ratio of second births between 2000 and 2010, there was also an increase in the sex ratio of first births (note that first births were not being monitored). Since first births form nearly two-thirds of all births in the 2010 census, there was no fall in the overall sex ratio at birth. The inference is that with the strict monitoring and penalties in place, parents who wanted sons simply ensured that their first child was a son to avoid the monitoring of second pregnancies.

These efforts by Chinese authorities were successful in that they did reduce SRB among the target group, i.e. women having their second child. However, the financial and logistical costs of the program must be considered, particularly if the program were expanded to monitor first pregnancies as well. The replicability of these efforts in other contexts is also dubious. Various government agencies were mobilized to monitor second pregnancies in China; not many other countries have the administrative capacity and manpower to carry out such an operation (ibid).

While Guo et al.’s (2016) analysis provides suggestive evidence of the impact of the ban’s enforcement on SRB, it does not statistically isolate the treatment effect of the ban. It is difficult to disentangle the impact of ban enforcement efforts from the broader “Care for Girls” efforts taking place simultaneously.

Other Countries

In Vietnam, sex selection was outlawed in 2003. However, enforcement of the law has thus far been regarded as lax, largely because of difficulties in monitoring the misuse of technology

(UNFPA Vietnam 2011). A similar reason is provided for Nepal's difficulties in implementing the ban (Puri & Tamang 2014).

All the South Caucasus countries have banned prenatal sex selection. However, there has been no monitoring or sanction imposed for breaches, no organization of an ethics body consisting of relevant medical personnel, and limited awareness-building campaigns for the general public about the ban (Liisanantti & Beese 2012).

3.2 Conditional Cash Transfers (CCTs)

Another direct approach that has been tried in India and China is to provide conditional cash transfers to parents who have daughters. The idea behind the conditional cash transfers is to discourage preferential treatment of sons over daughters by subsidizing the cost of daughters and encouraging investments in daughters.

Table 3 (next page) provides an overview of the studies that evaluate the effectiveness of such CCT programs. Further discussion of these studies follows in the subsections below.

Table 3. Summary of studies that examine the impact of Conditional Cash Transfer (CCT) programs on female child outcomes

Author (Date)	CCT program	Program aims	Data	Type of study	Observed outcomes
Holla et al. (2007)	Apni Beti Apna Dhan, Haryana, India	Balance child sex ratio, delay age of marriage for girls, improve the valuation of and investments in girls	Pooled birth-history data from first two waves of the NFHS (1992-93; 1998-99)	Quasi-experimental (difference-in-difference)	Reduced SRB, but positive effects for girl children erode over time
Sinha and Yoong (2009)	Apni Beti Apna Dhan, Haryana, India	(See above)	Pooled birth-history data from all three waves of the NFHS (1992-93; 1998-99; 2005-06)	Quasi-experimental (difference-in-difference)	No change in preference for girl children; some positive effects observed in terms of female child survival and educational attainment
Sekher (2010)	Different CCT Programs across India	See Annexures section of Sekher (2010)	In-depth interviews with key stakeholders	Qualitative (desk evaluation of operational aspects of CCT programs)	Short-term and long-term operational problems associated with CCT programs. Concerns of public trust in these programs
Sekher and Ram (2015)	Dhanlakshmi Scheme in seven Indian states (Andhra Pradesh, Bihar, Chhattisgarh, Jharkand, Orissa, Punjab, and Uttar Pradesh)	Balance child sex ratio, improve investments in girls, change families' mindsets towards girls	Survey data from 4,000 beneficiary and non-beneficiary households in eight blocks across five states (Punjab, Bihar, Orissa, Andhra Pradesh, and Jharkand). In-depth interviews and focus group discussions	Mixed methods. Quantitative element was quasi-experimental (propensity score matching)	Some immediate positive gains; no change in preference for girl children
Anukriti (2017)	Devi Rupak, Haryana, India	Reduce family size and balance child sex ratio	Pooled birth-history data from the NFHS and the District Level Household Survey of India	Quasi-experimental (difference-in-difference)	No change in son preference; increase in SRB

Li (2007)	Care for Girls Program (benefits component), China	Support girl-only families; improve investments in girl children; change preference for sons	China censuses (1950-2005), survey data from government bureaus, previous studies	Descriptive statistics; literature review	Success of benefits program is contingent on local development. Scope to improve design, and implementation of legislative measures that indirectly raise value of girls
Murphy (2014)	Care for Girls Program (benefits component), China	(See above)	Key informant interviews; analysis of policy documents and newspaper articles	Qualitative	Program has failed to deal with the underlying causes of gender inequity. Material benefits are conditional on local development

India

Since the 1990s, several Indian states have introduced conditional cash transfer programs to discourage son preference.⁸ Comparison of the different programs is complicated by the fact that the programs in different states have different objectives, and different eligibility criteria. However, some of the common features of these schemes can be delineated. Most schemes are targeted at families below the poverty line. They provide both immediate financial incentives for female births, and long-term support for families with girls starting from birth until age 18. The cash transfers are conditional on the provision of health and educational investments in girls and are typically made into the mother's bank account or the beneficiary child's bank account. The main implementing agencies are either the Department of Health, or the Department of Women and Child Development (Sekher 2010; Sekher & Ram 2015).

The initial evaluation of these schemes, conducted by Sekher (2010) in collaboration with the United Nations Population Fund, focused on operational aspects. It was based on interviews with state government officials, program managers, and NGOs. The main findings from the study were that:

- (a) the stipulations associated with the schemes were complicated, and guidelines for implementation were poorly understood by local staff;
- (b) there was limited involvement of key stakeholders like village councils and women's groups who could have helped state officials in identifying beneficiaries and monitoring implementation;
- (c) there was poor coordination between the health, education, social welfare, and financial sectors. As a result, beneficiary households faced delays in collecting the documentation required, opening zero-balance bank accounts, and receiving benefits;
- (d) there was no monitoring of operations at the field level, leaving little scope for remediation;
- (e) some schemes were discontinued before the beneficiary child reached adulthood (i.e. the schemes were discontinued before the beneficiaries received all the benefits promised). As a result, families in those states lost faith and interest in such CCT schemes.⁹

Following the desk-review of CCT schemes in 2010, Sekher and Ram (2015) used the *Dhanlakshmi* scheme as a case study to examine the impact of CCT programs on parents' attitude and behavior towards girl children. The *Dhanlakshmi* scheme was sponsored by the Government of India, and the pilot program was implemented in 2008 in selected blocks in the following seven states:

⁸ For a detailed description of the different CCT programs, see the Annexures section of Sekher (2010)).

⁹ The *Rajalakshmi* scheme that was initiated in the state of Rajasthan in 1992, and then discontinued in 2000 due to limited financial resources, is a case in point (see section A3, Appendix). In late 2000, Sharma et al. (2003) conducted interviews with local government officials, financial institutions backing the scheme, and beneficiaries, to gauge the popularity of the *Rajalakshmi* scheme, the reasons for its termination, and the reaction of different parties to the termination. They argue that the scheme was "immensely popular ... the number of beneficiaries increased from 4,917 in 1992-93 to 11,664 in 1997-98, (and) its acceptance was not limited to the general category but was observed among scheduled castes and scheduled tribes (as well)" (Sharma et al. 2003, p.65). However, the Unit Trust of India (UTI) – the financial institution backing the scheme – withdrew its support as it was unable to find instruments that would provide the promised level of returns. Once the UTI backed out, the local government failed to pursue viable alternatives such as investing in mutual funds, increasing the deposit amount, reducing the maturity amount, or seeking support from other financial institutions. Beneficiaries were offered redemption packages and options to invest in other plans, however, the premature termination of the program caused them to lose trust in all government backed schemes.

Andhra Pradesh, Bihar, Chhattisgarh, Jharkand, Orissa, Punjab, and Uttar Pradesh. Between 2008 and 2013, 336,770 girls were enrolled in the scheme (see section A3, Appendix).

For their evaluation, Sekher and Ram (2015) collected household survey data from 4,000 beneficiary and non-beneficiary households in 8 blocks across 5 states (Punjab, Bihar, Orrisa, Andhra Pradesh, and Jharkand) between 2013 and 2014. They used a propensity score matching (PSM) approach to evaluate how the behavior of beneficiary and non-beneficiary households differed,¹⁰ after controlling for characteristics that predict beneficiary status. They supplemented this analysis with key informant interviews and focus group discussions with surveyed household members.

The study found that girls in beneficiary households fared better. They were more likely to be enrolled in school, and their parents were more intent on them pursuing higher education. Parents in beneficiary households were also more willing to delay their daughter's marriage, and less likely to view their daughter as a liability. However, many parents in beneficiary households also saw the terminal benefits of the scheme as means to meet their daughter's marriage costs, and there is no evidence that the program changed families' preference for girl children. From a program design perspective, one of the major drawbacks highlighted was that there were no incentives for girls to complete secondary education (ibid).

Impact evaluations of other CCT programs also provide important policy lessons. Anukriti (2017) conducts an evaluation of the *Devi Rupak* program that was implemented in the state of Haryana in 2002/2003. The program had the dual aim of reducing fertility and balancing the sex ratio at birth in the state (see section A3, Appendix). For the analysis, Anukriti (2017) pooled women's birth-history data from the NFHS and the District Level Household Survey of India (DLHS). To isolate the treatment effect of the scheme on the number and sex-composition of children, she uses a difference-in-difference approach that exploits variation in the year and state of program commencement, and variation in future incentives by the composition of existing children who were born before the program was launched.

Her results suggest that while families responded to the incentives to reduce fertility, they did not forgo their preference for sons despite the higher benefits provided for having daughters. The incentives provided for one-boy only were sufficient for couples to cease childbearing or sex select at first birth. However, the higher incentives provided for one-girl only were not sufficient for couples to forgo their demand for sons; these couples did not cease child-bearing after the first child and sex-selected for a son at second birth. The net result of this program was a reduction fertility, but an increase in the SRB (ibid).

A conceivable way to improve the short-term effectiveness of this kind of program in balancing the SRB would be to remove the financial benefits for the one-boy only families. However, even programs that do not provide benefits for male children show mixed results in lowering son

¹⁰ BeneficiaryA beneficiary household is one which has at least one girl child enrolled in the scheme at the time of the survey, and a non-beneficiary household is one which has an eligible girl (age 1-4 years) who is not enrolled in the scheme.

preference. Evaluation of the *Apni Beti Apna Dhan* scheme that was implemented in Haryana in 1994 is a case in point (see Section A3, Appendix).

Holla et al.'s (2007) evaluation of the scheme draws on pooled birth history data from the first two rounds of NFHS, and a difference-in-difference approach that uses variation in the eligibility criteria, and the implementation of the program in Haryana versus neighboring states. The results from the evaluation suggest that the program had a positive effect on the SRB (probably due to the cash payment that is made quickly after the female child's birth). However, the positive effect of the program for girl children erodes over time despite the staggered payments that are promised if the girl remains alive, unmarried, and fulfills educational and health requirements by age 18. Vaccination rates for girl children did not improve following the initiation of the program, and as a result, the program had a negligible effect on improving child sex ratios.

Sinha and Yoong (2009) identify more successes of the program, but they also find that these successes were limited. They use pooled birth-history data from the NFHS, but from all three rounds (with three rounds of data they can evaluate outcomes for girls in the short and medium term), and a difference-in-difference approach that exploits variation in the eligibility criteria. Their evaluation results suggest that while beneficiary households were more likely to give birth to girls, and ensure their survival, there is mixed evidence on whether these girls saw improvements in their quality of life. Beneficiary households made more health investments in their young daughters, however this did not necessarily translate into better health status for the girls in the medium term. Furthermore, school-age girls in beneficiary households were not more likely to attend school than their counterparts in non-beneficiary households; however, if they did start attending school, they were more likely to continue attending school. The program does not have a clear, positive effect on mothers' preference for girl children either.

China

In 2000, China introduced a comprehensive program, titled "Care for Girls", to reduce sex selection (see Section A2, Appendix). After setting up a pilot project in Anhui province in 2000, and then pilots in 24 other provinces in 2003-05, a national plan was developed for this program in 2005-06. The national plan focused on advocacy, providing family planning services, cracking down on sex determination and sex selective abortions, building monitoring and evaluation capacity, and providing benefits to families with only girls. The benefits component focused on providing financial and other assistance to parents in daughter-only families via low interest loans, social security benefits, and educational scholarships. For families to be eligible for benefits, they must meet strict criteria: they must have had only one child or two daughters (including adoptees), they must be girl-only families, one member of the couple must be sterilized, and the wife must be 45 years old or younger (Murphy 2014; Li 2007; Guo et al. 2016).

In some provinces, daughter-only families are partnered with local officials. The officials help the families by obtaining subsidies for school tuition and housing improvements, and microloans to start small businesses (Li 2007; Murphy 2014). In some provinces, parents with daughters are offered conditional benefits under schemes such as the Sunshine Education Assistance Project that was started in 2008. Under this program, families that fulfill the eligibility requirements are given 1,000 yuan per year for three years, conditional on the funds going to the girls' high school education. Furthermore, these scholarships are provided to girls at public ceremonies to foster

public awareness of the value of daughters. Progress under this project is a key government priority, as highlighted by the fact that it is part of the local family planning officials' work evaluations. Another example of an education-centered benefits scheme is the Spring Buds program that allocates money for girls in rural families to continue their education.

There are no rigorous evaluations of the causal impact of these benefits programs on SRB, female child survival, and son preference. It is difficult to isolate the cash transfers' effect from the other programs bundled into the "Care for Girls" effort. However, there are some criticisms of the program that need to be noted. The criticisms of the program draw on observational data, key informant interviews at various administrative levels, government policy documents, and other policy reviews.

First, while the funding for most "Care for Girls" efforts come from central, provincial, and local authorities, the funding for the benefits program comes solely from local authorities. This makes the liquidity of the program contingent on local economic development; poorer counties are less likely to implement such schemes. The design of the programs is also determined at the county level. The effectiveness of these schemes in changing child sex preferences is contingent on how local authorities prioritize and manage the issue (Li 2007). For example, in some counties, local businesses are obliged to donate to the "Care for Girls" foundation fund, and this fund is used to cover the benefits provided to girl-only families (Murphy 2014). Whether local businesses are required to participate in these efforts, and if so, how much they donate and how they are made to comply with the requirements for donations, will vary across counties.

Second, the program is focused on girl-only families. The program effectively leaves out girls with a male sibling, who are arguably vulnerable in their own way, given that they must face tough competition for parental resources. Take the case of the Spring Buds program. This program, initially managed by the provincial and county women's federation groups, allocated money to poor families with girls to assist with educational attainment. However, in many counties, this program was co-opted by the "Care for Girls" effort, and the assistance to girls with male siblings stopped (Murphy 2014).

Third, the notion that families need to be "compensated" for having a girl needs to be examined. Does a CCT program tacitly agree that boys and girls are unequal, with girls being more a liability to families? What message does this framing send to young girls in their early years? Even if we argue that the CCT is intended as a more immediate measure to curb discrimination against girls, we must ask whether it changes parents' gender preferences. In-depth interview data from Murphy's (2014) qualitative study suggest that girl-only families that receive financial assistance display gratitude towards the government, but they do not display a change in attitude towards daughters. Evaluations of India's CCT programs come to similar conclusions on this.

4. Indirect Measures

Existing evidence suggests that compared to direct measures, indirect measures offer more promise in changing imbalanced child sex ratios and improving the status of women and girls in the long-term because they address the main causes of son preference. Indirect measures can include reform in areas such as property rights, old-age support, political participation, education and employment

(these measures are typically considered good policy choices irrespective of their impact on son preference). Indirect measures also include advocacy efforts.

4.1 Legislative Reform to Promote Women's Rights

Several markers of gender inequality and patriarchal systems are codified in legislation, and in economic and political practices. These markers can be selected for intervention to improve women's position in the economic, social, and political sphere, and to allow parents to see girls as worth investing in.

Section A4 in the Appendix outlines some of the legal measures to promote women's rights in China, India, and Korea. Note that this list is not exhaustive.

Inheritance laws and property rights

One area of possible intervention is in inheritance laws and property rights. In patrilineal societies, where property is transferred to the next generation only through the male line, married women prefer bearing sons instead of daughters. One of the reasons for this is that sons can inherit family property, and are therefore better positioned to provide financial support during old age (DasGupta et al. 2003). The importance of sons as a means to hold onto family property, and ensure support during old-age, is particularly emphasized in the case of widowhood as women would not inherit their deceased husband's property. While this is not the only reason for women's preference for male children, it can be argued that amendments to inheritance laws can make some progress in changing the valuation of daughters compared to sons.¹¹

Deininger et al. (2013) use state-level reforms to the 1956 Hindu Succession Act (HSA) in India to illustrate this (see section A4, Appendix). The 1956 Act practically guaranteed that ancestral property in Hindu, Buddhist, Jain, and Sikh families would be bequeathed only by male family members. However, reforms initiated in the states of Andhra Pradesh, Tamil Nadu, Maharashtra, and Karnataka ensured that sons and daughters would have equal rights to ancestral property. To estimate the causal impact of these reforms on intergenerational transfers in the four reform states, Deininger et al. (2013) draw on data from the 2006 Rural Economic and Demographic Survey (REDS), and use a difference-in-difference approach to compare the inheritance of land by males and females in the same household from fathers who died before and after the reforms were passed.¹² The evaluation results suggest that following the reforms, daughters were more likely to inherit family property, and parents increased investments in daughters' schooling. What is noteworthy here is that parents increased both physical capital and human capital transfers to

¹¹ There is evidence (see Bhalotra et al. (2016)) to suggest that inheritable land rights increases the motivation to exercise son preference in contexts where the tradition is for sons to inherit land. Following from this, it could be argued that if land rights could be passed on to male *and* female children, then the incentive to exercise son preference would diminish.

¹² These comparisons were augmented by looking at differences across Hindu families and non-Hindu families in reform states, and differences across reform states and non-reform states.

daughters; the latter was not used to substitute away from the former. While the reforms did not necessarily close the gap between males and females in terms of intergenerational transfers, they did improve the overall socioeconomic status of women.¹³

Yet, there are studies that illustrate the unintended consequences of amendments to inheritance law as well. For example, unlike Deininger et al. (2013), Roy (2015) finds that reforms to the 1956 HSA did not result in a higher likelihood that girls would inherit property. Instead, parents found a way to circumvent the law by “gifting” family property to sons, and compensating daughters for the disinheritance by providing a larger dowry or educational investments. While the increase in educational investments in daughters is encouraging, Roy’s (2015) study also indicates how differences in the treatment of boys and girls persisted despite legislative reform. The results of this analysis pertaining to inheritance are broadly supported by ethnographic work by Bates (2004),¹⁴ and mixed methods work by Brown et al. (2002).¹⁵

The disparity between Deininger et al.’s (2013) and Roy’s (2015) results can be explained by differences in the empirical strategy used. Roy’s (2015) empirical strategy is relatively similar to Deininger et al.’s (2013), however, she uses variation in the timing of death of the grandfather, not the timing of death of the father, to define treatment status. Citing Agarwal (1994), she argues that the initial amendments to the 1956 HSA relate to ancestral property owned by the grandfather. She uses 1999 REDS data for her analysis.

Rosenblau’s (2015) study paints a starker picture of the unintended consequences of inheritance law reform in India. The purpose of his study was to estimate the causal impact of the legislative amendments in the four reform states on female child mortality. For this, he uses data on children born in 1975 or later from three rounds of the NFHS, and employs a difference-in-difference approach that exploits variation in reform status across states, the timing of reform in reform states, the religious affiliation of households in reform states, and the landownership status of households in reform states. He finds that the amendments to the HSA increased the likelihood of female child mortality by a small but significant amount (0.17 percentage points).¹⁶ He argues that the provisions of the law made daughters more expensive to parents who preferred handing own property to sons, and thereby increased the incentive for parents to disinvest in their daughters’ health.

¹³ Evidence suggests that the inheritance law reform had positive impacts on women’s bargaining power within the household (Mookerjee 2017) and on women’s labor participation rates in high skilled jobs (Heath & Tan 2016).

¹⁴ Bates (2004) draws on intensive field research in Bheema, a village in the Pune district, in Maharashtra state. She finds that women in the village prefer to not assert their inheritance rights out of fear of disrupting their social networks. The author argues that since improvements in female education and employment have led to positive effects on other dimensions of gender equality in the village, the government would be well-advised to continue investing in education to encourage awareness of the benefits of women’s access to property rights.

¹⁵ Brown et al. (2002) conducted their study in selected blocks in rural Karnataka, India. They rely on information gathered from a 400-household survey, and in-depth interviews with women and key informants for their analysis. They find that daughters do not actively assert their property rights as they continue to believe that dowry is their share of family wealth. Many daughters are also unaware of the stipulations that protect them from disinheritance.

¹⁶ The likelihood of female child mortality increased by a slightly larger amount (0.32 percentage points) when the analysis sample was restricted to reform states.

Rosenblau's (2015) findings on the unintended consequences of reform are supported by Bhalotra et al.'s (2017) analysis. Bhalotra et al. (2017) draw on NFHS data, and use a difference-in-difference approach that exploits state-level variation in the timing of the inheritance law reform (and an indicator to capture the post-ultrasound period) to isolate the impact of inheritance reform on female feticide, female infanticide, and fertility stopping behavior. They find that following inheritance reform, SRB increased, female infant mortality (relative to male infant mortality) increased, and male-biased fertility stopping behavior increased. Furthermore, they find that stated son preference (measured as the desired share of sons among desired total births) increased in the post-reform period.¹⁷

Given the negative impact of the reform on female fetal and child survival, Deininger et al. (2018) question whether some of the positive first-generation impacts Deininger et al. (2013) find translate into positive second-generation impacts. To examine this, they draw on three-generation individual data from the 2011 REDS follow-up conducted in Maharashtra, Uttar Pradesh, and Orissa, and they use a difference-in-difference strategy that exploits variation in cohort exposure to the law, state variation in implementation, and gender of the child observed. They find that post-reform, first-generation female beneficiaries were more likely to complete primary education, brought more assets into marriage, and were more likely to have access to a bank account. These positive first-generation effects translated into positive second-generation effects as investments in the education and health of second-generation females (relative to male siblings) increased. At the same time, however, Deininger et al. (2018) observe that first-generation beneficiaries saw a reduction in the share of daughters born (i.e. the reform was associated with an increase in sex selective abortion among first-generation women).

Taken together, these studies suggest that while reform in property rights is an important step towards improving the status of women and girls, it does not necessarily bring about *immediate* positive change in parents' valuation of daughters.

Pension schemes

Another area of possible intervention is in social protection for the elderly. As highlighted previously, sons are preferred over daughters because they can support parents during old-age. In Hubei province in China, for example, nearly 50 percent of the respondents to a fertility survey stated that the primary reason to have a son was because they needed support during old-age (Davin 1985). It follows that when the State steps in as the main provider of support for the elderly, it obviates the economic need for sons as support during old-age. This, in turn, can erode some of the deep-rooted preference for sons.

Ebenstein and Leung (2013) provide some evidence of this using the case of China's rural old-age pension program. In 1991, China established an alternative to the family-based system of elderly support in rural areas, by initiating a funded, defined-contribution pension plan. Individuals would have to voluntarily contribute to the pension plan, and these contributions could be supplemented with subsidies from employers and local communities. To estimate the causal impact of this new

¹⁷ Some evidence also suggests that the reform was associated with an increase in marital conflict and the incidence of wife beating (Anderson & Genicot 2015).

social insurance scheme on the SRB, Ebenstein and Leung (2013) use (a) multivariate regressions to see whether change in SRB before and after 1991 was associated with program availability in the village, and (b) complement this with an instrumental variable (IV) model that instrumented variation in the program's availability using the share of the village's population ages 40 or more. The data for this analysis came from the 2002 China Household Income Survey and the Chinese census. The evaluation results suggest that the SRB increased more in counties that had fewer villages participating in the program, and the increase in SRB was 9 percent less in counties that did adopt the program even after controlling for other village-level characteristics.

Ebenstein (2014) finds similar results for Korea and Armenia. For details on the Korean study, see Section 5. For Armenia, Ebenstein (2014) tests how the collapse of the Soviet Union, and the withdrawal of social protections provided under the USSR, affected the male fraction of births. Using data from the Armenian census, he employs a difference-in-difference approach to compare the male fraction of births had by high educated and low educated parents, before (1983-1991) and after the Soviet collapse (1992-2001). The idea behind this empirical strategy is that low educated parents would be particularly vulnerable with the sudden withdrawal of social protection, and they would therefore be more likely to sex select and revert to traditional forms of old-age insurance. The difference-in-difference estimate suggests that after the fall of the Soviet Union, the male fraction of births for low educated parents increased by 2.2 percent. These results do not necessarily imply a causal relation between the availability of social insurance and the tendency to sex select (more details in following paragraph). However, the timing of the increase in SRB, and the group that particularly contributed to that increase in SRB, hint at the plausibility of a causal relationship.

Caution must be used when interpreting the results outlined above. A causal relationship between social protection and SRB is not fully established in these studies – an issue acknowledged by the authors of these studies as well. In the China study, for example, the instrumental variable approach used may not appropriately account for factors that affect both the instrument for program availability (population age structure) and the SRB. In the Armenia study, (a) the assumption that the trends in the male fraction of births for high educated and low educated parents were parallel in the Soviet era is not tested, and (b) other possible causes for rising SRB among low educated parents are not fully ruled out. Overall, the main difficulty with identifying a causal impact in these cases comes from the non-random assignment (or withdrawal) of social protection.

Female political participation

Measures to encourage political participation among women can be fruitful as well. With more female representation in the political sphere, girls' aspirations and parents' valuation of girls' capabilities can change as female politicians can serve as role models.

Beamen et al. (2009) test this hypothesis using 1991 census data and 2006-2007 household survey data from the Birbhum district in the state of West Bengal, India. In 1993, it was legally required that one-third of village council positions in India be randomly reserved for women. Since the assignment of the reservations for women was random, Beamen et al. (2009) can use simple regression models to estimate the causal impact of female political presence on gender attitudes.

They find that compared to individuals in never-reserved councils, individuals in reserved councils were more likely to perceive women as being effective leaders, and less likely to hold on to stereotypes about gender roles.

In a follow-up study, Beamen et al. (2012) use the same data set and similar empirical strategy to estimate the impact of the reservations on the gender gap in aspirations and educational attainment for adolescents. They find that compared to never-reserved councils, adolescent girls in twice-reserved councils saw a larger increase in aspirations than their male counterparts. Parents in twice-reserved councils also saw a larger increase in aspirations for daughters compared to sons. Adolescent girls in twice-reserved councils saw a larger increase in their educational attainment compared to adolescent boys, and adolescent girls spent less time on household work.

Kalsi (2017) exploits the same natural experiment to find that the infant mortality rate of girls (versus boys) at higher birth orders declined and the percentage of surviving boys (versus surviving girls) at higher birth orders declined following reservations in rural India. She argues that the likely channel for this was normative change that accompanied exposure to female leaders.

The presence of female politicians can also lead to investment in programs preferred by or strongly needed by the female population. Chattopadhyay and Duflo (2004) find evidence of this using household survey data from West Bengal described above, and from Udaipur district in Rajasthan, India. Note however, that the authors do not estimate whether female politicians increase expenditure on programs specifically targeted at female children.

Overall, the studies from the Indian context strongly suggest that the presence of female politicians can lead to a narrowing of gender gaps across various dimensions. There are studies in the context of developed countries that also provide evidence of this, namely the positive role model effect of female politicians.¹⁸

Education and employment opportunities

See Table 4 for an overview of the studies described below.

An expansion of educational opportunities (Pande & Astone 2007; Murthi et al. 1995; Ren 1995), and employment opportunities/financial resources for women (Duflo 2000; Luke & Munshi 2011; Qian 2008) is documented to improve outcomes for girls. This positive change can happen through various channels. Providing women with education can allow them to be active participants in the labor force, and this can go to improve their bargaining position within the household, and lower their financial dependence on male kin. The presence of women actively engaged in the formal

¹⁸ Latu et al. (2013) conduct an experiment with ~ 150 students from a Swiss university to study how random exposure to high-ranking female politicians versus male politicians (and exposure to female politicians versus no exposure) impact women's behavior. They find that extended exposure to female politicians had a positive effect on women's behavior during leadership tasks, and their self-assessments when performing those tasks. Campbell and Wolbrecht (2006) find similar results in the United States. Using longitudinal and cross-sectional data for high school seniors in the US, they conduct correlation/associative studies to highlight that – over time, and during a single period – an increase in the visibility of female politicians is associated with an increase in adolescent girls' aspirations to be politically involved.

labor force can foster the idea that girls are equally capable of being economically productive. This in turn can change young girls' aspirations and perceptions,¹⁹ and encourage parents to invest in their daughters (similar to the role model effect described above). Schooling and employment opportunities can also bring about ideational change by exposing young individuals to gender egalitarian ideas (see Thornton's (2001) literature review/commentary on developmental idealism).

Note that women with higher education and/or employment status do not always display a lower tendency to sex select. In fact, there are various studies that suggest that they are more likely to sex select (DasGupta 1987; Amin 1990). The results from the studies cited in this paragraph and the one above are not necessarily contradictory if one accounts for the non-linearity between maternal education (or other markers of socioeconomic development) and son preference (this argument is expanded upon in Section 5).

Table 4: Overview of studies that illustrate the link between female education/employment/access to financial resources, and female child wellbeing

Author(s) (Date)	Research question	Data	Empirical strategy	Key findings
Murthi et. al (1995)	What covariates are associated with gender-specific child mortality rates?	District-level data from 1981 Census	Multi-variate regression (associative study)	Higher female literacy in a district is associated with lower odds of a gender gap in child mortality. These results hold across all regions.
Ren (1995)	What covariates are associated with changes in the gender-gap in infant and child mortality rates?	China In-depth Fertility Survey (1985 and 1987)	Multi-variate logit regression (associative study)	When mothers are educated, girls had relatively higher odds of neo-natal survival than boys
Pande and Astone (2007)	What covariates are associated with lower levels of son preference?	1992-93 NFHS	Ordered logistic regression (dependent variable is son preference measured in an ordinal scale) (associative study)	Female education, particularly at secondary plus levels, was associated with lower son preference regardless of family size (or other controls)

¹⁹ See Stout et al.'s (2011) experimental study on how random exposure to successful women in science, technology, engineering, or mathematics (STEM) changed young girls' perceptions about the ability of females to succeed in STEM careers. Also see Marx and Roman's (2002) experimental study on how women's math test scores improved in the presence of women who represented stereotype defying information about women's mathematical abilities in general.

Duflo (2000)	Does the increase in household resources for grandmothers - following the expansion of the South Africa pension program - improve health outcomes for female grandchildren?	National household survey of South Africa carried out by the World Bank and the South African Labor and Development Research Unit at the University of Cape Town	Difference-in-difference approach that compares differences in height of children in eligible households and non-households, and differences in height of children who have been exposed to the program for a shorter period and children who have had full exposure to the program.	Pensions received by grandmothers had a substantial positive impact of female grandchildren's health. The effect was large enough to bridge half the gap in height-for-age between South African and American girls.
Luke and Munshi (2011)	Does the increase in income for women – after the expansion of employment opportunities in tea estates in Tamil Nadu, India – have a positive impact on female children in the household?	Survey of ~ 4000 female workers from 2002-2003	Different instrumental variables are used to instrument variation in female income, and estimate its' causal impact on child outcomes	Increase in female income leads to an increase in female children's schooling, particularly for historically disadvantaged groups
Qian (2008)	Do increases in female agricultural income (relative to male income) cause an improvement in the survival prospects and educational attainment of girls?	1990 Population census for China, and 1993 household-level survey data from Ministry of Agriculture	Difference-in-difference strategy that compares the gender gap in survival and education in the Maoist era and post-Mao era, between counties that plant tea and counties that do not plant tea. A county's production of tea is a differentiating factor because post-Mao reforms led to an increase in tea prices, and an increase in wages for tea cultivators	Increases in female income increases the survival prospects and educational attainment of girls

			(tea cultivators were typically female).	
DasGupta (1987)	What factors are associated with female child mortality in Ludhiana district, Punjab?	1984 baseline census of villages originally surveyed for the 1950s Khanna study. Census was supplemented with complete maternity histories for ever-married women ages 15-49	Descriptive statistics to illustrate associations between covariates and sex differentials in child mortality and health (associative study)	Women's education was associated with higher mortality for daughters of higher birth order
Amin (1990)	How is mother's education related to sex differentials in child mortality in rural South Asia?	Narangwal Health Project conducted in rural Punjab, India Sample of 8,050 children 0-36 months old between 1969-74	Multivariate hazard model to measure risk of dying (associative study)	First-daughters of educated mothers have lower post-neonatal mortality compared to sons than first-daughters of uneducated mothers. However, second order or higher daughters of educated mothers have higher post-neonatal mortality compared to sons than second order or higher daughters of uneducated mothers.

4.2 Advocacy

As highlighted in the previous section, legislative actions, while important, may not bring about immediate changes in individuals' gender-specific attitudes and behavior. In addition to this, there might be several dimensions of gender inequity outside the purview of the law that governments cannot change (or have limited leverage to change). For example, in Vietnam, the importance of sons for ancestor worship rituals continues even though women can also perform those rituals (UNFPA Vietnam 2013). Similarly, while women have attained higher status in the different countries studied here, the practice of patrilocal marriage, and the unequal gender arrangements it entails, perseveres. In China, the "Care for Girls" campaign tried to introduce the concept of uxorilocal marriages; however, uxorilocal arrangements are typically looked down upon, and the formal program never included the provision (Li 2007; Guilimoto 2012a).

One way of bolstering the impact of legislative reform, and triggering normative shifts is through advocacy and awareness raising campaigns. Advocacy and awareness raising campaigns can include:

- assigned days to celebrate women and female children;
- documentary and infotainment films, infotainment television and radio series;
- hiring celebrities as brand ambassadors for gender equity;
- posters in hospitals and other key public spaces,
- dissemination of technical reports, policy briefs, and editorials
- local counseling efforts, focus group discussions, and awareness building sessions

The stakeholders involved in these efforts include households, key community members, NGOs, medical personnel, different sections of the media, government organizations, and international organizations (Rahm 2012).

Mass-media campaigns are one of the most useful methods through which people's awareness of a social issue, and their values and behaviors with regards to that issue, can be altered. The popularity and geographic reach of mediums such as the radio, television, and the internet, make media campaigns particularly cost-effective in bringing about normative change.

There are numerous examples of how access to media, particularly television and film, has led to a shift in attitudes and behavior. Jacobsen (2011) exploits variation in spatial proximity to theaters showing Al Gore's *The Inconvenient Truth* and finds that zip codes closer to where the film was shown experienced a 50 percent relative increase in voluntary carbon offset purchases. Similarly, for Brazil, La Ferrara et al. (2012) uses differences in the timing of soap-opera coverage in different areas to show that women living areas that had network access to soap-operas showing small, happy families, were more likely to lower fertility. In Tanzania, Rogers et al. (1999) draw on quasi-random variation in access to an entertainment-education radio show on family planning across different areas to estimate the impact of the show on family planning adoption. They find that access to the soap-opera increased the listeners' belief that they could determine their family size by using contraception, and it also increased the probability that listeners would discuss family planning with their partners and peers.

Studies also illustrate how access to the television, films, and radio media platforms shift gender-specific attitudes and behavior. For example, Jensen and Oster (2009) use a three-year individual panel data set for India to see if gender norms and behavior changed between surveys and across villages depending on if and when they got cable TV. The key assumptions to identify a causal impact hold in their study: there were no pre-existing differences in women's status across villages that had and did not have cable TV, the timing of changes in the outcomes of interest was closely tied to the introduction of cable TV, and the outcomes of interest were not associated with future cable TV access. They find that with the introduction of cable TV, women were more likely to make autonomous decisions, report domestic violence as unacceptable, and report son preference as unacceptable.

In a complementary study, Ting et al. (2014) use NFHS-3 data to find that TV exposure in India is linked with a range of measures of women empowerment, and more specifically, a lower

preference for sons. Their empirical strategy was to use PSM to compare outcomes for women who were similar across every dimension except their TV viewership.

Similar patterns are observed in non-causal or correlation-based studies. Lin and Adserà (2013) also use NFHS-3 to find that mothers' exposure to TV was associated with girls spending fewer hours doing household chores, and a smaller gap between girls and boys in terms of time spent doing chores. Barber and Axinn (2004) use couples-data from the Chitwan Valley Family Study in rural Nepal to identify the negative association between exposure to different media formats and son preference. Barber and Axinn (2004) try to address the limitations of the nonrandomized research design by looking at the relationship between exposure to different media formats (newspapers, radio, TV, and movies have their own determinants for access and self-selection) and son preference. Pande and Astone (2007) use NFHS-2 data to find comparable results for the association between different types of media exposure (radio, TV, movies) and son preference.

These mediums are effective because they introduce individuals to lifestyles, values and behaviors that are different from their own. In doing so, they develop in viewers a sense of awareness of how their own social interactions compare with those of the characters they see on television or film (Jensen & Oster 2009). The fictional drama format is particularly advantageous as it can be entertaining and instructional without being condescending to the viewer. As such, they are more likely to be popular among the key target audience: young women (Naqvi 2006).

However, content produced for the multi-media format need not necessarily produce the desired social response. Content producers have to walk a thin line to make sure they do not alienate their audiences. For example, *Atmajaa* was a fictional drama centered on the issue of sex selection that aired in India in 2004. An audience impact study of the show suggested that while young women were receptive to the message of the show, older women felt negatively stereotyped, married women felt their decision-making process was not clearly depicted, and men felt poorly represented. Episodes following the impact study tried to address these issues, however, no evaluation was conducted for these later episodes (Naqvi 2006).

The media can also be effectively used to disseminate technical reports that can spur public awareness of the consequences of sex selection. Reports on census results, cross-country and over-time sex ratio comparisons, the local impact of excess males and bride scarcity, the resulting trafficking of women etc. can be circulated. Vietnam is an example of a country where observable sex imbalances in statistical surveys were immediately conveyed by the media to the public. As a result, sex selection soon became a national issue (Guilmoto 2012a).

Efforts to strategically draw international attention to growing social problems in a country and lackluster government responses to those problems can also be effective. For example, the resolution of the Council of Europe (2014; 2011) seems to have been successful in shaming South Caucasus countries about the unfettered rise in sex selection, and in pressuring these countries to strengthen policies (including banning prenatal sex selection) to counter it (ibid).

Aside from the resolution of the Council of Europe however, there have been limited awareness building efforts on the issue of sex selection and son preference in the South Caucasus countries. In Armenia, a six-episode TV series that drew attention to the concerns and achievements of

Armenian women was produced by the Hrayr Maroukhian Foundation (HMF) in collaboration with Yekir Media (funded by the Norwegian Foreign Ministry). None of the episodes explicitly spoke about sex selection, however, one did showcase a panel of successful Armenian entrepreneurs and managers. Such series, if they receive a large audience base, can trigger some shifts in perceptions about women's economic worth (Rahm 2012).

A criticism levied against advocacy efforts or awareness building campaigns is that they can lack a gender perspective when reporting on the issue of sex selection. Women are often portrayed as vulnerable individuals who need to be protected, and the issue of sex selection itself is framed as a trend that can lead to a shortage of potential brides. In 2005, a website search in China found that among nearly 2 million reports on sex selection, only 15% mentioned "gender equity" and only 4% mentioned "women's rights and interests" (Zheng 2007). In most countries, messaging around the issue of sex selection has also come under criticism for criminalizing abortion in general, and for placing undue burden of saving female fetuses on mothers (Naqvi 2006; Nie 2010).

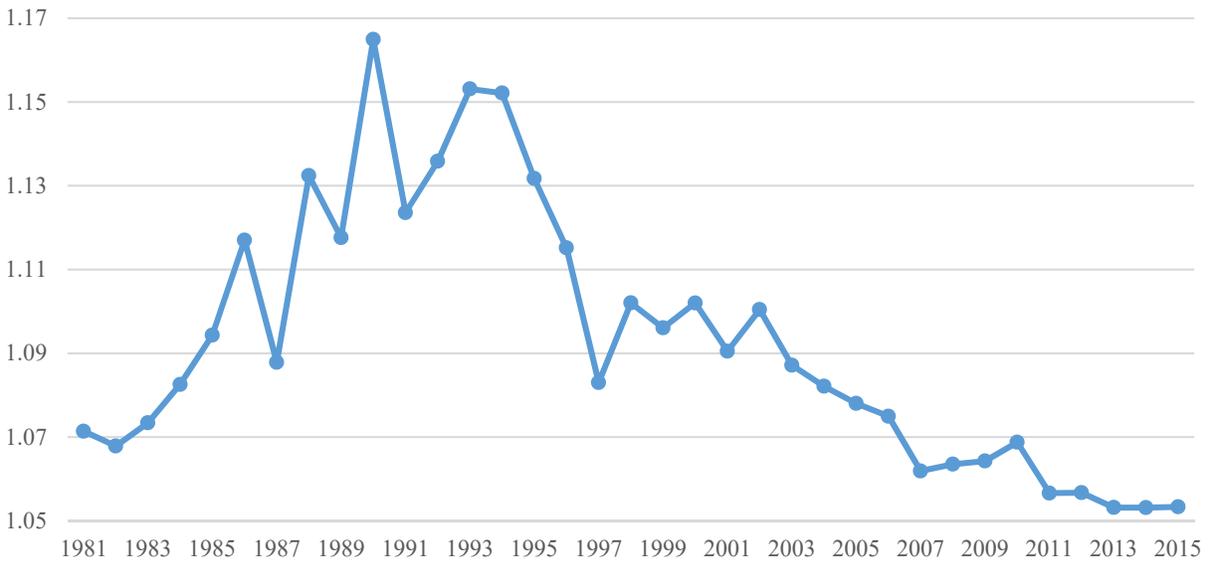
Advocacy and awareness raising campaigns can be strengthened with support from community leaders, political leaders, celebrities, youth organizations, and religious organizations. The involvement of these groups is key as they can bring about trickle-down effects. It is also important to actively involve the medical community - members of whom often feel criminalized in efforts to manage sex selection - as they play critical roles as points of access to reproductive technology (Guilmoto 2012a).²⁰ Women's groups should also be actively involved in these campaigns (in order to ensure that a gender perspective is incorporated in these campaigns), and the target audience for these campaigns should include men and mothers-in-law (since women typically do not have complete power to determine the sex composition of her children). For example, in India, awareness campaigns that target men and educate them on how the sex of the fetus is determined by the male sperm have been deemed effective in fostering a change in attitude among men about the sex of the fetus (Rahm 2012).

5. Republic of Korea's Success Story

The case of Korea is of interest because it is the only country, in recent times, to have reversed its trend in SRB and child sex ratios. As Figure 2A suggests, SRB was rising in the 1980s, peaked to 116.5 in 1990, and has since then been on a downward trend, reaching biologically normal levels in the late 2000s. How did Korea manage this turnaround, and what policy lessons does the Korean experience provide other countries grappling with sex imbalances?

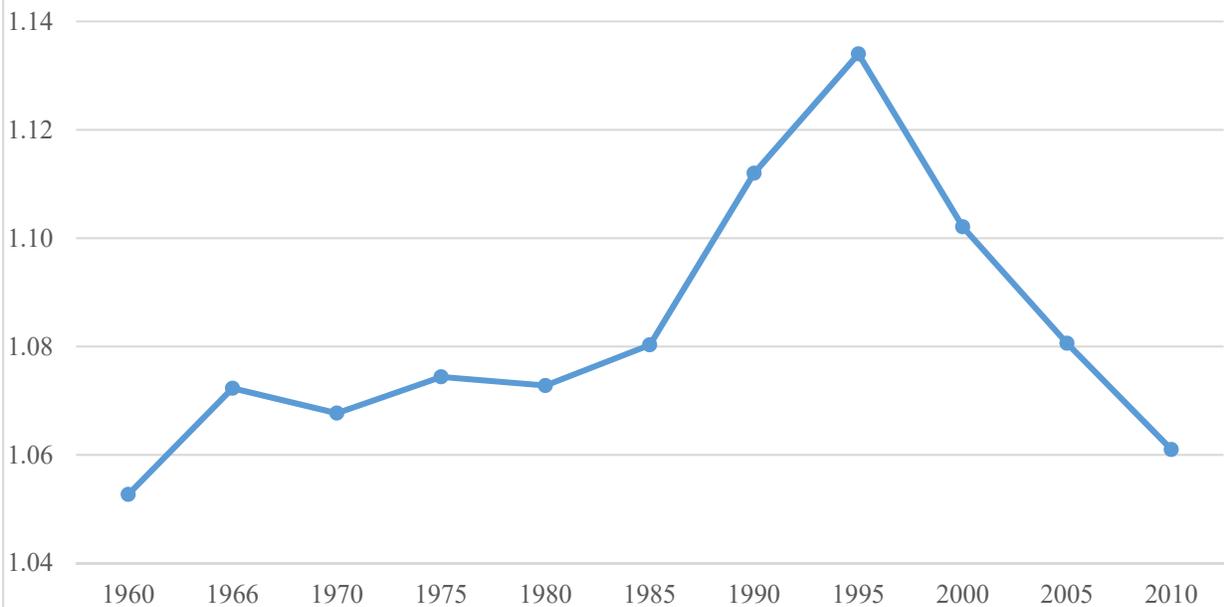
²⁰ In Nepal, for example, the Society of Obstetricians and Gynecologists developed a story-based documentary film to caution the public about the repercussions of sex selective abortions, and to draw awareness to the larger issue of gender equity. The organization also put up informational posters in their hospitals and clinics (Puri & Tamang 2014).

Figure 2A: Sex Ratio at Birth, South Korea, 1981 - 2015



Source: Korean Statistical Information Service

Figure 2B: Child Sex Ratio, South Korea, 1960 -2010



Source: Korean Statistical Information Service

Most experts argue that the Korean turnaround was primarily due to societal level shifts in gender-specific attitudes and behavior. There is limited evidence to suggest that the ban on prenatal sex selection technology was primarily responsible for the normalization of SRBs (Park & Cho 1995), and while the government passed key legislation that undermined patriarchal traditions, these

legislative changes largely occurred in response to the shift in societal views. Existing studies also do not sufficiently isolate the impact of key policy changes (in areas such as social security) on the sex ratio. Some of the literature suggests that campaigns to instill fear about the social problems created by excess males - particularly with regard to men not being able to find wives – were present in the 1980s and 1990s (Liisanantti & Beese 2012). However, there are no further details about these campaigns, or close evaluations of their effectiveness.

Normative change

Before industrialization, Korea was organized as a system of rigid patrilineages that reinforced the value of sons over daughters. Within this system, there was a rooted belief that lineage could be continued only through the line of the eldest son, and that sons were better suited to inherit family property, provide old-age support, and perform ancestor worship rituals. Daughters, contrarily, were regarded as outsiders to their natal families after marriage, as their productivity belonged to their husband's family. With the persistence of patriarchal norms, married women were highly motivated to bear sons as a son could help them secure their position in their husband's family, and provide financial support during old-age (Chun & DasGupta 2009).

The process of industrialization, and the concomitant urbanization, dismantled the forces underpinning son preference in Korea. With new economic opportunities, individuals did not have to rely on their clans for their livelihoods and for their social status. This reduced the incentive to fulfill traditional obligations. Industrial jobs also allowed people to save up for retirement so they were no longer dependent on sons to work the land, and care for them at old age (Chung & DasGupta 2007).

The day-to-day conditions of urban life further muted the centrality of sons in parents' lives. In urban areas, individuals live and work with people from different backgrounds. They are not surrounded by members of their clan or lineage, and therefore, they face less pressure to conform to filial norms. In rural areas, the practice of lineage exogamy (and village exogamy) makes it difficult for daughters to contribute to their elderly parents' lives. However, with migration to urban areas, and concurrent increase in physical mobility, elderly parents are equally likely to live with sons or daughters. Who the parent lives with became less a matter of gender or birth order, but more a function of physical proximity and the strength of the parent-child relationship. Improvements in women's education and labor market opportunities also enhanced the value of daughters, particularly as parents could now benefit from proximity to daughters (ibid).²¹

Note that the above argument emphasizes that modernization worked to reduce son preference primarily because of the normative change triggered in society at large. Improvements in individual level socioeconomic metrics do not necessarily correspond with a decline in son preference. In fact, Korea in the 1990s, was an example of a country that was economically developed but still had high sex ratios. SRB in Korea reached normal levels only in the 2000s, and

²¹ The effect of these changes is evident in contemporary intergenerational exchanges in Korea. In recent years, Korean elderly have seen a decline in economic support from sons, an increase in emotional support from daughters, and an increased likelihood of close relationships with daughter's/daughters' families (Chun & DasGupta 2009).

this can be explained by the normative change experienced in the prior decade. Between 1991 and 2003, the proportion of women in the same birth cohort who reported that they “must have a son” halved. The probability that a woman stated that she “must have a son” in 2003 was one-third of the 1991 level, even after controlling for various socioeconomic characteristics (ibid).

Put differently, the relationship between economic development and son preference was non-linear in the case of Korea. Economic development can initially worsen sex selection as it can heighten pressure to reduce family size (and therefore heighten pressure to sex select), and it can facilitate access to technology to exercise son preference. This can explain the spike in SRB following the introduction of prenatal sex determination technologies in the 1980s. Over time, however, shifts in social norms brought about by the conditions of urban life, eroded preference for sons (Bhat and Zavier 2003; DasGupta et al. Forthcoming).

Legislative Measures

Between the 1950s and the late 1980s, family law in Korea reflected the interests of patrilineal clans. Family headship was held by men, daughters did not have equal rights to property as sons in their birth clan, men were required to marry outside their lineage, and women were transferred to their husband’s lineage after marriage. After marriage, women did not have similar rights as their husbands. For example, in case of a divorce, women did not get to share child custody rights or property rights with their husband. Furthermore, husbands had the right to unilaterally determine where he and his wife should reside. This leeway practically ensured the continuation of patrilocal residence (Boer & Hudson 2017; Shin 2006).

Calls for revisions to Family Law were initially met with resistance. The authoritarian governments that were in place until the late 1980s sought to reinforce traditional Confucian principles of loyalty to the ruler and filial piety in order to maintain social and political stability. Following democratization in 1987, however, women’s groups gained the momentum necessary to push for key changes to Family Law. The 1989 revisions to Family Law stated that daughters and sons had equal rights to inherit property, that child custody rights and property rights in case of a divorce would not be automatically given to the father/husband, that married couples must jointly decide on the domicile, and that a husband could enter his name in his wife’s natal family register if he so chose (Shin 2006). Urbanization contributed to easy implementation of new inheritance laws as well; distribution of urban assets to daughters was easier than distributing lineage assets such as land (Chung & DasGupta 2007).

There are no rigorous evaluations of how this change in Family Law affected parents’ investments in or valuation of daughters. Such evaluations are complicated by the fact that the timing of these legislative changes broadly coincided with (and arguably, even followed) normative changes within civil society. In the late 1980s and early 1990s, the Korean population as a whole was increasingly starting to question and challenge traditional ways of organizing daily life (ibid).

Another significant piece of legislation in Korea in the 1990s was pension reform. This reform was/is important because the expansion of social insurance obviates some of the need for sons during old-age (Ebenstein & Leung 2013; Ebenstein 2014). Up until the 1990s, social protection expenditure by the state was limited, and the emphasis was on families to serve as the primary

caregivers for the elderly. However, in 1995, there was a massive expansion of pension coverage. While previous pension schemes were limited to workers in the formal labor force, the 1995 legislation provided compulsory coverage to self-employed individuals in rural areas, including farmers and fishermen. This marked a significant shift given that nearly a quarter of the workers in Korea were self-employed at the time. To finance this effort, every citizen was required to contribute 9.5% of their income to the pension program (Ebenstein 2014).

Ebenstein (2014) tests the hypothesized impact of social insurance on son preference using Korean census data on births observed between 1990 and 2000 for couples where the father was at least 35 years of age, and the mother was at least 30 years of age. He uses a difference-in-difference approach to estimate this impact. He looks at how the expansion of pension coverage to self-employed workers affected the male fraction of births, after controlling for changes in the male fraction of births borne by salaried workers who were already covered by the pension scheme. His difference-in-difference estimate shows that the introduction of mandatory social security was associated with a 2.21 percentage point decrease in the male fraction of births between 1990-1994 and 1995-2000.

This evidence suggests that parents in Korea altered their preference for sons in response to the policy change. However, Ebenstein (2014) himself notes that this analysis is not without its limitations. The data for trends in births prior to 1995 are not extensive enough to ensure that the key assumption for difference-in-difference estimation - pre-treatment parallel trends between the treatment group (self-employed workers) and control group (salaried workers) - holds.

Aside from the debate on the impact of enacted policy changes, it is important to highlight the legislative measures that the Korean government did not take until the mid-2000s, after sex ratios had started to normalize. The male family head system or *hojuk* (the basis for patrilineal succession) was not abolished in Korea up until 2005/06, despite active efforts by women's groups to do so. Following the abolishment of this system in 2005, the family-based registration system was replaced with an individual based registration system, marriage between individuals in the same lineage was allowed unless they were relatives within 8 degrees, couples could jointly decide on their children's family name, children in remarried families could change their family name, and under-age adoptees had the same rights as other children in the family (Shin 2006; Boer & Hudson 2017). The fact that this key legislation for gender equity was not passed until the late 2000s raises the question of whether state (in)action delayed the normalization of sex ratios in Korea.

Lessons learned from the Korean case

The Korean case is interesting in that it highlights both the success and failure of public policy in reducing gender inequity. On the one hand, the government's economic development agenda created conditions that undermined the institutional basis for son preference. The spread of employment opportunities allowed people to save up for retirement, the daily conditions of urban life freed individuals from the rules of the clan and allowed diffusion of new ways of thinking, and the rise in women's education and labor force participation changed parents' valuation of daughters. On the other hand, the state did not undertake necessary legislative reform (particularly

in the area of Family Law) to improve the overall status of women up until the mid-2000s. It could be argued that by delaying legal reforms such as the abolishment of the family head system, the state inadvertently delayed the normalization of SRB. In fact, there are several other dimensions of gender equity that Korea continues to fare poorly on despite all the progress it has made in reducing child sex ratios (The Economist 2014; Tsuya et al. 2000; Sung 2003). In terms of enacted legislation, the Korean state did ban prenatal sex determination, however, there is no conclusive evidence that this ban was critical to curbing prenatal sex selection.

Overall, the Korean experience suggests that the broader economic development agenda needs to be combined with legislative measures that promote women's status in their public and private lives, and advocacy campaigns that accelerate the diffusion of new gender norms. This is the approach that countries like China and India have adopted and are striving to implement. Korea witnessed a reversal in its sex ratio trend before these countries because (a) it industrialized and urbanized earlier and faster, and (b) it is a small and homogenous country where the diffusion of new norms is easier.

6. Conclusion

The purpose of this review was to conduct a stocktaking of the different policies that have been used to tackle the excess mortality of girls, and son preference more broadly. Having evaluated the different direct and indirect measures used, the following are recommended steps for countries trying to resolve the problem:

(1) Strengthen data collection and monitoring efforts

Access to data on child sex ratios at the sub-national level is relatively easy to obtain from censuses and surveys. However, reliable data on the SRB is harder to obtain given that it requires the establishment of comprehensive vital registration systems. Currently, such systems are not in place – particularly in economically disadvantaged areas – making it harder to assess the extent of prenatal sex selection, and the particular regions that are contributing to it. Without good vital statistics it is hard to monitor and evaluate regional programs aiming to curb SRB as well.

(2) Evaluate the costs of immediate measures to reduce sex selection

As sex selection rises, governments feel compelled to do something about it, and a ban on prenatal sex selection technology is the most immediate step they can take. Not surprisingly, most countries grappling with rising SRB and child sex ratios have implemented such a ban. This measure raises ethical concerns surrounding women's reproductive freedoms, but even if one were to set aside these considerations, evidence suggests that these bans are difficult and costly to implement. In China, the stringent implementation of the ban in the 2000s called for a tremendous effort on the part of various local authorities and family planning workers. Women who were pregnant with their second child were frequently monitored as part of the program, and even then, the overall SRB did not decline between 2000 and 2010. With second pregnancies being monitored, families that actively wanted a son just deferred sex selection to the first birth. Scaling up such a program

to ensure monitoring of all births would be a financial and logistical challenge, and evidence from the Nawanshahr model in India suggests that sustaining such efforts is difficult.

Moreover, there is evidence to show that bans can be self-defeating in improving outcomes for women and girls. Bans can make access to legal reproductive health care services difficult, and they can push couples with strong son preference to use postnatal discrimination as a substitute. Having unwanted girls can also worsen the treatment of mothers in the household.

CCT programs do not seem like a viable alternative either. Evidence from India and China suggests that these programs are ridden with implementation challenges, deliver short-term gains at most, and do not change underlying gender preferences among parents.

(3) Reform laws and institutional practices

Reform in areas such as family law, social security, workplace policies, educational policies, and political reservations can undermine some of the institutional underpinnings of son preference and bring about normative change. These reforms can potentially provide women with more bargaining power within the household, provide young adolescents with female role models, and encourage parents to invest in daughters. However, it must also be noted that legal reforms do not always bring about immediate shifts in gender norms.

(4) Strengthen advocacy efforts, and employ a multi-sectoral approach to do so

The effect of legislative reform in bringing about attitudinal change can be strengthened through advocacy efforts. Advocacy, particularly mass-media advocacy, is one of the most cost-effective ways of changing gender-specific attitudes and behavior. Compared to the bans on sex selective technology, advocacy efforts (in combination with legal reform) offer more promise in terms of undermining son preference and producing a more permanent shift away from sex selection.

Advocacy efforts can be even more effective when a diverse set of partners (media groups, NGOs, religious leaders, local leaders, celebrities etc.) come together. Members of these groups can disseminate reports to raise national awareness, hold discussion sessions that force an examination of gender norms and sex selective practices, and generate greater visibility for female achievers. However, the framing of messages in advocacy efforts needs to be managed to ensure that they focus on promoting gender equity.

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Appendix

Section A1: Regulations against Prenatal Sex Determination and Sex-Selective Abortions

China

- 1994: Law of the People’s Republic of China on Maternal and Infant Health Care
 - Article 32: “Medical and health institutions that in accordance with the provisions of this Law carry out...genetic disease diagnosis and pre-natal diagnosis, ligation operations and operations for termination of gestation must meet the requirements and technical standards set by the administrative department of public health under the State Council, and shall obtain the permission of the administrative departments of public health under the local people's governments at or above the county level. Sex identification of the fetus by technical means shall be strictly forbidden, except that it is positively necessitated on medical grounds” (Eighth National People’s Congress 1994)
 - Article 33: “Personnel engaged in making genetic disease diagnosis or pre-natal diagnosis as provided by this Law must pass the examination of the administrative department of public health under the people's government of the province, autonomous region or municipality directly under the Central Government, and obtain a corresponding qualification certificate” (ibid)
- 2001: Stipulations on Family Planning Technical Services
 - Article 15: “No institution or individual shall conduct fetal sex identification for non-medical reasons or artificial termination of pregnancy for sex selection” (State Council of the People’s Republic of China 2001)
- 2002: Population and Family Planning Law of the People’s Republic of China
 - Article 22: “Discrimination against and maltreatment of women who give birth to baby girls or who suffer from infertility are prohibited. Discrimination again, maltreatment and abandonment of baby girls are prohibited ” (Li 2007, sec.Appendix)
 - Article 35: “Use of ultra B or other techniques to identify fetal sex for non-medical purposes is strictly prohibited. Sex-selective pregnancy termination for non-medical purposes is strictly prohibited” (ibid).
- 2003: Stipulation on forbidding Non-medical Aimed Fetus Sex Determination and Abortion
 - Article 2: “Fetal sex identification and sex-selective pregnancy termination for non-medical purposes are strictly prohibited. Without the approval of authorities of health and family planning, no organization or individual shall conduct an operation for fetal sex identification or sex-selective pregnancy termination” (ibid)
- 2006: Decision of the Central Committee of the Communist Party of China and the State Council on Fully Enhancing Population and Family Planning Program and Comprehensively Addressing Population Issues
 - “Fetal sex identification and sex-selective pregnancy termination for non-medical purposes is strictly prohibited” (ibid)
- 2015: Notice to Strengthen the Prevention and Control of Blood Tests for Fetal Sex Identification
 - “Strengthen the supervision of various types of health care, family planning technical service agencies and their staff; prohibit blood collection for non-medical needs of the fetus sex identification” (National Health and Family Planning Commission 2015)
 - “Strengthen supervision of blood exit. Prohibit carry, mail, transport of blood samples exit, increase blood sample exit inspection efforts” (ibid)
 - “Strengthen supervision of online advertisements for fetal sex identification services” (ibid)

India

Main reference used: (Ministry of Health and Family Welfare 1994)

- The initial version of the Act, which came into operation in 1996, prohibited the use of prenatal diagnostic techniques for prenatal sex determination. The use of such diagnostic techniques was limited to the purpose of detecting genetic/metabolic/chromosomal disorders, congenital malformations, or sex linked disorders.
- Only institutions and medical professionals who are registered under the Act are allowed to use prenatal diagnostic techniques for the qualified purposes.
- Amended in 2003 to prohibit the use of pre-conception sex selection techniques. Amendment also aimed to increase regulation of scan provision by making it mandatory for medical institutions to:
 - Maintain records of the use of techniques capable of detecting the sex of fetus
 - Maintain records of the use of tests and procedures capable of leading to preconception sex determination
- Sale of ultrasound machines has also been restricted to institutions registered under the Act.
- Prohibits any form of communication of the sex of the fetus, and any form of advertisement of such techniques.
 - Contravention of law pertaining to advertisement of sex determination services can lead to imprisonment of up to three years, and a fine of up to Rs. 10,000
- Any contravention of the Act can lead to imprisonment of up to five years, and a fine of up to Rs. 100,000. First offenses can lead to imprisonment of up to three years, and a fine of up to Rs. 50,000.
- District/Sub-District Appropriate Authorities implement the provisions of the Act. These bodies have the powers of the Civil Court to search the premises and records of violators. They also have the authority to penalize the violators (sealing machines/premises, commissioning witnesses).
- National Inspection and Monitoring Committee conduct field visits, and provide feedback reports to state and central authorities.
- Awareness creation through Members of Parliament (MP) Scheme (2007)
 - Grants provided to MPs of the states of Chandigarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Punjab, and Rajasthan, for creating awareness around SRB

Republic of Korea

- 1987: Prohibition on Ascertaining the Sex of the Fetus
 - Restricted the medical provider from revealing the sex of the fetus to the pregnant woman or the woman's family
 - Restricted the use of ultrasound scans to authorized medical centers
 - Enforced requirements on documenting procedures performed on pregnant women (Ganatra 2008)
- 1994: Medical Practices
 - Imposed greater penalties on medical professionals who violated the 1987 Act
 - Penalties: up to 3 years imprisonment, USD 12,000 fine, and loss of professional license (Ganatra 2008, p.92)
 - Article 19.2 of Medical Practices Act: "Medical provider must not personally examine, or assist another in examining, a pregnant woman for the purpose of determining the sex of the fetus... Upon determining the sex of the fetus through examination, must not reveal such information to the pregnant woman, her family members, or any other persons" (Kim 1999, p.314)
- 2005: Bioethics and Biosafety Act
 - Law against preconception sex selection
- 2009: 1987 Act was amended to allow for sex determination, as the Constitutional Court declared the prohibitions on sex determination unconstitutional (Boer & Hudson 2017)
 - This happened following the normalization of SRB

Nepal

Main references used: (Ganatra 2008; Puri & Tamang 2014)

- 2002: Prohibition of prenatal sex determination and sex-selective abortion
 - Conducting or facilitating sex-determination test is punishable with 3-6 months of imprisonment.
 - Conducting or facilitating sex-selective abortion is punishable with one-year imprisonment.
 - Both the women undergoing the sex selection test/abortion, and the medical personnel conducting the procedure can be punished. If the women can prove in the court of law that a family member coerced her into the situation, then the family member and medical personnel are held accountable.
 - Provider wishing to provide any form of abortion service needs to be registered with the Ministry of Health.

Vietnam

Main reference used: (UNFPA Vietnam 2011)

- 2003: Government Decree No.104/2003/ND-CP
 - Use of sex determination technology, and use of sex selective abortion services is illegal
 - Conducting/facilitating a sex-determination test is punishable with a fine of up to three to seven million dong (USD 150 to 360)
 - Conducting/facilitating a sex-selective abortion is punishable with a fine of up to seven to fifteen million dong (USD 360 to 770)
 - In addition to the fines, medical personnel and institutions that perform these tests would be stripped of their licenses

Section A2: China’s “Care for Girls” Campaign

In 2000, a pilot project was started in Chaohu city in Anhui province. The main activities of the project were to inform communities of the effects of rising SRB, encourage awareness of rules pertaining to gender equality, hold focus group discussions with women, their mothers-in-law, and male family members, and monitor and punish those found practicing sex selection. Within three years, the goal of this program was achieved, as SRB decreased from 125 in 1999 to 114 in 2004. Following the success of this pilot project, the program was scaled up to 24 other provinces under the Care for Girls Scheme. Based on the experiences in these 24 provinces, a working model for national level implementation of the Care for Girls scheme was created in 2006 (Li 2007).

The table below outlines the provisions under the “Care for Girls” Campaign (ibid):

Category	Meaning	Contents	Successful examples
Organizing and Leadership	Providing institutional support by governments at all levels.	<ul style="list-style-type: none"> ● Establish an authority of “Care for Girls” campaign; ● Make annual programme of the campaign by local government; ● Issue special documents on the campaign; ● Provide special fund for the campaign; ● Conduct special events addressing SRB, etc. 	<p><i>Yancheng county, Henan province</i></p> <ol style="list-style-type: none"> 1. Establish a special authority in charge of “Care for Girls” campaign, with the head of county appointed as head of the authority; 2. Cooperate with relevant departments in cracking down on the “Two Illegalities”; 3. Strictly evaluate government performance.
Cracking down on the “Two illegalities”	Cracking down on non-medical aimed pre-natal sex determination and sex-selective induced abortion.	<ul style="list-style-type: none"> ● Crack down on the “Two Illegalities” through cooperation of relevant authorities; ● Encourage individuals to not engage in the “Two Illegalities” by reward; ● Investigate cases of the “Two Illegalities”; ● Supervise use of ultrasound machines and induced abortion. 	<p><i>Huanggang city, Hubei province</i></p> <ol style="list-style-type: none"> 1. Leader groups on different levels all put emphasis on investigating “Two Illegalities” cases; 2. Different offices in every county cooperate closely in cracking down on the “Two Illegalities”; 3. Cooperation with neighbouring counties to prevent migrants from doing sex-selective abortion.
Whole-course family planning and reproductive health services	Offering health-care services to women at reproductive age.	<ul style="list-style-type: none"> ● Provide authorized hospital delivery, abortion and ultrasound check; ● Offer contraceptive services; ● Provide regular IUD check, and treat pregnancy and gynaecologic diseases; ● Regularly call on pregnant and postpartum women. 	<p><i>Donghai county, Jiangsu province</i></p> <ol style="list-style-type: none"> 1. Identify target people; 2. Offer better services to women in pregnancy; 3. Stipulate the approved abortion, report death of girl infants; 4. Supervise and report pregnancy monthly; 5. Treat diseases for women at reproductive age.
Benefits and Interests Orientation	Supporting girl-only families by offering special benefits and interests in order to change preference for sons.	<ul style="list-style-type: none"> ● Enact preferential policies of reward to help girls in families without a son, and to improve girl-child’s survival environment and women’s development in domains of education, medical care, employment, old-age support and political participation. 	<p><i>Anxi county, Fujian province</i></p> <ol style="list-style-type: none"> 1. Build houses for poor families with girls only; 2. Alleviate poverty of families with girls only; 3. Help girls continue their education; 4. Give pension support to families without sons.
Advocacy	Change son-preferential ideology by giving wide publicity on knowledge related to laws and regulations, parenthood and reproductive health.	<ul style="list-style-type: none"> ● Develop networks and organizations of advocacy; ● Create a strong public-opinion atmosphere showing love for girls through slogans, picture posters, theatrical performances, advertising cards and other means; ● Cultivate awareness of “Care for Girls” by training; ● Encourage women to participate in social activities, etc. 	<p><i>Beijing</i></p> <ol style="list-style-type: none"> 1. Taking advantage of various mass media, such as broadcasting, television and internet; 2. Publicizing successful examples in these activities; 3. Establishing various locations for advocacy.
Management and evaluation	Ensure accurate statistics on the data of SRB and evaluation of work addressing SRB.	<ul style="list-style-type: none"> ● Register birth, abortion, infant and children (under 5) death accurately by sex; ● Mutual report of SRB data among relevant authorities; ● Integrating work performance of the “Care for Girls” campaign into evaluation system of relative authorities. 	<p><i>Jinghai county, Tianjin city</i></p> <ol style="list-style-type: none"> 1. Appointing specialized personnel for statistics; 2. Having a clear division of statistic responsibilities, fixing a schedule of reporting relevant data and procedure.

Section A3: Conditional Cash Transfer Programs in India

Rajalakshmi Scheme

Source: Sekher and Ram (2015)

Year of initiation	1992			
Implementing agency	Department of Medical, Health and Family Welfare			
Districts covered	Entire state of Rajasthan			
Objectives	<ul style="list-style-type: none"> - Meet the critical financial needs of the female child - Reduce population growth in the state 			
Benefits	Government of Rajasthan deposits a minimum of INR 1,500 in the name of the girl child. The maturity value of the minimum investment of INR 1,500 would vary depending on the age at which the girl child was entered into the scheme (and how long the investment was locked-in for):			
	Entry age of girl child (years)	Minimum investment amount (INR)	Lock-in period (years)	Maturity amount (INR)
	≤ 1 year	1,500	20	21,000
	1 < year(s) ≤ 2	1,500	19	18,000
	2 < years ≤ 3	1,500	18	15,000
	3 < years ≤ 4	1,500	17	13,000
	4 < years < 5	1,500	16	11,000
Eligibility conditions	<ul style="list-style-type: none"> - Age of person undergoing sterilization should be < 35 years - Couple should not have more than two children, and at least one of them should be a girl - Age of girl child/children should be < 5 years - If the father is undergoing sterilization, then the mother cannot be pregnant with the third child 			
Documents required	<ul style="list-style-type: none"> - Certificate from medical officer confirming sterilization - Certificate stating that the mother was not pregnant when the sterilization was done - Certificate confirming the number of living children, and the age and date of birth of the children 			

Dhanlakshmi Scheme

Source: Sekher and Ram (2015)

Year of initiation	2008																																										
Implementing agency	Department of Women and Child Development																																										
Districts covered	Selected blocks in Punjab, Andhra Pradesh, Orissa, Chattisgarh, Jharkand, Bihar, Uttar Pradesh																																										
Objectives	<ul style="list-style-type: none"> - Provide families incentives to invest in girl children - Balance child sex ratio - Change mindset of families towards girl children 																																										
Benefits	<p>The conditional cash transfers outlined below are preferably made to the girl's mother</p> <table border="1"> <thead> <tr> <th>Conditions</th> <th>Benefits (INR)</th> </tr> </thead> <tbody> <tr> <td>Girl child born after 19 November 2009, and birth is officially registered</td> <td>5,000</td> </tr> <tr> <td colspan="2"><i>Immunization</i></td> </tr> <tr> <td>In 6 weeks</td> <td>200</td> </tr> <tr> <td>In 14 weeks</td> <td>200</td> </tr> <tr> <td>In 9 months</td> <td>200</td> </tr> <tr> <td>In 16 months</td> <td>200</td> </tr> <tr> <td>In 24 months</td> <td>200</td> </tr> <tr> <td>Completion of full immunization</td> <td>250</td> </tr> <tr> <td colspan="2"><i>Education</i></td> </tr> <tr> <td>Enrollment in primary school</td> <td>1,000</td> </tr> <tr> <td>In class 1 + attendance</td> <td>500</td> </tr> <tr> <td>In class 2 + attendance</td> <td>500</td> </tr> <tr> <td>In class 3 + attendance</td> <td>500</td> </tr> <tr> <td>In class 4 + attendance</td> <td>500</td> </tr> <tr> <td>In class 5 + attendance</td> <td>500</td> </tr> <tr> <td>Enrollment in secondary school</td> <td></td> </tr> <tr> <td>In class 6 + attendance</td> <td>750</td> </tr> <tr> <td>In class 7 + attendance</td> <td>750</td> </tr> <tr> <td>In class 8 + attendance</td> <td>750</td> </tr> <tr> <td>Insurance maturity cover</td> <td>INR 100,000 if girl remains unmarried until age 18</td> </tr> </tbody> </table>	Conditions	Benefits (INR)	Girl child born after 19 November 2009, and birth is officially registered	5,000	<i>Immunization</i>		In 6 weeks	200	In 14 weeks	200	In 9 months	200	In 16 months	200	In 24 months	200	Completion of full immunization	250	<i>Education</i>		Enrollment in primary school	1,000	In class 1 + attendance	500	In class 2 + attendance	500	In class 3 + attendance	500	In class 4 + attendance	500	In class 5 + attendance	500	Enrollment in secondary school		In class 6 + attendance	750	In class 7 + attendance	750	In class 8 + attendance	750	Insurance maturity cover	INR 100,000 if girl remains unmarried until age 18
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Eligibility conditions	<ul style="list-style-type: none"> - All girls born after 19 November 2008, and whose births have been formally registered - Girls who have domicile status in selected blocks - Payments are conditional on immunization, and school enrollment until 8th grade - Insurance maturity cover is taken for girl born after 19 November 2008, and if the girl remains unmarried until age 18, she will get INR 100,000 																																										
Documents required	<ul style="list-style-type: none"> - Birth certificate - Domicile certificate - Immunization certificate - School enrollment certificate(s) 																																										

Devi Rupak

Source: Anukriti (2017)

Year of initiation	2002	
Implementing agency	Department of Health and Family Welfare	
Districts covered	Entire state of Haryana	
Objectives	<ul style="list-style-type: none"> - Stabilize population growth - Promote one-child norm - Balance child sex ratio 	
Benefits	If an eligible couple adopts sterilization, they can potentially receive the monthly benefits outlined below for 20 years. The benefits received depend on the number and sex composition of children at the time of sterilization.	
	Stage at which couple opts for sterilization	Monthly benefits
	After birth of first child, and if the first child is a girl	INR 500 (USD 8)
	After birth of first child, and if the first child is a boy	INR 200 (USD 3)
	After birth of second child, and if the second and first child are girls	INR 200 (USD 3)
A couple can wait until their youngest child reaches 5 years of age before undergoing vasectomy or tubectomy. However, they will receive the benefits only after sterilization is performed.		
Eligibility conditions	<ul style="list-style-type: none"> - Husband and wife must be less than 45 and 40 years of age, respectively, on the date of sterilization - Husband and wife should not be an income tax payer - Prospective beneficiaries must register with their local council or municipal committee 	
Documents required	Could not find a specific list of documents required. Based on eligibility conditions, the assumption is that the required documents would include child birth certificate(s), sterilization certificate(s), and documents confirming family's income status.	

Apni Beti Apna Dhan

Source: Holla et al. (2007); Sinha and Yoong (2009); Sekher and Ram (2015)

Year of initiation	1994 until 1998 Evolved in to <i>Ladli</i> scheme in 2005
Implementing agency	Department of Women and Child Development, Haryana
Districts covered	Entire state of Haryana
Objectives	<ul style="list-style-type: none">- Improve child sex ratio- Enhance the value of girls- Delay age of marriage for girls
Benefits	<ul style="list-style-type: none">- Offer mother with a monetary reward of INR 500 within 15 days of birth of daughter- Bonus award if girl completed Grade 5 (bonus of INR 5,000) and Grade 8 (bonus of INR 1,000)- Fixed deposit securities of INR 2,500 for each girl child, which would be redeemable on girl's 18th birthday if she is not married by then- Scheme was expanded in 1995 to provide a higher maturity on fixed deposits for girls who deferred cashing their securities. If the girl deferred the payment by 2 years, the final redeemable amount would increase to INR 30,000, and if the girl deferred the payment by 4 years, the final redeemable amount would increase to INR 35,000. Girls would also be offered a credit subsidy for entrepreneurship loans under the expanded provisions of the scheme
Eligibility conditions	<ul style="list-style-type: none">- Schedule caste or other backward caste families (SC/OBC)- Families below the poverty line that are not SC/OBC- Non-gazetted officers- Girl's domicile must be in Haryana- First, second, and third birth order girls only. Girls have to be born between 1 October 1994 and 31 December 1998
Documents required	<ul style="list-style-type: none">- Caste/Income certificate- Domicile certificate- Girl child's birth certificate- School enrollment certificate(s)

Section A4: Policies to Promote Gender Equality

China

Source unless stated otherwise: (Li 2007)

- 1985: Law of Succession of the People's Republic of China
 - Article 9: Males and females are equal in their right to inheritance
- 1986: Compulsory Education Law of the People's Republic of China
 - Article 9: All citizens are entitled to have equal opportunities to receive education, regardless of nation, race and sex.
- 1988: Stipulation of Labor of Woman Staff
 - Article 3: With the exception of the special types of work or post unsuitable to women, no unit may, in employing staff and workers, refuse to employ women by reason of sex.
- 2002: Law of the People's Republic of China on Land Contract in Rural Areas
 - "Article 6: In undertaking land contracts in rural areas, women shall enjoy equal rights with men. The legitimate rights and interests of women shall be protected in contract. No organizations or individuals may deprive their rights to land contractual management, which they are entitled to, or infringe upon such right" (Ninth National People's Congress 2002).
- 1992, 2005 revised: Law of the People's Republic of China on the Protection of Rights and Interests of Women
 - Article 2: The country shall take necessary measures to gradually perfect its systems that safeguard women's rights and interests, and to eliminate all discrimination against women. Discrimination against, maltreatment of, abandonment of, or cruel treatment in any manner causing injury or death of women shall be prohibited.
- 1950, 1981, 2006 revised: Marriage Laws of the People's Republic of China
 - Article 2: A marriage system based on the free choice of partners, on monogamy and on equality between man and woman, shall be applied. The lawful rights and interests of women, children and old people shall be protected. Family planning shall be practiced.
- 1990s: Rural pension program
 - Old-age security for the urban population has been in place since 1951 (Ebenstein & Leung 2013)
 - Rural residents could voluntarily choose to pay a contribution of between 2 to 20 yuan (0.33 and 3.3 USD) on a monthly, quarterly, or annual basis, and the benefit received would depend on the investment returns. The pension entitlement received was dependent on people's capacity to contribute to the scheme (Liu & Sun 2016)

India

- 1949: Equality before Law
 - Article 15(1): prohibits discrimination on the basis on sex
 - Article 15(3): allows for special provisions to women and children to protect them from discrimination
- 1956, 2005 revised: Hindu Succession Act
 - 1956: Women can inherit property from parents, however, they cannot inherit ancestral property (e.g. land). Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu initiated reforms in 1986, 1989, 1994, and 1994 respectively to provide daughters and son equal rights to all family property. Kerala abolished joint family property system; they instead chose for all family members to hold their share separately (Agarwal 1994; Deininger et al. 2013)
 - 2005: Act was amended at national level to give daughters and sons equal rights to parental and ancestral property (Deininger et al. 2013)
- 1961: Dowry Prohibition Act

- Penalties imposed for giving, receiving, or abetting in the process of giving or receiving dowries (Ministry of Women and Child Development 1961).
- 1949: Equality of Opportunity in matters of Public Employment
 - “No citizen shall, on grounds only of religion, race, caste, sex, descent, place of birth, residence or any of them, be ineligible for, or discriminated against in respect or, any employment or office under the State” (Krishna & Bharadwaj 2015).
- 1976: Equal Remuneration Act
 - “It is the duty of employer under the Act to pay equal remuneration to men and women workers for same work or work of a similar nature” (Krishna & Bharadwaj 2015)
- 1993: Women’s Reservation Bill
 - One-third of village council head positions were randomly selected and reserved for women (Chattopadhyay & Duflo 2004)
- 2002, Article 51A: “...a parent or guardian [shall] provide opportunities for education to his child or, as the case may be, [a] ward between the age of six and fourteen years.” (Sripati & Thiruvengadam 2004)
- 2007: National Old Age Pension Scheme
 - Means-tested scheme where individuals ages 65 or more would receive unconditional cash transfers. The monthly pension is around INR 200 per month. State governments can provide additional pensions for older people. (Nandi & Deolalikar 2013; Mujahid et al. 2008).

Republic of Korea (see section 5 of report)