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

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In parts of Asia, the South Caucasus, and the Balkans, son preference is strong enough to trigger significant levels of sex selection, resulting in the excess mortality of girls and skewing child sex ratios in favor of boys. Every year, an estimated 1.8 million girls 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 immediately, and it also has possible negative implications for efforts to improve women’s status in the long term. Recognizing this as a public policy concern, governments have employed direct measures such as banning the use of prenatal sex selection technology, and providing financial incentives to families that have girls. This study reviews cross-country experiences to take stock of the direct interventions used and finds no conclusive evidence that they are effective in reducing the higher mortality risk for girls. In fact, 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 only short-term benefits at most. Instead, what seems to work are policies that indirectly raise the value of daughters. The study also underscores the paucity of causal studies in this literature.

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In parts of Asia, the South Caucasus, and the Balkans, son preference is strong enough to trigger substantial levels of prenatal and postnatal sex selection, resulting in the excess mortality of girls and skewing 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” 1
Normal child sex ratios, i.e., when there is no prenatal and postnatal sex selection, would be 1.00 or close to 1.00. Normal sex ratios at birth (SRB), i.e., when there is no prenatal sex selection, would be 1.06. The Republic of Korea is not included here because it has seen a turnaround in its sex ratio since the mid-1990s.

While excess girl mortality has been documented in countries like mainland China, Taiwan, India, and Pakistan since the early twentieth century (Visaria 1971; Das Gupta and 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 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, it has managed a turnaround on this front (Chung and Das Gupta 2007; Guilmoto 2012a).

In the last four decades, the availability of prenatal sex diagnostics has allowed couples with strong son preference to select the sex of their baby before birth, and more effectively achieve their desired sex composition of children (World Bank 2012; Bongaarts and Guilmoto 2015). Between 1980 and 2015, the sex ratio at birth (SRB), that is, the 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 observed without prenatal sex selection. Prenatal sex selection also accounted for an increasingly greater portion of the total missing girls during this period (Bongaarts and Guilmeto 2015).

Not surprisingly, bans on the use of 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 itself. Son preference can also trigger a range of postnatal sex discrimination strategies from infanticide, to abandonment, to differential care during early infancy and 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) and child mortality (probability of dying between age 1 and 4) was higher for girls than for boys, contrary to the biological norm.3

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 persist. 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 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, Bhalotra, and Tam (2018, 19) find that for “every girl that survived due to ultrasound technology, three 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 (Anukriti, Bhalotra, and Tam 2018; Bhalotra and Cochrane (2010)).
| 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, Rep. of 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 subpopulations 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 1992–1993, 1998–1999, and 2005–2006 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 vs. 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 (1992–1993, 1998–1999, 2005–2006) | 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 vs. 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 |
| Anukriti et al. (2018) | Availability of ultrasound technology | Girls’ post-neonatal mortality, breastfeeding, and immunization status | Pooled individual data from NFHS (1992–1993, 1998–1999, 2005–2006) | 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 | No increase in relative female neonatal mortality and convergence in post-neonatal mortality rates of boys and girls. But for every additional girl that survives until age 5 in the post-ultrasound era (relative to pre-ultrasound), three girls are aborted | Reduced son-biased fertility stopping, 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 |

**Note on acronyms:** Sex ratio at birth (SRB); Indian National Family and Health Survey (NFHS); socioeconomic status (SES)
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 and Cho 1995; Guilmoto 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 (Blanchet 2005; Duong, Bélanger, and Hong 2007; Prakash and Vadlamannati 2014). Brides who are consensually bought from other countries can also face difficulties, since they are at higher risk of isolation, marital discord, and domestic violence (Chowdhry 2005; Williams and Yu 2006; Kim 2010; Kaur 2013). Men can also be vulnerable in this scenario. 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 (Edlund 1999; Das Gupta, Ebenstein, and Sharygin 2010). 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 (Chang and Zhang 2012; Wei and 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 the 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 the 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 and Li 1995, 637). 4

Given these concerns, governments face a strong impetus to act. As highlighted above, most countries with skewed child sex ratios 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 to 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 review seeks to answer these questions. It draws on cross-country experiences (especially from China, India, and the Republic of Korea, who have been grappling with this problem for decades) to conduct a stocktaking of the direct measures used, and to briefly highlight the relative payoff that indirect approaches offer. The stock-taking draws on experimental and quasi-experimental studies where available; in lieu of causal studies, it draws on qualitative and correlation-based studies.

**Sex Selection: Causes and Mechanisms**

*Causes*

The entrenched preference for sons over daughters is the root cause of sex selection. Societies that do not have son preference do not use discriminatory practices to alter the sex composition of children. Therefore, long-term success in reducing excess girl mortality 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 (Dyson and Moore 1983; Das Gupta et al. 2003; Das Gupta 2010).

Traditional kinship systems that undermine the value of daughters versus sons are seen in all countries that have substantial sex selection. Regions of these countries that have higher levels of co-residence with sons are more likely to have higher levels of sex selection (UNFPA Vietnam 2011; Guilmoto 2012c). Comparisons with Southeast Asian countries that have bilateral kinship systems – where daughters and sons have equal opportunities to contribute to parental well-being – are illustrative as well: Southeast Asian countries with bilateral kinship systems have normal mortality risks for girls.

While son preference is the root cause of 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 she is 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 (Das Gupta 1987; 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).

Economic stress is also cited as a reason for increased sex selection. During the wars in China in the 1930s, and during the famine in the 1950s, female child mortality rose above the biological norm (Das Gupta and Li 1999). Similarly, in the South Caucasus countries, the collapse of the Soviet Union and the withdrawal of social and economic protections, was followed by an increase in female child mortality (Guilmoto and Duthé 2013; Das Gupta 2015). In both cases, economic conditions forced people to sex select because having a son was a means of gaining security.

**Mechanisms**

**Postnatal Sex Selection**

Sex selection can take place postnatally or prenatally. 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 and Caldwell 2005). While active efforts by various entities have helped reduce the prevalence of infanticide/abandonment over time, claims that these practices are disappearing altogether are dubious (for example, see the study by Li, Zhu, and Feldman (2004) on Shaanxi province, China).

Passive postnatal sex selection refers to discriminatory attitudes towards female children in various aspects of child care: breastfeeding, immunization, healthcare, food and clothing access, educational investments and so on. These forms of neglect do not require much effort on the part of parents, but if practiced in a continuous manner, they can result in the excess mortality of girls, and alter the gender composition of children who remain alive (Chen, Huq, and D’Souza 1981; Das Gupta 1987).

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 where 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, Friedman, and Schady 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

The introduction of prenatal sex identification techniques revolutionized gender discrimination practices. If available and accessible, prenatal sex selection is as an attractive alternative to postnatal discrimination methods. It is easy to use, noninvasive, can be bundled with modern antenatal healthcare services, and provides the luxury of making sex selection decisions privately. Coupled with abortion methods, it ensures that the desired sex composition of children is met as unwanted female pregnancies are terminated within the first two trimesters. The use of this technology is higher in low fertility contexts as couples have fewer chances to try for a son.

Sex determination technology has evolved rapidly over the last three decades. The initial methods – 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. 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 and Feldman-Jacobs 2012; Bongaarts 2013). The initial users of ultrasonography for fetal sex determination were from the upper and middle classes. Over time, this technology spread across socioeconomic groups, and to rural areas, as the cost of manufacturing and using the equipment declined, the density of private clinics increased, and enterprising healthcare personnel tapped into the latent demand for this technology (Guilmoto 2012a).

In recent years, more effective methods of sex determination have emerged. For instance, 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 percent reliable, and are minimally invasive, as they only require a drop of blood from the mother. The cost of acquiring these test kits is low. They 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).

Abortion methods must also be available for couples to sex select. In most countries, the availability of abortion services preceded the availability of sex determination technology. But the use of these 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).
More recent developments in reproductive technology – preconception and preimplantation methods – do not require the use of abortion methods to prenatally sex select (Bongaarts 2013). Evaluations of preconception methods by Karabinus et al. (2014) suggest fairly high rates of effectiveness.

Effectiveness of Direct Measures

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.

More broadly, the conditions outlined under these bans can be summarized as follows:

(1) Healthcare personnel are prohibited from informing parents of the sex of the fetus (using words or signals). They are also prohibited from performing abortions for sex selection.

(2) Hospitals and healthcare units that provide prenatal diagnostic procedures, and abortion services must be registered with public health authorities.

(3) Prenatal diagnostic equipment used by these healthcare units, and the practitioners who perform diagnostic and abortion procedures, must be registered with public health authorities.

(4) Healthcare facilities and 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 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 conducted to inform and educate individuals 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 abortions 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 won’t 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). 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 performed out of free will, but rather an act resulting from the pressure to bear sons (Oomman and 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 only limited evidence to suggest that they are effective in normalizing SRB; in fact, the existing literature suggests that they are counterproductive to improving the status of girls and women. Bans have also proven difficult to implement. These criticisms are discussed further in the following subsections.

**Challenges with Implementation**

One of the primary reasons why enforcement of these bans is challenging is because it is difficult to procure evidence of the “crime.” The practice of prenatal sex selection involves 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. While performing routine scans, it is possible for doctors to break the law, and discretely signal the sex of 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, but 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 that authorities who are under pressure to catch offenders resort to sting operations (Guilmoto 2012a; Das Gupta 2016).

Successful enforcement requires the convergence of various factors. It 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, 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 this effort was to publicly shame couples considering sex selection by “mourning the death of unborn girls” in front of clinics. When the SRB 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 SRB rose again (Ganatra 2008).

This example highlights the challenge 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 problems about the excessive intrusion into women’s lives that is required for such monitoring exercises to work. Even simple monitoring efforts to calculate the SRB at the regional level are challenging due to poor vital registration systems, particularly in economically disadvantaged areas (WHO 2011; Guilmoto 2012a).

Unnecessarily harsh measures can also alienate key stakeholders in countering sex imbalances. For example, the Indian Radiological and Imaging Association has repeatedly complained about the enforcement of the Prenatal Diagnostic Techniques (PNDT) Act. Practitioners argue that they are harassed by local authorities for minor clerical errors, their equipment is unfairly seized, and, in some extreme cases, their licenses revoked for paperwork discrepancies. In 2016, members of the association even held a nationwide strike to protest the implementation of the Act (Indian Express 2016).

The ability of keep up with the pace of developments in sex determination technology is another concern. For example, in 2015 Chinese authorities had to enforce a new ban preventing the smuggling of mother’s blood samples to Hong Kong for fetal DNA tests (Global Times 2012; Rui and Jiayi 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 the Europe or Thailand for prenatal sex selection (Guilmoto 2012a).

**Unintended Consequences of the Ban**

Bans are a common legal tool used by governments 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 (Edmonds and Shrestha 2012; Bharadwaj, Lakdawala, and Li 2013). 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 United States, 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 healthcare 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 healthcare workers note feeling caught between respecting the law, and ensuring that their patients’ receive safe healthcare 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 the Republic of Korea illustrates how strict enforcements can restrict women’s access to legal health care services altogether. In 2010, the 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 mothers are treated in the household and in the community at large. In patrilineal societies, bearing a son matters for women, as it can improve their position within the household. For example,
Li and Wu (2011) use pooled data from the China Health and Nutrition Survey (CHNS) and multivariate regressions to show that women whose firstborns 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 firstborn child, finds that women whose firstborns were girls were more likely to suffer maternal and adult mortality. These studies are backed by the findings of ethnographic studies (Das Gupta et al. 2003). In recognition of the 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, Li, and Meng (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 intrahousehold bargaining power, and a decrease in suicide rates for women in rural China. While this study does not view such improvements in women’s welfare – which are conditional on having a male child – as related to improvements in women’s status overall, it does 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 seems to improve 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 greater risk of economic uncertainty and mortality. Similarly, Rahman, Foster, and Menken (1992) use data from the Matlab, Bangladesh, and discrete time hazard models (correlation-based approach) to find that women ages 45 or more who had an adult son living with them had lower mortality risk. 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 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. 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, Bhalotra, and Tam (2018) 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.

Are 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 nonrandomness 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).

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 professionals 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) conducted a rigorous ex post examination of the impact of the PNDT Act. They measured 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 allowed Nandi and Deolalikar (2013) to use Maharashtra as the pretreated or control state that was not affected by the national ban. They conducted a difference-in-difference analysis that compared 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 were that (a) Maharashtra and its neighboring states were on similar trajectories before 1988, that is, 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, that is, 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.
| 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, Rep. of 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, Das Gupta, and Li (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 |
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, the PNDT Act caused a 14 to 26 points 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 does 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.

In the Republic of 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 abortions 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 and Cho 1995; Ganatra 2008; Boer and Hudson 2017).

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 girl 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 the Republic of Korea did not reach biologically normal levels until the late 2000s, that is, 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 (Das Gupta 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. These broader forces resulted in a shift from extended families to nuclear ones, it allowed individuals to save for retirement, it shifted women’s employment opportunities and their ability to care for their parents, and it changed parent’s valuation of daughters. Broadly, it decreased adherence to patriarchal norms and decreased son preference. Between 1991 and 2003, the proportion of women in the same birth cohort who reported that they “must have a son” halved (Chung and Das Gupta 2007).

Furthermore, legal amendments to promote gender equality followed these normative shifts. While Family Law was revised in 1989 to provide girls and boys with equal inheritance rights, the family head system, which was the basis of patrilineal succession, was not abolished until the 2000s despite significant efforts by women’s groups to do so (Chung and Das Gupta 2007). It could be argued that the Republic of Korea would have seen an earlier turnaround in SRB if this significant piece of legislation had been enacted in the 1990s.

China. Under the Care for Girls program, 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, Das Gupta, and Li 2016).

To assess the impact of this effort, Guo, Das Gupta, and Li (2016) observe changes in the SRB 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 (first births were not being monitored). Since first births form nearly two-third of all births in the 2010 census, there was no fall in the overall SRB. 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, that is, 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 (Guo, Das Gupta, and Li 2016).

While the analysis of Guo, Das Gupta, and Li (2016) 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 has thus far been lax, largely because of difficulties in monitoring the misuse of technology (UNFPA Vietnam 2011). A similar reason has been provided for Nepal’s difficulties in implementing the ban (Puri and Tamang 2014).

The South Caucasus countries have banned prenatal sex selection as well. However, there have been no monitoring or sanctions imposed for breaches, no organization of an ethics body consisting of relevant medical personnel, and limited awareness-raising campaigns for the general public (Liisanantti and Beese 2012).

Conditional Cash Transfers

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

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

India. Since the 1990s, several Indian states have introduced CCT programs to discourage son preference. 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 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
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, Jensen, and Oster (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 (1992–1993; 1998–1999) | 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 (1992–1993; 1998–1999; 2005–2006) | 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 |
| Author (Date) | CCT program | Program aims | Data | Type of study | Observed outcomes |
|---------------|-------------|--------------|------|---------------|-------------------|
| **Anukriti (2018)** | 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 |

*Note on acronyms: Sex ratio at birth (SRB); Indian National Family and Health Survey (NFHS)*
implementing agencies are either the Department of Health, or the Department of Women and Child Development (Sekher 2010; Sekher and Ram 2015).

The initial evaluation of these schemes, conducted by Sekher (2010), 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 sector. 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). Consequently, families in those states lost faith and interest in such CCT schemes (also see the evaluation by Sharma, Goel, and Gupta (2003) of the Rajalakshmi scheme implemented in Rajasthan in 2002).

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’ attitudes and behavior towards girl children. The Dhanlakshmi scheme was sponsored by the Government of India, and the pilot program was implemented in 2008 in select blocks in seven Indian states (see table 3) Between 2008 and 2013, 336,770 girls were enrolled in the scheme. To evaluate the effectiveness of the scheme, Sekher and Ram (2015) conducted surveys with 4,000 beneficiary and nonbeneficiary households in eight blocks across five of the seven states in 2013 and 2014. They use propensity score matching (PSM) to estimate the effect of the scheme; PSM isolates the treatment effect by controlling for factors that predict beneficiary status. This analysis was supplemented with key informant interviews, and focus group discussions with select survey respondents.

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, a major drawback was that there were no incentives for girls to complete secondary education (Sekher and Ram 2015).

Impact evaluations of other CCT programs also provide important policy lessons. Anukriti (2018) conducts an evaluation of the Devi Rupak program that was implemented in the state of Haryana in 2002–2003. This program had the dual aim of reducing fertility and balancing the SRB in the state. To isolate the treatment effect of the scheme on the number and sex-composition of children, Anukriti (2018) 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-selecting 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 childbearing after the first child and sex-selected for a son at second birth. The net result was a reduction fertility, but an increase in the SRB (Anukriti 2018).

Some would argue that short-term improvements in programs like Devi Rupak could be achieved by not providing benefits to one-boy-only families. However, programs that do not provide benefits for male children, also show mixed results in lowering son preference. Evaluations of the Apni Beti Apna Dhan scheme that was implemented in Haryana in 1994 are a case in point. The evaluation by Holla, Jensen, and Oster (2007) 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 suggest that the program had a positive effect on 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 results suggest while beneficiary households were more likely to give birth to girls, and to 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, but 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 nonbeneficiary households (although, if they did start attending school, they were more likely to continue attending school). The program did not have a clear, positive effect on mother’s preference for girl children either.

**China.** In 2000, China introduced a comprehensive program, titled Care for Girls, to reduce sex selection. After setting up a pilot project in Anhui province in 2000, and then pilots in 24 other provinces in 2003–2005, a national plan was developed for this program in 2005–2006. 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 (Li 2007; Murphy 2014; Guo, Das Gupta, and Li 2016).

In some provinces, daughter-only families are partnered with local officials. The officials help 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 the qualitative study by Murphy (2014) suggests that girl-only families who 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.

The Promise of Indirect Approaches

Existing evidence suggests that compared to direct measures, indirect measures offer more promise in changing unbalanced 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 considered good policy choices irrespective of their impact on son preference). Indirect measures also include advocacy efforts.
**Legislative Measures**

In theory, legislative reforms, like the ones outlined above, empower women economically and politically, and reduce their dependence on male kin. They offer sons and daughters equal opportunities to care for their parents, and encourage parents to see their daughters as worth investing in.

In practice, many of these legal measures achieve the stated outcomes. For example, in patrilineal societies, married women prefer having sons because sons can inherit family property and provide support during old age (Das Gupta et al. 2003; Jayachandran 2015). However, if inheritance laws are amended to provide sons and daughters equal claim to family property, older women’s dependence on sons can be reduced. Daughters would be willing and able to care for parents, and parents would be encouraged to invest in daughters. As evidence, Deininger, Goyal, and Nagarajan (2013) find causal evidence (quasi-experimental study) that the expansion of inheritance rights to women in India increased daughters’ educational attainments and the likelihood that they would inherit family property. Similarly, Ebenstein and Leung’s (2013) quasi-experimental study suggests that the introduction of the state-sponsored pension program in rural China in 1991 suppressed the upward trajectory of SRB. The availability of alternate sources of material support during old age obviated some of the need for sons.

The presence of women in the political sphere is shown to have positive implications as well. Various experimental studies (Beaman et al. 2009; Beaman et al. 2012; Kalsi 2017) exploit the random assignment of reservations for women in village councils in India to demonstrate this. Following the reservation law, the survival prospects of higher-birth-order girls and the educational attainments for adolescent girls increased. Young girls saw a shift in aspirations, and in parent’s aspirations for daughters changed as well. Female political leaders broke gender stereotypes for young girls and their families by serving as role models.

Other measures that empirically result in positive outcomes for girls include the expansion of educational opportunities (see, e.g., Murthi, Guio, and Drèze 1995; Ren 1995; Pande and Astone 2007), and financial opportunities (see, e.g., Duflo 2000; Qian 2008; Luke and Munshi 2011) for women. These measures provide women with economic independence, provide young girls and their parents with role models, and foster gender egalitarian ideas.

There is also some evidence to suggest that these legislative measures may not necessarily bring immediate positive change in parents’ valuation of daughters (see, e.g., the quasi-experimental study by Rosenblum (2015) on how changes in inheritance law in India increased mortality risk for girls; and Amin’s (1990) correlation-based study and Das Gupta’s (1987) ethnographic study for how initial improvements in socioeconomic status increase the pressure and ability to sex select). But these unexpected findings do not call for the continuation of legal practices that systematically
exclude women. They suggest that legal reforms could be bolstered with advocacy efforts to change social norms and achieve more immediate positive outcomes for girls.

The case of the Republic of Korea is illustrative here. It shows how the relationship between socioeconomic development and sex selection can evolve with shifts in social norms:

Soon after industrialization and improvements in individual economic status, South Korea saw an increase in sex ratios from the early 1980s to the mid-1990s. Initial economic mobility increased the pressure to sex-select, and with the introduction of prenatal sex selection technology in the 1980s, individuals could afford effective means to sex select. Over time, however, the conditions of urban life brought about societal level shifts in gender norms and eroded son preference. By the late 1990s, sex ratios in South Korea had reached normal levels. Normative changes also led to legislative reforms to promote gender equality, e.g., the abolishment of the family-head system in the 2000s (Chung and Das Gupta 2007).

**Advocacy**

Mass-media campaigns can be particularly effective in altering people’s awareness of a social issue, and their values and behaviors associated with that issue, because they introduce people to situations that are different from their own. Furthermore, the popularity and geographic reach of media such as radio, television, and the Internet make media campaigns cost effective in bringing about normative change. Research highlights how access to these media bring about attitudinal and behavioral shifts on environmental issues (Jacobsen 2011) and family planning adoption (Rogers et al. 1999; La Ferrara, Chong, and Duryea 2012). Similarly, studies illustrate how access to different media platforms shift gender-specific attitudes and behavior (for quasi-experimental studies that examine the positive causal impact of television exposure on gender norms and son preference see Jensen and Oster (2009), Ting, Ao, and Lin (2014), and Lin and Adserà (2013)). Observation studies have noted that fictional dramas on gender issues can be especially effective in reaching out to young women (the target audience) because they are entertaining and instructional without being condescending to the viewer (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, and so on can be circulated. Vietnam is an example of a country where observable sex imbalances in statistical surveys was 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 to lackluster government responses to those problems can also be
effective. For example, the resolution of the Council of Europe (2014) 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 (Guilmoto 2012a).

Advocacy efforts can be strengthened with support from community leaders, political leaders, celebrities, youth organizations, and religious organizations. Involving 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 (ibid). 10

Conclusion

The purpose of this article is to conduct a stocktaking of the different policies that have been used to tackle sex selection, and son preference more broadly. Having evaluated the different direct and indirect measures used, this review argues that governments would be better suited to managing imbalanced child sex ratios by:

(1) Strengthening data collection and monitoring efforts

Access to data on child sex ratios at the subnational level are relatively easy to obtain from censuses and surveys. However, reliable data on SRB are harder to obtain given that they require 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. Without good vital statistics, it is hard to monitor and evaluate regional programs aiming to curb SRB as well.

(2) Evaluating the costs of direct 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 bans. These measures raise ethical concerns surrounding women’s reproductive freedoms, but even after setting aside these considerations, evidence suggests that these such 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 wanted a son 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 healthcare services difficult, and 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) Using legislative and other indirect measures to improve gender equity

Reform in areas such as family law, social security, workplace policies, educational polices, 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. To be sure, legal reforms do not always bring about immediate shifts in gender norms, but they can be bolstered through mass-media campaigns and other advocacy efforts that bring that bring together a diverse set of partners. Compared to bans on prenatal sex selection and CCT programs, such indirect measures offer more promise by undermining the root causes of son preference and producing a permanent shift away from sex selection.

Notes

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1. The phrase “missing girls” or “missing women” was coined by Amartya Sen in his widely cited article (Sen1990) on the dire consequences of systematic gender discrimination in parts of Asia.
2. In China, the excess mortality of girls today is as high as it was in the 1930s.
3. 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 infancy and childhood increases. In the case of India and China, however, the male-to-female ratio of infant mortality (probability of dying between age 0 and 1) and male-to-female ratio of child mortality (probability of dying between ages 1 and 4) is less than 100, indicating excess female infant and child mortality. In countries without documented son preference, the sex ratio of infant and child mortality is more than 100 (see United Nations 2011).
4. Reviewing the literature on the full range of potential welfare consequences associated with sex selective practices is outside the scope of this study as the focus is on whether the policies governments have adopted to manage skewed child sex ratios have been effective.
5. In 2007−2008, 21.2 percent of currently married women age 15−49 in rural India and 50.7 percent of currently married women age 15−49 in urban India received a sonography (ultrasound scan) as part of their antenatal check-up (IIPS 2010). Please refer to the fact sheets from the District Level Household Surveys for India for further information on ultrasound availability at district hospitals across Indian states (Ministry of Health and Family Welfare n.d.). For China, most researchers draw information on ultrasound diffusion using the Local Chronicles, but data on rural vs. urban availability of this technology is not cited in their papers.

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 and Fletcher 1998).

7. Hu and Schlosser (2015) find that health investment in female children improves, but that female child survival does not change. Anukriti, Bhalotra, and Tam (2018, 24−25) provide an explanation for why Hu and Schlosser’s empirical strategy results in this divergent conclusion.

8. According to figure 2 of the Nandi and Deolalikar (2013) paper, the female-to-male child sex ratio in Maharashtra decreased from 978 in 1981, to 954 in 1991, to 930 in 2001. Comparably, the female-to-male child sex ratio in Maharashtra’s neighboring states (the newly treated areas) decreased from 973 in 1981, to 952 in 1991, to 929 in 2001. Nandi and Deolalikar’s calculations suggest that the PNDT Act suppressed some of the decline in the child sex ratio in the newly treated areas between 1991 and 2001. For more information on the child sex ratio in the rural and urban subsamples in Maharashtra and its neighboring states, please refer to tables 1 and 2 in Nandi and Deolalikar (2013).

9. Eligible couples who opt for sterilization after the first child would receive monthly benefits, with higher benefits provided for families with only daughters. Eligible couples who go on to have a second child and then opt for sterilization, would receive additional benefits only if the first and second child are girls.

10. 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 hospitals and clinics (Puri and Tamang 2014).

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