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BY KATE GILLES  
AND CHARLOTTE  
FELDMAN-JACOBS

# WHEN TECHNOLOGY AND TRADITION COLLIDE: FROM GENDER BIAS TO SEX SELECTION

Normal sex ratios at birth range from 102 to 107 male babies born for every 100 female babies born.

**1.5**  
MILLION

girls around the world are missing at birth every year.

In at least nine countries, the sex ratio at birth of boy babies to girl babies is at 110 or higher.

Every year, as a result of prenatal sex selection, 1.5 million girls around the world are missing at birth—it is as if the entire female population of Nairobi simply disappeared.<sup>1</sup>

This alarming trend is the result of a perfect storm of three phenomena: the underlying and deep-seated gender inequities that lead parents to value sons over daughters; a trend toward smaller families; and modern medical technologies that can determine fetal sex early and cheaply (see Figure 1).

This brief focuses on the motivations and mechanisms behind the increase of prenatal sex selection; outlines regions and countries that have skewed sex ratios at birth; and explores the negative social, economic, and development effects on individuals, communities, societies, and countries. While prenatal sex selection was once thought to be unique to India and China, it actually threatens all regions where these three phenomena are converging. The practice now exists in other countries in South and East Asia as well as in eastern Europe, and could emerge in Africa in the not-too-distant future.<sup>2</sup> Policymakers need to be aware of the practice's potential growth, and how it threatens gender equality and progress in their own countries. With increasingly accessible technologies paving the way for further expansion, now is the time to learn from interventions that have shown promise in exposing or stopping the practice of sex selection.

## Imbalances in Sex Ratios at Birth

How do we know these girls are missing if they were never born? Under normal circumstances, about 102 to 107 male babies are born for every 100 female babies born. This is called the sex ratio at birth, or SRB.<sup>3</sup> In the 1980s, SRBs in Asia, beginning with India and China, rose quickly and dramatically—many more boys and many fewer girls were being born than would be naturally

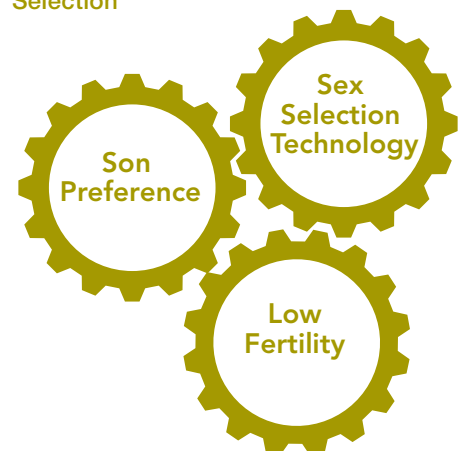
Sex ratio at birth (SRB) is the balance of male to female births, generally expressed as the number of male babies born for every 100 female babies born.

expected. These skewed SRBs (which remained severely elevated even after adjusting for under-registration of female children) suggested that females were being intentionally eliminated before birth through prenatal sex selection.

Since then, SRBs in the affected countries have remained high. In India, for example, ratios seem to be stabilizing in a few regions, but are continuing to rise in many others; and regions with previously normal SRBs are now seeing those levels increase.<sup>4</sup> Moreover, ratios are rising in other countries in Central, South, and East Asia, as well as areas of

FIGURE 1

### The Three Preconditions of Modern Sex Selection



Source: Christophe Guilmoto, "Sex Imbalances at Birth: Trends, Consequences, and Policy Implications," accessed at [www.unfpa.org](http://www.unfpa.org), on May 30, 2012.

## Sex Ratio at Birth in the Most Affected Countries

COUNTRY/YEAR	SEX RATIO AT BIRTH
China (Mainland) (2009)	118.1
Azerbaijan (2009)	117.6
Armenia (2008)	115.8
Georgia (2006)	111.9
Montenegro (2005-09)	111.6
Albania (2008)	111.5
Vietnam (2010)	111.2
India (2006-08)	110.6
Pakistan (2007)	109.9

**Note:** Sex ratio at birth (SRB) is the balance of male to female births, generally expressed as the number of male babies born for every 100 female babies born. The normal biologic range is 102-107 males born for every 100 females.

**Source:** Christophe Guilmoto, "Sex Imbalances at Birth: Trends, Consequences, and Policy Implications," accessed at [www.unfpa.org](http://www.unfpa.org), on May 30, 2012.

the Caucasus and Balkans (see table). Only South Korea has managed to achieve a decrease from the elevated levels of the 1980s and now has a normal sex ratio at birth.<sup>5</sup>

## Motivations Underlying Sex Selection

The recent dramatic increase in sex ratios at birth is a result of the convergence of three factors: persistent son preference, decreasing ideal family size, and the rapid spread of prenatal sex determination technology. Understanding the specific dynamics and nuances of each factor is crucial to devising effective, context-specific strategies to halt the expansion of prenatal sex selection.

Son preference, the oldest and most deeply rooted of the three factors, may be motivated by economic, social, and/or religious factors. Within the strict patrilineal systems that characterize the regions most affected by sex selection, sons may be viewed as not only desirable but an economic necessity. The earnings and labor of a son accrue to his parents, while the contributions of a daughter (who is expected to live with and support her husband's family after marriage) accrue to her in-laws. Parents, therefore, view expenditures on sons as investing in the household's well-being and their source of old-age care and support, whereas investments in daughters will benefit another family. This is especially true where dowries (money, property, or other goods given by the bride's family to the groom's family) are customary. Moreover, in some countries, sons are the designated heirs of family land and assets and having a son ensures that those assets remain in the family.<sup>6</sup>

### BOX 1

## Evolution of Medical Technologies

Technologies that allowed for identification of fetal sex in utero were first introduced in the 1970s. Since then, sex determination techniques have become more affordable, less technically demanding, and less invasive.

### Amniocentesis and Chorionic Villus Sampling

These procedures, which are used for genetic testing as well as sex determination, must be performed by trained medical personnel and involve some risks to the fetus, including miscarriage. Amniocentesis can be performed around the 16th week of pregnancy.

### Ultrasound

Ultrasound is also used to identify sex starting at around 16 weeks of pregnancy and is noninvasive, making it less technically demanding and low-risk. This method became prevalent in developing countries in the 1980s. It is increasingly offered by nonmedical personnel at low cost: An older, used machine may cost only a few hundred dollars and services are often offered at a cost of US\$15-30. Ultrasound equipment is also becoming smaller and more mobile, and, therefore, more easily available in rural areas.

### Blood Test

A test that analyzes fetal DNA found in mothers' blood has been found reliable 98 percent of the time after the 7th week of pregnancy. This simple, low-cost test can be ordered online, and women can take their own blood sample at home (via finger-prick), although samples must be processed by qualified laboratories.

**Sources:** World Health Organization, *Preventing Gender-biased Sex Selection: An Interagency Statement*. OHCHR, UNFPA, UNICEF, UN Women and WHO (2011), accessed at [www.who.int/reproductivehealth/publications/gender\\_rights/9789241501460/en/](http://www.who.int/reproductivehealth/publications/gender_rights/9789241501460/en/), on Jan 19, 2012; Bela Ganatra, "Maintaining Access to Safe Abortion and Reducing Sex Ratio Imbalances in Asia," *Reproductive Health Matters* 16, Supplement 31, (2008): 90-98; United Nations Population Fund, *UNFPA Guidance Note on Prenatal Sex Selection* (2009), accessed at: [www.unfpa.org/webdav/site/global/shared/documents/publications/2010/guidenote\\_prenatal\\_sexselection.pdf](http://www.unfpa.org/webdav/site/global/shared/documents/publications/2010/guidenote_prenatal_sexselection.pdf), on Jan 11, 2012; and Pam Belluck, "Test Can Tell Fetal Sex at 7 Weeks, Study Says," *New York Times*, Aug. 9, 2011.

In addition to economic motivations, sons often enhance a family's status and play a crucial role in religious customs and rites, such as funerals and ancestor worship.<sup>7</sup> Existing gender norms that enforce divisions of labor and power also position boys to assume public roles and responsibilities not often permitted to women.<sup>8</sup>

Ironically, the second factor in the increase of prenatal sex selection is the growing realization that smaller families bring improvements for families. Decreasing ideal family size and strict family

planning policies often intensify the perceived imperative to have at least one son, since the chance of having a son decreases with fewer births. Many families may welcome the birth of a daughter as long as they also have at least one son. Data show that couples who already have a daughter are more likely to turn to sex selection for subsequent births to ensure the birth of a boy, resulting in even more imbalanced SRBs for second and third births than for the first birth (see Figure 2).<sup>9</sup>

The availability of modern technologies that can be used for sex determination (see Box 1) is the third key factor driving prenatal sex selection. Ultrasound, a common method, has become cheaper and more widely available to middle-class and even lower-class families, and in rural as well as urban areas.<sup>10</sup> While greater access to ultrasound and related technologies has improved the quality of prenatal care for millions of women, it also brings the risk of increased use for sex selection.

Technologies that can be used for sex determination are available and widely used in many countries, but not necessarily for the purposes of sex selection. For example, although ultrasound is generally available in Morocco, Great Britain, and the United States, these countries do not have the elevated SRBs that China, India, and other countries have—perhaps further proof that while prenatal sex selection has been facilitated by technology, it is driven by such deeply rooted cultural valuation of sons over daughters that even wealth, urbanization, and education do not diminish son preference. In many countries, wealthy, educated, and urban families have been the first and most frequent adopters of modern technology for prenatal sex determination and selection.<sup>11</sup> Upper-class couples are subject to the same social pressures and expectations to have a son as are the poor, but are likelier to want fewer children and have earlier and greater access to modern technology. Addressing the gender-related motivations directly, alongside efforts to promote responsible use of technology, is essential to effectively preventing sex selection and achieving gender equality.

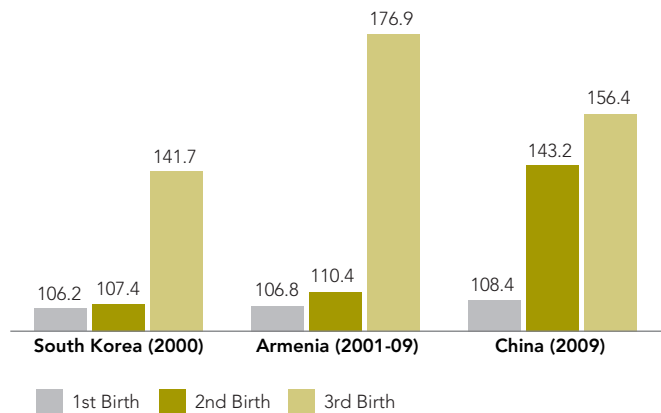
## Unintended Consequences

What are the negative results of sex selection and the resulting imbalanced sex ratios? The first generation characterized by elevated sex ratios has now reached adulthood, so while long-term effects are not yet clear, more-immediate consequences are already apparent.

One much-discussed outcome is the “marriage squeeze,” where a shortage of women leaves fewer brides available for the large numbers of prospective grooms. It is already considered a serious problem in China, India, and Vietnam, and will affect other countries as sex selection continues and SRBs remain high.<sup>12</sup> In societies where marriage and childbearing are nearly universal and an important source of social status, the lack of opportunity to marry leaves men marginalized—especially poor, uneducated, and rural men. Some experts, pointing to the association between elevated sex ratios and violence, theorize that increasing numbers of poor, unattached men may lead to a rise in crime and social unrest.<sup>13</sup>

FIGURE 2

### Sex Ratio at Birth, by Birth Order



**Source:** Christophe Guilmo, “Sex Imbalances at Birth: Trends, Consequences, and Policy Implications,” accessed at [www.unfpa.org](http://www.unfpa.org) on May 30, 2012.

The implications of the marriage squeeze are even graver for women. One might expect that as women become scarcer, their value and status should go up. Unfortunately, in the patriarchal contexts in which sex selection occurs, shortages of women may increase their worth as commodities but not their status as individuals, and any increased value is likely to accrue to men, who remain in control of women’s lives.<sup>14</sup> China, India, and Vietnam are already seeing increased female migration, bride importation, forced marriage, and trafficking. Vietnam has experienced an increase in the number of women marrying Chinese men, and reports indicate that hundreds of North Korean women are being sold as brides for Chinese men.<sup>15</sup> Women who marry foreign men are moving to a place where they do not know anyone and usually do not speak the language, putting them at increased risk for isolation, violence, and abuse.<sup>16</sup>

## Promising Approaches

While there is little evaluation to show that any one approach stops sex selection, lessons from ongoing research and interventions show that the most effective strategies are multifaceted and take into account the specific drivers and expressions of son preference. Short-term solutions have often focused on preventing prenatal sex selection through regulation of technology, but most experts warn that this is unlikely to be effective on its own. Instead, efforts should include comprehensive, long-term advocacy and activism to transform underlying discriminatory gender norms.<sup>17</sup> Most examples of efforts to halt the practice of sex selection come from India, which has struggled with particularly high rates of prenatal sex selection for many years, but perhaps the most promising case study is South Korea’s success in bringing its skewed SRB back to normal levels (see Box 2).

## DISCOURAGING THE MISUSE OF TECHNOLOGY

Efforts to address the “supply side” of sex selection have included legal restrictions on medical technology and partnerships with the medical community.

Many countries, including India, China, South Korea, Nepal, and Vietnam, have introduced laws restricting the use of technology for sex determination or selection purposes.<sup>18</sup> Laws may prohibit or regulate the determination and/or disclosure of fetal sex, abortion for the purpose of sex selection, advertising related to sex determination or selection services, or the sale and use of ultrasound machines. But experts agree that these laws are unlikely to achieve much success on their own, and may unintentionally limit women’s access to comprehensive medical care or criminalize women who seek such services.

Some medical organizations are working to promote codes of professional conduct related to the use of technology for sex determination and selection, while recognizing the imperative to protect women’s access to safe, comprehensive care. As noted in the International Federation of Gynecology and Obstetrics’ resolution against sex determination and selection for nonmedical purposes, the “individual right to procreative liberty needs to be balanced by the communal needs to protect the dignity and equality of women.”<sup>19</sup>

**Doctors as Partners and Advocates.** In 2006, UNFPA collaborated with the Indian Medical Association (IMA) and other medical professional associations to develop the “Doctors for Daughters” campaign to help doctors and other medical professionals understand India’s laws against sex selection, change gender norms and attitudes, and create champions of girls’ and women’s rights within the medical community. The campaign included an IMA resolution against sex selection, workshops to sensitize and train doctors, a toolkit explaining the importance of combating sex selection and the role of the medical community, and WHO-developed modules for use in undergraduate and graduate classes. The campaign recognized that, as direct service providers, medical professionals can be effective champions of gender equality but also need support to comply with the law without compromising patient care.<sup>20</sup>

## SETTING UP A POLICY FRAMEWORK THAT SUPPORTS WOMEN’S RIGHTS

Laws and policies that promote the rights and status of women and girls have an important role to play in decreasing the “demand” for sex selection services, especially if these policies target the well-being of girls and women broadly.

**Legislation for Financial Impact.** In the short-term, policies that provide financial incentives to parents of girl children may mitigate the perceived financial burden of daughters while creating opportunities for those daughters. Under the *Ladli* scheme in Delhi, India, for example, the government makes deposits to a bank account when a girl is born, with additional deposits made as the girl progresses through school, in an effort to improve

### BOX 2

## South Korea: A Study of Success

As one of the first countries to see a dramatic rise in its sex ratio at birth and the only country to successfully bring its skewed sex ratio at birth back to normal levels, South Korea’s experience is informative for other countries and emphasizes the importance of gender equality in addressing sex selection.

After prenatal sex determination technology became widely available in South Korea in the mid-1980s, the country experienced a steep rise in the sex ratio at birth, a rise that continued until the mid-1990s. The government took early steps to combat the supply of ultrasound and other technology for sex determination, introducing restrictions for their use. Penalties were harsh and strictly enforced; in 1991, eight physicians had their licenses suspended for performing illegal sex determination procedures. However, most experts attribute the turn-around to a transformation of traditional gender roles and attitudes, led by civil society. With urbanization and industrialization came a shift from an extended to nuclear family structure, better employment opportunities and increased participation of women in the workforce, and greater retirement savings. All of these changes meant decreased reliance on the traditional, patriarchal kinship system, increased gender equality, and decreased son preference. From 1985 to 2003, the proportion of women who said that they “must have a son” decreased from 48 percent to 17 percent.<sup>1</sup> Interestingly, laws and policies to promote gender equality followed rather than led these changes: The South Korean legal system was rooted in patriarchal traditions and was not significantly reformed until the 2000s.<sup>2</sup>

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birth registration of girls, promote girls’ education, and increase girls’ self-reliance. Funds are made available to girls when they turn 18 if they have remained unmarried and completed Standard 10 in secondary school. Launched in 2008, *Ladli* reached 135,645 girls in the first year and 140,006 in the second, and is credited with improving birth registrations, encouraging parents to invest in girl children, and possibly contributing to a positive change in the sex ratio at birth. However, it is still unclear whether the program actually ensures the birth of girls and significantly alters parents’ attitudes toward girl children. Additionally, because the program is limited to two girls per family and only low-income families are eligible, it may not reach all families.<sup>21</sup>

**Legislation on Inheritance and Property Rights.** Over the long term, legislation that strengthens women's economic, political, health, and human rights may shift cultural standards toward equal valuation of women and men. India has complementary laws that mandate equal inheritance for sons and daughters (the Hindu Succession (Amendment) Act of 2005) and equal responsibility for support and care of elderly parents (Maintenance and Welfare of Parents and Senior Citizens Act (MWPSCA) in 2007).<sup>22</sup> By ensuring the equal distribution of rights and responsibilities between sons and daughters, these laws promote girls' status within the family and society.

## INSTITUTING AWARENESS AND ADVOCACY CAMPAIGNS TO CHANGE CULTURAL NORMS

Mass-media campaigns and community-based programs focused on gender equality and the consequences of sex selection can positively affect women's social status and value by engaging individuals, families, and communities. Given the popularity of TV and radio, the diversity of the audience, and the large population and geographic size of many affected countries, mass media can spread knowledge about the negative consequences of sex selection and create opportunities for questioning social and cultural norms and attitudes.<sup>23</sup>

**Atmajaa ("Born from the Soul").** This fictional television series initially aired in India in 2004. The series dramatized the issue of sex selection, first within an urban, upper-middle class North Indian family and then in a rural village. Women's rights (particularly reproductive rights), the value of the girl child, and the negative societal consequences of sex selection formed the central themes, and the series explored the gender discrimination and traditional values that drive the practice of sex selection. The main audience was women of reproductive age, though the story was set in a family context and explored relationships among family members. An audience impact study conducted after the first part of the series aired found that young women were the most receptive to the messages of the show. Older women liked the series but felt negatively stereotyped; married women said that the decisions needed to be situated more clearly in the family; and men felt that the series did not adequately represent them. Later episodes attempted to address these points, although no evaluation has been conducted of those episodes.<sup>24</sup>

## Recommendations

**Strengthen data collection and evaluation to improve understanding of the problem and the most effective responses.** Accessible and reliable data on sex ratios at birth and related indicators are critical for identifying and addressing the practice of sex selection and can contribute to increased public and government awareness of the practice's severity.<sup>25</sup> Actions include:

- Strengthening birth registration systems and reporting and analyzing quantitative data at a regional level to identify significant differences within countries.
- Encouraging the collection of qualitative data to characterize gender dynamics and the drivers of son preference in specific contexts (including differences across socioeconomic groups within the same region).
- Monitoring and evaluating legislation and programs to identify which measures are effective and which are not.

**Promote appropriate use of medical technology.** Policymakers should focus on promoting responsible use of ultrasound and other technologies through educating and partnering with the medical community, rather than merely seeking to restrict access.

**Evaluate and reform laws to promote gender equality.** Ensuring that girls and women have equal standing and rights in the eyes of the law will create a framework to support gender equality. Policymakers should introduce or revise laws to guarantee women's inheritance and ownership rights, improve marriage and divorce laws to ensure greater protection and support, strengthen labor laws and increase labor force participation, and promote women's political rights.

**Support couples who have daughters and encourage women's participation in public life.** In the short term, policymakers can implement programs that provide support for families with only girls, either directly to the girls themselves (such as scholarships or health care) or to parents (such as pension support). Additionally, measures that encourage women to participate in civic associations and in politics will promote their standing and authority in the public sphere.

**Work with a diverse network of partners.** Professional groups, religious leaders, civil society, and the media can play a role in eliminating sex selection. Members of these groups can disseminate accurate information to the general public, speak up as champions of the rights of girls and women, encourage constructive dialogue and questioning of harmful gender norms, and support individuals and communities who are making positive change. Partnering with these groups can bolster official policies and programs, and result in an effective, comprehensive strategy to address the practice and drivers of sex selection.

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