

# Sex Imbalances at Birth:

Current trends, consequences and policy implications



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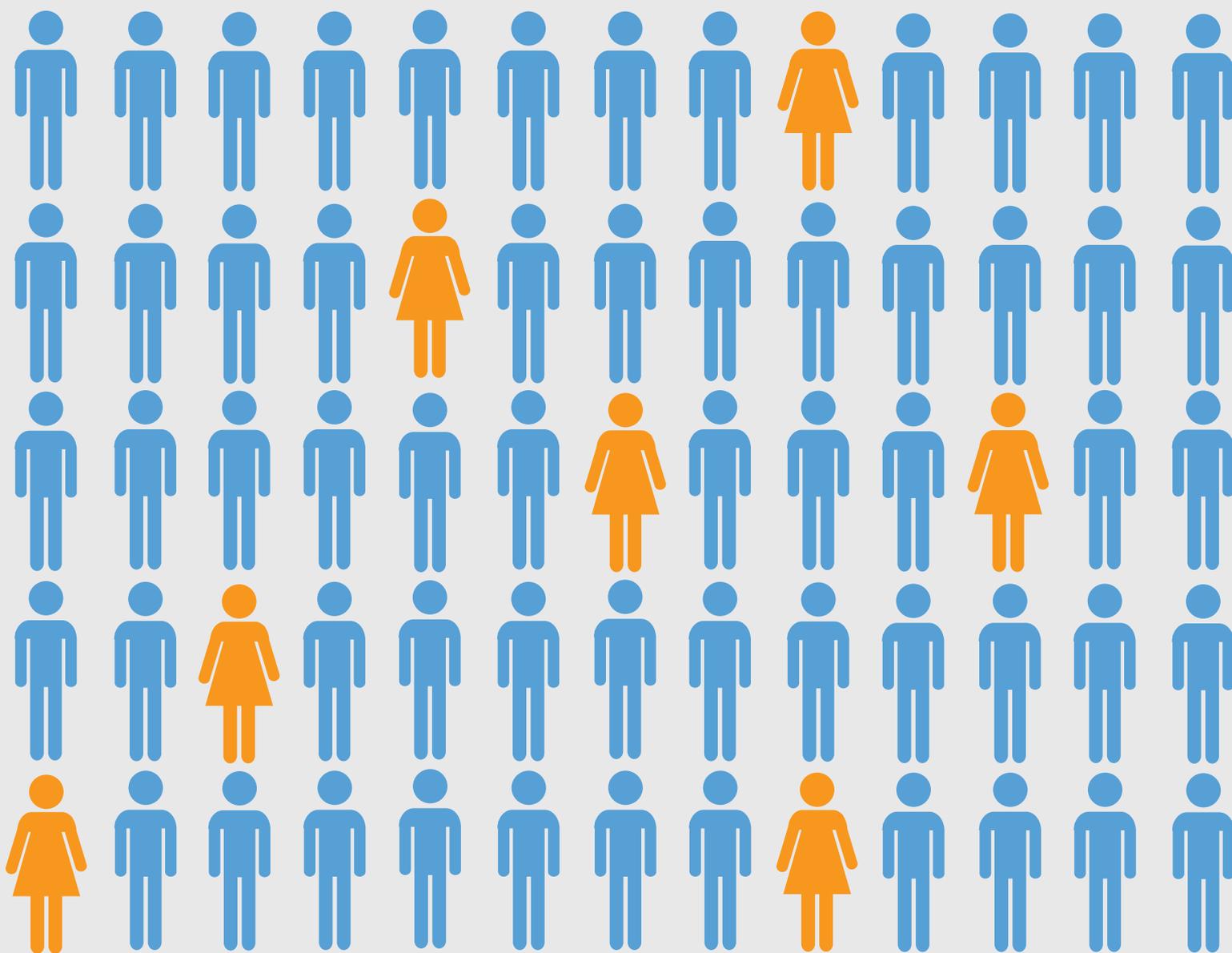
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# Sex Imbalances at Birth:

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UNFPA Asia and the Pacific Regional Office

# Foreword

## **Sex Imbalances at birth: Current Trends, Consequences and Policy Implications**

The sex ratio for the entire world population is 101 males to 100 females. Analysis of available national census data indicates that in recent decades, sex-ratio imbalances have grown in favour of boy children in a number of South Asian, East Asian and Central Asian countries. Prenatal sex selection leads today to distorted levels of sex ratio at birth (SRB), reaching between 110 and 120 male births per 100 female births in several countries pointing to the intensity of gender discrimination and son preference. The trend has shifted geographically over time, beginning in a number of Asian countries (China, India, and the Republic of Korea) in the 1980s, followed by some countries of the Caucasus (Azerbaijan, Armenia and Georgia) in the 1990s, and has more recently been followed by Montenegro, Albania, and Vietnam.

This distorted demographic masculinization, which has serious social and economic implications, is not a natural phenomenon but is achieved through a deliberate elimination of girls. The alarming trends in sex ratio imbalances at birth highlight son preference in several cultures and the misuse of scientific and technical advances in pre-natal sex-detection have combined to create these rising SRBs. Census data have often provided detailed mappings of these variations, both within countries and across social groups.

Sex selection in favour of boys is a symptom of pervasive social, cultural, political and economic injustices against women, and a manifest violation of women's human rights. The growing number of missing women (latest estimates indicate 117 million missing women) speak of a culture in which gender inequality is deeply rooted. Patriarchal structures reinforce son preference and a climate of violence and discrimination against women and girls in society. Declining fertility and rapid developments in the technology that allows parents to know the sex of the foetus have exacerbated this practice.

Present-day sex ratios among children are going to have a lasting impact on population dynamics in Asia. Projections show that in China and India, men will already vastly outnumber women of marriageable age for over two generations. Marriage simulations also suggest that the number of single men trying to marry after 2030 might exceed for several decades the corresponding number of unmarried women by 50-60% in both countries. The expected socio-economic consequences of these trends are alarming including potential risks of human rights violations such as abduction, trafficking and sale of women and girls for the purposes of marriage or sexual exploitation.

UNFPA began focusing on this issue in the 1990s, guided by the Programme of Action of the 1994 Cairo International Conference on Population and Development (ICPD), which recommends the elimination of "all forms of discrimination against the girl child and the root causes of son preference, which results in harmful and unethical

practices regarding female infanticide and prenatal sex selection.” The consensus agreement urges governments to “take the necessary measures to prevent infanticide, prenatal sex selection...” and says “leaders at all levels of the society must speak out and act forcefully against patterns of gender discrimination within the family, based on preference for sons....”

Over the last 20 years UNFPA has been supporting national interventions and engaged in research and advocacy to raise awareness and bring the issue of sex selection and the consequent sex ratio imbalance in populations to the forefront of governments’ agendas. Working with UNFPA and independently, governments, civil society, communities and academia in the affected countries have undertaken several initiatives to reduce the trend of sex selection and rising SRBs and to address the many dimensions of this issue –in terms of human rights, social policy and public health.

At the regional level, UNFPA first convened a conference on sex ratio imbalance in the Republic of Korea in 1994 to sensitize, gather experiences and develop responses for countries in the region, followed by conferences in China in 2004, India in 2007 and Vietnam in 2011. UN inter-agency cooperation was strengthened in 2011 through the development of an interagency statement, by United Nations agencies (OHCHR, UNFPA, UNICEF, UN Women and WHO) noting a joint framework for action on sex selection and identifying the expertise that each agency can bring for tackling this harmful practice. An inter-regional project to support further research, capacity building and south-south collaboration will be supported over the coming three years by UNFPA Asia and the Pacific Regional Office in collaboration with the UNFPA Eastern Europe and Central Asia Regional Office.

After two decades of these efforts, it is time to see where the world stands on this issue so critical to its progress. This report offers an updated review of the latest trends and differentials in sex selection, the progress and setbacks, the causative factors which differ across countries, governmental and community initiatives and the multi-dimensional implications of rising Sex Ratio at Birth.

The report concludes with a set of recommendations to combat gender discrimination and prenatal sex selection at the national and regional level. UNFPA is committed to contribute to the reduction of gender biased sex selection in affected countries, by strengthening evidence-based national policies and programmes in addressing gender inequality and sex selection at birth.



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# Acronyms and Abbreviation

CCT	Conditional cash transfer
HIV/AIDS	Human immunodeficiency virus infection/Acquired immunodeficiency syndrome
IEC	Information, education and communication
ISDS	Institute for Social Development Studies
IVF	In vitro fertilisation
KWN	Kosova Women's Network
MICS	Multiple Indicator Cluster Survey
NFHS	National Family and Health Survey
NGO	Non-governmental organization
NIPCCD	National Institute of Public Cooperation and Child Development
PGD	Pre-implantation genetic diagnosis
SES	Socio-economic status
SRB	Sex ratio at birth
TFR	Total fertility rate
UN	United Nations
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
WHO	World Health Organization



# Executive summary

Education, urbanization and economic development have significantly improved opportunities for Asian women and girls over the last two decades. Yet, this well-documented progress in women's status and gender equality has coincided with a less glorious fall in the proportion of girls among children in many countries. The decline, caused to a large extent by an increase in prenatal sex selection in the past 20 years, is leading to an alarming demographic masculinization. This intensifying gender imbalance will have an adverse impact at many levels on men, women and families over the next half century.

## **Skewed sex ratios at birth today: trends and differentials**

This report offers an updated review of the various facets and the latest trends and differentials in sex selection.

Prenatal sex selection leads to distorted levels of sex ratios at birth (SRB), which today range between 110 and 120 male births per 100 female births in many countries, as against the standard biological level of 104-106. Birth masculinity as measured by the sex ratio at birth reaches levels above 120 or 130 in some specific regions, pointing to the intensity of son preference and gender discrimination there. Meanwhile, postnatal sex selection – measured by excess deaths among female infants and young girls – has not yet disappeared from several countries, reflecting the continuing discrimination against and neglect of female children.

Available data demonstrate that prenatal sex selection is present not only in countries of South and East Asia, such as India and China, but also in Southeast Europe and the South Caucasus. A recent rise in birth masculinity is discernible in Viet Nam too. In all these countries, the SRB is now above 110 male births per 100 female births. A review of available studies reveals that major variations in SRB levels are linked to social and demographic characteristics. Higher proportions of male births are reported among higher-order births and in families with only girls, demonstrating the role of gender preferences in the decision to opt for sex selection. There are sizeable differentials across regions and ethnic groups, often related to variations in kinship systems. The sex ratio at birth observed among the poorest socioeconomic classes is also in many cases at a normal level.

## Understanding sex selection

The increase in prenatal sex selection is the joint product of three distinct factors:

- 1) Son preference constitutes the primary factor behind sex selection. It stems directly from the requirements of patrilineal and patrilocal household structures, in which girls and women have a marginal social, economic and symbolic position, and consequently enjoy fewer rights. Old age security is an additional factor as sons, rather than daughters, are expected to provide support to their parents throughout their life.
- 2) The growth of prenatal diagnosis technology, which enables parents to know the sex of their unborn child, is the second factor. Coupled with abortion, legal or not, sex determination may lead to pregnancy termination. The rise in SRB in specific countries has indeed often been linked to the spread of ultrasound technology through the private healthcare system. The future may see newer technologies that make it even easier to select the sex of one's offspring.
- 3) In addition to these demand and supply factors, low fertility represents the third factor because it exacerbates the potential need for sex selection – by reducing the probability of having a son in smaller families. Local fertility restrictions and spontaneous rapid fertility decline below replacement levels tend to compel parents who want both a son and a small family size to resort to sex selection.

Recognizing the respective role of these three essential components of sex selection in each affected country not only allows us to understand the specific contexts for sex ratio imbalances, but it also helps to envisage the future trends in birth masculinity in affected and still unaffected countries.

## The number of missing girls and the future impact of sex imbalances at birth

Using demographic estimates by the United Nations Population Division for 2010, the report estimates the current number of missing women by comparing age and sex distributions in 14 countries which have a significant incidence of prenatal sex selection or neglect of girls, with the rest of the world. The estimation procedure leads to a total gender gap of 117 million women missing in 2010, most of them from China and India. This number reflects not only the recent rise in the number of unborn girls due to prenatal sex selection, but also the cumulated toll of excess female mortality over several decades. The report also estimates that 39 million women below 20 years are missing in 2010. This figure corresponds to the gender gap over the period since 1990 when sex determination became common across the world. Historical data indicate that the gender gap between men and women has been rising since 1950, and since 1990 in particular, under the influence of prenatal sex selection. However, the overall impact of sex differentials in mortality is declining.

A set of demographic projections provides a more precise perspective of future distortions in the population structures of affected countries, particularly the sex imbalances among young adults. They show that even if the SRB levels were to come back to normalcy within ten years, an admittedly optimistic scenario, men in China and India would still face a serious “marriage squeeze” as they would

vastly outnumber women of marriageable age for several decades. Marriage simulations also suggest that the number of single men trying to marry after 2030 might exceed the corresponding number of unmarried women by 50-60 per cent in both countries for several decades. Not only would these men have to marry when significantly older, but this demographic imbalance would also lead to a rapid rise in bachelorhood in some countries, bringing an important change in countries where almost all men used to get married in the past. The rise of involuntary singlehood will particularly hit men from disadvantaged backgrounds.

Some field surveys already document the initial impact of these demographic imbalances on small regions in China and India while other, more speculative, studies, link the rise in the number of unmarried men to antisocial behaviour. Projected population figures suggest, however, that the forthcoming imbalance among adults will be of more considerable magnitude within the next two decades. The potential repercussions of this unprecedented situation in social and economic terms remain poorly understood, but family systems will have to evolve rapidly to adjust to the rise in male bachelorhood.

### **Policy initiatives to reduce sex imbalances at birth**

Apart from the manifest gender inequity that sex selection epitomizes, the rise in the SRB corresponds to a typical tragedy of the commons: the widespread pursuit of individual interests by manipulating the sex of one's children results after two decades in a collective social problem arising from the growing surplus of men. While most of Asia enjoys a demographic bonus due to the rising share of its working-age population, this durable sex imbalance will constitute a long-term demographic malus in most affected countries and calls for a larger involvement by governments.

After a period during which the reaction to the spread of prenatal sex selection was limited by many factors, governments and civil society organizations across Asia have embarked on a number of forceful initiatives to reduce sex imbalances at birth. Some countries have banned the practice of sex determination. However, such prohibitions are difficult to enforce for several reasons, such as the limited cooperation from parents and practitioners and the risk that it may limit access to legal abortion.

Another initiative is the introduction of policy schemes aimed to reduce the perceived disadvantages of girls in patriarchal systems – and reduce the imperative for male children. They offer parents of girls various incentives and support through cash transfer and other inducements. While these schemes may not do away with the age-old bias against girls and may not influence better-off households, they carry additional benefits such as better health and schooling for girls.

A more ambitious approach is through public and legal campaigns to change traditional value systems and social institutions biased against girls and women. A combination of advocacy campaigns and legal initiatives is needed to reverse the traditional preference for sons. Only such initiatives will reduce gender inequality in the long term, but their impact on reproductive behaviour and sex selection is likely to be slow.

A review of the large array of policy initiatives to combat prenatal sex selection points to the absence of any objective assessment of their actual effectiveness in reducing sex imbalances at birth. There is a lack of monitoring and evaluation instruments such as dedicated surveys and disaggregated vital statistics.

## Emerging priorities and future challenges

Trends in birth masculinity are twofold. On the one hand, there is a risk of prolonged deterioration in many regions of China and India, since sex ratio imbalances have not yet spread to the entire country. Provisional census data from China and India confirm the spread of prenatal sex selection to new regions. In addition, several countries in South Asia and elsewhere where son preference appears well entrenched, but with little or no sign of distorted SRBs, may soon be affected.

Yet, some progress has been recorded in many areas, starting with South Korea where birth masculinity is back to a normal level. Recent improvements in the most affected regions of China and India suggest that a combination of policy interventions and endogenous social change may be at work to bring down levels of birth masculinity. But there is still a long way to go before the transition cycle is achieved and the SRB is back to its biological level.

Dealing with the future demographic consequences and societal impact of past and present sex imbalances at birth may soon become the next major challenge for governments and communities.

The 16 recommendations offered at the end of the report address the various regional contexts presented here. For a start, our knowledge base is still fragmentary in many areas, with a lack of basic information on the specific sociological context of son preference and its interrelationship with current social and economic change. Understanding the intricacies of the social and demographic dynamics behind prenatal sex selection and estimating its extent in society are keys to mobilizing public authorities and public opinion. It will also help to design more effective policy interventions.

Countries where prenatal sex selection has been identified require government measures to reduce the impact of adverse sex ratios. At the same time, regular monitoring of demographic trends, most notably through a stronger civil registration system, and a large dissemination of survey results remain essential. There will be a continuous need to share information and statistics, both with the public and government departments, and to strengthen the capacity for interventions by the government and non-government organizations.

The closer monitoring proposed here should also extend to the working of the policy initiatives launched over the last ten years by regional and national governments to curb rising sex ratios at birth. Most initiatives should include built-in evaluation tools or be followed by regular impact assessment surveys. There is an urgent need to know what has worked and how, and to share experiences across countries through increased South-South policy dialogue.

**S**ocial differences between men and women have long translated into significant variations in occupational, economic, political or educational outcomes for them. A somewhat invariant trait of social structures is the gender gap in the access to resources and opportunities to the detriment of women and girls. However, the rapid social and economic advances in many countries, most especially in some parts of Asia, have generated a gradual change in this unequal distribution of resources between men and women. Through various processes linked to economic growth, such as improving access to education, urbanization and development of the service sector, many women have been able to obtain better jobs and strengthen their social and economic autonomy. In addition, changes in legal systems are challenging the most resistant forms of discrimination.

In demographic terms, this improvement in the status of women has been accompanied by a gradual reduction in the number of pregnancies, lower maternity risks, as well as by significant gains in life expectancy. Even though there is still a large number of women who have not benefitted from these shifts and remain excluded, women today live longer than men on average almost everywhere in the world.<sup>1</sup>

These well-documented advances in women's position and status have, however, coincided with darker aspects of demographic changes in several parts of the world. Starting from the 1990s, the proportion of girls among children began declining sharply in many countries due to son preference. This process, caused to a large extent by the emergence of prenatal sex selection, has intensified and expanded over more than two decades. As result, age pyramids are now increasingly skewed towards males among the younger generations, leading to a growing number of "missing girls". This historically unprecedented development is leading to an irreversible demographic masculinization, which is bound to influence the future of affected countries over the next half century.

This report offers an updated review of the different facets of the recent emergence of prenatal sex selection. It starts with a brief overview of the issue before examining in greater detail the nature of prenatal sex selection and excess female mortality and the extent of their spread across the world, with

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<sup>1</sup> The gender situation in Asia is summarized in the recent UNDP (2010) report. See also United Nations Population Division (2011) for the latest estimates of national population trends. This source will be used in this report for all demographic estimates except the sex ratio at birth.

a priority focus on Asia. The next section reviews the major variations in the intensity of sex selection observed within the affected countries. In a separate section, the known determinants of this new form of gender discrimination are explored in order to assess the specific roles of demographic change, new technology, and traditional gender-related attitudes. Another section discusses the potential consequences of these sex imbalances on the demographic and social foundations of affected societies, a review that remains in part exploratory because of its reliance on population forecasts and more speculative scenarios of social change. The next section presents the existing policy options and the way governments in the concerned areas have reacted to the evidence of sex selection. Given the growing extent of demographic imbalances, government and non-government actors need to make an all-out effort to combat prenatal gender discrimination and thus accelerate the return to the normal sex distribution of births and mitigate the overall effects of the ongoing sex ratio crisis.



The most obvious dimension of the rise in sex imbalances is the gradual change in demographic indicators over the last 25 years. This section gives a brief overview of the various factors likely to affect the sex distribution of any population, with an emphasis on the role played by deliberate methods used to alter the biological proportion of boys and girls. Using available statistics, the report describes the magnitude of sex imbalances at birth in various countries. Data show that excess female mortality in childhood, generally considered a somewhat archaic form of sex discrimination, in fact, still exerts a significant impact on demographic structures. The chapter ends with a discussion on the most revealing demographic and socioeconomic characteristics that have been found to be associated with skewed birth masculinity.

## 2.1 The mechanisms of sex selection

The issue of sex imbalances received wide publicity for the first time in 1990 when Nobel Prize winner Amartya Sen drew attention to the apparent deficit of women in many parts of Asia. His analysis emphasized that a large number of women were “missing,” as evidenced by the millions of women that should have been found in Asian countries had their distribution by sex been similar to what was observed elsewhere in the world.

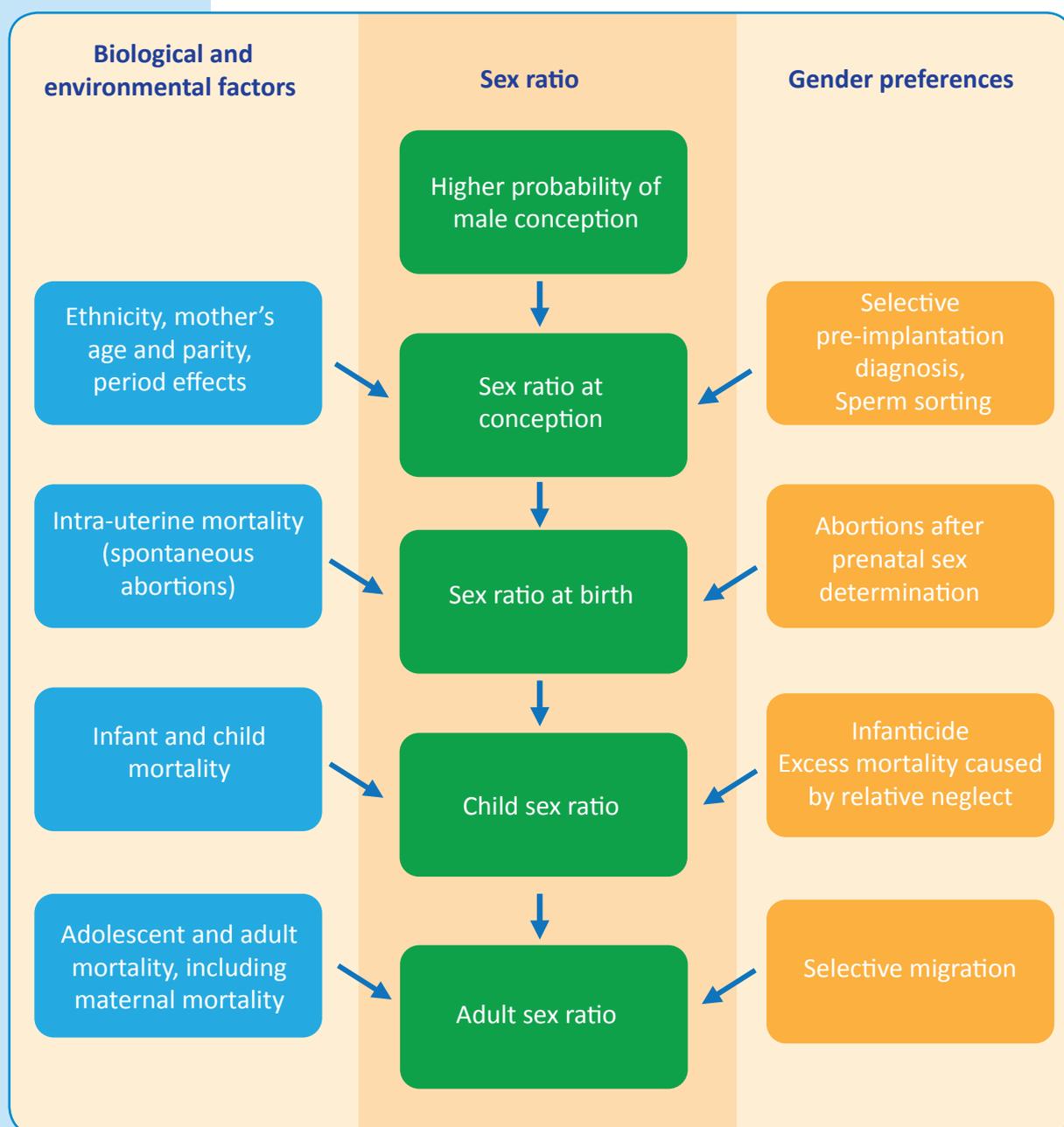
In the late 1980s, this gender gap was chiefly determined by excess female mortality, a testimony to the unequal benefits of the progress in health conditions during the twentieth century. As the results of the new round of censuses in China and India came out in the 1990s, statisticians started to notice that the proportion of young boys among children was swelling, an increase that could not be attributed to mortality differentials. In the following years, fieldwork surveys and in-depth statistical analyses demonstrated that the new sex imbalances were caused by selective abortions of female foetuses.<sup>2</sup>

Comprehending the sex distribution by age was however made difficult by the large number of distinct factors likely to affect sex ratios. Figure 1 sums up the main determinants of sex ratio variations from conception to adulthood, highlighting two types of factors. On the left side are endogenous factors that are mostly biological or linked to the general social and economic environment.

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<sup>2</sup> Initial demographic accounts can be found in Das Gupta and Bhat (1997), Park and Cho (1995) and Zheng et al. (1993). See also Attané and Guilmoto (2007).

Figure 1: Factors affecting sex ratios at different ages



On the right side are factors that are directly related to social decisions and ultimately to gender preferences, including active and passive discrimination against girls (Chahnazarian 1988; Waldron 1998).

Many factors affecting the proportion of the sexes are obviously unconnected to gender discrimination. Among them, biological factors play a central role. To start with, the probability of conceiving a male embryo is slightly higher than that of conceiving a female embryo in the human species.<sup>3</sup> In spite of the fact

<sup>3</sup> Biological determinants of sex at birth are an example of poorly understood factors of sex distributions. Several statistics collected in countries with reliable birth registration systems document slight but significant, though often unexplained, variations in birth masculinity (Parazzini et al. 1998; Grech et al. 2003).

that intra-uterine mortality (spontaneous abortions) appear to be slightly more frequent for male foetuses, the resulting sex ratio at birth in the absence of social manipulations is usually close to 105 male births per 100 female births (see Box 1).

On the other hand, statisticians have long described the relatively better survival prospects of girls vis-à-vis boys. Statistical evidence indicates that male mortality rates are on the whole higher than corresponding female rates, a feature observed from the foetal stage to old age. The prevalence of high maternal mortality rates in less developed societies is the main exception to this rule. Life expectancy at birth among women consequently tends to surpass that of men in almost all countries. This gap in longevity between the sexes ranges from two years in Sub-Saharan Africa to almost four years in Asia, six years in North and South America and more than seven years in Europe. Higher mortality rates among men cause the sex ratio to gradually decline with age, starting from 105 at birth to values below 100 during adulthood and among the elderly. If the specific effects of migration and under-enumeration are omitted, mortality is the main cause for changes in sex ratios.

One lingering impediment to the statistical analysis of sex distributions is the lack of reliable estimation of the “normal” SRB in countries where birth registration is incomplete. As there are only indirect estimates of the biological standard of SRB in many Asian countries, the interpretation of higher than expected sex ratios is not easy. This has led to the hypotheses that in some areas racial or epidemiological factors account for a higher biological SRB. But so far, nothing seems to indicate that the biological SRB lies outside the conventional 104-106 range in countries affected by sex imbalances at birth. Hence this factor cannot explain but a minor part of the measured gender gaps.<sup>4</sup> In fact, there are a few reliable birth registration series for several Asian subpopulations and their SRBs tend to be close to 105.<sup>5</sup>

The biological and environmental female advantage in mortality has not resulted in a global predominance of women because of the severely distorted population structures in many countries, especially in Asia. The causes for these demographic imbalances are manifold, but they invariably refer to some of the factors listed on the right side of Figure 1. In the past, the female biological advantage in survivorship has been negated by active discrimination, and the differential mortality between men and women has been the main driver behind sex imbalances. Women’s lives were shorter than men’s in many countries; excess female mortality is, in fact, a telling manifestation of the lower value of women and the corresponding preference for the male sex. Traces of such discriminatory attitudes and their impact on mortality risks are still clearly visible in many Asian societies, as the section below on excess female mortality in childhood details.

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4 Sudden changes in the sex ratio at birth have sometimes been linked to war and other conflict environments (Polasek 2006). However, not only does the evidence of this relationship remain thin, but the magnitude and duration of these variations is negligible compared to the large sex imbalances examined in this report.

5 Illustrations of such populations with a normal sex ratio at birth can be seen in birth statistics from unaffected countries such as Japan, Sri Lanka, Thailand, Mauritius and Iran.

## Box 1: Sex ratio and measurement issues

### *Sex ratios by age*

Sex ratios are usually measured as the number of males per 100 females. The same formula applies to different age groups as well as to births. Yet, sex ratios are sometimes expressed as females per 1000 males or simply as percentages of the total population. The biological level of sex ratio at birth is around 105 male births per 100 female births. Put differently, male births account on average for slightly more than 51 per cent of all births, a gap between boys and girls that can be explained only as the long-term effect of natural selection processes among human societies. This SRB level of 105 is not invariant and reliable statistical series based on birth registration have shown the existence of modest, but significant, variations across regions and periods. There are, for instance, distinct trends detectable in annual SRB series, as well as variations among some ethnic groups. As a result, the standard SRB level is often taken as between 104 and 106 male births per 100 female births, allowing for minor differences across samples (Parazzini et al. 1998).

Under the impact of mortality – which tends to favour women over men – sex ratios decline with age, crossing the 100 line during adulthood or earlier. Migration does, however, alter this picture in areas where and from where men or women migrate disproportionately. For instance, adult sex ratios in rapidly growing cities are often influenced by the nature of migratory flows towards cities. Among the elderly, sex differentials in survivorship are even more pronounced and it is not uncommon for sex ratios to plunge to levels below 60 men per 100 women.

### *Measurement issues*

Sex ratio estimates are extremely sensitive to the size of the samples used. A sex ratio of 100 computed over a sample of 5000 observations may fluctuate between 94.6 and 105.7 (95 per cent confidence interval). As a result, estimates derived from sample data offer only imperfect estimates and it is always preferable to rely on large samples.

For SRB, the best source for estimation remains the birth registration data – when vital statistics are available and exhaustive. The major advantage of birth registration data is that they provide annual and regional series, which help to identify differentials and trends. But when there is no registration data, a second option is to use census data. The age and sex distribution of the infant population and children or the sex ratio of the recent births reported by mothers are available from census sources, including for administrative subunits. They are, however, also slightly affected by sex differentials in infant and child mortality, as well as by age misstatement among children.

Average SRB estimates tend to be close to 105 in the absence of prenatal sex selection. When large samples are used, levels around 110 are suspect and cannot be explained by random variations in birth masculinity, including short wartime fluctuations. Confirming the presence of prenatal sex selection requires both converging quantitative sources (such as census-based sex ratios and birth samples) and additional documentation on existing sex selection technology, reproductive behaviour, and son preference in the areas concerned.

Discriminatory systems have evolved rapidly over the last three decades, fuelled to a large extent by advances in prenatal sex determination. As Figure 1 displays, several methods to discriminate among unborn girls coexist today. The most sophisticated methods are based on pre-conception selection and require access to the elaborate equipment necessary to perform sperm sorting, pre-

implantation genetic diagnosis (PGD) or in-vitro fertilization (IVF). When used for sex selection, the techniques present many advantages to users, in particular the benefit of avoiding any unwanted pregnancy (or, more precisely, pregnancies of unwanted foetuses) and of complete confidentiality. Cost and accessibility factors, however, restrict these technologies to developed countries and to the most affluent populations.

By far the most common methods used nowadays for sex selection derive from the gradual introduction of prenatal diagnosis technologies in the 1970s. Combined with abortion, whether legal or not, prenatal sex determination is the key to understanding how couples have become able to decide whether to continue or to interrupt a pregnancy on the basis of their gender objectives for their family. Among these methods, ultrasounds are the most widely used.

## 2.2 Skewed sex ratios at birth observed from Asia to America

The data presented here are based on the most recent reliable sources for each country or region. While these estimates should ideally be based on registered births, the series used here had to be supplemented with indirect estimates for countries whose birth registration systems do not provide reliable figures.

Of the countries and regions presented in Table 1,<sup>6</sup> all except South Korea today display significantly skewed SRB levels. Subregional estimates have also been added to illustrate the extent of variations in birth masculinity found within larger countries.

The overall picture that emerges from this comparative analysis is that the issue of adverse SRB levels is not limited to China and India. In spite of its obvious concentrations among specific communities and in a limited number of countries, prenatal sex selection has become a more global phenomenon, with distinct manifestations in several continents.

### Southeast Asia

On the whole, China is today the major contributor to the growing sex imbalances at birth.<sup>7</sup> The SRB started probably to increase in China in the late 1980s. According to the latest census estimate and in agreement with annual figures published by China's National Bureau of Statistics, the SRB is today close to 118, one of the highest levels ever observed in a country. This figure, when compared to the 105 SRB standard, points to a proportion of deficit female births close to 12 per cent of all female births. With a total number of 84 million births estimated for 2005-10, these excess births correspond to a surplus of more than 0.9 million male births per year.<sup>8</sup> Another estimate (see Box 2) suggests that in the absence of a previous male birth, about 25 per cent of women resort to prenatal sex selection in China. The peak in birth imbalances seems to have

6 For lack of reliable data on birth masculinity, we could not present the situation in Afghanistan and Nepal, where the proportion of male births may also be abnormal.

7 Recent studies of China include Banister (2004), Cai and Lavelly (2007), Chu (2001), Gu et al. (2007), Li et al. (2007).

8 Projections and comparative figures in this report are all derived from 2010 United Nations estimates (United Nations Population Division 2011).

**Table 1: Most recent estimates of the sex ratio at birth in various countries, 2007-2011**

Country / regions	SRB	Period	Data source
<i>East and Southeast Asia</i>			
<b>China</b>	117.8	2011	Annual estimate
Anhui Province	128.7	2010	2010 census
Fujian Province	125.6	2010	2010 census
Hainan Province	125.5	2010	2010 census
Hong Kong	116.2	2011	Birth registration*
Taiwan	108.4	2009	Birth registration
<b>Singapore</b>	107.5	2009	Birth registration
<b>South Korea</b>	106.7	2010	Birth registration
<b>Viet Nam</b>	111.2	2010	Annual demographic survey
Red River Delta Region	116.2	2010	Annual demographic survey
<i>South Asia</i>			
<b>India</b>	110.5	2008-10	Sample registration
Punjab State	120.3	2008-10	Sample registration
Haryana State	117.9	2008-10	Sample registration
Uttar Pradesh State	114.9	2008-10	Sample registration
<b>Pakistan</b>	109.9	2007	Population and demographic survey
<i>West Asia</i>			
<b>Azerbaijan</b>	116.5	2011	Birth registration
<b>Armenia</b>	114.9	2010	Birth registration
<b>Georgia</b>	113.6	2009-11	Birth registration*
<i>Southeast Europe</i>			
<b>Albania</b>	111.7	2008-10	Birth registration*
<b>Montenegro</b>	109.8	2009-11	Birth registration
Sources: national statistical offices, Eurostat			
* Provisional data			

been reached in 2005, at 120, and available annual estimates for China indicate a slight decrease over the last five years.

The SRB in several provinces of China was significantly higher than the national average, reaching levels of 125-130 male births per 100 female births in 2010. Such an excess corresponds to almost a quarter of male births. In view of its high level of development, Hong Kong surprisingly also displays high SRB figures, but it

seems possible that the large number of women from mainland China delivering in Hong Kong has inflated the proportion of male births. In contrast, the SRB in other advanced areas of the region (Taiwan, South Korea and Singapore) is less skewed, with only a minority of the population resorting to prenatal selection. South Korea provides the only case of a rapid SRB increase till the mid-1990s, which has been followed by an equally rapid decline since then. Viet Nam's level of birth masculinity may appear modest. Yet, the rise in this country began less than ten years ago, and SRB levels have already passed 120 in the Red River Delta. Viet Nam, therefore, offers a threatening scenario of potential aggravation of SRB in the coming years.<sup>9</sup>

### **South Asia**

In South Asia, the most affected country is India.<sup>10</sup> Prenatal sex selection was reported here immediately after the introduction of the new sex diagnosis technology in the 1980s. Yet, the overall level of birth masculinity remains moderate in comparison with China. The recent decennial rise in child sex ratio from 108 to 109, reported by the provisional 2011 census, is also modest. This moderate SRB level is in part due to the higher level of fertility obtained in India, which reduces the likelihood of having no son (Box 2). But the low level of birth masculinity comes also from the limited geographical spread of gender discrimination, which is heavily concentrated in a few regions of the country. While birth masculinity is normal in large parts of India, several states in the western and northwestern parts of the country are seriously affected. SRB levels around 120 are common in Punjab, Haryana and Gujarat. Since 2001, skewed SRB levels have spread to new areas in north and central India such as Uttar Pradesh, and this deterioration tends to cancel out the progress observed between 2001 and 2011 in northwest India.

In the absence of any recent census and birth registration data, Pakistan's situation is known only via the sample population surveys conducted in the country. These surveys have repeatedly reflected a modest but significant imbalance at birth, with SRB levels oscillating around 109. This is probably the region where sex selection is the least documented in Asia. Nepal and Bangladesh will soon be better documented with the results from the 2011 census round.

### **Southeast Europe and West Asia**

Apart from South and East Asia, sex selection seems to be well entrenched only in two clusters of countries in Southeast and Eastern Europe. Levels above 110 are observed in Albania and Montenegro, as well as in Azerbaijan, Armenia and Georgia (Table 1). Statistics are at times incomplete in these countries and many demand a detailed demographic analysis. But sex imbalances at birth have been systematically confirmed by census figures and other sample survey estimates.<sup>11</sup>

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9 On Viet Nam's recent SRB increase, see General Statistics Office (2011), Guilimoto (2012b), Pham (2010).

10 Birth masculinity in India is examined by Bhat (2002), Bhat and Zavier (2007) and Jha et al. (2011). See also John et al. (2008).

11 See Meslé Vallin, and Badurashvili (2007), and Brainerd (2010). The Council of Europe has offered a recent review of data from Eastern Europe (Stump 2010). Thanks to a recent survey conducted in 2011 on sex-selective abortions (UNFPA 2012), Armenia is probably the country in Eastern Europe with the largest existing documentation on sex imbalances.

## Box 2: Parity, sex composition and the impact of sex selection

Little is known about the actual frequency of prenatal sex selection among women because of the inability of surveys to record the actual frequency of sex-selective behaviour. The number of abortions itself is always poorly estimated, even in countries where abortion has been legal for several decades. In addition, women seldom report sex selection as a reason for terminating a pregnancy, especially when the practice is illegal. Yet, information on the proportion of women performing sex selection is key to understanding the dynamics leading to skewed sex ratios at birth.

In order to get a notion of sex-selective behaviour, the fertility process can be simulated in China and India. This estimation assumes a normal SRB of 105 and total fertility rates (TFR) close to currently estimated levels – about 1.6 and 2.7 children per woman in China and India, respectively. In this simulation, the probability of having an additional birth is assumed to be twice higher among women with no previous male birth than among women with a son. In keeping with its population policy, the pivotal moment for sex selection in China follows the birth of the first child. In India, it is only after the first two births that the average fertility is significantly higher. Using these parameters, we can estimate the proportion of sonless women – after one birth in China and two births in India – who opt for sex selection and abort all subsequent female pregnancies until they give birth to a boy. The final estimate presented in Table is the proportion of sex selectors that results in simulated TFR and SRB levels similar to levels observed in 2010.

Fertility assumptions	Sex ratio at birth	Sonless women practicing sex selection*
<b>China</b> <ul style="list-style-type: none"> <li>• Women have one or two births</li> <li>• Women without son have 80% chance to have a second birth (40% with a previous son)</li> <li>• Average fertility = 1.6 children per woman</li> </ul>	118.4	25%
<b>India</b> <ul style="list-style-type: none"> <li>• Women have two or three births</li> <li>• Women without son have 90% chance to have a third birth (45% with a previous son)</li> <li>• Average fertility = 2.7 children per woman</li> </ul>	110.1	30%

\* women assumed to abort all female foetuses for second births in China and third births in India

### Simulation model relating the proportion of sonless women practicing prenatal sex selection to SRB and TFR levels in China and India.

This estimation suggests that about 25 per cent of women in China and 30 per cent in India resort to sex selection for their last birth in the absence of a previous boy. Two conclusions can be drawn from this model. First, the current sex imbalances at birth observed in China and India result from a relatively modest percentage of women opting for sex selection after failing to have a boy. The vast majority of women do not, in fact, practice sex selection. Second, even with a larger proportion of women resorting to prenatal sex selection in India, the resulting SRB is much lower than in China. This result is due to differences in fertility levels since Indian women have one more child on average than women in China. In fact, an additional child reduces by half the probability of having no son and the potential need for sex selection for their subsequent pregnancy. This confirms the prediction that the ongoing fertility decline in India will exert additional pressure on son-seeking families to practice sex selection, with a parallel impact on the overall proportion of male births.

In the South Caucasus, birth masculinity levels briefly reached levels as high as 118 during the previous decade, as illustrated by Azerbaijan and Armenia whose statistical offices provide ample evidence of the SRB trends. In contrast, the statistical evidence is more fragmentary for Georgia, but the sex ratio at birth jumped from the normal level of 105 that was observed until the 1991 independence to 111 at the turn of the century and has remained high ever since.<sup>12</sup> Albania and Montenegro represent a distinct regional cluster of prenatal sex selection, with adjacent Kosovo and Macedonia also being affected.<sup>13</sup>

The documentation on skewed sex ratios remains incomplete in these countries, with almost no in-depth qualitative surveys on gender preference and fertility choices to describe the context for sex-selective abortions.<sup>14</sup> The new round of censuses in this region and the ongoing field surveys are likely to provide a more detailed confirmation of recent SRB levels and of the socioeconomic determinants of son preference.

### **Diaspora in developed countries**

A final matter of concern with respect to the extent of sex-selection concerns industrialized countries with large diasporas from South and East Asia. Among these subpopulations, made up mostly of recent migrants, surveys and in-depth studies of census samples have shown the existence of skewed levels of sex ratio at birth. Affected countries in which investigations could be conducted include, in particular, the United States, Canada and the United Kingdom. For instance, Asian-Americans of Korean, India and Chinese ancestry tend to have a larger than usual proportion of boys, even if their overall SRB rarely exceeds 108 (Almond and Edlund 2008; Almond et al. 2009). Slightly higher values have even been estimated for Asian immigrants in the United Kingdom and in Italy (Dubuc and Coleman 2007; Meldolesi 2011).<sup>15</sup>

Prenatal sex selection among the Asian diaspora is especially revealing, since migrants manifest almost identical gender preferences to those in their home countries, even when living in the different social, economic and political environment of industrialized countries. This is true, for instance, for the Chinese communities living outside mainland China that are not subjected to any birth control policy. Combined with the existence of sex selection among native populations of Southeast Europe, the demographic behaviour of many immigrant communities indicates that sex selection is far from being restricted to a limited number of countries in South and East Asia and concerns Europe and North America also.

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12 The reliability of the birth registration system appears questionable in Georgia. The abnormally high level of birth masculinity since 1995 has, however, been confirmed by different sources such as the 2002 census and the 2005 Multiple Indicator Cluster Surveys (MICS) and the Georgia Reproductive Health Survey surveys (Duthé et al. 2011). In Georgia, the price of a sex determination test in a private clinic (about US\$ 7 in 2011) is cheaper than that of a pregnancy test (Badurashvili 2011).

13 The latest SRB figures based on vital registration were 108.1 in Macedonia for 2011 and 111.7 in Kosovo for 2010.

14 See, however, KWN (2008) on Kosovo and UNFPA (2012) on Armenia.

15 The proportion of male births has also been shown to be higher than normal among Albanian immigrants in Italy and Greece (Meldolesi 2011; Verropoulou and Tsimbos 2010).

## 2.3 Postnatal gender discrimination among children

Skewed sex ratios at birth tell us only part of the story, as gender discrimination also exerts itself after birth. The sex distribution of the child population has long been distorted by the presence of higher mortality among girls, especially during the first two years of their life. These higher mortality risks are the results of many factors usually captured under the label of girl neglect. They relate to various discriminatory attitudes vis-à-vis girls in postnatal care, breastfeeding, food allocation (both quantity and quality), proper clothing, parental surveillance, recourse to health facilities (frequency and expenses), immunization, etc. As for deliberate female infanticide, which was earlier reported in parts of China and India, it has mostly disappeared during the last two decades thanks to the relentless fight conducted by local authorities and civil society, and the emergence of prenatal selection as an alternative method to prevent unwanted female births.

In the absence of specific discrimination against girls, mortality rates among boys across the world tend to be on average higher by about 20-25 per cent. As a result, the mere fact that female mortality rates observed in one area may be equal to or higher than equivalent male rates signals the presence of discriminatory behaviour against girls.<sup>16</sup> Unfortunately, reliable mortality estimates by sex and age are often missing in the countries under study due to the absence of death registration statistics. It is, therefore, preferable to use the comparative numbers of death by sex and age given by the United Nations Population Division for estimating this gender gap in mortality. Table 2 is based on these figures for 2005-2009. The sex ratio of mortality rates were computed using the sex-specific mortality rates under 5 years for a selection of countries. In the absence of deliberate discrimination, this sex ratio of mortality rates should range from 110 to 125, slightly increasing with the overall mortality level. This is what is today observed in countries of North America, South America, Africa and Europe. Based on the United Nations figures, we have used these values to estimate the expected sex ratio of mortality rates under 5 according to various levels of life expectancy at birth.

The results shown in Table 2 pertain to countries with higher female mortality than expected. The sex ratio of mortality rates is therefore lower than ratios obtained outside Asia. This table includes most countries with adverse SRB shown in the previous table, but figures are negligible in countries such as South Korea, Singapore, Montenegro and Viet Nam, since they never seem to have significantly experienced any excess female mortality. However, a few South Asian countries have been added (Afghanistan, Bangladesh and Nepal) for which United Nations mortality estimates point to a manifest female disadvantage in survivorship.

Our estimates reflect the magnitude of the excess female mortality under 5: male mortality is actually lower than female mortality in four countries of our sample,

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<sup>16</sup> On sex differentials in mortality, see Hill and Upchurch (1995), United Nations (1998), Fuse and Crenshaw (2006). For a recent review, see United Nations (2011).

with the lowest ratio observed in China (71) and India (88).<sup>17</sup> Compared to female mortality below 5 years, male rates are thus 29 per cent lower than female rates in China. In contrast, the same male rates are about 33 per cent higher than female rates in Brazil, a country with an almost similar level of life expectancy. In India, this relative imbalance is slightly less pronounced. Nepal and Afghanistan also figure in this list with higher mortality among female children. Elsewhere in the Caucasus, in Albania as well as Bangladesh and Pakistan, the sex differentials also point to excess female mortality, but of moderate magnitude.

The next column of Table 2 provides an estimate of the expected sex ratio of mortality rates. These standard values are based on a regression analysis of mortality ratios and life expectancy at birth using values observed elsewhere in the world. The last column is the absolute number of excess female deaths from 2005 to 2009. It is computed as the difference between the observed and expected numbers of female deaths under 5. While the previous mortality sex ratios describe the relative intensity of sex discrimination, their overall demographic consequences shown in this column are also determined by the level of infant and child mortality. This is why India, where infant and child mortality is high, comes first with a total of 261,800 extra deaths per year during 2005-2009, with China a distant second in spite of more adverse mortality differentials between girls and boys.

Mortality among children is now falling rapidly all over Asia. For instance, available WHO estimate life tables for China suggest that less than 2 per cent of children die before reaching the age of 5. Consequently, the absolute impact of sex differentials in mortality on the number of deaths is on the decline even though its numerical impact remains considerable today.

Unlike prenatal selection and infanticide, which are based on conscious decisions, girl neglect is often based on passive attitudes of negligence. To a large extent, communities and families are unaware of the consequences of their discriminatory behaviour on female survivorship and the resulting excess mortality rates among girls are only visible to demographers. Today, female neglect may partly correspond to the delayed behaviour of parents with unwanted daughters who have failed to use prenatal selection. This explains why the number of excess female deaths during the first five years of life, however large, pales in comparison with the female deficit obtained at birth following prenatal selection, as our estimates in Table 5 illustrate.<sup>18</sup> This comparison suggests that the balance has strongly shifted over the last two decades from girl neglect to prenatal selection, a phenomenon that has amounted to a revolution in gender discrimination.

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17 This estimate of excess female mortality closely corresponds to the 2009 life tables of China and India prepared by the WHO. In China, excess female mortality is most prominent during the first year of life, whereas the female disadvantage extends to later years in India. According to the life table derived from the 2010 census, female mortality is still higher than male mortality by 5% in China.

18 While a precise estimation is difficult in view of the diversity of statistical sources used, excess female mortality may account today for about a fifth of the overall number of missing girls.

**Table 2: Excess female infant and child mortality in various countries, 2005-2010**

Country/region	Mortality sex ratio under 5 (per 100)		Excess female deaths under 5 per year (in thousands)
	Observed (UN estimates)	Expected (life expectancy)	
Afghanistan	98	110	14.2
Albania	104	124	*
Azerbaijan	104	121	*
Bangladesh	103	120	13.8
Armenia	108	123	*
China	71	122	99.5
Georgia	110	122	*
India	88	119	261.8
South Korea	114	125	*
Montenegro	114	123	*
Nepal	94	120	4.0
Pakistan	105	119	23.2
Singapore	123	125	*
Viet Nam	118	123	*
<b>Total</b>			<b>418.1</b>
<b>Africa</b>	<i>112</i>		
<b>Latin America and Caribbean</b>	<i>130</i>		
<b>Northern America</b>	<i>122</i>		
<b>Europe</b>	<i>125</i>		

- Mortality sex ratios are computed as ratios of male mortality rates under 5 years to female rates.
- Observed ratios are computed from the World Population Prospects 2010. Ratios of other continents given for comparison purposes.
- Expected ratios for affected countries are computed from the life expectancy estimates by regressing life expectancies against mortality sex ratios in the rest of the world.
- Excess female deaths under 5 are computed as the annual difference between the numbers of observed and expected deaths per year.
- \*: negligible (less than one thousand).

## 2.4 Variations of sex ratio across households and regions

An essential feature of the current distortions in sex distribution among births and children relates to the extent of variations observed across households, regions or social groups, and even the birth history of mothers. This is a pivotal aspect of the sex ratio analysis on several grounds. Firstly, it helps to dispel the notion that biological differences may be at work in some areas of Asia or among specific ethnic groups. If sex ratio imbalances were caused primarily by biological or genetic factors, there would, for instance, be no differentials between social groups or between mothers at different birth orders. A second reason is that these variations point to specific phases of the family-building processes and to specific subpopulations, illuminating the mechanisms and the rationale behind deliberate sex discrimination.

### 2.4.1 Sex selection and family composition

The most documented dimension of sex ratio variations pertains to birth order (parity). Data suggest that parents are often indifferent to gender at the time of the birth of their first child. The gender imperative for the next children becomes stronger in the absence of a child of the preferred male sex. This is especially strong for the child expected to be the last in the family and to “fill the gap” in the gender composition of the progeny. In the past, parents were ready to repeat births indefinitely in their quest for a boy. Wider access to modern contraception from the 1970s onwards only made this strategy easier and more flexible by allowing women to stop bearing children once the desired gender composition was attained — the so-called “stopping rule”. It is therefore not surprising that the sex ratio of the last births was as high as 132 in India in 2005. However, today’s low fertility in many Asian countries means that parents wish to have a fixed number of children, and local fertility regulations exacerbate this constraint.<sup>19</sup>

In almost all cases, the statistics show that the adverse sex ratio at birth increases with birth parity. The sex of the previous births, when available, turns out to be an even stronger predictor of the sex ratio at birth of the next birth: sonless parents are most likely to influence the sex of their next child or its survival (Bhalotra and Cochrane, 2010).

This relationship is illustrated by the birth order statistics given for four selected countries in Table 3. In South Korea ten years ago and in Armenia, it is only after the first two births that the SRB shoots up. The increase is especially impressive in Armenia where there were 75 per cent more male than female births at parity three or higher from 2001 to 2008. In China, the impact of the fertility restrictions is reflected after the first birth, and the increase in birth masculinity is marked among second births. In several Chinese provinces, the sex ratio of the second-order births exceeds 160 and the proportion of male births can even represent two-thirds of them in some rural areas.

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<sup>19</sup> The figure for India derives from the National Health and Family Survey of 2005-06. For the links between gender preference and fertility, see also Basu (2009).

**Table 3: Sex ratio by birth order, South Korea, Armenia, China and Viet Nam, 2000-2009**

	Birth order 1	Birth order 2	Birth order 3	Birth order 4
Armenia (2001-08)	106.8	110.4	176.9	177.4
China (2010)	113.8	130.3	161.6	145.9
Republic of Korea (2000)	106.2	107.4	141.7	154.9
Viet Nam (2009)	110.2	109.0	115.5*	
*: Birth order 3 and above				

Sources: South Korea: Kim (2004); China: 2010 census; Armenia Statistical Office; Vietnam (UNFPA 2010).

Interestingly, in more developed areas such as South Korea or Taiwan, variations in birth masculinity by birth order remain visible. While the SRB for the first and second births is today normal, it rises to higher values such as 120 in Taiwan and 110 in Korea for the third or later births. This suggests that there remains a small proportion of the population resorting to prenatal sex selection after two births.<sup>20</sup>

Viet Nam, however, is a case apart, since SRB estimates are almost similar across parities (Table 3).<sup>21</sup> Not only can an excess SRB level be noticed among first births, but the masculinity of the higher-order births appears rather modest compared to what is measured elsewhere. In this country, some parents may, in fact, insist on a first male birth and use prenatal sex selection to that effect. A similar trend can be detected from the 2010 census results from China, where the SRB among first births has recently risen to 113 in the country, with a peak above 120 observed in Guangdong. In demographic terms, prenatal sex selection affecting first-order births has potentially huge consequences, since first births account for more than half of all births when fertility is below replacement level. Such situations suggest that the ultimate preference for boys may also have shifted to an upfront rejection of female births among some couples.

#### **2.4.2 Regional differences**

Census and survey data have also provided materials for a detailed analysis of sex ratio regional variations within countries. These disparities indicate how gender discrimination is related to social and economic factors, and also how it may propagate in the future towards new population segments. One of the most common geographical variations is between urban and rural areas, as is visible, for instance, in Azerbaijan, China, Pakistan and India. This represents the combined and often opposite effects of son preference, fertility levels and supply factors. Son preference is usually stronger in rural settings, notably because of the dependence on sons in agriculture or the sway of traditional institutions in the countryside. But at the same time, higher fertility and less stringent birth planning regulations in rural areas offer a safety valve to parents who failed to

<sup>20</sup> Disaggregated data are drawn from Chun (2011) and Directorate-General of Budget (2010).

<sup>21</sup> The SRB among third births in Viet Nam does however record a remarkable jump to 132 when it follows the previous birth of two daughters, illustrating the role of gender composition on the sex of subsequent births.

have a son as a first child. Urban areas are more prosperous and provide access to a large number of private and public facilities offering reproductive services.

A regional analysis offers an illuminating perspective on the geography of gender discrimination. Variations across regions in China, Viet Nam and India are very pronounced and local sex ratio levels may be two to four times more skewed than the national average. Maps of sex ratio distribution are characterized by several pockets of high SRB values surrounded by areas where the intensity of gender discrimination seems to diminish gradually (see Box 3). The lessons this spatial analysis teaches us are two-fold. On the one hand, many areas within affected countries in Asia have retained absolutely normal sex ratio levels. Once again, explanations for the relative immunity of many regions to the wave of demographic masculinization unfolding over more than 20 years are multifarious. These regions may be somewhat underdeveloped and characterized by high fertility and lower access to modern health facilities, factors accounting for a delay in the spread of prenatal sex selection. This may be the case for several peripheral regions in China and Viet Nam, as well as for several areas of north-central India. But, on the other hand, the intensity of gender bias also appears weaker in many regions where the birth of a boy is not an indispensable component of family building and honour and prenatal sex selection makes little sense in sociological terms.

The latter argument applies to most of south and east India and to some parts of Viet Nam, where sex ratio levels have remained normal. The same can be said of Asian countries such as Japan, Thailand and Sri Lanka, which are characterized by bilateral kinship or cross-cousin marriage, and where no sex imbalances at birth have ever been observed.<sup>22</sup> More than individual characteristics, the nature of family systems appears to play a major role in shaping gender preferences

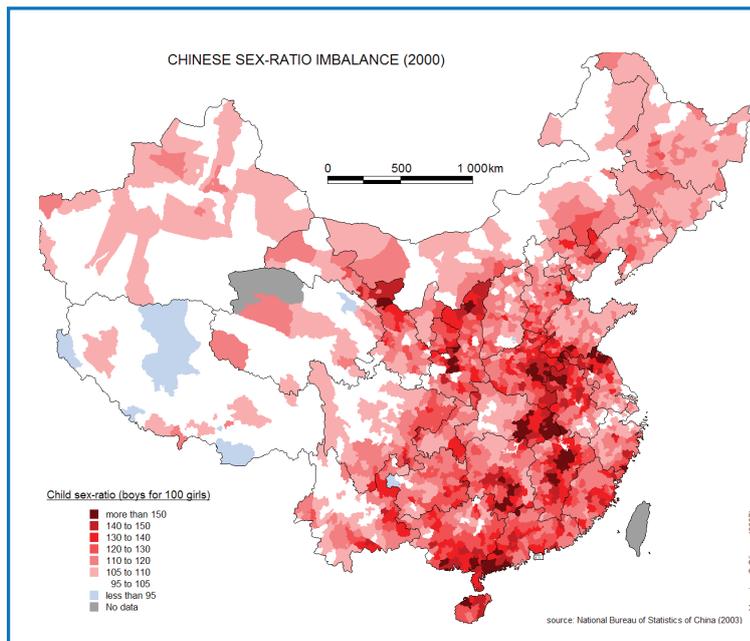
### Box 3: The geography of gender discrimination

A somewhat systematic feature of sex ratio imbalances is their uneven geographical distribution in affected countries. Disaggregated tables indicate the concentration of high birth masculinity in a few regions, as illustrated in Table 1. While the average SRB may be 110 in a given country, local values may be as high as 125 in some areas but near normal in other areas (Guilmoto and Oliveau 2007). This is especially visible in large countries, where regional heterogeneity has a direct impact on SRB levels. West China, south and east India and south Viet Nam are illustrations of large areas where sex ratio levels are almost normal, unlike the rest of the country.

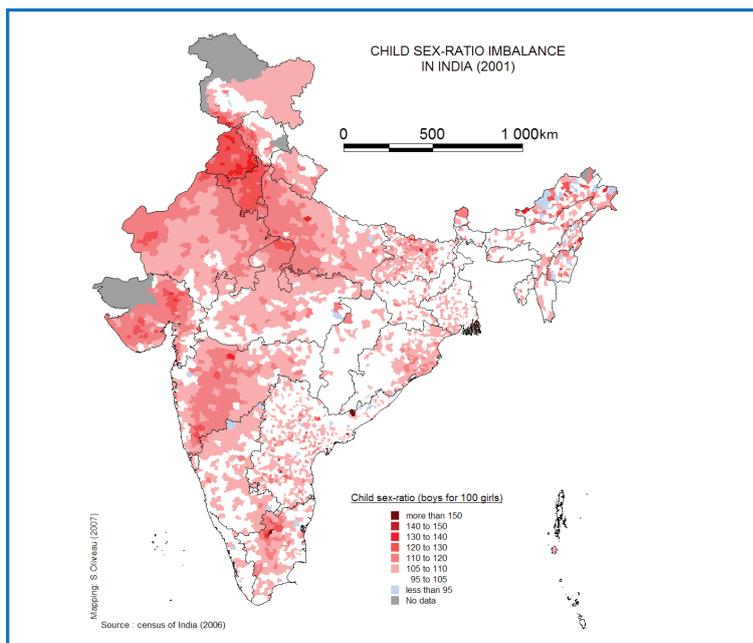
In contrast, local levels close to 150 are not uncommon in small pockets of central China and northwestern India, pointing to the presence of extreme forms of gender discrimination in some localities. Some of these areas coincide with regions in which female infanticide was reported in the past. This geographical correspondence with demographic behaviour already described for the nineteenth century illustrates how present-day gender arrangements may be rooted in longstanding local institutions, such as patrilineal kinship systems and hypergamic marriage patterns (Chakraborty and Kim 2010).

<sup>22</sup> The links on kinship and skewed sex ratios in Asia are examined by Das Gupta et al. (2003), Chakraborty and Kim (2010), Bryant (2002), Dube (2007), Murphy et al. (2012) and Guilmoto (2012b). For the influence of kinship systems in Southeast Europe, see Kaser (2002).

### BOX 3 Continued.....



**Child sex ratio, Chinese counties, 2000**



**Child sex ratio, Indian sub-district units, 2001**

These geographical differentials are sometimes perplexing as their origin is manifold. Variations across regions stem from the different phases of the demographic transition which regions are going through. Low-fertility and more prosperous regions have been affected earlier by the emergence of prenatal sex selection. The comparison of SRB maps taken at different periods shows the process of spatial diffusion through which high birth masculinity has spread in India and China, moving in particular from more advanced regions to relatively poorer areas. This proves that social, economic and demographic change has contributed to the changing map of gender discrimination. In China, variations in the local enforcement of fertility regulations may also have contributed to some of differentials observed at a county level. These maps also illustrate long-term regional differences based on specific social and cultural contexts,

because of which the intensity of son preference tends to vary. For instance, the distribution of kinship systems in India is at the core of the clear-cut variations between the northwestern part of the country and other regions.

The same observation seems also to apply to the regional differences recently observed within Viet Nam as the Red River Delta region – where birth masculinity is at its highest – is also characterized by more traditional forms of gender bias (General Statistics Office, 2011). In South Korea, the differences in SRB observed during the 1990s across provinces are attributed to both regional features and the distribution of religious groups (Kim 2007).

### 2.4.3 Social and economic differentials in birth masculinity

Data permitting, demographers have highlighted many other determinants of variations in the sex ratio at birth.<sup>23</sup> Table 4 offers a brief summary of these findings. Cultural and religious heterogeneity is often at the core of observed variations in sex ratio. In India, religious, ethnic and caste factors may predominate, and they explain, for instance, the extremely high SRB values observed in the northwestern part of the country. In China and Viet Nam, available ethnic statistics point to cultural differences, with many minorities displaying low or normal SRB levels.

**Table 4: Social, demographic and economic factors affecting prenatal sex selection**

	Impact on sex ratio at birth or child sex ratio	Country
<b>Birth order</b>	<ul style="list-style-type: none"> <li>• Sex ratio increases rapidly with higher birth order</li> <li>• Sex ratio highest among final births</li> </ul>	All countries, diaspora populations
<b>Reproductive health</b>	<ul style="list-style-type: none"> <li>• Sex ratio normal among women who have not performed an ultrasound test</li> <li>• Sex ratio normal among women who did not know the sex of their child in advance</li> </ul>	Viet Nam, India
<b>Gender composition</b>	<ul style="list-style-type: none"> <li>• Sex ratio highest in families with no previous son</li> <li>• Normal sex ratio among families with a son</li> </ul>	All countries, diaspora populations
<b>Rural/urban</b>	<ul style="list-style-type: none"> <li>• Moderate variations, with opposite trends across countries</li> </ul>	All countries except Viet Nam
<b>Region</b>	<ul style="list-style-type: none"> <li>• Geography is the strongest source of sex ratio variations within the country</li> </ul>	All countries
<b>Ethnicity</b>	<ul style="list-style-type: none"> <li>• Ethnic groups exhibit very distinct sex ratio levels</li> <li>• Most minority groups have lower sex ratio levels</li> </ul>	Viet Nam, China, India, Singapore
<b>Religion</b>	<ul style="list-style-type: none"> <li>• Hindus, Sikhs, Buddhists, and Jains have comparatively higher sex ratio levels than Muslims or Christians</li> </ul>	India, South Korea
<b>Socioeconomic status</b>	<ul style="list-style-type: none"> <li>• Lower sex ratio among the poorest households</li> <li>• Highest among the most affluent in several countries</li> <li>• Decreases among the most affluent in China</li> <li>• Lower sex ratio among women with social insurance in China</li> </ul>	China, India, Viet Nam
<b>Educational level</b>	<ul style="list-style-type: none"> <li>• Sex ratio increasing with educational level</li> </ul>	China, India, Viet Nam

Sources: studies of sex ratio differentials in China, India, South Korea and Viet Nam, and on Asian diasporas mentioned in the text

<sup>23</sup> Recent studies of SRB differentials include: Bhat and Zavier (2007), Guilmoto (2008), Jha et al. (2011), Guilmoto and Ren (2011), Cai and Lavelly (2007), General Statistics Office (2011), Kim (2007), Kim and Song (2007).

In view of the rapid pace of economic development characterizing affected countries, studies have also examined SRB variations by socioeconomic status (SES) and highlighted significant differences across households. In India and in Viet Nam, the link is clearly positive: the SRB is close to a normal level of 105 among the poorest households, while the richest SES quintile displays higher SRB levels. In such configurations, poverty seems to curb the spread of sex selection: higher fertility and poor access to modern technology act as brakes to the emergence of prenatal discrimination. In contrast, better off and affluent households want fewer children and have at their disposal all the means available to achieve their family's targets in terms of size and gender composition. Such a link between socioeconomic status and birth masculinity has potentially serious repercussions in view of the unrelenting economic progress recorded in these countries. When birth masculinity is higher among the richest socioeconomic groups, economic growth per se may cause a gradual increase in SRB levels among the formerly poor sections of the population.

In China, however, the picture appears more complex. Estimates from the 2005 intercensal survey show that the most educated and prosperous classes tend in particular to have a smaller SRB (111) than the national average (120). While the richest households have extremely low fertility and easy access to technology, factors that tend to increase birth masculinity, the reason for this downturn in SRB level probably stems from a lower intensity in the bias against girls. Such a trend is encouraging, as sex selection may recede under the impact of further social development and economic advancement. As a matter of fact, this is the pattern observed in South Korea, where prenatal sex selection has almost entirely disappeared. In this country, rapid social change has over the last two decades made traditionally unequal gender arrangements more and more obsolete in a modern industrialized society where women have greater access to high education, employment, and decision-making.

In concluding, it appears that socioeconomic status tends to be initially positively related to prenatal sex discrimination: higher average fertility decline and lower access to modern technology tend to delay the spread of prenatal sex selection among the poorest categories. This partly explains why prenatal sex selection is not yet prevalent in poorer countries, but that it may emerge in the future under the effect of economic development. In East Asia, there are signs that further economic progresses, urbanization and female employment may ultimately lead to the erosion in traditional patriarchal values biased against female births, facilitating a gradual return to normal SRB values. The Republic of Korea provides a clear illustration, even if its development level remains unmatched by any of the other South or East Asian countries where son preference is common.

The first sections of this report have described the intensity of demographic discrimination and the main dynamics behind it. But they have left the most crucial questions unanswered: Why has gender discrimination reached such intensity, and why particularly in Asia? We now need to probe the motives and conditions that have allowed these demographic transformations to take place.

## 3.1 The preconditions of prenatal sex selection

The previous section on demographic, social and economic determinants of SRB variations has already highlighted a large number of covariates of higher SRB. Complemented with field studies on gender discrimination, these findings point to the large array of potential drivers and determinants of the gender bias.<sup>24</sup> They suggest that sex selection is mainly an adaptive behaviour to avoid births of the unwanted sex and represents a rational strategy that comes as a response to fixed constraints and modern opportunities. The comprehension of sex selection has, however, long been dominated by the prevalence of local narratives, in which cultural, economic or political circumstances are given precedence. As a result, explanations for the rise in prenatal sex discrimination often revolve around contextual elements such as dowry inflation in India, family planning regulations in China, Confucian patriarchal norms elsewhere in East Asia, or the economic crisis and conflict conditions in Eastern Europe. Contexts are undoubtedly crucial to understanding the unfolding of the sex ratio crisis within regional settings and to identify the social contours of gender preference.

Yet, the emphasis on contextual environments tends to obscure the obvious social and demographic commonalities shared by the increase in male births from Korea to Albania over the last 30 years. It is clearly an almost simultaneous phenomenon, which is unique in the demographic history of the world, and its onset seems closely connected to demographic and technological changes that have affected almost the entire planet. It is, therefore, essential to adopt

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<sup>24</sup> For a comparative analysis of sex selection in Asia, see Croll (2000) and Miller (2001).

a more cross-regional approach to understanding the emergence of prenatal sex selection. The model used here is derived from the theory devised by demographer Ansley Coale to account for the onset of fertility decline. This explanatory framework aims at isolating the independent factors at work in prenatal sex selection and at offering a model in which regional contexts could be analyzed and compared.<sup>25</sup> We have identified the three main preconditions for sex selection:

1. Sex selection should be feasible: parents need access to acceptable and efficient methods to alter the random, biological distribution of children by sex.
2. Sex selection should be advantageous: altering the sex composition of their offspring should be seen as beneficial to parents and families.
3. Sex selection should be necessary: where son preference exists, low fertility strengthens the need for prenatal sex selection for both limiting the number of children and attaining the desired number of sons.

These prerequisites may also be translated into a simple framework: parents have to be *able* (first condition), *ready* (second condition) and *compelled* (third condition) to resort to sex selection. The first precondition sounds straightforward: availability of enabling technology is an indispensable ingredient for adequate sex selection. But this aspect entails many independent conditions, such as the effectiveness of available methods, their cost and accessibility, as well as the legal environment. Methods also need to be socially acceptable, as specific techniques such as infanticide or abortion may be considered objectionable for ethical reasons. To a large extent, this component refers to supply-side factors and it determines whether *it is possible to do it*.

The next precondition relates to a standard utilitarian framework in which sex selection proceeds from specific gender needs and preferences. Sex selection and the birth of male children should be associated to distinct benefits for the mother, the parents, the family or the community.<sup>26</sup> To explore this typical demand factor, various determinants such as economic and social motives are reviewed, as well as other religious or symbolic considerations that explain why *it is worthwhile to do it*.

The last precondition corresponds to the automatic consequence of fertility decline on the gender composition. By increasing the marginal cost of additional children, the small-family norm compels parents to make choices regarding the maximum size of their family. But left to biological chance, an increasing proportion of couples would risk remaining sonless without active prenatal sex selection. The squeeze effect of fertility decline therefore explains why *it is necessary to do it*.

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25 For detail, see Guilhoto (2009). Coale's original formulation includes a different third precondition ("matter of conscious choice") instead of low fertility as used here (Coale 1973; Lesthaeghe and Vanderhoeft 2001).

26 It may be noted that the attitudes of different household members towards the desired gender composition of the family may differ. A woman may, for instance, resort to sex selection in order to please her husband's family and their desire for a male heir.

**“It is possible”:**

### **3.2 the revolution of the sex selection technology**

The rapid progress of sex imbalances in Asia is most commonly related to the progress of technology. But it should be remembered that many traditional methods to influence the sex composition of one’s family existed in the past, some of which survive today. Each country and region in Asia is, in fact, a depository of traditional methods, which are usually based on the belief that material circumstances or divine intervention could ensure the conception and the birth of the desired sex. Going on a pilgrimage or following a specific diet are two commonly mentioned strategies followed by parents eager to have a boy. Other factors and methods that are thought to influence the sex of the child, include prayers; astrological, meteorological or astronomical considerations; and timing and type of intercourse. These prenatal “folk methods” are probably of limited reliability, and unlikely to have left any tangible impact on sex composition. But the appeal of such beliefs is still strong as illustrated by the many traditional recipes to ensure the birth of a son in Viet Nam or the fluctuations in SRB levels in auspicious or inauspicious years in countries following the Chinese astrological calendar.<sup>27</sup>

A rapidly disappearing remnant of the “old discriminatory regime” is infanticide, one of the oldest and crudest postnatal methods used to alter the gender composition of families. Infanticide’s effectiveness is beyond doubt, and its financial cost is also extremely limited. But the huge psychological cost of this brutal method made its use mostly exceptional and often limited to particularly unwanted births such as out-of-wedlock pregnancies. Infanticide as a routine practice has always been limited to specific regions and communities, as was the case in Salem region in south India.<sup>28</sup>

Neglect of the girl child is a more common method, as the analysis of excess mortality among girls has illustrated. It is a passive strategy which has the effect of depriving girls of their fair access to and share of household resources, with reduced survival probability as a consequence. Yet, routine discriminatory behaviour against girls does not invariably lead to higher mortality. As such, daughter neglect is a “low-tech” method, requiring almost no financial or other effort from parents, but with a limited effectiveness in changing the gender composition of the family. However, what is striking is the persistence of this excess mortality in spite of the availability of prenatal sex selection in many countries (Table 2). This suggests that prenatal methods do not entirely meet the latent demand for sex selection.

The spread of modern prenatal diagnostic techniques followed the gradual diffusion of two main technologies – amniocentesis and ultrasonography – in Asia in the 1970s. By the 1980s, thousands of clinics were already in operation offering sex diagnosis services. Coupled with abortion, which was made legal in

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<sup>27</sup> See for instance NIPCCD (2008) and Bandyopadhyaya and Singh (2007). The examples given here are taken from ISDS (1997), and Lee and Paik (2006).

<sup>28</sup> On South India, see Srinivasan (2006). See also Caldwell and Caldwell (2005) on infanticide in Asia.

many countries before that period,<sup>29</sup> prenatal sex identification offered a perfect solution to couples who wanted both fewer children and a socially adequate number of sons. The progress in the distribution of the new prenatal technology was very uneven across Asia and Eastern Europe. It initially reached the large metropolises in China and India by 1980,<sup>30</sup> and was firmly established there by 1990. Ultrasound machines were soon manufactured locally. The progress of the technology in smaller towns and the countryside followed during the next decade, as the overall density of networks of private clinics increased.

In Southeast Europe and in the former Soviet republics of South Caucasus, the technology emerged only after the fall of the socialist regimes, most probably due to the appearance of imported medical equipment and of more flexible private healthcare facilities catering to the customers' needs. In Albania, a country where strong patriarchal norms favouring the male progeny remain prevalent, the rise in SRB observed during the 1990s is also linked to the liberalization of abortion in 1995, but in the South Caucasus, the use of abortion had already spread during the Soviet era. In Viet Nam, modern prenatal diagnosis equipment appears to have reached the country only after 2000, explaining why prenatal sex selection had been almost non-existent during the twentieth century in spite of the extent of the preference for male children (Guilmoto et al. 2009; Gammeltoft et al. 2007).

The fact that prenatal sex diagnosis could be offered not only in large hospitals, but also in small health units such as private clinics or local dispensaries, contributed to their wide diffusion across urban and then rural areas. The process was first driven by the middle and upper class demand for reproductive technology. Enterprising doctors and clinic managers have played an active role in the diffusion of the technology during a period that witnessed a boom in private health care. Ultrasound is today a relatively easy technique to implement, with no need for highly trained staff or extra operational expenditure. The price of scanning machines has rapidly fallen, and an ultrasound test is today extremely affordable.

Abortion has been legalized only lately in some countries such as Nepal and Albania, or remains either strictly outlawed or limited to life-saving situations as is the case for Myanmar, Pakistan, Bangladesh and the Philippines. This, of course, does not mean that selective abortions do not take place in these countries, but rather that these are illegal acts often conducted in unsafe conditions (Warriner and Shah, 2006). It should also be stressed that relying on abortions may be unacceptable to some sections of the population. There are few philosophical or religious principles that explicitly bar individuals from choosing the sex of their children, but recourse to abortion still remains a very sensitive matter in many communities. For instance, among Christians and Muslims, pregnancy termination is discouraged or condemned. The presence of populations of

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29 Abortion has been legal in China since the 1950s, in Viet Nam since the 1960s and in India since the 1970s. It was legalized in the 1920s in the former Soviet Union. In contrast, it was fully legalized in Albania only in the 1990s and in the following decade in Nepal. Abortion is still outlawed in countries such as Pakistan or Bangladesh.

30 See, for instance, the impact of the first sex prenatal determination tests introduced in Indian cities in the mid-1970s (Ramanamma and Bambawale 1980). The diffusion of ultrasound equipment across China is described in Chen et al. (2011).

Christian and Muslim countries in the list in Table 1 suggests, however, that sex preferences and gender imperatives tend to prevail over religious precepts.

The reasons for the rapid diffusion of ultrasonography are many. It is a non-intrusive, easy-to-use technology favoured by both women and practitioners over other methods. Moreover, the tests are conducted under medical control and the method also invariably looks more “modern” and “rational”. Not only is it part of modern health care services, but it also can be portrayed as reflecting a woman’s capacity to anticipate her births and the gender requirements of the family. Governments have also often supported systematic prenatal scanning for the monitoring of births to detect foetal anomalies and in several Asian countries such as Japan, selective abortions of disabled foetuses are seen more as a collective responsibility than an individual decision by parents. In such an environment, the spread of prenatal diagnosis for improving the quality of the offspring in Asia leads to a high level of “moral pragmatism” in reproductive decision-making that may easily be extended to gendered objectives of the couple.<sup>31</sup>

The main technical drawback of ultrasound for deliberate sex selection is that the sex of the foetus is not visible before three months or more of pregnancy, forcing women to undergo second-trimester abortions in most cases. This suggests the potential for success of a more recent technology for sex diagnosis based on the analysis of foetal blood (Devaney et al. 2011). The discovery of the presence of foetal blood in the mothers’ blood led researchers to identify markers of the sex of the embryo. A relatively cheap blood sample analysis can now provide information on the sex of the foetus during the second month of pregnancy. Commercial tests are available in many industrialized countries, allowing women to be informed of the sex of their children far earlier than was possible in the past. Other recent developments include two major pre-implantation methods: sperm sorting (sorted sperm are then used in artificial insemination or IVF procedures) and pre-implantation genetic diagnosis (IVF embryos are genetically tested for sex and then implanted). These techniques, which are available in industrialized countries, require access to a well-equipped laboratory.

For a variety of reasons, including cost and legal prohibition, these methods are presently not accessible in most Asian countries. Pre-implantation techniques, for instance, require access to high-tech laboratories and these facilities cannot circumvent existing laws in Asia against prenatal sex selection. Laboratories in industrialized countries marketing relatively inexpensive blood test kits by mail do not offer their services to customers residing in China or India. More affluent Asians, able to travel to Europe or Thailand, or communities residing in industrialized regions such as Taiwan, the United Kingdom or North America, have access to these new methods, which offer an almost undetectable way to carry out sex-selective pregnancies, without resorting to second-trimester abortion.<sup>32</sup>

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<sup>31</sup> These issues are discussed in detail in Sleeboom-Faulkner (2010a, 2010b).

<sup>32</sup> Data are limited on the actual number of visitors of South or East Asian origin seeking access to prenatal sex selection in countries like Thailand or Japan offering modern facilities. Taiwan has recently published statistics on births conceived by assisted reproductive technology. The average sex ratio at birth of these births over 2001-2007 is 115, leaving no doubt that these technologies are partly used for sex selection purposes (Directorate-General of Budget, 2011).

The long history of sex selection, from infanticide to sperm selection, suggests that although sex-selective abortions are today the most common means to achieve gender objectives, future scientific advances are bound to result in further technological progress, making sex determination or manipulation even easier and earlier, and perhaps more difficult to detect. This rapidly changing technological environment will have important consequences on the design of policies trying to regulate prenatal sex selection.

## **“It is worthwhile”:**

### **3.3 the demand for boys**

Understanding the rationale behind sex preference remains the key to deciphering the dynamics of sex ratios. In most industrialized countries from Japan to North and Latin America, the two other preconditions of sex selection are met: not only is sex selection technology available and affordable, but fertility levels are also rather low. Yet, sex ratios at birth have not significantly changed, and the reason is the near-total absence of resolute gender preference among these societies.

There is a long list of reasons for which the arrival of sons is deemed preferable in affected countries.<sup>33</sup> The catalogue offered here is probably not exhaustive and applies very differently to individual countries, since the context for gender preferences can only be understood with reference to cultural and social features specific to each region. A recent study conducted in Viet Nam provides illustrations of such contextual determinants of son preference (Box 4).

On the surface, gender discrimination often boils down to the fact that a girl constitutes a source of “impoverishment” for her family, while delivering a boy is seen as more rewarding. This suggests a simple cost-benefit framework applied within a patriarchal system in which gender roles and trajectories diverge, opposing the specific “costs” related to girls and the “benefits” accruing from boys. What makes transnational comparisons difficult is that gender discrimination is always expressed in a local cultural idiom coloured by enduring social, ethnic or religious traditions peculiar to specific settings. For instance, in South Asia, girls are perceived to be especially vulnerable as they carry the family honour. This pressure explains the emphasis on early marriage, including among children, and accounts also for a high level of violence against women and wife-battering.

It is with reference to costs arising during or after their marriage that daughters appear to be distinctly more “expensive” than sons. Wedding expenses and the institution of dowry make marriage an extremely unequal exchange between families in most areas of South Asia. Parents of the bride incur large expenses while parents of the groom benefit from these financial and material transfers, including payments and gifts granted after the marriage. At the same time, dowry is often seen as the key for the most prestigious marriage in a system

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<sup>33</sup> The regional variations in gender preference have given rise to a large literature, starting with Williamson (1976) and Cleland et al. (1983). Kaser (2008), Das Gupta et al. (2003) and Croll (2000) provide reviews focusing on southeast Europe and Asia.

otherwise characterized by norms of hypergamy—whereby women marry men of higher socio-economic backgrounds. The overall expenses incurred for the marriage of a daughter correspond to several years of income, and they are indeed often seen as a pre-mortem bequest, substituting for the inheritance from which women in South Asia are usually excluded. In dowry-practicing communities, having a son instead of a daughter entails considerable economic gains.<sup>34</sup> None of these conditions applies to West or East Asia, where marriage payments appear more balanced. Dowry payments are usually modest and the reverse practice of bride price is also common. In fact, in China, it is now grooms that are expected to accumulate assets before marriage and the issue is less about marriage payments than about family support.

Where multigenerational patrilineal households are common, resources are pooled between parents and their male children. As a result, the income from married sons and their spouses will also benefit their parents. It is a crucial dimension of the traditional economy, since sons usually work on their family's land or take up their father's business. Multigenerational cohabitation also means that parents may enjoy constant financial, emotional and other kinds of support from their sons' families. In contrast, married daughters are not supposed to contribute to their parents' expenses after marriage; when they do, even substantially, their contribution goes almost unacknowledged as if support from married girls constituted a potential source of discredit.

#### Box 4: The need for sons as seen from Viet Nam

The preference for sons over daughters is widespread in Asia, but it is always expressed differently in each cultural context. For instance, unequal marriage exchanges, such as the dowry system in India which impoverishes parents of brides, have no influence on the relative valuation of boys and girls in Viet Nam. Similarly, the notion of honour common in Southeast Europe and South Asia, in which the reputation of the entire family or community rests on women, seems to play no role in gender systems in Viet Nam. Contrary to the situation in China and India, there is no trace of sex differentials in mortality or selective infanticide in Viet Nam. Likewise, the stringent conditions of the birth planning policy encountered in China, which exacerbate the need for prenatal sex selection among second births, do not apply to Viet Nam. Even if Viet Nam has now reached replacement levels in fertility, the decline happened more slowly and with less pressure from the local authorities.

Yet, the desire for smaller family size, reinforced by the family planning policy, has compelled women and families to opt for ways to ensure the birth of a son -- through prenatal sex selection, adoption, or if necessary, unsanctioned extrapregnancies. A recent study conducted for UNFPA in different parts of Viet Nam details the range of reasons that people offer to explain their recourse to prenatal sex selection.<sup>35</sup>

Sons are on the whole perceived as important status symbols, indispensable elements of the perpetuation of the patrilineal family, guarantors of the continuing worship of the ancestors, family helpers and sources of old age support.

<sup>34</sup> It may also be noted that the observed spread and inflation of dowry have been often attributed to a perceived scarcity of brides during the second half of the twentieth century (Bhat and Halli 1999).

<sup>35</sup> UNFPA (2011). See also ISDS (2007), Bélanger (2002) and Rydstrom (2002).

#### BOX 4 Continued.....

The first reason given for the need for sons relates to patriarchal values derived from the traditional Confucian system and the founding role of the patrilineage (*ho*) in society. Families require a son to continue the family line and to perpetuate the family name. Since the household structure is patrilineal in most parts of Viet Nam, the absence of a male heir means the end of the family. As a respondent stated, "Even if [the son] ruins the family or even beats or kills his parents, he is still a son." A son's formal kinship responsibility eclipses his individual character. Having a son to perpetuate the family is a duty towards one's parents, but it is also an almost religious requirement, as only sons are entitled to carry out ceremonies to worship ancestors and take care of the family graves. With no son, a man will have to pass on this responsibility to the closest male relative, such as his brother's son.

These considerations run parallel with a more pragmatic appreciation of the sons' role in day-to-day life. Cohabitation with married sons is frequent and reinforces the feeling that sons can be trusted to help and look after their parents. Regardless of the substantial support extended by married daughters to their parents, which many surveys have documented, sons are still regarded as the first source of social and economic security in Viet Nam. Lack of retirement benefits and rising healthcare costs exacerbate this anxiety among aging or ailing parents. Unsurprisingly, inheritance rules tend to be biased towards sons for these reasons, and women often get a reduced share of the family property.

All these customs, very often at odds with existing laws, have generated strong pressure on young couples to bear sons. Married couples receive regular injunctions to produce a son, and many women report wanting a son to please their husband and his parents. Sonless women face continuous difficulties with their in-laws and they may be deserted by their husbands. Men with no son are also derided and find themselves discriminated against by their friends and colleagues. Because of their failure to bear a son, they are considered as lesser adults than men with a male heir and treated differently. When they construct a new house, families with no son are often scoffed at for building a house "for charity," i.e. for no valid reason since the dwelling will only be transmitted to their son-in-law. In contrast, in regions and among ethnic groups where the sway of the patrilineal system is weaker and where more bilateral kinships had prevailed till a recent past, the cohabitation of married men with their wife's family is more common, women enjoy a better status and the primacy placed on male births is far less common.

Asian countries have also undergone a rapid decline in adult mortality. As result, parents will live longer, but pension benefits and social security are restricted to a small percentage of the population. Local legislations usually hold children responsible for the care of their parents. The long-time support extended by sons therefore becomes an indispensable source of security for the elderly, placing parents with no son in a vulnerable socioeconomic position. Married daughters are expected to live away from their parents and their natal family, and therefore have limited interaction with them after marriage. Co-residence and support for the elderly are thus closely related to inheritance, of which daughters are often deprived. This exclusion is especially common in relation to land property rights in rural areas even when they are entitled to them by law. But these are domains in which the impact of social, demographic and economic

change can be expected to be rapid. Nuclear families, insurance systems, waged labour and women's increasing earning capacity tend to progressively erode the dependence on sons for economic support.

The benefits of sons extend to non-financial domains, such as their being a source of protection and affection for the parents. Having several sons in rural China is also preferable as a way to strengthen the family power within the clan or vis-à-vis rival clans. The preservation of the family name and tradition is another frequent imperative, from the Balkans to East Asia. In the past, the symbolic need for a son was so strong in Albania or Montenegro that some women ("sworn virgins") even had to renounce marriage and acquire a masculine identity in order to assume the role of a virtual son in families with no male offspring (Durham 1909). In several countries, the obvious economic role of sons in patriarchal systems has coalesced into strictly defined religious duties. In several Hindu and Buddhist societies, only male descendants can perform rituals during the funerals of their parents or ceremonies for their ancestors. Their filial responsibility therefore extends to the afterlife of their family.

In such an environment, raising sons appears a more sound social and economic option than having daughters, who will end up living in and working for another family. As a result, each cultural setting is replete with customs and sayings celebrating the birth of a son, lamenting that of daughter, and mocking the upbringing of daughters by describing it as "watering a flower in the neighbour's garden". Husbands may be entitled to divorce sonless women and take a second wife. Sonless parents may therefore feel permanent anguish in the face of their entourage's reaction, which ranges from discriminatory customs when a girl is born to constant pressure applied by mothers-in-law, the extended family, the community, friends, and colleagues. Very often, when asked why they prefer sons to daughters, women and men mention social pressure as their main motive, rather than economic benefit.

The multidimensional aspects of son preference derived from field analysis make it almost impossible to evaluate this "demand factor" quantitatively. Studies often identify patriarchal features in all kinds of societies, from industrialized to developing countries, and may postulate son preference from all manifestations of gender inequity. Yet, we have to recognize that male domination does not translate into prenatal sex selection in many areas, even when the other two preconditions are met (low fertility and access to technology). Moreover, the intensity of the need for sons tends to greatly vary within countries, with specific regions or ethnic groups more inclined to practice prenatal sex selection than others. Gauging the exact intensity of son preference would then be a good predictor of such predispositions. But there are very few data-based indicators available for comparing the magnitude of the gender bias across regions or across social groups. The ideal number of sons and daughters is often taken as a proxy for gender bias (Fuse 2010), but it is far from a perfect indicator, since it is based on stated opinions rather than on observed behaviour. A better marker of sex preference comes from fertility behaviour, and can be measured by the probability of having another child according to the sex of the previous children (Filmer et al. 2009). Available estimates indicate that the absence of a son may

tend to double the probability of a subsequent pregnancy in some countries. Even though it is difficult to compute without detailed birth history or family composition, parity progression ratios – the probability of having another child at various parity levels – among women without previous male births may offer a convincing benchmark to assess the actual intensity of sex preference, whether prenatal sex selection is observed or not.<sup>36</sup>

## “It is necessary”:

### 3.4 the squeezing effect of fertility decline

A straightforward precondition for prenatal sex selection stems from the impact of declining fertility. In a high-fertility regime, few people fail to give birth to a son since the probability of having only female children is low for large families: less than 3 per cent with five children. But this risk increases as the number of children reduces, reaching 11, 24 and 49 per cent with three children, two children and one child, respectively. Rapid fertility decline therefore exacerbates the “need” for sons in inverse proportion to the average number of children born to women.<sup>37</sup> When parents express more stringent masculine needs than simply having at least a son – such as having more sons than daughters – the pressure for sex selection will be even stronger.

During the large-scale introduction of modern contraception in the 1970s, birth rates started to decrease, but the final family size remained flexible. Couples were able to opt for an additional pregnancy in case of a child’s death or in the absence of a male child. This system characterized by sex-specific “stopping rules” in fertility behaviour remains common in large parts of Asia. With fertility levels between two and four children per woman, sonless families are few and can still have an additional birth to reach the desired gender composition. Talking of fertility choices, women often have limited autonomy or bargaining power when it comes to the family size. Lack of access to information and family planning facilities combined with pressure from the rest of the family on the number and sex of expected children have long led in high-fertility settings to unwanted births and unmet needs for birth control.

However, fertility levels have fallen below replacement levels in many Asian regions where women today on average have two or fewer children. An additional second or third child represents a serious social and economic liability that parents want to avoid. In addition, family planning authorities have long urged the population to adopt a small family norm and fertility regulations in countries such as Viet Nam or China also act as a strong deterrent. For that reason, sex selection has initially been attributed to the strict implementation of family-planning policy in Asia. Local policies undoubtedly contribute to the fall of fertility and to the subsequent potential increase in the proportion of sonless

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<sup>36</sup> The possibility of prenatal sex selection in Viet Nam was for instance clearly detected in 1995 by Haughton and Haughton who studied parity progression, almost a decade before it became a statistical reality.

<sup>37</sup> A more formal treatment of the relationship between son preference and fertility can be found in Basu and de Jong (2010).

families.<sup>38</sup> The impact of the most forceful population policy measures on birth masculinity is likely to have been indirect, accelerating the pace of fertility decline and forcing parents to make a trade-off between the number and the sex of children they want. But there is no indication that it had any impact on gender preferences per se.

Fertility decline has been mostly voluntary in other regions and the emergence of sex selection was spontaneous. When birth rates fell, a parallel rise in SRB levels was reported from Taiwan and South Korea to India, Albania or Azerbaijan, countries with no stringent fertility restrictions. Some observers have claimed that changes in fertility policies in countries like China would improve the SRB.<sup>39</sup> But recent studies in Chinese provinces characterized by ultra-low fertility levels suggest that birth rates would be unlikely to rebound in a major way if local fertility regulations were relaxed (Zheng et al. 2009). Consequently, it is fair to think that a more flexible fertility policy would probably be accompanied by a larger number of births without sex selection, but the skewed ratios would not disappear overnight because of the rootedness of both the small-family norm and gender preference.

There is a lesson in this analysis for regions and social groups which still have relatively high fertility levels. In these subpopulations, the future decrease in the number of children women have will increase the biological probability of not having sons. As a matter of fact, a decrease by one child in fertility rates translates exactly into a doubling of the proportion of couples with no son in the absence of prenatal selection, so the increasing pressure of low fertility may soon be felt in new regions of East and South Asia. Elsewhere, a significant upturn in fertility appears unlikely and the small family size will continue to compel many couples to choose between the number and the gender of their offspring.

### 3.5 Synthesis

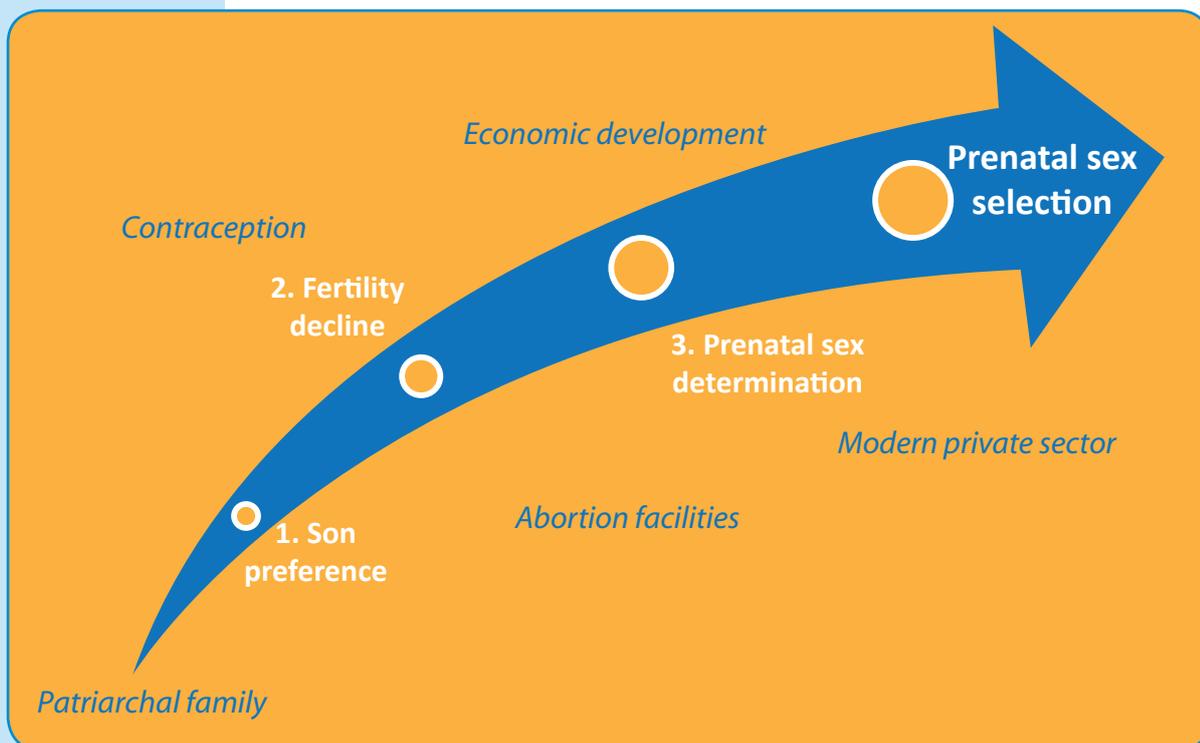
The chart in Figure 2 sums up the three conditions necessary for prenatal sex selection. These three factors operate like “intermediate variables” through which any social factors influencing prenatal sex selection must operate. Each of them may be in turn influenced by other factors such as kinship systems, education, ethnicity or economic development. It remains important to conceive each factor as independent of the other, even when they are frequently associated – as illustrated by the close link between new technologies and fertility decline or between son preference and high fertility. But for analytical purposes, it is better to consider the independent effect of each of these components on the propensity to discriminate against unborn girls. It is necessary as well to keep in mind that all three factors are indispensable and the failure to observe one of them in a given context may be the explanation for the local absence of skewed sex ratios at birth.

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<sup>38</sup> Allowing couples to have an extra child after the birth of a daughter is common in rural parts of China. This adjustment of fertility norms is a typical concession to the gendered needs of a family.

<sup>39</sup> Some studies have also tried to assess the rise in sex ratio at birth attributable to the birth planning policy (Li et al. 2011; Ebenstein 2011) and the potential impact of its relaxation (Zeng 2007). Yet, birth masculinity is now lower in metropolitan areas where fertility regulations are the most drastic.

**Figure 2: The preconditions for prenatal sex selection**



Nonetheless, the pivotal factor is, of course, the intensity of gender preferences biased towards male progeny. Where patrilineal systems are uncommon and son preference does not exist, the only case of declared sex preference relates to the demographically inconsequential strategy of “family balancing,” when parents want to ensure the birth of children of a different sex.<sup>40</sup> Access to modern technology is the second indispensable ingredient of prenatal sex selection, and Asia’s booming private healthcare system has merely adjusted its diversified supply of services to the expressed need for sex selection instruments. Fertility decline finally acts as an additional squeeze factor that makes sex selection even more required to avoid unwanted births.

In areas with high fertility or inadequate access to modern sex selection equipment, the current pace of social and economic modernization may encourage a new range of couples to use sex selection to respond to their needs for smaller families with a son. The spatial and socioeconomic analysis of national heterogeneity in SRB illustrates the fact that large chunks of currently affected countries in South and East Asia have so far remained immune to prenatal sex selection. This may not remain permanent. The recent spread of skewed sex ratios to poorer, higher-fertility states of India such as Bihar and Rajasthan yields a clear illustration of this social and geographical diffusion. It may also be hypothesized that parts of Western and Central China and Viet Nam may also see their levels of birth masculinity increase in the future.

<sup>40</sup> For gender preferences in Western Europe and North American, see for instance Hank and Kohler (2000) and Van Balen (2006).

# The present and future consequences of abnormal sex ratios

## 4

In affected countries, present-day sex ratios among children will leave an indelible mark on population structures for the next 50 years. This chapter examines the consequences of these demographic trends. It assesses the current impact of sex imbalances by using the recent world population forecasts, and presents the estimates of the number of missing women and girls. The next subsection covers the future consequences as predicted by demographers, using population projections and marriage simulations. The objective is to assess the situation of “surplus men” in the marriage market. The last subsection will be based on a review of the potential social, economic and political ramifications of current sex imbalances on the future adult population. This subsection partly refers to the limited evidence available today from ongoing field studies and to a more exploratory discussion centered on the possible societal consequences of demographic masculinization.

### 4.1 Missing women in 2010

Previous estimates of the extent of prenatal sex selection and of excess deaths among young girls have already provided insights on the large numbers affected by discriminatory processes. This section adopts a broader perspective of demographic discrimination by looking at the number of missing women and missing girls in 2010. Such a computation proceeds from the comparison between the observed female population of today in countries affected by sex imbalances and the expected female population if the sex distribution by age was identical to that of the rest of the world.

Our methodology is described in Box 5, but the basic idea consists of dividing countries into two groups - countries with signs of sex discrimination among children (Group 1) and the rest of the world (Group 2). As a result, the sex ratios of the first set of countries are significantly higher according to the age and sex distributions estimated by the United Nations for 2010, as shown by the curves in Figure 3. The interval between these two series of sex ratios corresponds to the gender gap caused by sex selection and excess mortality. The expected number of women in Group 1 countries is computed by using the observed age and sex distribution in Group 2 after adjustment for the overall mortality level. The difference between the expected and the observed numbers of women provides the gender gap, i.e. the estimate of missing women.

### Box 5: Measuring the gender gap in 2010

The number of missing women is estimated by comparing groups of countries. Group 1 includes all countries featuring in either Table 1 or Table 2 where sex discrimination is attested. It includes therefore in East Asia -- China (with Hong Kong and Macao) and Republic of Korea; in Southeast Asia -- Singapore and Viet Nam; in South Asia -- Afghanistan, Bangladesh, India, Nepal and Pakistan; in Eastern Europe -- Albania, Armenia, Azerbaijan, Georgia and Montenegro.

Group 2 is composed of, broadly speaking, the rest of the world. It covers countries in North and South America, Africa, Oceania, most of Europe and significant parts of Asia. It accounts for 55 per cent of the world population in 2010 and may include some countries where there are light traces of excess mortality. The average sex ratios by age groups computed for Group 2 are assumed to be the standard sex distributions in the absence of sex-based discrimination. In addition, sex ratios tend to be influenced by the overall level of mortality, as lower mortality is associated with relatively better female survival and higher sex ratios.

Figure 3 demonstrates that sex ratios of Group 1 countries are more masculine at all ages because of the cumulated effects of sex-based discrimination from gestation to adulthood. These standard sex ratios by age (Group 2) are then applied to the male population of affected countries (Group 1) after correction for mortality levels in order to compute the size of the expected female population by age without sex discrimination (prenatal selection or excess female mortality). These estimates are finally compared to the observed female population in Group 1 countries to estimate the number of expected, but “missing” women in each age group in 2010. The same calculation was finally repeated for these two country groups for different periods for which United Nations demographic estimates are available.

A few caveats about the methodology may be mentioned here:

First, age and sex distributions used for this computation have been taken from the latest United Nations estimates for 2010 for lack of available or reliable census figures. This choice is guided by the need for a homogeneous and consistent population dataset, but it may have significant implications for countries without census such as Pakistan or with distinctly lower census-based sex ratios such as China.

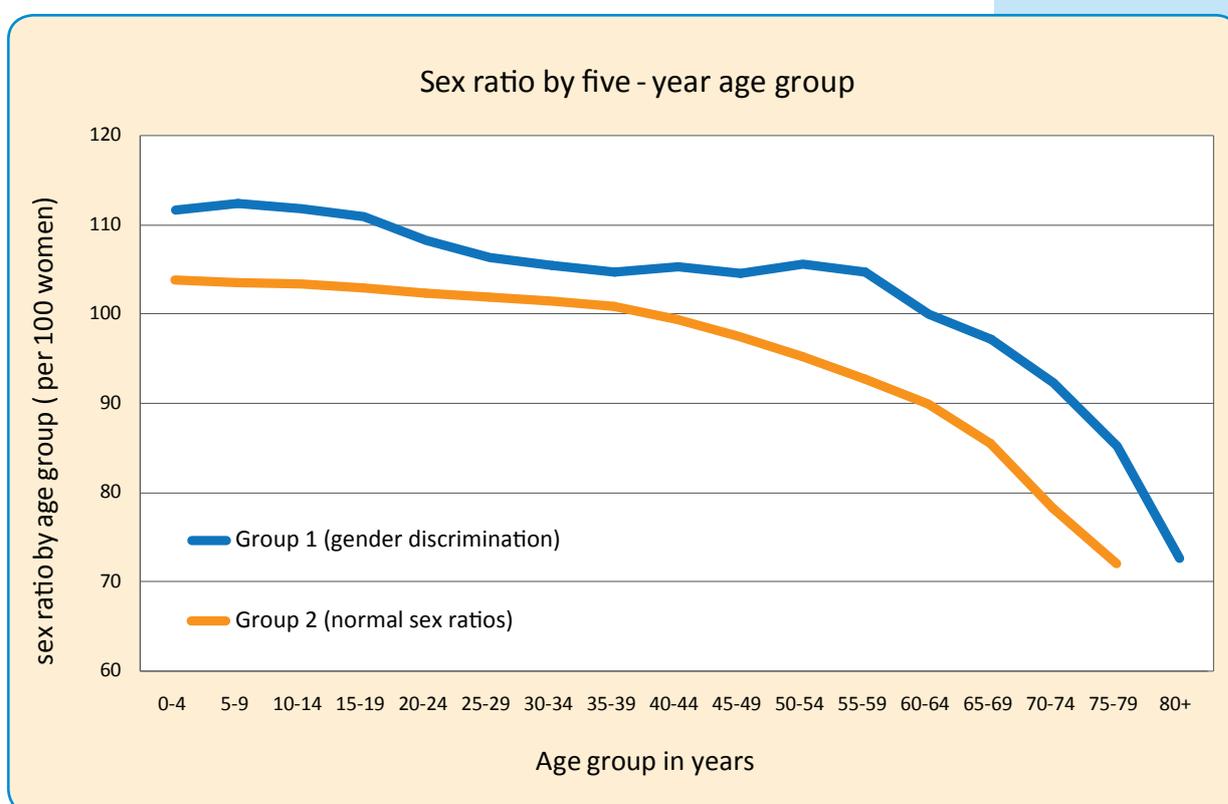
Secondly, this computation rests on the assumption that the male to female mortality pattern depends only on mortality levels and is not affected by local environmental or biological factors. Excess male mortality as observed among adults, while partly attributable to behavioural features, is also taken as reference.

Finally, another limitation is the absence of correction for the impact of international migration due to the incomplete United Nations database on migration. In countries in South Asia, international migration is predominantly masculine and this may result in an underestimation of missing adult women.

Other estimates of the gender gap are available in Klasen and Wink (2003) for the late 1990s, with a rough update given in UNDP (2010). Anderson and Ray (2010) have also attempted to disaggregate the number of missing women by cause of deaths.

The results of the computations are shown in Table 5. They indicate that almost 117 million women can be estimated to be “missing” from the demographic records. This number represents about 8 per cent of the total female population in these countries. Estimates of missing women can also be given by country, even if the sex distribution is affected by local migration and estimation issues.<sup>41</sup> Almost 57 per cent of the total number of missing women are from China, while India accounts for 30 per cent of the total. Seen differently, the percentage of missing women in the female population varies considerably in each country, exceeding respectively 7 per cent and 10 per cent in India and China. Other countries do not contribute significantly to this aggregate total, with the exception of Pakistan and Bangladesh.<sup>42</sup>

**Figure 3: Sex ratios by age groups, countries with sex discrimination and rest of the world, 2010**



These figures are not comparable with previous estimates of missing women derived by different procedures. Yet, the availability of long-term population forecasts from the United Nations makes it possible to repeat the exercise with the same countries for different periods: the gender gap appears to have

<sup>41</sup> Probably 8 million out of a total 10 million international migrants from India are men (estimates provided by S. Irudaya Rajan), which may lead to an underestimation of missing women. In China, the estimated gender gap could be lower by more than 10 million if we use the 2010 census rather than United Nations figures. Census data do, however, underestimate the male population in China, especially among young adults.

<sup>42</sup> Estimates for Pakistan may be considered statistically fragile in the absence of census figures since 1998.

regularly increased over the last decades, climbing from 60 million in 1950 to 117 today. This aggregate figure will diminish only slowly after 2020, in spite of the reduction in SRB levels incorporated in the parameters of the United Nations population prospects for 2010-2100. In fact, the imprint of the gender gap is here to stay. It explains why the world population is predominantly masculine today and why it should stay so till 2080 even if the sex ratio at birth falls back to its biological level everywhere in the forthcoming decades.<sup>43</sup>

Of great interest to us is the contribution of recent birth cohorts to this global sex imbalance. Estimates of missing women have been computed for the population below 20, i.e. born after 1990 when the prenatal diagnosis methods started to spread in Asia and other areas. These figures are also affected by the high level of excess female mortality in childhood examined previously. In 2010, missing girls are estimated to be almost 39 million in number, and they represent 7.6 per cent of women aged less than 20 years in affected countries.<sup>44</sup> Precise data are missing to estimate the exact contribution of prenatal sex selection to this total, but current SRB and mortality levels suggest that a vast majority of these missing girls were in fact never born.

China's missing girls number 24 million, and they make up more than 60 per cent of the total of missing girls. In China, the gender gap represents no less than 14 per cent of the female population born since 1990. In India, where prenatal sex selection is less widespread, 13 million girls can be estimated as missing. But the contribution of excess mortality to this gap is considerable in this country (Table 2). China and India account, in fact, for 95 per cent of the gender gap below 20 years. Absolute numbers of missing girls are much lower in other countries, but the proportion of the gender gap remains close to or greater than 5 per cent in the Republic of Korea, where SRB levels have now returned to normalcy, and in the lesser-known cases of the Caucasus and of Southeast Europe.

## 4.2 Future population and marriage imbalances

The numbers in Table 5 give a graphic measure of the extent of sex imbalances. They show that among younger generations, prenatal sex selection combined with the declining impact of excess mortality can reduce by 5 to 10 per cent the volume of the female population. The intensity and the duration of current birth imbalances will shape the future of these populations and determine the magnitude of the masculinization of their structures for the next 50 years. Using demographic projections and simulations, it is possible to investigate the exact impact of these changes on populations in the future, looking in particular at the adult population and at the growing scarcity of young women, which is going to affect family-building processes.

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<sup>43</sup> These figures are based on the 2010 United Nations population forecasts. Because of women's mortality advantage, females tend to be more numerous than males in national populations. Yet, the demographic weight of China and India and their skewed sex distribution explain why the world population should remain masculine for the next 70 years.

<sup>44</sup> By comparison, the cumulated death toll due to HIV/AIDS over 1980-2007 is of 24 million people (Bongaarts et al. 2011)

**Table 5: Gender gap in various countries, 2010**

	Gender gap			
	Total population		Population 0-19 years	
	In thousands	%	In thousands	%
<b>Afghanistan</b>	1 097	7.2%	502	5.7%
<b>Albania</b>	40*	2.5%	15	3.1%
<b>Armenia</b>	31*		31	7.4%
<b>Azerbaijan</b>	104		104	7.8%
<b>Bangladesh</b>	2 020	2.8%	354	1.2%
<b>China</b>	66 163	10.3%	23 687	14.2%
<b>China, Hong Kong SAR</b>	27*		27	4.4%
<b>Georgia</b>	19*		19	3.8%
<b>India</b>	43 267	7.3%	13 197	5.6%
<b>Montenegro</b>	2*		2	2.7%
<b>Nepal</b>	114*		114	1.7%
<b>Pakistan</b>	2 907	3.4%	281	0.7%
<b>Republic of Korea</b>	533	2.2%	260	4.8%
<b>Singapore</b>	114	4.5%	11	1.9%
<b>Viet Nam</b>	245*		245	1.7%
<b>Total</b>	116 685	7.7%	38 850	7.6%

- Numbers given in thousands
- Percentages computed over the corresponding female population
- \*: no measurable gender gap among adults
- See text and Box 5 for the computation procedure followed

With most of the population already born at the beginning of the forecasting and demographic trends known to be fairly stable, population projections offer very reliable simulation tools for understanding how population structures will evolve in the future. Projections presented here for China and India are based on a standard set of mortality, fertility and migration assumptions for the future (see also Box 6).<sup>45</sup> However, two distinct SRB variants have been introduced. In the first scenario, the SRB is assumed to return to 105 male births per 100 female births in 2020. This transitional scenario corresponds to an extremely rapid return to normalcy. Such a turnaround is admittedly a rather optimistic scenario for both China and India. The second scenario is based on a stable SRB at 120 as observed in 2005 in China and a slight increase to 113 for India, followed by stagnation until 2100. These parameters correspond to a deepening sex ratio crisis.

<sup>45</sup> These projections are limited to China and India for several reasons: their considerable share in the global gender gap as seen previously and the availability of detailed demographic indicators. Other projection results for China are available in Jiang et al. (2007). For Viet Nam, see General Statistics Office (2011).

The likely course of birth masculinity will probably fall within these two extremes. But projection results indicate that the overall population sex ratio of China and India will remain masculine in both scenarios. In other words, even in case of an impressive decline in birth masculinity, their population will remain predominantly masculine until 2100, a trend that will deeply impact the average sex ratio of the world population. However, if the SRB is allowed to stay at its current high level, the projections indicate that the overall population sex ratio will increase from 107 in China today to 116 in 2100 and in India from 107 to 114. When focusing the analysis on the adult population of marriageable age 15 to 49 years, the full increase in adult sex ratio will be felt only from 2020 onwards, when birth cohorts affected by skewed SRB levels reach adulthood. In the most favourable scenario, the peak will be attained during the 2030s in both countries. But if the SRB remains at its current level, the adult sex ratio will, of course, continue to grow and reach 121 in China and 113 in India during the second half of the century.

### Box 6: Population projections and marriage simulations

#### *Population projections and sex ratios, 2010-2100*

The projections derive from a procedure and a set of parameters adapted from those of the United Nations' population prospects published in 2007 and lead to an estimation of age and sex structures for both China and India from 2005 until 2100. The main difference between these two sets of projections relates to the different SRB scenarios used: a rapid transition scenario toward a normal 105 level or a business-as-usual scenario in which SRB remains high and stable till 2100. The analysis is restricted to China and India, which represent 95 percent of the total number of missing girls below 20.

The results are the projected age and sex distributions of China and India from 2010 to 2100 according to these two SRB scenarios. Adult sex ratios are computed from these age and sex populations after being weighted by the probability of marrying by age and sex. In other words, they correspond to the sex ratio of men and women expected to marry in each period according to the marriage schedule. For this purpose, nuptiality data are from China's 2005 1 per cent survey and from India's recent NFHS-3 (National Family and Health Survey) round. According to these sources, the age difference at marriage is two years in China, but five years in India. A gradual increase in the age at marriage among women during the next decades is also introduced as a factor (see Guilmo 2012a for detail).

#### *Marriage projections, 2010-2100*

The adult sex ratios described above are computed as cross-sectional indicators. They correspond therefore to average birth cohorts of men and women reaching age at marriage. But they do not factor in the effect of the backlog of unmarried men on the marriage market. In fact, we know that men who fail to marry during one period are likely to affect the marriage market during the next period as they again try to marry. An alternative, cohort-based methodology was therefore developed for simulating the cumulative effects of men unable to marry on the marriage market.

**BOX 6 Continued.....**

	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
<b>China</b>										
Marriage Squeeze	99	124	160	157	155	144	127	121	115	110
% single men at 50	3.3	3.2	4.1	9.3	14.5	14.6	12.8	9.6	7.2	6.0
Marriage Squeeze*	99	117	148	144	145	140	124	122	118	112
% single men at 50*	3.3	3.1	3.2	6.9	10.6	11.1	10.8	8.8	7.4	6.6
<b>India</b>										
Marriage Squeeze	104	125	145	158	164	157	141	134	129	125
% single men at 50	1.1	1.3	2.4	5.0	8.0	10.0	10.2	8.6	7.2	6.5
Marriage Squeeze*	104	112	118	122	122	120	116	117	119	119
% single men at 50*	1.1	1.3	1.7	3.0	4.5	5.7	6.4	6.3	6.4	6.7

Simulations based on the rapid SRB transition model

Marriage squeeze: ratio of expected male marriages to 100 expected female marriages

\*: refers to an alternative scenario based on an additional delay in male marriage by two years in 2050 (30.5 years in both China and India)

The method is based on a longitudinal simulation of the nuptiality behaviour of both men and women. It estimates the number of actual marriages during each successive five-year period starting from 2005 till 2100. To do this, separate marriage schedules are applied by age for men and women. The number of marriages during the next time interval is estimated from where the single population five years later is derived. When the number of prospective grooms outnumbers that of prospective brides, the number of male marriages is reduced accordingly. But as a result, the number of single men increases during the next period and the “marriage squeeze” (i.e. the sex imbalance between expected male and female marriages) becomes more acute.

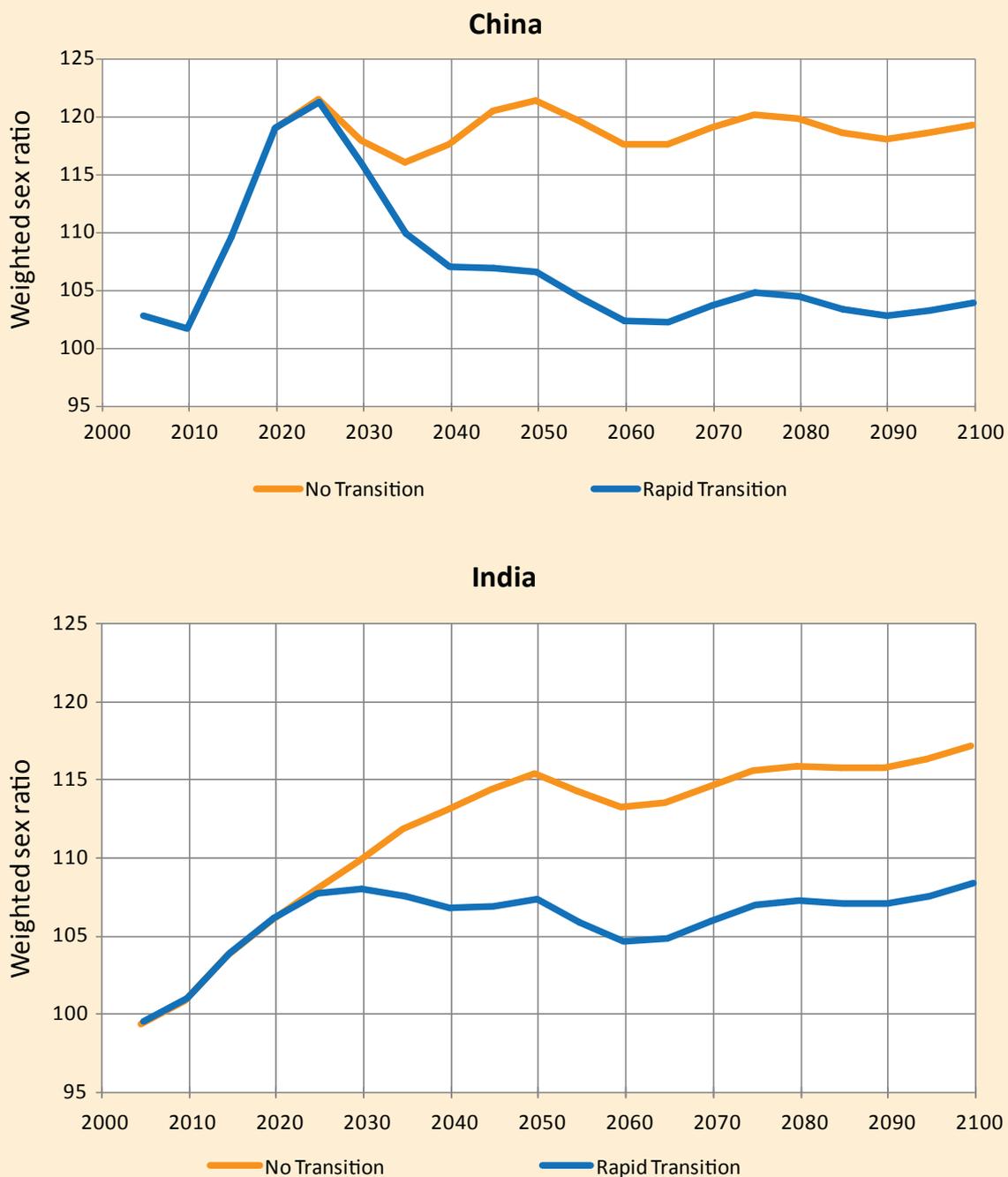
Single men are assumed to try to marry during each successive period again as long as they are aged less than 50 years. Cohort size is corrected for mortality and marriages simulations also include estimated remarriages. Table presents the results based on the optimistic rapid SRB transition scenario: marriage squeeze intensity and proportion of men unmarried at age 50.

While the female age at marriage is allowed to increase until 2050, the spousal age difference is supposed to remain constant in the first simulations. But the rise in male singlehood is likely to significantly delay age at marriage. A different set of simulation also shown in this table postulates an increase by two years in the male age at marriage in 2050 to 31.5 years. As results illustrate, such a delay in age at marriage would partly alleviate the marriage squeeze and reduce the frequency of bachelorhood.

### 4.2.1 Adult sex ratio and marriage rates

Taking into account marriage rates by age and sex yields a better idea of change in the adult sex ratio. This modified adult sex ratio, taking into account the age at marriage by sex, is a first approximation of the future marriage squeeze due to the current sex imbalances at birth. It is based on recently observed marriage rates by sex and is limited to the traditional heterosexual and monogamous marriage (see also Box 6). The results are shown in Figure 4.

**Figure 4: Adult sex ratios weighted by marriage rates in China and India according to two SRB scenarios (no transition and rapid transition), 2005-2100**



In China, the increase in the weighted adult sex ratio is extremely rapid after 2010. It is expected to peak at 121 in 2025. After this period, the adult sex ratio will oscillate around 120 in the absence of a sex ratio transition. In the optimistic scenario of a rapid SRB decline, this weighted sex ratio in China will remain above 110 until 2035 and will reach almost normal levels only during the second half of the century.

India's situation is less erratic because of its low SRB level and the slower process of fertility decline. The weighted adult sex ratio will increase from 100 to 107 in 2025, and will decrease thereafter according to the optimistic scenario. However, for reasons related to India's population structures, the adult sex ratio will remain above 105 for the entire period. With no diminution in SRB levels, the adult sex ratio will record a gradual growth to a plateau of 115 attained only in 2050. These projections demonstrate that the sex imbalances observed have had little impact so far on the adult population. But demographic conditions will fast deteriorate during the present decade and will soon translate into a growing gap between young men and young women about to marry. The gap will reach 20 per cent in China and 7 per cent in India by 2025.

#### **4.2.2 *The actual extent of the forthcoming marriage squeeze***

Yet, this index based on adult sex ratios does not adequately reflect the way men and women will be impacted by the gradual crowding of the "marriage market". What is seen here are the sex ratio of each new marriage cohort and the corresponding proportion of excess men. But the marriage system is more sensitive to changes in demographic structures than this sex ratio suggests. In fact, men who fail to marry during one period will try again to marry during the next periods, creating a growing backlog of unmarried men. As a result, this excess of men will tend to add up over consecutive periods as long as they remain of marriageable age and the extent of the overall surplus of involuntary bachelors will be much bigger than anticipated.

More elaborate simulations have been conducted to describe the forthcoming bottleneck for young men and its potential effects on marriage patterns. Women will be in great demand and they will face no difficulty in marrying at the age of their choice, being in fact able to select their prospective husbands from a fast increasing pool of unmarried men. But for men born after 2000, the situation will be radically different from that of their predecessors. The continuous arrival of new waves of surplus men will create a dramatic marriage squeeze, in which the number of prospective grooms will exceed that of unmarried women by 60 per cent by 2030 in China and by 2050 in India. The marriage squeeze will decrease gradually in the scenario of a rapid SRB decline, but the squeeze will be felt for several decades (see Table in Box 6).<sup>46</sup> Simulations based on a rapid sex ratio transition indicate that 15 per cent of Chinese men and 10 per cent of men in India will not be able to find a wife by 2050, even if SRB is assumed to return to normal in 2020.

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<sup>46</sup> In the less optimistic scenario of no change in the current levels of SRB, the male surplus in the marriage market would reach 90 per cent in both countries after 2050, which means that there would be about twice as many men ready to marry as women.

Our simulations postulated a fixed age difference between brides and grooms. But faced with such adverse conditions, men will first try to adjust to this imbalance by delaying marriage beyond age 30 and by lengthening their search period. This delay may allow some of them to improve their social standing through education and a professional career and to get better chances to find a bride afterwards. Additional demographic simulations indicate that were the age difference between spouses to gradually increase by two years, the demographic imbalance would substantially diminish. In such a scenario of delayed male marriages, a larger proportion of the surplus men would be able to find a partner. With these revised hypotheses, the proportion of men unmarried at age 50 would increase in China from 3 per cent today to 11 per cent in 2050. The increase in India would be from 1 per cent of men unmarried at age 50 today to almost 7 per cent during the second half of the century. While these singlehood rates are lower than the theoretical values of 15 and 10 per cent quoted above, these most optimistic scenarios still leave a significant fraction of the future generations of adult males unmarried in these two countries.

The proportion of male bachelors has traditionally been almost negligible in both countries. The demographic transformations envisioned here correspond therefore to nothing less than a sea change in marriage patterns for millions of men, with important social and economic ramifications for family structures. This demographic analysis is done on the assumption that most men will try to marry women and that the traditional marriage remains the main institution for family building. These are, of course, some of the various dimensions of the social system that may evolve in the future, with distorted adult sex ratios acting as a catalyst to change.

### **4.3 Implications on the adult populations and families in the future**

The rapidly changing demographic structures described in the previous sections will no doubt induce profound social changes in the societies concerned. Yet, the sociological evidence of these potential transformations in marriage patterns and family structures is still limited since the impact of the first wave of skewed sex ratios in the late 1980s is visible only in small regions of India or China. Current sex imbalances have also generated some literature of a more speculative character on the larger or long-term consequences of the masculinization of Asia's population. All these sources are used to discuss the possible implications of skewed sex ratios.

Within a patriarchal setting, the reduced numerical share of women in the twenty-first century could imply that a woman's traditional roles as wife, daughter-in-law or mother will become even more essential to the reproduction of a male-dominated society. We may also factor in the fact that the decline in the proportion of women among adults tends also to reduce the number of annual births and that fertility is already below the replacement level from Albania to Caucasian countries and China, as well as in several other regions in Asia. In theory, this changing demographic environment could ultimately generate pressure for higher fertility levels and perhaps for systematic and early marriage of girls. But this goes against all nuptiality trends observed in

more advanced East Asian countries where women marry later and where the institution of the universal marriage is gradually fading away. Moreover, a renewed stress on women's reproductive responsibilities will also conflict with the need for longer education and with better employment prospects, often associated with delayed female marriage and lower fertility. There are obviously conflicting trends towards greater female autonomy, on the one hand, and more emphasis on women's reproductive duties in countries hit by a deficit of marriageable women, on the other.

An already observed range of phenomena relates to the stress on marriage systems. Since the marriage system behaves to some extent as a free open market, it is men who will first experience the deepest effects of demographic imbalances. As figures shown previously indicated, men trying to marry will outnumber women by 50 per cent in a few decades in India and China. The resulting involuntarily delayed marriage and increasing competition among bachelors should probably be favourable to longer educational and training investments, resulting in better human capital and skills. Similarly, accumulation of wealth and assets necessary to marry in a demographic environment characterized by a serious sex ratio squeeze may also affect the national economy through higher income and savings levels (Wei and Zhang 2009; Du and Wei 2011).

The decline of ethnic, caste and regional endogamy may act initially as a safety valve for the marriage bottleneck by enlarging the pools of marriageable women. The few studies devoted to the current impact of sex ratio distortions in Asia have already shown that men unable to marry locally have resorted to the importation of brides from lower economic backgrounds, other ethnic groups, or more distant regions. Single men in China can turn to women from the poorest rural localities in central China, while bachelors in India's northwestern states are known to import wives from lower-status groups and different regional background. As a matter of fact, there are already considerable international marriage migrations within Asia (Kim 2008). The main destinations areas are today Taiwan and South Korea, but other countries such as China and India suffering from a scarcity of brides may also generate new waves of female migrations from Nepal, Bangladesh, Viet Nam, Laos, Mongolia or other neighbouring countries. Yet the overall numbers of surplus men projected for China and India in the future defy the most fanciful scenarios of marriage migrations, with no remote regions or neighbouring countries able to offset the mounting female deficit in the world's two most populated countries. Neither do long-distance migrations of single men outside Asia in quest for a bride represent a more plausible solution, since they would entail an implausible explosion in the number of international migrants.<sup>47</sup>

When the marriage market is not fluid enough, unions are difficult to arrange without extended networks (matchmakers, matrimonial agencies) or, at times, criminal organizations that specializes in human trafficking. Cases of kidnapping, forced marriage, trafficking, sexual exploitation, and abuse of women already abound across Asia and Southeast Europe, only partly fuelled by existing sex imbalances among adults.<sup>48</sup> But with the further degradation that the demographic simulations establish, the role of illegal organizations is

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<sup>47</sup> China and India are already the world's main providers of international migrants.

<sup>48</sup> The press today provides the largest number of illustrations of the distortion of the marriage market and its consequences. See also the following studies: Asian Development Bank (2002), Blanchet (2005), Davis (2006), Kaur (2008; 2009), Shakti Vahini (2003), Kumar (2009), Trent (2011), Li et al. (2010).

likely to augment rapidly to respond to the need for sex workers or spouses. The increasing role of trafficking will inevitably lead to growing levels of various forms of gender-based violence in countries with a scarcity of brides.

Structural economic and social inequality also means that unmarried men will be drawn from the poorest regions and classes of society, since the more affluent men will find it easier to attract prospective brides. The proportion of men remaining unmarried among the low-income groups could well be twice as high as the national average estimated previously. This, in fact, corresponds to the typical situation of rural men during the modernization of European society after 1950, when a large proportion of farmers were excluded from the marriage market and remained single.

Available studies already describe the vulnerable conditions of unmarried men from underprivileged backgrounds. Prolonged bachelorhood has been linked to increased reliance on organized prostitution and sex trade and a parallel increase in AIDS transmission in China. The differential impact of a shortage in women on various social classes may lead to the formation of a “demographic underclass,” drawn mainly from poorer households in deprived environments. This social and economic inequity may gradually expand into unequal access to heterosexual marriage. The risk of increasing social unrest among the “bare-branches” (the Chinese expression for men unable to marry) has already been mentioned repeatedly by observers. They have tried to link it with a rise in crime and antisocial behaviour, and sometimes with threats to international security through conflict and unregulated migration, but hard evidence remains limited as long as the marriage squeeze is not felt with full force.<sup>49</sup>

Thus the arithmetic of nuptiality in China and India remains plainly disadvantageous to men who will spend longer years unmarried, with an increasing proportion among them unable to marry at all. As a result of this prolonged or permanent bachelorhood, the entire family structure will undergo significant changes. Many unmarried men would have to be accommodated within the family structure, with similar expected duties towards their ageing parents, but with a reduced share of domestic power because of their status as single and childless men. In regions where a significant proportion of parents today have a single son, the risk of permanent bachelorhood will prevent the perpetuation of the patrilineal family. Such a change will inevitably erode the strength of the traditional patriarchal family based on the male progeny.

Women marrying older men may gain a stronger role in the new family arrangements, and enhanced possibilities for divorce and remarriage would further strengthen their position vis-à-vis their husband’s family. Institutions such as the dowry system or the exclusion of women from family inheritance could probably give way to a more symmetrical system between men and women, and by and large to greater gender equity. This would further contribute to a weakening of the patriarchal system that gave rise to the need for sons in the first place and may also transform the family norm, allowing the emergence of alternative family arrangements not based on heterosexual marriages.

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49 On the possible impact of sex ratio on crime and AIDS in China, see Edlund (2007), Tucker et al. (2005). Hudson and den Boer (2004) provide the most pessimistic view of the consequences of the growing number of unmarried men. See also Poston and Glover (2005), and Urdal (2012).

Yet, the deficit situation may not automatically improve the status of women, as simplistic economic models would suggest. As already seen, the shortage of women may also translate in increasing pressure to marry and perform traditional reproductive duties, higher risk of gender-based violence, increasing forced fraternal polyandry, rising demand for sex work, and thriving trafficking networks. Moreover, women's reduced demographic share in several countries would translate into a weaker political voice in public decision-making, with men strengthening their control on public and political institutions and wielding a greater influence on family and gender legislations.

#### 4.4 Conclusion

In conclusion, it is important to focus on the demographic dilemmas and their conflicting implications. On the one hand, most Asian countries are known to have benefited from a significant demographic bonus linked to the rapid fertility decline since the 1970s. This upsurge in the proportion of the working-age population has reduced the weight of the dependent population and created a unique "window of opportunity" for increases in savings, productivity and investment in human capital. But this review projects a different and less favourable facet of the recent demographic dynamics observed in several countries, with the emergence of a demographic *malus*<sup>50</sup> caused by the rapid reduction in the proportion of women in the forthcoming decades.

Skewed sex ratios at birth will, among other things, translate into an accumulation of excess men in each affected country. The demographic simulations show that such sex imbalances are not socially sustainable over a prolonged period, mainly because of the impact of the resulting disproportions among young adults on the traditional marriage systems. Even a very rapid decline in prenatal sex selection, as hypothesized in our model, will not prevent a serious disruption of demographic equilibria, and will reshape the demographic foundations of family systems in the future.

The extent to which social systems will be able to adapt to these demographic changes is unknown, due to the lack of comparable historical examples and of straightforward and feasible solutions to sex imbalances of this magnitude. The previous section has identified several ways in which local societies may adjust to this change, but the few studies conducted so far relate only to small communities affected by sex imbalances at birth observed as early as the 1980s. They therefore provide only a tentative outline of the possible adaptation by local societies to the deficit of women as we have still no idea of the coping mechanisms likely to emerge when marriage postponement or bachelorhood affect millions of men in China and India.

Society will also need to plan for the future of these masculine societies. We know already that the forthcoming marriage squeeze will inevitably result in a rise in male bachelorhood. We should also avoid a class-blind view of the demographic *malus*, since it is also clear that men from underprivileged sections will suffer disproportionately from this marriage squeeze. Singlehood will, in

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<sup>50</sup> The word "malus" is taken here to mean a negative bonus or a penalty.

fact, become an additional demographic disadvantage to the already existing social and economic inequalities affecting men from impoverished localities, low-status communities, or poor educational backgrounds. The near absence of a social insurance system for men without children makes them especially vulnerable in societies in which marriage is expected from everyone for both cultural and economic reasons.

There is presently a dearth of research on the changing situation in communities affected by a surplus of adult men since it is a relatively recent phenomenon and as a result, the recent research on the demographic consequences of the masculinity bulge is often speculative and more often based on imaginative modelling rather than field-based findings. But it is critical to understand the repercussions of sex imbalances on men and women and on local societies in the decade to come.

Such research could focus, in particular, on the gradual changes in sexual behaviour especially among unmarried men; the adaptation of marriage systems to the rise of bachelorhood; and the potential impact of bride scarcity on sex trade, human trafficking and gender violence. An additional challenge will be to reconsider the dominant representations of masculinity and femininity on which the traditional institutions of marriage and family are built. The surplus of adult men will probably prompt societies to better acknowledge and accommodate the diversity of family arrangements.

As prenatal technology emerged in Asia in the 1980s, it soon became obvious that some couples would use it to adjust their fertility to their gender objectives. The increase in sex-selective abortions was a predictable consequence, but the larger demographic implications of this silent revolution in sex discrimination were still unknown.

The sex ratio crisis presents the characteristics of a typical tragedy of the commons, the well-known social trap in which resources held in common are gradually depleted by individual behaviour (Hardin 1968). Today's opportunistic behaviour of the few who actively discard female foetuses will result tomorrow in a collective loss of social stability – a severely unbalanced marriage market. Many people still consider that practicing sex selection is a clever and somewhat innocuous solution to their gender predicament. Many of them had female births before practising sex selection and may believe therefore they have already contributed to the common pool of girls. They try to circumvent laws restricting access to prenatal sex selection, without paying attention to the overall consequences of their private choices. Thanks to government, media and academic mobilization in several countries, public awareness has gradually built up and convinced a large section of the population of the unsustainable consequences of prenatal sex selection (NIPCCD 2008). A turning point in a tragedy of the commons corresponds precisely to the phase when communities start assessing the long-term implications of their actions. Moreover, the emergence of a typical “social externality,” such as demographic imbalances and the ensuing forced male singlehood, will compel governments and civil society organizations to intervene.

The initial reaction of governments was slow and impaired by many factors: a late realization of the gravity of the crisis, mostly for lack of adequate monitoring of demographic trends; a certain level of indifference due to the poor value given to women and girls; and a relative reluctance to consider the extent and political implications of the issue. Academics also had their share of responsibility by initially trying to link distorted sex ratios to factors such as measurement errors, hepatitis B, or biological differences. This diagnosis phase characterizes several East European countries where the official attitudes towards sex imbalances at birth range today from partial acknowledgment to complete ignorance or public denial—in spite of a rise in birth masculinity noticeable since the 1990s.

In South and East Asia, the first response by public authorities was to outlaw sex-selective abortions, as happened in China, India and South Korea during the 1990s. Notably, it was mainly the access to prenatal diagnosis technology that was initially targeted, rather than the underlying bias against daughters. Results of this approach were, however, disappointing in China and India and hardly slowed down the continuous increase in sex-selective abortions till the beginning of the twenty-first century. Since then, policy initiatives and interventions launched across Asian countries have greatly diversified and now cover a much broader category of domains and targets. For some experts, however, their impact has been significantly weaker than anticipated, and the still high SRB levels observed today tend to support this interpretation. As we shall see, the levers available to governments have limitations in terms of scope, effectiveness, side effects or financial costs.

This section offers a brief overview of these policy initiatives.<sup>51</sup> They are classified in three categories related to their ultimate targets: prenatal sex selection, preference for sons, and gender attitudes and institutions. The section starts with a presentation of the more direct policies aiming at preventing selective abortions. It then turns to existing compensatory schemes expected to improve the status of girls and counterbalance the undervaluation of female births. The section ends with a review of the broader initiatives to fight against the roots of gender discrimination.

## 5.1 Regulating prenatal sex selection

The simplest step to counter sex imbalances at birth appears to be banning prenatal sex selection. This response is definitely narrower in scope than any other type of intervention, since it aims at a specific decision or behaviour of the individual or family, with no consideration for the root cause of son preference that drives this action or behaviour. Yet, such interventions could in theory prove very effective in limiting the misuse of prenatal technology by raising the costs of access to the supply chain and temporarily reducing the birth imbalances. In theory, such prohibitions may concern either prenatal sex testing or selective abortion. Yet, banning sex-selective abortions per se is unfeasible since there is no way to distinguish selective abortions from other abortions. No one can identify the real motive for terminating a pregnancy and interfering with “suspicious abortions,” such as abortions of women with no son, would only lead to an arbitrary curtailment of abortion rights. Where abortion is legal, it may create additional hurdles for women to enjoy their reproductive rights.

Prohibitions therefore primarily concern prenatal sex diagnosis, by forbidding health workers and radiologists from telling parents the sex of the foetus. Public authorities have gradually introduced and implemented legislations outlawing the disclosure of the sex of the foetus: bans usually started with regulations

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<sup>51</sup> This section draws in particular from the following references: for India see Josef (2007), Sinha and Yoong (2009), and Sekher (2012); for China see Li (2007), Eklund (2011), Wesler (2006), Zheng (2007) and Tan (2008); for South Korea see Westley (1985) and Kim (2007). See also Pande et al. (2009) and the materials collected by the “Counting Girls” project of the International Center for Research on Women. No systematic comparative review of policies and interventions against sex selection exists.

applicable to public health facilities, but they were eventually extended to all other medical centres and clinics. Yet, it was soon recognized that effective implementation of such regulations would face a large number of practical difficulties, most notably the challenge caused by the sheer number and diversity of private healthcare centres, the corruption of service providers, and their collusion with their customers. In addition, it is almost impossible to establish that clinicians had facilitated sex-selective abortions, when only gestures or code words can be used to indicate the sex of a foetus following an ultrasound test.

In China, the prohibition of sex selective abortions was first announced at the end of the 1980s, and it became an official regulation in 1998. It was enshrined in the Family Planning Law of 2005 in articles 35 and 36. Yet, implementation of this legislation was limited by the absence of relevant sanctions. Unlike infanticide, sex-selective abortions do not constitute a crime in China. It is not clear whether the prohibition of prenatal sex selection is truly enforced there. The Chinese legislators were not ready to introduce in the law more stringent provisions to identify and punish offenders. One official reason was the reluctance to interfere with women's access to prenatal care and abortion, while a larger cause for this conservative attitude was the primacy of the fertility control policy over other measures. Since in many rural areas couples are allowed to have an additional pregnancy after the birth of a daughter, banning sex selection among second or higher-order births would prevent parents from ensuring the birth of a son. This could also result in a large number of unauthorized "out-of-plan" births, slowing down the reduction in demographic growth and endangering the family planning objectives. A ban could also force parents to resort to infanticide or to abortions conducted in unauthorized structures by unregistered practitioners, with potentially grave health consequences for women. These serious misgivings explain why the official prohibition of sex diagnosis and sex selection has resulted in very few condemnations of parents or practitioners, despite the fact that millions of selective abortions have taken place in China since these provisions were introduced at both national and provincial levels.

In countries with less restrictive fertility policies, governments have found it easier to introduce more severe laws targeting sex selection performers and users. In India, a first act against prenatal diagnosis was formulated in 1994, but following the exacerbation of sex imbalances measured by the 2001 census, it had to be strengthened in 2003 to make it more effective in impacting prenatal sex selection in the country. In recognition of the difficulty of catching offenders, the 2003 legislation has incorporated specific provisions to strengthen the prohibition, such as extending the responsibility from the woman to the husband and his family, allowing individuals to file complaints, making the offence non-bailable and creating hotlines for anonymous reports of sex selection cases. The prescribed sanctions include fines up to US\$ 2,000 and imprisonment for up to five years.

These bans are notoriously difficult to enforce unless local authorities devote resources to proper implementation by stricter monitoring of pregnancies and medical institutions. Targeted sting operations have been conducted to demonstrate the involvement of doctors. The deterrent effect of such legislation could be of greater consequence if cases of punished violators receive wide

publicity among both users and performers of sex selection. In South Korea, the medical community was obliged to comply with the new ban on sex selection introduced in 1987 under the threat of license termination and fines.

Reviews documenting the difficulties in implementing these bans have reported all the above-mentioned practical reasons. The lack of commitment from provincial or local authorities is a clear obstacle to a full enforcement of such bans. In countries such as India where local traditions have a strong role in determining norms and practices, many laws relating to gender, family and community matters -- such as caste discrimination, dowry payment, or minimum age at marriage -- are routinely flouted for these reasons. Moreover, enforcing agencies receive little cooperation from involved parties such as families and clinic owners.

This does not mean that these prohibitions have had no impact, positive or negative. Indirectly, they might have affected access to prenatal care and to abortion. They do increase to varying extents the “access cost” of sex selection. As a result, they have probably more effectively prevented poorer households from using modern sex selection technology than households with greater financial means.

There is still no independent confirmation of the effectiveness of these prohibitions and of their exact effect on prenatal sex selection. These bans have been introduced at the national level, and there is therefore no way to assess the effectiveness of these laws at the micro-level in reducing sex imbalances at birth. Some studies tried to use available time series, contrasting outcomes before and after the ban, but the numerous intervening factors simultaneously at play in shaping regional SRB trends – fertility levels or intensity of son preference – reduce the relevance of this approach. There are also instances of a strong administrative commitment to implement the ban on prenatal sex selection in some areas. These specific local experiences may provide us with materials for assessing the real impact of a full enforcement of legal dispositions if comparative micro-level data are made available.

## **5.2 Supporting families with girls**

As stated previously, the legal prohibition of sex selection may undermine efforts to provide safe abortions to women, bearing in mind that the vast majority of prenatal tests and pregnancy terminations are unconnected to sex selection. Moreover, bans focus only on the symptom of a much wider and deeper system of gender discrimination pervading local society and do not address the underlying preference for sons. They are, therefore, at best a short-term solution to prenatal sex selection. Moreover, it is only a matter of time and of cost before sonless parents discover alternative methods to meet their gender requirements. In the framework used here, the so-called demand factors will remain in place and will simply force couples to adjust their strategy to the changing supply situation.

As for the demand side, the underlying reason for son preference can easily be converted into a purely economic interpretation of differentials in the returns

of girls and boys. This explains why the second most common policy option followed by legislators to address the economic imbalance between parents of girls and boys is to introduce financial and other incentives through conditional cash transfer (CCT) schemes.

Since it is not feasible for governments to tax boys – most of them born for random biological reasons – to discourage active sex selection, the alternative solution is subsidizing girls to counterbalance the perceived socio-economic disadvantage of raising girls. Some governments in Asia have enacted various provisions to provide rewards and compensation to girls and to their parents, including: cash paid on birth, amounts deposited in savings accounts with subsequent payments conditional on school attendance or immunization, scholarships for girls, payment at marriage, pension benefits to sonless parents, tax exemptions, and insurance policies. CCT programmes are often rather complex as they vary according to the families targeted (girl-only families vs. families with girls, poor vs. non-poor households) and their time frame (instant or long-term benefits).<sup>52</sup>

A clear advantage of these programmes is that they aim at redressing the inequality in gender valuation of children and allow parents with girls to devote more resources to their upbringing. They deal with some of the core aspects of gender discrimination in care and education and enhance the value of daughters. In fact, incentives can also be linked to several other worthy objectives such as birth registration, health behaviour, school enrolment, legal age at marriage, and contraception. Because of their flexibility and their wider ambit, these programmes may exert indirect or direct influence on many other outcomes related to gender equity and reproductive health. It would be somewhat misleading to see them only as instruments to correct skewed sex ratios, since CCT schemes have a potentially much larger scope.

However, such initiatives do suffer from some constraints and limitations. A first drawback relates to their implementation. CCT programmes are not always adequately advertised. They are fraught with the risks of corruption and embezzlement by the local administration. Another weak point is their targeting. They are of little use in areas where son preference is absent and this explains the wide differences in policy initiatives across Indian states that are unevenly affected by prenatal sex selection. In some countries, such reward-based programmes may also clash with strict fertility policies based on penalties for extra births. In addition, these programmes cannot easily simultaneously target poor and better-off households, since the relative costs of raising girls vary across households according to their socioeconomic level. As a matter of fact, most of them aim only at the poorest households; families above the poverty line are usually not eligible for the incentives. Programmes targeting middle-class households through tax rebates or other financial mechanisms would be far more costly to the treasury and politically less easy to justify. It may also be noted that these CCT schemes are akin to new poverty or welfare programmes, which, in democratic settings like India's, could have important electoral implications (Sekher 2012).

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<sup>52</sup> For instance, some schemes provide help on the birth of girls, while other schemes offer various types of support for the education of girls or even for their wedding. Parents of girls may also be entitled to special retirement benefits.

Cash incentives have also been criticized for their tacit recognition of unequal gender valuation, as if girls were to be regarded as a permanent liability for their families. Yet, these programmes also contribute to a gradual change in the local mindset and do, in fact, transform the gender system by raising the value of girls. There are additional benefits in terms of health behaviour, schooling and late marriage, as noted earlier. What is obvious is that since these programmes mostly target underprivileged households, their overall impact is to subsidize female children among the poorest sections, reinforcing the social imbalances in sex ratio and the relative masculinity of the rich.

In China, such efforts are part of the “Care for Girls” programme launched in 2003, which includes scholarships given only to girls, and assistance to parents in daughters-only families in the form of low-interest loans or special pension and social security benefits.<sup>53</sup> While there is still no published evaluation of the exact effects of this programme, this is probably the largest campaign ever launched to counterbalance the impact of son preference on reproductive behaviour. In India, these schemes are relatively recent, but they have been flourishing in states affected by skewed sex ratios. Their apparent success can be gauged by the number of recipients, sometimes exceeding the estimated target population, and the fact that they seem, in several cases, to be accompanied by a reduction in SRB levels (see Box 7). No systematic longitudinal study exists yet to demonstrate their direct impact on birth masculinity and indirect effects on health and education, but disaggregated census results may soon be available to assess their demographic effects.

### 5.3 Broader gender equitable policies

The programmes reviewed in the previous sections appear to leave the root cause of gender inequity unaddressed to a large extent. As anthropological research has long documented, active demographic discrimination and son preference exist chiefly in patrilineal family systems in which women play a marginal role. Conversely, wherever kinship systems possess more bilateral characteristics, son preference and gender discrimination are more superficial features of social systems and usually do not translate into active sex selection. Tackling gender inequity derived from kinship systems is a much more challenging enterprise, aimed at changing mindsets, attitudes and, ultimately, behaviours that are all inherited from unquestioned traditions.

There are two layers of interventions targeting patriarchal value systems and practices. The first relates to broad IEC (information-education-communication) policies and concentrates on advocacy campaigns to raise awareness and to change mindsets. It combines positive messages on the contribution of girls and women to family and society with negative messages on the implications of prenatal sex discrimination. This approach is easier and less expensive to implement than cash transfers or technology monitoring.<sup>54</sup>

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<sup>53</sup> On the Care for Girls programme, see for instance Li (2007), Eklund (2011).

<sup>54</sup> Communication and outreach are, for instance, important aspects of the more holistic “Care for Girls” programme in China. India’s UNFPA office has also accumulated a large experience in targeted communication on prenatal sex selection.

Well-targeted mass media campaigns ensure the creation of proper conditions for a change in attitudes and behaviour among specific groups, such as opinion and decision makers (religious leaders, party cadres, lawmakers, local civil servants), members of the medical community, and segments of the public (schoolgoing children, migrants). Community, religious and political leaders are targets of prime importance for these campaigns because of their potential to generate trickle-down effects. It is also essential for the medical community, often hastily blamed for the very existence of prenatal sex selection, to be part of the campaigns through its associations and prominent members because of their influence on the healthcare system and their role as sex selection providers.

The youth is a natural target for these efforts, since they are going to shape the future and may offer alternatives to the status quo defended by their parents. But, more broadly, campaigns directed at the general population are needed to counterbalance traditional value systems favouring male children. In many cases, gender bias and unequal family structures correspond to widely shared norms and representations inherited from the past. While these norms and values may have become irrelevant in modern society, they are still carried over by a strong social inertia and they tend to shape gender roles and expectations. There is no direct way through which legislations can address these normative systems. Long-term campaigns are required to displace old representations and ideologies.

Apart from advocacy campaigns promoting gender equity and women's empowerment, the media is a formidable tool for spreading awareness on the extent of sex imbalances, their nature and their potential consequences. Statistical data, sociological studies and in-depth reporting will serve as indispensable materials for well-informed press articles. Reports on census results, the local impact of bride scarcity, and the related rise in women's trafficking can, for instance, accelerate the public realization of the collective implications of selective abortions. Census and survey reports also offer strong fact-based materials and analyses for journalists and public opinion. Viet Nam provides the instance of a country where results of statistical surveys pointing to sex imbalances at birth have been immediately relayed by the media to the public, making prenatal sex selection a national issue within a few years.

At a local level, the publicity given to areas where sex ratios appear to be the most skewed leads to a process of "public shaming" that motivates decision-makers and civil society organizations to react. At the international level, the publicity given to the bias against girls and the resulting sex imbalances may affect the international image of a country and prompt governments to act.<sup>55</sup> At a community level, all families should also be made aware that individual sex selection is a crime against girls and has wider consequences on society. They should be informed in detail of the penalties for such actions and be convinced of their strict and fair implementation.

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<sup>55</sup> In Eastern Europe, the sudden realization of the extent of sex imbalances at birth has been to a large extent due to the recent resolution by the Council of Europe Parliamentary Assembly in 2011 (Stump 2011).

Raising consciousness is a slow process and may be less immediately effective in changing behaviours than cash transfers or ultrasound regulations. In fact, because advocacy relies on a gradual change in opinions, its final impact on attitudes and practices remains indirect. But its role in combating traditional attitudes inimical to girls is undeniable and it is integral to a comprehensive policy addressing prenatal sex selection. Rather than focus simply on outputs by measuring communication performance, opinion surveys should also help to assess the impact of campaigns in raising awareness, changing opinions and attitudes and mobilizing public support. Countries have already accumulated a wealth of experience in this respect based on various media materials and communication strategies. This experience will need to be properly evaluated and shared internationally.

The second strategy for combating discrimination takes a more direct approach on existing practices and norms, starting with the remains of gender inequity in the legal systems. This line of action is promising, yet more difficult to undertake in view of the deep entrenchment of gender attitudes and their historical transformation into cultural or religious norms. Several markers of gender inequity and patriarchal systems can easily be identified and could, in theory, be selected for intervention. To name a few: transmission of family name, inheritance rules, land rights, patrilocal marriages, unequal marriage payments, divorce rights, gender-based violence, old age support, biased religious practices, and population policies. Many of these issues are already covered by specific laws - for example family codes, employment laws and legislation governing property rights and succession.

Still, continuous efforts are required to ensure that all the aspects of these laws are gender-friendly. Many laws have not been touched yet and need redrafting. Even recent legislation may be incomplete. One famous example is the change in the Hindu succession laws in India. The amended Act passed in 2004 aimed at granting equal inheritance rights to daughters and sons and removed some of the unequal provisions existing in the joint family system. But several loopholes subsisted: for instance, the 2004 Act did not abolish unequal land property and tenancy rights in some states. Parents remain free to discriminate against children according to their sex in their will. Similarly, land reforms introduced in China have unwittingly reinforced the role of men and of patrilineal clans. In many other cases, the newly introduced provisions and laws reinforcing gender equity are not properly implemented. Such incomplete enforcements of these laws stem from the combined passive resistance of both citizens and local civil servants, a testimony to the rift existing between the legal framework projected by these laws and the strength of unbalanced gender arrangements on the ground.

Sometimes, new social legislations apparently unrelated to sex discrimination may also indirectly improve the situation of women. This is most notably the case in the gradual introduction of social security and pension benefits. China is clearly leading in this domain, with the social insurance system and the minimum living security programme having been established in all provinces in 2007. The gradual extension across the country of new insurance programmes addressing health, unemployment or pension issues will go a long way in making families

less dependent on sons for financial support. Elsewhere, the family remains the only institution supporting individuals against economic and health shocks, and its customary patrilineal nature marginalizes the contribution of women.

Other areas for intervention concern dimensions of gender inequity lying outside the purview of the law. Since many discriminatory practices are based more on customs than on written rules, governments have limited leverage on them and change should come from within. Religious and marriage customs largely fall in this category and correspond to what sociologists would call “sticky norms” (Kahan 2000). For instance, the role traditionally ascribed to sons in rituals following the death of their parents and the influence of Confucian traditions in East Asia provide illustrations of social domains in which governments have little influence, except through prolonged campaigning. Another example comes from the custom of patrilocal marriages. Irrespective of the improvements recorded in women’s economic, legal and social status, patrilocal marriage arrangements mean that married women will live with (or close to) their husbands’ family and directly contribute to its prosperity and well-being, reinforcing the asymmetrical nature of gender arrangements. This is one area in which Care for Girls has attempted to intervene, but most existing policies against sex selection have no provision for uxorilocal marriages that are often looked down upon.

Governments often profess that they “cannot change culture,” even though campaigns have already been successfully conducted against age-old social practices labeled as social evils or superstitions. There is an obvious need for innovative policy initiatives designed to address these asymmetrical customs, which constitute an obvious corollary of prevailing kinship systems favouring the male offspring. Both marriage arrangements and funeral customs illustrate two domains in which traditional practices across Asia tend to put women at a clear disadvantage and for which targeted interventions may be able to hasten social change. What we know of these “sticky norms” is that they are more amenable to progressive deterrence than to a frontal legal onslaught and the role of targeted campaigns is therefore primordial.

## **5.4 Strengthening policy responses**

The official recognition of the extent of sex ratio imbalances in several Asian countries took almost a decade to happen and we can distinguish different phases in this process. The smaller former socialist countries in Eastern Europe are going through the first diagnosis phase, in which the level of public awareness of prenatal sex selection is almost nonexistent. The inadequate statistical evidence tends to curb the realization of the nature of the situation. As a result, many lawmakers, law-enforcers and a large part of the population question the mere existence and magnitude of distorted sex ratios. This tends to slow down the policy responses to the sex ratio crisis and even prevent gender-friendly legislations from being adopted or properly enforced. In several countries, this phase is not yet over and any policy response will have to be preceded by concerted efforts in qualitative and quantitative studies to document the extent and context of sex imbalances.

Where demographic evidence was made available earlier, a lack of commitment among some of the major stakeholders at various levels is probably the reason for the belated engagement with some of the core issues of gender inequity. For instance, birth control policies may have stood in the way, with excess male births perceived as a mere harmless side effect in the process of fertility decline. In this second phase, studies will need to cover in greater detail the present and long-term gender implications of adverse SRB levels and a wide dissemination of these results targeting the main stakeholders is required.

But in the end, the solution for the political predicament lies in fostering alternative coalitions that bring together forward-looking legislators and administrators, concerned citizens, and civil society organizations to design the necessary legislations and ensure their ratification and implementation.<sup>56</sup> All policy components mentioned so far – regulation of sex selection, advocacy, incentives, and gender laws – would need to be part of the comprehensive response to the challenge of distorted sex ratios at birth.

An additional required element would be to ensure regular monitoring and evaluation of the programme component. There is indeed a wide gap between the wealth of schemes and policies initiated and the paucity of monitoring instruments available to assess their effectiveness on birth masculinity and their potential side effects and consequences on related issues such as access to abortion, status of girls, health behaviour or gender disparities.<sup>57</sup> The present review of these initiatives has, in fact, been hampered by the lack of any objective assessment of their functioning, direct impact, possible side effects, and cost effectiveness. Cash transfers, for instance, constitute a direct onslaught against unequal gender valuation, but they also consume a large amount of the government's financial resources. Therefore, an assessment of the effectiveness of such expensive schemes in reducing the perceived cost of raising daughters appears to be of primary importance.

Tools to evaluate the progress of specific policies should include baseline and regular follow-up surveys as well as in-depth retrospective analyses. The need for adequate monitoring and evaluation of policy initiatives is emphasized when public and civil society organizations from various regions are increasingly engaged in dialogue and experience sharing.

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<sup>56</sup> The successful fight against the tradition of foot binding in China, in which new associations ensured the rapid diffusion of new norms against foot binding within the community, is often mentioned in this connection (Wexler 2006). But unlike foot binding, sex selection is neither visible nor painful: missing girls and future unmarried men have no natural representative in society and may therefore remain voiceless for a long time.

<sup>57</sup> The study by Srinivasan and Bedi (2011) provides a detailed assessment of a successful intervention against sex discrimination.

# Emerging regional priorities and policy challenges

## 6

The gradual accumulation of local investigations and statistical studies has made it possible to get a fair idea of the current situation after more than 20 years of prenatal sex selection across Asia and Eastern Europe. We have today a more reasonable understanding of the main mechanisms behind prenatal sex selection, the dynamics at work in many settings and the main stakeholders of this crisis. It is also possible to confidently outline some of the likely future developments and point to the priority needs for effective intervention.

### 6.1 Emerging regional trends

The analysis has shown that though gender discrimination represents a somewhat predictable response of societies constrained by deep-seated patriarchal norms and practices, it is in no way a permanent feature of Asian societies. Son preference and patriarchal systems appear as a fixed component of the social matrix inherited from century-old traditions, but they are in reality part of the wider process of social transformations characterizing contemporary Asian societies that have already irreversibly reshaped many other purportedly traditional societal features. The wave of social and economic transformations has not always been beneficial to women. Prenatal sex selection is, in many ways, the product of economic and demographic changes. The emergence of smaller, nuclear family units has generated a dramatic squeeze effect on parents wanting sons. Market forces have rapidly responded to this increasing risk of sonless offspring by making sex selection technology accessible almost everywhere, and market-driven clinic owners and practitioners have rushed to meet the consumers' demand for prenatal testing. Similarly, governments have encouraged family planning campaigns that have unwittingly put unborn girls at risk and have found it almost impossible to regulate the ensuing prenatal sex selection.

In the course of this report, a significant number of future drivers of sex imbalances have been mentioned. For instance, there is still a significant potential for deterioration in parts of China, India and Viet Nam where prenatal sex selection has not yet set foot. The continuation and extension of the demographic transition and the increasing prosperity reaching larger segments of the population will spread prenatal sex selection to new territories and so far unaffected social groups. The same can be said of countries where son preference

appears well entrenched, but where other conditions for its emergence and diffusion are not yet met. Several such countries in South Asia are vulnerable to future deterioration in their sex ratios. Other regions in the world, such as countries in Africa or in the Middle East – where abortion is still rare or fertility levels high – may be affected in the future by prenatal sex selection. Meanwhile, technology itself may evolve towards methods easier to implement and more difficult to detect, as the newly available techniques in industrialized countries suggest.

There are therefore several signs of potential further deterioration for the future, ranging from the intensification of sex selection among the first births to the diffusion of gender discrimination to new regions and poorer groups. The disappointing results of the latest census in Viet Nam or India tend to confirm this pessimism. In India, elevated sex ratio levels were recorded in several states such as Maharashtra, Rajasthan and Uttar Pradesh, pointing to an overall deterioration in 2011 that confirms that the sex ratio crisis in several areas is yet to reach its apogee. Similarly, recent census results from China indicate the degradation of SRB levels of some provinces such as Guizhou or Ningxia.

Yet, progresses have been observed in many areas and gender preferences are also amenable to external change and policy interventions. Social change, economic development and government regulations now play a major role in shaping social and economic behaviour and in reducing age-old inequalities. These transformations contribute to the gradual erosion of traditional gender inequity inherited from rural societies and of the rationale for sex selection. South Korea offers the textbook example of a full transition of its SRB. After reaching levels above 115 in the mid 1990s, birth masculinity has gradually declined back to almost normal levels and now oscillates around 106 male births per 100 female births. This return to normalcy has been associated with rapid social and economic transformations that have affected South Korean society during this period and the accompanying changes in gender attitudes following the progress in women's education and access to employment. Yet, the simultaneous impact of the different facets of government interventions – from the prohibition of sex selection to campaigns promoting gender equity and legal changes – remains poorly documented.<sup>58</sup> Future research should endeavour to explore in detail the mechanisms at work during the late 1990s and the respective contributions of spontaneous social change and targeted policy interventions in South Korea. This will provide important lessons for countries committed to fighting prenatal sex discrimination.

Trends towards greater gender indifference have also been observed in Taiwan (Lin 2009).<sup>59</sup> A less often examined example is Japan where the traditional strong son preference manifested through fertility behaviour appears to have entirely disappeared after the Second World War. Legislations that addressed both gender inequity and unregulated prenatal selection, along with a process

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<sup>58</sup> Prenatal sex identification in South Korea was outlawed in 1987 and offenders from the medical community were threatened of severe penalties since 1992. At the same time, the family and labour laws were changed to remove gender inequity in employment and family matters and several media campaigns were launched. See Kim (2007), Chung and Das Gupta (2007) and Chun (2011).

<sup>59</sup> See Lin (2009) on Taiwan and Kureishi and Wakabayashi (2011) on Japan.

of social change which reduced some of the most blatant differentials between men and women, seem to have been the main drivers for this complete reversal of SRB trends.

While this downturn has not been replicated elsewhere, SRB trends have nevertheless been stagnating or declining in a few countries during the last ten years.<sup>60</sup> In Caucasian countries and in the Southeast Europe, SRB levels reached their peak at the beginning of the century and have at times slightly decreased since then. Annual SRB estimates for China, which had documented a somewhat unstoppable increase since the late 1980s, did eventually reach a plateau around 120 in 2005. Over the last five years, a slight downturn seems perceptible: not only has the SRB ceased to increase, but there is also a modest, but consistent downward trend confirmed by the latest census-based estimate in 2010. Disaggregated data also suggest that the richer sections of the population tend to exhibit lower SRB levels, a feature implying that continuing economic progresses and social change may help to bring down birth masculinity in the country.<sup>61</sup> In addition, the SRB seems to have levelled off or decreased in the most developed parts of the country such as the metropolitan regions. The disaggregated results of the 2010 census will shed additional light on the effectiveness of the intervention in the Chinese counties where various initiatives from the Care of Girls programme were launched.

In India, where a regional deterioration is visible from the 2011 census figures, observers have often missed the brighter figures from the northwestern regions. Provisional census data, in fact, depict a decennial stagnation or a substantial reduction in child sex ratio levels in the most affected northwestern states of Punjab, Haryana, Delhi, Himachal Pradesh and Gujarat. In some districts from Delhi to Gujarat, the improvements in SRB levels have indeed been remarkable according to census data and other sources (see Box 7).

While there is no analytical study of the factors behind this recent change across Asia, it is fair to assume that a number of policy interventions may have been instrumental in this turnaround in India or China. These ranged from the implementation of the ban of sex-selective abortions to cash transfer schemes and active campaigning. If we attempt to link this turnaround to the three intermediate factors of prenatal sex selection examined earlier, it seems obvious that none of these changes can be attributed to higher fertility levels. Two other factors may account for the decline in birth masculinity: an increased control of prenatal facilities, limiting the frequency of sex-selective abortions, and a change in the gender preference system, characterized by a reduction in the bias against daughters. These are precisely the two dimensions of the sex imbalances that have been targeted by policy initiatives over the last decade in India.

As a conclusion, we should emphasize again that the situation is likely to deteriorate in some regions in the years to come, with a new rise in SRB levels observed in specific areas. The complete sex ratio transition cycle, from the initial ascent in the proportion of male births fuelled by the access to new technology to the later downturn caused in particular by receding son preference, has only

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60 See Das Gupta et al. (2009) and Guilmo (2009).

61 On the social and economic factors of SRB decline in China, see Murphy et al. (2011) and Guilmo and Ren (2011).

been observed in the Republic of Korea. But encouraging signs from China and India suggest that the transition towards normal levels of birth masculinity is under way in several regions. In addition, governments and civil societies have, on the whole, taken the full measure of the phenomenon and have started to recognize its unsustainable implications for the future demographic balance in the affected regions. The introduction of a battery of interventions during the last ten years is a clear testimony to this new proactive attitude. Yet, prenatal or postnatal discrimination against girls has not decreased in many areas, and even if it were to decline rapidly, several millions of men will get trapped in this unprecedented demographic change. Accelerating the turnaround towards normal sex ratios through greater gender equity is, therefore, both an achievable and highly desirable objective for the near future, but planning for the future of the younger generations and the impact of sex imbalances has become the next item on the agenda.

### Box 7: The downturn of birth masculinity in northwest India

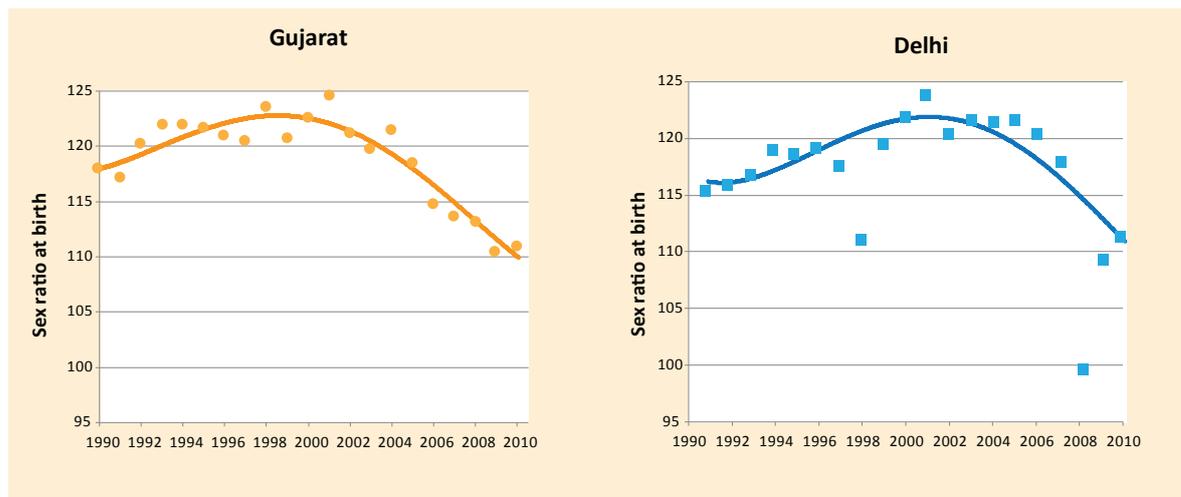
There have been signs of significant changes in SRB levels in several states in northwest India from the 2011 census. But, when available, civil registration data confirm the downward trend illustrated by the census data as annual estimates for two states reproduced below demonstrate.

Civil registration figures in Punjab for instance suggest an overall significant decline in SRB from 133 in 2001 to 122 in 2008, somewhat similar to the trend derived from the census. We can even examine individual districts such as Shahid Bhagat Singh Nagar (formerly Nawanshahr) in Punjab. The drive against selective abortions conducted in this district by local authorities in 2005 is described as the most vigorous campaign to prevent prenatal sex selection. It has even drawn some criticism on ethical grounds for some of its aspects. But 2011 census data also indicate that this district registered a record fall of 10 per 100 in its child sex ratio during the ten years preceding the census. The district's sex ratio now stands as one of the lowest in northwest India.

Delhi provides a precious illustration of the benefits of SRB monitoring, since birth registration in Delhi is of very good quality. These statistics tell us a somewhat unexpected and enlightening story on regional SRB trends. Birth masculinity has long been very high in Delhi, as attested by 2001 census estimates. Birth registration data indicate that SRB levels in Delhi rose very early and were already around 115 during the 1990s, increasing to 120 by 2000. Delhi's vital statistics indicate stagnation after 2000, with SRB oscillating around 121 till 2005, an admittedly very high plateau of prenatal discrimination for one of India's most developed metropolitan areas.

However, a distinct downward trend has been visible since 2006. Birth masculinity decreased to almost 115 at the end of 2007, a level in line with the 2011 census estimate for 2005-2011 births. Then, the relative number of male births suddenly plunged in 2008. This year coincided with the introduction of the Ladli scheme, a conditional cash transfer programme targeting parents of girls from the poorest households (Sekher 2012). As a matter of fact, the SRB fell below 100 and female births outnumbered male births in 2008, an unlikely occurrence that local authorities gladly attributed to the success of their financial scheme. However, the sex ratio at birth measured over more than 330,000 births in Delhi simply cannot fall under 100. The success of the scheme probably resulted in a leap in spurious registration rather than a real reversal of the biological sex ratio at birth.

## BOX 7 Continued.....



What remains undeniable is that a large chunk of the population of Delhi promptly took notice of the introduction of the scheme and of its potential benefits to parents registering female births. Since then, birth registration data show that the SRB recovered to more plausible levels above 105: 109.3 in 2009 and 111.0 in 2010. These estimates, corroborated by data from other sources, suggest that a formidable decline has probably taken place in Delhi, bringing the SRB from 120 to 110 in five years. Even if the upsurge in female births in 2008 was largely artificial, the Ladli scheme has no doubt contributed to this remarkable achievement of bringing down the SRB.

In addition to the case of Delhi, the neighbouring state of Haryana has benefited also from a somewhat similar, but older CCT programme directed at parents of girls. The Apni Beti Apna Dhan programme was launched in 1995 and may already have influenced birth masculinity and girl survival. The programme in Haryana was complemented by its own Ladli scheme in 2006. The official recent SRB estimates around 116 in 2009 points to a slight decline from levels in the 120-125 range recorded after 2000.

In Gujarat, annual SRB estimates confirm the presence of an earlier downturn. The SRB first peaked around 2000 at a level close to 125. But the proportion of male births has then gradually declined at a sustained rate from 122 to 110 in less than ten years, a decrease the regional government attributes to the success of its *Beti Bachao Abhiyan* scheme. As with Delhi, birth registration data from Gujarat chronicles a rather rapid decrease in SRB levels over the last decade. Such a turnaround is clearly visible from annual estimates, but hardly distinguishable from census decennial figures based on child sex ratios.

## 6.2 Recommendations

The challenges ahead differ significantly according to the various contexts presented here. We may therefore distinguish the different phases in which countries or regions are in relation to prenatal sex selection. There is an initial phase in which instruments of diagnosis are needed to launch the policy dialogue with local governments and other stakeholders in areas where the situation remains poorly known or denied.

The other countries where our knowledge of their status vis-à-vis prenatal sex selection is stronger correspond to a more advanced phase, in which a closer monitoring of trends and a variety of policy interventions are required. Within a South-South cooperation framework, these “more advanced” countries could also provide assistance to countries where prenatal sex selection is still lesser known.

Our knowledge base is fragmentary and presents serious gaps in some poorly studied regions. In several areas, there is a lack of basic information on demographic trends and of field surveys on the gender situation and the origin of son preference. For instance, the underpinnings of gender inequity in Southeast Europe and in the Caucasus and the exact contribution to it of the accelerated social and political change over the last 20 years are poorly known. We are equally unfamiliar with the role of the gradual dismantlement of most state protection and insurance systems in the further reduction of birth rates.

At a more global level, it is felt that one of the major requirements today is a better monitoring of the current situation. There is for instance only indirect evidence of the trends in Pakistan or Nepal. Statistics are incomplete and rarely provide an adequate picture of annual trends or of regional differentials.

Decennial censuses are still often the only reliable source for tracking emerging trends. The absence of birth registration statistics prevents us from monitoring the rapid changes that seem to have occurred in several regions. It is no coincidence if South Korea is the country with both the best statistical system and the most effective experience in curbing excess sex ratios. Learning from the past experience of countries in which the issue of skewed sex ratios went unrecognized for more than a decade, a country like Viet Nam seems precisely to have opted for a systematic process of information collection and sharing despite the fact that the rise in its sex ratio is rather recent.

This report recommends the following as essential steps to combat gender discrimination and prenatal sex selection. The first five are for countries in the first phase.

### **Recommendations for countries in the first phase.**

1. Local qualitative surveys of families and health practitioners to describe the mechanisms and their rationale of sex selection.
2. Analysis of direct and indirect statistical evidence such as surveys, birth registration, and sample census data.
3. Dissemination of the findings through publications, workshop, press conferences and other media.
4. Initiation of dialogue with concerned government agencies.
5. Comparative analysis of international trends.

In country where prenatal sex selection has been identified, the introduction of government measures are needed to reduce the impact of adverse sex ratios. At the same time, regular monitoring of demographic trends, most notably through a stronger civil registration system, remains essential to identify newly affected regions or social categories, as well signs of a turnaround in specific areas. There will be a continuous need to share information and statistics, both with the public and government departments, and to strengthen the capacity for intervention of government and NGOs.

### **Recommendations for countries where prenatal sex selection has been identified.**

1. Comprehensive policy interventions adapted to each social and cultural setting covering advocacy, regulation of prenatal sex selection, support to families with girls, and change in relevant laws and traditional institutions.
2. Regular public communication campaigns on the policy objectives and their components (including penalties to offenders).
3. Capacity building activities among the government agencies and NGOs.
4. Analysis of trends through direct and indirect statistical evidence at disaggregated level - surveys, birth registration and census.
5. Qualitative surveys to describe the adjustments of social systems to sex imbalances among adults notably in relation to marriage, sexuality, and gender-based violence.
6. Regular dissemination of the findings in publications, workshop, press conference and other media.

These monitoring efforts should also extend to the working of the policy initiatives launched over the last ten years by regional and national governments to curb rising sex ratios at birth. There is a serious need to know what works and how it works in order to help design the most effective policy responses and understand which experiences can be replicated in different contexts. South-South cooperation may become an essential instrument in this process. Further research is also required to assess the functioning and the impact of interventions, especially for regulation of sex selection, advocacy campaigns and CCT schemes.

### **Recommendations for regional actions.**

1. Dedicated surveys to assess the local performance and impact of interventions.
2. Comparative review of current and past campaigns, policies and interventions to fight sex selection in Asian countries (South Korea, India, China including Taiwan, Singapore, Viet Nam).
3. Statistical evaluation of the impact of campaigns and interventions recently implemented across Asia.
4. Continued monitoring of international trends in sex ratio at birth and sex imbalances among adults.
5. Support to international dialogue on the policy responses to prenatal sex selection: communication strategies, evaluation of programme cost effectiveness, role of government and NGOs.

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