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MDGs and gender inequality

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Abstract

As the countdown to 2015 has begun, debates about the continuation of the MDGs and their reformulation have taken on greater urgency and significance. Our view is that there is a need to reformulate them to better reflect deprivations and inequities that are pervasive but not sufficiently emphasised in the present version. A case in point is gender inequality. While various dimensions of gender inequality are included in the MDGs, we argue that these reflect a somewhat narrow focus – especially because the deprivation that women face from the womb to the rest of their lives – is not fully captured. Following Amartya Sen and others, we focus on the phenomenon of 'missing women' that best captures the cumulative impact of multiple deprivations to which they are subjected. Our analysis reinforces the case for this measure, and broadens and updates recent estimates of missing girls and women. The key questions addressed are the reasons underlying the continuing increase in the number of missing women in China and India. We broaden this measure by including: (i) missing adult women; (ii) excess maternal mortality ratio; (iii) casualties resulting from violent conflicts and the forms these take; and (iv) domestic violence against women. Even though the magnitudes differ, these together are a brutal violation of women's human rights that remains pervasive in a large part of the developing world – especially Asia and North Africa. The perspective on gender inequality offered here may seem daunting, but raises concerns that go much beyond the somewhat narrow focus that the MDGs embody. The policy implications are accordingly more formidable, but underline the centrality of women's empowerment through education and employment opportunities, social networks that give women voice to express their concerns arising from life-long deprivations that often take brutal forms, expansion of health services to reduce infant and maternal mortality risks, and enforcement of laws that penalise violation of women's human rights.

Keywords: MDGs, gender equality, missing women, maternal and child mortality, son preference, violence, conflicts

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Introduction

As the countdown to 2015 has begun, deep questions have been raised and are being debated about the continuation of the MDGs and their reformulation. Broadly, the views could be classified as: abandoning them as they are unfair to low-income countries, with limited capacity for achieving them; extending them to a longer period to enable countries lagging behind to catch up with the rest; and reformulating them to better reflect deprivations and inequities that are pervasive but not sufficiently emphasised in the present version. A case in point is gender inequality.

The concern for gender equality in MDGs takes many distinct forms, including parity in school enrolments, share in productive employment, women's representation in parliament and an important role in household decision-making (UN, 2013).[1] While these are important taken together as a measure of gender inequality, we argue that they reflect a somewhat narrow focus – especially because the deprivation that women face from the foetal stage to adulthood is not fully captured. This is referred to as the phenomenon of 'missing women', following the pioneering contributions of Amartya Sen in a series of writings (1990, 1992, 2001, 2003) that led to other significant contributions by leading demographers. Our analysis reinforces the case for this measure, and broadens and updates recent estimates of missing girls and women.

1. Scheme

In Section 2, we first review the concept of missing women as developed by Amartya Sen. This is followed by a review of early estimates of missing women, given mainly by Sen, Coale and Klasen, among others, for the 1980s and early 1990s. In the next subsection, we review the updated estimates by Klasen and Wink for the 1990s. This is followed by our own updated estimates for China and India during 2001 and 2011. We compute both absolute numbers of adult and (aggregate of) missing women and children in the age-group 0-4 years, and their shares in surviving women and girls. The next subsection reviews the role of the one-child policy and how it contributed to a worsening of imbalance in the child sex ratio (girls/boys). As South Korea is one of the Asian countries with a highly unbalanced sex ratio of girls to boys, the reasons underlying the daughter deficit are examined, based on a recent econometric analysis. Some important policy insights that have wider relevance emerge from the review. Section 3 is devoted to a review of the recent evidence on variation in maternal mortality ratio and the underlying reasons. These estimates are updated by us for China and India in a context of changes in birth rates and life expectancy. In Section 4, we examine explanations offered for the unbalanced sex ratios of females to males and of girls to boys. The first subsection is devoted to cultural versus biological factors; the next subsection reviews evidence on sex-selective abortions, with a focus on India in the broader context of a few other Asian countries where such abortions are widely prevalent; this is followed by a related subsection on the extent and impact of sex-selective abortions on

[1] As progress in these indicators and prospects of eliminating gender disparity by 2015 or later are examined elsewhere (Imai et al. 2013), we will concentrate here on broadening the vision of gender equality and new estimates.

missing girls. Section 5 reviews evidence on conflicts and gender inequality, through different channels. The important point here is that these channels have brutal and long-lasting effects on the lives of women and children. Following a recent report (WHO, 2013), Section 6 examines the pervasiveness of often brutal forms of violence against women because of their powerlessness, and the public health concerns raised by them. The global review in the first subsection is followed by an in-depth study of domestic violence in India and what needs to be done to curb it – especially empowerment of women. The concluding section summarises the main findings with a broad brush treatment of policies needed that are admittedly more ambitious and daunting, but not infeasible.

2. The missing women

(a) Concept and measurement

In a series of writings, Sen (1990, 1992, 2001, 2003) has drawn attention to multiple forms of gender inequality that begin from the womb and continue thereafter. As elaborated, gender inequality is not one homogeneous phenomenon, but a set of disparate and interlinked problems. Following Sen, we will concentrate on missing girls and women. To the extent feasible with available evidence, attention is also devoted to sex-selective foetal abortions.

One problem is the undernourishment of girls as compared with boys. Although girls are no more deprived than boys at the time of birth, ample evidence exists suggesting that an initial neonatal condition of broad nutritional equality turns into a female disadvantage. It is not so much a result of girls being fed less than boys, as of neglect of healthcare of the former. Undernutrition is largely due to greater incidence of illness, as it affects both absorption of nutrients and performance of bodily functions.

Maternal undernutrition is much more common in South Asia than in other regions. Significant proportions of women are undernourished, based on body mass index or BMI (Kulkarni et al., 2013a), among ever married women, with consequential characteristics (e.g. incidence of anaemia).

Yet another related concern is prevalence of low birthweight.[2] Globally, more than 20 million infants are born with low birthweight, with high concentrations in two developing regions: Asia and Africa. Seventy-two percent of low birthweight (LBW) infants in developing countries are born in Asia, where most births also take place, and 22 percent are born in Africa. India alone accounts for 40 percent of low birthweight births in the developing world and more than half of those in Asia (UNICEF, 2004).

Sen, among others, argues that these problems are interconnected causally. One causal pathway is: neglect of girls and women tends to yield more maternal undernourishment, and this in turn tends to yield more foetal deprivation and distress, underweight babies, and child

[2] The incidence of low birthweight (LBW) in a population is defined as the percentage of live births that weigh less than 2,500g out of the total of live births during the same time period. The low birthweight incidence rate therefore is: (number of live born babies with birthweight less than 2,500g/number of live births) x 100. There are two main causes of LBW: premature birth and intrauterine growth retardation (IUGR).

undernourishment, leading to long-term health risks.[3] More specifically, low birthweight babies who suffer from growth retardation in their childhood generally grow up to be adults of short stature and low body mass index (BMI). When the BMI falls below a critical value, a person is more prone to various functional impairments, such as high morbidity, and low work capacity. Through a different pathway that links directly to adult ailments, Barker et al. (1995) show that low birthweight is closely associated with the higher incidence much later of several adult diseases, such as hypertension, glucose intolerance, and other cardiovascular hazards.[4]

(b) Estimates of missing women

Given similar health care and nutrition, women are likely to have lower age-specific mortality rates than men do. This appears to reflect primarily biological differences. Indeed, even female foetuses tend to have a lower probability of miscarriage than male foetuses have.
Just about everywhere, more male babies are born than female babies, but throughout their respective lives the proportion of males goes on falling as we move to higher and higher age groups, due typically to greater male mortality rates, as in Europe and North America. The excess of females over males reflects this greater survival chance of females in different age groups. However, in many parts of the developing world, Asia and North Africa, females receive fewer resources, and less health care than males do. Consequently, the mortality rates of females often exceed those of males in these regions. The concept of "missing women" was designed to capture women's adversity in mortality and to better understand the quantitative difference between (1) the actual number of women in these countries, and (2) the number we expect to see if the gender patterns of mortality were similar in these countries as in other regions of the world that do not have a significant bias against women in terms of health care and other resources for survival (Osmani and Sen, 2003).

First, let us consider the contrast in female/male ratio between the developed and two developing regions. In Europe and North America, the sex ratio is 1.05 and yet the global ratio is 0.98. This 'shortfall' is glaring in Asia and North Africa: the ratio is 0.97 in Egypt and Iran, 0.95 in Turkey, 0.94 in China and Bangladesh, 0.93 in India, and 0. 92 in Pakistan. Next, using the female–male ratio for Sub-Saharan Africa (1.02), which exhibits little bias against women in terms of health care, and social status and mortality, Sen (1990) calculated the number of missing women elsewhere. With India's female–male ratio of 0.93,

[3] There is, of course, no one-to-one relationship between the weight at birth and subsequent weight and height during childhood, because of the phenomenon of 'catch up growth' that offsets a weight deficit at birth by moving low weight babies along an accelerated growth path. Yet, a large body of epidemiological evidence suggests that, given the same environment, a baby born with low birthweight is much more likely to remain undernourished (in terms of height-for-age and weight-for-age) than one born with normal weight (Osmani and Sen, 2003).

[4] Known as the 'foetal origin of adult disease' hypothesis, it postulates that the same nutritional deprivation that causes intrauterine growth retardation leads to low birthweight and much later ailments that afflict adults. When faced with inadequate access to nutritional resources (owing to maternal undernutrition), the foetus undergoes an adaptation. This adaptation serves the foetus well by helping it cope with nutritional stress in utero, but the same adaptation also hampers its ability to cope with the conditions of relative plenty that might be encountered in later life. Hence, there is a greater risk of falling prey to chronic diseases for low birthweight babies who grow up to be relatively affluent adults (Osmani and Sen, 2003).

there is a difference of 9 percent (of the male population) between that ratio and the Sub-Saharan African ratio of 1.02. This yielded a figure of 37 million missing women in India in 1986. Using the same Sub-Saharan ratio, the number of 'missing women' in the world appeared to be more than 100 million.

There are of course alternative methodologies and estimates of missing women. Using Western demographic experience without female disadvantage, Coale (1991) estimated 29 million missing women in China, 23 million in India, and an overall total of 60 million for selected countries. Klasen (1994) calculated the 'gap' of missing women in the contemporary third world by comparing the actual number of women with the expected number estimated from European demographic history. The estimated missing women were 80 million.[5] As emphasised by Sen (2001), it is not so much the difference between these estimates, but the fact that 'gender bias in mortality takes an astonishingly high toll' (p. 471).

(c) Updated estimates of missing women in the 1990s

The estimates of missing women in Sen, Coale and Klasen were based on data in the 1980s and early 1990s, using different methodologies. In a more recent analysis Klasen and Wink (2002) update their estimates of missing women using data for the 1990s.[6]

When the countries included by Sen, Coale and Klasen were considered, the estimated total number of missing women for the 1980s and early 1990s was about 87 million.[7] Using Sen's assumption of the sex ratio prevailing in Sub-Saharan Africa increased the number to 102 million. Using Coale's assumption based on the West model life tables and a fixed sex ratio at birth lowered the estimate to 58 million.

Globally, the number of women rose from 87 million to 94 million. Thus the cumulative impact of gender bias in mortality exacted an increasing absolute toll on women. However, the number of missing women as a share of surviving women fell from 7.7 percent to 6.9 percent.

In China, the number of missing women rose from 34.6 million to 40.9 million, an increase of 6.3 million over the period 1990-2000. The share of surviving women also rose from 6.3 percent to 6.7 percent. India recorded a small increase in the number of missing women – from 38.4 million in 1991 to 39.1 million in 2001. The share, however, fell from 9.4 percent to 7.9 percent.

[5] The 2001 results are similar to the 1981 results and there are reasons to believe that some of the oscillations are also due to more a complete enumeration of females (Dyson 2001). See also Klasen Wink (2002) for an insightful review of the evidence.

[6] The methodology used is the same as that used by Klasen (1994). Based on the East model stable populations selected according to the mortality level and population growth and a predicted sex ratio (boys/girls) at birth obtained from a regression of sex ratio at birth on life expectancy at birth, estimates of missing women were calculated as the difference between actual and expected women. This is extended to the 1990s.

[7] Note that this estimate is slightly higher than that reported in Klasen (1994) because of (i) final adjustments to the census returns in China, India and Egypt; and also because of (ii) slight differences arising from the expanded regressions predicting the sex ratio at birth.

As sex ratios declined in most regions and countries, there was a slight decline in the share of missing women, while population growth ensured that the absolute number of missing women increased in several countries (Klasen and Wink, 2002).

(d) New estimates of missing women in India and China

Using more recent data for India and China, we have carried out a detailed estimation of missing women. These estimates include missing girls, adult and all women. Updating estimates of missing women in these two countries is important, as China accounted for 44 million missing women, and India for 37 million in a total of more than 100 million worldwide (Sen, 1992). So the question addressed below is whether these numbers have risen in the more recent period, 2002-2011.

Let us first consider the results in Table 1.

The population growth rate was faster in India than in China (17.65 percent and 5.19 percent) over the period. The male population also grew at a much faster rate in India (17.21 percent, and 5.03 percent). The growth rate of female population was faster in both countries – especially in India – compared with the male population growth rate (18.13 percent in India, and 5.37 percent in China). Life expectancy at birth rose both for males and females in both countries – from 60.6 years to 63.6 years for males in India, and from 69.6 years to 71.6 years in China; and from 62.6 years to 66.7 years for females in India, and from 72.9 years to 75 years in China.

The sex ratio rose in India rose from 932.91 per 1,000 males in 2001 to 940.27 in 2011, implying a decadal growth of 0.70 percent. In China, the sex ratios were slightly higher – 937.64 in 2001 and 940.69, implying a lower decadal growth rate of 0.33 percent. Using the same sex ratio norm that Amartya Sen used (1,020 per thousand males), our estimates of missing women rises from 46.35 million in 2001 to 49.73 million in 2011, an increase of 3.38 million. The decadal increase was thus 7.30 percent. Although the increase in number of missing women *despite* a higher sex ratio may seem surprising, it is not, as the number of males grew rapidly, which more than compensated for the smaller difference between the sex ratio norm and the actual sex ratio in 2011. However, as a share of surviving women or as a relative measure of missing women, there was a reduction – from 0.09 in 2001 to 0.085, implying a decadal reduction of 9.17 percent.

Turning to missing girls in the age group 0-4 years, the child population decreased from 120.08 million in India in 2001 to 118.33 million in 2011, implying a decadal reduction of 1.47 percent. The population of boys decreased from 63.58 million to 62.74 million, implying a decadal reduction of 1.32 percent. The population of girls decreased from 56.51 million to 55.59 million, a decadal reduction of 1.63 percent. Thus, the rate of reduction of girls was slightly faster. The sex ratio decreased from 888.79 girls per 1,000 boys in 2001 to 885.96 in 2011, implying a decadal reduction of 0.32 percent. Using a sex norm of 952 girls per 1,000 boys (Bhaskar and Gupta, 2007), there was a slight increase in the number of missing girls – from 4.04 million to 4.17 million. As a share of surviving girls too, the number rose – from 0.072 to 0.075, implying a decadal growth of 3.08 percent.

Table 1: Missing women and girls in China and India

Country	China				India			
Year	**2001**	**2011**	**Decadal change**	**%Decadal growth**	**2001**	**2011**	**Decadal change**	**%Decadal growth**
All age								
Both sexes population (in millions)	1270.74	1336.72	65.97	5.19	1028.61	1210.19	181.58	17.65
Male population (in millions)	655.82	688.78	32.96	5.03	532.16	623.72	91.57	17.21
Female population (in millions)	614.92	647.93	33.01	5.37	496.45	586.47	90.02	18.13
Sex ratio (females per 1000 males)	937.64	940.69	3.05	0.33	932.91	940.27	7.36	0.79
Sex ratio norm (females per 1000 males)	1020.0	1020.0	0.00	0.00	1020.0	1020.00	0.00	0.00
Missing women population (in millions)	54.01	54.63	0.61	1.14	46.35	49.73	3.38	7.30
Missing women relative to surviving women	0.088	0.084	-0.004	-4.01	0.093	0.085	-0.01	-9.17
Children 0-4 years								
Both sexes population (in millions)	83.93	77.31	-6.62	-7.89	120.08	118.33	-1.76	-1.47
Male population (in millions)	45.26	41.40	-3.85	-8.52	63.58	62.74	-0.84	-1.32
Female population (in millions)	38.68	35.91	-2.77	-7.15	56.51	55.59	-0.92	-1.63
Sex ratio (females per 1000 males)	854.56	867.33	12.77	1.49	888.79	885.96	-2.83	-0.32
Sex ratio norm (females per 1000 males)	952.38	952.38	0.00	0.00	952.38	952.38	0.00	0.00
Missing girls population (in millions)	4.43	3.52	-0.91	-20.46	4.04	4.17	0.12	3.08
Missing girls relative to surviving girls	0.114	0.098	-0.016	-14.336	0.072	0.075	0.003	4.791

Notes: 1. Calculated by the authors. Comparable data for India and China is obtained from International Data Base (IDB) from http://www.census.gov/population/international/data/idb/informationGateway.php and Census of India, Govt. of India.
2. Missing women**/**girl population = (Sex ratio norm - Sex ratio)*male population/1000.
3. Missing women/Girls relative to Surviving women/Girls l= Missing girls population/Female population (in millions)
4. **Decadal change** =Values in 2011 column - Values in 2001 column and **%Decadal Growth** = **Decadal change***100/values in 2001column.

So the contrast is striking – while absolute numbers of both missing women and girls rose – especially of women – the relative shares of missing women decreased, while those of missing girls rose.

In China, child population decreased more sharply – from 83.93 million in 2001 to 77.31 million in 2011, implying a decadal reduction of 7.89 per cent. Boys' population decreased at a faster rate than that of girls – the former decreased from 45.26 million in 2001 to 41.40 million in 2011, a decadal reduction of 8.52 percent. A smaller number of girls decreased from 38.68 million to 35.91 million, a reduction of 7.15 percent. Sex ratio of girls rose – from 854.56 to 867.33, a decadal growth of 1.49 percent. Using the same norm as for India (952.38 girls per 1,000 boys), we find a reduction in the number of missing girls – from 4.43 million to 3.52 million – a large decadal reduction of 20.46 percent. Relative to surviving girls, the share fell from 0.114 to 0.098, a decadal reduction of 14.36 percent.

So the contrast between China and India is in some ways striking. The absolute number of missing women in India, though lower than in China, rose much faster. However, relative to surviving women, the reduction was larger in India. The absolute number of missing girls was slightly larger than in China in 2011. However, while in China the number fell sharply, there was a small increase in India. The relative number of missing girls also declined sharply in China, while there was a small increase in India over the decade 2001-2011.

In brief, the deprivation of women from the womb through to the rest of their lives remains pervasive, *despite* changes in the decade, 2001-2011.

As shown in Table 2, the sex ratio (female/1,000 males) in China varies across the age groups 20 plus four years and successive four-year intervals, but without a clear-cut pattern in 2001. In the oldest age-groups, 65-69, 70-74 and 75 +, the ratios are highest, with considerably higher ratios in the two oldest age-groups, 70-74 and 75+, than the norm of 1,020 females/1,000 males. The ratios are also relatively high among two younger age groups, 25-29 (950.26) and 35-39 (948.18).The estimate of missing adult women in the age group 20+ was 27.88 million. In the age groups, 20-24 years, 25-29 years, and 30-34 years, the numbers of missing women rose, falling slightly in the age-group, 35-39 years, and older age groups except those above 70 years (in which there was an excess of adult women). Relative to surviving women, the share of missing adult women was 6.7 per cent. The corresponding shares in most age groups were high, starting from the youngest (20-24 years) and much higher in older age groups (40-44 years, 50-54 years, 55-59 years, 60-66 years) and, not surprisingly, negative in the two oldest age groups (70-74 years and 75 +years).

Over the period 2001-2011, the adult female/male ratio rose from 956.10 to 967.03. The age-specific ratios display an interesting pattern. In the age groups above, 30+years, the sex ratios were higher in 2011. Both in the younger age groups, 20-24 years and 25-29 years, as also in the oldest two age groups, the ratios were lower. The number of adult missing women was

slightly lower in 2011 (26.96 million, as compared with 27.88 million in 2001). The numbers were, however, higher in the youngest age group, 20-24 years, and lower up to the age-group, 35-39 years, higher in the next age group, 40-44 years, lower in older groups and an excess in the oldest age group, 75 +. The share of missing adult women was lower in 2011 (fell from 6.7 percent in 2001 to 5.5 percent in 2011). Except for the two youngest age groups, 20-24 years and 25-29 years, among all older age groups the relative share of missing women fell, with an excess in the oldest age group, 75+.

So the point to note is that age-specific mortality rates make a difference. However, a limitation of the present analysis is the fixity of the sex ratio norm across all adult age groups.

Table 2: Missing adult women in China, 2001-2011

Age group (in years)	Adult age group												
	20+	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+
Total population, 2001 (in millions)	853.53	93.98	112.89	126.07	116.10	76.09	86.86	64.30	47.11	41.05	35.65	25.82	27.60
Male population, 2001 (in millions)	436.34	48.46	57.88	65.02	59.60	39.46	44.61	33.30	24.42	21.29	18.01	12.60	11.69
Female population, 2001 (in millions)	417.19	45.51	55.00	61.05	56.51	36.63	42.26	31.00	22.69	19.76	17.64	13.22	15.91
Sex ratio 2001 (females per 1000 males)	956.10	939.07	950.26	939.01	948.18	928.26	947.30	930.93	929.13	928.09	979.71	1049.35	1360.84
Missing women population 2001 (in millions using sex ratio norm=1020)	27.88	3.92	4.04	5.27	4.28	3.62	3.24	2.97	2.22	1.96	0.73	-0.37	-3.99
Missing women relative to surviving women 2001	0.067	0.086	0.073	0.086	0.076	0.099	0.077	0.096	0.098	0.099	0.041	-0.028	-0.250
Total population, 2011 (in millions)	1001.12	123.58	104.88	92.15	110.88	123.58	113.14	73.23	82.26	59.08	40.99	32.51	44.85
Male population, 2011 (in millions)	508.95	64.26	53.84	47.22	56.53	63.35	57.61	37.59	41.70	30.03	20.65	16.11	20.06
Female population, 2011 (in millions)	492.17	59.32	51.04	44.93	54.34	60.23	55.53	35.64	40.57	29.05	20.33	16.40	24.79
Sex ratio 2011 (females per 1000 males)	967.03	923.14	948.08	951.57	961.20	950.71	963.87	948.17	972.99	967.36	984.43	1017.46	1236.06
Missing women population 2011 (in millions using sex ratio norm=1020)	26.96	6.22	3.87	3.23	3.32	4.39	3.23	2.70	1.96	1.58	0.73	0.04	-4.33
Missing women relative to surviving women 2011	0.055	0.105	0.076	0.072	0.061	0.073	0.058	0.076	0.048	0.054	0.036	0.002	-0.175
Change in missing women population 2001-2011 (in millions)	-0.92	2.30	-0.17	-2.04	-0.96	0.77	-0.01	-0.27	-0.26	-0.38	0.01	0.41	-0.35
Change in missing women relative to surviving women population 2001-2011	-0.012	0.019	0.002	-0.014	-0.015	-0.026	-0.019	-0.020	-0.049	-0.045	-0.005	0.030	0.076

Source: Authors' calculations.

In sharp contrast to China**,** the number of missing adult women rose from 19.63 million in 2001 to 23.51 million in 2011 in India, by about 20 percent, as shown below in Table 3. The adult female/male sex ratio rose slightly, from 954.07 in 2001 to 956.49 in 2011.

The age distribution of the sex ratio differed in the two censuses. The youngest age group, 20-24 years, had the lowest sex ratio, while the oldest three groups, 65 + years, had the highest ratios, exceeding the norm of 1,020 females per 1,000 males. Between these age groups, the sex ratio rose or remained unchanged with the highest in the age group, 60-64 years. The numbers of missing adult women fall from the youngest age group with excess women in the three oldest age groups. The share of missing women falls consistently from the youngest to all older groups except the three oldest with surplus women (relative to the norm).

In 2011, while the aggregate adult sex ratio was slightly higher, in the three youngest age groups, 20-24 years, 25-29 years, 30-34 years, it fell and then rose among all older groups exceeding the norm in the three oldest groups relative to 2001. The numbers of missing women were higher in the first five age groups (up to 44 years), lower in all older groups and a rising excess in the three oldest age groups.

In brief, as in China, changes in numbers and shares of missing women vary across age groups in India. It is surmised that higher numbers of missing women in younger age groups are dominated by higher maternal mortality rates, while among older women better education in the period 2001-2011 more than compensates for lower maternal mortality. Whether older women also have more remunerative jobs cannot be ruled out as a contributory factor. Among the oldest, the biological advantage that women have, together with better care in 2011 than in 2001, could partly explain their excess.

Table 3: Missing adult women in India, 2001-2011

Age group (in years)	Adult age group												
	20+	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75+
Total population, 2001 (in millions)	581.81	95.17	88.70	79.19	67.65	57.49	48.33	40.13	32.98	26.15	19.61	13.41	13.00
Male population, 2001 (in millions)	297.74	49.27	45.70	40.70	34.79	29.59	24.91	20.64	16.84	13.19	9.70	6.48	5.93
Female population, 2001 (in millions)	284.07	45.90	43.00	38.49	32.86	27.90	23.42	19.49	16.15	12.96	9.91	6.94	7.08
Sex ratio 2001 (females per 1000 males)	954.07	931.45	940.80	945.50	944.33	942.96	940.10	943.91	959.03	982.69	1021.07	1071.62	1194.11
Missing women population 2001 (in millions using sex ratio norm=1020)	19.63	4.36	3.62	3.03	2.63	2.28	1.99	1.57	1.03	0.49	-0.01	-0.33	-1.03
Missing women relative to surviving women 2001	0.069	0.095	0.084	0.079	0.080	0.082	0.085	0.081	0.064	0.038	-0.001	-0.048	-0.146
Total population, 2011 (in millions)	724.06	105.14	99.55	93.10	86.44	76.76	64.99	54.27	44.17	34.81	26.54	18.71	19.57
Male population, 2011 (in millions)	370.08	55.10	51.79	48.16	44.41	39.24	33.15	27.60	22.36	17.45	13.07	8.98	8.79
Female population, 2011 (in millions)	353.98	50.03	47.76	44.94	42.03	37.53	31.84	26.68	21.81	17.36	13.48	9.73	10.79
Sex ratio 2011 (females per 1000	956.49	907.99	922.25	933.01	946.42	956.51	960.68	966.73	975.35	994.86	1031.71	1083.88	1227.62

males)													
Missing women Population 2011 (in millions using sex ratio norm=1020)	23.51	6.17	5.06	4.19	3.27	2.49	1.97	1.47	1.00	0.44	-0.15	-0.57	-1.82
Missing women relative to surviving women 2011	0.066	0.123	0.106	0.093	0.078	0.066	0.062	0.055	0.046	0.025	-0.011	-0.059	-0.169
Change in missing women population 2001-2011 (in millions)	3.88	1.81	1.44	1.16	0.63	0.21	-0.02	-0.10	-0.03	-0.05	-0.14	-0.24	-0.79
Change in missing women relative to surviving women population 2001-2011	-0.003	0.028	0.022	0.014	-0.002	-0.015	-0.023	-0.026	-0.018	-0.013	-0.010	-0.011	-0.023

Source: Authors' calculations.

(e) One-child policy in China

Much has been made of the deterioration in child sex ratio as a result of the one-child policy in China introduced in 1979. A careful recent review is carried out in Hesketh et al. (2005).

In 1979, China's share of the world population was a quarte,r with just 7 percent of the world's arable land. Two-thirds of the population were under 30 years, and the baby boomers of the 1950s and 1960s were entering their reproductive phase. Strict population containment was seen as essential to economic reform and to improvements in living standards. So the one-child family was introduced.

The regulations under this policy comprise restrictions on family size, late marriage and childbearing, and the spacing of children (when a second child is permitted). The policy, however, applies to a minority of the population – urban residents and government employees, with a few exceptions. The exceptions include families in which the first child has a disability, or where both parents work in high-risk occupations, or are themselves from one-child families.

In rural areas, which consisted of 70 percent of the population at that time, a second child is allowed after five years, but this provision sometimes applies only if the first child is a girl, a manifestation of son preference. A third child is allowed among some ethnic minorities and in remote, underpopulated areas. The penalties for violation include substantial fines, confiscation of belongings, and dismissal from work.

The policy relies on near universal access to contraception and abortion. A total of 87 percent of women used contraception, with intrauterine devices and sterilisations accounting for 90 percent of contraceptive methods since the mid-1980s. As a result, abortion rates are low (25 percent of women of reproductive age had at least one abortion).

An official claim is that this policy has prevented 250-300 million births. The total fertility rate decreased from 2.9 in 1979 to 1.7 in 2004, with a rate of 1.3 in urban areas and under 2.0 in rural areas.

The effect of this policy on the sex ratio at birth, and on the ratio of male live births to female live births, has risen since the introduction of this policy, from 1.06 in 1979 to 1.11 in 1988 and then to 1.17 in 2001. In comparison to the norm of 1.03 to 1.06, this is highly imbalanced. Also, there is a marked gradient across birth order: in rural areas, the sex ratio for the first birth is 1.05 (within the norm), and rises with birth order – for the second child, it is 1.23 and peaks at 1.32 for the fourth child. In urban areas, the sex ratio is 1.13 for the first birth and peaks at 1.30 for the second. Some urban Chinese resort to sex selection with the first pregnancy, given the option of one child. In rural areas, most

couples are allowed to have a second child, provided the first is female. So if the second (or subsequent) child is female, the pregnancy is not reported, allowing the couple to have a son.

Sex-selective abortion after ultrasonography undoubtedly accounts for a large proportion of the decline in female births, aided further by non-reporting of female births. Although female infanticide is rare now, less aggressive treatment of sick female infants is not uncommon.

The consequences of this sex imbalance have been socially disastrous – kidnapping and trafficking of women for marriage, and increased numbers of commercial sex workers, with a higher prevalence of HIV/AIDS virus and other sexually transmitted diseases

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Hesketh et al. (2005) make an emphatic case for relaxation of the one-child policy, as circumstances have changed significantly in recent decades, with slowing population growth, the high sex-ratio, the increasing number of elderly people, and the risks associated with avoidance of medical care for unapproved pregnancies.

(f) Childlessness and daughter deficit in South Korea

Among the few studies that investigate this link, a notable one is Chung and Das Gupta (2011), based on the 2003 Korea National Fertility and Family Health Survey. This study examines the relationship between the characteristics of individual women and their families on daughter deficit (defined later) at the family level.

Sex ratio at birth or in young children is used as a proxy measure of son preference. South Korea had very high sex ratios at birth, as sex selective technology became available before anywhere else in Asian countries. The sex ratio at birth was about 117 at the national level in 1990, rising to 130 in patriarchal areas. In China, the sex ratio at birth rose from 107 in 1981 to 111 in 1990, and then to 117 in 2001. In some rural counties, for example in Anhui and Guangdong, the sex ratio was as high as 130. .

The contrast in sex ratios of children in the age group 0-4 years over 1960-2005 in South Korea, India and China is striking. While it rose in South Korea between 1960 and 1990, it declined between 1990 and 2005. In India, the sex ratio rose between 1961 and 1971, remained (nearly) unchanged between 1971and 1981, and then rose between 1981 and 2001. In China, the ratio rose moderately between 1964 and 1982, somewhat steeply between 1982 and 1990, and much more steeply between 1990 and 2000.

To put the South Korean analysis in perspective, a brief review of the findings for India and China is given below.

In a study of rural India, Pande and Astone (2007) report that women's education, media access, caste and religion were significantly associated with son preference. In a study of rural China, Li and Lavely (2003) found that the expectation that a son will provide financial support in old age tends to increase son preference. Other predictors of son preference included ancestor worship, women's education and their personal autonomy. Chung and Das Gupta (2011) use an innovative methodology. Daughter deficit is defined as a case in which a married woman has no daughter at all, or fewer daughters than sons among her children. Note that a daughter deficit appears only if a woman has a child.

Two types of decision are considered: one is an unconditional decision that relates to whether a woman has a child; and the second is a decision that relates to whether a woman has a daughter deficit conditional on that she has a child.[8]

The education level of a woman and that of her husband positively influence the decision to have a child. However, the likelihood for a woman to have a child decreases when her educational level is higher than that of her husband, while a higher level of the latter increases the likelihood. Women with a white-collar job have a lower likelihood of having a child, but a higher likelihood of a daughter deficit. Women living in a metropolis show a lower likelihood of having a daughter deficit. The likelihood of having a child decreases with the age of the woman at marriage, but is unrelated to having a daughter deficit. A woman is not likely to have a child if her husband was the only son.[9] A reduction in the number of children a woman has, particularly one to two, tends to increase remarkably the daughter deficit.

Women's education is significantly and negatively associated with a daughter deficit. Women who had completed at least senior high school were more likely to remain childless, but among those who had a child, the likelihood of a daughter deficit varied, albeit slightly. A higher education for women thus facilitates childlessness and thereby decreases the daughter deficit.

The daughter deficit is more likely among women whose husbands had a higher level of education.

[8] A bivariate selection model is applied to a system of two sequential equations: the first is a probit of whether a woman has a child and the second is another probit of whether the woman has a daughter deficit. For details, see Chung and Das Gupta (2011).
[9] The explanation offered by Chung and Das Gupta (2011) is contrived and far from intuitive.

As these results may seem confusing, the net effect of a *given* level of education of women and their husbands was computed. When all women and their husbands had completed a senior high school level, the probability of a daughter deficit was higher by 2.6 per cent, implying the dominant role of the husband's education level.

Much recent evidence supports the view that women's employment lowers son preference. Chung and Das Gupta (2011), however, offer a more nuanced view: if all women had a white-collar job, the overall probability of a daughter deficit falls by 2.9 percent. So, in South Korea, it is not just women's employment, but employment in white-collar jobs that reduces daughter deficit.

A woman's age at marriage is monotonously and negatively associated with daughter deficit. Overall, if all women married below the age of 22 years, then the probability of daughter deficit would increase by 9.8 percent relative to the baseline cohort of women. But, if all women married at the age of 26 years or older, the probability decreases by 11 percent. In many countries, high proportions of early marriages are arranged by the parents and the pressure to conform to traditional values – especially bearing a son – is greater.[10]

Evidence on whether development of a village reduces daughter deficit is mixed. Chung and Dasgupta (2011), however, report that village development reduces daughter deficit. The overall probability of a daughter deficit decreases by 6.1 percent when all women lived in metropolitan areas relative to the baseline women cohort. By contrast, if all women lived in rural areas, the probability of daughter deficit increased by 4 percent.

South Korea experienced a rapid fall in fertility, from 6.02 in 1960 to 1.08 in 2005. This is mainly the result of change in the values impinging on the bearing and caring of children. In China, by contrast, the government's one-child policy in 1979 forced mainly urban residents and government employees to comply with it. Regardless of the reasons for the lowering of fertility rate, a son preference norm is likely to increase female foeticides. Although illegal in South Korea, sex selection abortions are common. In China, too, the one-child policy led to a reduction in female births because of the availability of sex-selective abortions. Thus, a decreased fertility aggravates daughter deficit. Simulations for South Korea show that, on the assumption of a one-child family norm, the probability of a daughter deficit would increase from 0.35 to 0.57 (63.9 percent) relative to the baseline women cohort.

[10] In Nepal, for example, a large proportion of women used to get married before the age of 15, and they were likely to stop bearing children as soon as they had a son, whereas those marrying later were not under so much pressure to stop bearing children after bearing a son (Chung and Das Gupta, 2011).

In sum, each socio-economic characteristic of a woman and her family influences the daughter deficit through three channels: (i) its effect on the decision to have a child; (ii) its effect on the decision to have a daughter deficit; and (ii) both. Women's education, for example, influenced daughter deficit through its effect on the decision to have a child. Another important insight is that declining fertility is likely to exacerbate the problem of 'missing girls'.

3. Maternal mortality

In our view, excess maternal mortality is another significant manifestation of women's neglect and deprivation during postpartum, leading in extreme cases to death.[11]

Globally, the maternal mortality ratio declined by 47 percent, from 400 maternal deaths per 100, 000 live births in 1990 to 210 in 2010. All regions have made progress, with the highest reduction in East Asia (69 percent), North Africa (66 percent) and South Asia (64 percent). Meeting the MDG target of reducing the ratio by three-quarters, however, requires accelerated interventions, including improved access to obstetric care, assistance from skilled health personnel at delivery and the provision of antiretroviral therapy to all pregnant women who need it (UN, 2013; Ronsmans and Graham, 2006).

In an important contribution (Hogan et al. (2010), estimates of maternal mortality are constructed for 181 countries, covering 1980-2008. They estimated that there were 342,900 maternal deaths worldwide in 2008, down from 526,300, implying an annual reduction of 1.5 percent. With the onset of the HIV epidemic in the early 1990s, the decline of global maternal deaths slowed down – from an annual reduction of 1.8 percent between1980 and 1990 to 1.4 percent between 1990 and 2008. The MMR (maternal mortality ratio) showed a similar reduction: 251 per 100,000 live births in 2008, down from 320 in 1990 and 422 in 1980, implying a yearly decline of 1.8 percent. For comparison, the MDG target of a 75 percent reduction from 1990 MMRs by 2015 would need an annual reduction of 5.5 percent. In the absence of HIV prevalence, the MMR in 2008 would be 206.

The new evidence points to greater optimism than generally believed, as substantial reduction in MMR seems feasible over a fairly short period. The econometric analysis of the large data set identifies four drivers of reduction in maternal mortality.[12] First, the

[11] Maternal deaths are defined as those occurring up to 42 days postpartum. A new category has been proposed to include late deaths up to one year postpartum. Most maternal deaths occur between the third trimester and the first week after the end of pregnancy. In Matlab, Bangladesh, for example, the maternal mortality rate was more than 100 times higher on the first day after birth and 30 times higher on the second day after birth than in the second year postpartum. Mortality rates are especially high after an abortion or stillbirth (Ronsmans et al. 2006).

[12] The dependent variable in the regressions is maternal mortality rate instead of maternal mortality ratio. This is defended on the grounds that, since the global birth cohort has not

global total fertility rate (TFR) has dropped from 3.70 in 1980 to 3.26 in 1990 and 2.56 in 2008. Despite rising numbers of women of reproductive age, the decrease in TFR has kept the size of the global birth order cohort stable. Also, the MMR and TFR are strongly correlated.[13] Second, per capita income, which influences maternal mortality through different channels (e.g. nutritional status of mothers, their access to health services) has been rising steadily – especially in Asia and Latin America. Third, maternal education has increased. Finally, even though it was not included in the regression analysis, the steady rise in coverage of skilled birth attendance has lowered maternal mortality, as elaborated below.

In developing countries, the proportion of deliveries attended by skilled personnel rose from 55 percent in 1990 to 66 percent in 2011. Yet, in about 46 million of the 135 million live births in 2011, women delivered with inadequate care. But regional variations are glaring. While coverage was universal in East Asia (100 percent), it was as low as 50 percent in South Asia, a region with highest level of maternal mortality. Women who give birth in rural areas are at a still greater disadvantage. In 1990, 44 per- cent of deliveries in rural areas of the developing world were attended by skilled personnel, as opposed to 75 percent in urban areas. In 2011, the coverage increased but the rural–urban gap persisted. More than half (53 percent) of women in rural areas received skilled assistance at delivery, while the corresponding urban share was 84 per- cent. In South Asia, the share in urban areas was 40 percent in 2011, compared with 72 percent in urban areas.[14]

A WHO study identified major causes of maternal mortality as consisting of severe bleeding, hypertensive diseases, and infections.[15] Although this is a widely observed pattern, underrepresentation of deaths due to complications of induced abortion or HIV/AIDS cannot be ruled out (Ronsmans and Graham 2006).

A few country case studies in Ronsmans and Graham (2006) are encouraging. They show that substantial reductions in maternal mortality are feasible. Thailand, for example, took 18 years to reduce its maternal mortality ratio by three-quarters, and a reduction of two-thirds took 21 years in Matlab, Bangladesh. These case studies, however, point to considerable diversity in the mix of policies used. The policy mix includes liberalisation of abortion laws, control of infectious diseases, easier access to hospital care, and provision of midwifery care.

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changed much over the period 1980-2008, progress in MMR has been similar to progress in reducing maternal deaths (Hogan et al. 2010).

[13] It is unclear, however, whether TFR was adjusted for its endogeneity.

[14] In the context of MDGs, an important recent assessment is Lozano et al. (2011).

[15] Deaths from accidents, murders or suicides during pregnancy or within 42 days of delivery are typically excluded from maternal mortality statistics. In India, for example, deaths due to domestic violence were the second largest cause of death in pregnancy (Ronsmans and Graham 2006).

Comparison of maternal mortality in China and India in Table 4 is of considerable interest. The crude birth rate fell in India between 2000 and 2010 – from 25.9 per 1,000 people to 22.2 – as also in China, where the birth rates were considerably lower. Neonatal mortality rate also fell in both countries – in India, from 40.5 per 1,000 live births to 33.1, and, in China, from 17.9 to 9.4. Infant mortality rate too recorded a sharp reduction – in India, from 64.2 per 1,000 live births to 48.6, while in China a considerably lower infant mortality rate of 28.8 was reduced to 13.7 (a reduction of more than 50 percent). Mortality rate for boys under five was quite high in India (84.1) in 2000, and it fell to 60.8, whereas in China it dropped from a much lower rate of 35.5 to 16.1 (a reduction of more than 50 percent).

Table 4: Maternal mortality ratios and life expectancy in China and India: 2000 and 2010 by age and sex

Country	**China**		**India**	
Indicators	**2000**	**2010**	**2000**	**2010**
Birth rate, crude (per 1,000 people)	14.0	11.9	25.9	22.2
Mortality rate, neonatal (per 1,000 live births)	17.9	9.4	40.5	33.1
Mortality rate, infant (per 1,000 live births)	28.8	13.7	64.2	48.6
Mortality rate, under-5, male (per 1,000 live births)	35.5	16.1	84.1	60.8
Mortality rate, under-5, female (per 1,000 live births)	34.4	15.6	91.6	66.2
Mortality rate, under-5 (per 1,000 live births)	35.0	15.9	87.7	63.4
Mortality rate, adult, male (per 1,000 male adults)	159.1	137.8	273.8	253.2
Mortality rate, adult, female (per 1,000 female adults)	105.4	88.0	204.6	168.0
Death rate, crude (per 1,000 people)	6.5	7.1	9.0	8.0
Maternal mortality ratio (modeled estimate, per 100,000 live births)	61.0	37.0	390.0	200.0
Life expectancy at birth, male (years)	69.6	71.6	60.6	63.6
Life expectancy at birth, female (years)	72.9	75.0	62.6	66.7
Life expectancy at birth, total (years)	71.2	73.3	61.6	65.1
Lifetime risk of maternal death (%)	0.1	0.1	1.4	0.6

Source: Calculated by the authors using World Development Indicators (WDI), World Bank.

The mortality rate for girls under five was much higher than that for boys (91.6 compared with 84.1 for boys) in 2000 and dropped to 66.2 (still much higher than that for boys) in 2010, with similar decadal reductions for boys and girls. In China, the girls' mortality rate

was slightly lower than that for boys (34.4 as compared with 35.5 for boys) and dropped sharply to 15.6 in 2010, with similar decadal reduction rates. Maternal mortality ratio in India (390 per 100,000 live births) was about six-and-a-half times greater than in China (61) in 2000. There was a sharp reduction in India to 200 in 2010 – of about 49 percent. China recorded a slightly lower decadal reduction of about 40 percent. While the lifetime risk of maternal death dropped in India from 1.4 percent to 0.6 percent, it was much lower in China (0.1 percent) and remained unchanged between 2000 and 2010.

To conclude, China's record in reducing neonatal, infant and under-five mortality rates for boys and girls was far superior to India's. Further, while the maternal mortality ratio in India was a multiple of China's, the decadal reduction rate was higher in India. Lifetime risks of maternal mortality declined in India, but remained much higher than China's unchanged risks over the period 2000-2010.

4. Explanations of sex ratio imbalance

(a) Cultural versus biological factors in explaining missing women

It is widely believed that there is a strong son preference in East Asia and South Asia underlying the phenomenon of 'missing women'. Both India and China have banned the use of sex-selective technologies, and officials have spoken out against female infanticide. These are meant to encourage parents to view daughters as being just as valuable as sons. But the facts reveal a different picture.

The assumption of a strong cultural preference in these regions driving the imbalance in sex ratios rests on a variety of factors. Social and economic factors interact to make females less valuable than sons. Dyson and Moore (1983), for example, support this claim by a regional contrast in male bias. They demonstrate that there is greater male bias in Northern India than in the South and East. Greater female autonomy in the South reflects inheritance laws and marriage patterns. Women often marry within the same village (or a neighbouring one) in the South, and property is passed on to daughters. Also, the custom of cousin marriage keeps property within the same family.

Households resort to female infanticide and postnatal withholding of health care; and since the mid-1980s, when technology for foetal sex determination became affordable, there has been a shift towards prenatal sex selection by means of induced abortions. As cases of female infanticide are often not reported as live births, they cannot be distinguished from the effects of prenatal sex selection.

In a recent contribution (Oster, 2005), a new explanation is offered that relies on the greater propensity of women infected with hepatitis B to give birth to boys. Based on this hypothesis, she points out that 75 percent of missing women in China in 1980-90 were due to this infection. This is questioned in two comments by Dasgupta (2005, 2006).

These focus on the proportions of excess female mortality attributable to biological and cultural factors. Examining China's census data, she found that while the sex ratio at birth (the ratio of male births to female births) was in the normal range of 1.05-1.06 for first births, it became unusually masculine at higher birth orders. This pattern is observed for 1982 and 1989, that is, both before and after sex-selective technology became widespread. There is another twist to this tale. The sex ratio at birth varies sharply by the sex composition of the living children of the woman. In 1989, the sex ratio was normal (1.05) for first births. For second births, it was markedly different, varying according to whether the first child was male or female. Women who had a son as the first child had a low sex ratio (1.01) for the second child, while those whose first child was a daughter had a very high sex ratio (1.49) for the second child. This reflects a strong preference for sons among women who already had a daughter.

Dasgupta (2005, 2006) reports the same pattern of parental preference in South Asia and in East Asia both *before* and *after* the spread of sex determination technology.[16] Data from Bangladesh, India and South Korea, especially in the periods preceding the availability of such technology, show that boys and firstborn girls had similar mortality levels, but that girls born to families which already had a daughter recorded a much higher mortality rate. After the sex determination technology became widespread, the South Asian and South Korean data show that the use of this technology is correlated with the sex composition of existing children, as in China.

Dasgupta (2005, 2006) argues that the regional contrast in male bias in India is associated with the use of ultrasound and amniocentesis – specifically, northwestern region (with the highest female deficits) witnessed a steep rise in the use of these technologies among women who had only borne daughters, as compared to those with a son, while southern region (with low female deficits) did not show a marked difference in the use of these technologies by the sex composition of their children. By contrast, Oster (2006) did not find a clear association between these regional differences and prevalence of hepatitis B. What makes Oster's view more untenable is the fact that, even if such association was observed, the differential prevalence of hepatitis B could not have persisted for so long in the presence of large interchange across regions. Another caveat, noted by Oster herself, is that, although several Sub-Saharan countries have high prevalence rates of hepatitis B, they do not show excessively masculine sex ratios. Finally, consistent with the findings of Dasgupta, but contrary to the claim of Oster, women who have only daughters account for the majority of the excess female foetuses among the total abortions.

The balance of evidence thus favours the cultural explanation for the missing women, while biological factors such as hepatitis B have a minor role.

[16] This is not necessarily a causal inference, as advocates of randomised trials have been emphasising.

More recent evidence for India supports the cultural explanation – specifically, the close relationship between the sex ratio at birth and sex composition of existing children – pointing to the important role of parental son preference, but with diminution of the sharp regional divide and a restrictive effect of the 1994 Pre-Conception and Pre-Natal Diagnostic Technicques Act on the imbalance in child sex ratios.

(b) Sex-selective abortion and child sex ratios

(b.1) Legal restrictions on sex determination and abortions in India

India is one of the few countries that have more males than females. The problem is particularly severe at younger ages: the child sex ratio (number of girls per 1,000 boys in the 0-6 age group) has declined over the last four decades: from 964 in 1971 to 962 in 1981, 953 in 1991, 927 in 2001, and 914 in 2011.[17] Although similar ratios are observed in other Asian countries too (e.g. China, Taiwan, Singapore, and Vietnam), India has one of the lowest sex ratios in the world (Nandi and Deolalikar, 2013).

The child sex ratio depends on two factors: sex ratio at birth and gender-specific mortality rates among children born. While preventing the abortion of female foetuses reduces the masculinity of the sex ratio at birth, it has the likely consequence that unwanted girl foetuses grow into girls who will be deprived of nutrition and healthcare. These unwanted girls will then be more vulnerable to infant and child mortality.

Abortion was legalised under the Medical Termination of Pregnancy Act of 1971. Foetal sex determination techniques such as amniocentesis, originally intended for the detection of foetal abnormalities, were introduced in 1975. Rampant abuse of such techniques has become a major social concern. Rapid growth of networks of private clinics providing sex determination and abortion services is not surprising, as the tests are cheap and widely available.

The Indian government aimed to curb the astonishing increase in sex-determination tests and abortion of girl foetuses by passing the Pre-Conception and Pre-Natal Diagnostics Technique (PNDT) Act in 1994.[18] This Act prohibited the use of diagnostic methods to determine the sex of an unborn child. However, there is a general perception that the Act has been ineffective.

The severity of the problem of sex-selective abortions could be gauged by recent estimates that of course vary a great deal. Some estimates of aborted female foetuses

[17] We have updated the number for 2011.

[18] The state government of Maharashtra was the first to impose a complete ban on all (public and private) prenatal sex determination in 1988. The rest of India followed suit with a similar ban by the central government (PNDT Act, effective from 1996).

range between 50,000 and 100,000 every year, while other studies point to a much higher incidence – 1.1 million households (Nandi and Deolalikar, 2013).[19]

Despite the ban on sex-selective abortions, the child sex ratio continued to decline between 2001 and 2011.[20] The PNDT Act was modified in 2003, but major issues remain. A spate of policy initiatives undertaken by the Maharashtra government (e.g. restrictions on the availability of abortion pills, reduction of the abortion limit to 10 weeks), for example, run the risk of criminalising abortion (Jain, 2013).

In a recent contribution, Subramanian and Selvaraj (2009) investigate the effect of the PNDT Act, based on the National Sample Survey (NSS) data for 1983, 1987/88, 1993/94, 1999/2000, and 2004/05. A binary logistic regression model is used to estimate the log odds of a male infant (0-1 years) in a comparison of pre-and post-PNDT time periods.[21] Given the paucity of reliable and nationally representative data on proportions of sexes at birth, proportions of sexes of infants are considered as a proxy variable. The explanatory variables include expenditure quartiles (as a proxy for income quartiles), parental education and social caste, rural or urban location, and a time variable representing periods before and after the implementation of the PNDT Act.

The main findings are summarised below. There is a positive association between income and the odds of a male infant (hereafter OR) such that the latter rises with higher quartiles. But this association weakens in the post-PNDT period. There is also a positive association between father/male head of the household with post-secondary education and the odds of a male infant. There was no variation in OR across caste groups. In the context of state variations, a surprising result is that Kerala is not very different from other states in terms of its OR. This finding is in agreement with Jha et al. (2006) that reported a ratio of 765 females per 1,000 males in Kerala for second-order births, conditional on the first birth being female. Meanwhile, female/male ratios for the second birth in Kerala, conditional on the first being male, were not substantially different from those of other states (>1000). The third, and not so surprising finding, is the absence of any significant effect of the PNDT Act on the OR.

Following Subramanian and Selvaraj (2009), the son preference could be dormant among those low on the socio-economic hierarchy (for example, Scheduled Castes [SCs] and Scheduled Tribes [STs]), but they fail to practise discrimination because of their limited resources. The weakening of the income effect in the post-PNDT period seems consistent with this conjecture. As income opportunities expanded in the 1990s,

[19] In 2011, more than 620,000 abortions were reported in India. The actual numbers may be well over 6 million, largely performed in non-registered institutions, by untrained people, and in unhygienic conditions. Unsafe abortions account for nearly 8 percent of all maternal deaths in India (Jain, 2013).
[20] Our estimates show this.
[21] Note that modifications of the PNDT Act in 2003 were not analysed.

technologies available for foetal sex determination followed by sex-selective abortions became considerably more affordable. The higher OR in urban areas is also a manifestation of greater concentration of such technologies there relative to rural areas. So, the authors claim that these patterns cannot be attributed to the implementation of the PNDT Act. Rather, it was a combination of significant economic improvement since 1999/2000 and easier affordability of foetal sex-selection and selective abortion technologies that altered the pattern from one of higher OR among the more affluent to another in which all groups had similar OR. In that case, however, the methodology used is suspect, as it confounds the effects of these changes with the implementation of the PNDT Act. Indeed, no credible conclusions can be drawn about the failure or ineffectiveness of the PNDT Act from a before-and-after comparison of the sort carried out.

A recent analysis (Nandi and Deolalikar, 2013) uses a more rigorous methodology and offers a more reliable assessment of the impact of the PNDT Act on child sex-ratio.[22] Specifically, it convincingly rejects the consensus (Jha et al. 2006, Visaria, 2007, Subramanian and Selvaraj, 2009) that this Act has not been effective.

The Nandi-Deolalikar analysis is based on a meticulous analysis of India's Census data for 1991 and 2001. The main study area is western Maharashtra and its neighbouring states of Gujarat, Andhra Pradesh, Karnataka, Madhya Pradesh and Chattisgarh.

Villages and towns in Maharashtra, which had already passed and implemented legislation banning sex-selective abortions in 1988, were not affected by the national PNDT Act in 1996, and thus constitute the control group (or classified as 'pre-treated' group). The treatment (or the 'newly-treated') group comprised villages and towns in the states bordering Maharashtra – states that were subject to the centrally mandated PNDT Act during the period 1991-2001.

Villages in neighbouring districts on both sides of the Maharashtra border show a weakly significant improvement of 19.9 points in the child sex ratio as a consequence of the PNDT Act. Among the rest of the rural subsamples (designed to overcome the 'spillover effects'), the positive impact of the PNDT Act ranges between 13.7 and 26.4 points (significant at the 5 percent level). The largest subsample of all towns exhibits a significant positive effect of 13.9 points, but in other subsamples there is no effect.

The conclusion therefore is that the 1996 PNDT Act was not an utter failure, especially in rural areas. The partial effect of the Act was positive on the child sex ratio. Interpreted in light of the declining sex ratio, this finding implies that the deterioration would have been

[22] Associations between abortion laws and sex selection have been examined for Taiwan (Lin and Luoh (2008), China (Li and Zheng, 2009) and Nepal (Valente, 2011). In these cases, a negative association is reported.

greater *without* the PNDT Act. It implies that this Act resulted in at least an additional 106,000 surviving girls aged 0-6 years in the newly treated rural areas.

(b.2) Extent of sex-selective abortions and missing girls in India

Although foetal sex determination for selective abortion has been illegal in India since 1994, evidence suggests that the practice flourishes. An important contribution (Jha et al. 2006), for example, based on the Special Fertility and Mortality Survey (SFMS) of 1998, focuses on the fertility history of (ever married) women and upon children born to them in 1997. Their main finding is that a woman is substantially more likely to have a boy if she has a large number of girls. For families who already have one child, the probability of the second child being a girl is 0.515 if the first child is a boy, but only 0.422 if the first child is a girl. Similarly, for families who already have two children, the probability of the third child being a girl varies from 0.531 (if both previous children are boys) to 0.466 (one previous boy and one girl) to 0.409 (both previous children are girls). Jha et al. argue that these differences are attributable to selective abortions, with parents aborting girl foetuses if they already have daughters.

They construct estimates of selective abortions, assuming (i) a normal sex ratio of 102 to 105 boys per 100 girls; and (ii) all discrepancy between this norm and the actual sex ratio in the case of second births where the family has one girl, and of third births when the family has two girls, is due to selective abortions. These two assumptions yield a deficit of 0.31-0.34 million girls. Further assuming that selective abortion explains half of the 'missing girls' among firstborn or at higher orders, an additional estimate of missing girls of 0.14-0.20 million is obtained. Thus, they arrive at a total of 0.45-0.54 million selective abortions in 1997. Assuming this pattern operated over two decades, they report 10 million missing girls.

Arnold et al. (2002) give an alternative estimate, based on their analysis of NFHS of 1992/93 and 1998/99. The latter NFHS shows a rise in the sex ratio of children (boys per 100 girls) born in the five years preceding the survey, as also in the number of induced abortions in the last few years preceding the second survey. In a group of states in Northern India known for their bias against girls (Gujarat, Haryana and Punjab), the probability of an abortion is greater if the first child is female. Induced abortions also increase with the number of sons. An interesting insight is that there is no correlation between the use of ultrasound and gender bias, since several states with high ultrasound use (Goa, 62 percent of pregnancies), Kerala (44 percent) and Tamil Nadu (31 percent), are also the states with favourable sex ratios for girls under five. However, the Northern India states (Gujarat, Haryana and Punjab) have a higher than average use (19-20 percent). Arnold et al. (2002) find that about 0.1 million sex-selective abortions occur every year.

These calculations illustrate the need for caution in interpreting quantitative estimates not just of abortions but, more importantly, of missing women.

Abnormality in the sex ratios reflects failure in human development. The important point is that it is endemic in large parts of Asia and the Pacific region.[23] While this abnormality is chronic in India, China, South Korea, Taiwan and Hong Kong, the problem of sex-selection is becoming increasingly prevalent in Vietnam, Azerbaijan, Armenia and Georgia, and also in Nepal, Bangladesh and Pakistan.

5. Conflicts and gender inequality

In the last five decades, more than half of all nations have been victim to civil conflicts, with 25 or more deaths per year, or full-fledged wars, with 1,000 or more casualties per year. Following a peak in the late 1980s and 1990s, while the incidence of wars and consequent deaths has declined, a substantial number of people – especially in poorer countries and regions – remain vulnerable to death and destruction (World Bank, 2011).

A rich and insightful survey (Buvinic et al. 2012) examines carefully the impacts of violent conflict on males and females and the role of gender inequality in adaptive responses to conflict. A short and selective summary of this and related studies is given below, with illustrative evidence focused on, but not limited to, Asian countries.

Direct and indirect effects of violent conflicts are distinguished. The former comprise the killing, wounding and physical destruction, while the latter include effects on economic performance and human welfare.

The World Bank (2011) estimated that the average cost of civil war is equivalent to more than 30 years of GDP growth for a medium-sized developing country, and trade levels take 20 years to recover. Between 1981 and 2005, poverty rose substantially in countries experiencing major violence, and fell sharply in those that experienced minor or negligible violence.

Conflicts often reappear: 90 percent of the last decade's civil wars occurred in countries that had experienced a civil war since 1945 (World Bank, 2011). Indeed, 'conflict traps' exist in which countries that are poor and weak in human development are caught in protracted cycles of conflict and poverty (Buvinic et al. 2012).

(a) Mortality and morbidity

Young adult men typically suffer the highest mortality in conflicts, causing a shortage of working-age males and a high share of females and widows in the population. The World

[23] For an insightful extension of this debate, with a focus on gender bias in education in India over the period 1993-2004, see Chaudhri and Jha, 2011.

Bank (2011) estimated that men constitute 90 percent of the missing, while women and children account for 80 percent of the refugees. A recent study (Cohen, 2011) found that males accounted for 74 percent of fatalities in Sierra Leone, 87 percent in East Timor and 84 percent of killings and disappearances in Guatemala. A not-so-recent study by Krug et al. (2002) reports 310,000 deaths due to wars in 2000, concentrated mostly among men in the age-group 15 to 44 years. Using census and DHS data, Neupert and Prum (2005) found that 65 percent of the 2 million deaths during the Khmer Rouge occupation in Cambodia were men. Of these deaths, 45 percent were among people younger than 14 years or older than 60 years, implying that most of these deaths did not occur in combat, but were an indirect result of this occupation. These deaths were distributed equally between men and women.

(b) Health impacts

Violent conflicts have serious indirect health effects that stem from exposure to infectious disease, malnutrition, poor sanitation and a breakdown of health services. Both women and children are more vulnerable to these indirect effects. Vulnerability to disease is exacerbated by loss of income and assets, population displacement or orphanhood. Women are often at greater risk of contracting HIV/AIDS due to displacement and have a greater likelihood of being victims of sexual violence. The flood of refugees from the genocides of Burundi and Rwanda into Tanzania resulted in a seven percentage point increase in child mortality and an increase of 15-20 percentage points in infectious diseases (Baez, 2011). Reduced access to health care has negative consequences for women: unwanted pregnancies, maternal mortality and preterm babies.[24]

(c) Widowhood

Although patchy, available evidence points to grim outcomes for widows and their households. Bruck and Schindler (2009) and Schindler (2010) are among a few insightful studies of war widowhood. Most of the more than 500,000 deaths in the Rwandan genocide comprised men, resulting in unbalanced sex ratios. The genocide widows and children faced different and often more difficult problems in earning incomes because of loss of resources tied to men and destruction of social networks.

(d) Adaptive or second-round effects

These effects are associated with responses that differ by gender, including adaptive responses by households to violent shocks. Households reallocate labour between the genders and resources assigned to children following these shocks.

Evidence for developing countries suggests that aggregate economic shocks yield ‘added worker’ effect for women in low-income countries and ‘discouraged worker’effects in high income countries (Sabarwal et al. 2010). Another recent contribution (Bhalotra

[24] For a more detailed review and sources, see Buvinic et al. (2012).

and Umana-Aponte, 2009) found on the basis of DHS data for 66 countries that women with more education often reduced their workforce participation in response to income shocks, while those with less education increased their participation.

Children are highly vulnerable to deterioration in health conditions during and after conflicts. Hoeffler and Reynal-Queral (2003), for example, report that a five-year war is associated with a 13 percent increase in infant mortality that persists during the first five years of peace.

Schady (2004), based on data from 59 developing countries, found that infant mortality rises with negative economic shocks and that female infants are at greater risk of mortality. Another study (Valente, 2011) reports higher probability of miscarriage in high-conflict Nepali districts. She argues that maternal stress, rather than poor access to health facilities, is largely responsible for higher neonatal mortality.

Summing up, the direct and indirect effects of violent conflicts are generally not gender neutral. Males suffer most deaths during violent conflicts, and often gender inequalities are exacerbated. While many households rebound from violent shocks, women left alone to provide for their families are vulnerable to poverty that may persist across generations. Targeting widows and their families with post-conflict assistance may impede this channel of transmission and halt reproduction of conflict-related poverty (Buvinic et al. 2012).

6. Violence against women

(a) Global estimates

That predators continue to get away with crimes committed against women is now common knowledge. But less known is the fact that the worst perpetrators are often those most intimately known to women, or that, as a consequence, the latter are vulnerable to life-long health-related risks. These frightening revelations are contained in a recent World Health Organisation report (2013), issued in collaboration with the London School of Hygiene and Tropical Medicine and the South African Medical Council.

The forms of violence against women are many. These include violence by an intimate partner and rape/sexual assault and other forms of sexual violence perpetrated by someone other than a partner (e.g. stranger, friends, family members, police, and military personnel), as well as female genital mutilation, honour killings and trafficking of

women. The WHO report (2013) confines itself to physical and/or sexual intimate partner violence and non-partner sexual violence.[25]

The global estimate of physical and/or sexual intimate partner violence among all ever-partnered women was 30 percent. The prevalence was about 38 percent of ever-partnered women at some point in their lives in South-East Asia – among the highest in the low- and middle-income countries.[26] What is indeed striking is that exposure to violence is already high among women in the age-group 15-18 years, implying that violence begins early in women's relationships. The prevalence rate peaks in the age-group of 40-44 years. By contrast, globally, 7.2 percent of women reported ever having experienced non-partner sexual violence. Among the regions considered, South East Asia recorded the lowest prevalence rate (4.9 percent).

Globally, 35.6 percent of women experienced either non-partner sexual violence or physical or sexual violence by an intimate partner, or both. The regional variation is large-ranging, from 27.2 percent to 45.6 per- cent, with South East Asia recording 40.2 percent.

The health effects of exposure to intimate partner violence comprise: incident HIV infection; incident sexually transmitted infections (STIs); induced abortion; low birth weight; premature birth; injuries; suicides; and death from homicide. Confirmation of these effects is, however, constrained by limited evidence. Hence our review is selective. There has been growing realisation that intimate partner violence is an important contributor to women's vulnerability to HIV and STIs. Of the studies of incident HIV/STI, two on HIV from Sub-Saharan Africa and one on STI from India found an elevated risk of HIV/STI among those reporting partner violence.[27]

Violent relationships often lead to adverse sexual and reproductive health outcomes. Not surprisingly, therefore, women in such relationships have more unintended pregnancies. Of the 80 million unintended pregnancies each year, at least half are terminated through induced abortions and nearly half of those take place in unsafe conditions. Analysis of data from 31 countries corroborates that women with a history of intimate partner violence are more likely to report induced abortions.

Intimate partner violence was positively associated with low birth weight (<2500 g), and also with preterm birth (<37 weeks), even after adjusting for confounding factors.

[25] Given the lack of consensus on standard measures of emotional/psychological partner violence, this aspect of violence is not covered in the WHO report (2013).
[26] Since the WHO report (2013) uses the WHO regional classification and does not include East and South Asia, we will focus mostly on the contrast between the global and South East Asia region.
[27] For details, see WHO (2013).

Exposures to traumatic events often lead to stress, fear and isolation, which in turn cause depression and suicidal behaviour. Evidence from various studies suggests a positive association between violence and incident depression. Although evidence on the association between violence and suicidal attempts was paltry, it indicates a positive association.

Analysis of data from 31 countries shows that the proportion of women who suffered injuries among all women who had experienced partner violence was as high as 41.8 percent (WHO, 2013).

Across all countries, the median prevalence of intimate partner homicide was about 13 percent, with as many as 38 percent of all murdered women being killed by an intimate partner. The median prevalence of intimate partner homicide among all murdered women was highest in South East Asia (55 percent) and considerably lower in the Africa region (40 percent).

Violence against women is a public health problem of alarming proportions. It is globally pervasive, puts women's health at risk and limits their participation in society. As discussed below, much of the variation in violence against women is a result of economic and sociological factors that promote a culture of violence against them. Some of the interventions include: questioning of social norms that support male authority and condone violence against women; reforming discriminatory inheritance practices; and strengthening women's economic rights (WHO, 2013).

In March 2013, 103 member states at the 57th session of the Commission on the Status of Women at the UN agreed to end violence against women and girls and to protect their human rights and fundamental freedoms. Whether this will lead to concrete action by governments to prevent the abuse experienced by half the world's population remains to be seen.[28]

(b) Shades of domestic violence in India[29]

Every hour 25 women fall victim to crimes; 11 suffer cruelty by husbands and other relatives; three are raped; and there is one dowry death.

Horrific crimes against women have, in fact, continued unabated. What is worse is that there has been an acceleration of such crimes in recent years, with the annual rate rising from 5.9 percent in 2006 to 7.8 percent during 2006-2011. Cases of domestic violence against women by their husbands and other relatives comprised over 43 percent of all crimes against women in 2011. Domestic violence also accelerated, with the annual rate

[28] *The Lancet*, 20 June 2013.
[29] Adapted from Kulkarni et al. (2013b).

rising from 8.25 percent in 2006 to 11.41 percent between 2006-2011, *despite* a landmark legislation in 2006 declaring 'wife-beating' a crime (National Crime Bureau Records, 2012).

Violence is rooted in dowry issues – women are beaten, threatened, burned and even killed to extract gifts of money, jewellery and consumer durables (e.g. a television set, fridge) from their families.[30] Such cruelty is not confined to cases around dowry, however. Negligence of domestic duties, poorly prepared food and going out alone without permission, a sign of independence, are often dealt with just as cruelly.

(b.1) Shades

Our analysis, based on the *India Human Development Survey 2004-05*, throws new light on the perceptions of patterns of domestic violence as well as some correlates.[31] Since perceptions may not accurately reflect actual cases of domestic violence, the margins of error are difficult to assess. By contrast, actual cases are likely to be underestimates, for fear of provoking further violence. Therefore, neither the National Crime Bureau nor the National Family Health Survey data on actual cases can be taken at face value. Another issue is the overlap between seemingly *distinct* forms of violence (e.g. marital rape, dowry-related, or stemming from neglect of domestic duties). Hence, occurrence of multiple forms of domestic violence is typically more likely (e.g. dowry-related violence and that associated with the neglect of domestic duties) than any specific form alone (e.g. dowry-related). To circumvent this difficulty, we have constructed, for example, categories such as whether dowry-related violence was perceived as occurring with any other form of violence (e.g. associated with going out alone, neglect of domestic duties). This allows us to compare the incidence of a few dominant forms of domestic violence, but without an unambiguous and mutually exclusive classification.

Out of the four categories considered, the highest incidence of violence was associated with going out alone without permission (about 39 percent), followed by neglect of household duties (about 35 percent), badly cooked meals (about 29.50 percent), and dowry-related (about 29 percent).

[30] For an important contribution assessing the prevalence and correlates of both physical and psychological violence in Kerala – an Indian state – see Panda and Agarwal (2005).

[31] In a recent contribution, Eswaran and Malhotra (2011) construct a non-cooperative model of resource allocation within a household in the developing countries that focuses on domestic violence as an instrument for enhancing bargaining power. They show that the extent of domestic violence faced by women is not necessarily declining in their reservation utilities, nor necessarily increasing in their spouses'. The empirical analysis is based on the National Family Health Survey data for India for 1998-99, and throws new light on the two-way causality between autonomy and domestic violence against women. Not just the model predictions but also the findings are somewhat surprising, if not counterintuitive.

(b.2) Urban, rural and slums

Locational differences are striking. Slums show the highest incidence of all forms of violence, followed by rural and urban areas. Violence associated with neglect of domestic duties was over 44 percent in slums, over 37 percent in rural areas and about 27.50 percent in urban areas. A similar pattern is observed for bad cooking, with the highest violence in slums (over 33 percent, 32 percent in rural areas and about 21.50 percent in urban). Dowry-related violence was also highest in slums (about 33 percent), followed by rural areas (31.50 percent) and then urban (22 percent).

A disaggregation into six major metros (Mumbai, Delhi, Kolkata, Chennai, Bangalore and Hyderabad) does not corroborate the north-south divide that has been the staple of demographers. Dowry-related violence was highest in Bangalore (48.55 percent), followed by Chennai (about 33.50 percent) and lowest in Delhi (about 18 percent). Violence associated with neglect of household duties follows a slightly different pattern, with the highest incidence in Chennai (53 percent), followed by Bangalore (over 47 per-cent) and lowest in Delhi (about 11 percent). While Bangalore overtakes Chennai in violence associated with bad cooking (about 47 percent and over 35 percent, respectively), Delhi exhibits the lowest incidence (6.2 percent).

As these are perceptions, associations with economic conditions, household endowments including educational achievements, employment and earnings, and cultural characteristics (whether affiliated to scheduled castes and scheduled tribes [SCs/STs], other backward classes [OBCs] and others) unravel a few key correlates, but are not necessarily causal inferences.

(b.3) Correlates

At the state level, in all four types of violence, there are strong negative correlations between state GDP per capita and the incidence of such violence. The higher the state GDP per capita, for example, the lower was the incidence of dowry-related violence. Comparison of incidence of this between the lowest and highest (physical) asset groups suggests that dowry-related violence in the latter was 67 per- cent of that in the lowest group. Similar findings are obtained for other forms of violence – neglect of domestic duties (72 percent), bad cooking (66 percent), and going out alone without permission (67 percent). So states with larger shares of highest asset group exhibit lower domestic violence. That (relative) affluence has a dampening effect on domestic violence is plausible.

(b.4) Empowerment

Educational achievements of women make a significant difference too – the higher the proportion of women with 10 years or more of education, the lower is the incidence of violence. Comparison of dowry-beating between this group and another with lower education reveals a large difference – 10 percentage points. Differences in other forms

of violence are large, too – neglect of domestic duties (9.50 percentage points), and going out alone (16 percentage points). Higher education expands the fallback options for women outside the home and thus lowers domestic violence.

Women's empowerment is often measured in terms of outside wage employment and earnings relative to those of men. Our analysis confirms these links, but in a nuanced way. At low ratios of female wage employment to male wage employment, the incidence of dowry-beating rises slightly, but falls thereafter quite sharply. A similar relationship is observed between the ratio of female earnings to male earnings and such violence, pointing to thresholds below which neither ratio lowers domestic violence. Rather, at low values, it rises. So high levels of female employment and earnings are critical to lowering domestic violence against women.

Whether domestic violence is cultural, too, is examined in terms of variation across SCs/STs, OBCs and Others. As these groups also imply a ranking in terms of economic status, with SCs/STs as the most disadvantaged, OBCs as less disadvantaged and Others as least disadvantaged, any association between domestic violence and these groups is likely to reflect both differences in cultural practices and economic conditions. Subject to this caveat, the higher the proportions of SCs/STs and OBCs, the higher is the frequency of domestic violence in its multiple forms.

In conclusion, while judicial activism has a limited role in curbing domestic violence, expansion of economic opportunities for women, higher education facilities, asset accumulation, and curbing of gender-related discriminatory practices in the labour market hold promise.

7. Concluding observations

The main findings are summarised from a broad policy perspective.

As the countdown to 2015 has begun, debates about continuation of MDGs and their reformulation have taken on greater urgency and significance. Broadly, one view is to abandon them altogether, as they are unfair to low-income countries with limited capacity for achieving them; another is to extend them to a longer period, to enable countries lagging behind to catch up with the rest; and a third and most influential view is to reformulate them to better reflect deprivations and inequities that are pervasive but not sufficiently emphasised in the present version. A case in point is gender inequality.

While various dimensions of gender inequality are included in the MDGs, we argued that these imply a somewhat narrow focus – especially because the deprivation that women face from the womb to the rest of their lives is not fully captured. Amartya Sen drew attention to the phenomenon of 'missing women' that best captures the cumulative

impact of multiple deprivations to which women are subjected. Our analysis reinforces the case for this measure, and broadens and updates recent estimates of missing girls, adult women and (aggregate of) women. Much of the analysis focused on India and China, which contributed 44 million missing women, and 37 million in India out of a total of 102 million missing women in the 1980s. So the key questions addressed are the reasons underlying such large magnitudes of missing women and whether their numbers have risen over time. We broaden this measure by including: (i) adult women; (ii) excess maternal mortality ratio; (iii) casualties resulting from violent conflicts and the forms these take; and (iv) domestic violence against women. Even though the magnitudes differ, these together constitute a brutal violation of human rights of women that remains pervasive in a large part of the developing world – especially Asia and North Africa.

The contrast between China and India during the period 2001-11 is in some ways striking. The absolute number of missing women in India, though lower than in China, rose much faster. However, relative to surviving women, the reduction was larger in India. In China, the number of adult missing women was slightly lower in 2011 (26.96 million, as compared with 27.88 million in 2001). In sharp contrast, the number of missing adult women in India rose from 19.63 million in 2001 to 23.51 million in 2011, by about 20 percent. As in China, changes in numbers and shares of missing women in India vary across age groups, with highest numbers in younger age groups (20+4 years and the next higher age interval (s)). The absolute number of missing girls was slightly larger than in China in 2011. However, while in China the number fell sharply, there was a small increase in India. The relative number of missing girls also declined sharply in China, while there was a small increase in India over the recent decade.

Attention was drawn to the consequences of the one-child policy in China on the sex ratio at birth and ratio of live male births to female live births – specifically, higher sex imbalance. It is argued that, whatever justification this policy had when it was enacted, there is a strong case for its relaxation, as the circumstances have changed significantly in recent decades: slowing population growth, the continuing sex imbalance with birth order, the increasing number of the elderly, and the risks associated with avoidance of medical care with unapproved pregnancies.

There were 342,900 maternal deaths worldwide in 2008, down from 526,300, implying an annual reduction of 1.5 percent. With the onset of the HIV epidemic in the early 1990s, the decline of global maternal deaths slowed down – from an annual reduction of 1.8 percent between1980 and 1990 to 1.4 percent between 1990 and 2008. The MMR (maternal mortality ratio) showed a similar reduction: 251 per 100,000 live births in 2008, down from 320 in 1990 and 422 in 1980, implying a yearly decline of 1.8 percent. For comparison, the MDG target of a 75 percent reduction from 1990 MMRs by 2015 would need an annual reduction of 5.5 percent. In the absence of HIV prevalence, the MMR in 2008 would be 206.

The new evidence points to greater optimism than generally believed, as substantial reduction in MMR seem feasible over a fairly short period. Essentially, there are four drivers of reduction in maternal mortality. First, the global TFR has dropped from 3.70 in 1980 to 3.26 in 1990 and 2.56 in 2008. Despite rising numbers of women of reproductive age, the decrease in TFR has kept the size of the global birth order cohort stable. Also, the MMR and TFR are strongly correlated. Second, per capita income, which influences maternal mortality through different channels (e.g. nutritional status of mothers, their access to health services), has been rising steadily – especially in Asia and Latin America. Third, maternal education has increased. Finally, the steady rise in coverage of skilled birth attendance has lowered maternal mortality.

Selected case studies, however, point to considerable diversity in the mix of policies used. The policy mix includes liberalisation of abortion laws, control of infectious diseases, easier access to hospital care, and provision of midwifery care.

In the last five decades, more than half of all nations have been victim to civil conflicts, with 25 or more deaths per year, or fully fledged wars, with 1,000 or more casualties per year. Following a peak in the late 1980s and 1990s, while the incidence of wars and consequent deaths have declined, a substantial number of people – especially in poorer countries and regions – remain vulnerable to death and destruction. But 'conflict traps' exist in which countries that are poor and weak in human development are caught in protracted cycles of conflict and poverty. The effects on men and women are often brutal and long lasting.

Young adult men typically suffer the highest mortality in conflicts, causing a shortage of working-age males and a high share of females and widows in the population. Evidence suggests that men constitute 90 percent of the missing, while women and children account for 80 pe cent of the refugees (World Bank, 2011). Of the 2 million deaths during the Khmer Rouge occupation in Cambodia, 65 percent were of men. Of these deaths, 45 percent were among people younger than 14 years or older than 60 years, implying that most of these deaths did not occur in combat, but were an indirect result of this occupation. These deaths were distributed equally between men and women.

Violent conflicts have serious indirect health effects that stem from exposure to infectious disease, malnutrition, poor sanitation, and a breakdown of health services. Both women and children are more vulnerable to these indirect effects. Vulnerability to disease is exacerbated by loss of income and assets, population displacement, or orphanhood. Women are often at greater risk of contracting HIV/AIDS, due to displacement and greater likelihood of being victims of sexual violence.

Although patchy, available evidence points to grim outcomes for widows and their households. Genocide widows and children face different and often more difficult

problems in earning incomes, because of loss of resources tied to men and destruction of social networks.

Summing up, the effects of violent conflicts are generally not gender neutral. Males suffer most deaths during violent conflicts, and often gender inequalities are exacerbated. While many households rebound from violent shocks, women left alone to provide for their families are vulnerable to poverty that may persist across generations. Targeting widows and their families with post-conflict assistance may impede this channel of transmission and halt reproduction of conflict-related poverty.

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The health effects of exposure to intimate partner violence comprise: incident HIV infection, sexually transmitted infections (STIs), induced abortion, low birthweight, premature birth, injuries, suicides and death from homicide. Confirmation of these effects is, however, constrained by limited evidence.

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Violence against women is a public health problem of alarming proportions. It is globally pervasive, puts women's health at risk and limits their participation in society. Much of the variation in violence against women is a result of economic and sociological factors that promote a culture of violence against them. Some of the interventions include: questioning of social norms that support male authority and condone violence against women; reforming discriminatory inheritance practices; and strengthening women's economic rights.

In conclusion, the perspective on gender inequality offered here may seem daunting, but raises concerns that go much beyond the somewhat narrow focus that the MDGs embody. The policy implications are accordingly more formidable, but underline the centrality of women's empowerment through education and employment opportunities, social networks that give women voice to express their concerns arising from life-long deprivation that often takes brutal forms, expansion of health services to minimise infant and maternal death risks, and enforcement of laws that penalise violation of women's human rights.

References

Arnold, F., Kishor, S. and Roy, T. K. (2002). 'Sex-selective abortions in India', *Population and Development Review*, 28(4), 759-785.

Baez, J. E. (2011) 'Civil wars beyond their borders: the human capital and health consequences of hosting refugees', *Journal of Development Economics*, 96(2), 391-408.

Barker, D. J. P., Gluckman, P. D., Godfrey, K. M., Harding, J. E., Owens, J. A. and Robinson, J. S. (1995). 'Fetal nutrition and cardiovascular disease in adult life', *The Lancet* 341, 938–941.

Bhalotra, S. and Umana-Aponte, M. (2009). 'Distress work amongst women? The dynamics of labour supply in sixty-six developing countries'. Paper presented at 4th IZA/World Bank Conference on Economics and Development, Bonn, Germany, 4 May.

Bhaskar, V. and Gupta, B. (2007). 'India's missing women: biology, customs, and economic development', *Oxford Review of Economic Policy*, 23(2), 221-238.

Bruck, T., and Schindler, K. (2009). 'The impact of violent conflicts on households: what we know and what should we know about war widows?' *Oxford Development Studies*, 37(3), 289-303.

Buvinic, M., Dasgupta, M., Casabonne, U. and Verwimp, P. (2012). 'Violent conflict and gender inequality: an overview', *The World Bank Research Observer*, doi:10.1093/wbro/lks011.

Chaudhri, D. P. and Jha, R. (2011) 'Child poverty, demographic transition and gender bias in education in India: household data analysis (1993–94 and 2004–05)', ASARC Working Paper 2011/17. Canberra: Australian National University.

Chung, W. and Das Gupta, M. (2011). 'Factors influencing "missing girls" in South Korea', *Applied Economics*, 43(24), 3365-3378.

Coale, A. (1991). 'Excess female mortality and the balance of the sexes in the population: an estimate of the number of "missing females"', *Population and Development Review*, 17, 517-523.

Cohen, D. K. (2011). 'Causes of sexual violence during civil war: cross national evidence (1980-2009)', Humphrey School of Public Affairs, University of Minnesota, mimeo.

Das Gupta.M. (2005). 'Explaining Asia's "missing women": a new look at the data', *Population and Development Review*, 31(3), 529-535.

Das Gupta, M. (2006). ‘Cultural versus biological factors in explaining Asia's "missing women": response to Oster’, *Population and Development Review*, 32(2), 328-332.

Dyson, T. (2001). ‘The preliminary demography of the 2001 census of India’, *Population and Development Review*, 27, 341-356.

Dyson, T. and Moore, M. (1983). ‘On kinship structure, female autonomy, and democratic behaviour in India’, *Population and Development Review*, 9, 35-60.

Eswaran, M. and Malhotra, N. (2011). ‘Domestic violence and women’s autonomy’, University of British Columbia, mimeo.

Hesketh, T., Lu, L. and. Xing, Z. W (2005). ‘The effect of China’s one-child policy after 25 years’, *New England Journal of Medicine*, 353, 1171-1176.

Hoeffler, A. and Reynal-Querol, M. (2003). ‘Measuring the costs of conflict’, World Bank, mimeo.

Hogan, M. C., Foreman, K. J., Naghavi, M., Ahn, S. Y., Wang, M., Makela, S. N., Lopez, A. D. and Lozano, R. (2010). ‘Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millennium Development Goal 5’, *The Lancet*, April, 12.

Imai, K. S., Gaiha, R, Kulkarni, V. S. and Thapa, G. (2013) ‘Beyond 2015: a new perspective’, Draft, July.

Jain, A. (2013). ‘Sex selection and abortion in India’**,** *BMJ 2013; 346: f1957* (25 March).

Jha, P., Kumar, R., Vasa, P., Dhingra, N., Thiruchelvam, D. and Moineddin, R. (2006). ‘Low male to female sex ratio of children born in India: national survey of 1.1 million households’, *The Lancet*, 367, 211-18.

Klasen, S. (1994). ‘”Missing women” reconsidered’, *World Development*, 22, 1061-1071.

Klasen, S. and Wink, C. (2002). ‘A turning point in gender bias in mortality? An update on the number of missing women’, *Population and Development Review*, 28(2), 285-312.

Krug, E. G., Dahlberg, L. L., Mercy, J. A., Zwi, A. B. and Lozano, R. (eds.) (2002). *World Report on Violence and Health.* Geneva: World Health Organisation.

Kulkarni, Vani. S., Kulkarni, Veena, S. and Gaiha, R. (2013a). 'Underweight and obese women in India' (in preparation).

Kulkarni, V. S., Pandey, M. and Gaiha, R. (2013b). 'Four walls and the cry for help', *The Hindu*, 15 June.

Lin, Ming-Jen and Ming-Ching Luoh (2008). 'Can Hepatitis B mothers account for the number of missing women? Evidence from three million newborns in Taiwan', *American Economic Review*, 98(5), 2259–2273.

Li, Hongbin and Hui Zheng (2009).'Ultrasonography and sex ratios in China', *Asian Economic Policy Review*, 4(1), 121–137.

Li, J. and Lavely, W. (2003). 'Village context, women's status, and sex preferences among rural Chinese women', *Rural Sociology*, 68, 87-106.

Lozano, R., Wang, H., Foreman, K. J., Rajaratnam, J. K., Naghavi, M., Marcus, J. R., Dwyer-Lindgren, L., Lafgren, K. T., Philips, D., Atkinson, C., Lopez, A. D. and Murray, C. J. (2011). 'Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis', *The Lancet*, 24 September.

Nandi, A. and Deolalikar, A. (2013). 'Does a legal ban on sex-selective abortions improve child sex ratios? Evidence from a policy change in India', *Journal of Development Economics,* forthcoming.

National Crime Records Bureau (2012). *Crime in India 2012*. New Delhi: Government of India.

Neupert, R. and Prun, V. (2005). 'Cambodia: reconstructing the demography stab of the past and forecasting the demographic scar of the future', *European Journal of Population*, 21, 217-246.

Osmani, S. and Sen, A. (2003). 'The hidden penalties of gender inequality: fetal origins of ill-health', *Economics and Human Biology* 1(2003), 105–121.

Oster, E. (2005). 'Hepatitis B and the case of missing women', *Journal of Political Economy*, 113, 1163-1216.

Oster, E. (2006). 'Proximate sources of population sex imbalance in India', *Demography*, 46(2), 325–339.

Panda, P., and Agarwal, B. (2005). 'Marital violence, human development and women's poverty status in India', *World Development*, 33(5), 823-850.

Pande, R. P. and Astone, N. M. (2007). 'Explaining son preference in rural India: the independent role of structural versus individual factors', *Population Research and Policy Review*, 26, 1-29.

Ronsmans, C., and Graham, W. J. (2006). 'Maternal survival 1, maternal mortality: who, when, where, and why', *The Lancet*, 30 September.

Sabarwal, S., Sinha, N. and Buvinic, M. (2010). 'How do women weather economic shocks? A review of the evidence', Working Paper 5496, World Bank, Policy Research Department, Washington, DC.

Schady, N. (2004). 'Do macroeconomic crises always slow human capital accumulation?' *World Bank Economic Review* 18(2), 131-154.

Schindler, K. (2010). 'Who does what in a household in a genocide – evidence from Rwanda?' Discussion Paper 1072, DIW, Berlin.

Sen, A. (1990). 'More than 100 million women are missing'. *New York Review of Books,* 37(20).

Sen, A. (1992). 'Missing Women', *British Medical Journal* 304, 586-587.

Sen, A. (2001). 'The many faces of gender inequality', *The New Republic*, September, 17.

Sen, A. (2003) 'Missing women – revisited', *British Medical Journal*, 6 December.

Subramanian, S. V. and Selvaraj, S. (2009). 'Social analysis of sex imbalance in India: before and after the implementation of the pre-natal diagnostic techniques', *Journal of Epidemiology and Community Health*, 63, 245-252.

Unicef (2004). *The State of the World's Children 2004*. New York: Unicef.

United Nations (UN, 2013). *The Millennium Development Goals Report*. New York: UN.

Valente, C. (2011). 'What did the Maoists ever do for us? Education and marriage of women exposed to civil conflict in Nepal', World Bank Policy Research Working Paper 5741, July.

Visaria, L. (2007). ‘Deficit of girls in India: can it be attributed to female selective abortion?’ in T. Patel (ed.), *Sex-selective Abortion in India – Gender, Society and New Reproductive Technologies.* New Delhi: Sage Publications.

World Bank (2011). *World Development Report 2011: Conflict, Security and Development.* Washington, DC: World Bank.

World Health Organisation (2013). *Global and Regional Estimates of Violence Against Women: Prevalence and Health Effects of Intimate Partner Violence and Non-partner Sexual Violence*. Geneva: WHO.

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