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China's Sex Ratio at Birth: Reported Ratios, Actual Ratios, and Expected Trends

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Extended Abstract

The typical sex ratio at birth (hereafter referred to as SRB) in most countries in the world is about 103-106 males born for every 100 females. In contrast, the SRB reported in China's 2000 census short form was almost 117, the highest ever reported in any country. The SRB reported in the long form (a 10-percent sample of those receiving the short form) was even higher – 120. Although this latter figure has been favored by some China experts and found its way into mainstream media (e.g., CBS News 60 Minutes, 2006), the short form figure of 117 is fully representative of reported births.[1]

Excessively masculine SRBs in China (a well as other parts of the world) imply that daughters are "missing," which has generated much attention and concern. A key explanation of China's SRB imbalances is the selective abortion of female fetuses, a practice brought about by the confluence of son preference, low fertility, and new technologies permitting the early detection of fetal sex (Hull, 1990; Johannson and Nygren, 1991; Gu and Roy, 1993; Zeng, et al., 1993; Coale and Banister, 1994; Banister, 2004). Yet the distortion of reported SRBs in China is not due to prenatal discrimination alone. Some portion of infant females may be alive but not reported in censuses and surveys. The same fertility restrictions in China that may enhance fatal discrimination against daughters may also encourage excessive hiding of daughters (Cai and Lavely, 2003).

If we seek to understand actual trends in prenatal discrimination (as well as future implications for sex imbalances among adults), we need to carefully review the demography of sex ratio distortions at birth and early childhood in China. This paper does so by comparing reported sex ratios across a variety of data sources collected at different points in time. We begin by considering distortions in the SRB around 1989. The reported SRB from the 1990 census (for calendar year 1989) was 111.3 (see Figure 1). However, four different sources of evidence suggest that the true sex ratio at birth in 1989 was only about 108, 3 per 100 below the reported rates. These sources include hospital survey data as well as backdating of child sex ratios reported in the 1995 national 1-percent population sample survey, the 2000 census, and new school enrollment figures in 1996 for children reaching age 7 (Figure 1).[2]

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[1]The long form reported SRB (120) may be favored over the short form reported SRB (117) in part because of its similarity to reported sex ratios at ages 1-4, which exceeded 120. As shown in this paper, figures of 120 and above are excessively inflated by underreporting of daughters.

[2]The hospital data come from annual surveys from 1987-1991 (reported in Zeng, et al., 1993). New school enrollment data are collected by the Ministry of Education and refer to the number of children entering China's school system. Typically, such enrollments occur among children at age 6, although a portion are enrolled at age 7, and a tiny fraction enter above age 7 (Scharping, 2005). Figure 1 uses enrollment data in Zhang (2005; Zhang's calculations adjust for slight differences in presumed enrollment rates by sex) and assumes that children entered school at age 7. If they entered instead at age 6, this figure would shift to the right. Note also that we did not back project the school enrollment cohorts to account for excess female mortality and out-migration since birth (factors that *were* incorporated in back projections of child sex ratios from

The aforementioned findings really should not be much of a surprise, even for those who first brought attention to rising SRBs in China. Hull (1990) offered underreporting of female births as one among several hypotheses to explain the reported SRB of 111.0 in the 1987 1-percent survey by the State Statistical Bureau. Johannson and Nygren (1991) noted the reported SRB of 111.6 for 1985-87 from a 2-percent survey by the State Family Planning Commission in 1988, but after adding estimated adoptees (sex ratios of whom are highly feminine) to birth counts, the implied SRB dropped by about 3 per 100 (to 108.9). Zeng et al. (1993) argued that sex-differential underreporting was the most important cause of the elevation of the sex ratios at birth reported in each of the above surveys as well as in the 1990 census.

Although the hospital data series only extends from 1987-91, school enrollment data can be used to calculate sex ratios of more recent birth cohorts. School enrollment data for 2002 suggest that the true sex ratio at birth was no higher than 112.7 as of 1995 (see footnote 1), still about 3 per 100 below the 115.6 reported in the 1995 1-percent sample census. Since 1995, it is possible that the 3 per 100 gap between reported and actual SRBs has declined, yet no evidence exists that it has.[3] We thus presume that the true sex ratio at birth in 2000 was 114, 3 per 100 below the 117 reported in the 2000 census short form.

Figure 1 helps to eliminate a number of myths regarding sex underreporting by child age. For instance, reported sex ratios at ages 1-3 tend to be even more distorted than those at age zero (which correspond to births during the year prior to the census/survey). Some observers theorize that the reported sex ratios at ages 1-3 are correct and that reported SRBs understate the true SRBs. Yet Figure 1 suggests that reported ratios at ages 1-3 cannot be correct. As child cohorts are counted at later ages, the SRBs implied by backdated sex ratios become lower (more feminine). For instance, the SRB implied by 2-year olds in 1995 is about 6 per 100 higher than that implied by 7-year olds in 2000.

Another near universal myth we will address is that rural parents exhibit greater prenatal discrimination against daughters than urban parents. Once disaggregated by birth order, SRBs tend to be higher in *urban* areas. The higher overall SRBs reported in rural areas results from a "composition effect" – sex ratio distortions are most common at higher birth orders, which are more prevalent in rural areas.

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census counts). Either of these alternative procedures suggest SRBs from enrollment data that are *below* those depicted on Figure 1, which should be considered maximum estimates.

[3] Some experts believe that female births in China were more likely to be reported after provinces began to allow rural couples to have a second child without penalty if the first child was female. However, even if this new policy did encourage better reporting of females, the policy was already in place in almost all provinces by the early 1990s. If the gap between reported and actual SRBs declined due to this policy, the decline should have occurred by the mid 1990s.

Finally, we will conclude by reviewing a variety of clues pointing to future trends in the SRB in China. The 2005 1-percent national population sample survey data should be available by the end of 2006 and the results will be added to Figure 1. At this juncture, the best clues available suggest that the true SRB in China will soon fall from recent levels, if it has not already fallen. These clues include the following:

1. increasing urbanization (and other "composition effects");
2. patterns of SRB change as fertility falls elsewhere in East Asia;
3. implementation of a recent "care for girls' program in China to increase the status of daughters; and
4. the case of South Korea.

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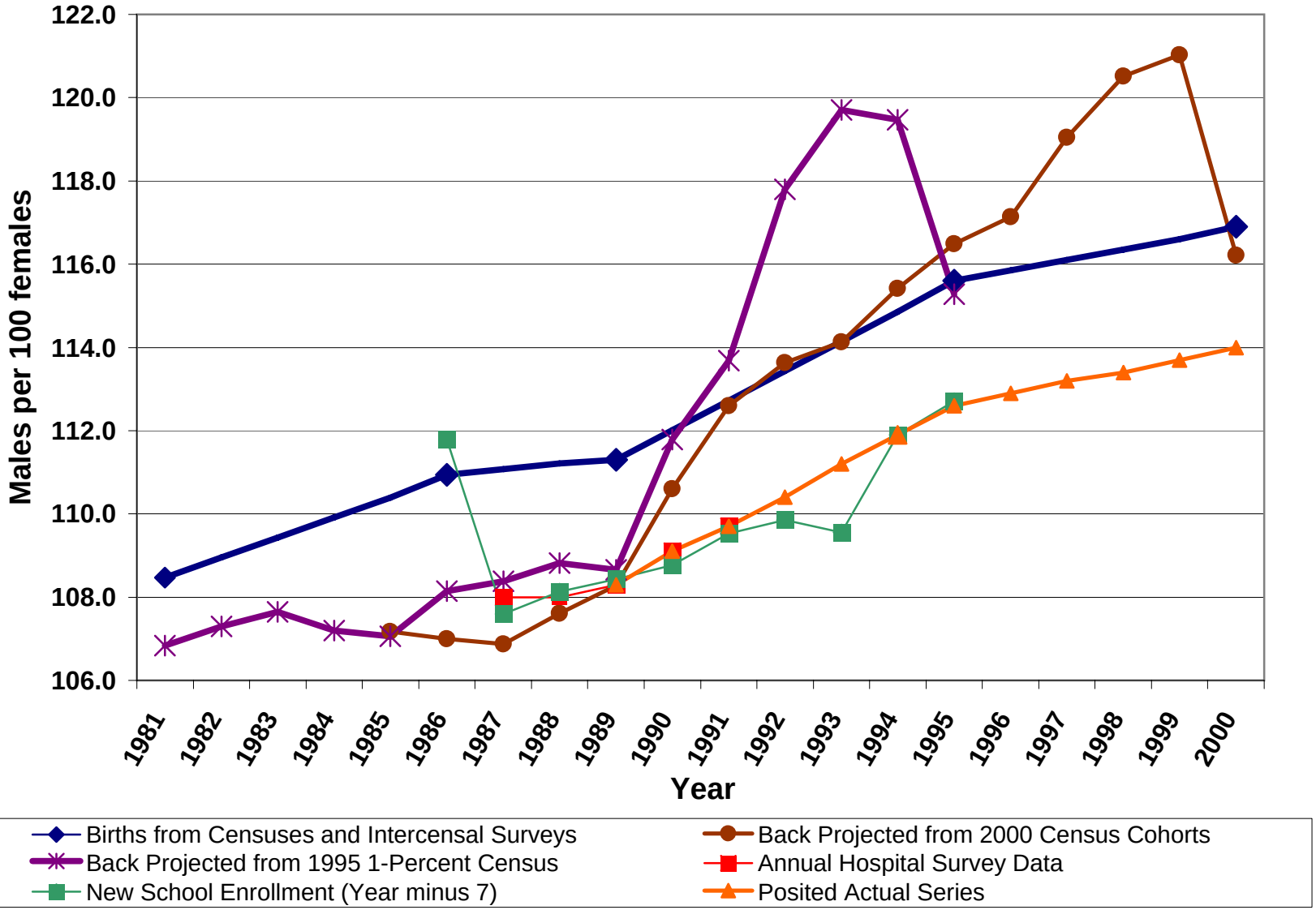
Figure 1. China sex ratios at birth implied by various sources: 1982-2000



Sources: Births during year preceeding censuses and interncensal surveys - National Bureau of Statistics, 1982, 1988, 1993, 1997, 2002; Back projections by authors from 1995 and 2000 child counts incorporate sex differences in mortality and international migration; Hospital surveys - listed in Zeng et al., 1993; New school enrollments 7 years hence (and scaled for slight underenrollment of females) - Zhang, 2005.