

**Sex Selective Abortion, Hidden Girls, or Infanticide?
Explaining the Female Deficit in a Chinese County**

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As sex ratios have risen in China over the past 25 years, uncertainty has persisted about the proximate mechanisms producing the rise. Sex-selective abortion, girls alive but hidden in the population, and sex-selective infanticide have all been advanced as explanations, but the precise mix of these mechanisms is not known. Convincing explanations are elusive because the behaviors involved are unobserved, performed out of view in family homes or quietly in clinics, and omitted from reports by local officials. The instrumentalities that produce the female deficit are important because they delimit policy choices. For example, efforts to curb the rise in sex ratios by outlawing sex-selective abortion will be ineffective and counter-productive if infanticide is a readily available substitute.

Given the sensitive nature of the problem, no single source of data can produce a complete or credible picture. This study triangulates the problem using a combination of data sources from one peripheral rural county in eastern Yunnan Province, a county with unusually high child sex ratios. The data sources include qualitative research materials collected in 1993 and 1994 in the form of interviews with local officials, health workers, and citizens; local documentary evidence; data from a county-wide probability sample of women (N=1,062) who bore children in the years 1991-93; and county census tabulations from 1990 and 2000.

The Setting

“Diandong” County² was selected for study by collaborators at Yunnan University because it met three criteria: a population mainly of the majority Han nationality; relatively poor; and ecologically varied. Diandong is a mountainous county a six hour drive east of Kunming. The population resides in a series of relatively isolated valleys, known locally as *bazi*. The economy is mainly agricultural. Rice and maize are the major staples and tobacco the major cash crop. Quarrying and building materials are major sidelines. The non-Han population, largely concentrated in the south of the county, consists of Buyi, Yi and Miao. A comparison of socioeconomic indicators of Diandong and three more inclusive territorial units at successively higher levels of administration-- Qujing Prefecture, Yunnan Province, and China--suggest that it would be fair to call Diandong a peripheral county in a relatively peripheral province (Table 1). Our fieldwork in the county was carried out in the fall of 1993 and spring of 1994, and that time period is the “ethnographic present” of this account.

Table 1

Health conditions in the county are relatively poor but improving. Many mountain villages are seriously short of water. Literacy rates are low, particularly among women. Poverty and distance to medical services are barriers to better health practices. Home birth is the norm, usually in quite unsanitary conditions. Animals often live in or adjacent to houses. Superstitious and unhealthy childcare practices, such as delayed breastfeeding and swaddling, still persist in some areas of the county. Still, there is a network of local health workers which, since the late 1980s, have brought information,

some prenatal care, kits for sterile delivery, and infant vaccination to most mothers in the county. Given the poverty and inaccessibility of many parts of the county, this is a very considerable achievement.

Birth planning is a high priority of Diandong government. Because Diandong is a poor and mountainous county, the strictures imposed are somewhat looser than those imposed elsewhere in rural China, yet enforcement has tightened in recent years. Diandong, like other Chinese counties, receives an annual quota of births that is sent down from the province. Birth planning activities are governed by unpublished regulations at province and local level.¹ The basic policy, as outlined by local officials, is that every couple (with the exception of state employees) is permitted two children. Spacing between first and second births should be four or five years. Fines of up to 3,000-4,000 RMB, depending on the township, may be levied on couples who exceed the birth quota. One child couples, rare in Diandong, receive a 100 RMB reward and the "three preferences" (*sanyou*) for the child in entry into nursery, school, and employment, but these latter are options that seem to apply only to state sector employees, a tiny fraction of the population. National minorities are under the same restrictions, however, only three years of spacing is required, and other concessions are made in enforcement.

Policy implementation is guided by the policy of "insert an IUD after the first child, sterilize after the second" (*yitai fang, ertai zha*) that was first enunciated nationally in 1983. The policy that makes birth planning performance a major criterion of cadre evaluation at every level (sometimes referred to at the "one vote down" system), instituted nationally in the late 1980s, is also practiced in Diandong. There are penalties for units and cadres that exceed the birth quota. Poor performance may bring a fine (*renkou shikong fei*) or other administrative sanction against an official or against a township government.

Diandong has unusually high and rising juvenile sex ratios, although they are not unusual for the locale. The sex ratio of the population 0-4 rose from 106 males per 100 females in 1982 to 124 in 1990 (see Table 2), a sharper rise than occurred in Yunnan and nationally. In fact, Diandong's juvenile sex ratio is in the top 3 percentile of China's approximately 2400 county-level units. Diandong is located in a cluster of high sex ratio counties mainly centered on Qujing prefecture. This clustering is an important issue in itself, but one that we cannot take up in this paper.

Table 2

The Proximate Cause of High Sex Ratios

In this section the three mechanisms explaining high sex ratios in Diandong—hidden girls, ultrasound, and infanticide—are considered in turn.

¹ Among those quoted to us were Yunnan Province Birth Planning Regulations of 1990 (*Jihua shengyu tiaoli*) and the Luoping Xian Document No. 30 of 1991.

Hidden girls. The idea of “hidden” children rests on the plausible assumption that infants and children are more likely to go unreported in censuses and surveys than children who are older and presumably more conspicuous. Cai and Lavelly (2003) estimated the number of hidden children in the 1990 census by comparing the age 0-4 cohort enumerated in the 1990 with the same cohort (then age 10-14) observed in the 2000 census. They used back-projection of the 2000 observation to predict the true size of the 1990 cohort, under the assumption that persons age 10-14 are fully enumerated. They found that, nationally, 6.2% of males and 7.5% of females aged 0-4 went uncounted in 1990. The differential undercount by sex accounts for approximately 28% of girls 0-4 “missing” in 1990 (2003: 21).

The method employed by Cai and Lavelly may be applied to county populations under the assumption of low net inter-county migration of children under age 15. The net movement of children across county boundaries could influence the rate at which children are detected as hidden. A net out-migration would bias the estimate of hidden children downward. If net migration differs by sex of child, this will influence the sex-specific estimate of the hidden. Because our concern is with hidden *girls*, this latter problem is crucial. If girls exit the county at higher rates than boys, it will lead to an underestimate of the back-projected cohort and hence to an underestimate of hidden girls.

The estimate of hidden children in Diandong is shown in Table 3. The procedure uses the cohort age 0-4 in 1990 as enumerated in the 1990 census and as observed a decade later in 2000 (the fact that it was actually 10.33 years later should not influence the result). A 2000 Diandong county life table constructed by Cai (2005) provides survival ratios (L_x values). The back projection suggests a rate of under-enumeration similar to that at the national level—2,178 boys represent 7.1% of the cohort, and 1,426 girls represent 5.8% of the cohort. However, the results indicate a higher undercount of males than females. Technical factors might possibly account for this unexpected result, for example, if female child mortality were greatly undercounted, or if there was considerably more net out-migration of female children than male. However, lacking information, we must also consider the possibility that there is a local tendency to conceal male children.

Table 3

The hidden-children adjusted cohorts yield a sex ratio age 0-4 of 126.33 as compared to the observed ratio of 124.68. This result suggests that hidden girls do not account for the elevated child sex ratio in 1990.

Ultrasound. Sex-selective abortion is often cited as one of the mechanisms producing the elevated sex ratio. One of the earliest and most forceful statements was that Zeng et al. (1993) who provided statistics on the growing availability of ultrasound-B machines in China. Subsequent studies of the sex ratio of aborted fetuses (e.g., Li 1994) and local field studies (Chu 2001) have provided evidence of the use of sex-selective abortion in some areas. In the years since Zeng et al. there has been no systematic publication of statistics on ultrasound or large-scale study of its use, and the studies of aborted fetuses

have focused on urban areas or provinces (e.g., Zhejiang) where ultrasound machines are most prevalent. Although it can be assumed that availability of ultrasound technology spread in the 1990s, but evidence on ultrasound remains sparse.

Peng and Huang (1999) propose that traditional Chinese medical practitioners are able to perform reliable pre-natal sex determination by examining the pulse of pregnant women. If true, it would mean that modern sex-selective technologies are not a precondition for sex-selective abortion. The authors had traditional specialists use pulse examination to predict the sex of the fetus among pregnant women in the obstetrics section of three hospitals in Bengbu, Anhui, and followed up the women a year later. They found that the traditional diagnosis was correct in over 80% of cases, for pregnancies as early as six weeks. These remarkable results require replication before they can be interpreted as a medical or social phenomenon. Even if traditional practitioners have this ability, the extent to which pulse examination was or is used for sex determination is as unknown.

Ultrasound examination was rare in Diandong in 1993. In our sample of 1,062 birth mothers, 32 women (3%) reported that they had ever had an ultrasound examination. Local officials anticipated an expansion of the use of ultrasound examinations for the purpose of birth planning monitoring and to promote reproductive health, and at least one village reported having a new ultrasound machine still in the box but not yet in use. Given the novelty of ultrasound in the county in 1993, and the minor exposure of women to its use, it would appear that ultrasound examination could have had little role in producing the elevated sex ratio of cohort born 1986-1990, or even in the subsequent years prior to our investigation.

Infanticide. We have two important external sources of data on infant mortality in Diandong. The first is the county report of the 1990 census (“Diandong” Census Office 1992). The second is an internal county report that reports death rates and sex ratios at birth for 1991 (“Diandong” People’s Congress 1992).

Each county census volume contains the materials necessary to create life tables, separately by sex, for 1989 and the first six months of 1990. We calculated life tables for Diandong in 1989 using Chiang’s (1968) method. Several studies of the 1990 census have shown deaths to be seriously underreported, with sizable variation in the completeness of reporting across provinces (Li and Feldman 1995:5). Since there is no suggestion that mortality could be *over*-reported in the census, census-based estimates of mortality in Diandong can be considered to be conservative. The life table q_0 value is the probability of death in the first year of life; it is thus the life table equivalent of the Infant Mortality Rate. The census puts Diandong 1989 IMR at 73 per 1000 for males and 128 per 1000 for females and the sex ratio of births at 122.6 males per 100 females.

The second source of data on mortality is from a manuscript report on family and marriage issues that was presented by county officials (“Diandong” People’s Congress 1992). The report expresses deep concern about rising sex ratios in the county, and in this context provides central death rates for infants by sex, as well as sex ratios at birth by parity for 1991. These rates would put 1991 IMR at 64 per 1000 for males and 160 per

100 for females. The source of these figures is not stated, making a quality assessment impossible, but it should be noted that, regardless of the statistical system from which they arise, an over-statement of infant death is quite unlikely.

The 1990 census indicates that the female infant mortality in 1989, as measured by life table q_0 , was 1.75 times higher than male. The internal county report gives mortality rates for 1991 (shown in Table 4) which are consistent in magnitude with the census report but which show female mortality to be 2.5 times higher than male. The substantial deterioration of female mortality in such a brief span of time was paralleled by a sharp rise in the reported sex ratio of births in the same period, from 123 in 1989 to 147 in 1991.

Table 4

The sharp difference between the 1989 and 1991 rates invites questions. What would cause a sharp rise in the SRB and in female infant mortality within only two years, even as male infant mortality was declining? Such discontinuities suggest a demographic shock, and in the absence of such a shock, we should perhaps put little faith in the 1991 figures.

However, Diandong did indeed experience a shock in 1990. China's birth planning program tightened in 1989 and 1990. Rates of contraceptive use rose sharply and fertility fell (Nygren and Hoem 1993; Greenhalgh, Zhu and Li 1994). There is a growing consensus that China attained replacement-level fertility in 1990 or soon after (Feeny and Yuan 1994; Retherford et al. 2005; Cai 2005). Birth planning activity in Diandong paralleled these national trends. 1990 was a "high tide" of birth planning activity as the county vigorously implemented the "first parity IUD, second parity sterilize" policy. Activity peaked in June, July, and August when twenty-two doctors from neighboring counties and provinces joined seven mobile surgical teams at work in the county. Of the year's 14,770 sterilizations, 59% were carried out in that three-month period ("Diandong" Nianjian 1992:328-329). Statistics read from a wall chart in one township underscore that 1990 was a high tide. There were 1,321 female sterilizations in the township in 1990 compared with 228 in 1991, 313 abortions in 1990 compared with 25 in 1991. Of the abortions in 1990, 113 were first trimester and 200 were second trimester.

The "high tide" of 1990 signaled a broad and lasting change in policy and fertility. The policy had been preceded in 1989 by the establishment, in most townships, of modern birth planning service stations. While only twenty-five of Diandong's 150 administrative villages adopted the policy of "zero excess fertility" ("Diandong" Nianjian 1991:326), the shift in policy enforcement extended throughout the county. Diandong's crude birth rate dropped from 24.4 in 1989 to 15.5 in 1990, and 16.9 in 1991. So effective was the high tide of summer 1990 that Diandong women had 5,006 births in the first six months of 1990, and 2,144 births in the last six months.

Large sex differentials in infant mortality are circumstantial evidence that many females are intentionally killed, neglected or abandoned. But the evidence that female infanticide

and abandonment is common in Diandong is more than just circumstantial. Over several weeks of interviews we received many first- and second-hand accounts of infanticide, even though we never once inquired directly about it. Officials told us of the practice, health workers told us, and in some cases, even our survey respondents told us.

An officer of the “Diandong” Women’s Federation told us that abandonment of female infants was a local problem. She mentioned that infants were often left at the artificial mountain (*jiashan*) in the marketplace in the county town, a phenomenon we observed ourselves on more than one occasion. A township birth planning cadre, asked to explain high sex ratios in his area, told us that girl babies are “thrown away” (*zhuaille*, in the local dialect). At meetings with township and village maternal and child health workers, we were told repeatedly and insistently about infanticide and abandonment. One health worker explained: “When a male is born, everything is fine, but when a female is born there are problems. They throw the baby away. After seven or eight days they report that the baby has died. They have all kinds of reasons. There are a lot of these cases.” Another said: “Some women just keep having children until they have a boy. The girls they just get rid of” (*chulidiao*). All of the health workers could cite many such cases and some could cite cases that occurred the previous week. Our questionnaire, of course, did not ask about infanticide, but some interviewers made notations in the margins of the questionnaire. Samples of this marginalia include: “...didn’t feed the child—after two days, threw it away.” “...husband says someone came to take the child away; earlier the wife said they left it at the artificial mountain.” “...respondent says a stillbirth, but the doctor that delivered says it was thrown away.”

There is also documentary evidence. Lists of infant deaths provided to us by local health workers generally contained cause of death. The major cause of death for males was illness, while the major cause of death for females was “unknown” or “accident,” which a health worker conceded were often euphemisms for infanticide. In many cases, however, the notations were quite direct. One township provided a list of 55 deaths to infants that occurred to children in 1991-93. Of the 23 male deaths, 21 died due to illness; of the 29 female deaths, 17 died due to accidents, and 5 others noted causes such as abandonment, poisoning, and drowning.

It remains to note that the reported differential in the official death rates would not completely account for the elevated sex ratio at birth or the sex ratio of children. It is likely that most cases of female infanticide go unreported as either births or deaths. Thus the infant mortality rate for females greatly understates the true rate.

Discussion

Local studies are useful for understanding demographic processes because intensive research and multiple data sources can provide a picture that cannot be obtained from census and survey data collected over large areas. The situation in Diandong in the early 1990s cannot represent the broader conditions of rural China, but it can alert us to the range of possibilities. The Diandong case is significant in several ways.

There has been considerable reluctance by researchers to consider infanticide as anything more than a rare occurrence. It is an article of faith among demographers in China that infanticide is a rare occurrence. Zeng et al. (1993: 295) make the case against infanticide, starting with the argument that “Both the social and administrative structure and the close bonds among neighbors make it difficult to conceal a serious crime such as infanticide.” But in Diandong, infanticide is scarcely concealed and neighbors and officials are aware of it. This is a case in which the local society closes ranks around a custom that is considered a shameful but not a serious crime.

The situation in Diandong in 1990 is unlikely to be unique. As noted above, Diandong lies in a cluster of high sex ratio counties. There is no reason to believe that Diandong differs from its neighbors with respect to the mechanisms underlying these high ratios. The mortality conditions reflected in the 1990 census in Diandong are in fact typical of broad areas of southern China. For example, infant mortality of females in Guangxi Autonomous Region was more than double that of males in the 1990s (Table 5). In substantial regions of Guangxi the situation is considerably more extreme.

Table 5

Across China, rising sex ratios since 1980 has been accompanied by a steady deterioration of female infant mortality relative to male. The ratio of female q_0 to male q_0 rose from .95 in 1981 to 1.41 in 2000 (Table 6). These figures undoubtedly understate the rise because female infant mortality tends to be more underreported than male. The female disadvantage is not homogeneous in space. Female infant mortality is more than double that of male in major areas of Guangxi, Guangdong, Jiangxi, Hubei, Henan, and Anhui (Lavelly and Cai 2004). Diandong has relevance for understanding both the general trend and these regional phenomena.

Table 6

The case of Diandong also has implications for policies designed to reverse the sex ratio trend, now a national priority. President Hu Jintao has stated:

With the strengthening of the responsibility system, with the joint evaluation of indicators of population quantity and population sex ratios, we aim in three to five years of effort to bring the trend of rising sex ratio under control (Xinhua 2004-04-04).

Senior family planning officials have stated that the government plans to reverse the sex ratio imbalance by 2010 by banning sex-selective abortion, campaigns against son preference, and insurance schemes and other incentives to ameliorate the position of daughters (China Daily 2005-04-25).

However, to the extent that infanticide is a readily available alternative to sex-selective abortion, banning pre-natal sex determination may only lead families to resort to less desirable alternatives. As Goodkind (1996) has argued, banning sex-selective abortion

may lead to discriminatory treatment of daughters of families who desire a son. If infanticide is a real option in large areas of rural China, policies designed to curb sex-selective abortion are likely to have perverse consequences.

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Table 1
Selected Characteristics of China, Yunnan, Qujing, and Diandong, 1990

| | China | Yunnan | Qujing | Diandong |
|---------------------------------|---------------|------------|-----------|----------|
| Total population | 1,133,682,501 | 36,972,610 | 5,227,734 | 459,984 |
| Han (%) | 91.9 | 66.6 | 92.2 | 87.8 |
| Non-agricultural population (%) | 19.4 | 12.2 | 9.2 | 6.2 |
| Annual per capita income (yuan) | 1267 | 954 | 819 | 765 |
| Illiteracy age 15 + (%) | 12 | 37 | 51* | 46 |
| Male illiteracy (%) | 6 | 24 | 33* | 28 |
| Female illiteracy (%) | 18 | 51 | 69* | 64 |
| Crude birth rate 1989-90 | 21.0 | 23.6 | 17.4 | 24.0 |
| Crude death rate | 6.3 | 7.7 | 5.7 | 7.8 |
| Natural increase rate | 14.7 | 15.9 | 11.7 | 16.2 |
| Sex ratio of births 1989 | 111.8 | 107.7 | 121.4 | 124.0 |

* Illiteracy age 12 +.

Sources: National Population Census 1991; Population Census Office of Yunnan Province 1992; Population Census Office 1993; Qujing District Administrative Statistical Bureau.

Table 2

Sex ratio of the population 0-4 by census year: China, Yunnan, Qujing, and "Diandong"

| Year | China | Yunnan | Qujing | Diandong |
|------|-------|--------|--------|----------|
| 1953 | 106.8 | 103.6 | 104.0 | - |
| 1964 | 105.7 | 102.9 | 103.5 | - |
| 1982 | 107.1 | 104.2 | 106.1 | 106.1 |
| 1990 | 110.2 | 107.4 | 119.6 | 124.7 |

Sources: National Statistical Bureau Population Census Office 1986; The National Population Census Office Under the State Council 1991; China Statistical Publishing House 1993; Population Census Office of Yunnan Province 1992; Yunnan Provincial Statistical Bureau 1991, 1992; The Population Census of Yunnan Province 1984; Qujing District Administrative Statistical Bureau; "Diandong" County Population Census Office 1988, 1992.

Table 3
Calculation of the Number of Hidden Boys and Girls age 0-4:
Diandong Xian 1990

| Variable | Male | Female | Source |
|--|--------|--------|--------------------------------------|
| Population 0-4 1990 (p_{90}) | 28,564 | 22,909 | 1990 Census |
| Population 10-14 2000 (p_{00}) | 30,375 | 24,206 | 2000 Census |
| L_0 | 92698 | 82659 | 2000 census life table (Cai 2005) |
| L_1 | 371832 | 344252 | |
| L_{10} | 458989 | 424645 | |
| Observed survival rate | 1.063 | 1.057 | p_{00}/p_{90} |
| Predicted by back projection (p_{90pred}) | 30,742 | 24,335 | $p_{00}*(L_0+L_1)/L_{10}$ |
| Number "hidden" (<i>hidden</i>) | 2,178 | 1,426 | $p_{90pred} - p_{90}$ |
| Adjusted 0-4 1990 | 30,742 | 24,335 | $p_{90} + hidden$ |

Table 4
Reported mortality rate at age 0 (m_0) and estimates of q_0 : Diandong 1989 and 1991

| | 1989 | | 1991 | |
|-------|------|--------|------|--------|
| | Male | Female | Male | Female |
| m_0 | .078 | .146 | .068 | .188 |
| q_0 | .073 | .128 | .064 | .160 |

Sources: 1989 from 1990 Census ("Diandong" Census Office 1992: 18, 488); 1991 from "Diandong" People's Congress 1992.

Table 5
Male and Female q_0 for Guangxi Zhuang Autonomous Region, 1990-2000

| Year | Male q_0 | Female q_0 | Source |
|---------|------------|--------------|-------------------------------|
| 1989-90 | 27.3 | 63.7 | 1990 Census (Huang and Liu) |
| 1990 | 30.8 | 69.5 | 1990 Census (Lu et al.) |
| 1989 | 33.2 | 39.4 | 1990 Census (Jiang et al.) |
| 1994-95 | 34.0 | 81.9 | 1995 1% sample (Guangxi 1996) |
| 2000 | 17.5 | 30.9 | 2000 Census (Cai 2005) |

Table 6
Life Table q_0 and Ratio of Female to Male: China 1981-2000

| Year | Male | Female | Ratio F/M |
|---------|------|--------|-----------|
| 1981 | 38.7 | 36.7 | .95 |
| 1989-90 | 25.4 | 29.4 | 1.15 |
| 2000 | 22.1 | 31.2 | 1.41 |

Footnotes

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² Use of a pseudonym is only intended to spare the county notoriety.