Sex ratio at birth among Chinese babies born in Italy is lower than in China

F Festini, G Taccetti, T Repetto, M L Cioni, M de Martino

In industrial countries sex ratio at birth (SRB) (male/female) varies between 1.07 and 1.03, with a decreasing trend in the past few decades. Population statistics of the past 20 years report that SRB in China is constantly and considerably increasing. According to official census data, the SRB of Chinese newborn babies was 1.168 in 2000 but in some provinces it exceeded 1.3. The increase of SRB has been a cause of concern in China as it is considered a possible cause of relevant social problems for the future, because of the increasing surplus of adult men without a female partner.

As no data are currently available about the SRB among Chinese living outside their homeland, we decided to calculate the SRB of an entire population of live births born during a decade to ethnic Chinese people settled abroad.

PARTICIPANTS, METHODS, AND RESULTS

Tuscany, a region in central Italy with 3.4 million inhabitants, has had a relevant influx of immigrants from China's People Republic since the early 1990s. According to Italian Statistics Bureau data, 17 400 Chinese immigrants were living in Tuscany by the end of 2002.

Using the data of the Tuscan neonatal screening programme for cystic fibrosis for the 1 July 1992 to 30 June 2002 period, on the basis of the information contained in the forms filled out at birth by the obstetricians, we separated the children born to both Chinese parents from other Tuscan babies. No children with just one Chinese parent were reported. As the screening programme covers 99.9% of the region’s newborn babies, we are confident that we analysed an entire population of Chinese infants born abroad. Then we calculated the SRB of the two groups both overall and by year, and their 95% confidence intervals (95% CI). Differences

**Table 1**  Comparison of the SRB of Chinese babies born in China with the SRB of Chinese and non-Chinese babies born in Tuscany, 2000. Comparison between the SRBs of Chinese and non-Chinese babies born in Tuscany, Italy, 1992–2002

<table>
<thead>
<tr>
<th>Period†</th>
<th>Live births</th>
<th>SRB</th>
<th>SRB 95%CI</th>
<th>Live births</th>
<th>SRB</th>
<th>SRB 95%CI</th>
<th>χ² p value</th>
<th>Live births</th>
<th>SRB</th>
<th>SRB 95%CI</th>
<th>χ² p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>644</td>
<td>0.969</td>
<td>0.830 to 1.131</td>
<td>28247</td>
<td>1.058</td>
<td>1.033 to 1.082</td>
<td>NS</td>
<td>17721620</td>
<td>1.168</td>
<td>1.166 to 1.169</td>
<td>0.017</td>
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<tr>
<td>1992–93</td>
<td>159</td>
<td>1.120</td>
<td>0.821 to 1.527</td>
<td>24149</td>
<td>1.098</td>
<td>1.070 to 1.126</td>
<td>NS</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1993–94</td>
<td>180</td>
<td>0.978</td>
<td>0.731 to 1.308</td>
<td>24788</td>
<td>1.059</td>
<td>1.033 to 1.085</td>
<td></td>
<td></td>
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<tr>
<td>1994–95</td>
<td>198</td>
<td>1.020</td>
<td>0.773 to 1.340</td>
<td>24334</td>
<td>1.066</td>
<td>1.039 to 1.093</td>
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<td></td>
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<tr>
<td>1995–96</td>
<td>238</td>
<td>1.016</td>
<td>0.789 to 1.310</td>
<td>25076</td>
<td>1.068</td>
<td>1.042 to 1.095</td>
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<td>1996–97</td>
<td>368</td>
<td>1.127</td>
<td>0.919 to 1.382</td>
<td>25826</td>
<td>1.049</td>
<td>1.024 to 1.075</td>
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<tr>
<td>1999–97</td>
<td>390</td>
<td>0.959</td>
<td>0.787 to 1.170</td>
<td>25695</td>
<td>1.071</td>
<td>1.056 to 1.109</td>
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<tr>
<td>1998–99</td>
<td>490</td>
<td>0.983</td>
<td>0.824 to 1.173</td>
<td>26502</td>
<td>1.066</td>
<td>1.041 to 1.092</td>
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<tr>
<td>1999–00</td>
<td>560</td>
<td>1.066</td>
<td>0.903 to 1.258</td>
<td>27699</td>
<td>1.075</td>
<td>1.050 to 1.101</td>
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<tr>
<td>2000–01</td>
<td>693</td>
<td>0.957</td>
<td>0.825 to 1.111</td>
<td>28677</td>
<td>1.056</td>
<td>1.032 to 1.081</td>
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<tr>
<td>2001–02</td>
<td>869</td>
<td>1.097</td>
<td>0.962 to 1.267</td>
<td>28611</td>
<td>1.047</td>
<td>1.023 to 1.072</td>
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<tr>
<td>1st half</td>
<td>1143</td>
<td>1.059</td>
<td>0.943 to 1.189</td>
<td>124173</td>
<td>1.067</td>
<td>1.055 to 1.078</td>
<td>NS</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2nd half</td>
<td>2002</td>
<td>1.024</td>
<td>0.953 to 1.100</td>
<td>137184</td>
<td>1.063</td>
<td>1.052 to 1.074</td>
<td>NS</td>
<td></td>
<td></td>
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<tr>
<td>Overall</td>
<td>4145</td>
<td>1.033</td>
<td>0.972 to 1.098</td>
<td>261357</td>
<td>1.065</td>
<td>1.057 to 1.073</td>
<td>NS</td>
<td></td>
<td></td>
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</table>

of SRB between non-Chinese Tuscan newborn and Chinese born in Tuscany, as well as between Chinese born in Tuscany and Chinese babies born in China, were analysed with χ² test p values.

The number of live births in the decade under investigation was 265 502. Among them, the number of infants born to ethnic Chinese immigrants was 4145. In Table 1 the SRB of Chinese immigrants’ babies is compared with the SRB of other Tuscan infants and to the SRB of babies born in China in 2000. China’s SRB for the 1992–2002 period is only partially known. In any case, all available annual data show SRB values over 1.13.4

COMMENTS
The SRB of the entire population of Chinese infants born in Tuscany is significantly lower than that of Chinese babies born in their homeland and is not different from that of non-Chinese Tuscan babies.

To explain the high SRB found in China, besides the well known strong cultural preference for sons2 4 5 a wide use of ultrasonography for antenatal sex detection and selective abortion of female fetuses has been described despite laws that strictly prohibit such practice.2 4 5

Moreover, a considerable under-registration of female births has been evidenced.2 4 5 The “one child family” policy introduced by China’s authorities in 1979 has been considered among the possible causes of both of the described practices.2 4 Overlapping the traditional son preference, it has stimulated on the one hand antenatal sex selection—so that the only permitted child is a son—and on the other hand the under-reporting of female babies—so as not to deprive couples of another opportunity to have a son. Our data are particularly interesting considering that in Tuscany antenatal sex detection is not prohibited and fetal ultrasonography, medical assistance during pregnancy, and abortion are provided free of charge to Chinese immigrants, whereas nothing suggests that they have abandoned their cultural preference for sons.

Many factors have been reported that influence SRB: medical factors (such as variations in sexual hormone levels, paternal and maternal age, etc), occupational exposures to substances and environmental pollutants.7 To our knowledge, no elements suggest a role of such factors in determining a lower SRB in Chinese born in our region.

Our data show that in social contexts in which a cultural preference for sons exists, the presence of rules limiting the number of children per family has a role in determining a higher SRB.

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