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Where are the missing girls? Gender discrimination in 19th-century Spain



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1. Introduction

ABSTRACT

This article shows that average (male-to-female) infant and child sex ratios were abnormally high in late 18th- and 19th-century Spain, thus pointing to some sort of unexplained excess female mortality early in life. This pattern, which is also shared by other countries in Southern Europe, disappeared at the turn of the 20th century. Rather than female infanticide or other type of extreme violence against girls, these results might be explained by gender discrimination in terms of an unequal allocation of food, care and/or workload within the household. In high-mortality environments, this type of discrimination easily resulted in higher female mortality rates.

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It is now 25 years since Amartya Sen (1990) forcibly drew the world's attention towards the phenomenon of missing girls in the developing world, especially in South and East Asia. Abnormal infant sex ratios pointed to gender discrimination in the form of sex-selective abortion, female infanticide and/or the mortal neglect of young girls (Klasen and Wink, 2002; Das Gupta et al., 2003; Hesketh and Xing, 2006). Traditional son preference was actually being reinforced by the decline in fertility rates and the possibilities that modern techniques opened in terms of determining the gender of the foetus. Despite the journalistic buzz and the considerable research directed towards analysing the situation in developing economies today,¹ the historical experience of western countries has either received little attention or considered that these issues had little importance. Lynch (2011) argues, for instance, that there is little evidence for this kind of gender discrimination in pre-industrial Western Europe. According to this author, the European household formation system, together with prevailing ethical and religious values, prevented these same impulses becoming more widespread. Other studies, however, point to the neglect of girls during infancy and childhood in 19th century Europe, especially under adverse economic conditions or where wage labour opportunities for women were scarce (Johansson, 1984; Humphries, 1991; Baten and Murray, 2000; McNay et al., 2005; Horrell and Oxley, 2016).² Gender discrimination within the household via an unequal intra-family allocation of food, care and workload may therefore have led to excess female mortality early in life.

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¹ For relatively recent examples in the media, see 'The war on baby girls: Gendercide', *The Economist* (March 2010), '160 Million and counting', *The New York Times* (June 26, 2011) or 'It's a girl: The three deadliest words in the world', *The Independent* (January 18, 2012).

² Examining differential mortality, Harris (1998, 2008), however, does not find evidence of a systematic gender bias. According to Horrell and Oxley (2016) who analyse data on heights of children working in factories, greater deprivation for girls is only visible at older ages due to the additional burden that housework entailed for factory girls.

By relying on data for Western Europe between 1740 and 2010, this paper first provides an estimation of a hypothetical historical sex ratio in absence of gender discrimination. Compared to this benchmark, average (male-to-female) infant and child sex ratios in 19th-century Spain were abnormally high, thus pointing to some sort of unexplained excess female mortality early in life. This behaviour, which is shared by other Southern European countries, mostly disappeared at the turn of the 20th century. However, rather than female infanticide or other type of extreme violence against girls, the excess female mortality found here might be explained by gender discrimination in terms of an unequal allocation of food, care and/or workload within the household. In high-mortality environments, this differential treatment is likely to result in more girls dying from the combined effect of undernutrition and illness.

Apart from the literature on skewed sex ratios and that on gender discriminatory practices in 19th century Europe, this article also relates to a growing wave of studies interested in gender inequality and economic development (Doepke et al., 2012; Eastin and Prakash, 2013; Dilli et al., 2015). The latter claim that gender equality is not only a moral issue but also economically efficient (Dollar et al., 2001; Currie and Moretti, 2003; Klasen and Lamana, 2009; Alesina et al., 2013).³ A recent World Development Report consequently puts gender equality on the spotlight as a crucial strategy for economic progress in developing countries (World Bank, 2011). Unveiling thus forgotten patterns of gender discrimination becomes of paramount importance.

2. Literature review

The presence of unbalanced sex ratios in South and East Asia, especially in India and China, has been linked to practices of gender discrimination in early life (Sen, 1990). Different methods to control the number and gender composition of families' offspring, such as female infanticide and the neglect of young girls, had been long practised by families in these regions (Lynch, 2011, 252–253). Son preference is widely related with economic and cultural factors affecting the perceived relative value of women (Das Gupta et al., 2003). Moreover, these patterns do not seem to entirely vanish with economic development, which is normally associated with improving opportunities for women (Dilli et al., 2015).

Evidence of gender-discriminatory practices in pre-industrial Europe is however thin. Economic difficulties of supporting a newborn and shame at bearing a bastard child appear to be the main motives behind infanticide, which were more prevalent among working-class women who had given birth to a child out of wedlock (Lynch, 2011, 254). However, information on the gender of victims of infanticide is usually lacking. Although research on unbalanced sex ratios at birth and family reconstitution data suggest the presence of gender discrimination in families' reproductive strategies (Bechtold, 2001; Beise and Voland, 2002), other studies, however, fail to find clear signs of this kind of practices (Derosas et al., 2004). Much more evidence exists on the widespread practice of child abandonment. Foundling institutions proliferated throughout Europe to receive these children and prevent infanticide (Derosas et al., 2004; Lynch, 2011, 255). Given the extremely high levels of mortality associated with these institutions, child abandonment has been considered as a kind of surrogate infanticide. Although some foundling hospital is Southern Italy systematically received more girls than boys, conclusive evidence of gender selection in child abandonment is again scarce (Lynch, 2011, 256).

Longstanding features present in European societies, such as the household formation system and the prevailing ethical and religious values, seem to have limited the extent of the mortal neglect of newborns and young girls (Das Gupta et al., 2003; Lynch, 2011). Another strand of the literature, nonetheless, stresses that parents seem to have treated their sons and daughters differently throughout childhood both in Britain and continental Europe. During the 19th century, the living standards of girls, relative to boys, seem to have deteriorated as they grew older, especially in adverse economic conditions or where wage labour opportunities for women were scarce (Johansson, 1984; Humphries, 1991; Pinelli and Mancini, 1997; Schofield, 2000; Baten and Murray, 2000; McNay et al., 2005).⁴ The 'double burden' arising from working both in the labour market and in domestic chores also probably led to greater deprivation for older girls (Horrell and Oxley, 2016). Klasen and Wink (2002, 289–290) argue that discriminatory practices, either via an unequal intra-family allocation of food, care and workload, are likely to explain excess female mortality at these ages.⁵

As in the rest of Europe, direct evidence of female infanticide or the mortal neglect of young girls is almost absent in the Iberian Peninsula.⁶ However, women faced severe discrimination in many dimensions of 19th-century Spain. Legally subordinated to their fathers and husbands, women were expected to remain within the domestic realm and those who did work in paid jobs received significantly lower wages (Camps, 1998; Sarasúa, 2002; Borderías et al., 2010). The inferior status of women was also reflected in an unequal allocation of resources within the household, both in terms of nutrition and educational investments (Sarasúa 2002; Borderías et al., 2014).⁷

Being such a male-oriented society, it is therefore legitimate to hypothesise that gender discrimination might have also involved other kinds of mistreatment towards girls.⁸ A glimpse of the existing son preference can be discerned from a popular proverb: 'Wish I had a boy, even if he becomes a thief'.⁹ Although, as commented above, clear evidence is missing, Reher and Sanz-Gimeno (2004,

³ Although adhering with this view, Duflo (2012) offers a less optimistic picture of the potential of women's empowerment.

⁴ Recent research on medieval England also suggests excess female mortality probably arising from discriminatory practices (Bardsley, 2014).

⁵ Harris (1998, 2008), in contrast, does not find clear evidence of a systematic gender bias in differential mortality between boys and girls.

⁶ On infanticide and child abandonment in Spain, see Pérez Moreda (1980, 167–187; Pérez Moreda et al., 2015), Valverde (1994), Revuelta-Eugercios (2013) or Berraondo (2013). As in other parts of Europe, information on gender is often lacking.

⁷ Furthermore, women served men who usually ate first, whereas women frequently had their food later in the kitchen (Borderías et al., 2014, 212). Likewise, women could not attend secondary and tertiary education (Sarasúa, 2002, 608–609).

⁸ Gender discrimination still persists today in terms of wages, participation in the labour market, and political empowerment (World Economic Forum, 2013). The most dramatic side of these issues takes the form of domestic violence. In this regard, see the survey data on violence against women in Spain examined by Tur-Prats (2015).

⁹ Our translation: 'Nazca mi hijo varón, aunque sea ladrón'.

27–29) nonetheless argue that, in such a male-oriented society, preferential attention given to male infants and children may well have played a role for the survival of their female counterparts: in other words, excess male mortality should have been greater than it actually was.¹⁰ In this regard, it appears that boys were breastfed longer than girls and that may have resulted in a greater likelihood of girls falling ill (Gómez Redondo, 1992, 205; Borderías et al., 2010, 183). Likewise, analysing the impact of mother's death in a medium-size Spanish town between 1870 and 1950, Reher and González-Quiñones (2003, 68–72) find that boys were comparatively better off than their sisters, thus suggesting that some sort of gender discrimination was in place. The influence of family intervention favouring male infants may have been even more important before the demographic transition (Reher and Sanz-Gimeno, 2004, 29). Next sections offer new evidence supporting that certain forms of gender bias against young girls were indeed present in Spain at least between the second half of the 18th century and the late 19th century, and possibly in other Southern European countries as well.

3. Infant and child sex ratios in the long run

Direct evidence of historical gender discrimination at birth or at young ages is unfortunately very difficult to obtain. Due to their very nature, individuals and families tried to hide these practices and thus quantitative or anecdotal evidence is very scarce. Also, given that infant mortality was extremely high, it was relatively easy to disguise infanticide and/or the mortal neglect of infants as natural deaths (Derosas et al., 2004, 158).¹¹ Sex-specific mortality rates, therefore, may include the effect of discriminatory practices.¹² Instead, relying on Population Censuses, we turn to data on infant and child sex ratios, that is, the number of boys per hundred girls in different age groups. In the absence of manipulation, sex ratios tend to be remarkably regular, so comparing the observed figure to an expected gender-neutral sex ratio allows assessing the cumulative impact of gender bias in peri-natal, infant and child mortality and therefore the importance of potential discriminatory practices.

Estimating a gender-neutral sex ratio in the absence of discrimination is not straightforward (Klasen and Wink, 2002, 287). The norm for sex ratios at birth revolves around 105.9 in most developed countries, including contemporary Spain (Klasen, 1994, 1062).¹³ However, due to the biological survival advantage of girls and the subsequent excess male mortality both in utero and early in life, male infant sex ratios in the mid-19th century should have been lower (Bhaskar and Gupta, 2007). In high-mortality environments, especially before the advent of modern medicine, sex ratios at birth can be relatively low even in the presence of gender-discriminatory practices. Evidence from the biomedical literature and comparative studies within and across countries suggest that the sex ratio at birth rises with the level of development (Klasen, 1994; Waldron, 1998; Hansen et al., 1999; Klasen and Wink, 2002). Improvements in nutritional status and overall health conditions reduce the general incidence of miscarriages and stillbirths and, given male excess pre-natal mortality, these improvements especially affect the survival probabilities of male foetuses.¹⁴

Using life expectancy as a proxy for health conditions and relying on contemporary data, Klasen and Wink (2002, 288) estimate that 10 years of greater longevity are associated with a 0.9 percentage-point increase in the sex ratio at birth. Inadequate nutrition, poor living conditions, lack of hygiene and the absence of public health systems in 19th-century Spain imply that the expected sex ratio at birth in 1860 should therefore be lower than it is today. Life expectancy at birth in Spain increased from 29.8 to 79 years between 1860 and 2000 (Dopico, 1987; World Bank, 2002),¹⁵ so this change, according to the previous (admittedly rough) estimate, would entail that sex ratios at birth in mid-19th century Spain should be reduced by 4.4 boys.

Moreover, our data relies on infant and child sex ratios (aged 0–1, 1–5 and 6–10) and the female biological survival advantage is not only visible before birth but also during infancy and childhood (Pinelli and Mancini, 1997; Klasen and Wink, 2002, 289, United Nations, 2011). Again, excess male infant mortality should be more pronounced under adverse conditions.¹⁶ Infant mortality in Spain was extremely high during the period of study: in 1863–1970, around 24.5% of children died before reaching their first birthday, a figure much higher than other European countries (Dopico, 1987, 176; Ramiro-Fariñas and Sanz-Gimeno, 2000a).¹⁷

¹⁰ Also in Dopico and Reher (1998, 86) and Pérez Moreda et al. (2015, 196).

¹¹ According to Derosas et al. (2004, 158), "many infants died from smothering, suffocating, irregular feeding, and exposure to cold".

¹² Also, cause-specific mortality rates by sex are only available from the early 20th century.

¹³ For different reasons, the "natural" sex ratio at birth differs from parity. On this issue, see James (1987) and Chahnazarian (1988).

¹⁴ Long time-series from Belgium, Japan, England and Sweden suggest an increase in the sex ratio at birth between 2 and 3 boys per hundred of girls over the past 120–200 years, during which life expectancy increased by about 30–40 years (Klasen and Wink, 2002, 307).

¹⁵ The demographic transition in Spain did not start until the late 19th century and the early 20th century (Dopico and Reher, 1998). Anthropometric evidence confirms the deplorable living conditions existent in mid-19th-century Spain. See, for instance, Martínez-Carrión and Pérez-Castejón (2000), Martínez-Carrión (2002) or Moreno-Lázaro (2006).

¹⁶ Although the relative excess vulnerability of male infants increased between 1750 and 1970 due to shifts in the main causes of infant deaths, from infectious diseases to perinatal conditions (Drevenstedt et al., 2008), the huge decrease in infant mortality for both sexes that took place during this period led to a decline in the absolute difference between male and female infant deaths. The latter is the relevant metric when explaining the long-term evolution of sex ratios. This issue is even more complex because improving health conditions also tended to increase the survival rate of (relatively weak) male foetuses (thus increasing sex ratios at birth). This, however, may in turn partly explain why these male babies suffered higher infant mortality rates.

¹⁷ If we add childhood mortality, 44.1% of the children before reaching the age of 6. The high levels of infant and childhood mortality are related to the importance of infectious diseases. However, undernutrition was also a factor to be taken into account even well into the 20th century, especially if we consider that the lethality of infectious diseases also depends on the child's nutritional status. Although some advances took place in the late 19th century, only improvements on nutritional status and public health systems allowed infant and child mortality rates to decline throughout the 20th century. On childhood mortality patterns during the demographic transition in Spain, see Reher et al. (1997), Ramiro-Fariñas and Sanz-Gimeno (2000a; 2000b) and Reher and Sanz-Gimeno (2004).



Fig. 1. Mortality rates and infant sex ratios, 1857-2011.

Excess male mortality during the first year of life would then imply that the infant sex ratio should be 2.1 boys lower than the sex ratio at birth.¹⁸

Therefore, instead of around 105.9, infant sex ratios in the absence of gender discrimination should have been expected to be somewhat just below parity (99.4) in mid-19th century Spain.¹⁹ Next section reaches a similar figure relying on sex ratios and infant mortality rates for a large number of countries in historical Europe, thus complementing the estimation based on Klasen and Wink (2002). Fig. 1 depicts the evolution of the infant sex ratio, together with that of the male and female infant mortality rate, in Spain between 1857 and 2011. It confirms that infant sex ratios show a clear upward trend from the beginning of the 20th century in consonance with the narrowing gap between male and female infant mortality rates due to improving health conditions.²⁰ Infant mortality rates, as well as the difference between sexes, were higher in 1860 than in 1900, suggesting that the infant sex ratio should have been even lower at that date. In contrast, our data shows that, in 1860, the average infant sex ratio was 104.4.²¹ As the graph evidences, this figure is not specific to 1860: the infant sex ratio in 1857 and 102.3 in 1900. After that, it initiated a strong upward trend.²² This disparity relative to what would be expected from a gender-neutral figure (around parity as discussed above) suggests that some sort of gender discrimination was reducing the number of girls very early in life, at least during an important part of the second half of the 19th century, a behaviour that seems to recede from 1880s onwards.

¹⁸ In 1863–1870, infant mortality rates were around 25.5 and 23.4 for boys and girls respectively (Dopico, 1987, 176). Nowadays, infant mortality rates are extremely low, around 0.5%, so any gender differences in infant mortality is negligible (World Bank, 2002). On differential infant and childhood mortality by sex, see also Reher and Sanz-Gimeno (2004, 27–29).

¹⁹ In India, where gender discrimination has been historically high, for instance, the sex ratio at age 0–1 was below parity in most states in 1931, reaching around 106 in 1981 (Bhaskar and Gupta, 2007, 226–227). In the US, the sex ratio for those aged 0–5 rose from 102 in 1900 to 105 in 2000 (224).

²⁰ Infant sex ratios are computed using data from the Spanish Population Censuses. Male and female infant mortality rates are taken from the Spanish Statistical Yearbooks (*Anuarios Estadísticos de la Población*).

²¹ As a matter of comparison, in Punjab (India) in 1931, where there is qualitative evidence of infanticide and a strong son preference, the infant sex ratio was 102.3 (Gupta, 2014, 7).

²² The decline in the sex ratio during the last third of the 19th century might be related to the worsening of living conditions during the first stages of modern economic growth (Martínez-Carrión and Pérez-Castejón, 2002, 421). The upward trend shown in Fig. 1 is interrupted in 1920 and 1940. Both the 1918 Spanish Flu pandemic and the Civil War are likely to have worsened the disease environment, thus negatively affecting the relative male survival rate, at least temporarily. The extreme rebound found in 1950 when infant sex ratios almost reached 108 boys per hundred girls may be hypothetically linked to a return to gender discriminatory practices associated with the extremely adverse economic conditions that followed the aftermath of the Civil War and the economic autarchy implemented by the dictatorship.



Fig. 2. Infant and child sex ratios, 1857-2011.

It is important to note that under-enumeration may affect our analysis. If parents failed to record female babies more than males, the sex ratio would be overestimating the number of boys and would therefore be a poor indicator of the mortal neglect of girls.²³ The poor enumeration of females appears to have affected sex ratios at birth in India in 1991 (Dyson, 2001). Reher (2007) argues that under-registration was an important issue in the population censuses of the period analysed here. Although this author however does not find that underreporting varied by sex (254), this problem may especially influence the 0–1 age-cohort because a high proportion of infant deaths went unreported, especially those who died in the first 24 h of life (Dopico, 1987).²⁴ Given than we rely on the number of live children this issue is probably less worrisome. In any case, the older age-groups should be virtually free from this concern, so employing them in our analysis not only allows assessing whether gender discrimination continued during childhood, but also provides a robustness check of the results obtained using infant sex ratios.

In this regard, Fig. 2 depicts the evolution of sex ratios at different ages over time and confirms that sex-specific under-reporting cannot explain away the fact that infant sex ratios in Spain were abnormally high until the late 19th century. Parents may have failed to report girls early in life but they should be visible when older. If this was the case, and in absence of other gender-discriminatory practices, child sex ratios in 1860 should be, as discussed above, below parity and they should follow an increasing trend given that improving health conditions relatively benefited boys.²⁵ In contrast, sex ratios at age 1–5 and 6–10 mimic those at age 0–1, thus evidencing that female infanticide and/or the mortal neglect of young girls was behind the high sex ratios we observe. The female survival advantage is also evident here: as expected, average sex ratios decrease with age, especially in high-mortality environments. In 1860, for instance, the sex ratio declines from 104.7 to 103.8 and 102.6 as children grew older.

This image of unexplained patterns of excess female mortality portrayed by these 19th-century figures is confirmed by adding an additional data point to this portrait: in the late 18th century, the Floridablanca Census (1787) yields a sex ratio of 104.5 at age 0–7. Although the age-group is not perfectly comparable to the information provided in the 19th century censuses, this is an exceptionally high figure, even higher that the 104.7 boys per hundred girls at age 0–1 found in the 1860 census.²⁶ A clear picture thus emerges suggesting that some sort of gender discrimination was reducing the number of girls very early in life.

²⁵ As expected, child sex ratios are lower than infant sex ratios because female survival advantage offers girls some protection during childhood (as the sex differences in infant mortality rates depicted in Fig. 1 also evidence). Improving nutrition and sanitary conditions throughout the 20th century narrowed the mortality gap between boys and girls and, consequently, sex ratios at different ages got closer to each other.

 $^{^{23}}$ Although less worrying, the under-enumeration of girls would nonetheless point to some sort of gender discrimination.

²⁴ In this regard, Dopico (1987, 175) points that the under-reporting of early childhood deaths was larger for females.

²⁶ Due to the female survival advantage, the sex ratio at age 0–7 should be lower than that at age 0–1.



Fig. 3. Child sex ratios (aged 0-4), 1740-2001.

4. The Spanish experience under the European mirror

Comparing the evolution of sex ratios in Spain to that of other Western European countries further confirms that a pattern of unexplained excess female mortality early in life was already present in late 18th century Spain and did not disappear until the turn of the 20th century, a feature that might be present in other countries of Southern Europe as well. If, as defended by the conventional view, gender discrimination in infancy and childhood was absent from historical Europe (Lynch, 2011), sex ratios in those countries would reflect the hypothetical gender-neutral sex ratio. The trends observed in other countries thus provide a useful benchmark from which to assess the Spanish figures. In addition, tracing the evolution of child sex ratios back in time also allows testing whether the previous estimation of a gender-neutral sex ratio, which was based on data on contemporary countries (Klasen and Wink, 2002), is consistent with historical data.

For comparability reasons, Fig. 3 relies on information at age 0–4. As evidenced there, child sex ratios in the high-mortality environments of the past were much lower than today.²⁷ In the Nordic countries, where we have data that goes back to the mid-18th century, sex ratios were well below parity around that period. The trend that these numbers depict, which keeps declining as we move back from 1900 to 1750, contrasts clearly to the Spanish figures that remained in a high plateau during this period. The situation in France stood in between but, as in Spain, it also experienced relatively high figures during the 19th century. Other countries such as the Netherlands and England-Wales, whose data is only available from mid-19th century onwards, enjoyed relatively low child sex ratios that closely followed the international trend.

The previous graph, however, can be somewhat misleading because the timing of the demographic transition varied by countries, thus potentially affecting mortality sex differentials.²⁸ Fig. 4 plots infant mortality rates and child sex ratios in each country at different periods and fits a fractional polynomial regression to this data, thus extending the work of Klasen and Wink (2002) to historical Europe.²⁹ Assuming that this trend predicts a gender-neutral sex ratio, infant mortality rates around 250, as those existing

 $^{^{27}}$ Due to data availability, Spanish figures in 1860 and 1877 refer to sex ratios at age 1–5. Also, as commented before, the data for 1787 refers to the 0–7 aged-group. Given that, due to male excess mortality, these figures tend to be lower than those at age 0–4, reporting them is a conservative estimate that would play against finding excessively unbalanced sex ratios. Data is also available for other Western European countries from mid-19th century onwards (see footnote 37 for more details). Including them in the graph, however, does not alter the picture depicted here and makes the graph unnecessarily messy.

²⁸ In mid-19th century, for instance, while infant mortality in Spain revolved around 250, the Swedish figure was closer to 150.

²⁹ As with the previous graph, data coverage pairing infant mortality rates and child sex ratios varies by country: Austria (1869–2001), Belgium (1846–2001), Denmark (1870–2001), England-Wales (1841–2001), Finland (1751–2001), France (1830–2001), Germany (1880–2001), Greece (1928–2001), Ireland (1871–2001), Italy (1861–2001), the Netherlands (1840–2001), Norway (1855–2001), Portugal (1911–2001), Scotland (1861–2001), Spain (1787–2001), Sweden (1751–2001) and Switzerland (1870–2001). There is also data for Germany in 1871 but the infant mortality rate (330) is well above the other estimations. Being such an extreme outlier, and due to its potential unreliability, we have decided to exclude this particular data point. The predictions of the model however are not altered if this information is considered. The data comes from Mitchell (2013), Louis and Yves (1975) and the Statistical Yearbook of Finland (2014). Table A.1 in the Appendix presents summary statistics by period.



Fig. 4. Infant mortality rates and sex ratios, 1750-2001.

in mid-19th century Spain, would correspond to a sex ratio of 101.1. This number is a conservative estimate because this prediction includes information about countries that may have treated boys and girls differently. In any case, child sex ratios in Spain, depicted by the black dots, were situated well above the confidence interval plotted in Fig. 4 during the late 18th century and the second half of the 19th century. As was also evident in Fig. 3, child sex ratios in Spain remained abnormally high until the late 19th century when they began to converge with the observed international trend. This is further illustrated by contrasting the path followed by Spain and Sweden (reflected by the black crosses): almost indistinguishable from 1910 onwards, they are clearly apart when infant mortality was high.

Moreover, as mentioned above, the previous figure may hide discriminatory behaviours taking place in other countries as well. Interestingly, the high figures present in the high-mortality environments existing in the 19th century mostly belong to Southern European countries. Fig. 5 again plots infant mortality rates and child sex ratios but it now identifies which dots correspond to other countries in Southern Europe (France, Greece, Italy and Portugal). In addition, the fitting line is computed excluding these countries (except France), thus assuming that the hypothetical gender-neutral sex ratio is better captured by the behaviour of other European countries. The predicted sex ratio in absence of discrimination now yields a below-parity figure (99.5), which expands the distance between this hypothetical benchmark and the figures observed in these countries. This number is remarkably close to the figure predicted above (99.4) relying on the model outlined by Klasen and Wink (2002) based on differences in life expectancy. The graph therefore suggests that a gender discriminatory bias was increasing female infant and child mortality in Southern Europe. In this regard, while Italy also presents extremely high sex ratios, in line with those in Spain, the figures for France are lower, somewhat in between those found in Europe and the general trend. It is important to note that, although the Portuguese and Greek figures are also consistent with this interpretation, they are only available from 1911 and 1928 respectively, thus making inferences for these countries more hazardous.

The analysis of regional variation within Spain further confirms the patterns observed above.³⁰ Relying on provinces as the unit of analysis, child sex ratios were correlated both over time and spatially, but only up to 1900. Although this result could be due to certain disease environments arising from different climatic conditions and affecting the differential gender mortality, especially before the

³⁰ Results available upon request.



Fig. 5. Infant mortality rates and sex ratios, 1750-2001.

advances in health and nutrition taking place throughout the 20th century, regression analysis shows that provincial variation in infant and child sex ratios is not explained by climatic variables.

5. Concluding remarks

Infant and child sex ratios in Spain were abnormally high in the late 18th century and the 19th century. This pattern of unexplained female excess mortality, a feature shared also by other countries in Southern Europe, disappeared at the turn of the 20th century when sex ratios began to converge with the non-discriminatory trend observed in other countries. The evidence described here suggests that discriminatory practices resulting in excess female mortality early in life may have constituted a veiled feature of Spanish society at least between the late 18th century and the turn of the 20th century. Excess female mortality was not necessarily the result of ill-treatment of young girls, but could have been just based on receiving less attention, a circumstance that probably cumulated as infants grew older. In a period of extremely high mortality, a slight discrimination either in the way young girls were fed or treated when ill, as well as in the amount of work they were entrusted with, could easily have led to mortal consequences. This interpretation, compatible with the lack of anecdotal evidence on female infanticide or other extreme versions of mistreatment of young girls, would point to more passive, but pervasive, forms of gender discrimination. We should not forget that the type of behaviour described here only adds another layer to a well-known picture where women and girls were systematically discriminated. The fact that this pattern disappeared at the beginning of the 20th century is not likely due to declining discrimination but to increasing living standards. As income levels and the disease environment gradually improved, the life-threatening consequences of discriminatory practices faded away as the unequal allocation of resources within the household no longer differentially affected female mortality rates.

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Appendix

Table A.1

	Obs.	Mean	St. Dev.	Min	Max
	1750–1799				
Infant mortality	7	198.4	23.6	164	209
Sex ratio (aged 0–4)	7	99.8	2.3	97.2	104.5
	1800–1849				
Infant mortality	12	177.8	26.4	145	240
Sex ratio (aged 0–4)	12	100.7	0.80	99.1	102.1
	1850–1899				
Infant mortality	59	163.6	45.5	91	259
Sex ratio (aged 0–4)	59	101.7	1.3	98.8	104.0
	1900–1949				
Infant mortality	77	105.5	43.7	34	231
Sex ratio (aged 0–4)	77	102.7	1.4	99.7	105.5
	1949–2001				
Infant mortality	101	19.6	17.4	3	94
Sex ratio (aged 0-4)	101	105.2	0.7	102.6	107.7

Infant mortality and sex ratios in Western Europe, 1750–2001. Summary statistics (by period).

Data coverage: Austria (1869–2001), Belgium (1846–2001), Denmark (1870–2001), England-Wales (1841–2001), Finland (1751–2001), France (1830–2001), Germany (1880–2001), Greece (1928–2001), Ireland (1871–2001), Italy (1861–2001), the Netherlands (1840–2001), Norway (1855–2001), Portugal (1911–2001), Scotland (1861–2001), Spain (1787–2001), Sweden (1751–2001) and Switzerland (1870–2001). The information comes from Mitchell (2013), Louis and Yves (1975), and Statistical Yearbook of Finland (2014).

Supplementary materials

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