Infanticide and Sex Ratio at Birth in Contemporary Italy

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ABSTRACT

Despite some doubts on the reliability of the infanticide data available for Italy, it can be shown that the phenomenon continues to decrease. Nowadays, cases of infanticide can be interpreted as the consequence of lack of information on the possibility to terminate pregnancy legally. Nevertheless, given their low incidence, it cannot be ruled out that they may also be largely attributed to the rejection of infants, particularly those with serious diseases. These observations can be supplemented with others related to the analysis conducted on sex ratio at birth, in order to highlight any anomalies in that relationship. Genetic, and more generally, biological factors have certainly had (and still have) an important influence in determining the changes. However, in the light of what has emerged from the data, the practice of infanticide cannot be completely ruled out when seeking an explanation for the lower than expected number of females born in specific periods.

Key words: infanticide, sex ratio at birth, Italy, 20th century, abortion

Introduction

The phenomenon of infanticide is associated with the evolutionary history of our species. There is no clear evidence of it with respect to the Palaeolithic age as it is almost impossible to find newborn remains in a good state of conservation, however in recent decades many authors, in the wake of McKeown[1], have claimed that it was commonly used by the hunter and gatherer peoples to limit increases in population and keep it in balance with the available environmental resources[2]. It is evidenced in many agricultural societies, often in the form of human sacrifice, and was widely practiced in Greek and Roman antiquity also for eugenic purposes[3].

Despite being opposed by the Catholic Church, infanticide, like abandonment of infants (often followed by death), was practiced in the West in the Middle Ages and throughout the modern age[4]. The purpose of this research, related to the Italian population, is to examine the phenomenon from a quantitative point of view, to study the changes over the last centuries, and to propose, with the necessary caution, some interpretative hypotheses. Particular attention will be focused on the trend of sex ratio at birth, in order to explore the hypothesis that deliberately killed infants are concealed behind its abnormal values.

Sources and Methods

The study is divided into three parts: in the first, infanticides committed in Italy each year are compared with live births; in the second, infanticides by region are analysed; in the third the time trend of the sex ratio at birth is examined.

The following definitions of some relevant concepts were used in the analyses:

- the »resident population« consists of persons with their habitual abode in the territory considered, even if they are temporarily absent;
- a »live birth« is a product of conception which breathes or shows other signs of life once it is expelled or extracted from the mother's body, regardless of the length of gestation;
- a »stillborn« is a product of conception of twenty-eight weeks or more (this limit varies slightly from country to country, however) expelled or extracted from the mother and which shows no signs of vitality;
- »infanticide« is the voluntary killing of a child in early childhood.

In order to study the overall trend of the phenomenon in Italy, data obtained from heterogeneous sources, some-

times of doubtful reliability, were used. Starting from the data on infanticide relating to the 1880–1882 period, the information was taken from a paper by Raseri[5] in which the author reports data broken down by the twenty districts in which the courts of appeal were located. Moving on, for the period from 1896 to 1949 the information was derived from Di Bello and Meringolo[6], which report the summary tables for the above years published in the Istat judicial statistical yearbook, 1949 volume. However, it must be clarified that from 1896 to 1930 the data refer to criminal acts, i.e. analysis of information on the characteristics of convicts, whereas from 1932 to 1949 they refer to delinquency, i.e. the set of components gathered concerning the contexts in which the crimes took place. The data on the 1949–1961 period were also taken from Di Bello and Meringolo,[6] and they relate to reported crimes; those for 1962–2004 were taken from tables on »reported crimes for which the judicial authority started criminal proceedings« and »reported persons, according to type of crime« in the yearbooks published by Istat[7,8]. Finally, the data from 2005 to 2014 come directly from the Istat website (dati.istat.it, consulted on 21/02/2016 at 9.00 a.m.)[41].

Moving on to data on live births of the resident population, a first part from 1880 to 1947 comes from Istat historical data sets available online (table 2.3.1, seriestoriche.istat.it, consulted on 10/10/2015 at 12.36 p.m.)[41]. The same applies to the 1948 to 2009 data (table 2.5.1, seriestoriche.istat.it, consulted on 10/10/2015 at 12.36 p.m.)[41], whereas for recent years use was made of the demo.istat.it database (consulted on 10/10/2015 at 2.30 p.m.)[41]. All data on live births from 1952 to 1987 were also checked using the »Historical summary of statistics on population«[9], and up to 1996 using the Istat yearbooks[10,11].

As for the calculations made, the number of infanticides (not broken down by gender) in each year was divided by the number of live births and multiplied by one thousand. It was thus possible to highlight the years in which there was a higher incidence of infanticide.

It was not possible to go far back in time for the second part of the study, concerning the territorial distribution of infanticide in the different regions of Italy. The data on the phenomenon for 1950 to 1961 were derived from the volume by Di Bello and Meringolo[6], for 1962 to 2004 from the Istat yearbooks[7,8], for the years after 2005 from giustiziaincifre.istat.it (consulted on 20/2/2016 at 5.00 p.m.)[41], and finally for 2010 to 2014, directly from dati.istat.it under »crimes reported by the police to the judicial authority« (consulted on 21/5/2016 at 9.00 a.m.)[41]. Data on live births by region from 1952 to 1987 were taken from the »Historical summary of statistics on population, years 1951–1987«[9], for 1988 to 1996 from the Istat yearbooks[10,11], for 1997 to 1999 from dati.istat.it, and finally for 2000 to 2014 from demo.istat.it.

The number of infanticides committed by region and by decade was divided by the number of live births (and multiplied by one thousand) observing the same breakdown. The purpose of this calculation was to pinpoint,

for the time range considered, those regions in which the incidence of infanticide was higher, allowing comparison between the regions of Northern Italy (Piedmont, Aosta Valley, Lombardy, Liguria, Friuli-Venezia Giulia, Trentino-Alto Adige, Veneto, Emilia-Romagna), Central Italy (Tuscany, the Marches, Umbria, Lazio), Southern Italy (Abruzzi, Molise, Campania, Apulia, Basilicata, Calabria) and the Islands (Sicily, Sardinia).

Given the doubtful reliability of the data gathered (it is likely that until the mid 20th century, many infanticides were effectively hidden or their perpetrator not found) and the heterogeneousness of the sources used, an attempt was also made to analyse the data on live births and stillbirths by gender and calendar year, in the hypothesis that stillbirths could conceal deliberately killed infants and, particularly, that an abnormal sex ratio for live births could be an indication of infanticides which were committed but did not come to light. It is indeed reasonable to believe that the killing of female infants was more frequent than of male infants, particularly in peasant societies. For 1926–2014 with reference to Italy, these data were derived from the historical data sets provided by Istat (http://seriestoriche.istat.it/ table 2.5.1, consulted on 25/9/2016 at 2.00 p.m.)[41]. For comparison, the same data for other European countries were then used: Norway (http://www.ssb.no/, consulted on 3/5/2016 at 2.00 p.m.)[42], Greece (http://www.statistics.gr/, consulted on 3/5/2016 at 11.00 a.m.)[43], Scotland (http://www.nrscotland.gov.uk/, consulted on 4/5/2016 at 8.30 a.m.)[44], France (http://www.ined.fr/, consulted on 2/5/2016 at 9.00 a.m.)[45].

With reference to Italy, a first set of calculations consisted in totalling male live births until the promulgation of the law authorising voluntary termination of pregnancy (in 1978); in totalling female live births until promulgation of this law; in calculating the sex ratio at birth from the totals obtained. The intention was to thus obtain the value for the Italian population, avoiding as far as possible distortions related to selection of abortions based on gender. The sex ratio at birth was then also calculated for each year of the period analysed.

Subsequently, the following were calculated for each year: the number of »expected female live births« based on the sex ratio for the 1926–1977 period, the difference between »expected female live births« and »female live births« as resulting from the demographic statistics, the number of »expected female stillbirths« based on the sex ratio calculated for stillbirths, the difference between »expected female stillbirths« and »female stillbirths« as resulting from the Istat data. These calculations were also made for the other European countries considered.

The sex ratio for live births was therefore given by the formula ("male live births 1926–77« / »female live births 1926–77«) X 100, and amounts to (25103103 / 23778757) X 100 = 105.569.

The »expected females« based on this sex ratio can be calculated from the »total number of live births (male and female) in the year considered« e.g. giving 396790 for 1945. In this case the difference between observed females

and expected females is 396193 – 396790 = –597. Alternatively, »expected females« can be calculated from the »number of male live births in the year considered« e.g. giving 397355 for 1945. In this case the difference between observed females and expected females is 396193 – 397355 = –1162.

The second method of calculation was chosen in order to find out not only in which years observed female live births were lower than expected, but in particular how many were lacking compared to what could be expected for a specific number of male live births. The same was done for »expected female stillbirths« in order to know not only in which years observed female stillbirths were higher than expected, but also how much higher they were compared to what could be expected for a specific number of male stillbirths.

Finally, the significance of the largest anomalies found in the sex ratio at birth was ascertained with methods used by demographers to identify deviations scarcely attributable to random variations[12].

Results

Trend of infanticide in Italy

As stated above, the sources used for this first elaboration are heterogeneous, making it difficult to formulate hypotheses on the evolution of the phenomenon. Starting with an overview (Figure 1), the data gathered refer to different events: infanticide »crimes«, convictions and reported offences. Specifically, those relating to 1880–1882 ("crimes«) should be comparable, at least as a first approximation, with the data after 1930: as 303 infanticides were committed in 1880, 320 in 1881, and 310 in 1882, there were only three cases of infanticide per ten thousand births. In those same years, 82, 73 and 93 defendants were tried respectively. Stoppato[13] states that only 30% of them were convicted and believes that the number of infanticides »carried out in the shadows and not known« was considerable.
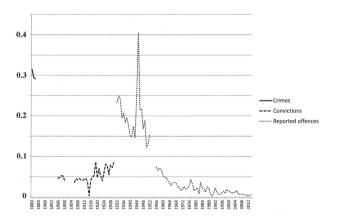

Fig. 1. Number of events divided by the number of live births and multiplied by one thousand (Italy, resident population with the borders of the period).

Moving on, for 1896 to 1930 the data refer to criminality, therefore for this period the information concerns convictions. As can be seen in Figure 2, their incidence cannot be described as steady and it increases in the years following the First World War.
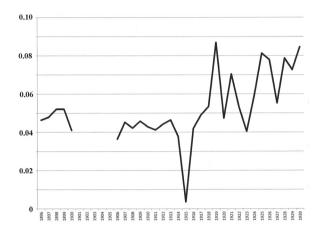

Fig. 2. Number of convictions divided by the number of live births and multiplied by one thousand (Italy, resident population with the borders of the period).

However, for 1932 to 1949 we have information on delinquency (Figure 3). A steady decrease in infanticides can be noted up to 1944, with a sharp rise in 1945, followed by a decrease.
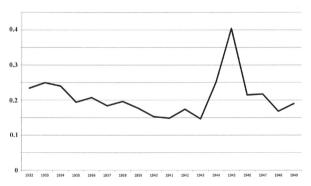

Fig. 3. Number of reported offences divided by the number of live births and multiplied by one thousand (Italy, resident population with the borders of the period).

For 1950 to 2014 the data still concern delinquency (with gaps for the first part of the 50s). A steady decrease is clear, with drops in periods during which it is assumed there were situations attributable to a reduction in the number of crimes (Figure 4).

Infanticide by region

As for the incidence of infanticide in the different regions of Italy, in the first period analysed, which spans 1950 to 1959, the highest values are in Northern Italy: the Aosta Valley shows an incidence of 1.01 per thousand. Although on the one hand this abnormal value can be seen
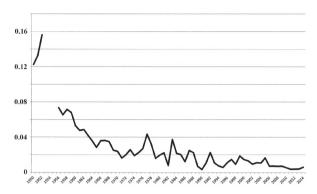
Fig. 4. Number of reported offences divided by the number of live births and multiplied by one thousand (Italy, resident population).

in relation to the low number of live births (few offences suffice to give a high incidence), on the other hand relatively high incidences were calculated for almost all regions of Northern Italy.

Turning to the 1960–1969 period, the phenomenon was more widespread in Northern Italy, with the Aosta Valley (0.17), Trentino-Alto Adige and Liguria (0.09). They are followed by Abruzzi (0.09). For 1970–1979 the highest values are found in one region in Northern Italy and one in Southern Italy, Trentino-Alto Adige and Calabria respectively, with the same incidence of infanticide: 0.06; followed by Piedmont, Liguria and Abruzzi with 0.04.

For 1980 to 1989 there is a higher incidence in the regions of Northern Italy, specifically Friuli-Venezia Giulia (0.08), Liguria (0.05) and Emilia-Romagna (0.04). Between 1990 and 1999, the highest incidence is in Southern Italy with Molise (0.07), followed by Umbria and Calabria (0.03) and finally other regions of the South: Campania, Apulia and Basilicata (0.02).

From 2000 to 2009 infanticide appears to be more widespread in Southern Italy, specifically in Molise (0.04) and Campania (0.02), and in the centre with Umbria (0.03) and Lazio (0.02). Finally, for 2010 to 2014 the highest values are noted in Abruzzi (0.047) and then in Northern Italy with Trentino-Alto Adige (0.020) and Emilia-Romagna (0.016).

Sex ratio at birth

As to the results obtained for sex ratio at birth with reference to Italy, it may be noted (Table 1) that from 1940 to 1949 and then from 1970 onwards, there are rather high values resulting in negative deviations of observed female live births from their expected values based on the sex ratio calculated for 1926–1977. With regard to the data on stillbirths (Table 2), since the '60s the number of female stillbirths is higher than the expected values, albeit only slightly.

Concerning the comparison with the other European countries considered, it should be noted that for Greece it was not possible to obtain the breakdown of stillbirths by gender. Norway, for which data are available from 1910,

TABLE 1
ITALY: SEX RATIO AT BIRTH*

Years	M live births	F live births	Sex ratio	Expected F	Difference
1926–29	2205444	2092931	105.4	2089093	3838
1930–34	2612118	2486697	105.0**	2474312	12385
1935–39	2580888	2447766	105.4	2444730	3036
1940–44	2367604	2239335	105.7	2242698	−3363
1945–49	2472251	2334012	105.9**	2341824	−7812
1950–54	2220063	2104171	105.5	2102941	1230
1955–59	2255454	2137878	105.5	2136465	1413
1960–64	2440239	2313323	105.5	2311501	1822
1965–69	2454399	2327409	105.5	2324914	2495
1970–74	2284597	2154688	106.0**	2164070	−9382
1975–79	1919935	1809922	106.1**	1818646	−8724
1980–84	1582058	1490342	106.2**	1498595	−8253
1985–89	1449904	1364811	106.2**	1373412	−8601
1990–94	1434740	1347677	106.5**	1359048	−11371
1995–99	1363001	1280184	106.5**	1291094	−10910
2000–04	1357409	1280452	106.0**	1285797	−5345
2005–09	1443894	1359947	106.2**	1367720	−7773
2010–14	1348419	1272985	105,9**	1277281	−4296

* The figure for 1926–77, prior to the Italian law on voluntary termination of pregnancy, is 105.569

** Significant deviations (p–value <0.05)

TABLE 2
ITALY: SEX RATIO FOR STILLBIRTHS*

Years	M stillbirths	F stillbirths	Sex ratio	Expected F	Difference
1926–29	91941	71859	127.9**	75814	−3955
1930–34	99891	80952	123.4**	82369	−1417
1935–39	91620	74904	122.3	75549	−645
1940–44	74579	60821	122.6**	61497	−676
1945–49	85162	69830	122.0	70224	−394
1950–54	75164	61254	122.7**	61980	−726
1955–59	66566	54318	122.5	54890	−572
1960–64	59941	49991	119.9	49427	564
1965–69	47331	40700	116.3**	39029	1671
1970–74	32900	29428	111.8**	27129	2299
1975–79	19912	17235	115.5**	16419	816
1980–84	12354	11155	110.7**	10187	968
1985–89	9265	8254	112.2**	7640	614
1990–94	7380	6537	112.9**	6086	451
1995–99	5608	5018	111.8**	4624	394
2000–04	4565	4094	111.5**	3764	330
2005–09	4270	3800	112.4**	3521	279

* The figure for the entire period considered is 121.272

** Significant deviations (p–value <0.05)

shows a different live births trend from Italy: from the first half of the 70s observed live births exceed those expected (Table 3). The same phenomenon is observed for Greece and Scotland. What was observed for France is, however, the same as what was observed for Italy (Table 4). For France, data are available from the beginning of the 20th century and increases in the sex ratio at birth during and after both World Wars are very clear. It is noteworthy in this regard that the former increase is not seen in Norway, a country which did not take part in the First World War, whereas it can be seen in neighbouring Finland, which was involved[14]. With reference to the data on female stillbirths, note finally that in France and Norway also (but not Scotland) there is an increase in the difference between observed females and expected females over time.

Discussion

Infanticide in 1880–1930

In 1881 Raseri published an essay on illegitimate children and abandoned children, to study the characteristics of the phenomenon, ascertain its causes and assess whether the closure of children's home foundling wheels favoured an increase in infanticide[15]. He also stated that until 1880, infanticide reports and convictions were grouped together with the other offences against the person within the criminal statistics. In a second paper[5], he analysed the phenomenon in the 1880–1882 period: a minimum of 933 infanticides were committed in those three years.

In the 19th century it was difficult to control fertility and to plan births[16]. The contraceptive methods used (continence, coitus interruptus, condoms, syringes for irrigations, prolonged breastfeeding) were not reliable and women would resort to abortion to remedy failed contraception. Abortion was ineffective in many cases, and more than mechanical abortion performed by midwives, resort was made to methods based on herbs and roots, use of substances such as lead, arsenic, phosphorus or quinine pills, or bloodletting, hot baths and violent physical exercise[17].

The laws intended to curb abortion favoured proliferation of the illegal market. But over time the establishing of support services for mothers, and above all the opportunity to use more reliable methods of contraception, led to a reduction in the number of unwanted births.

With regard to the criminality data, the number of convictions for infanticide was appreciably lower than the number of reported offences: there is therefore a considerable difference between the offences allegedly committed, those reported, and finally the convictions. For the latter we can observe a generally upward trend for 1896–1930 with peaks in 1919, 1921, 1925, 1926 and the 1928–30 three year period (Figure 2).

Infanticides in 1932–2014

With regard to the 1932–2014 data on reported offences, a reduction in incidence is observed up to 1944, with a sharp rise in 1945, the final year of the Second World War (0.4 per thousand live births) and a subsequent decline (Figure 1). In particular, from 1947 to date, a steady decrease in infanticide is noted, with a plunge

TABLE 3
NORWAY: SEX RATIO AT BIRTH*

Years	M live births	F live births	Sex ratio	Expected F	Difference
1910–14	157895	149071	105.9	148923	148
1915–19	159992	151411	105.7	150901	510
1920–24	165638	156833	105.6	156226	607
1925–29	133249	126160	105.6	125677	483
1930–34	115396	108532	106.3	108839	−307
1935–39	112553	106725	105.5	106157	568
1940–44	137663	128796	106.9**	129841	−1045
1945–49	169922	158961	106.9**	160267	−1306
1950–54	160339	150904	106.3	151228	−324
1955–59	162872	153904	105.8	153617	287
1960–64	162452	153097	106.1	153221	−124
1965–70	206124	193638	106.4	194411	−773
1971–74	128586	122034	105.4	121279	755
1975–79	135595	128430	105.6	127890	540
1980–84	130194	123009	105.8	122796	213
1985–89	140797	133707	105.3	132797	910
1990–94	155237	146389	106.0	146416	−27
1995–99	153558	145112	105.8	144832	280
2000–04	146008	138765	105.2**	137711	1054
2005–09	152015	144049	105.5	143377	672
2010–14	153908	146088	105.4	145163	925

* The figure for 1910–77, prior to the Norwegian law on voluntary termination of pregnancy, is 106.025

** Significant deviations (p–value <0.05)

at the beginning of the 50s when the incidence is literally halved (Figure 4). Though for the 50s one can think of the war being over and conditions of relatively greater wellbeing, for the later decades a relationship could be established with the legislative changes of those years, which took place precisely in the legislation on the family, health and social security. Specifically, it should be remembered that 1970 saw the introduction of the divorce law, 1975 the new family law, and that family planning clinics were set up in 1975. The »laws on social protection of maternity and voluntary termination of pregnancy« were enacted in 1978. Finally, in 1980 the National Health Service ensured medical care for everyone.

As for the distribution in Italy, it can be seen that the regions with the highest incidence of infanticide were initially (from 1950 to 1989) those located in the North, and for the more recent decades (from 1990 to 2009) those of Southern Italy. For the final period analysed (from 2010 to 2014), although the data are still insufficient to give indicative incidences, the highest values are in Abruzzi, Trentino-Alto Adige and Emilia-Romagna.

Sex ratio at birth: factors involved in biological determination of gender and hypotheses of selection made through infanticide

Prior to a discussion of the data, it is necessary to review the biological factors which can affect the sex ratio at birth and explain its variations over time[18-20]. It has been postulated that this sex ratio, determined genetically and estimated to be approximately 105–106 males per 100 females in all human populations, can be affected by:

– age of parents: some evidence supports the theory that a higher age of parents is associated with a decrease in males [21-23].

– *relationship between pregnancies: some* authors suggest a relationship between foetal gender and the gender of a previous pregnancy[24,25], attributing this relationship to a predisposition to conceive foetuses of a particular gender or to an interaction between one pregnancy and the previous one. Others found no significant differences in the sex ratio of infants born after males compared with infants born after females[26,27].

TABLE 4
FRANCE: SEX RATIO AT BIRTH*

Years	M live births	F live births	Sex ratio	Expected F	Difference
1901–04	1829383	1753715	104.3**	1743444	10271
1905–09	2165356	2068346	104.7**	2063634	4712
1910–14	2033765	1943305	104.7**	1938225	5080
1915–19	1160847	1099317	105.6**	1106314	−6997
1920–24	2023388	1919438	105.4**	1928335	−8897
1925–29	1935591	1846366	104.8	1844663	1703
1930–34	1828849	1752993	104.3**	1742935	10058
1935–39	1596179	1534669	104.0**	1521195	13474
1940–44	1489419	1415042	105.3**	1419451	−4409
1945–49	2108464	1995308	105.7**	2009415	−14107
1950–54	2115815	2010871	105.2**	2016420	−5549
1955–59	2082965	1987799	104.8	1985113	2686
1960–64	2167926	2069559	104.8	2066083	3476
1965–69	2175128	2072696	104.9	2072947	−251
1970–74	2190873	2076702	105.5**	2087952	−11250
1975–79	1900465	1804155	105.3**	1811187	−7032
1980–84	2006201	1905345	105.3**	1911956	−6611
1985–89	1973630	1877838	105.1	1880915	−3077
1990–94	1891161	1796563	105.3**	1802320	−5757
1995–99	1883776	1789810	105.3**	1795282	−5472
2000–04	1964456	1872181	104.9	1872172	9
2005–09	2019175	1927525	104.8	1924320	3205
2010–14	2019553	1928745	104.7**	1924680	4065

* The figure for 1901–74, prior to the French law on voluntary termination of pregnancy, is 104.929

** Significant deviations (p–value <0.05)

– ovulation induction and assisted procreation: according to some authors ovulation induction with clomiphene citrate or gonadotropins induces a decrease in the sex ratio[28,29]. According to others the reduction in sex ratio evidenced by these studies is, by contrast, due to the inclusion of individuals predisposed to produce more females[30].

– socio-economic status and quality of medical care: their improvement allegedly has the effect of raising the sex ratio of offspring[31].

– pollutants: according to Potashnik, Goldsmith and Insler[32] the exposure of men to dibromochloropropane causes a decrease in the sex ratio of their offspring. In the Seveso disaster of 1976, the exposure of males to dioxin led to a reduction in the sex ratio[33], which is also evident among workers exposed to dioxin or similar compounds[34]. Fukuda et al.[35] showed that a lower sex ratio is found in the offspring of couples who are heavy smokers. This could be explained by assuming that smoking has antiestrogenic and toxic effects in women and lowers testosterone levels in men[36].

– *nutritional factors:* it is possible that male embryos require greater energy. Indeed, although unconfirmed[37], a study by Tamimi et al.[38] demonstrates that the daily calorie intake of women pregnant with a male child is 10% higher than for women pregnant with a female child. As a result, it is possible that male foetuses are disadvantaged by poor nutrition. A study conducted on a rural community of Ethiopia[39] demonstrates a correlation of foetal gender with maternal nutritional status; even in industrialised countries such as Italy, the mother's energy reserve would seem to play a role in its definition[40].

As will be seen below, none of the proposed factors appear entirely convincing, at least as an explanation of the observations for Italy. Table 1 shows that for 1940 to 1949 and from 1970 onwards there is a negative deviation of observed female live births from the expected values. As for the first period (Second World War and the immediate post-war period), at that time there was no decrease in the age of parents, reduction in pollutants or improvement in the socio-economic status of the population. Therefore it cannot be ruled out that the increase in the sex ratio at

birth was partly due to unreported infanticides. From 1970 onwards there is a constant difference between the number of female live births and the number of expected live births. The former were fewer than the latter, and this phenomenon is also evident in the years after 1977. On the basis of the assumption that males are more subject to perinatal mortality than females, it may be hypothesised that progress in nutriti on, hygiene and medicine had shifted the sex ratio in their favour. However, mention must be made of the start of various methods of diagnosing the gender of unborn babies during that same period: ultrasound, amniocentesis and chorionic villus sampling.

Ultrasound enables the gender to be known from sixteen weeks of pregnancy and its low cost has contributed to its spread. In addition to that, it was recently added the possibility of determining gender even earlier through maternal blood tests. Amniocentesis was one of the first techniques used, but it is a costly, invasive test which is only available between the fifteenth and nineteenth week of pregnancy. Finally, chorionic villus sampling enables a child's gender to be known from the ninth week, but with an approximately 3% risk of miscarriage.

In the light of the above, and the widespread nature of back-street abortions in the years immediately before the law on voluntary termination of pregnancy, the practice of selective abortion based on the gender of unborn babies cannot be completely ruled out when seeking an explanation for the lower number of female live births than expected births. An entirely similar operation to that performed for live births was repeated with reference to stillbirths (Table 2). The outcome was that starting from the '60s, the number of female stillbirths has been systematically higher than the expected values, albeit only slightly.

Comparison with the data on the other European countries considered is particularly interesting, although difficult to interpret (perhaps precisely for that reason). As expected, France shows very similar trends to Italy. Norway, in contrast, shows a different trend to Italy as regards live births observed since the 70s. Turning to the data on female stillbirths, over time there is a rise in the observed value compared with the expected value in all countries considered except Scotland.

Conclusion

Despite the repeatedly expressed doubts on the reliability of the infanticide data available for Italy, it can be shown that the phenomenon continues to decrease but remains constantly present. Nowadays, cases of infanticide can be interpreted as the consequence of lack of information on the possibility to terminate pregnancy legally. However, given their low incidence, it cannot be ruled out that they may also be largely attributed to the rejection of infants, particularly those with serious diseases. In addition, the decrease in cases of infanticide does not appear very connected to the 1978 law on termination of pregnancy, as has been argued, as the decrease began in the mid 50s and strengthened with the deployment of services in the 70s.

The analysis by region showed a slightly higher incidence of infanticide offences initially in Northern Italy, then in Southern Italy in recent decades. These observations can be supplemented with others related to the analysis conducted on sex ratio at birth, in order to highlight any anomalies in that relationship. Genetic, and more generally, biological factors have certainly had (and still have) an important influence in determining the changes. However, in the light of what has emerged from the data, the practice of infanticide cannot be completely ruled out when seeking an explanation for the lower than expected number of females born in specific periods (nor for more recent times, can the practice of selective abortions influenced by the possibility to know an unborn baby's gender early in pregnancy be completely ruled out): the data on 1945, when a significant increase in the incidence of infanticide corresponds to an increase in sex ratio at birth and an increase in the difference between observed and expected female stillbirths, are an indication to this effect.

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INFANTICID I SEKSUALNI OMJER ROĐENIH U SUVREMENOJ ITALIJI

S A Ž E T A K

Unatoč nekim sumnjama na pouzdanost podataka o čedomorstvu dostupnim za Italiju, može se pokazati da se fenomen i dalje smanjuje. Danas se slučajevi čedomorstva mogu protumačiti kao posljedica nedostatka informacija o mogućnosti zakonskog ukidanja trudnoće. Ipak, s obzirom na njihovu nisku učestalost, ne može se isključiti da ih se također može pripisati uglavnom odbijanju dojenčadi, posebno onih s teškim bolestima. Ta opažanja mogu se nadopuniti drugim osobama povezanim s analizom provedenom na omjeru spolova pri rođenju, kako bi se istaknuli eventualne anomalije u toj vezi. Genetički i općenitije biološki čimbenici svakako su imali (i još uvijek) važan utjecaj u određivanju promjena. Međutim, u svjetlu onoga što se pojavilo iz podataka, praksa čedomorstva ne može se potpuno isključiti kada traže objašnjenje za niži od očekivanog broja žena rođenih u određenim razdobljima.