AGE-SPECIFIC MORTALITY TRENDS IN FRANCE AND ITALY SINCE 1900: PERIOD AND COHORT EFFECTS *

Graziella CASELLI

University of Rome, Italy **

Jacques VALLIN

Institut National d'Etudes Démographiques, France

James W. VAUPEL

University of Minnesota, USA

Anatoli YASHIN

International Institute for Applied Systems Analysis, Austria

Abstract. Although France and Italy currently exhibit very similar expectations of life, their mortality patterns by age and sex are not the same. The differences were much greater at the beginning of the century than they are now. Graphical presentation of the data since 1900 by age, period and birth cohort is used to explore in detail the differences in trends and to bring out, in particular, differences between the two countries in period and cohort effects. In addition to providing more details on well-known period effects – the secular decline in mortality in both countries (with Italy largely 'catching up' with France), and the immediate effects of the world wars – similarities and differences in cohort effects are also apparent. The two countries exhibit clear differences not only in terms of immediate casualties of the wars, but also in terms of the long-term impact of unfavourable wartime living conditions on the cohorts most affected.

** *Author's address*: Dipartimento di Scienze Demografiche, Università di Roma, Via Nomentana 41, I-00161 Roma, Italy.

*Résumé.   **Tendances de la mortalité par âge en France et en Italie depuis 1900 : effets du moment, effets de génération***

Les structures par âge de la mortalité ont évolué différemment en Italie et en France, et les différences observées aujourd'hui entre les deux pays ne sont plus les mêmes qu'au début du siècle. Dans cette évolution, la tendance générale au progrès sanitaire a joué un rôle majeur, plutôt favorable à l'Italie qui a vu sa mortalité se rapprocher de celle de la France aux jeunes âges et accentuer son avantage aux âges adultes. Ce n'est guère qu'aux âges élevés que la France a amélioré sa position relative. Cependant, le passage de la situation de 1900 à la situation actuelle a suivi un cheminement complexe et chaotique où les perturbations dues aux guerres mondiales tiennent une place importante. Celles-ci sont à l'origine de divers effets de génération qui sont mis ici en évidence grâce à un procédé graphique de représentation en courbes de niveau appliqué aux séries, disponibles pour ces deux pays, de quotients de mortalité par année d'âge et année d'observation, de 1899 à 1979.

1. Introduction

Present-day France and Italy are similar in population size (55 and 57 million inhabitants respectively in 1985), economic development and – roughly speaking and despite a certain heterogeneity – cultural origins. As members of Western Europe, they also share a long history, in particular, the two world wars which have deeply marked both countries in the 20th century.

However, this common experience does not exclude broad differences, both political and socio-economic. In 1900, whereas France had been a united country for several centuries, modern Italy was only 30 years old: its population was very heterogeneous, the result of this longer lack of unity. Political unity was, in turn, to transform Italy's economy deeply. In a first stage, the disappearance of the Kingdom aggravated the disparity between the agricultural south and a north in process of industrialization. In terms of economic development, therefore, Italy as a whole lagged behind France – which was well into the Industrial Revolution as early as the mid-19th century – for a long time, not really becoming a major industrialized country until the economic boom of the 1960s. From the demographic viewpoint, the two countries differed greatly during the whole of the 19th and the first half of the 20th centuries. In France, demographic transition started much earlier and was expressed in a very low rate of population growth due to the early start of the fertility decline at the end of the 18th century. In Italy, on the other hand, although mortality started to

decrease somewhat later than in France, fertility remained high much longer – up to the end of the 19th century. Consequently, between 1900 and 1940 the population of Italy grew from 33 to 45 million inhabitants, whereas that of France was almost stationary. Another consequence was the high emigration Italy experienced during this period, compared with continuous immigration in the case of France. However, since the Second World War, the population patterns of the two countries have been much more similar, both of them reflecting the baby boom in the 1940s/1950s and the 1970s drop in fertility.

In both France and Italy, life expectancy is currently high (around 74 years since the beginning of the 1980s), but the age/sex-specific mortality patterns differ. The differences reflect not only the present-day situation in each country, but also their past history. We therefore thought it would be interesting to study the age/sex-specific mortality trends of the two countries over a long period in as much detail as possible, attempting more particularly to distinguish between cohort effects and those related to period changes.

Complete series of mortality data by individual years of age and calendar years are available from 1869 to 1979 for Italy [Natale and Bernassola (1973), Caselli and Greco (1983)] and from 1899 to 1982 for France [Vallin (1973, 1984)]. We have, therefore, studied the period 1899–1979. For both countries, these data include the military and civil deaths not registered in vital statistics during the war periods. They cover each national territory as defined by its present boundaries. To make such long series easier to read and interpret, we adopted the graphical representation method of mortality surfaces elaborated by Vaupel, Gambill and Yashin (1985). After comparing the sex and age structures of mortality in France and Italy, we attempted to distinguish between period and cohort effects using this method. Finally, we examined what differentiates certain Italian cohorts from their French counterparts.

2. Past and present mortality patterns in France and Italy

Computed in the framework of a longitudinal study, the age-specific death probabilities available for Italy are probabilities for a given cohort between two birthdays: each probability therefore involves the cohort's experience in two successive calendar years (corresponding to

a parallelogram on a Lexis-diagram). For France, two series of death probabilities are available, one by calendar years (computed from a dual classification of deaths by age and year of birth, the frame of a Lexis-diagram square thus) and one by cohorts (like the Italian data). Comparison required us to adopt the second (cohort) series. The period observations we refer to, therefore, each concern in fact part of two successive years. For easier reading, each period centred on January 1st of the second of the two years was dated as this second year: thus, for example, the first death probability, concerning 1899 and 1900, was dated as 1900 and the last (for 1978–1979) as 1979.

To eliminate random or short-term variations, we used the mean death probabilities for the last five-year period (1975–1979) to illustrate the age-specific patterns of mortality (fig. 1). Although infant mortality is higher in Italy than in France, the death probabilities at ages 1–15 for both sexes are roughly the same for both countries; if anything, they are slightly higher in France. At ages 15–23, they are much higher in France than Italy, and they remain considerably higher in France up to age 55. From then on, the sexes differ: for males, the two countries show very similar patterns, whereas for females the probabilities are noticeably higher for Italy than for France.

The situation was very different at the beginning of the century (fig. 2). For both sexes, higher mortality was observed in Italy not only during infancy but also throughout childhood and the adolescent years up to age 15. The two countries showed very similar patterns from 15 to 25 (with slightly higher female mortality for Italy than for France). Finally, above age 25, the two countries had very similar patterns for females, whereas male mortality was higher in France right up to the oldest age groups.

Such differences in the age-specific mortality trends of France and Italy obviously depend partly on a different development of health and social conditions, but they may also be due to factors concerning the history of particular groups of generations. For instance, the relative structures observed for France and Italy in 1950–1954 are similar to those observed at the beginning of the century (fig. 3), but in 1950–1954 an anomaly appears in Italy's mortality at around age 35 for both sexes. For this period, it is difficult to find a contextual explanation, but this higher mortality for Italy may well be attributed to the particular history of the generations born during World War I [see Caselli, Vaupel and Yashin (1985)]. A second anomaly, this time for
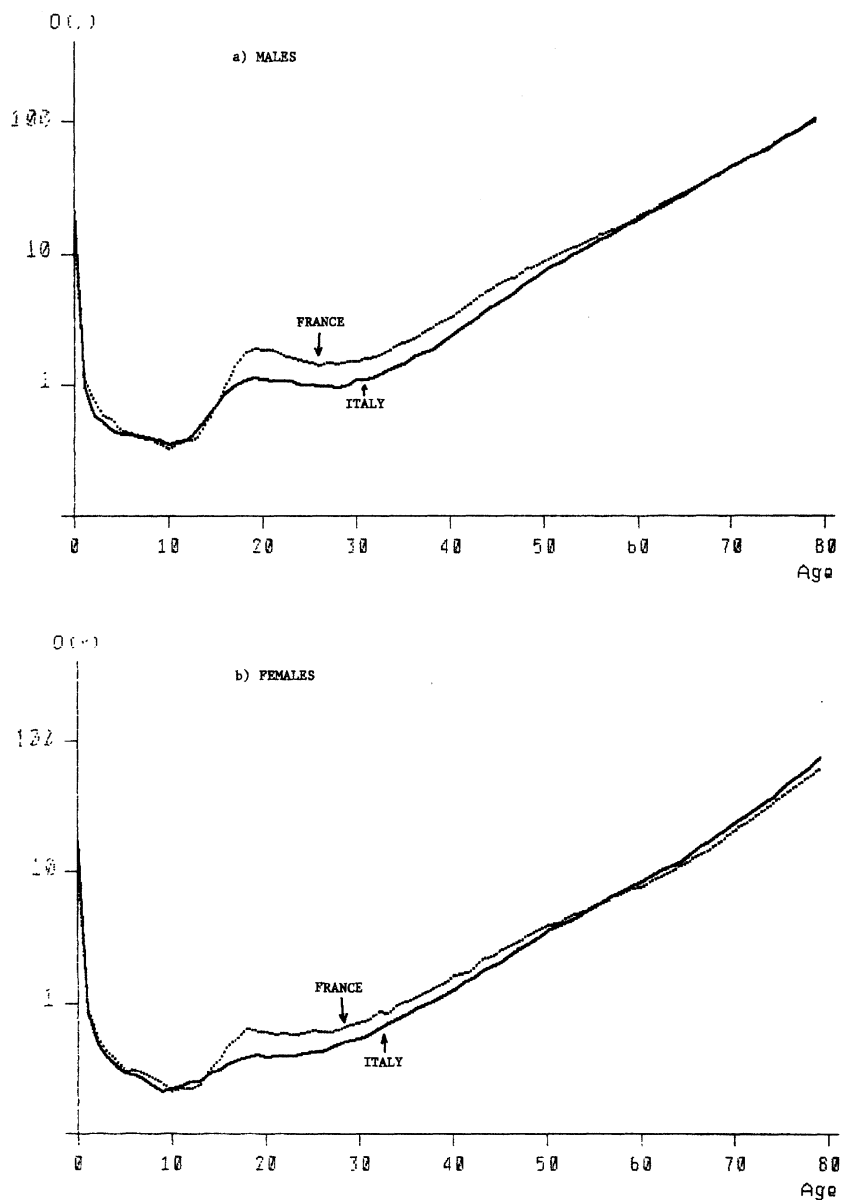
Fig. 1. Male and female age-specific mortality in France and Italy, 1975–1979.

Italian males, appears around age 45: once again, the higher mortality may be related to the history of the generations concerned, who were around 15 years old at the end of the 1914–1918 war. Horiuchi (1983),

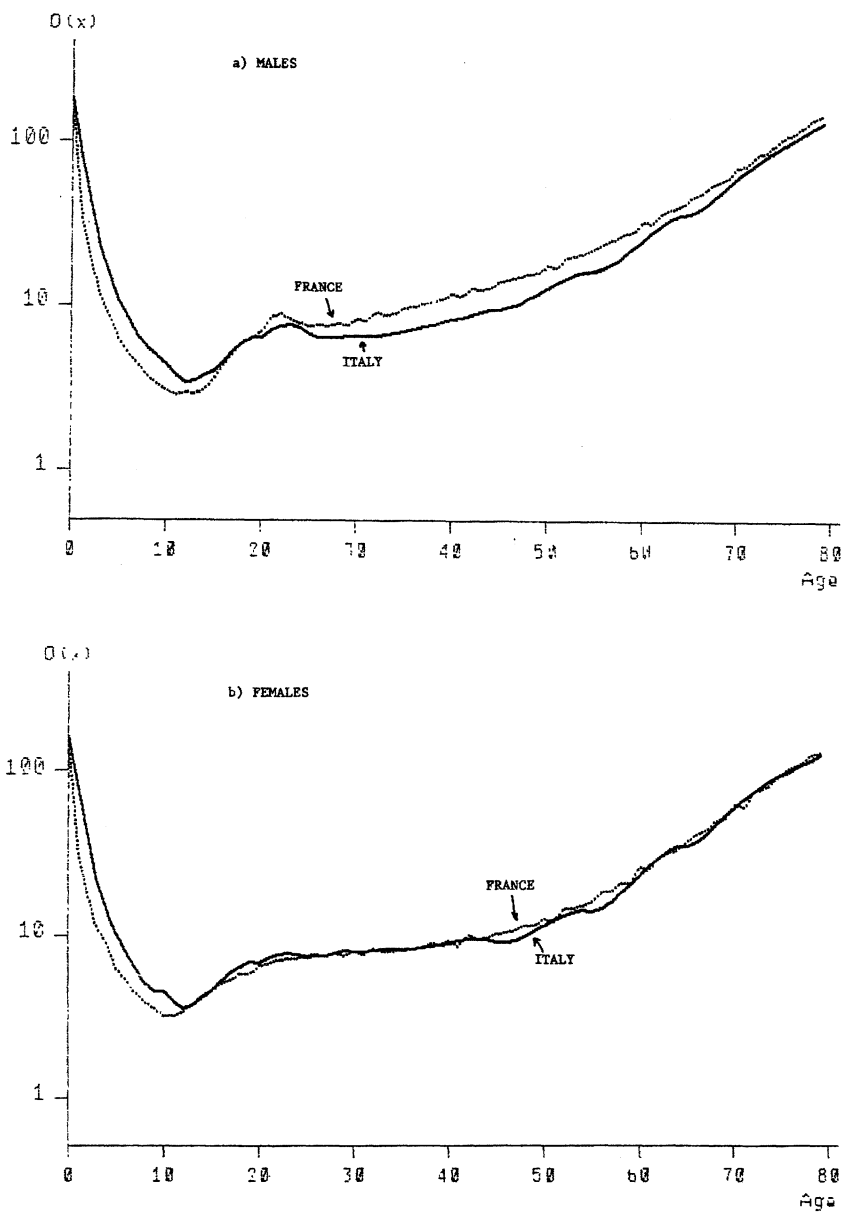*G. Caselli et al. / Age-specific mortality trends*

Fig. 2. Male and female age-specific mortality in France and Italy, 1900–1904.

studying cohort mortality in Germany, has noticed excess mortality at adult ages for men who were adolescents during the war years. Caselli and Capocaccia (n.d.) have also observed this feature for Italy.
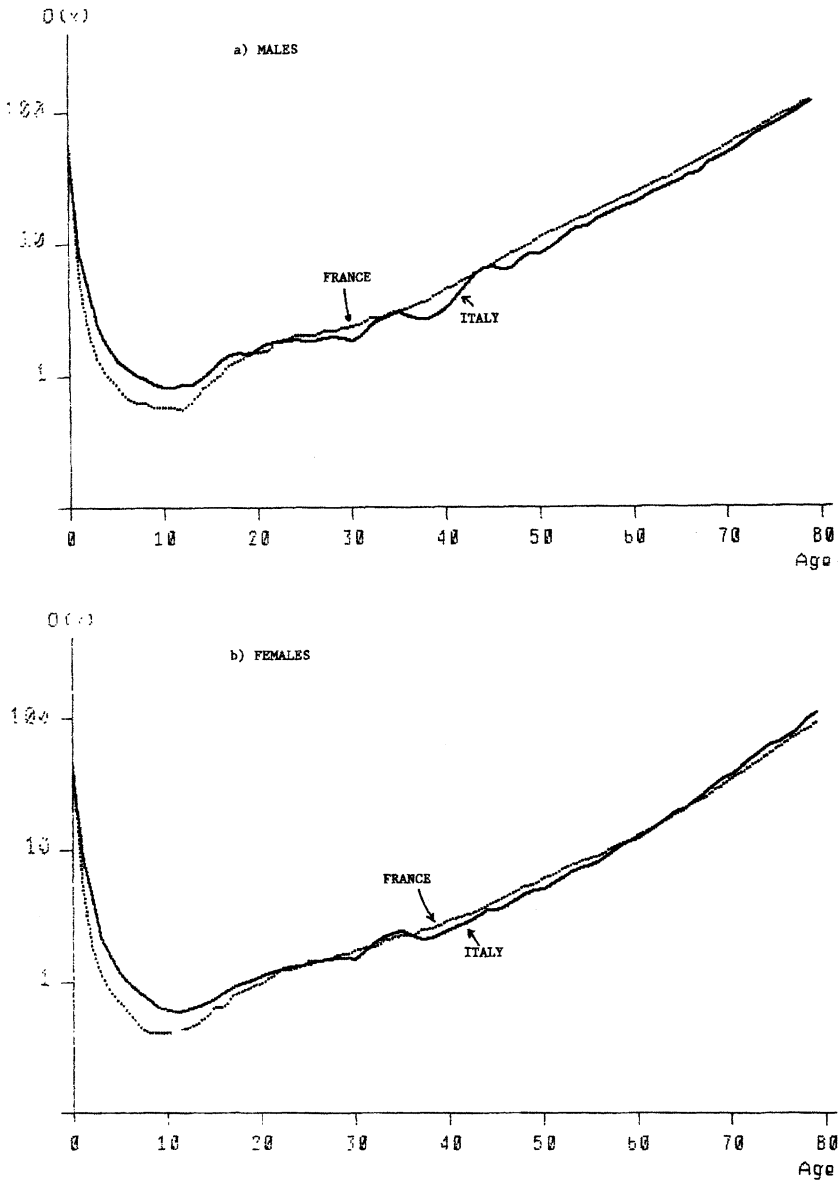
Fig. 3. Male and female age-specific mortality in France and Italy, 1950–1954.

Changes in the relative French/Italian patterns of age/sex-specific mortality stand out more clearly when we examine the ratios of the French to Italian death probabilities (fig. 4). At the beginning of the
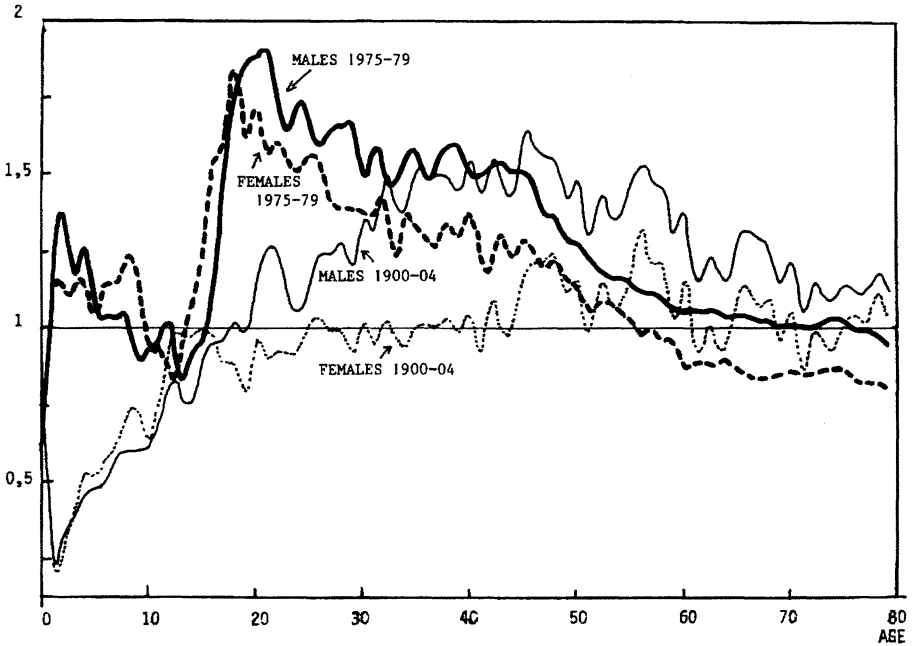
Fig. 4. Ratios of the French to Italian death probabilities.

century, health conditions in the first years of life were much better in France than in Italy for both sexes. At adult ages, on the contrary, they were roughly the same for females, but male mortality was already much higher in France than in Italy, particularly at ages 30–60. Today, Italy's higher mortality at the young ages has disappeared for both sexes, to be replaced by a slightly higher French mortality around age 5 (although infant mortality remains higher in Italy). At ages 15–30, the French excess already observed for male mortality leaps upward, and is now accompanied by a similarly high excess for females, while at ages 30–50, the French excess is almost as high for females as for males. After age 50, however, the French excess has practically disappeared for males, while female mortality is now higher in Italy. Thus the overall French–Italian mortality ratio, which was highly differentiated according to sex at the beginning of the century, is only very slightly so today: the distance separating the male and female mortality structures, which was very broad at the beginning of the century in both countries, is almost non-existent now. In particular, the excess female mortality at childbearing ages which was still strong in Italy at the
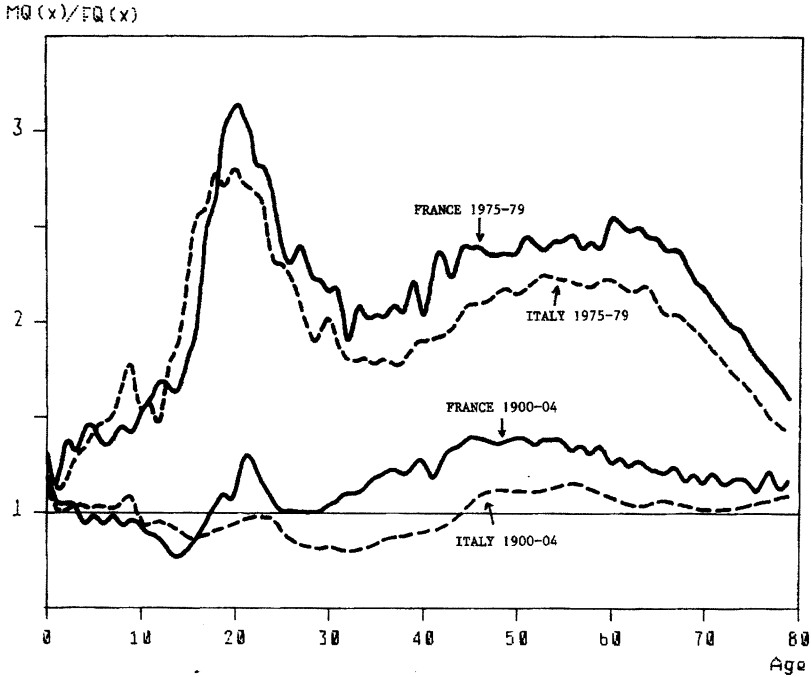
MQ(x)/FQ(x)

Fig. 5. Excess male mortality in France and Italy between 1900–1904 and 1975–1979.

beginning of the century has disappeared, giving way, as in France, to a high excess male mortality at these ages (fig. 5).

A comparison of the age/sex-specific mortality patterns of the two countries involves a closer examination of these differences and their evolution. This sets the problem of how to represent clearly almost a century's mortality change.

3. Effectively representing a whole century's age / sex-specific mortality

To observe a continuous trend in age-specific mortality, the three dimensions of age, time period and mortality level must be taken into account. A two-dimensional sheet of paper cannot be used for constructing a figure inscribed in a three-dimensional space: we therefore adopted a method traditionally used in architecture, the perspective representation technique. A judicious choice of scale and projection angle ensures an interesting overall view, throwing into relief some of
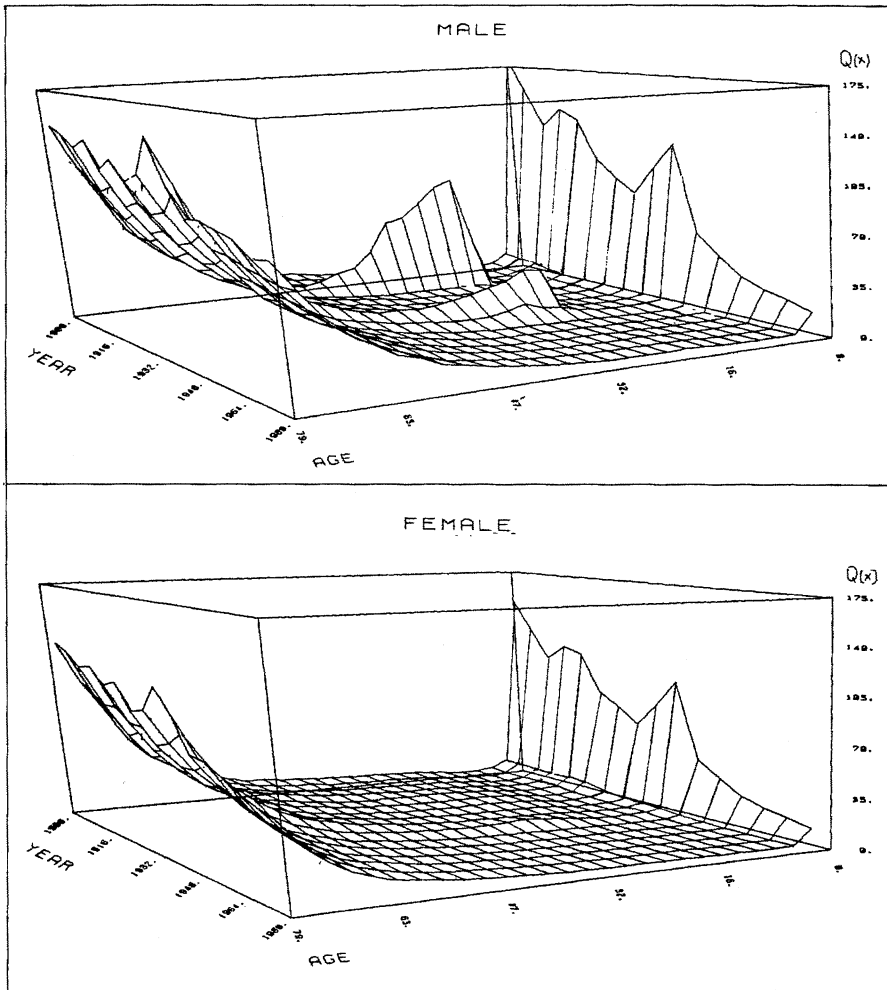
Fig. 6. Three-dimensional representation of French mortality trends since 1900.

the more important features of the mortality surface thus represented (figs. 6 and 7). The consequences of the two world wars, for instance, on the French male population are revealed in a new and very eloquent light. These consequences can be directly compared with other outstanding features of the mortality pattern, such as the importance of infant mortality and its evolution since 1900. Differences in this respect between the sexes or between the two countries become immediately
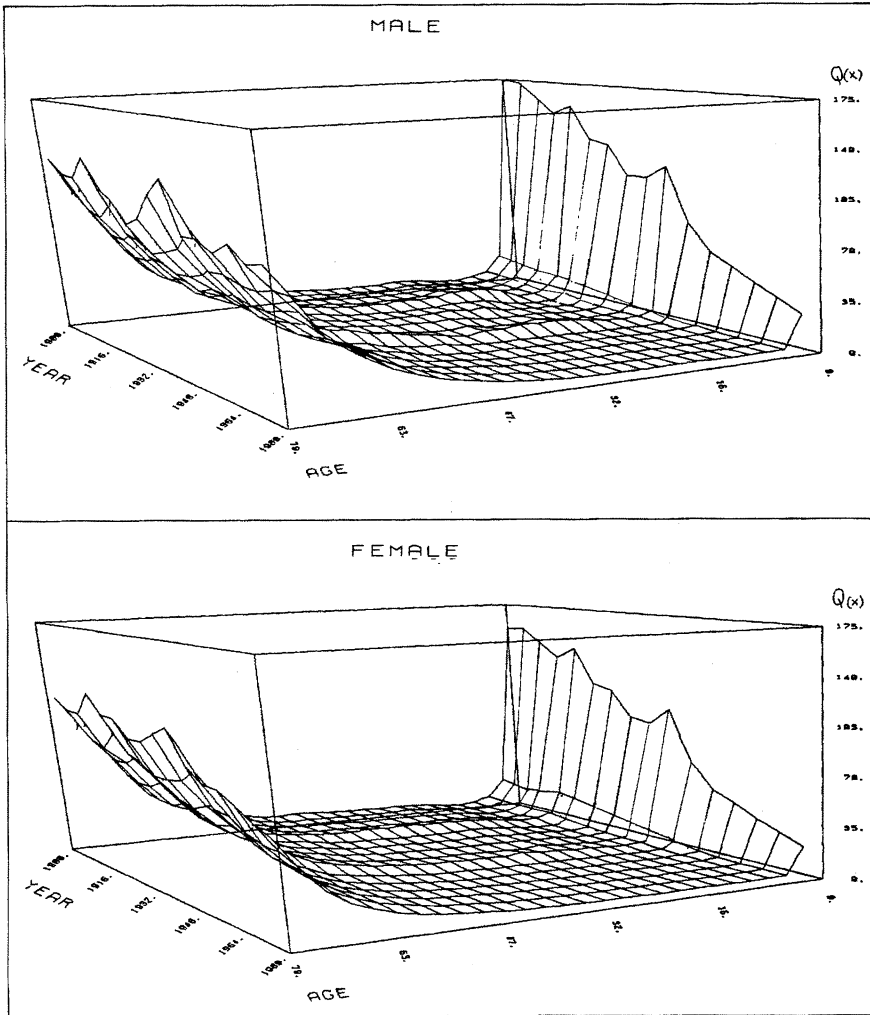
Fig. 7. Three-dimensional representation of Italian mortality trends since 1900.

appreciable. However, this method does nothing more than show in a new light aspects of mortality which are already well known. It cannot take us beyond the general descriptive stage, nor help us differentiate between the effects of changing health or social conditions and those related to specific cohort histories.

To go any further, we must revert to the orthogonal method of projection, but, depending on which dimension we choose to project on

the other two, we obtain a completely different presentation of the
results. The types of representation most commonly used by demogra-
phers are based either on mortality levels by age (as in figs. 1, 2 and 3)
or on mortality levels by calendar year (or, more rarely, by cohort).
These classical types of representation reveal in detail the fluctuations
in mortality level, either according to age for a given time period (or
given generation), or according to time for a given age group. But the
number of different time periods (in the former case) or ages (in the
latter) that can be compared on one graph is very limited (above ten it
becomes illegible). A third solution, offered by Vaupel, Gambill and
Yashin (1985), consists of a method of projection by age and calendar
year whereby the mortality level is traced in curves in a way similar to
that in which contour lines on maps represent altitude according to
latitude and longitude. Clarity once more requires selection and this
method, like the other two, involves a certain loss of information, as it
retains only groups of mortality levels. Despite this restriction, we
considered it the best solution for representing our mortality data.

Figs. 8 (France) and 9 (Italy) illustrate this type of relief representa-
tion of the male and female mortality patterns. Darker hatching
indicates higher mortality levels, light zones lower levels. The age-
specific mortality structure for a given time period appears as we read
the figure from bottom to top. Starting with a narrow dark zone
representing infant mortality, we quickly come across a light zone
reflecting the very low child mortality, then progressively darker zones
corresponding to the increase of mortality with age. Reading from left
to right, we can see how the mortality level for a given age group has
changed over time, becoming progressively lighter as health conditions
have improved, but with dark vertical bands reflecting the two world
wars. But what we found particularly interesting about this method is
the fact that, by reading diagonally instead of vertically or horizontally,
we can also observe the cohort-specific variations.

The impact of the two world wars is salient, much more pronounced
for males than for females and for France than for Italy. World War I
is seen to have particularly affected French males aged 18 to 35 or even
40 during the five war-years (1914–1918). In 1918–1919, the effects of
the war were aggravated by the outbreak of Spanish influenza. For
French females, only the effects of this particularly violent epidemic
are clearly visible. Italy, not engaged in the war until the second half of
1915, and then only on a smaller front, had fewer military losses, which
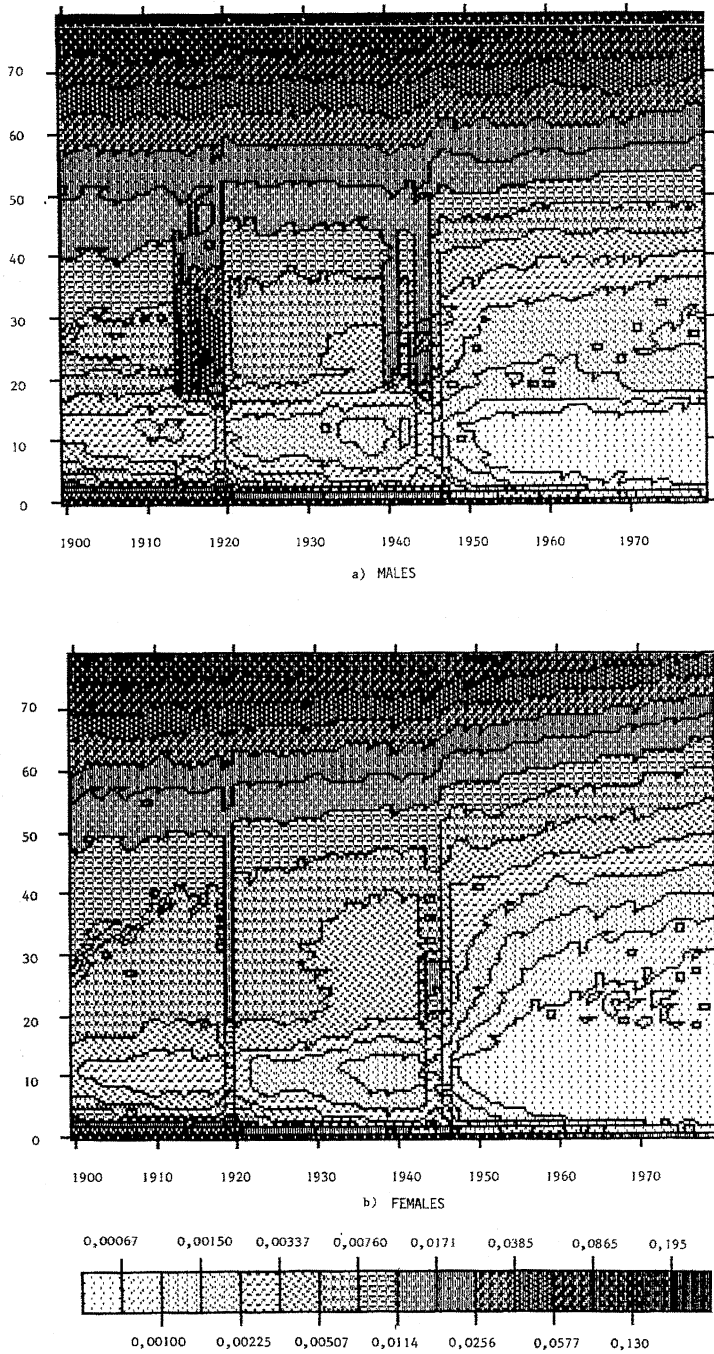
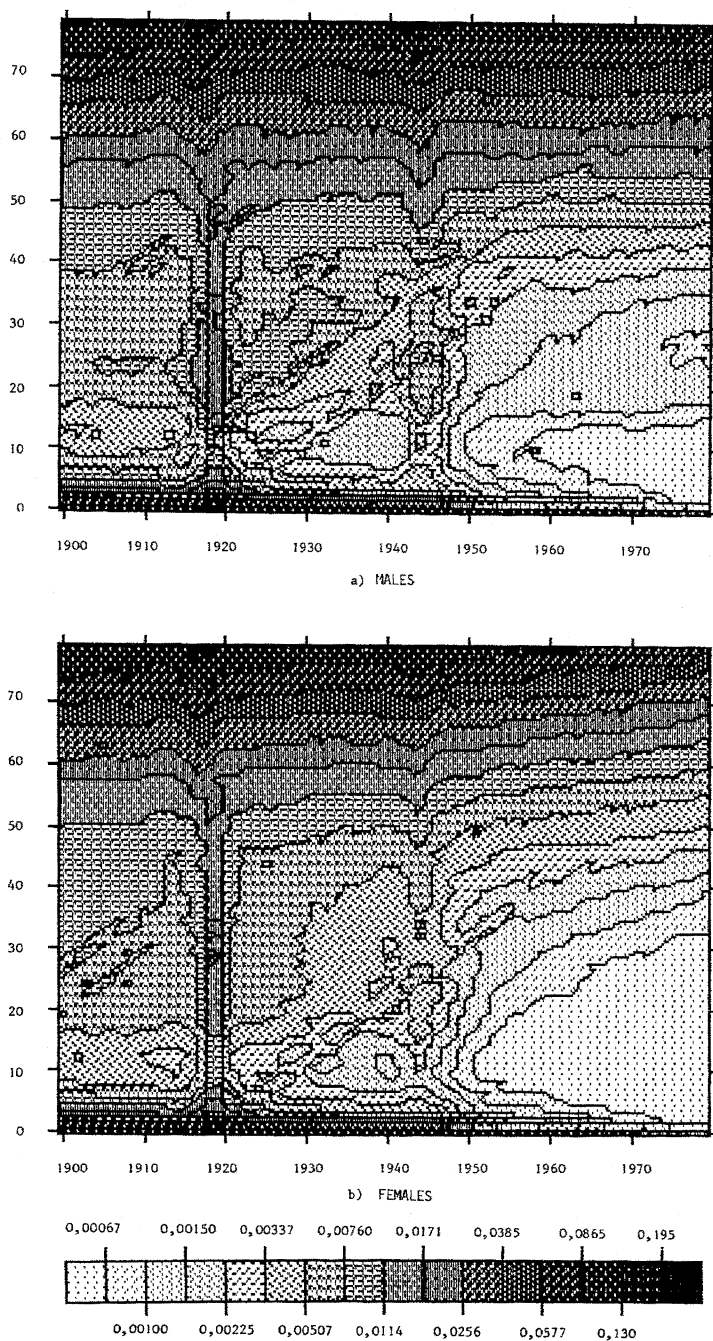Fig. 8. Age-specific mortality in France between 1900 and 1979.

Fig. 9. Age-specific mortality in Italy between 1900 and 1979.

is reflected in the corresponding male age groups. But Italian women, and children and old people of both sexes, were much more deeply marked by the war than were their French counterparts. In 1918–1919, the effects of influenza appear, as in France, but this cannot explain the Italian excess mortality observed in 1916 and 1917.

The impact of World War II is less direct and more widespread: military losses were fewer but civilian ones higher. In France, the effects of the 1940 Campaign and of the Liberation are visible for the male age groups concerned, but both sexes and all age groups reflect a certain excess mortality throughout 1942–1945. In Italy, the effects of the war are more diffuse (for both males and females) than in France and are strongest among the elderly.

A third period effect appears clearly on both graphs for females for the 1920s–1930s. Around 1930, the zone of very low mortality (under 5 per 1000), until then reserved for children and adolescents (ages 5 to 18), suddenly extends to women aged 18–40, reflecting the rapid decline in maternal mortality observed in the 1920s and 1930s. A more detailed study of the French data for females aged 15–50 in 1920 and 1940 (fig. 10) reveals the contrast between mortality at the childbearing ages, which decreases rapidly, and the adjacent ages. This is no doubt partly due to the drop in fertility, but also to the rapid headway made in obstetrics and maternal health. It also reflects a simultaneous decrease in the number of tuberculosis deaths, which was particularly high for women in these age groups at the beginning of the century.

In addition to these period effects, certain cohort effects appear equally clearly, but this time only for Italy. As Caselli et al. (1985) have observed, the Italian male cohorts most deeply involved in World War I have much higher mortality than the adjacent cohorts throughout the 1920s and 1930s. Similarly, those born during the 1914–1918 war seem to have higher mortality than the adjacent cohorts for at least 30 years, although the difference here is smaller. This second cohort effect also appears for the female cohorts, perhaps even more visibly.

Although in an earlier study, using another approach, Vallin (1973) also observed for France the long-term effects of World War I on the male cohorts that had suffered the higher military losses, this is not visible here. They were, therefore, less pronounced than in Italy. Paradoxically, a war that caused fewer immediate deaths in Italy than in France eventually affected the Italian cohorts more deeply. The remarks we have already made concerning women, children and old
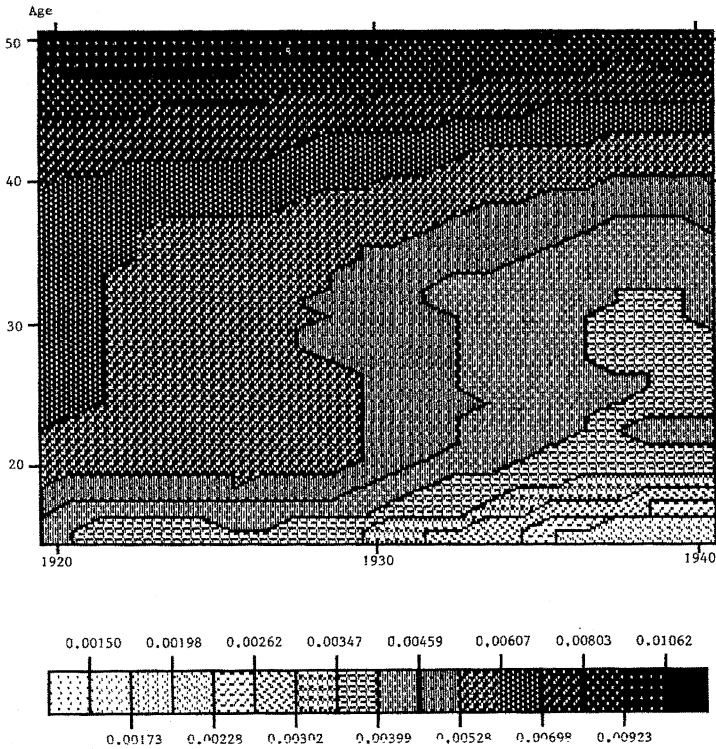
Fig. 10. French female death probabilities at ages 15–50 between 1920 and 1940.

people indicate that the consequences of World War I on the general health and food situation were much stronger in Italy than in France. This evidently affected men as much as women. Moreover, the soldiers demobilized after 1918 were in a deplorable state of health [Gini and Livi (1924), Mortara (1925)], no doubt worse than in France; also, in the later war years, Italy recruited more very young males (as young as 16) than France did.

Such important differences between France and Italy suggest that a more detailed comparative study could shed more light on the mortality patterns of each country. Mortality ratios (or differences) can be represented by the same type of curve projection as the mortality levels.

4. Comparison of mortality trends in France and Italy

The degree of detail chosen (year of age and year of birth) means that the ratios of French to Italian death probabilities fluctuate too
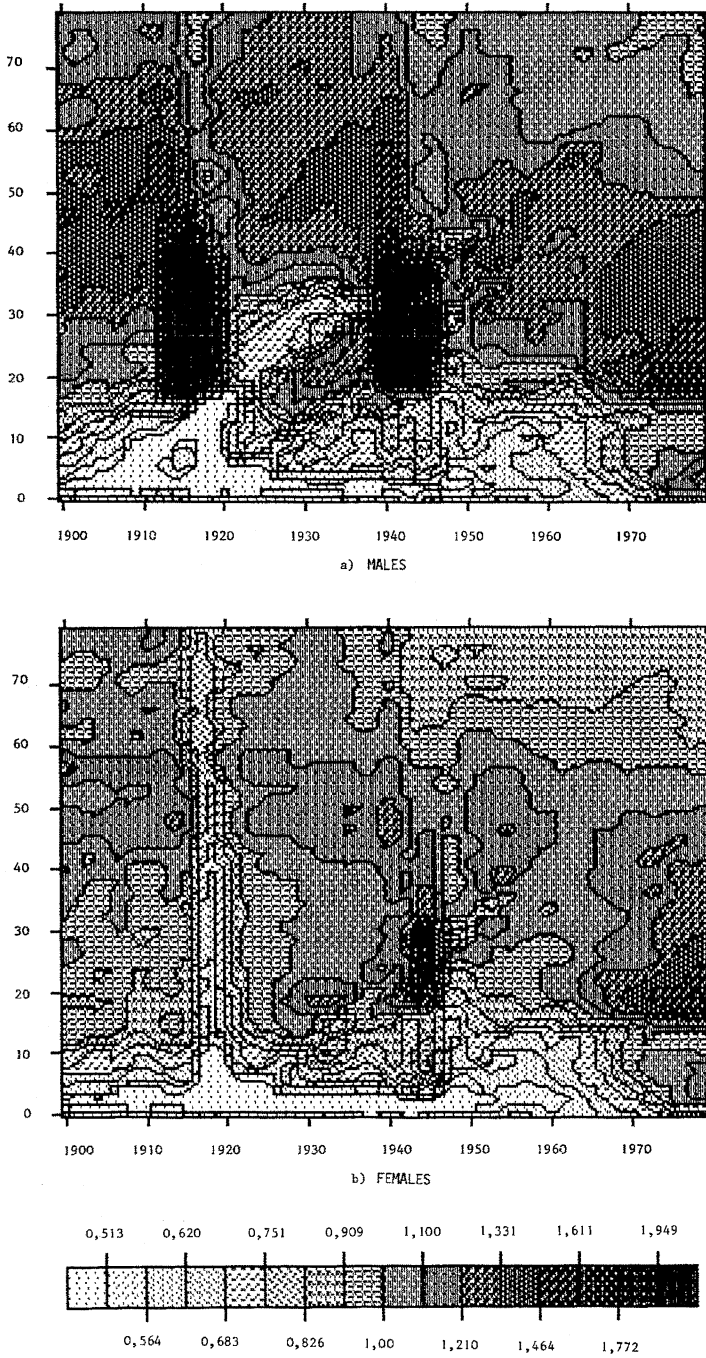
Fig. 11. Ratio of the French to Italian death probabilities by year of age and year of birth between 1900 and 1979 (after smoothing by the 5×5 weighted-surfaces method).

much to be used without prior correction. Fig. 11 was obtained after smoothing the curve by the weighted-surfaces method proposed by Vaupel et al. (1985). The lighter zones indicate excess mortality for Italy, the darker ones excess mortality for France.

At the beginning and end of the period, we find the differences already illustrated by fig. 4. But we can also see that changes in the French/Italian mortality ratios reflect a very intricate history combining short-term changes and cohort effects. The higher infant mortality for Italy lasts throughout the period studied, for both sexes, despite a recent improvement. Similarly, child mortality remains higher in Italy throughout the period until the late 1960s: the appearance of excess French mortality around age 5 is very recent. The death ratios for the other ages are much more sensitive to changes in the history of the two countries. However, we can observe that the increase in excess French mortality at ages 15 to 30 is also very recent, becoming really pronounced only after 1965 for both males and females. But beyond these differences at the beginning and end of the period, our attention is drawn to the important role historical factors play in distorting the mortality structures of both sexes.

The dominant feature of the graph for males is the very high excess mortality for France caused by the military losses sustained during the two world wars. France lost almost 1,500,000 men on the battle-fields compared with Italy's 600,000. However, another striking feature is the extension of the higher infant and child mortality observed for Italy to adolescence and even up to age 18 during the later years of World War I. For these same years, the excess French mortality observed till then at the higher ages decreases considerably, giving way to an excess Italian mortality above age 70. This supports what has already been said about the negative effects of the war on the food and health situation in Italy. These years stand out starkly on the graph for females, which shows an unambiguously higher mortality for Italy, at all ages, between 1915 and 1918.

Fig. 11b also reveals the high excess mortality that affected Italian women of childbearing age between 1900 and 1930. In the 1920s, this concerned all ages below 40, but it then disappeared completely at the end of the 1920s. This is related to the decline in maternal mortality mentioned above: starting more slowly in Italy during the first three decades, it accelerated towards the end of the 1920s, catching up with France completely.

The role of cohort effects in the mortality differences between the two countries is also well displayed by fig. 11. For females, the cohorts born during the later years of World War I (1916–1918) clearly show a higher mortality for Italy, which even extends fairly visibly beyond World War II. Once again, we find the same feature, although less marked, for the corresponding male cohorts. For Italian males aged 15 to 20 in 1916–1918, a very definite excess mortality is now observed.

More diffusely, a zone of higher mortality appears for the French cohorts aged 20–35 between 1914 and 1918. In other words, what fig. 8 for France alone did not reveal is brought into relief by this comparison with Italy, whose corresponding cohorts were less affected by their war experience.

Such cohort effects become more legible if, instead of smoothing our data, we use quinquennial cohort death probabilities. We computed these probabilities for each year of age and year of birth, obtaining a sort of moving average for each generation. Then, to emphasize the absolute distance separating the probabilities of the two countries, whatever the mortality level, we replaced the ratios by the differences.

This new angle makes the female cohorts born in 1916–1918 particularly striking: in this case, the excess mortality observed for Italy extends right up to the early 1960s (fig. 12b). The same feature is now just as visible on the graph for males (fig. 12a), where we also see more clearly the effects of the war on the cohorts who were aged 15 to 20 during the latter war years. The evolution of these cohorts is particularly interesting: after a long period of higher Italian mortality, they seem to experience a higher French mortality at ages 45–60. This may be due to the combination of a selection effect among the Italian cohorts and delayed war effects on the French cohorts which had been hidden by the extent to which they affected the Italian cohorts.

The revelation of the long-term consequences of World War I on the history of certain cohorts is no doubt the most original contribution of this method of graphic representation of mortality trends since the beginning of the century. It enables us to pinpoint the cohorts concerned and the ages at which they are affected by excess mortality. We can then revert to a more classical type of presentation to study in more detail the nature and extent of the factors underlying this phenomenon.
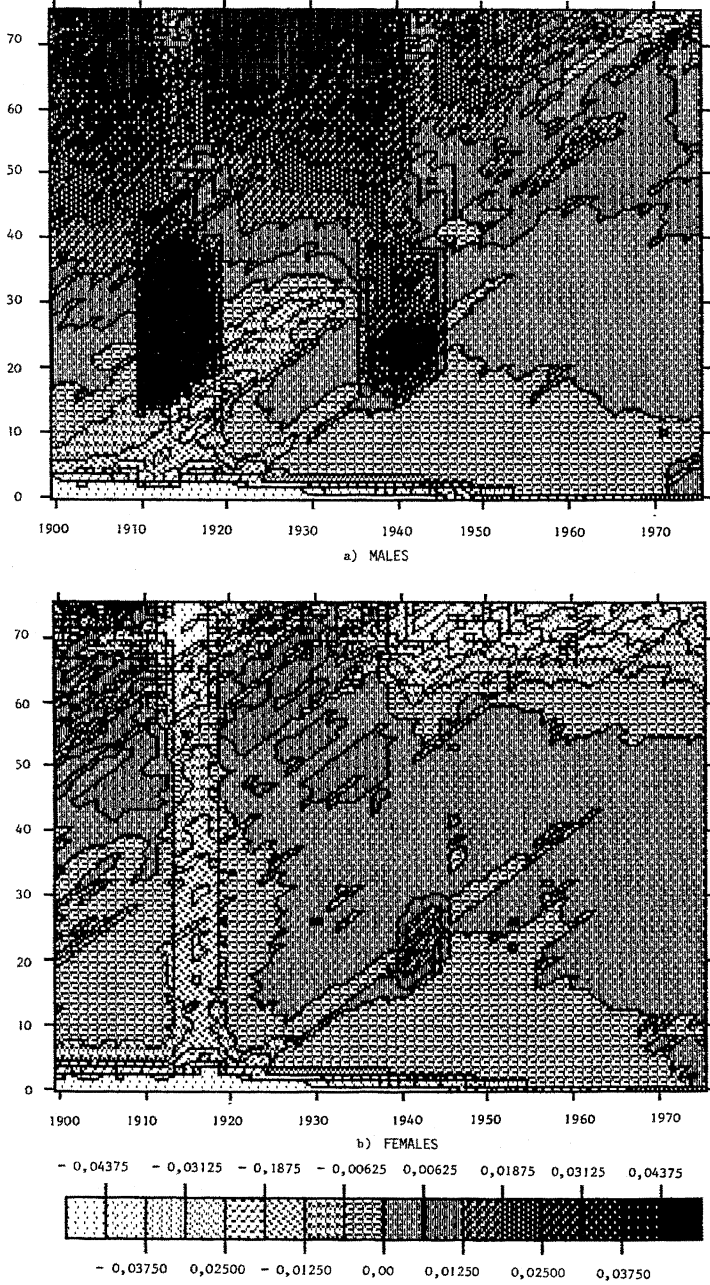
Fig. 12. Difference between the French and Italian death probabilities computed for each age and year of birth over a 5-year interval.

5. The long-term effects of World War I on certain cohorts

5.1. The Italian cohorts born in 1916–1918

Infant mortality was particularly high in Italy for the cohorts born in
1916–1918. This is partly due to the outbreak of Spanish influenza, as
the infant mortality rate for the 1918 cohort rose to a level that had not
been experienced for several decades, but also, more generally speak-
ing, to the war conditions, as the 1916 and 1917 cohorts also show very
high rates of infant mortality (table 1). In France an increase in infant
mortality is also observed for these cohorts, but it is less impressive.
This higher infant mortality in Italy is presumably due not only to the
negative effects of the war on existing health conditions, but also to
food shortages. The 1916–1918 Italian cohorts were born in a particu-
larly difficult context which seems to have marked the children who
survived.

As Caselli and Capocaccia (n.d.) have observed, the mortality of
these three cohorts remains higher than that of adjacent groups of
cohorts (1914–1915 and 1920–1924) up to age 50, for both men
(fig. 13a) and women (fig. 13b). The lower mortality for the 1920–1924
cohorts is no surprise: born later, they experienced better health
conditions throughout their lives, simply because of the general pro-
gress made in this field. However, the difference is so strong that it can

Table 1

Infant mortality rates (‰) for French and Italian cohorts born between 1910 and 1920.

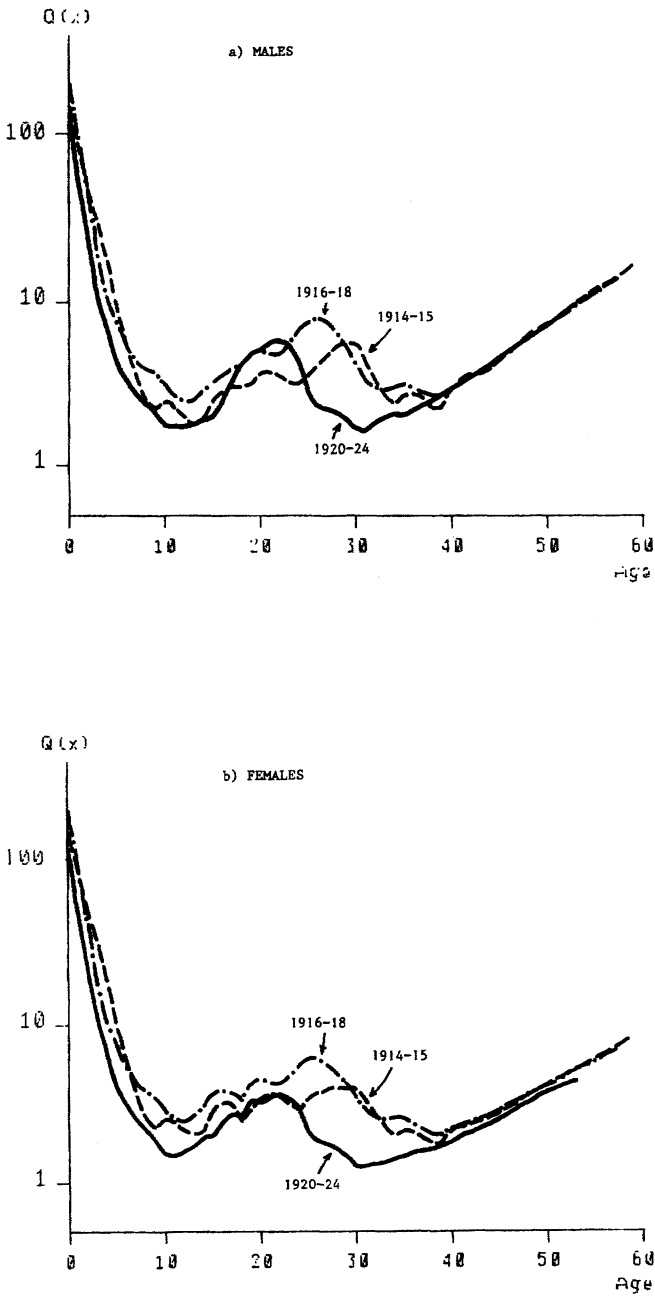| Birth cohort	Males		Females	
	France	Italy	France	Italy
1910	138	151	114	137
1911	162	156	137	142
1912	124	140	102	125
1913	124	144	103	128
1914	132	150	107	135
1915	135	171	112	156
1916	148	199	122	180
1917	148	216	122	200
1918	162	198	136	183
1919	154	157	129	144
1920	117	134	96	122

Fig. 13. Annual death probabilities of the Italian 1914–15, 1916–18 and 1920–24 groups of cohorts.

hardly be attributed entirely to the headway made in such a short time. As for the 1914–1915 cohorts, having been born earlier than the 1916–1918 ones, they should logically have had higher mortality than the latter.

On the contrary, their mortality, for both males and females, is constantly lower than that of the 1916–1918 group up to age 50, apart from two exceptions which, in fact, confirm the rule as they are directly related to period factors: at ages 2 to 5, the death probabilities of the 1914–1915 group are influenced by the 1918 Spanish influenza, and at ages 26 to 32, by World War II. The 1920–1924 group of cohorts also reflects the latter at ages 16 to 25. Ignoring these two contextual features, the curves for these three groups would show a more or less permanent opposition between the 1916–1918 cohorts on the one hand, and the 1914–1915 and 1920–1924 cohorts on the other.

This feature of the Italian cohorts born in 1916–1918 is not observed in France, for either sex: nor does it appear if we compare the 1914–1918 group with the adjacent groups of cohorts (France being engaged in the war earlier, in 1914). This explains why it was such a striking feature of the French–Italian mortality differences represented in fig. 12.

5.2. Italian male cohorts aged between 15 and 20 during World War I

The excess mortality affecting the Italian male cohorts aged between 15 and 20 during World War I was more difficult to bring into relief. All the cohorts born between 1890 and 1919 have been affected to some extent by one or other of the two world wars. The resulting fluctuations in the mortality curves hinder our observation all the more as the crucial ages are reached either between the two wars or during one of them, depending on the cohort. If we use groups of cohorts, the problem is accentuated as the apparent effect of the war years is extended, but we cannot represent each cohort individually or the figure becomes illegible. We therefore chose to represent the annual death probabilities for one out of every three of the cohorts born between 1894 and 1913 (fig. 14), leaving blanks for the war years. In this way, the long-term effects of World War I appear quite distinctly. Up to age 40, the 1903, 1900 and 1897 cohorts, aged 15, 18 and 21 respectively in 1918, show mortality patterns very similar to the older
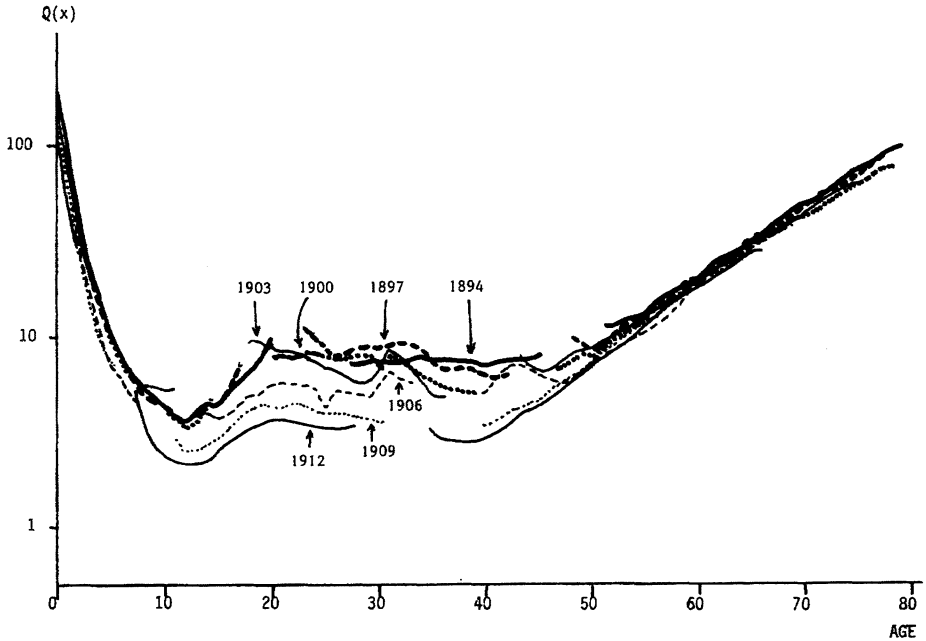
Fig. 14. Annual death probabilities of the Italian male cohorts born in 1894, 1897, 1900, 1903, 1906, 1909 and 1912.

1894 cohort (even higher at certain ages), whereas the younger cohorts, those born in 1906, 1909 and 1912, show, at the same ages, declining mortality patterns which visibly reflect the headway made in health conditions.

If we compare the French and Italian patterns (fig. 15a), we observe a much higher mortality for the Italian 1903 cohort, aged 15 in 1918, which was more deeply affected by the hardships of World War I than its French counterpart. This cohort continues to have a consistently higher mortality up to World War II. An excess Italian mortality is also observed for the 1897 cohort, aged 21 in 1918, but the long-term effect is not the same: as the cohort was more widely engaged in World War I in France than in Italy, the long-term effects are inversed after 12 years or so, when a high excess mortality appears for the French cohort.

5.3. The French cohorts engaged in the 1914–1918 war

The older the cohorts, the earlier we observe this excess mortality for France and the higher it is. The male cohorts born in 1893–1895 are, as
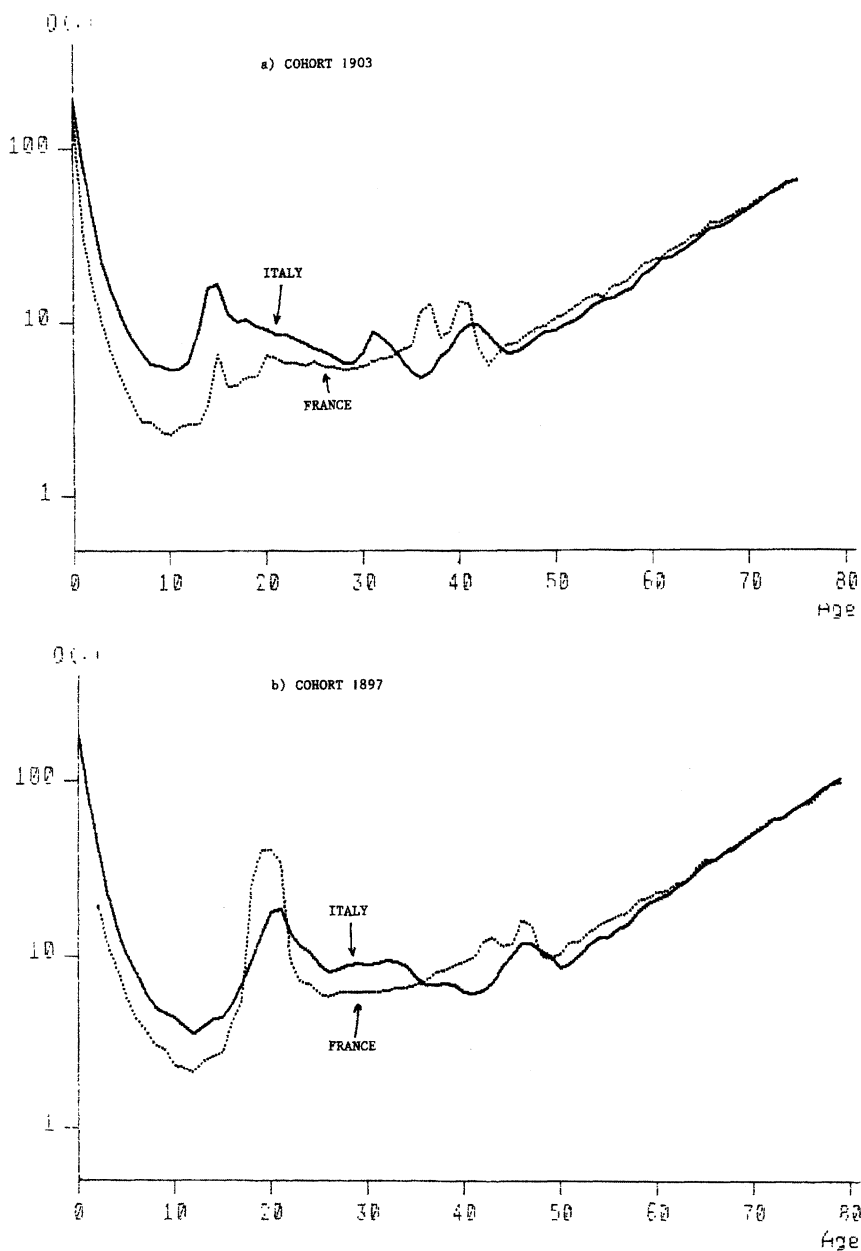
Fig. 15. Annual death probabilities of the French and Italian male cohorts born in: (a) 1903; (b) 1897.
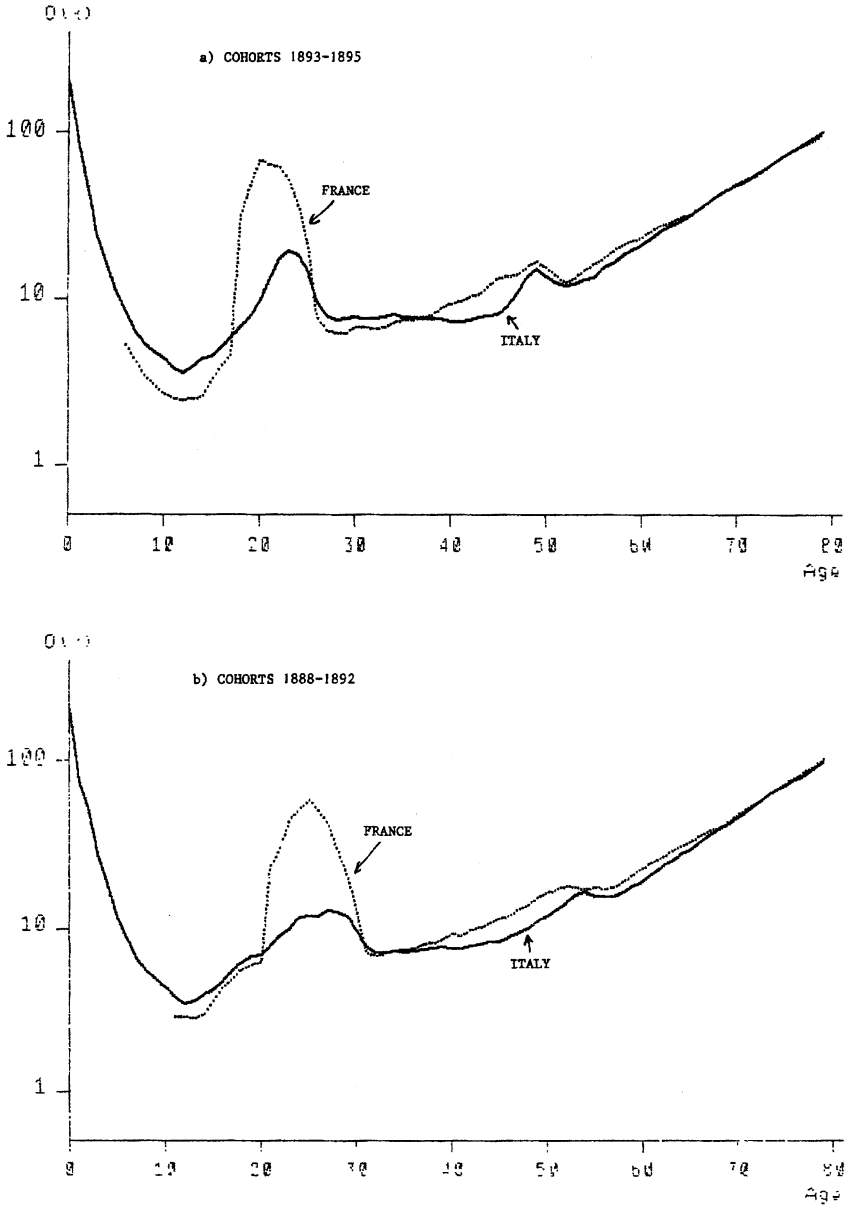
Fig. 16. Annual death probabilities of the French and Italian male cohorts born in: (a) 1893–95; (b) 1888–92.

we have seen, those that paid the heaviest toll to World War I in France. In Italy, though less intensely than in France, these cohorts also suffered heavy losses, being affected both by the war itself and by the particularly difficult conditions endured by the Italian recruits. For the years immediately following the war, their mortality is higher in Italy than in France, but this situation is reversed before age 30 (fig. 16a). Does this mean that the long-term effects of the war are stronger in France than Italy (while the medium-term effects are higher in Italy), or has the much higher infant and child mortality in Italy introduced a selection effect? The pattern observed for the older 1888–1892 cohorts, whose contribution to the war was still very high in France, but much lower in Italy, tends to favour the first assumption: despite slightly higher child mortality for Italy, these cohorts then show an almost constant excess mortality for France (fig. 16b). Confirming the findings of Vallin (1973), our figures thus reveal the long-term effects of World War I on the French cohorts which suffered the heaviest losses in 1914–1918.

6. Concluding remarks

Four conclusions are to be drawn from this comparative study of French and Italian mortality since the beginning of the century. Firstly, the age/sex-specific mortality patterns of the two countries have not followed the same trends, and the differences observed today are not those of a century ago. Secondly, the general health progress made in both countries has played an important role, on the whole more favourable to Italy: its infant and child mortality have drawn nearer the French level, while it has increased its advantage regarding adult mortality, whereas France has strengthened its position only at the older ages. But thirdly, the distance covered since 1900 has not been straightforward: there have been many perturbations, the most important of which being the two world wars. They affected the two countries differently not only in their immediate effects on both the civil and military populations, but also in the long-term effects on the cohorts that had suffered most. These differences help to highlight certain cohort effects. Fourthly, however, these cohort effects, related largely to World War I, seem to have disappeared today, presumably partly because of selection eventually relevelling the chances of survival

of the various cohorts and partly because of general health progress masking the slight differences that may remain. Cohort effects may account for some of the past differences between France and Italy, but this does not seem to be the case for present mortality.

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