THE MORTALITY OF TWINS : A CASE STUDY FROM DATA OF THE FRENCH FAMILY SURVEYS 1975 AND 1999 IN FRANCE

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The frequency in twin births has experienced a spectacular increase in nearly all the industrialised countries during the last thirty years, under the joined effects of postponement of maternities and infertility treatments. In France, for example, the frequency of twin births increased from 8.9 out of 1,000 in 1972 to 15.0 in 2000 (a 70% increase) (Insee).

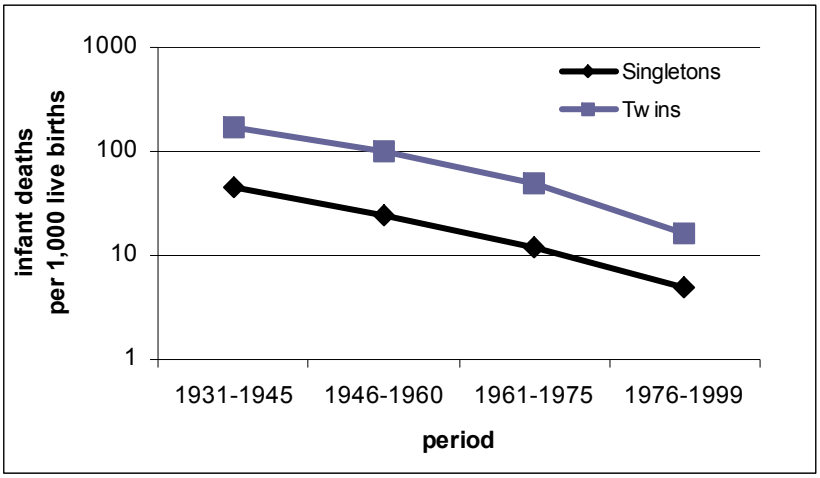
Twins children experience more health problems and higher mortality than children born from single pregnancy at least at the early beginning of their life. Infant mortality is two to nine times higher for them than for singletons (Duchesne, 2001 for Quebec(2001); Pison, 1991 for Afrika(1975-1987); Botting, Macdonald and Macfarlane, 1987 for England-Wales(1982-1984); Pons, Richard and Papiernik, 1991 for France(1979-1989)). Twinning is considered more and more as an important health problem in part because of the rise of the twinning rate which lowers the decline in perinatal and infant mortality.
Because of their little weight at birth, their premature feature and complications at delivery – frequent in multiple births –, twins are more exposed to early death. But outside this «birth's capital», the particular case of twins should allow us some further suppositions about more dynamic aspects, especially what concerns context of catching diseases. One member of a twin's pair is particularly exposed to some contamination when its co-twin is effectively sick, in the case of a contagious disease. The fact to be equally aged and to be often together can play a significant role. Even without a contagion from one twin to its counterpart, as they are exposed to the same pathologies or to similar life/environment's conditions, twins are more at risk to developp similar diseases. Moreover the genetic correspondence in case of identical twins heightens these risks. Children born from simple prengancies, who are not bred up with children of exactly the same age in their family, but with older or younger brothers and sisters, are less exposed to familial contagions.

Researches in field of twin's oder multiple birth's mortality are often confronted to lack of quality data, just as well what concerns the type or quality of informations collected as what concerns the number of observations. Main factors as weight at birth, premature feature and complications of delivery have been largely illustrated and discussed. Differential mortalities among twin's birth according to sex and type of twins – with monozygotic twins more fragile than dizygotic ones - have been illustrated (Bulmer, 1970; Boklage CE., 1987). On contrary rarely researches have been interested - or had corresponding data - to study the dynamic aspect of twin mortality, that means increased risk of contamination between twins of same pair as presented over.

Data sources:

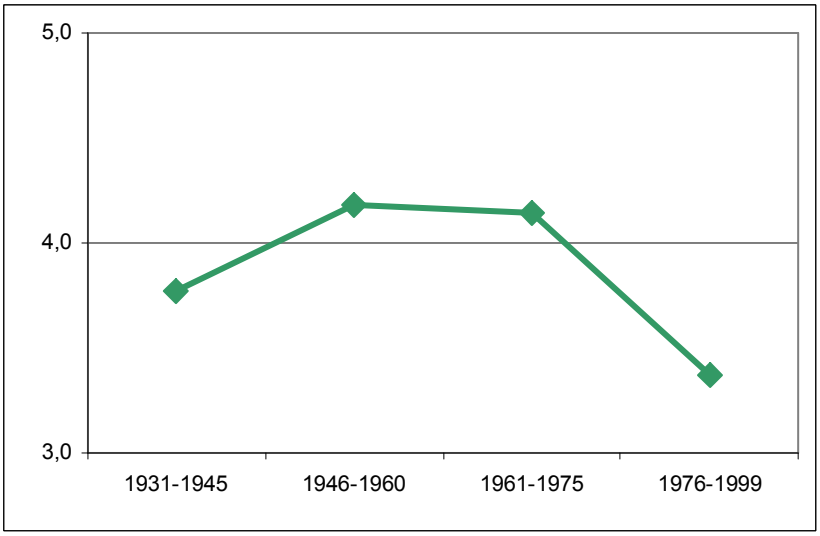
Data from French family surveys - conducted in France in 1975 and 1999- were exploited on that purpose. Both surveys questioned around 500,000 women representative of the French female adult population. They collected birth histories and included moreover information on children deaths if they occurred. The variables used in our analysis were the following one: type of child (singleton or twin), period of delivery, age of the mother, rank of delivery, and exclusively for the mother: socioprofessional class, diploma, nationality indicator (French at birth, French by acquisition, Foreign), place of birth, region of residence, size of the urban/rural unit of residence. Data were extracted on all children born alive after 1930 (to reduce risks of recall bias) until 1999. The children sample finally gathers a total of 1,172,605 children, and among them 22,355 twins. Descriptive figures about comparative levels of infant mortality between twins and singletons from our data reveal as expected a sharp decline for both type of children across time (Fig 1). The second graph provide first estimations of the overmortality ratio of twins over the period, estimated at around 4, with an apparent decline in the last quarter XXth of the century.

Fig. 1: Infant mortality of twins and singletons in France according to the period of delivery from 1931 to 1999.



Source: Family surveys 1975 and 1999.

Fig. 2: Mortality ratio twins/singletons according to the period of delivery from 1931 to 1999.



Source: Family surveys 1975 and 1999.

Analyse of French family surveys should allow us to study in detail the mortality of twins, to compare in particular the age at death between twins and singletons, as well as the ageof death within a twinning couple. It doesn't allow us to distinguish identical (monozygotic) from fraternal (dizygotic) twins, but it will be possible to estimate indirectly differences among the two types of twins by comparing twins pairs of same sex (which gather all monozogothic twins and a part of dizygotic twins) to twins pairs of different sex (which gather remaining dizygotic twins). Family surveys don't provide us informations about morbidity, only about mortality. But its analyse can allow us to indirectly evaluate the impact of increased contamination's risks about twins health. As much as possible, study will take into account the effects of different familial and socio-economic factors (familial composition, socio-professional category, matrimonial status, place of residence, residential or professional mobility, and so on...), so as to compare life's conditions of twins to those of singletons.
Contrary to certain cohorts where children are followed only few years after birth, the French family surveys collect information about individuals until adulthood. Comparisons will so not be limited to small ages and we will examine for example wether the overmortality of twins compared to singletons persists for greater ages. Answer is *a priori* negative, but it isn't excluded that twins could preserve a particular fragility.