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Nearly half of the world's twins are born in Africa

Nearly 1 in every 100 deliveries is a twin birth. Triplet, quadruplet and higher order deliveries occur much more seldom — only once in 10,000 deliveries. Is the incidence of twin births the same everywhere in the world? Do twins grow up like other children? Do they have the same life expectancy? (1)

In 1999, out of 2.8 million twins born worldwide, nearly 1.1 million (41%) were born in Africa; 39% were born in Asia, 13% in America, 6% in Europe and 0.5% in Oceania.

Yet Africa accounts for only 13% of the world's population (767 million, out of 6 billion), whereas almost two thirds (61%) live in Asia, 14% in America and 12% in Europe. Two combined reasons explain why twin births are so much more frequent in Africa than elsewhere. In the first place, the African birth rate is twice to four times higher than the average birth rates of other continents: according to UN statistics, in 1999, the African birth rate reached 37 children per thousand inhabitants, compared with only 21 in Asia and 10 in Europe [1].

The second reason is that the twinning rate (proportion of twin deliveries in the total number of deliveries) is also much higher in Africa than elsewhere: almost twice that of Europe and three times that of Asia. In Africa, twenty deliveries out of every thousand are twin births; in Europe, the proportion is 12 per thousand and in Asia only 7. As a result of these combined trends, Africa is responsible for 41% of the world's twins.

However, the only real difference

between continents pertains to the incidence of fraternal twins (see box). The proportion of identical twins is the same everywhere in the world, and their high number in Africa is due to its high birth rate: indeed, 22% of the world's identical twins are born in Africa, just as are 22% of the world's babies. Africa's lead is thus mainly due to the high incidence of fraternal twins, since 52% are born on that continent.

◆ Twins have a more difficult start in life

In all parts of the world, the mortality rate of twin babies is much higher than that of singletons, due to their low birthweight, their tendency to be premature, and complications at birth. Twins born in countries where health care systems for pregnant women and

Table - Twin births in the world in 1999

	Continent				
	Africa	Asia and Oceania	America	Europe	Total
Population (in millions)	767	3,663	818	729	5,977
Birth rate (1)	37	21	19	10	22
Twinning rate (2)	20	7	12	12	10
of which: identical twins	4	4	4	4	4
fraternal twins	16	3	8	8	6
Births (distribution in %)					
total (single or multiple)	22	60	12	6	100
twins	41	39	14	6	100
of which: identical twins	22	60	12	6	100
fraternal twins	52	27	14	7	100

(1) annual number of births per thousand inhabitants
(2) number of twin births per thousand births.
Sources: population figures and birth rate: United Nations (1998) [1] - twinning rate: author's estimate based on refs. [2] and [4].

(1) This article concerns only twins, which are far more frequent than triplets, quadruplets, etc.

newborn infants are deficient are thus often doomed to an early death. In countries where such care systems have been set up, the mortality rate of twins, like that of other children, has declined, though it nonetheless remains much higher.

Twins run the highest risk of dying at birth and just after. The risk of giving birth to a stillborn twin is three to four times as high as that of giving birth to a stillborn singleton. Thus, in Africa, the rate of stillbirths, which, as it is, is quite high for singletons (between 20 and 50 per 1,000) is even higher for a twin (from 100 to 200 per 1,000). In other words, almost one in five or ten twins is stillborn [2]. In developed countries, the rate of stillbirths, though five to ten times lower than in Africa, is still four times higher for twins than for singletons — for instance, in 1994, the rate in England and Wales was 19.2 per 1,000 for the former and 5.3 for the latter [3].

The mortality rate of twins born alive is also

higher than that of singletons: in the first month following birth, the mortality rate is five to seven times higher for the former than for the latter, both in developing countries, where infant mortality rates are high, and in developed countries, where the rate is low [2, 3]. After the first month, the gap decreases, but until the age of one year, regardless of the total rate, the mortality rate of twins still remains twice to three times higher than that of singletons. The mortality rate of twins continues to exceed that of singletons throughout childhood.

In addition to this biological handicap, which is primarily linked to low birthweight, pre-term delivery and complications at birth, twins may sometimes suffer social discrimination. Indeed, no society is indifferent to twins. Some societies welcome their birth as a happy event worth celebrating, while others see it as a misfortune and fear them. The care given to twins depends on this perception. In Africa, twins are often

The biology of twinning

It is a long known fact that twins come in two kinds: identical twins and fraternal twins. Biologists call the former monozygotic twins and the latter dizygotic twins, in reference to their different origins:

Identical (monozygotic) twins are born from a single egg, or zygote, resulting from the fertilization of an ovum by a spermatozoon; in the course of its development, the egg splits into two parts. The two resulting embryos are genetically identical, which explains the great resemblance of monozygotic twins. In particular, they are always of the same sex.

Fraternal (dizygotic) twins are born from the ovulation and fertilization of two different ova during the same cycle. Each of these ova is fertilized by a spermatozoon and the twins resulting from these two eggs or zygotes are no more similar, from a genetic point of view, than ordinary brothers and sisters. Fraternal twins can be of the same sex or of opposite sex, both variants being equally frequent.

Fraternal and identical twins thus correspond to two different biological processes, and their incidence depends on different factors.

Identical twin deliveries always occur at the rate of 3.5 to 4 per 1,000, regardless of the mother's age, birth order or geographic origin. The same proportion has actually been observed among all mammals, except for some armadillos which systematically give birth to monozygotic quadruplets or octuplets. In addition, all women seem to run an equal risk of having identical twins, whether or not they have previously given birth to twins [4].

Conversely, the proportion of fraternal twin births is extremely variable. The main factors influencing these variations are:

the age of the mother. Beginning with a near zero level at puberty, the proportion steadily increases up to the age of 37, where it reaches its maximum level, then rapidly decreases back to zero level by the time of

menopause (1);

the order of birth. The age factor being equal, the dizygotic twinning rate increases with every childbirth. This factor is nevertheless less influential than age;

the geographic origin. The same variations according to the mother's age and the order of birth are observed everywhere, but their intensity differs from one place to another. The age of the mother and the order of birth being equal, the dizygotic twinning rate is twice as high in Sub Saharan Africa, than in Europe, and four to five times higher than in China or Japan. These variations are partly linked to hormonal differences of genetic origin (2);

individual and family characteristics. Some women may have several sets of fraternal twins; this predisposition to twin pregnancies is partly genetic and can be observed among the sisters and daughters of women who have had twins;

medical treatments. In the 1970s, the popularity of sterility treatments modified the trends described above by stimulating a high increase in the twinning rates of developed countries, where these treatments are most widespread. The twinning rate increased in particular among older women, who are more likely to turn to such treatments.

(1) This variation corresponds to that of the Follicle Stimulating Hormone (FSH), which ensures the development of the ova. The rate of this hormone in the blood steadily increases with age. The drop in the fraternal twin rate after the age of 37 could be due to weaker ovarian functions and to the higher mortality of fertilized eggs as menopause draws nearer.

(2) The FSH rate is on average higher in populations with high twinning rates than in those with low twinning rates. These hormonal differences are partly genetic; this explains, for example, why the twinning rate of the "Black" population in the United States was until recently much higher than that of the "White" populations, somewhere in between the European and the African rates; indeed, African-Americans are the result of a mix between populations of European and African origin.

believed to possess supernatural powers; they may be overly protected or on the contrary completely rejected. Here is an example of such opposite extremes:

“For the Dogon, the Bambara and the Malinke of West Africa, twins recall and embody a mythical ideal. They represent, as it were, a state of perfection [...] which non-twins have lost for ever. The first living creatures were pairs of twins of opposite sex. Losing this twin nature [...] was the price human beings had to pay for a misdeed committed by a forefather long ago. But the birth of twins is a reminder of this early state of bliss, and celebrated everywhere for this reason.” [5].

Conversely, several central African peoples, like the Ndembu and the Lele, for example, consider the birth of twins to be animal and repulsive. The Luba of Congo call them “children of misfortune” and the Tonga traditionally killed one of the pair [5].

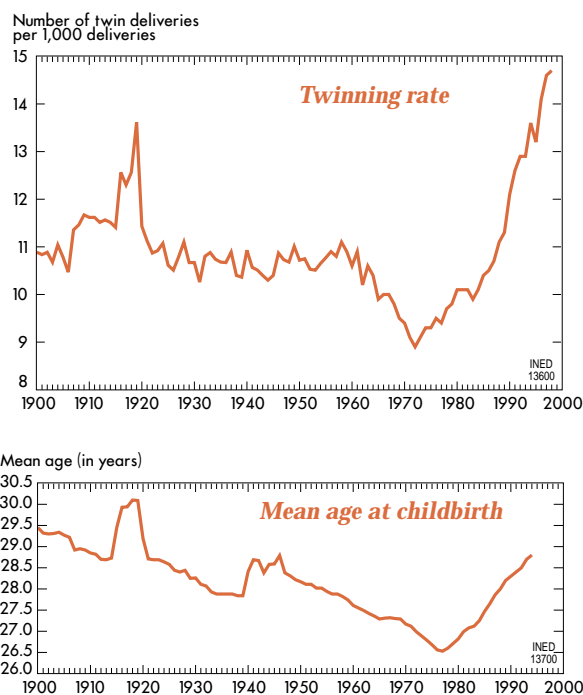
These customs have for the most part disappeared, but the overmortality of twins is often higher in East or South Africa than in West Africa, where they are generally given a warmer welcome [2].

◆ **Africa’s high twinning rate: a public health issue**

In addition to the handicaps listed above, African twins suffer the added disadvantage of being born in the region with the highest mortality rate in the world. Owing to this combination of negative factors, very few manage to survive: between a quarter and a half die before reaching the age of 5. The high frequency of twin births thus prevents the African infant mortality rate from decreasing. With a twinning rate of 20 per 1,000 and a twin mortality rate before age one which is four times higher than that of other babies, the deaths of twins account for 11 to 14% of deaths of all infants of that age.

The problem is particularly acute in regions such as Southwest Nigeria, where one in every twenty deliveries is a twin birth, and one child in ten a twin (2). The overmortality rate of twins is three to four times higher than that of singletons and the deaths of twins account for 25 to 30% of deaths of infants under the age of one. Given the greater vulnerability of these children, greater commitment in terms of prenatal and neo-natal care for mothers-to-be and infants is comparatively needed in order to obtain a similar decrease in the infant mortality rate. The high proportion of deaths of twins is indeed a serious public health issue and warrants the setting up of special monitoring programs to identify twin pregnancies and provide special care to future mothers and newborn babies. The aim of such programs would be to ensure that deliveries are performed in good conditions and that the twins, once born, are duly

Figure 1 – Variations in the twinning rate and mean age of women at childbirth in France



Source: INSEE [6].

vaccinated and fed — nursing two babies at once is not an easy task — , and cared for when they are ill.

◆ **The twin-boom in developed countries: the case of France**

Until recently, developed countries had much lower twinning rates than Africa; they are now quickly catching up, due to the increasing frequency of twin births. In France, for instance, in the first half of the century, the incidence of twin deliveries was about 1 per 100, a proportion which did not significantly vary, except during World War I, when the twinning rate temporarily rose. In the 1960s, the proportion of twin deliveries declined, reaching a low 8.9 per 1,000 in 1972. The rate then began to climb again and by 1987, it had risen back to the level of the first half of the century. However, the upward trend did not stop there, and even gained momentum: by 1998, the twinning rate had reached 14.7 per 1,000, a 65% increase compared with 1972 (6). The same downwards and upwards trends were observed in most developed countries. What is the explanation?

The twinning rate depends on many different factors, among which the age of the mother and the or-

(2) Though the average twinning rate in Africa is 20 per 1,000, it varies within the continent. It is lower in North Africa and in East Africa, and higher in West Africa (2). Within West Africa itself, the rate is very high — at least 25 per thousand births — in the coastal range going from Ghana to Cameroon, along the Gulf of Guinea. Within this range, record rates, around 40 to 45 per thousand, have been observed among the Yoruba, the main ethnic group of Southwest Nigeria [3].

der of birth. The mean age of mothers has varied in the past 50 years. In the 1950s, the mean age was close to 28; it then fell to 26.5 in 1977. A rapid increase followed and by the end of the 1990s, the average age was over 29. Twinning rate fluctuations are partly linked to modifications in childbirth schedules. Indeed, older women tend to have twins more often than younger women. The twinning high of World War I is thus partly due to the rise in the mean age of women at childbirth during wartime. Between 1910 and 1914, the average was close to 29; the outbreak of the war prompted a sudden increase, up to almost 30, between 1915 and 1919. After the war, the rate dropped back to prewar levels. Conversely, when the mean childbearing age fell, as in the 1960s and 1970s, the twinning rate declined as well. Similarly, when the mean age at childbirth increased at the end of the 1970s, the twinning rate rose as well. However, early or late childbearing only accounts for one aspect of twinning incidence variations. Thus, the peak level of the twinning rate during WWI is probably also due to the fact that couples who conceived during war years were among the more fertile. Many men were fighting at the front, and a high proportion of conceptions occurred during leaves. These leaves were very short, and the couples that did manage to conceive were the most fertile. Children born to hyperfertile women thus represented a larger proportion of births than they did in peace time, and hyperfertile women are precisely those who have fraternal twins.

From the opposite angle, the drop in the twinning rate observed in the 1960s was not only due to the fact that mothers had their children at a younger age; the age factor being equal, the twinning rate also decreased. An overall decline in the fertility rate occurred at that time, and large families were few. Women whose first children were twins reached upon the first pregnancy — or the second, for those who wanted three children — the desired number of children. These women were less likely to have subsequent pregnancies than those who had had the same number of pregnancies, but no twins. Thus, women predisposed to having twins were less and less represented in birth orders following the first, since they were more likely to control their pregnancies: as a result, the twinning rate declined (3).

◆ The impact of sterility treatments

In France, at the end of the 1970s, the rise in the childbearing age contributed to the increase in the proportion of twin deliveries, but only in part. Indeed, another important factor to be taken into account is

(3) In countries where women do not practice birth control, the opposite is probably true, i.e. the most fertile women, those who give birth to fraternal twins, are overrepresented in higher birth orders.

the introduction of sterility treatments (7). French physicians began to prescribe hormone treatments to stimulate ovulation in 1967. However, not only do these treatments make it possible for hypofertile women to conceive, they also significantly increase the likelihood of multiple pregnancies. These treatments have become so popular that today, in France, 400,000 menstrual cycles are stimulated each year, in addition to those stimulated for in vitro fertilization (IVF). IVFs are suggested to women when ovarian stimulations are unsuccessful. The first French "test tube" baby, Amandine, was born in 1982. Since then, the number of IVFs performed each year has dramatically increased, reaching 20,000 per year in the early 90s and 40,000 per year today. In order to improve the likelihood of success, physicians practicing in vitro fertilization often implant several ova or several embryos at once: 2.5 on average in 1997. However, this procedure involves a high risk of multiple births. Almost one out of four IVF pregnancies leads to the birth of twins, as opposed to one in 100 for natural pregnancies. The growing frequency of sterility treatments accounts for two thirds of the increase in the twinning rate during the last thirty years, the remaining third being due to the fact that women tend to have their children later in life.

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