Birth Spacing and Child Survival

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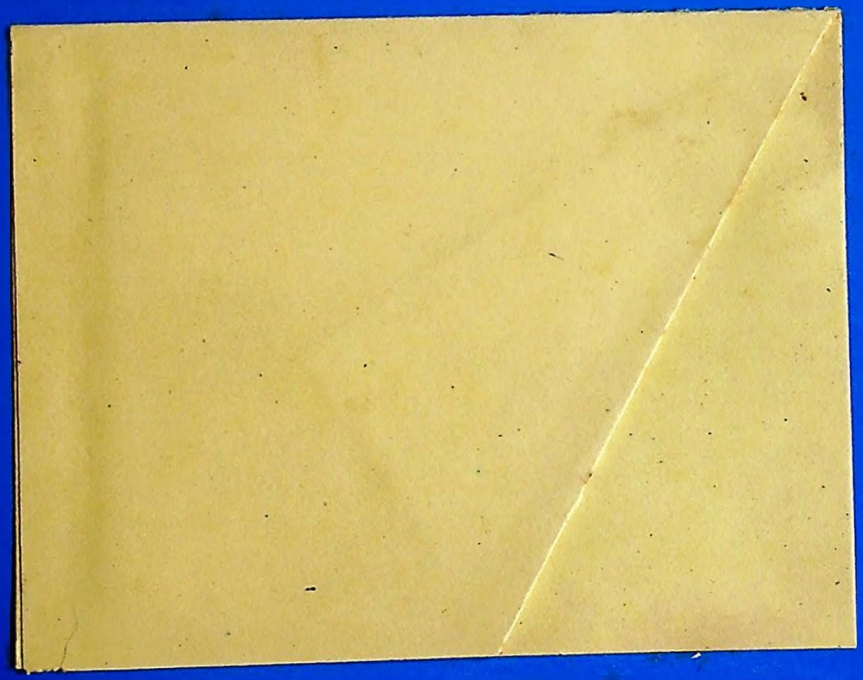
The Center gratefully acknowledges the support of the United States Agency for International Development (Cooperative Agreement DPE–3030–00–4049–00) that made possible the preparation, publication, and distribution of this report.



Birth Spacing and Child Survival

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How to Use this Chartbook

This chartbook is designed to be used in a variety of ways:

As a briefing booklet. If you only have a little time but want to know the most important facts about birth spacing and child survival, read the large print in Chapter 1 and the bold-print in Chapter 2.

As an information booklet. If you want more detail, read the other sections as well.

As a guide to further study. If you would like to learn more or explore a particular issue, look up the relevant references from the numbers given in the text.

If you have trouble getting the documents you want, the Center's library can help you obtain them. Address requests for assistance to the Library, Center for Population and Family Health, Columbia University, 60 Haven Avenue, New York, N.Y. 10032 USA.

A child's chances of dying can be increased by many factors, including malnutrition, infectious illnesses, and lack of health care. In the long run, if death rates among children in developing countries are to be substantially reduced, we must work to correct all these conditions, along with the poverty that usually underlies them.

But what can we do to prevent deaths now? One promising way is to encourage parents to space the births of their children. The importance of birth spacing and its potential for improving child survival are the subjects of this chartbook.

The book is divided into three chapters.

Chapter 1 presents data on the high risk of childhood death that is linked to short birth intervals, and on the improvement in child survival that good spacing promises.

Chapter 2 discusses some of the implications of these data for health programs.

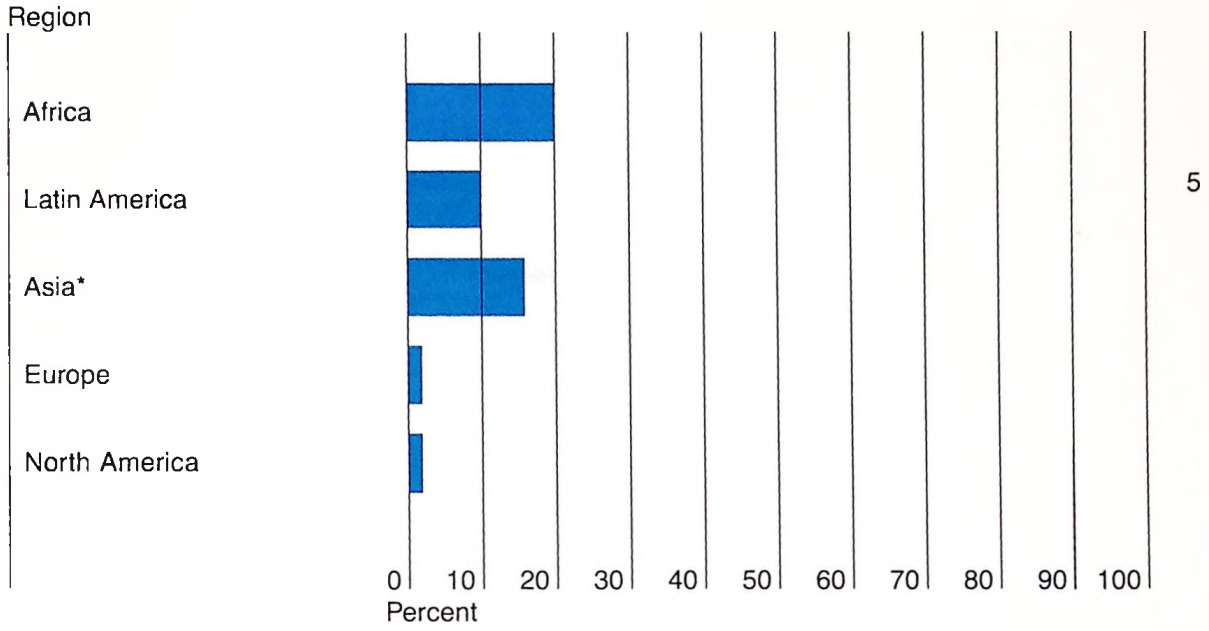
Chapter 3 addresses questions people often ask about birth spacing, including, "Who has short birth intervals?" and "Why are short birth intervals dangerous to children's health?"

Chapter 1
Risks and Benefits

Every day, 40,000 children less than 5 years old die, most of them in developing countries.[1]

Among children born this year, about 1 in 5 Africans, 1 in 6 Asians*, and 1 in 10 Latin Americans will not live to see their fifth birthday.[2] By comparison, fewer than 1 of every 50 children born in Europe or North America will die before they are 5 years old.

Chart 1
Percent of children who will die in the first 5 years of life



*Not including the People's Republic of China.
Source: Derived from ref. 2.

Three aspects of childbearing influence child survival: birth spacing, maternal age, and birth order.[3–5] Of these, birth spacing is the most powerful factor. Until recently, however, we had relatively little information on birth spacing, and most of the information we did have was from industrialized countries.[3–6]

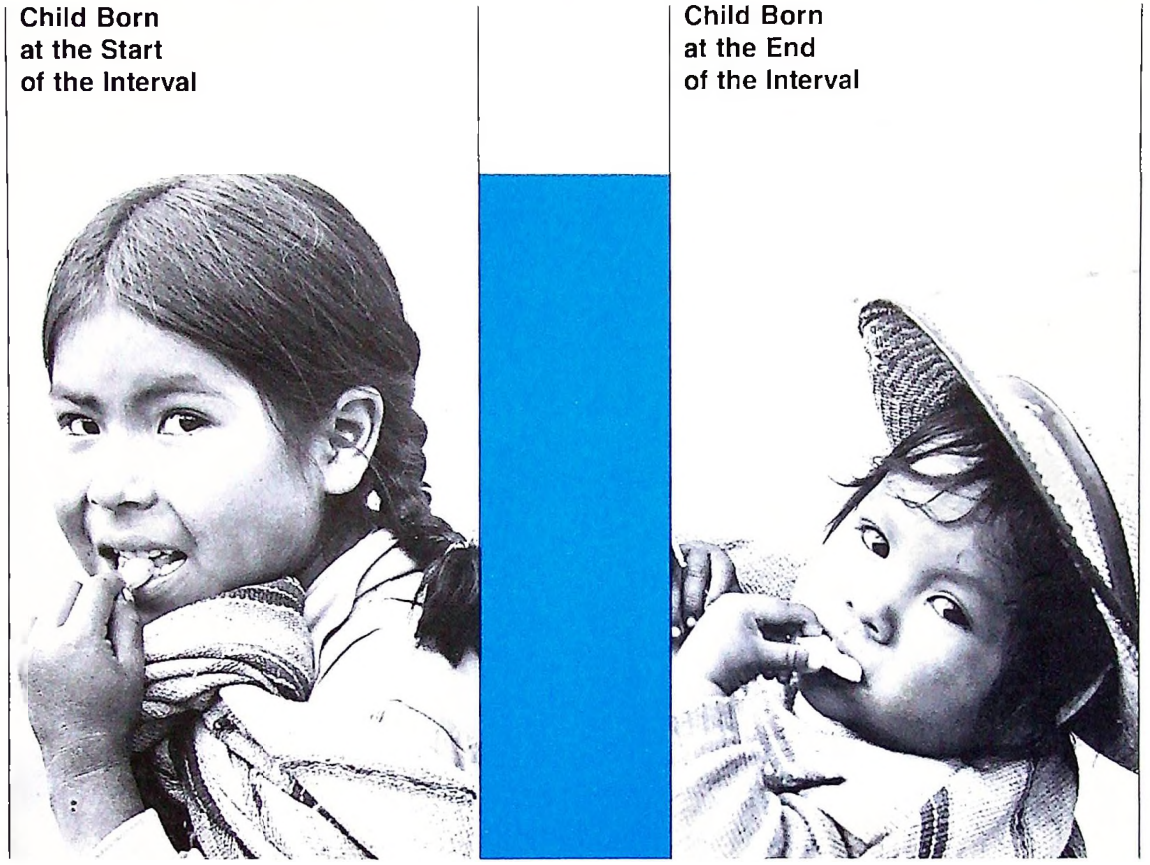
In the last few years, this situation has changed as a result of the World Fertility Survey (WFS). This is a series of surveys conducted in dozens of developing countries during 1972–1982. In these surveys, women aged 15 through 49 were asked, among other things, about the number, timing, and survival of their children.

Thanks to the WFS, we now have a wealth of information on birth spacing and child survival from Third World countries. Furthermore, because the surveys were conducted and analyzed in a standardized manner, the findings from various countries can be compared. The data presented in this report are drawn almost entirely from the WFS—either from the country reports, or from special analyses of the data.

The length of time between two births in a family (the "birth interval") greatly influences child survival. When two children in a family have a short birth interval between them, both have a much greater chance of dying than do children with a longer interval between them.

Birth intervals less than 2 years long are too short–the shorter, the more hazardous. Birth intervals of 3 or more years usually carry the least risk.

Charts 2, 3, and 4 show death rates among children with short birth intervals compared to death rates among children with longer birth intervals.



As children grow older, they become stronger and better able to resist and recover from illnesses. As a result, most deaths among young people take place before age 5, and most of these deaths occur in the first year of life (infancy). The increase in deaths associated with short-interval births is also usually greatest during the first year. The combination of these effects results in extremely high rates of infant death among children born at the end of a short interval.

Sometimes the interval between births is short because the younger child was born a month or two early. Such babies are quite likely to die soon after birth, especially in developing countries. However, taking premature births into account reduces the effect of short-interval births only slightly. [7,8]

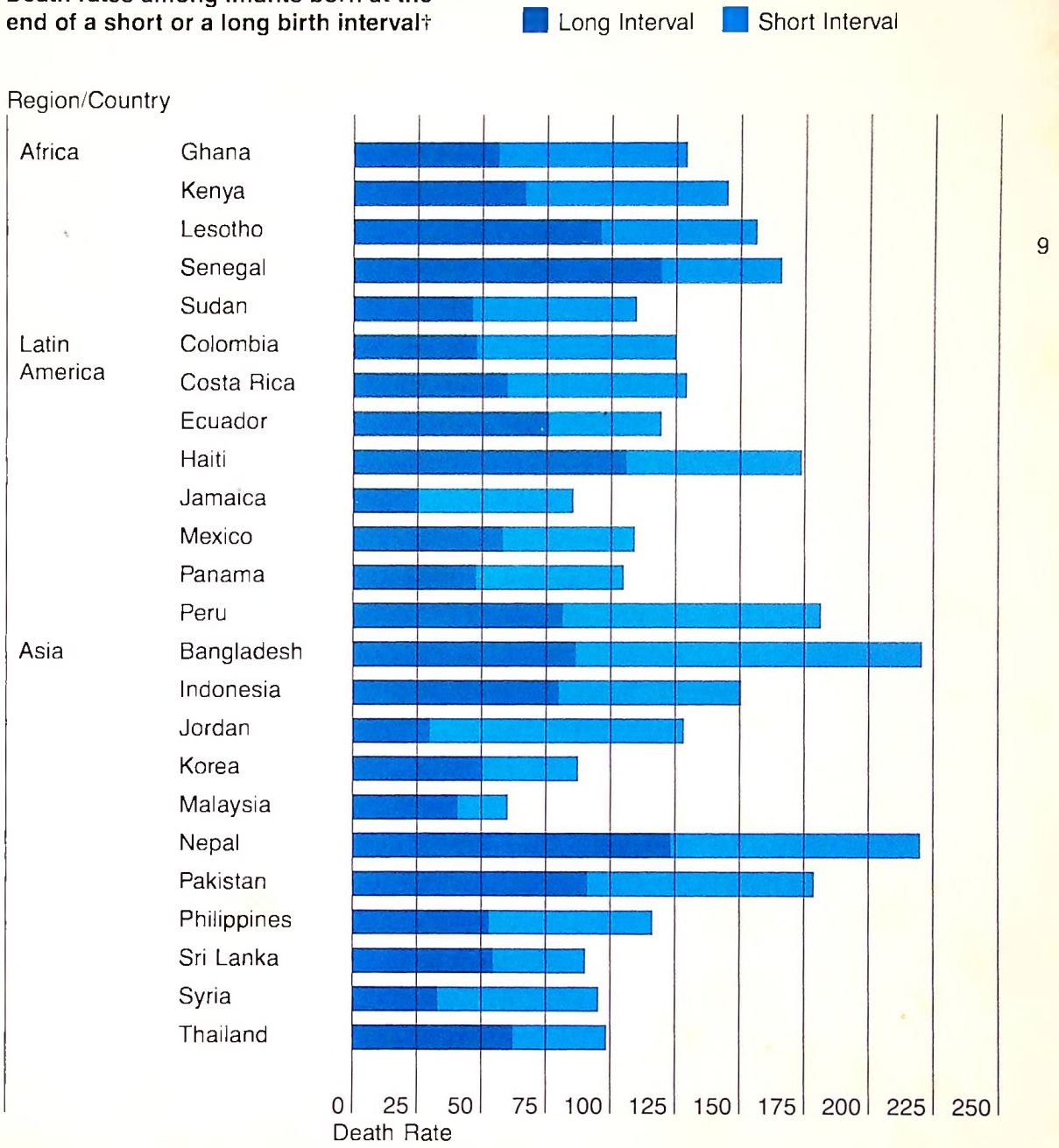
Data on deaths in infancy are shown for 24 countries (Chart 2), while data on deaths at 1–4 years of age are available for 20 countries (Charts 3 and 4).

In this book, the effect of birth spacing on children born at the start of a short interval is discussed only in terms of deaths at 1–4 years of age. One of the reasons for this is that, in most cases, the older child of the pair of siblings is already 9 months old (i.e., most of the way through infancy) when the next child is born. Nevertheless, a short birth interval probably harms the older child of the pair even before the younger is born: the mother may wean the older child too early because she is pregnant again.

The danger to child survival posed by short birth intervals is greatest in the first year of life (infancy). In developing countries, children who are born at the end of a birth interval of less than 2 years are, on average, twice as likely to die in infancy as are children born after a long interval.*

Chart 2 shows infant death rates among children born less than 2 years after their next older brother or sister, and death rates among infants born after a longer birth interval. In every country for which we have these data, children born at the end of a short interval have substantially higher death rates than do other children.[9]

Chart 2
Death rates among infants born at the end of a short or a long birth interval†



*Averages are medians unless otherwise specified.

†These are deaths in the first year of life per 1,000 live births. A short interval is less than 2 years; a long interval is 2–6 years.

Source: Derived from ref. 9, T.7.

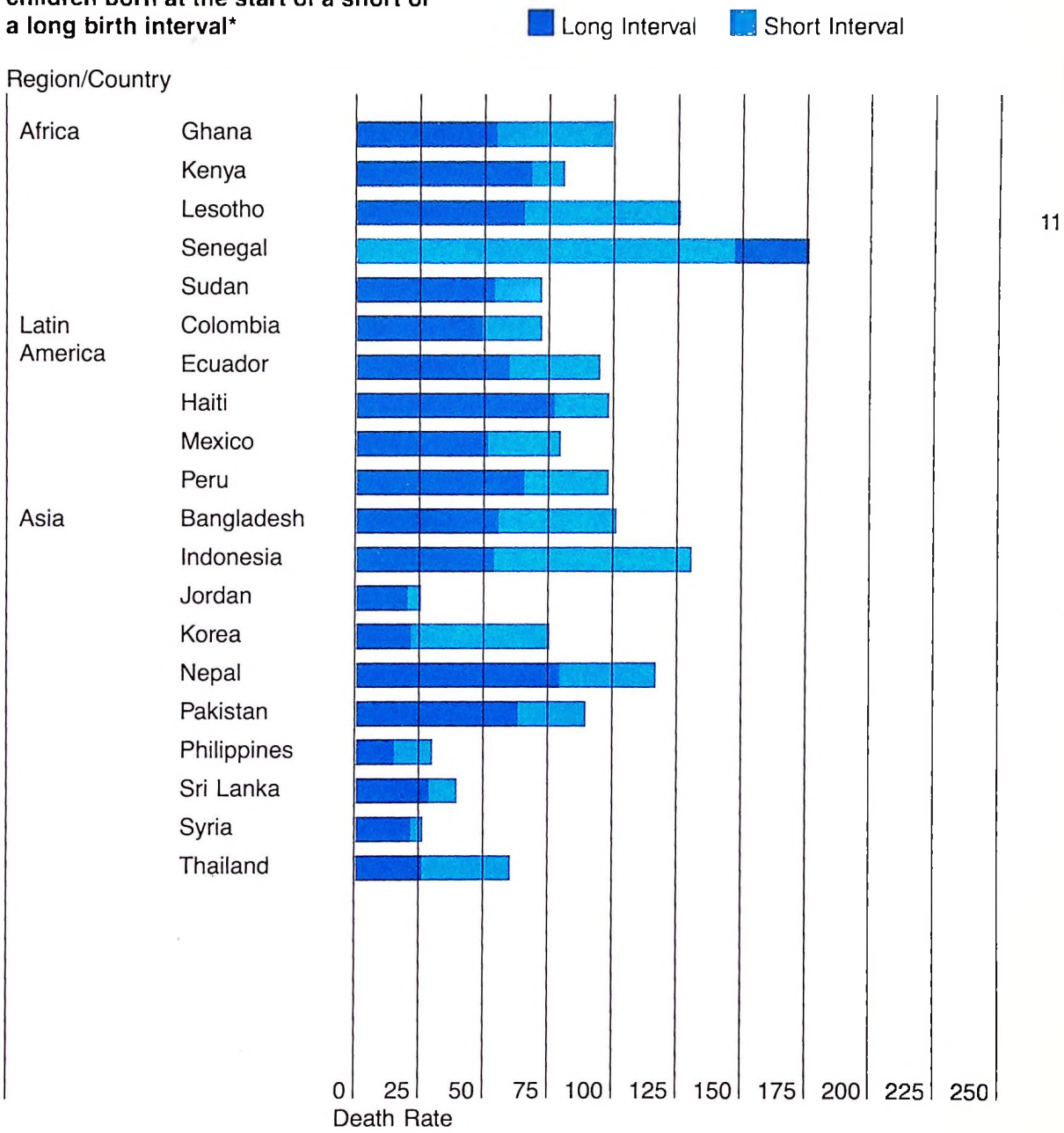
As everyone knows, poor children are more likely to die than are children of wealthy families. So, it is important to take into account the effects of poverty when studying the influence of birth spacing on child survival. In many developing countries, cash income is not a good way to measure a family's wealth. For example, farmers often trade their produce for goods and services, without any money changing hands. Researchers have found that the education of the mother is a useful indicator of standard of living in developing countries. Furthermore, mother's education is closely related to child survival, even more so than father's education or occupation.[10]

In Charts 2, 3, and 4, only the children of uneducated women are included. Excluding the children of educated women does not distort the findings because uneducated women far outnumber educated women in most developing countries, and because WFS researchers found that there is little interaction between education and the size of the increase in death rates associated with short-interval births.[9] Of course, overall mortality rates are much higher among the children of uneducated women.

Although the increased risk of death linked to short birth intervals weakens as children grow older, it lasts until they are at least 5 years old. On average, children born either at the start or at the end of a short interval are 50% more likely to die at ages 1–4 than are other children.[9]

Chart 3 shows the effect of birth spacing on the survival of the child born **at the start** of the birth interval. Death rates at 1–4 years of age among children born at the start of a short interval are compared to those among children born at the start of a longer interval. In 19 of the 20 countries for which we have data, short birth intervals pose a substantial risk to the health of young children.

Chart 3
Death rates at 1–4 years of age among children born at the start of a short or a long birth interval*



*These are deaths per 1,000 children aged 1–4, per year. For children under 2 years of age, a short interval is less than 18 months. For children aged 2–4, a short interval is less than 30 months. Long intervals are those with no births in those time periods.

Source: Derived from ref. 9, T. 8.

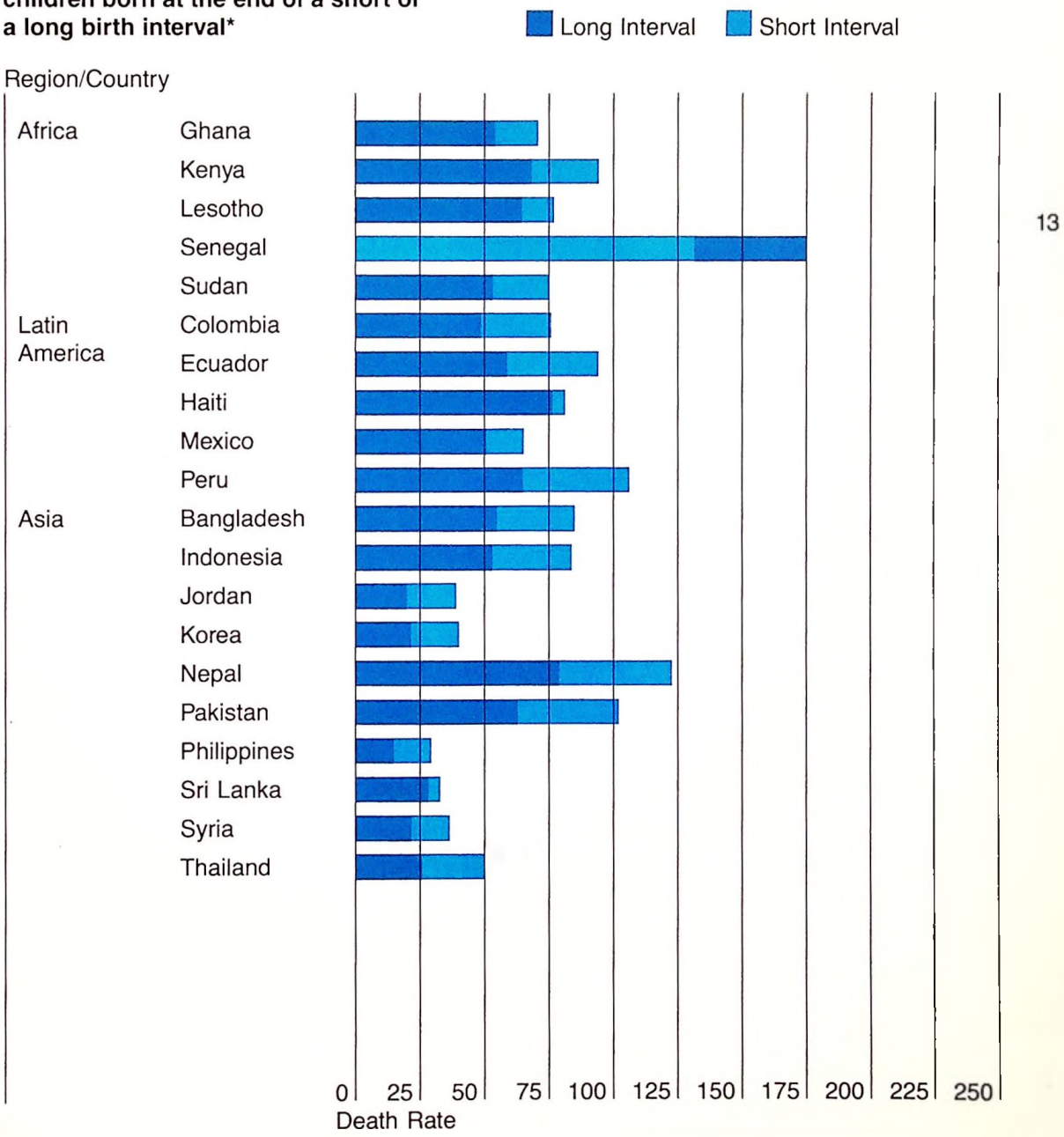
There is no obvious reason why birth spacing has a large effect in some countries and a relatively small one in others. The size of the effect does not vary systematically with geographic region, level of infant mortality, nor proportion of births that have short intervals. Furthermore, the ranking of individual countries varies greatly. For example, in Lesotho, there is a large difference in death rates between short-interval and long-interval children in Chart 3, but not in Chart 4.

Among children aged 1–4, the data from Senegal do not show the usual birth spacing effect. We don't know why this is so. If one were to accept the data shown in Charts 3 and 4, this would mean that in Senegal short birth intervals improve child health! This is not believable, because information from dozens of other countries shows the opposite. Furthermore, the WFS results from Nigeria (which have not yet been fully analyzed, and so are not included in the charts) also show a substantial excess in deaths among infants and toddlers born at the end of short birth intervals.[11] There are, however, several other studies in Africa that have not found an increased risk of childhood deaths among short-interval births.[12–15] Whether these odd findings are explained by methodological problems in the studies or reflect real differences remains to be seen.

Chart 4 shows the effect of birth spacing on the survival of the child born **at the end** of the birth interval. Deaths at 1–4 years of age among children born at the end of a short interval are compared to those among children born after a longer interval. Again, the data for all but one of the countries show that short birth intervals seriously endanger the health of young children.

Charts 3 and 4 show the increased risk of death among children born either at the start **or** at the end of a short birth interval. Children who are unfortunate enough to be born at **both** the start and the end of short birth intervals have, on average, twice the risk of death in early childhood as children in families with well-spaced births.[9]

Chart 4
Death rates at 1–4 years of age among children born at the end of a short or a long birth interval*



*These are deaths per 1,000 children aged 1–4, per year. A short interval is less than 2 years; a long interval is 2–6 years.

Source: Derived from ref. 9, T. 8.

While there is no clear pattern in the increase of childhood death rates associated with short intervals, there is an obvious pattern in the frequency of short intervals. As Table 1 shows, 3 of the 4 countries in which less than 20% of births follow short intervals are in Sub-Saharan Africa. Five of the 7 countries in which at least 40% of births follow short intervals are in Latin America.

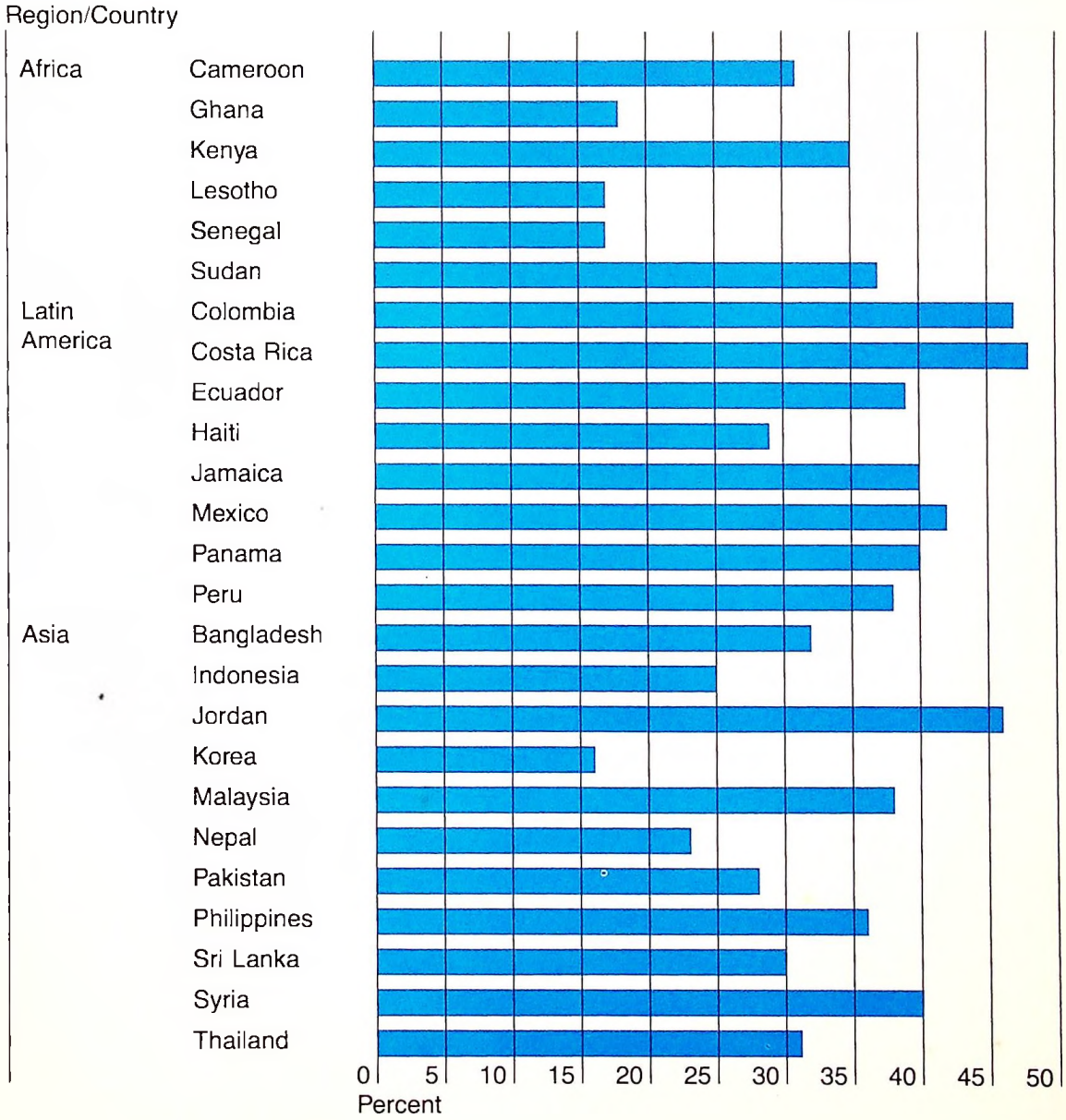
Table 1
Percent of all children born at the end of an interval of less than 24 months

Region/Country	16–19	20–24	25–29	30–34	35–39	40+
	Percent					
Africa	Ghana Lesotho Senegal			Cameroon	Kenya Sudan	
Latin America			Haiti		Ecuador Peru	Costa Rica Colombia Jamaica Mexico Panama
Asia	Korea	Nepal	Indonesia Pakistan	Bangladesh Sri Lanka Thailand	Malaysia Philippines	Jordan Syria

Source: Derived from refs. 9, T. 2, and 16.

Unfortunately, short-interval births are quite common. The proportion of all children born at the end of an interval less than 2 years long ranges from only 16% in Lesotho and Korea to more than 45% in Jordan, Colombia, and Costa Rica. (See Chart 5.) In these 25 countries, on average, 1 child in 3 is born at the end of a short interval. Even in countries where short-interval births are least common (e.g., Lesotho), at least 1 child in 6 is born with this handicap.

Chart 5
Percent of all children born at the end of a short birth interval*



*A short interval is less than 2 years.

Source: Derived from refs. 9, T. 2, and 16.

Because we have data on both the effects of birth spacing and how common short intervals are, we can estimate how much difference in child survival it would make if all births were well-spaced. Other researchers have used other methods to make this kind of estimate, with somewhat different results.[17]

Methodology for Estimating Infant Deaths Averted

1. For each country, we determined the proportion of all births that followed short intervals (less than 24 months).[9,T.2,16]

2. We determined the infant mortality rates among infants born after short and long intervals.[18,19]

3. Then we calculated the percent of deaths attributable to short birth intervals, using the following formula:[20]

$$\frac{I_o - I_n}{I_o}$$

Where:

I_o = $P_n I_n + P_s I_s$
= infant mortality rate in the population, excluding first births and the few births after intervals of more than 6 years.

I_n = infant mortality rate after long intervals (24–47 months)

I_s = infant mortality rate after short intervals (<24 months)

P_n = proportion of births at long intervals

P_s = proportion of births at short intervals

Example: Kenya

$P_n = 0.65$ $P_s = 0.35$
$I_n = 68$ $I_s = 117$

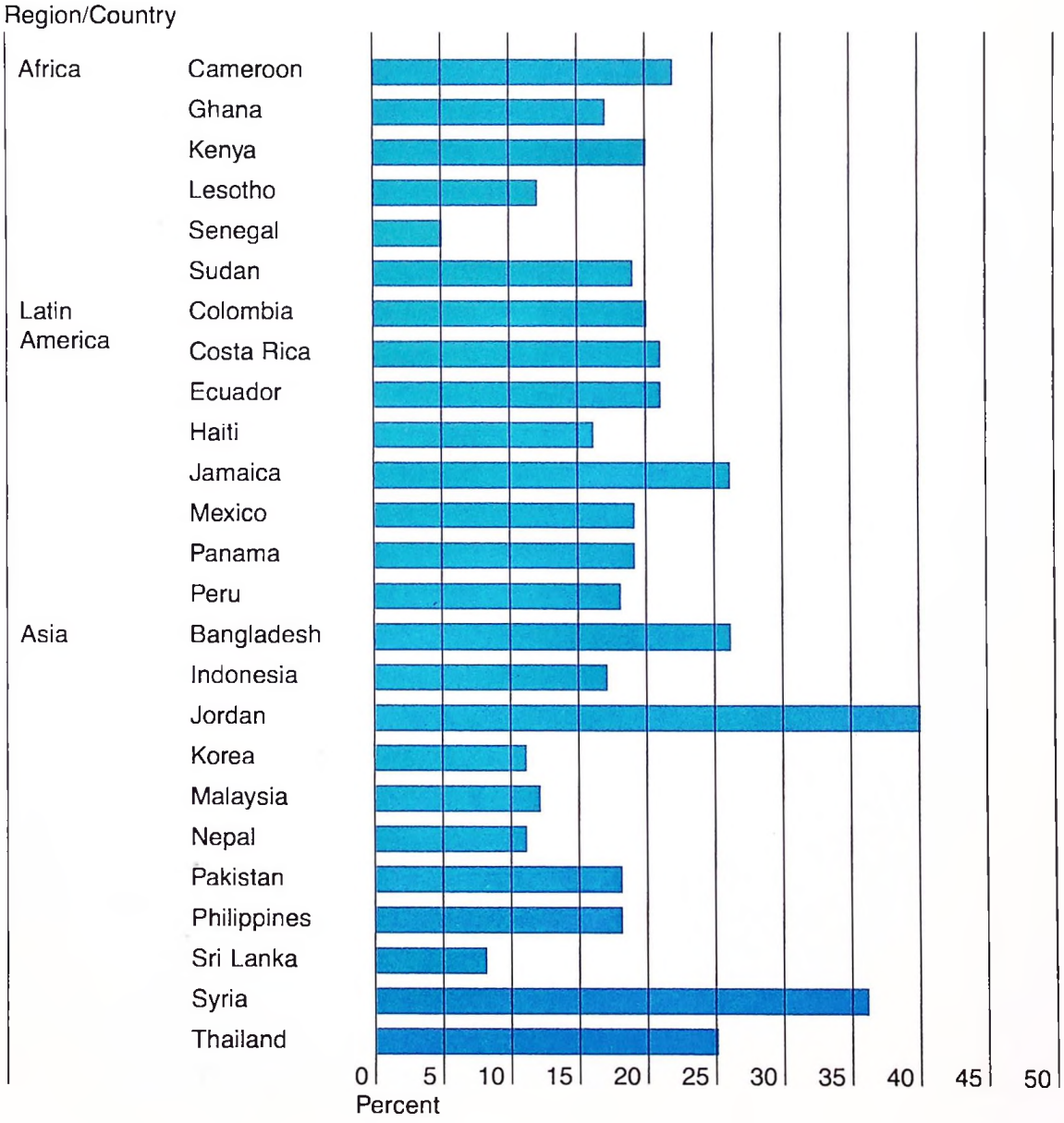
$I_o = 0.65(68) + 0.35(117) = 85.15$

$$\text{Deaths averted} = \frac{85 - 68}{85} = 20\%$$

We have seen that short birth intervals are associated with high rates of childhood death, and that short birth intervals are common. What would happen if all couples waited at least 2 years before having their next child?

Chart 6 shows the estimated reduction in infant deaths if all children were born after an interval of at least 2 years. The reduction in infant deaths would range from 5% in Senegal to 40% in Jordan. On average, about 1 out of 5 infant deaths would be averted through good birth spacing.

Chart 6
Estimated reduction in infant deaths if all children were born at the end of birth intervals at least 2 years long*



*These are deaths in the first year of life per 1,000 live births.

Chapter 2
Program Implications

Chapter 1 has shown that improving birth spacing could prevent the deaths of many children in developing countries. Is this a realistic goal? In this chapter several factors are discussed that make birth spacing a feasible and important component of child survival programs.

In most societies, birth spacing is not a new idea.

Science often confirms what people have learned through experience. This is clearly the case with birth spacing.

In a World Health Organization study more than 42,000 women were interviewed in Latin America, North Africa, and Asia.[21,22] More than 9 out of every 10 women said that short birth intervals harm child health.

In many societies in Sub-Saharan Africa there are long-standing traditions of spacing births for health reasons.[23] For example, Nigerian and Togolese women say that a birth interval of more than 2 years is healthiest.[24] In Zimbabwe it is said that children born too close together "burn" each other.[25]

There are many ways to space births–some traditional, some modern.

People have been spacing births for thousands of years using such methods as withdrawal, abstinence, and prolonged breastfeeding. So, while it is best to make a range of effective methods of contraception easily accessible to all people, couples should be encouraged to use whatever means they can to postpone their next pregnancy for a few years.

Birth spacing is a step toward child survival that couples can take on their own.

Parents everywhere want their children to live and develop well, but in poor countries there is often little that they can do to make this wish come true. Good spacing of births is an action that couples can take on their own–whether they are rich or poor, whether they live in a city or in a village–to improve the health of their children. Parents and policymakers need to understand this important fact.

Birth spacing complements other child survival activities.

Programs to encourage birth spacing can work together with other child survival activities, such as programs of immunization or of oral rehydration for diarrheal diseases. When health workers are talking to mothers about the health benefits of immunization, oral rehydration, and breastfeeding, they can easily discuss the benefits of good birth spacing.

Family planning services can be supplied in a variety of programs.

A number of international agreements state that all people have a right to decide on the number and timing of their children.[26] Unfortunately, millions of people live in rural areas or crowded slums where it is difficult or impossible to obtain family planning advice and supplies. In these areas, there are also usually shortages of resources and personnel.

For these reasons it is extremely fortunate that there are a number of contraceptive methods that can be dispensed safely by nonmedical personnel.[27–30] In many countries, condoms, foaming tablets, and oral contraceptives are sold in pharmacies or dispensed by village volunteers who have received some training.

Chapter 3
Questions and Answers

This chapter addresses some of the questions that may come to mind, such as: "What groups of people are most likely to have short interval births?" or "Are some kinds of children more affected than others by short birth intervals?"

The answers to these questions are based on in-depth analyses of World Fertility Survey data from Cameroon, Ghana, Indonesia, Kenya, and Mexico.[7,16] These analyses were carried out at Columbia University's Center for Population and Family Health.

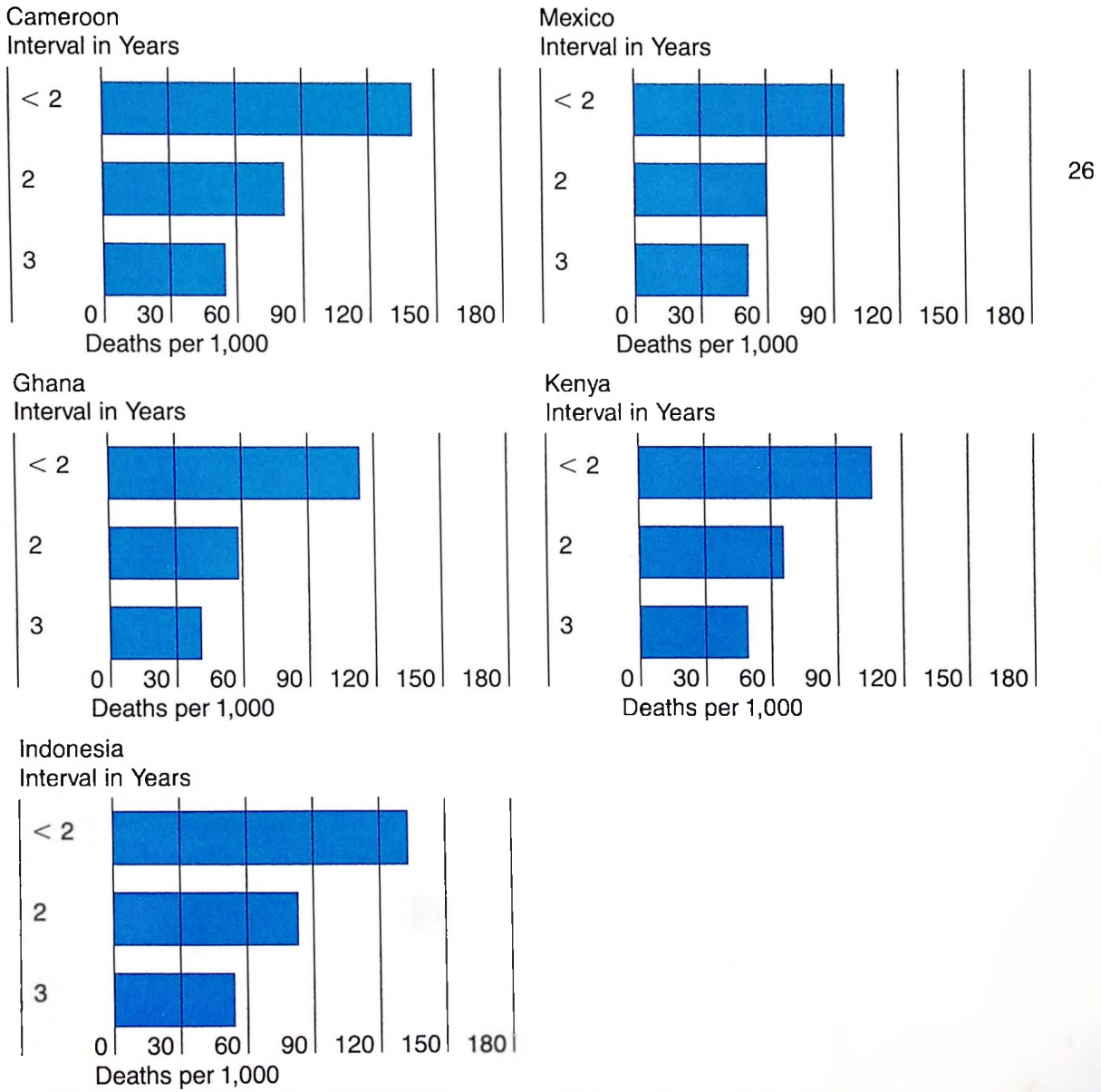
Question:

How short a birth interval is too short?

Answer:

Less than 2 years is definitely too short. Furthermore, a child's chances of surviving are better with a 3-year interval than with a 2-year interval.

Chart 7
Infant death rates among children born at the end of birth intervals of less than 2 years, of 2 years, and of 3 years*

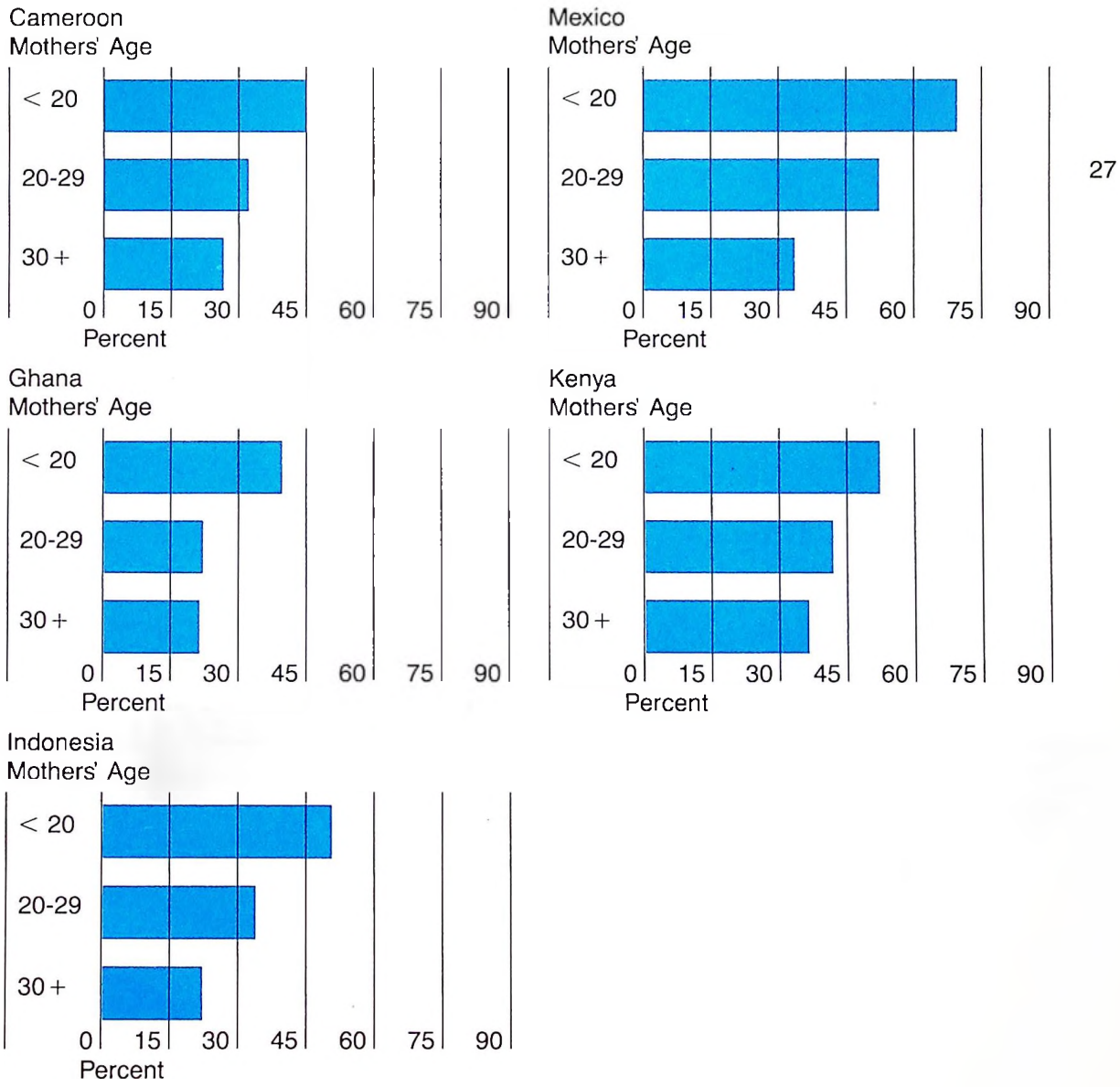


*Probability of death during the first year of life per 1,000 live births. Interval categories are <24, 24–35, and 36–47 months.

Question:
Are younger women more likely than older women to have closely-spaced births?

Answer:
Yes. Women less than 20 years old have the highest proportion of short-interval births of any age group, ranging from 39% in Ghana to 69% in Mexico.

Chart 8
Percent of children born at the end of birth intervals less than 2 years long, by mothers' age



Question:

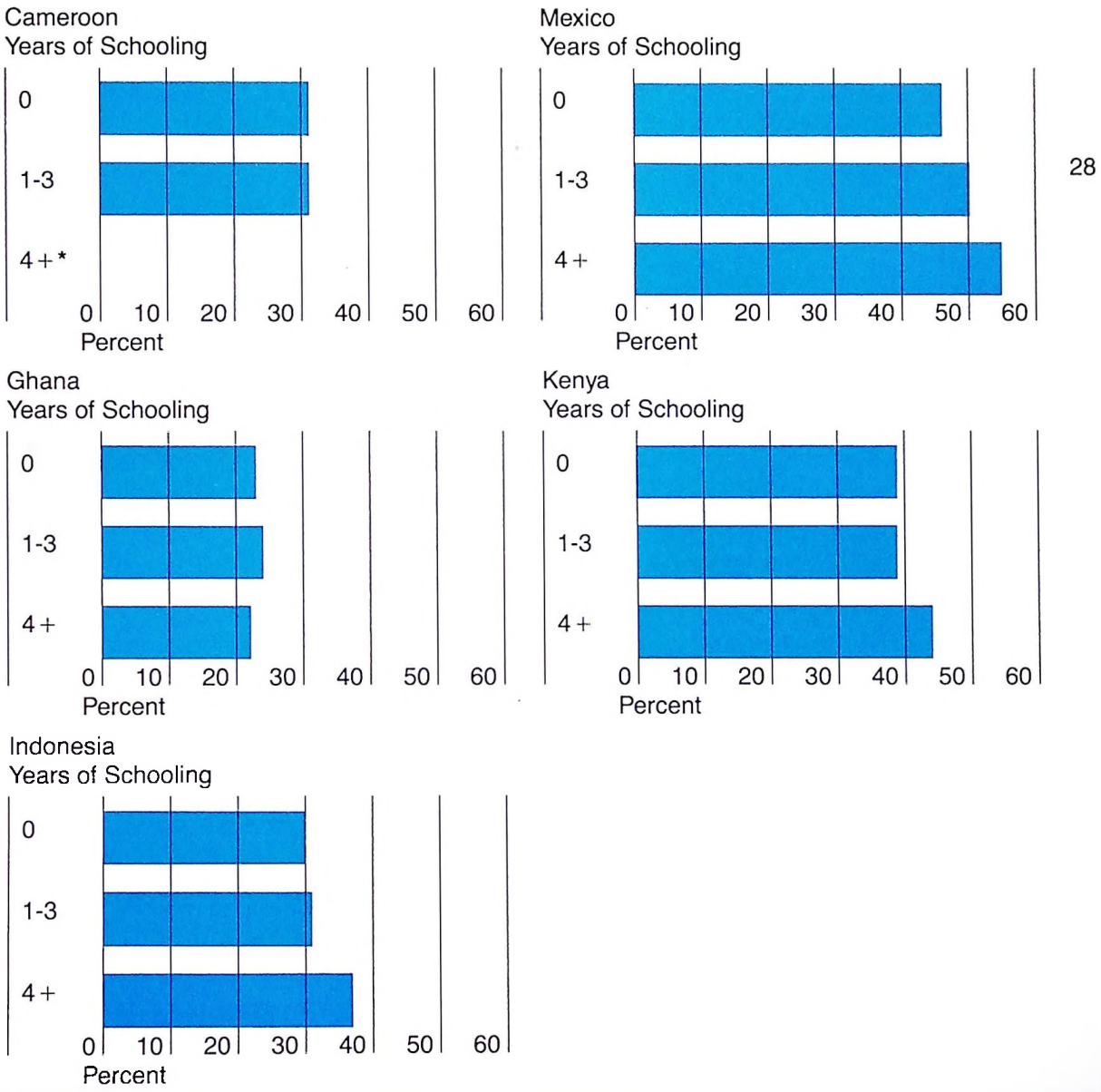
Are uneducated women more likely than educated women to have closely-spaced births?

Answer:

Apparently not. In the WFS as a whole, there was no clear association between short birth intervals and education.[31]

In the 5 countries for which we have in-depth data, women with 4 or more years of schooling often have somewhat higher proportions of short-interval births than do less educated women. This may be due to the fact that, in some developing countries, breastfeeding has declined among educated women.[32] Many of these women are not yet using modern contraceptives to space their pregnancies.

Chart 9
Percent of children born at the end of birth intervals less than 2 years long, by mothers' education



*Not available

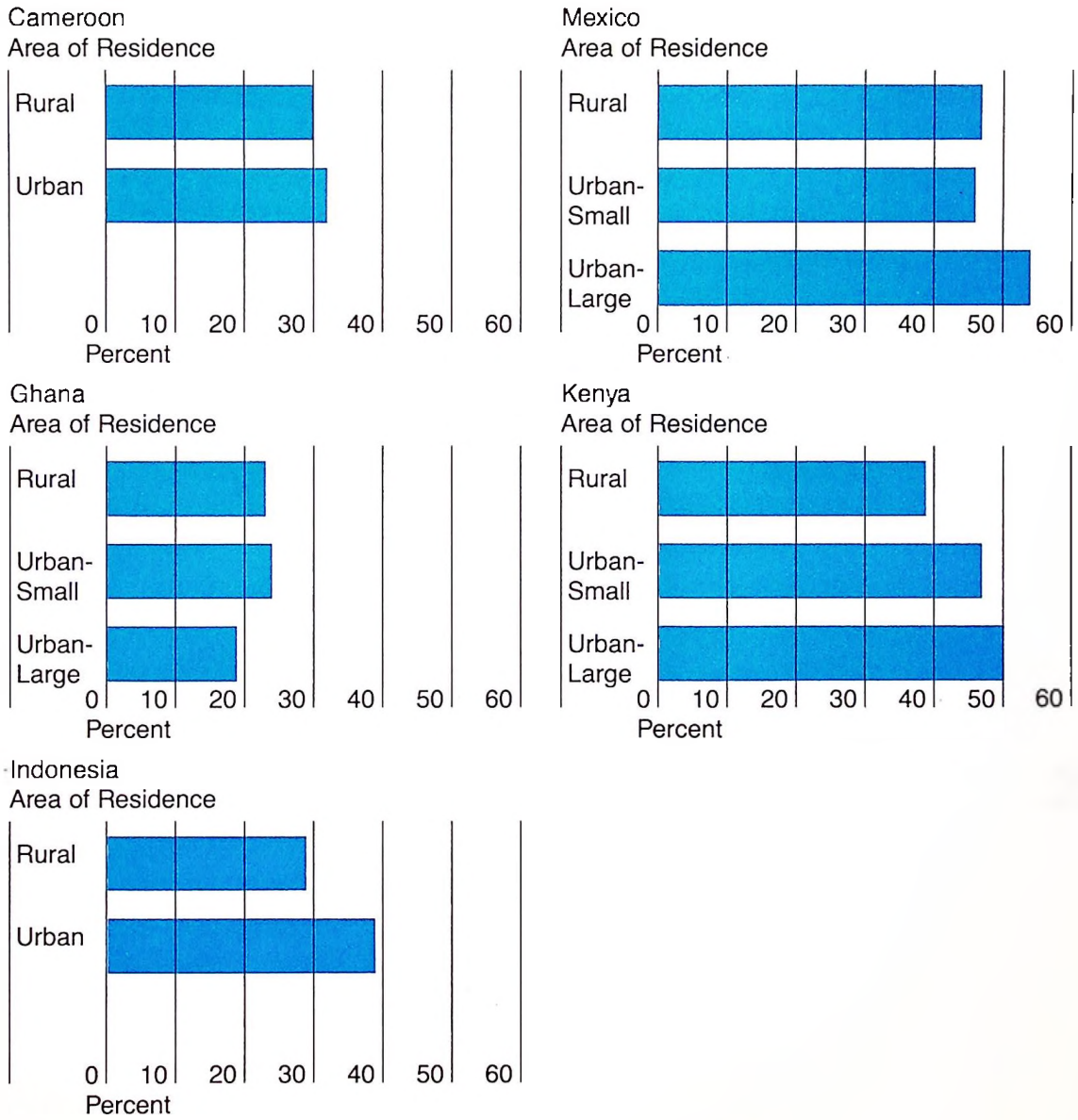
Question:

Are rural women more likely than urban women to have closely-spaced births?

Answer:

No. City women in 4 of these 5 countries had somewhat higher proportions of short-interval births than did women living in the countryside. This finding may be due, at least in part, to declines in breastfeeding and postpartum sexual abstinence among urban women.

Chart 10
Percent of children born at the end of birth intervals less than 2 years long, by area of residence



Question:

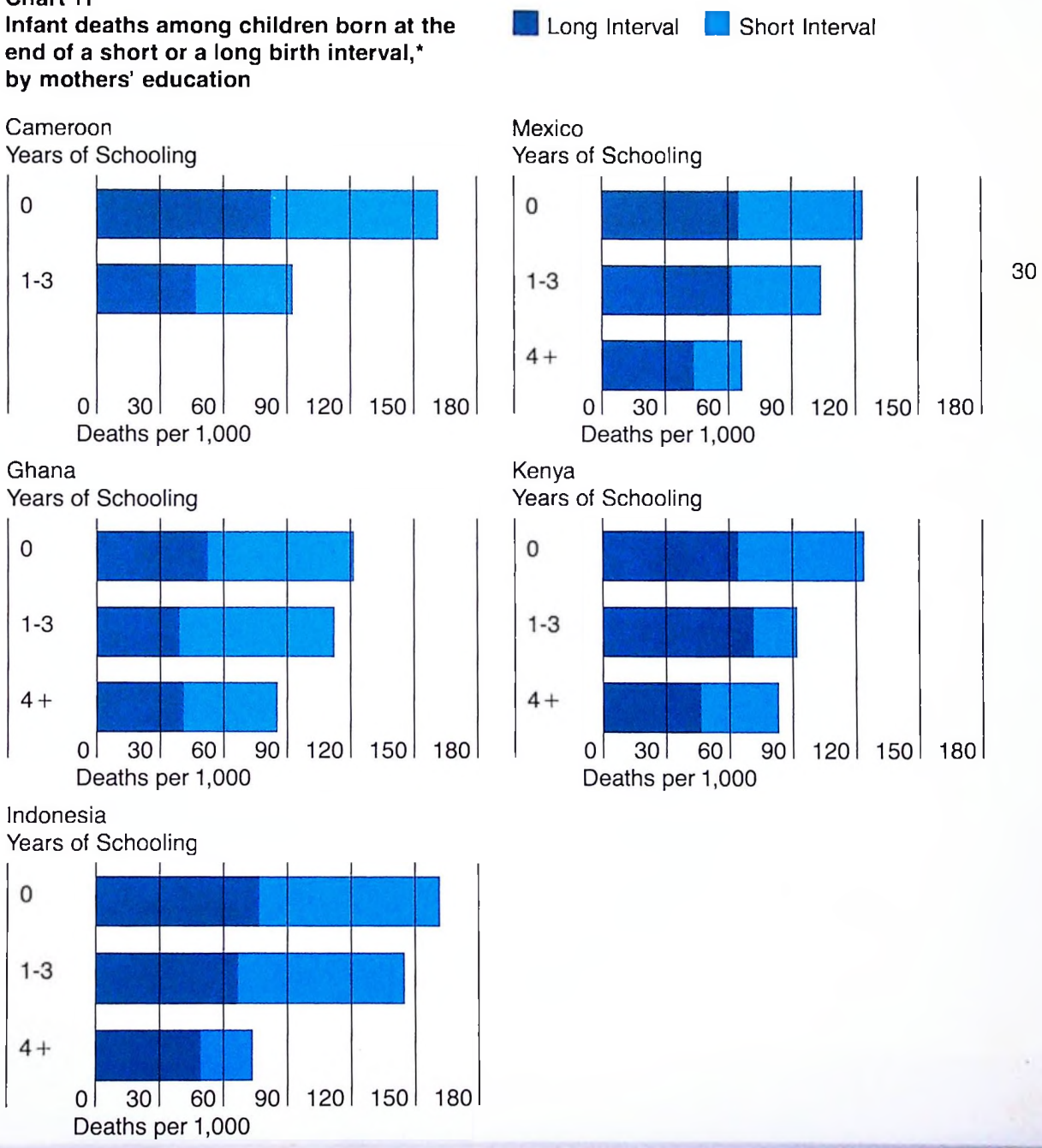
Does having a short birth interval pose more danger to some children than to others? For example, are short birth intervals more dangerous for the children of uneducated than of educated mothers?

Answer:

Perhaps. In Chart 11, the difference in death rates associated with short birth intervals is somewhat greater among children of uneducated women than among children of educated women. However, in the WFS as a whole, no significant relationship between the mother's education and the effect of birth spacing was found.[9]

The important point is that short birth intervals are a serious threat to the health of all children.

Chart 11
Infant deaths among children born at the end of a short or a long birth interval,* by mothers' education



*A short interval is less than 2 years; a long interval is greater than 2 years.

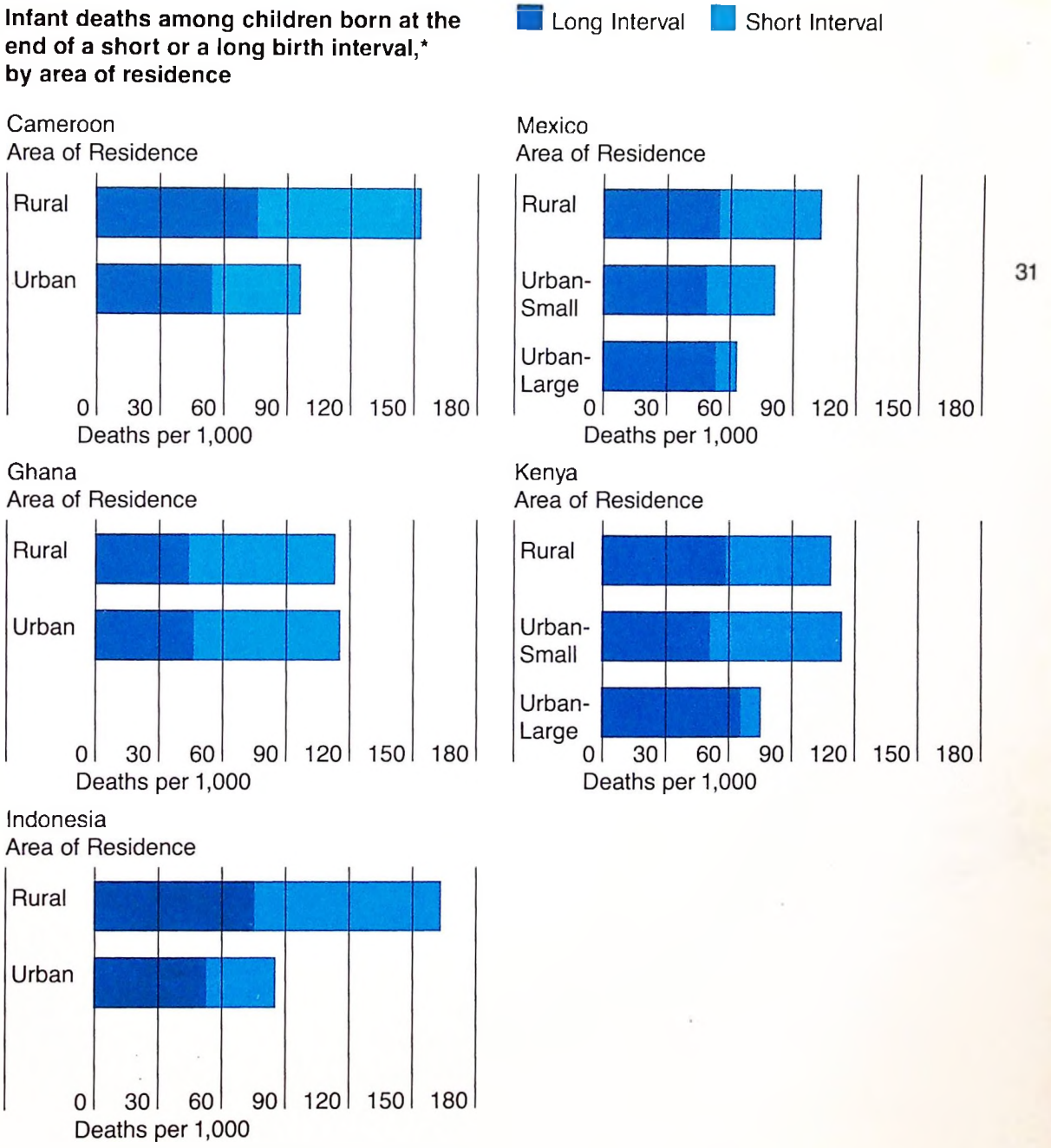
Question:

Are short birth intervals more dangerous for rural than for urban children?

Answer:

In some countries, apparently so. It appears that living in a city, especially a large one, can offset some of the danger associated with short birth intervals, at least in 4 of these 5 countries. This effect may be due to better access to medical care in urban centers. But even in large cities, short birth intervals substantially increase children's chances of dying.

Chart 12
Infant deaths among children born at the end of a short or a long birth interval,* by area of residence



*A short interval is less than 2 years; a long interval is greater than 2 years.

Question:
Do factors such as education and rural residence, rather than birth spacing itself, account for the apparent effect of birth spacing on childhood death rates?

Answer:
No. First, although the risk of death associated with short intervals varies somewhat, it is not much reduced when these other factors are taken into account.

Second, the effect of birth interval on child survival during the first 2 years of life is often stronger than that of other factors, including maternal education.[9,16]

Question:
For many years, studies have shown that infants born to very young and very old mothers, and to women who already have 3 or more children, are more likely to die than are other infants. Does the effect of birth interval remain when these factors are taken into account?

Answer:
Yes. In fact, we now know that birth interval usually has a more powerful effect on child survival than do these other factors. When birth interval is included in the analysis, the effects of maternal age and birth order are often greatly reduced, and sometimes even disappear.[15]

The previous charts have shown that:

1. Short-interval births are common among all groups of people, regardless of residence, education, and maternal age.
2. In all groups, short birth intervals are linked to lower rates of child survival.
3. The effect of birth interval is not the result of such other factors as maternal age, birth order, and maternal education.

But why are short birth intervals a hazard to child survival? Unfortunately, we do not know the answer to this question. Furthermore, exploring the WFS data has not provided strong clues. In fact, analysis of these data has weakened some of the most commonly cited explanations.

Question:
One theory about birth spacing is that closely-spaced children compete for food and the attention of their parents. Is this competition a major cause of the birth spacing effect on child survival?

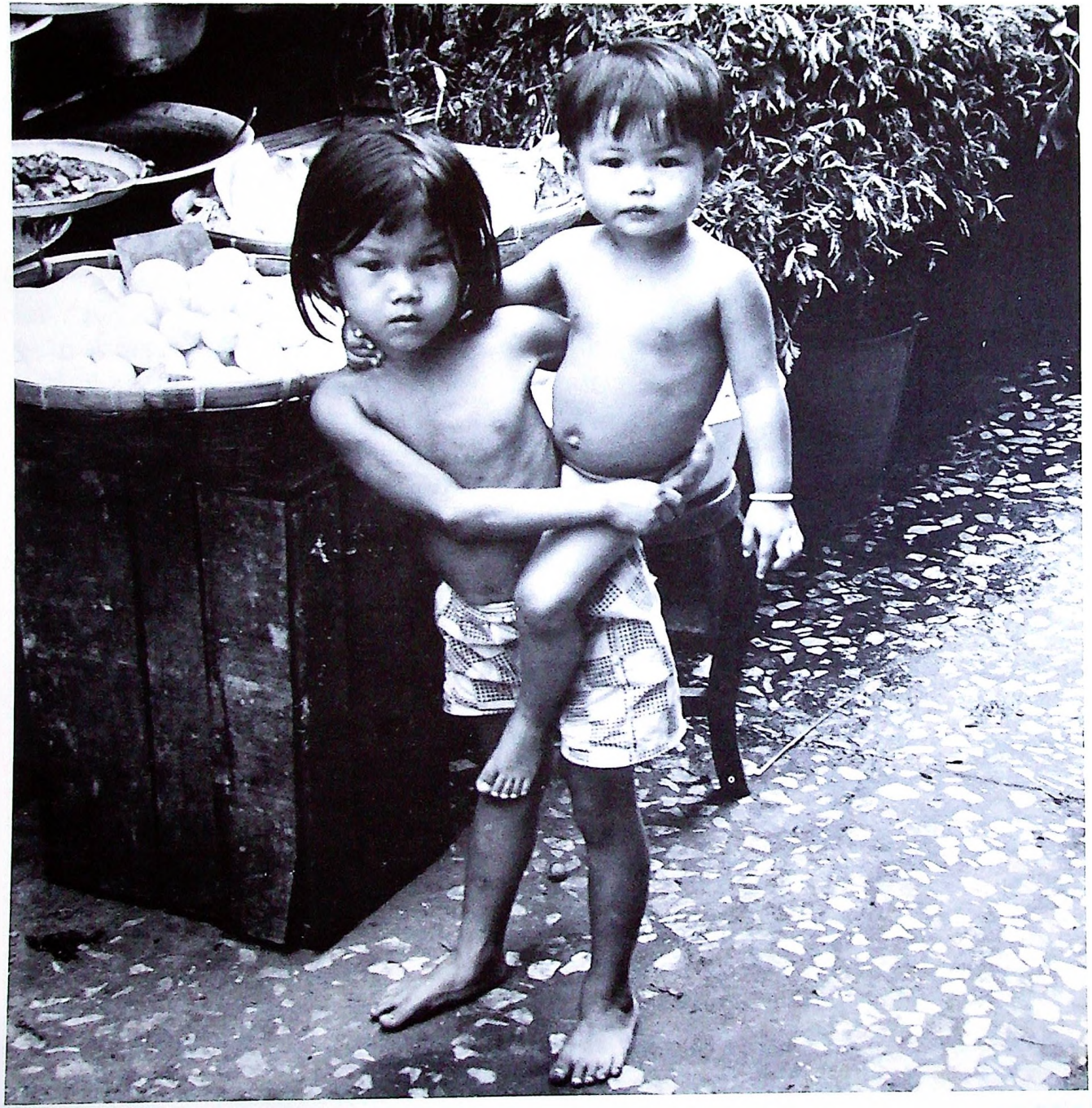
Answer:
No. Competition within the family cannot explain much of the effect of birth spacing. For example, the high risk of death for children with a short interval between them does not change even if one of the children dies. The surviving child will still have a high risk of death for several more years.[33–35] If competition were a major reason for the effect of birth spacing, the risk of death would decrease after the death of the other sibling.

Question:
Could it be that short birth intervals are not a cause of child death but just a characteristic of families at high risk for other reasons?

Answer:
This does not seem to be the case. First of all, previous charts have demonstrated that short intervals pose a danger to children in families with the advantages of education and urban residence, as well as to children in disadvantaged families. Secondly, one sign of a "high-risk" family is the death of a child. But the effect of birth spacing is not much stronger in these families than in families where earlier children have not died.[7,8,15,16]

Question:
If a woman has several births in a short span of time, this must be a great strain on her strength. Could it be that this strain, called "maternal depletion," explains a large part of the birth spacing effect?

Answer:
No. While depletion of the mother's resources might explain some of the effect of birth spacing on the survival of newborns, it seems less likely to explain deaths among older children.



Conclusion:

There is no easy way to explain away the powerful and persistent relationship between birth spacing and child survival. Perhaps each of the theories mentioned in Chapter 3 contributes a little to the effect of birth spacing.

In any case, the important points are that we know that poor birth spacing is dangerous to children's health, and we know what to do about it:

Make this information known to parents and policymakers.

Make family planning services easily accessible to everyone who wants to use them.

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