Risk of Spontaneous Abortion in Italy, 1978–1995, and the Effect of Maternal Age, Gravidity, Marital Status, and Education

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This paper describes the trend in the risk of spontaneous abortion in Italy from 1974 to 1995. There was a dramatic decline in the risk after the law that legalized induced abortion was passed in 1978, which implies that probably many induced abortions performed before 1978 were registered as spontaneous abortions. Data for 1991 have been extracted from the Italian national registers of births and abortions and analyzed to investigate the effects of maternal age, gravidity, marital status, and education on the risk of spontaneous abortion. In comparison with women under age 20 years, the risk is found to be increased for women aged 35–39 (odds ratio = 1.45) and women over age 40 (odds ratio = 3.10). The odds ratio is almost 2 for women who have been pregnant two or more times previously. Unmarried women have an increased risk (odds ratio = 1.33), but no important effect of education was observed. There is an important interaction between maternal age and gravidity. The risk of spontaneous abortion is excessively high for young women with high gravidity. It is hypothesized that this could be due to the effect of short intervals between pregnancies. Am J Epidemiol 2000;151:98–105.

It is estimated that between 10 and 20 percent of all clinically recognized pregnancies result in spontaneous abortions (1–4). If the losses before and around the time of implantation, estimated to be between 15 and 25 percent (5, 6), as well as the spontaneous abortions that are unrecognized because they occur before the beginning of the next menstrual cycle (about 22 percent) (7), are added to this number, it is clear that more than 50 percent of all conceptions probably result in spontaneous abortions.

There are relatively few complete national registries of spontaneous abortion, but, in Italy, registration started in 1956. However, studies of the epidemiology of spontaneous abortion have been difficult, if not impossible, until recently because it has been hard to distinguish between spontaneous and induced abortions. In 1978, the law that legalized induced abortion in Italy was passed, and 1 year later, the national bureau of statistics (ISTAT), in agreement with the Italian Ministry of Health, started to collect national data on spontaneous abortions separately from the legal notifications of induced abortion. This national database includes only medically diagnosed cases of spontaneous abortion that occurred in public or private hospitals and that, until 1993, involved a stay in the hospital of at least 1 day. Since 1994, all spontaneous abortions, including those to women who stayed in the hospital for less than 24 hours, have been included in the register. Validity checks of the registers have been performed in the two most populous regions of Italy, Lombardy in 1980–1981 and Lazio in 1989. Both of these checks revealed that there was no notification of 15 percent of known cases of spontaneous abortion and that about 4.5 percent of the women for whom notification was given were treated as outpatients and, until 1994, were not included in the register (8, 9).

Despite these limitations, the notification system has gained wide acceptance, and it is believed to be practically complete for all cases admitted to the hospital (9, 10).

This paper has two main objectives: first, to describe the trend in the number of reported spontaneous abortions in Italy between 1974 and 1995 (which may not reflect the trend in the true risk) and, second, to use information extracted from certificates of livebirths, stillbirths, induced abortions, and spontaneous abortions to investigate the effect of maternal age, gravidity, marital status, and mothers' education on the risk of a notified spontaneous abortion. If the degree of
underreporting were associated with these risk factors, the estimates of their effects obtained from the reported cases would not necessarily reflect their effect on the true risk.

**MATERIALS AND METHODS**

Various indices might be devised to quantify the occurrence of spontaneous abortion in epidemiologic studies. Ideally, the proportion of all conceptions that result in a spontaneous abortion would be calculated, but, in practice, this is impossible. It is difficult to obtain the true total number of spontaneous abortions for the numerator of the proportion and equally difficult to know the true number of conceptions for the denominator. Thus, the numerator of the index is restricted to the number of known spontaneous abortions, and the denominator may be either the number of livebirths, which yields the so-called spontaneous abortion ratio, or better, an estimate of the total number of known conceptions, in which case the index is known as the spontaneous abortion rate. The denominator of this rate is the total number of known pregnancies, that is, the sum of the spontaneous abortions, the induced abortions, the stillbirths (late fetal deaths), and the livebirths, but a disadvantage of this index is that the spontaneous abortion rate will depend on the frequency with which pregnancies are terminated by induced abortion. Since an induced abortion cannot subsequently spontaneously abort, there will be a tendency for the spontaneous abortion rate to be lower in populations in which induced abortion is very frequent. Clearly, if induced abortions are performed very early in pregnancy, the numerator will not include the spontaneous abortions that would have occurred if the induced abortions had not been performed. This problem of competing risks between the induced and the spontaneous abortions has been considered by several authors (11–13) and can be resolved by adjusting the number of induced abortions in the denominator. Examination of the distributions of the age of gestation of both spontaneous and induced abortions reveals that, on average, the induced abortions occur earlier than the spontaneous abortions, and in Italy, it has been estimated that the induced abortions are exposed to only 25 percent of the risk of spontaneous abortion that is experienced by fetuses that progress to 28 weeks (or, in the case of Italian data, 180 days) of gestation (8). Thus, the calculated risk of known spontaneous abortion is the number of known spontaneous abortions divided by the sum of the spontaneous abortions, 25 percent of the induced abortions, the stillbirths (late fetal deaths), and the livebirths. This “simplified true abortion risk” (STAR) would seem to be the best estimate of the risk of known spontaneous abortion (12). However, even this index refers to only known spontaneous abortions and known pregnancies, so it does not, in fact, estimate the real risk that a conception will result in a spontaneous abortion.

To calculate the STAR, data were abstracted from certificates collected by the national bureau of statistics. However, the certificates that contain information on livebirths and stillbirths are not the same as those used for induced abortions or spontaneous abortions. For the description of the time trend in the risk of spontaneous abortion, this has not presented any difficulty, since numbers of events can readily be extracted from each of the three data files. However, for the analysis of the effects of risk factors, it has been necessary to combine the three data files, selecting only the variables (maternal age, gravidity, marital status, and education) that both are of interest and are included on the three certificates. Because 1991 was the latest available year for which each of the three data sets contain the variables of interest, the analysis of these four risk factors is confined to the data for 1991. Even considering just these four risk factors, the definitions used in the three certificates are not identical. For example, for marital status, the certificates for induced and spontaneous abortions include five categories (never married, married, legally separated, divorced, and widowed), whereas on the certificate for live- and stillbirths, the date of marriage is requested, and the absence of this information has been taken to imply that the woman has never been married. Thus, in the analysis, only the two categories “never married” and “ever married” are considered. Similarly, the files do not correspond for the categories of level of education. On the abortion certificates, there are five categories: no certificate of education, elementary school certificate (schooling from age 6 to 10 years), lower secondary school certificate (ages 11–13 years), high school certificate (ages 14–18 years), and university degree, whereas in the files of births, the first two categories are combined. This has meant that the variable “education” has had to be considered in only four of the five possible categories. Nowadays, there are relatively few Italian women with no certificate of education, and the combination of the first two categories probably does not obscure important differences between the educational groups.

The four risk factors included in the analysis are associated with one another, and to eliminate the effect of confounding between these variables, logistic regression has been used, in which the outcome variable is spontaneous abortion or not, and the independent explanatory variables are dummy variables representing the categories of the risk factors.
RESULTS

As figure 1 shows, there was a sudden massive decrease in the reported annual number of spontaneous abortions immediately after the introduction of the law that, in May 1978, legalized induced abortion in Italy. In 1974, a total of 129,250 spontaneous abortions were reported, which corresponds to 14.9 per 100 livebirths. In 1977, the number was 106,055 (14.3 per 100 livebirths), but by 1980, this had fallen to 56,622 (8.8 per 100 livebirths).

Since 1980, there has been an irregular rise in the number and risk of reported spontaneous abortions in Italy, but the increase observed in 1995 is also because before 1994 only spontaneous abortions that involved a hospital stay of more than 24 hours were included in the register. Table 1 shows the annual number of reported spontaneous abortions, the ratio between these numbers and the corresponding numbers of livebirths and the STAR for selected years between 1974 and 1995. It is clear that, although the number of reported spontaneous abortions has increased slowly and irregularly during the period from 1980 to 1995, the abortion ratio and the STAR have steadily increased from 8.2 to 12.2 percent and from 7.0 to 11.4 percent, respectively.

Table 2 shows, for 1991, the numbers of reported spontaneous abortions, the percentage distribution, and the risk (STAR percent) according to the age of the woman, her marital status, her level of education, and her number of previous pregnancies. Table 3 shows the crude and adjusted odds ratios associated with each category of the four variables studied. Given the very large number of spontaneous abortions included in the analysis, comparisons between the categories of the variables are almost all statistically significant, and the confidence intervals are narrow.

About half of the spontaneous abortions occur in women between ages 25 and 34 years (table 2). The crude risk is minimum among women aged 20–24 years and increases rapidly with advancing age. Teenagers have a slight increase in risk in comparison with women aged 20–24 (table 3). The adjusted odds ratios indicate that the risk of spontaneous abortion does not change much for women under age 35 years, but increases more rapidly thereafter. The adjusted odds ratios in the two highest age groups are considerably less than the crude odds ratios, which implies that

![Figure 1](https://example.com/figure1.png)

**Figure 1.** The trend in the spontaneous abortion ratio (%) in Italy in 1974–1995. The law that legalized induced abortion was passed in 1978. Data were obtained from the Italian National Bureau of Statistics.
some of the excess risk observed in the crude odds ratios can be explained in terms of confounding due to the other variables.

About 90 percent of the spontaneous abortions occur among married women, for whom the crude risk is 8.7 percent, whereas unmarried women have a crude odds ratio of 1.16 (table 3), which increases to 1.33 when adjusted.

There is a relatively large number of women for whom information on the achieved level of education is missing (5.2 percent of the total). The crude odds ratios are all close to one, and adjustment does not produce a meaningful trend.

There were an approximately equal number of spontaneous abortions reported for women with no previous pregnancies, one previous pregnancy, and two or more pregnancies. The crude risk of abortion increased from 6.69 percent among women with no previous pregnancies to 14.47 percent for women who had been pregnant two or more times previously (table 2). For this last group, the crude odds ratio is 2.36, but, in contrast, the adjusted odds ratio is 1.93 (table 3).

As part of the routine examination of the data, we decided to explore the possibility of two factor interactions between the variables. Of particular interest and importance was the interaction observed between maternal age and the number of previous pregnancies. All of the interaction terms in a regression model, which also included all of the other study variables, were highly statistically significant and negative. The effect of this interaction can be interpreted most easily by examining table 4, which shows the risk of spontaneous abortion (STAR) for the 18 possible combina-

TABLE 2. Number of spontaneous abortions notified, percentage distribution, and risk (STAR%*) according to sociodemographic characteristics, Italy, 1991

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Spontaneous abortions</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>STAR%</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>&lt;20</td>
<td>1,765</td>
<td>3.0</td>
<td>8.07</td>
</tr>
<tr>
<td>20-24</td>
<td>8,759</td>
<td>14.9</td>
<td>6.65</td>
</tr>
<tr>
<td>25-29</td>
<td>17,434</td>
<td>29.6</td>
<td>7.23</td>
</tr>
<tr>
<td>30-34</td>
<td>15,277</td>
<td>25.9</td>
<td>8.81</td>
</tr>
<tr>
<td>35-39</td>
<td>9,990</td>
<td>16.9</td>
<td>13.64</td>
</tr>
<tr>
<td>≥40*</td>
<td>5,392</td>
<td>9.1</td>
<td>26.76</td>
</tr>
<tr>
<td>Unknown</td>
<td>349</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Married</td>
<td>52,901</td>
<td>89.7</td>
<td>8.72</td>
</tr>
<tr>
<td>Single</td>
<td>5,661</td>
<td>9.6</td>
<td>9.97</td>
</tr>
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<td>Unknown</td>
<td>404</td>
<td>0.7</td>
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<tr>
<td>Education</td>
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<tr>
<td>University</td>
<td>3,497</td>
<td>5.9</td>
<td>8.35</td>
</tr>
<tr>
<td>High school</td>
<td>16,105</td>
<td>27.3</td>
<td>7.79</td>
</tr>
<tr>
<td>Lower secondary school</td>
<td>28,107</td>
<td>47.7</td>
<td>8.81</td>
</tr>
<tr>
<td>Elementary school</td>
<td>8,202</td>
<td>13.9</td>
<td>9.04</td>
</tr>
<tr>
<td>Unknown</td>
<td>3,055</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>Gravidity</td>
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<td>0</td>
<td>20,115</td>
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<td>6.69</td>
</tr>
<tr>
<td>1</td>
<td>17,199</td>
<td>29.2</td>
<td>8.00</td>
</tr>
<tr>
<td>≥2</td>
<td>21,263</td>
<td>36.1</td>
<td>14.47</td>
</tr>
<tr>
<td>Unknown</td>
<td>369</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>58,966</td>
<td>100</td>
<td>8.88</td>
</tr>
</tbody>
</table>

* STAR%, simplified true abortion risk percent.

As part of the routine examination of the data, we decided to explore the possibility of two factor interactions between the variables. Of particular interest and importance was the interaction observed between maternal age and the number of previous pregnancies. All of the interaction terms in a regression model, which also included all of the other study variables, were highly statistically significant and negative. The effect of this interaction can be interpreted most easily by examining table 4, which shows the risk of spontaneous abortion (STAR) for the 18 possible combina-

TABLE 4. Risk of spontaneous abortion (STAR%*) according to woman's age and number of previous pregnancies, Italy, 1991

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>No. of previous pregnancies</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>≥2</td>
<td>Total</td>
</tr>
<tr>
<td>&lt;20</td>
<td>7.22</td>
<td>12.16</td>
<td>22.29</td>
<td>8.07</td>
</tr>
<tr>
<td>20-24</td>
<td>5.74</td>
<td>7.26</td>
<td>13.12</td>
<td>6.65</td>
</tr>
<tr>
<td>25-29</td>
<td>6.19</td>
<td>6.89</td>
<td>11.94</td>
<td>7.23</td>
</tr>
<tr>
<td>30-34</td>
<td>7.03</td>
<td>7.70</td>
<td>11.94</td>
<td>8.81</td>
</tr>
<tr>
<td>35-39</td>
<td>11.01</td>
<td>11.23</td>
<td>16.02</td>
<td>13.64</td>
</tr>
<tr>
<td>≥40*</td>
<td>22.01</td>
<td>22.91</td>
<td>28.62</td>
<td>28.76</td>
</tr>
<tr>
<td>Total</td>
<td>6.69</td>
<td>8.00</td>
<td>14.47</td>
<td>8.88</td>
</tr>
</tbody>
</table>

* STAR%, simplified true abortion risk percent.
† Risk is based on 94 observed spontaneous abortions. All other risks in the table are based on at least 250 abortions.
tions of age and number of previous pregnancies. Inspection of the marginal rates shows the crude effects of maternal age and number of previous pregnancies, but inspection of the rates in the body of the table reveals the extent and form of the interaction between these two variables. For example, for women under age 20 years, the effect of increasing the number of previous pregnancies from zero to two or more is to increase the risk from 7.22 to 22.29 percent—a threefold increase in risk. For women aged 20–24 years, this multiplicative increase is 2.3; for the women in the successively older age groups, the increase is 1.8, 1.7, 1.5; and, for women over age 40, it is only 1.3. Similarly, the optimum age for women having their first pregnancy is 20–24 years, but for the second and higher-order pregnancies, the optimum age is 25–29. Thus, this interaction manifests itself as an increase in risk of spontaneous abortion among younger women who have been pregnant previously. Equivalently for older women, having had previous pregnancies does not increase the risk of spontaneous abortion as much as it does for younger women.

None of the other two factor or higher-order interactions produced statistically significant ($p = 0.05$) or interpretable trends in the coefficients of the logistic regression models.

**DISCUSSION**

In Italy, a spontaneous abortion is defined as a product of conception that is delivered spontaneously before 180 days (i.e., 25 weeks and 5 days), without reference to the absence of life. In many studies of spontaneous abortion and stillbirths (or late fetal deaths), the definition includes fetal losses up to 28 weeks (195 days), which was the definition proposed by the World Health Organization (WHO) in 1957 and used until 1977 (14). The difference between the Italian legal definition of spontaneous abortion and that proposed by the WHO is unlikely to have any important consequences for the analysis of trends or risk factors because the number of spontaneous abortions that occur between the 26th and 28th weeks of gestation is relatively small, at about 1 percent of the total (8, 10). More recently, the WHO has redefined spontaneous abortion in terms of the weight of the embryo or fetus that, if it were to be adopted internationally, would help to make studies more comparable. The WHO now defines a spontaneous abortion as the expulsion or extraction from the mother's body of an embryo or fetus with a weight equal to or less than 500 g, which corresponds to a gestational age of about 20–22 weeks, and unlike the earlier definitions, this latest one does not specify that the embryo or fetus must show no signs of life (15).

In round numbers, there were about 727,000 known conceptions in Italy in 1995, which resulted in about 521,000 livebirths, 2,000 stillbirths (late fetal deaths), 140,000 induced abortions, and 64,000 spontaneous abortions. Subsequently, there were about 4,500 infant deaths. Clearly, in terms of total pregnancy wastage, 140,000 induced abortions represents a major social problem, but among losses attributable to biological factors, the number of spontaneous abortions clearly dwarfs both the stillbirths and the infant deaths.

The vast literature on the epidemiology of infant mortality spans at least a century. For example, a textbook on infant mortality was published in 1906 (16), and a historical review of the subject appeared in 1913 (17). The literature on the epidemiology of stillbirths has a history of at least a half a century, for example, the early reviews by Sutherland in 1946 and 1949 (18, 19). It is surprising that, in comparison, so little is known about the epidemiology and social significance of spontaneous abortions. An obvious reason for this could be that the measurement of risk in epidemiology requires a precise and accurate count of both the numerator and the denominator. For example, for women who have been pregnant previously. Equivalently for older women, having had previous pregnancies does not increase the risk of spontaneous abortion as much as it does for younger women.

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It would seem that before induced abortion was legalized in Italy in 1978, many abortions were, in fact, illegally performed and reported as spontaneous abortions. After 1978, the number of reported spontaneous abortions rapidly declined, and the number that remained in subsequent years may more realistically represent the phenomenon of known spontaneous abortion, even if there may still remain a relatively small number of misclassified induced abortions. Even so, the monitoring and interpretation of the trend in spontaneous abortion may be difficult because there has been a tendency for pregnancies to be diagnosed earlier, especially with the wide availability of “do-it-yourself” pregnancy tests and the fact that women nowadays are probably more likely to maintain a menstrual “diary.” In the period 1980–1995, the number of livebirths declined from about 640,000 to 521,000, and the number of spontaneous abortions increased from 52,900 to 63,500. While it is certainly possible that the
risk of spontaneous abortion really has changed in this period because of changes in the social habits of women (for example, a greater proportion are members of the workforce (20)), because of changes in the environment (for example, in the level of atmospheric pollution), or for biological reasons resulting from changes in the pattern of family formation—the data show that the mean maternal age at childbirth, which was 26.8 years in 1980, had risen to 29.6 by 1994, while the mean age at the first birth rose from 24.4 to 27.7 years in the same period (21, 22)—it is possible, and perhaps more plausible, that the major explanation of the rise in the risk of spontaneous abortion (both the ratio and STAR) is that women nowadays may be more aware of an early spontaneous abortion than was the case earlier. If this were the only reason for the apparent rise in the risk, it would imply that, compared with the level of reporting in 1995, only about two thirds of the spontaneous abortions in 1980 were reported or, equivalently, that the perceived risk as opposed to the actual risk has increased by about 50 percent.

The data also demonstrate that there is considerable regional variation in the risk of known spontaneous abortion in Italy. The value of STAR in the northern regions has risen from between 9 and 10 spontaneous abortions per 100 known pregnancies in 1980 to between 12 and 13 in 1995, while in the southern regions, the values have risen from between 5 and 8 spontaneous abortions per 100 livebirths in 1980 to between 7 and 9 in 1995. The values for the central regions are between those of the north and south. The tendency for the risk to have increased between 1980 and 1995 is seen in all regions.

In the analysis of spontaneous abortion in Italy in 1991, the effects of maternal age, marital status, educational level, and gravidity have been investigated by considering both their crude values and those estimated from logistic regression analysis. The regression analysis produces estimates of the independent effects of the factors when the influence of confounding due to the other variables is removed. Clearly, the variables included in the analysis are associated: Unmarried mothers tend to be younger and nulliparous when compared with married women; women with a high level of education tend to have their pregnancies later in life and to have fewer pregnancies than do women with less education; first pregnancies occur at an earlier age than do second, third, or higher-order ones; high gravidity would, on average, imply a shorter interval between pregnancies in younger women than in older women; and if the interval between pregnancies were to affect the risk of spontaneous abortion, this effect would manifest itself as an interaction between maternal age and gravidity. A comparison of the crude and the adjusted effects in table 3 indicates the impact of these associations on the estimates of the independent effects of the factors. For example, the crude risk associated with the two oldest age groups is reduced after adjustment, probably because part of the crude risk is caused by the tendency for these women to have higher-order pregnancies. Similarly, the crude increase in risk for unmarried women (odds ratio = 1.16) underestimates their true disadvantage; when the facts that they tend to be young and of low gravidity are taken into account, the odds ratio is increased to 1.33.

Even if in Italy the vast majority of pregnancies and spontaneous abortions occur in married women, there is an increase in risk of spontaneous abortion for unmarried women (adjusted odds ratio = 1.33). The most plausible explanation of this increase in risk is that these women tend to be socially disadvantaged. Although they tend to be young, they have a higher risk of unemployment and are therefore probably, in general, poorer. They may lack the support of a permanent partner and the support of their own family; the pregnancy may not have been desired, and the unmarried woman may not be very aware of the medical and social facilities available to pregnant women.

The lack of a consistent effect of duration of education is perhaps surprising because the level of education tends to act as a proxy for the general concept of social class. The group of women with the lowest level of education apparently have a slight reduction in the risk of spontaneous abortion. The women with lower secondary school education have the highest adjusted odds ratio, and this group contains about half of the women who spontaneously aborted, but the increase in the adjusted odds ratio is not very great, especially when compared with the other large group of women, those with a high school education. However, these slight variations in the odds ratios between the educational groups could also be caused by sampling error, misclassification, confounding due to other variables not included in this analysis, or other biases.

The adjusted risk of spontaneous abortion is found to be minimum for women aged 20–24 years, although the risk does not change by much for younger women or those not older than 35. The adjusted odds ratios are 1.45 and 3.10 for the age groups 35–39 and more than 40 years, respectively. This finding of an increase in risk for older women is not new and has been reported in many other studies (23–32).

However, because maternal age, parity, and gravidity are closely associated, the interpretation of the observed effects is not always easy (33, 34). There is a tendency for women of high gravidity to be selected on the basis of previous spontaneous abortions. That is, a woman with a history of spontaneous abortion will tend to try to
conceive again in order to achieve her desired family size. In an analysis of completed reproductive histories, it was found that when final gravidity was held constant, the risk of spontaneous abortion decreased with each successive previous pregnancy (35), but this probably reflects the fact that as gravidity increases, a higher proportion of women achieve their desired family size. This study does provide a new indication of how the age effect changes depending on the gravidity of the woman. The risk of spontaneous abortion also increases with gravidity, with the adjusted odds approximately two for third or higher-order pregnancies in comparison with first pregnancies. However, the interaction found between maternal age and gravidity suggests that this increase in risk depends on the age of the women. Table 4 shows that the risk (STAR) changes from 6.69 percent for the first pregnancy to 8.0 percent for the second pregnancy and 14.47 percent for the third or higher-order pregnancies. That is, second pregnancies have 1.2 times the risk of first pregnancies, and third or higher-order pregnancies have 2.2 times the risk. However, this disguises the effect that age has on the gravidity effect. For women aged under 20 years, second pregnancies have 1.7 times the risk of first pregnancies, and for those of third or higher orders, the risk is 3.1 times higher. On the other hand, for women aged over 40 years, second pregnancies have almost the same risk as do first pregnancies, and higher-order pregnancies have only 1.3 times the risk. High gravidity dramatically increases the risk of spontaneous abortion among young women, but its effect becomes successively less important as the age of the woman increases.

If the true explanation of this interaction were that the risk of spontaneous abortion is not only dependent on the maternal age and the gravidity of the woman but also on the interval between the successive pregnancies, it would have very important implications for individual couples who are planning a family because of the apparent contradiction between the relative safety of having a family while the mother is still under about age 35 years and not having intervals that are too short between successive pregnancies. It would seem that couples who wish to minimize the risk of spontaneous abortion should not wait too long before starting a family and should use contraceptive methods to ensure that the intervals between successive pregnancies are conducive to a healthy reproductive life for the mother and her children.

ACKNOWLEDGMENTS

This article is the result of a collaboration between the Istituto di Igiene (Institute of Hygiene) of the University of Rome “La Sapienza” and the Istituto Superiore di Sanità (Italian National Institute of Health) and was funded by the project “Prevenzione dei fattori di rischio della salute materno-infantile.”

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Am J Epidemiol Vol. 151, No. 1, 2000


