Induced abortion

Report of a
WHO Scientific Group

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Geneva, 14–18 November 1977

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INDUCED ABORTION

Report of a WHO Scientific Group

A WHO Scientific Group on Induced Abortion met in Geneva from 14 to 18 November 1977. The meeting was opened by the Secretary of the Scientific Group on behalf of the Director-General.

1. INTRODUCTION

A decade ago, the World Health Assembly, recognizing that abortion constituted a serious public health problem in many countries, urged the Organization to assist Member States, upon their request, in the development of family planning services within the basic health services (I). It also requested the Organization to encourage and promote research in human reproduction and the health aspects of fertility regulation.

Many countries have expanded the provisions for induced abortion within the health care system, and some have sought assistance from WHO in the development of abortion care, including the initiation of national training programmes. The Organization has also developed a range of research activities. In 1969, a Scientific Group on Spontaneous and Induced Abortion was convened in Geneva to discuss definitions, to examine the epidemiology and health effects of abortion, and to recommend research (2). Many of the issues raised in the research recommendations of that Scientific Group have either been resolved or are under investigation, in large part with WHO support and collaboration, through the activities of the Organization's Special Programme of Research, Development and Research Training in Human Reproduction, its Division of Health Statistics, and its Division of Family Health.

The present meeting was convened to review current knowledge of the epidemiology of induced abortion, of the efficacy and safety of techniques, and of the organization of abortion services.

REFERENCES

2. EPIDEMIOLOGY OF INDUCED ABORTION

Epidemiological data on abortion are available in a number of countries in which abortion is legal and freely available. Even in these countries, however, such data may not be complete. Data from countries in which abortion is illegal are always fragmentary and unreliable. However, restrictive abortion regulations are sometimes not adhered to in practice, so that reliable information is occasionally available from those countries in which this situation obtains. In the following section, data on both legal and illegal abortion are included—the limitations of the latter notwithstanding—in an attempt to present as complete as possible a picture of the dimensions and health implications of induced abortion.

2.1 Sources of information

2.1.1 Registration of abortion

Registration provides reliable and comprehensive information in some countries, but elsewhere reporting may be incomplete and lacking in detail, or the data collected may not be published. Underreporting may occur owing to unduly complex forms, concern for confidentiality, especially in private practice, or other reasons. The study of abortion rates after a liberalization of abortion laws may allow estimates of the preliberalization incidence of illegally induced abortion. Registration of abortion that does not make a distinction between legal, illegal and spontaneous abortions is of little value. Even when the three types of abortion are distinguished, the information remains incomplete, since spontaneous abortions would only be registered in the event of hospital admission or medical consultation, and thus undoubtedly many very early abortions would be missed. Illegal abortions would at best be registered only if complications arose.

2.1.2 Hospital statistics

Official hospital statistics may not be a reliable source of comparative data, either between countries or over time. Definition or preference of diagnostic categories may vary; incomplete abortions may not be identifiable as induced or spontaneous. At the same time, where induced abortion is illegal, many physicians intentionally classify known or suspected induced abortion as being spontaneous abortion. Even where abortion is legally provided, there may be differences in insurance or
sick-leave benefits for induced and spontaneous abortions; such differences may result in deliberate misclassification.

Hospital statistics on the categories "incomplete abortions" or "septic abortions" have been proposed as an indicator of induced abortion in areas where abortion is illegal. Use of such categories may be subject to bias; for example, access to illegal abortion performed under safe conditions may depend on social position.

Some of the problems described above could be alleviated by systematic efforts to standardize diagnostic criteria and hospital records.

2.1.3 Mortality statistics

Since certification of cause of death is often inaccurate—particularly in cases of spontaneous or illegal abortion—and since the fatality rate is not known for either category, it is not possible to make even rough estimates of the incidence of illegal abortion from mortality statistics. The accuracy of reporting might be improved if deaths due to abortion were reviewed along with other maternal deaths and with deaths due to other causes in women in the reproductive age group. In addition, health authorities should monitor reports on abortion deaths in the medical literature and other appropriate sources of information.

2.1.4 Changes in birth rates

Assuming constant conception rates, numbers of births and numbers of abortions are inversely related. Since spontaneous abortion is unlikely to change much, a rise or fall in the induced abortion rate may be inferred from a fall or rise in the birth rate, especially over short periods (as in Romania in 1966–1972, when the number of illegal abortions increased after sudden restrictions in the abortion law). For unmarried women, both the illegitimate birth rate and the rate of births after pre-nuptial conception should be studied.

2.1.5 Surveys of providers of abortion

Surveys of providers of legal abortion have yielded useful results in the USA and are now being undertaken in the Republic of Korea. If health authorities desire information on illegal abortion, surveys of illegal providers who are not medically qualified could be attempted.
2.1.6 Retrospective surveys

Efforts have been made to carry out retrospective surveys in a number of countries in which abortion is illegal. However, the incidence of underreporting by respondents is not known. In fact, even where abortion is legal, reporting can be as low as 55% of the cases, as has been revealed in retrospective interviews conducted two years later in the home (f). It is likely that information is more reliable (though not completely so) when obtained as part of a medical history, and less reliable in settings where abortion is illegal.

During the last twenty years, retrospective studies of illegal abortion have been conducted in Greece, Malaysia, the Republic of Korea, Turkey, and several Latin American countries (2-7). Findings from these surveys are of variable validity. A high rate of underreporting was found in Turkey and Venezuela, where field data were cross-validated with hospital data.\(^1\)

Although such studies cannot give reliable figures on the incidence of induced abortion, they do allow estimates of changes over time and provide data on certain characteristics of women having abortions, including attitudes and practices in relation to contraception. Comparisons between groups of women with different characteristics (i.e., educational level, ethnicity, etc.) may be misleading, since the rate of underreporting may vary between groups. Some investigators have utilized the randomized response technique—a method that allows the respondent to answer interview questions on her abortion experience anonymously. This method has the disadvantage of requiring a large sample size and a high degree of statistical sophistication in order to avoid gross overestimates and underestimates.

2.1.7 Prospective studies

Monthly interviews and/or collection of urine or venous blood for pregnancy testing are theoretically the most accurate method of gathering data on all pregnancies, but experience has shown that cooperation is difficult to obtain and many women drop out of the study. In addition, the interpretation of "false positives" is open to question. Prospective studies have the disadvantage of being expensive, especially when they involve the use of laboratory tests.

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\(^1\) Cited in a report by the WHO Task Force on the Assessment of the Sequelae of Abortion (in preparation).
2.1.8 **Combination of hospital and field studies**

The WHO Task Force on the Assessment of the Sequelae of Abortion\(^1\) attempted to develop a method which would define both epidemiological parameters and health service costs of illegally induced abortion by developing a specifically designed research protocol (Annex I). This design requires the collection of data from a hospital, to be followed by a field study among the women of the community served by the same hospital. The hospital-based study should precede the field study to the extent that the field interviews for the two studies cover the same period of time. This procedure would allow cross-validation of findings from the field with the findings of the hospital-based study by reinterviewing previously hospitalized women in their homes. This method has been adopted in current studies in Nigeria, Turkey, and Venezuela. Preliminary findings suggest that, while the method might not necessarily provide satisfactory data on illegal abortion incidence, it could furnish useful data on the health service cost of illegal abortion.

2.1.9 **Prosecutions for illegal abortion**

Such data are not a useful guide to the incidence of the phenomenon, since even in those countries in which abortion is completely illegal, and illegal abortion is common, prosecution rarely occurs.

2.1.10 **Medical insurance statistics**

Since the confidential doctor-patient relationship discourages correct reporting of diagnosis, medical insurance statistics are almost completely useless as a source of information about the frequency of abortion.

2.2 **Estimated incidence**

Abortion is common but exceedingly difficult to measure. However, it is unlikely that any population has attained a low level of fertility without the use of induced abortion, legal or illegal.

2.2.1 **Illegal abortion**

About 60% of the world’s population live in countries in which abortion is either illegal or permitted only for specified indications.

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\(^1\) A group of scientists from developing and developed countries who formulate and implement collaborative research projects within the framework of the WHO Special Programme of Research, Development and Research Training in Human Reproduction.
Legal restrictions notwithstanding, it is widely recognized that abortion constitutes one of the most prevalent methods of fertility control. Evidence from recent studies in Latin America suggests a large increase of illegal abortion (6). This practice is widespread and has become increasingly frequent among women of the more disadvantaged social groups. It has also been shown that the number of illegal abortions in certain sections of the population can be reduced by family planning programmes (9, 10).

2.2.2 Legal abortion

In calculating abortion incidence, a clear distinction should be made between abortion rates and ratios. The two concepts furnish different, but complementary, information on the subject. Both indicators are necessary if the phenomenon of induced abortion is to be understood. An apparent rise in abortion ratios is often due not to an increased number of abortions but to a reduced number of births.

The patterns of legal abortion rates (per 1000 women) and abortion ratios (per 1000 births or pregnancies) vary widely among countries and regions, reflecting differences in premarital sexual behaviour, age at marriage, desired family size, availability of and access to contraceptive services (including surgical sterilization), use of contraception for postponing the first birth, spacing births and/or terminating childbearing, as well as the legal and economic restraints, religious and moral attitudes, and social pressures surrounding abortion. It has been noted, for example, that in such countries as Sweden, the United Kingdom and the USA, women under 20 years of age, unmarried women and childless women represent a high proportion of those obtaining legal abortions, while in the countries of eastern Europe, mature women, married women and mothers predominate. These differences in percentages do not tell the whole story, however. They do not so much reflect higher abortion rates among the very young, the unmarried, and the childless in the western countries, compared with eastern Europe, but rather higher rates among the older, married women with children in the latter countries. These higher rates, in turn, appear to be related to differences in access to and utilization of contraception and surgical sterilization. In the USA and western and northern Europe, highly effective methods of contraception are widely used by married couples and sterilization is increasingly chosen by those couples who have achieved the number of offspring they desire. In eastern Europe, on the other hand, modern contraceptive methods have only recently gained acceptance, while surgical sterilization is discouraged by governments. Legal abortion is
therefore widely used as a method of child-spacing as well as for the ultimate limitation of family size.

In the few countries of the developing world in which relatively large numbers of legal abortions are performed, these are still heavily concentrated among older, high-parity women. In certain urban areas, however, increasing numbers of unmarried, childless teenagers are seeking and obtaining legal abortions. It cannot be determined to what extent this phenomenon reflects a shift from clandestine (and unreported) abortion to legal services, or major changes in sexual behaviour.

Another difficulty in the estimation of abortion incidence is related to the mobility of abortion-seeking women. Studies from countries or areas in which legal abortion is not widely available suggest that women seeking pregnancy termination will often have recourse either to illegal abortion (11) or to legal abortion in other areas (12) or even other countries.

Table 1 shows legal abortion rates and ratios in recent years for countries in which the data concerned are available.

The rapid rise in the number of abortions reported in all countries after a liberalization of their abortion laws reflects in part a replacement of illegal abortions by legal abortions and in part a replacement of unwanted births by abortions. The relative magnitude of the two components undoubtedly varies from country to country, but cannot be determined with certainty. The shift from illegal to legal abortion is reflected in a decline in abortion mortality, documented in many countries. This decline may occur in two phases: in the early stage, deaths due to legal abortion may merely replace deaths following illegal procedures; later, the total number of abortion-related deaths declines.

Available data lend no support to the concern sometimes voiced that a large proportion of couples have abandoned contraceptive efforts after legal abortion has become more accessible (13).

Another feature of abortion practice which sometimes gives rise to the fear that abortion is replacing contraception as a method of fertility control is the fact that the percentage of abortions done on women who report having had previous induced abortions increases over time. The rate at which women admit to having had previous induced abortions is, of course, variable. However, an increase is inevitable as the population of women who have already had one abortion (and are therefore at risk of requiring another) increases. It should be remembered that the population which forms the denominator of the first abortion rate includes women who are not sexually active, those who have conscientious or other objections to abortion, those who want to have children,
## Table 1

<table>
<thead>
<tr>
<th>Country</th>
<th>Year *</th>
<th>Number of abortions a</th>
<th>Abortion rate per 1000</th>
<th>Abortion ratio per 1000 c</th>
<th>Live births</th>
<th>Live births plus abortions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>1974</td>
<td>123 500</td>
<td>14.2</td>
<td>65.8</td>
<td>828</td>
<td>453</td>
</tr>
<tr>
<td>Canada</td>
<td>1975</td>
<td>49 300</td>
<td>2.2</td>
<td>9.5</td>
<td>138</td>
<td>121</td>
</tr>
<tr>
<td>Canada (including residents of Canada obtaining abortions in the USA)</td>
<td>1975</td>
<td>39 000</td>
<td>2.6</td>
<td>11.4</td>
<td>185</td>
<td>142</td>
</tr>
<tr>
<td>Cuba</td>
<td>1974</td>
<td>131 500</td>
<td>14.5</td>
<td>71.3</td>
<td>640</td>
<td>381</td>
</tr>
<tr>
<td>Czechoslovakia</td>
<td>1976</td>
<td>84 600</td>
<td>5.7</td>
<td>26.7</td>
<td>595</td>
<td>227</td>
</tr>
<tr>
<td>Denmark</td>
<td>1976</td>
<td>26 800 a</td>
<td>5.3</td>
<td>25.8</td>
<td>410</td>
<td>291</td>
</tr>
<tr>
<td>England and Wales a</td>
<td>1976</td>
<td>101 000 a</td>
<td>2.1</td>
<td>10.5</td>
<td>173</td>
<td>147</td>
</tr>
<tr>
<td>Finland</td>
<td>1976</td>
<td>19 000 a</td>
<td>4.1</td>
<td>16.0</td>
<td>228</td>
<td>224</td>
</tr>
<tr>
<td>France</td>
<td>1976</td>
<td>133 500 a</td>
<td>2.5</td>
<td>12.4</td>
<td>198</td>
<td>156</td>
</tr>
<tr>
<td>German Democratic Republic</td>
<td>1975</td>
<td>87 800</td>
<td>5.2</td>
<td>25.2</td>
<td>485</td>
<td>325</td>
</tr>
<tr>
<td>Hungary</td>
<td>1978</td>
<td>94 700 a</td>
<td>8.9</td>
<td>41.5</td>
<td>511</td>
<td>338</td>
</tr>
<tr>
<td>India a</td>
<td>1978</td>
<td>214 000 a</td>
<td>0.35</td>
<td>1.7</td>
<td>9 a</td>
<td>9 a</td>
</tr>
<tr>
<td>Japan a</td>
<td>1978</td>
<td>664 100</td>
<td>5.9</td>
<td>24.9</td>
<td>350</td>
<td>264</td>
</tr>
<tr>
<td>Norway a</td>
<td>1975</td>
<td>15 100 a</td>
<td>3.8</td>
<td>19.7</td>
<td>271</td>
<td>213</td>
</tr>
<tr>
<td>Poland a</td>
<td>1975</td>
<td>138 600</td>
<td>4.1</td>
<td>17.5</td>
<td>215</td>
<td>177</td>
</tr>
<tr>
<td>Scotland</td>
<td>1975</td>
<td>7 300</td>
<td>1.4</td>
<td>7.1</td>
<td>108</td>
<td>97</td>
</tr>
<tr>
<td>Scotland (excluding residents of Scotland obtaining abortions in England)</td>
<td>1975</td>
<td>8 400</td>
<td>1.6</td>
<td>8.1</td>
<td>123</td>
<td>110</td>
</tr>
<tr>
<td>Singapore</td>
<td>1976</td>
<td>15 500</td>
<td>8.8</td>
<td>27.5</td>
<td>362</td>
<td>286</td>
</tr>
<tr>
<td>Sweden</td>
<td>1978</td>
<td>32 400 a</td>
<td>3.9</td>
<td>20.1</td>
<td>330</td>
<td>248</td>
</tr>
<tr>
<td>Tunisia a</td>
<td>1978</td>
<td>20 900</td>
<td>3.5</td>
<td>17.1</td>
<td>100 a</td>
<td>91 a</td>
</tr>
<tr>
<td>United States of America a</td>
<td>1975</td>
<td>1 034 200</td>
<td>4.8</td>
<td>22.1</td>
<td>322</td>
<td>247</td>
</tr>
</tbody>
</table>

### Sources:
- *Latest year for which data are available.*
- *All numbers rounded to nearest 100.*
- *Recomputed using live births during the same period as the abortions.*
- *Preliminary data.*
- *Residents only.*
- * Abortions performed under the National Family Planning Programme.*
- *Reporting incomplete.*
- *Fiscal year ending 31 March.*
- *Based on estimated births.*
- *Approved applications.*
- *Abortions reported in survey of service providers by the Alan Guttmacher Institute, New York, NY, USA.*
and those who have been sterilized or are infertile, etc.—all of which effectively reduces the first abortion rate. The population seeking a repeat abortion, on the other hand, is composed of women who are fertile, sexually active, use methods of contraception which are less than satisfactory, do not want to give birth (at least for the time being) and do accept abortion as a means of avoiding an unwanted birth (14).

A higher incidence of repeat abortion must be expected in settings where effective contraception is not used and, specifically, where contraceptive services are not offered to women undergoing abortion, or where voluntary sterilization is not available.

2.3 Social and demographic characteristics of women seeking illegal abortions

As with all other data on illegal abortion, information on the social and demographic characteristics of women resorting to illegal abortions is fragmentary and biased. Some of the reasons for the bias are evident from the discussion presented in section 2.1.

The variety of factors, including reproductive behaviour, accessibility and use of effective contraception, socioeconomic conditions and cultural mores, is such as to produce different patterns of social and demographic characteristics among those who have illegally induced abortions in different countries and areas. Although data on illegal abortion are often fragmentary and biased, they are useful in order to develop or modify the appropriate services. For example, in circumstances where there is limited access to contraception, a predominance of hospitalizations on account of septic abortion among high-parity older women certainly demonstrates a need for postpartum family planning services, as well as the likelihood that these services will be well received. On the other hand, a high or increasing number of such cases among single, nulliparous women requires a different approach.

Whereas in many developing countries there is an association between increasing age and parity with induced abortion, in the urban areas of some countries there is a suggestion that the relative numbers of cases among young, single, educated women are not insignificant and may be rising. However, as noted previously, the difficulty of obtaining reliable information from some or all groups leaves much to speculation.

It is generally held that access to medical care and the ability to pay for that care are closely associated with fewer risks of complications from illegally induced abortions among more advantaged women. When socially disadvantaged women seek abortions, they are at increased risk
of serious complications because they are able to afford only low-cost abortions carried out by untrained persons and under unsafe conditions.

2.4 Relationship of induced abortion to contraception

Data on the availability and use of contraception may be as unreliable as information relating to the incidence of induced abortion, but it seems that the contribution of contraception and induced abortion in reducing fertility usually varies during demographic transition in the following manner: both induced abortion and contraceptive use increase, but while induced abortion may make a relatively large initial contribution to the decline in the birth rate, it is overtaken by contraception within a few decades. The speed with which this phenomenon occurs, and indeed whether it occurs at all, depend upon the rate at which contraception is adopted. The introduction of contraception into a situation where induced abortion is the main method of fertility control has been shown to be associated with a decline in induced abortion (15).

In the absence of contraception, induced abortion is a relatively inefficient method of fertility control because two to three abortions would be possible during the period occupied by one full-term pregnancy and lactation. Long-term trends in contraceptive practice have been shown not to be adversely affected by the introduction of liberal abortion laws. In the USA, for example, a series of four surveys showed that the proportion of white married women aged 15–44 years who were protected by contraception (including sterilization) increased from 66.5% to 79.0% during the period 1965–1975 (Table 2). Between 1965 and 1970, when legal abortion was generally not available, the annual increment in the number of women protected was 0.2%. From 1970 to 1973, when abortion was available on request in some states, the annual increment

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage using contraception</th>
<th>Percentage Increment</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Annual</td>
</tr>
<tr>
<td>1965</td>
<td>66.5</td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>67.6</td>
<td>1.1</td>
</tr>
<tr>
<td>1973</td>
<td>72.9</td>
<td>0.3</td>
</tr>
<tr>
<td>1975</td>
<td>79.0</td>
<td>0.1</td>
</tr>
</tbody>
</table>

reached 1.8%, rising to 3.0% after abortion was made increasingly available by the Supreme Court ruling in 1973 (16).

The proportion of sexually active unmarried women in the USA aged 15–19 years who reported contraceptive use also rose markedly over the same period.

An increase in contraceptive use following liberalization of the abortion laws was also observed in other countries such as the German Democratic Republic and India. While the main reason for increased contraceptive use is the general desire for fertility control, another factor might be increased provision by the health services system of contraceptives counselling.

2.5 Consequences of illegal abortion for health

2.5.1 Mortality

Mortality and morbidity from illegal abortion vary according to the conditions under which the abortion is performed, the type of procedure, the skill of the person performing it, the stage of gestation, age, health and parity of the woman, etc.

It is not possible to arrive at an estimate of the fatality rate for illegal abortions, since the number of procedures performed is unknown. Although data are unavailable and estimates are often based on arbitrary assumptions, it is beyond doubt that illegal abortion contributes considerably to the maternal mortality rate, especially where this rate is high.

Some evidence of the contribution of illegal abortion to mortality can be obtained by examining changes in mortality following changes in the abortion laws. It has been observed that the liberalization of abortion laws is generally followed by a reduction in maternal mortality due to abortion as well as in morbidity and hospital admissions for abortion complications. Conversely, restriction of previously liberal abortion laws may result in an increase in morbidity and mortality, as is illustrated by the experience of Romania. In that country, prior to November 1966, when a relatively restrictive abortion law came into force in an effort to raise the birth rate, almost all induced abortions performed were legal terminations. Thereafter, the number of admissions to hospital on account of complications associated with illegal abortion and the number of deaths attributed to abortion increased sharply (see Fig. 1 and Table 3).

Since mortality from obstetrical causes kept declining during the period 1965–1972, despite a marked increase in fertility, the changes in
Fig. 1
Birth rate per 1000 population and number of deaths from abortion, Romania, 1961–1972.

Table 3
Birth-related and abortion-related deaths in Romania, 1965–1972

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of obstetrical deaths</th>
<th>Rate per 100 000 births</th>
<th>Number of abortion deaths</th>
<th>Rate per 100 000 women aged 15-44 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>173</td>
<td>51.3</td>
<td>64</td>
<td>1.4</td>
</tr>
<tr>
<td>1966</td>
<td>152</td>
<td>46.5</td>
<td>83</td>
<td>1.9</td>
</tr>
<tr>
<td>1967</td>
<td>311</td>
<td>41.3</td>
<td>170</td>
<td>3.8</td>
</tr>
<tr>
<td>1968</td>
<td>395</td>
<td>36.1</td>
<td>221</td>
<td>4.9</td>
</tr>
<tr>
<td>1969</td>
<td>229</td>
<td>31.0</td>
<td>622</td>
<td>8.8</td>
</tr>
<tr>
<td>1970</td>
<td>182</td>
<td>30.8</td>
<td>715</td>
<td>8.9</td>
</tr>
<tr>
<td>1971</td>
<td>158</td>
<td>28.8</td>
<td>364</td>
<td>7.9</td>
</tr>
<tr>
<td>1972</td>
<td>136</td>
<td>29.8</td>
<td>370</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Source: World Health Statistics Annual for the years concerned.

* As of 1 November 1966.
abortion mortality were probably the result of an increase in illegal abortion.

2.5.2 Morbidity

The mortality confirmed by evidence as being related to illegal abortion is but the tip of the iceberg in comparison with the morbidity related to this cause. Unfortunately, data on morbidity are very limited and fragmentary. In general, illegally induced abortion is considered a cause of frequent and severe short-term complications and long-term sequelae. Because illegal abortions are performed often by unqualified persons under insanitary conditions and sometimes late in pregnancy, they constitute a serious public health problem. The most common complications experienced are excessive blood loss, pelvic infection and shock.

Many of the patients concerned require hospitalization. For example, in Italy a study of illegal abortion performed by non-medically-qualified persons using catheter insertion revealed that about half the cases had to be admitted to hospital (11). Illegal abortions performed by a physician are, of course, likely to be safer and less frequently require hospitalization.

The morbidity associated with illegal abortion would be expected to be reduced after the liberalization of legal codes and the provision of safe abortion services. There are now data from several countries confirming this hypothesis. In New York City, USA, for example, the number of admissions to the ten municipal hospitals for complicated illegal abortions was reduced by about 50% in the years following liberalization of the law in 1970 (17). A 50% drop in the number of such admissions has also been reported from Yugoslavia during the decade following the liberalization of the abortion law (18). Similar reductions were observed in other eastern European countries and in Great Britain.

The reduction in morbidity due to illegal abortion may not be observed immediately after the liberalization of abortion laws. It is evident that in order to achieve such a reduction, not only must appropriate services be made available to the population, but also women must be informed of their existence and be motivated to use them. In settings where abortion is not only illegal but also subject to social and moral disapproval, the health benefits derived from the liberalization of abortion laws may not become evident until several years later, since illegal abortions will continue to be performed on women who do not meet the requirements of the law, who do not know the legal situation, or who do not wish to seek abortion openly.
No data are available on the possible negative consequences for the health of infants (such as increased perinatal and infant mortality associated with unsuccessful attempts at illegal abortion or with neglect).

2.6 Research in progress

The Scientific Group was aware of the following investigations in progress:

(1) Methodological studies designed to develop methods of estimating the impact on health and cost to health services of clandestine abortions in various communities.

(2) Follow-up studies of contraceptive practice after abortion.

(3) Continued evaluation of incidence and patterns of legal abortion in various communities and countries.

(4) Continued evaluation of repeat abortion.

(5) Continued evaluation of the interrelationships between abortion, contraception and fertility (in the demographic sense—i.e., birth rate).

REFERENCES


3. MEDICAL ASPECTS OF LEGAL ABORTION

3.1 Mortality

Fertility rates associated with legally induced abortion, which are well documented in many countries, have declined substantially over the past decades, as is shown in Table 4. Differences in rates between countries and over time are often due partly to differences in the stage of gestation at which abortion is performed and partly to the fact that in earlier years abortion was more often performed on women with concomitant illnesses.

Mortality due to abortion increases steeply as the period of gestation at which it is performed lengthens (see Table 5).

It is unlikely that the lowness of abortion fatality rates obtaining in developed countries will rapidly be achieved in developing countries, especially in rural areas—in which setting, however, birth-related mor-
Table 4
Legal abortion deaths for selected countries and years

<table>
<thead>
<tr>
<th>Country and year</th>
<th>Number of abortions</th>
<th>Number of deaths</th>
<th>Mortality ratio per 100 000 abortions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czechoslovakia:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1957-1966</td>
<td>721 300</td>
<td>28</td>
<td>3.8</td>
</tr>
<tr>
<td>1967-1972</td>
<td>587 500</td>
<td>11</td>
<td>1.9</td>
</tr>
<tr>
<td>Denmark:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1940-1950</td>
<td>19 500</td>
<td>38</td>
<td>194.9</td>
</tr>
<tr>
<td>1953-1957</td>
<td>23 700</td>
<td>16</td>
<td>87.5</td>
</tr>
<tr>
<td>1961-1965</td>
<td>27 400</td>
<td>9</td>
<td>32.8</td>
</tr>
<tr>
<td>1967-1978</td>
<td>149 300</td>
<td>4</td>
<td>2.7</td>
</tr>
<tr>
<td>England and Wales:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1968-1970</td>
<td>165 000</td>
<td>34</td>
<td>20.6</td>
</tr>
<tr>
<td>1971-1972</td>
<td>286 700</td>
<td>29</td>
<td>10.1</td>
</tr>
<tr>
<td>1972-1973</td>
<td>330 100</td>
<td>13</td>
<td>3.9</td>
</tr>
<tr>
<td>Hungary:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1957-1962</td>
<td>917 300</td>
<td>40</td>
<td>4.4</td>
</tr>
<tr>
<td>1963-1967</td>
<td>912 800</td>
<td>13</td>
<td>1.4</td>
</tr>
<tr>
<td>1969-1975</td>
<td>1 334 400</td>
<td>16</td>
<td>1.2</td>
</tr>
<tr>
<td>Sweden:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1948-1948</td>
<td>10 700</td>
<td>97</td>
<td>252.3</td>
</tr>
<tr>
<td>1949-1953</td>
<td>28 000</td>
<td>27</td>
<td>96.4</td>
</tr>
<tr>
<td>1954-1963</td>
<td>35 200</td>
<td>21</td>
<td>59.7</td>
</tr>
<tr>
<td>1964-1975</td>
<td>201 200</td>
<td>7</td>
<td>3.5</td>
</tr>
<tr>
<td>United States of America:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>163 500</td>
<td>50</td>
<td>16.0</td>
</tr>
<tr>
<td>1971</td>
<td>489 800</td>
<td>48</td>
<td>9.5</td>
</tr>
<tr>
<td>1972</td>
<td>568 800</td>
<td>24</td>
<td>4.1</td>
</tr>
<tr>
<td>1973</td>
<td>744 600</td>
<td>26</td>
<td>3.5</td>
</tr>
<tr>
<td>1974</td>
<td>888 600</td>
<td>27</td>
<td>3.0</td>
</tr>
<tr>
<td>1975</td>
<td>1 024 200</td>
<td>27</td>
<td>2.6</td>
</tr>
</tbody>
</table>

* Without sterilization.
# Deaths notified by hospitals reporting abortions.

Mortality would be correspondingly higher. Mortality due to first-trimester abortion is probably lower everywhere than that after full-term delivery.

A computer model based on data from developed countries, which takes into account the mortality risk due to legal abortion in the first trimester, to birth-related causes, and to various methods of contraception, suggests that the use of one of the barrier methods, with first-trimester legal abortion as a reserve measure in case of failure, is safer
Table 5
Standardized fatality rates after legal abortion and relative risk of corresponding birth-related mortality, by week of gestation, USA, 1972–1975

<table>
<thead>
<tr>
<th>Weeks of gestation</th>
<th>Deaths per 100 000 legal abortions</th>
<th>Birth-related relative risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 or less</td>
<td>0.6</td>
<td>24.8</td>
</tr>
<tr>
<td>9–10</td>
<td>1.7</td>
<td>8.8</td>
</tr>
<tr>
<td>11–12</td>
<td>3.6</td>
<td>4.1</td>
</tr>
<tr>
<td>13–15</td>
<td>7.1</td>
<td>2.1</td>
</tr>
<tr>
<td>16 or more</td>
<td>20.2</td>
<td>0.7</td>
</tr>
</tbody>
</table>


† Relative risk of death attributed to complications of pregnancy, childbirth, and the puerperium, excluding abortion and ectopic pregnancy, compared to abortion-related deaths, standardized to population of women with no abortion, same maternal age and race, same week of gestation (woman’s age and race, week of gestation) assumed to be independent of other abortion outcomes.

The standardised birth-related mortality rate was 14.9 per 100 000 live births.

(in terms of mortality) than all other available fertility-regulating procedures (I). This model is not, however, applicable to developing countries, and the data available are insufficient to permit the construction of a model that would be of relevance to those countries.

3.2 Morbidity

Postabortion complications and sequelae can conveniently be divided into "early"—i.e., those occurring within a month of the abortion—and "late"—i.e., those occurring after the first month. The "early" complications can be further subdivided into "immediate" complications, occurring (although not necessarily diagnosed) during the procedure and recovery period, and "delayed" complications, occurring during the remainder of the first month.

3.2.1 Early complications

In a large-scale study conducted in the USA in 1970–1971 (2), early complications following legal abortion (including uterine perforation, cervical injury, pelvic infection, haemorrhage, retained products of conception, thromboembolism, and anaesthetic and psychiatric complications) were reported three to five times more frequently after second-trimester abortion than after first-trimester abortion. The pattern was the same for major and minor complications.
3.2.2 Late sequelae

3.2.2.1 Rh sensitization. Sensitization of an Rh-negative woman during the abortion of an Rh-positive fetus does occur, but the incidence can be reduced by injection of anti-Rh immunoglobulin within 72 hours of the operation. Because the earliest stage of gestation at which such sensitization can occur and the minimum dose of immunoglobulin required to prevent it are not known, it is customary to give the full dose (300 μg) to all women at risk.

3.2.2.2 Psychological aspects. Much has been published on the psychological aspects of abortion. The diversity of opinion about the nature of psychological sequelae seems to be due to failure to take into account previous psychiatric illness, the stigma attaching to pregnancy out of wedlock, discord in personal relationships, the psychic trauma of genital-tract surgery, the distress associated with administrative delays and with hostile staff attitudes, and possible regrets about sterilization if this procedure is combined with the abortion.

However, there is now a substantial body of data, reported from many countries after careful and objective follow-up, suggesting frequent psychological benefit and a low incidence of adverse psychological sequelae; moreover, when postabortion depression does occur, it is apparently often due to stresses other than the abortion (3). There is some evidence that guilt and depression are commoner in cases where the abortion was performed for strictly medical indications (e.g., ill health of the mother or suspected or diagnosed malformation of the fetus). A recent study in England has established that the incidence of postabortion psychosis is very low (0.3 per 1000 legal abortions) compared with postpartum psychosis (1.7 per 1000 deliveries) (4).

Any evaluation of the psychological sequelae of induced abortion must be judged in the context of the stress of having an unwanted pregnancy, and the possible hazards of refused abortion. However, straightforward comparison of the psychological sequelae of abortion granted with those of abortion refused is impossible for the following reasons:

(1) Patients refused abortion are often overtly healthier or in better social circumstances than those granted abortion, and therefore should be expected to show a lower incidence of adverse sequelae.

(2) Most studies of refused abortion show a high incidence of illegal abortion, legal abortion obtained elsewhere, and spontaneous abortion. It cannot be assumed that the residual group continuing the pregnancy are representative of the whole.
(3) It is difficult to obtain the cooperation in follow-up of women whose request for abortion has been denied.

The outcome of refused abortion is nevertheless of great interest in view of its implications for the health and happiness not just of the woman but also of the child. In women with psychiatric disease who have been refused abortion, reports describe little change in the psychiatric condition, but incapacity to look after the child is common (5). A study of women in Sweden without overt psychiatric disease showed that, although many who were refused abortions did adjust to their situation and grew to love the child, about half would have preferred abortion, a large minority suffered considerable distress, and a small minority developed severe disturbance (6).

The methodological problems of studying the outcome of refused abortion for the child are formidable, but according to the results of an investigation recently reported from Czechoslovakia (7), which has taken account of the problems, the children concerned—especially the boys—suffer some degree of social, medical and psychological disadvantage.

3.2.2.3 Infertility. It is obviously possible that unsuccessfully treated pelvic infection following an abortion may result in relative or complete infertility. Fortunately this chain of events is very rare when abortion is performed by skilled practitioners in a medical setting. There is no evidence that infertility occurs more or less often after abortion carried out under such conditions than after delivery in comparable circumstances.

3.2.2.4 Long-term sequelae. When the long-term sequelae of induced abortion are immediately followed by a complication, the relation between the events is clear. Those which affect a succeeding pregnancy follow after a lapse of time during which other factors may intervene. Prospective studies, while desirable, are beset by formidable difficulties, which are insuperable in the case of illegal abortion.

A large number of retrospective inquiries have been made, some of which suggest that legal abortion is followed in a subsequent pregnancy by an increased risk of spontaneous abortion, ectopic pregnancy, short gestation and reduced birthweight. Reports from Hungary (8, 9) suggested that the widespread use of legal abortion had led to a reduction of mean birthweight through the mechanism of cervical incompetence. Two studies, one carried out in Great Britain (10) and the other in Israel (11), confirmed the Hungarian findings, but other investigations, in

23
China (Provinz of Taiwan) (12), Japan (13), the USA (14) and Yugo-
slavia (15), failed to do so.

Second-trimester abortion is also reported to be more common in
pregnancies following legal abortions in Great Britain (10, 16, 17) and
Poland (18), but this was not confirmed in China (Provinz of Taiwan (12)
or the USA (14).

The apparently conflicting results from these studies may be due to
the fact that the characteristics of the women who had abortions differed
from those of their peers who did not, to differences between the centres,
and to differences in the technique of abortion and the research methods
which were used.

A WHO Task Force study of the long-term sequelae of abortion
recruited women when they attended for routine antenatal care in nine
different centres. Women whose last pregnancy had terminated in an
induced abortion (index group) were then compared with three control
groups of comparable age and social class. It was soon apparent that
there were important differences in the characteristics of the index group
which could affect the outcome of the current pregnancy. Furthermore,
these characteristics differed in their frequency and social connotation
between centres. Smoking, stage of gestation at first antenatal attend-
ance, education and marital status were the most important of these
variables.

In order to make valid comparisons, the outcome of pregnancy was
compared between subgroups so that women whose only experience of
pregnancy was an induced abortion were compared with primigravidae
and with those whose only pregnancy experience had been either sponta-
aneous abortion or live birth. Mean birthweight was found to be lower
in the index subgroup than in primigravidae, but this difference dis-
appeared when allowance was made for the effect of smoking. The mean
birthweight for second babies was higher than that for first babies, as
would be expected, but when the first pregnancy had ended as an induced
or spontaneous abortion, the mean birthweight of the subsequent infants
was no different from that of first babies born to the primigravidae.

A similar analysis of gestation length was carried out after exclusion of
those women with uncertain menstrual dates. Mean gestation in those
who previously had had an induced abortion, a spontaneous abortion or
given birth to a live child was two days less than in primigravidae.

The influence of the method of abortion was examined by comparing
those women in the index group who had had a dilatation and curettage
with those who had had vacuum aspiration. The analysis was complicated
by the fact that the selection of method was strongly centre-specific.
Three centres (Debrecen (Hungary) and Łódź and Warsaw (Poland)) used dilatation and curettage almost exclusively, while four other centres favoured vacuum aspiration (Copenhagen (Denmark), Newcastle (England), Helsinki (Finland) and Ljubljana (Yugoslavia)). Only three centres (Helsinki, Ljubljana and Stockholm) used both methods. Tables 6, 7 and 8 illustrate respectively the incidence of low birthweight (less than 2501 g), short gestation (less than 258 days), and mid-trimester spontaneous abortion for the index and control groups. In the three centres in Hungary and Poland, where dilatation and curettage was the main method used, the rate of low birthweight was significantly greater in infants born to women who had had either an induced or a spontaneous abortion than in those whose mothers’ only previous pregnancy had resulted in a live birth. Part of the effect on low birthweight may be explained by the effects of parity. In the centres where both dilatation and curettage and vacuum aspiration were used, induced abortion by the latter method and spontaneous abortion were associated with a significantly increased rate of short gestation. In the two centres where induced abortion was nearly exclusively by vacuum aspiration, no effect was seen on the rates of low birthweight, short gestation or mid-trimester spontaneous abortion.

The study design does not, of course, permit accurate estimation of the overall risk of spontaneous abortion following induced abortion, since recruitment to the study is at a stage later than that at which an unknown proportion of spontaneous abortions will have already occurred.

<table>
<thead>
<tr>
<th>Study group</th>
<th>Debrecen, Łódź and Warsaw centres</th>
<th>Copenhagen and Newcastle centres</th>
<th>Helsinki, Ljubljana and Stockholm centres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only previous pregnancy ended in:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Induced abortion by dilatation and curettage</td>
<td>78/796 (9.5%)</td>
<td>0/28 (7.1%)</td>
<td>2/155 (1.3%)</td>
</tr>
<tr>
<td>Induced abortion by vacuum aspiration</td>
<td>0/0*</td>
<td>10/297 (6.1%)</td>
<td>12/2033 (0.6%)</td>
</tr>
<tr>
<td>Spontaneous abortion</td>
<td>25/555 (4.5%)</td>
<td>36/540 (6.7%)</td>
<td>20/353 (5.7%)</td>
</tr>
<tr>
<td>Live birth</td>
<td>92/945 (9.5%)</td>
<td>23/492 (4.7%)</td>
<td>18,860 (0.2%)</td>
</tr>
<tr>
<td>No previous pregnancy</td>
<td>50/864 (5.8%)</td>
<td>17/461 (3.7%)</td>
<td>21,989 (0.2%)</td>
</tr>
</tbody>
</table>

Significant differences between groups using χ² tests excluding small group denoted by asterisk

| Dilatation and curettage vs. live birth | No significant differences between groups |
| Spontaneous abortion vs. live birth | χ² = 7.10; P < 0.01 | No significant differences between groups |

---

Table 6

Frequency of low birthweight (less than 2501 grams) for singleton live births
### Table 7
Frequency of short gestation (less than 258 days) for singleton live births

<table>
<thead>
<tr>
<th>Study group</th>
<th>Debreecen, Lódź and Warsaw centres</th>
<th>Copenhagen and Newcastle centres</th>
<th>Helsinki, Ljubliana and Stockholm centres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only previous pregnancy ended in:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Induced abortion by dilation and curetage</td>
<td>76/770 (10.3%)</td>
<td>9/26 (11.5%)</td>
<td>3/144 (2.15%)</td>
</tr>
<tr>
<td>Induced abortion by vacuum aspiration</td>
<td>0/2 *</td>
<td>12/253 (4.75%)</td>
<td>12/202 (5.97%)</td>
</tr>
<tr>
<td>Spontaneous abortion</td>
<td>27/341 (7.9%)</td>
<td>20/307 (6.5%)</td>
<td>22/348 (6.35%)</td>
</tr>
<tr>
<td>Live birth</td>
<td>66/698 (7.5%)</td>
<td>18/458 (3.95%)</td>
<td>12/389 (2.05%)</td>
</tr>
<tr>
<td>No previous pregnancy</td>
<td>69/833 (8.2%)</td>
<td>10/416 (2.4%)</td>
<td>18/334 (3.0%)</td>
</tr>
</tbody>
</table>

**Significant differences between groups using Mantel-Haenszel but excluding small group denoted by asterisk**

- No significant differences between groups
- Vacuum aspiration vs. live birth
  - $\chi^2 = 7.14; P < 0.01$
  - Spontaneous abortion vs. live birth
  - $\chi^2 = 9.99; P < 0.01$

### Table 8
Frequency of mid-trimester spontaneous abortion

<table>
<thead>
<tr>
<th>Study group</th>
<th>Debreecen, Lódź and Warsaw centres</th>
<th>Copenhagen and Newcastle centres</th>
<th>Helsinki, Ljubliana and Stockholm centres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only previous pregnancy ended in:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Induced abortion by dilation and curetage</td>
<td>40/676 (5.9%)</td>
<td>0/22</td>
<td>4/98 (4.13%)</td>
</tr>
<tr>
<td>Induced abortion by vacuum aspiration</td>
<td>1/2 *</td>
<td>2/192 (1.05%)</td>
<td>2/148 (1.39%)</td>
</tr>
<tr>
<td>Spontaneous abortion</td>
<td>19/297 (6.4%)</td>
<td>12/465 (2.56%)</td>
<td>6/264 (2.28%)</td>
</tr>
<tr>
<td>Live birth</td>
<td>13/676 (1.9%)</td>
<td>4/302 (1.31%)</td>
<td>6/462 (1.25%)</td>
</tr>
<tr>
<td>No previous pregnancy</td>
<td>15/740 (1.6%)</td>
<td>5/300 (1.65%)</td>
<td>6/364 (2.35%)</td>
</tr>
<tr>
<td>% booked by 14 weeks</td>
<td>60.7%</td>
<td>49.8%</td>
<td>48.1%</td>
</tr>
</tbody>
</table>

**Significant differences between groups using Mantel-Haenszel but excluding small group denoted by asterisk**

- Dilatation and curettage vs. live birth
  - $\chi^2 = 0.961; P < 0.001$
- Spontaneous abortion vs. primum gravida
  - $\chi^2 = 11.72; P < 0.001$
- Spontaneous abortion vs. live birth
  - $\chi^2 = 9.23; P < 0.01$
- Spontaneous abortion vs. primum gravida
  - $\chi^2 = 19.10; P < 0.001$
However, with a sufficient number of cases recruited by the 14th week after the last menstrual period, the risk of second-trimester abortion can be estimated. As noted in Tables 6, 7 and 8, among the women in the centres where dilatation and curettage predominated, there was a three-fold risk of second-trimester spontaneous abortion following abortion induced by that procedure, or following a previous spontaneous abortion. No such increase in risk was found following abortion induced by vacuum aspiration.

3.3 Particular groups at hazard of increased mortality and morbidity

3.3.1 Age

It has been clearly shown in a number of countries that very young women, particularly those who are unmarried, are more likely to obtain late and therefore more hazardous abortion than are more mature women. In a study in the USA (2), the morbidity (corrected for gestational stage) was rather stable until after 40 years of age, when it increased sharply.

3.3.2 Parity

Nulliparae are usually younger than parous women, and may be less familiar with the pathways for obtaining legal abortion, and so are more often late in seeking abortion. On the average, the force required to dilate the nulliparous cervix is greater than that required in the multiparous woman, so that the technical difficulties and hazards of an abortion at a later stage are increased.

A Yugoslav study showed significantly higher complication rates of first-trimester abortion in nulliparae than in women with a previous live birth. Women who had had a previous induced abortion did not differ in this respect from nulliparae (19). No evidence exists that early complications are more or less frequent for repeat abortions than for first abortions. There are reports, but no conclusive evidence, of adverse outcomes of subsequent pregnancies, but their importance should be assessed in the light of the reproductive intentions of the women concerned (e.g., if repeat abortion is being used as a method of family limitation, then theoretically adverse outcomes of subsequent pregnancies, which may rarely occur, are relatively unimportant).

3.3.3 Socioeconomic status

It is well established that women in lower socioeconomic groups tend to obtain abortion at a later stage of gestation, and are thus exposed
to greater risk. In Great Britain, the Lane Committee Report (20), found that this was partly because they presented late to their family doctors or other agencies, but also because their progress through the decision-making system was slower.

Data on socioeconomic status are not available for abortions performed in the USA. However, data on ethnic group suggest that the mortality rate for non-white women, who are often less privileged, is more than twice that for white women. This is true both before and after standardization for age and stage of gestation (21).

3.4 Techniques of abortion

3.4.1 Uterine curettage

This method has two major technical variations—namely, vacuum aspiration and classical curettage. Except in very early pregnancy, two types of surgical intervention are involved: first, dilatation of the cervix to allow the introduction of a cannula or a curette, and then evacuation of the products of conception.

3.4.1.1 Cervical dilatation:

(1) Preoperative dilatation

Because instrumental dilatation may be difficult and traumatic, especially in primigravidae at 10 or more weeks of gestation and in those with a tight and unyielding cervix, preoperative dilatation may offer some advantages. The available methods are insertion of Laminaria tents and administration of prostaglandins. Laminaria tents vary in diameter, and if several tents of small diameter (1.5 mm) are used, removal is facilitated. There is no evidence of an increased risk of infection. The standard practice is to leave the tent in place overnight, but how much the time interval may be reduced without losing effectiveness remains to be investigated.

Prostaglandins may be given by the vaginal, intracervical or extra-amniotic route, either the night before the operation, or a few hours before. The optimum route, compound, vehicle, and dosage have not yet been determined, but investigation of these aspects is in progress.

(2) Mechanical dilatation during operation

There is very little precise information on the immediate hazards of cervical dilatation, but in view of the potential long-term hazards (i.e., adverse effects at the next pregnancy), it is recommended that the cervix
should be dilated only to the minimum extent required to complete the evacuation. Research is needed (a) on the frequency of early and late complications of abortion in relation to the amount and speed of dilatation and the type of dilators used, and (b) on the effect of local and general anaesthesia upon the ease of dilatation of the cervix.

3.4.1.2 Uterine evacuation:

(1) Vacuum aspiration (suction curettage, uterine aspiration)

This is at present the most frequently used technique in the majority of countries in which induced abortion is available. The total complication rates for first-trimester abortions are, on the whole, lower than with other abortion techniques. Table 9 lists the clinically most significant complications found with this method as well as with classical curettage (see paragraph (2) below). The percentages indicated in Table 9 show the range of complication rates for each of the complications listed. The great variation in complication rates between various studies is true also for studies concerned with other methods; it reflects mainly variations in definitions and in study populations, and probably also, to some extent, differences in techniques, training, intensity of follow-up, etc.

Research on different types of aspiration cannulae has shown no clear-cut advantage of flexible, plastic cannulae over rigid metal ones. Plastic cannulae are more difficult to resterilize, and there is a danger of the tip breaking off in utero. Electrical suction pumps have been widely used in developed countries, but manually operated suction pumps have been found satisfactory in India, and would seem preferable in areas where electric power is not reliable.

A WHO Task Force study done in Ljubljana and Singapore (27) compared local and general anaesthesia in first-trimester vacuum aspiration by random allocation of patients. There was no difference in immediate complications such as major haemorrhage, although the volume of the aspirate was slightly increased with general anaesthesia in both centres. The rate of recurettage was increased with local anaesthesia in one centre, but not in the other. This might have been due to the fact that the local anaesthesia technique had only recently been introduced in the first centre, and the doctors had less experience of it. Clinical experience has shown that suction procedures in the early weeks of pregnancy can be conducted under analgesia or sedation only, without anaesthesia. Where general anaesthesia is in use, halothane should be avoided because it promotes uterine relaxation.
(2) **Dilatation and curettage (classical curettage)**

This method is also mainly used in the first trimester, but has often been utilized at a later stage in pregnancy (13–15 weeks). Table 9 shows

<table>
<thead>
<tr>
<th>Complication</th>
<th>Vacuum aspiration</th>
<th>Dilatation and curettage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemorrhage</td>
<td>0.10–3.90</td>
<td>0.48–6.00</td>
</tr>
<tr>
<td>Infection</td>
<td>0.24–7.20</td>
<td>1.20–1.54</td>
</tr>
<tr>
<td>Perforation</td>
<td>0.06–0.45</td>
<td>0.06–0.38</td>
</tr>
<tr>
<td>Cervical injury</td>
<td>0.10–1.08</td>
<td>0.28–1.10</td>
</tr>
<tr>
<td>Recurrent</td>
<td>0.42–2.80</td>
<td>0.09–2.16</td>
</tr>
<tr>
<td>Continued pregnancy</td>
<td>0.04–0.08</td>
<td>Not stated</td>
</tr>
</tbody>
</table>

* *Summary of results of various studies reported between 1974 and 1977.*

specific complication rates encountered with dilatation and curettage for the more serious complications in seven recent studies (22–28). In studies which analyse the complication rates in relation to gestational stage at operation as well as to method used, the evidence is fairly conclusive that in early pregnancy—at least up to and including 10 weeks—vacuum aspiration has fewer complications than dilatation and curettage, but after the tenth week, the complication rates (especially those of bleeding and recurrent) increase with the former technique in comparison with the latter (27–28).

3.4.2 **Prostaglandins**

Prostaglandins (both natural and analogues) are at present expensive and therefore available only in some countries. They have been used to induce first- and second-trimester abortion, thus minimizing the trauma of surgical procedures. While many routes have been investigated in clinical studies, the intra-amniotic, extra-amniotic, intracervical and vaginal routes appear the most promising in respect of balancing effectiveness with an acceptable level of gastrointestinal side-effects (nausea, vomiting and diarrhoea). The intravenous and intramuscular routes either have been abandoned or are less commonly used.

3.4.2.1 **Intra-amniotic route.** A single injection is usually performed from 16 weeks onwards, preferably through an indwelling catheter.
With some difficulty, injection can be performed as early as the 14th week of pregnancy. The injection-abortion interval is shorter with intra- amniotic prostaglandin than with saline or ethacridine lactate, even without augmentation with additional prostaglandin or oxytocics.

3.4.2.2 Extra-amniotic route. Extra-amniotic instillation may be carried out continuously or on an interrupted basis via a catheter passed through the cervical canal. Alternatively, a single, long-acting dose in a suitable medium may be instilled and the catheter removed, thus reducing the risk of infection from an indwelling catheter. This method may be used from 13 weeks onwards.

3.4.2.3 Intracervical and vaginal routes. Intracervical and vaginal applications have been used to achieve preoperative cervical dilatation. Vaginal application alone may be effective in inducing very early abortion —i.e., up to 56 days from the last menstrual period.

3.4.3 Hypertonic solutions

The solutions which have been used are dextrose (now infrequently employed because of the risk of sepsis), urea (only administered by the intra-amniotic route and with intravenous oxytocin or combined with prostaglandins) and saline.

The saline method is probably still the most widely used in the second trimester, and has two basic variations—namely, intra- and extra- amniotic instillation of a hypertonic solution of NaCl. There are, however, a vast number of minor variations in technique, which include the following features:

- the amount of amniotic fluid withdrawn, if any;
- the amount of solution instilled;
- the concentration of saline used;
- the technique of intra-amniotic instillation of the solution: exchange transfusion, one-time injection, slow drip infusion, etc.;
- the type of catheter used for extra-amniotic installation: indwelling or not;
- the addition of other drugs or devices to increase uterine contractions: oxytocin, prostaglandin, *Laminaria*, etc.

The technique of intra-amniotic instillation is the most often used; the extra-amniotic approach seems to be employed mostly in the Scandinavian countries, but recently there have been reports of its use in other
countries. The latter technique is much simpler to carry out and, moreover, it can be performed without any technical problems in the 13th-15th weeks, when intra-amniotic injection is a more difficult procedure. However, the time interval between the instillation and the abortion is required to be longer and the failure rate higher.

A potentially dangerous complication specific to this technique is hypernatraemia if an overdose is given or if inadvertent intravascular injection occurs (less likely if a catheter is used). The features are headache, chest pain, hypotension and shock, followed by haemolysis, anuria, coma, convulsions and, occasionally, death.

Controlled studies comparing intra-amniotic prostaglandin with saline instillation confirm the substantially more rapid effect of prostaglandin, but report a higher frequency of side-effects. Complications are also increased. In such a study, carried out by WHO (29), the rate of heavy bleeding (total blood loss greater than 500 ml) was three times as high with prostaglandins (4.5% of cases as compared to 1.5% for saline) and surgical evacuation was deemed necessary in 41.3% compared to 31.8% for saline. A report from the Center for Disease Control (CDC), Atlanta, GA, USA (30) (based on reporting from a number of United States centres using data collection forms similar to those employed by the Joint Program for the Study of Abortion (JPSA), conducted by the Abortion Surveillance Bureau under the auspices of CDC), shows a similarly increased risk of complications, especially infection, haemorrhage and tissue retention. Prostaglandins had an overall higher risk of complications (1.6 times), but the mean abortion time was 4.4 hours shorter. Controlled trials of extra-amniotic prostaglandin are not yet conclusively to be lower. There is no satisfactory estimate of mortality due to prostaglandin use in any country. In the WHO clinical trials, no deaths have occurred among the more than 4000 women studied.

3.4.4 Ethacridine lactate

This technique is similar to the extra-amniotic instillation of saline. Ethacridine lactate, an acridine derivate solution, is instilled, usually in amounts of 50–150 ml, through an indwelling catheter, which is left in place for a few hours. Oxytocin is normally given in intravenous infusion, either at the time of the injection or 24 hours later if no effect is achieved. A small controlled study comparing ethacridine lactate and saline showed a higher success rate for the former (the difference being significant only in the 13th–16th weeks of pregnancy) (31). Another comparative study of ethacridine lactate and extra-amniotic prostaglandin P4 showed a similar cumulative success rate with the two techniques after 48 hours
(32) Ethacridine lactate had an overall lower complication rate than prostaglandin F₂ and extra-amniotic saline. In a study in Bombay in which ethacridine lactate instillation was used, 70% of the 160 subjects aborted within 48 hours; however, there was one case of ruptured uterus, as well as several cases with chills and rigor and one death from anaemia due to severe bone-marrow depression. All studies report a low rate of infection.

3.4.5 Combination methods in the second trimester

Abortions procured by the use of prostaglandin, hypertonic solutions and ethacridine lactate can be expedited by the administration of an intravenous oxytocic infusion. However, studies suggest that although this does shorten the injection-abortion interval, there are more cases of cervical damage. Laminaria tents have also been used to augment cervical dilatation. Various combinations of prostaglandins with hypertonic solutions have been employed to minimize the disadvantages of each method. No ideal combination has emerged.

3.4.6 Complications of all second-trimester two-stage methods

(1) Haemorrhage and infection tend to be more frequent and severe than in the first trimester.

(2) Cervical lacerations or fistulae occur in up to 3% of cases receiving intra-amniotic prostaglandin, but they can also occur after uterine and saline abortions. The frequency of detection improves if speculum examination is routine.

(3) Incomplete abortion is common (around 30%), though it decreases with advancing gestation. Controlled studies show no difference in the incidence whether saline or prostaglandin is used. Many centres practise routine curettage after expulsion of the fetus.

(4) Water intoxication is a complication of oxytocin infusions, especially in the second trimester of pregnancy; since the uterus is less oxytocin-sensitive then than at term, large doses of oxytocin (which has a weak antidiuretic effect) are required, and are often administered with large volumes of intravenous fluid. A number of cases have been reported (33, 34) in which the complication could probably have been prevented by careful supervision and by restriction of the amount of fluid infused.

(5) With all second-trimester procedures, there is a small risk that the fetus will show transient signs of life. This risk is at its lowest when hypertonic solutions are used.

3.4.7 Hysterotomy

This technique can be used in both the first and the second trimester, but the rate of serious complications is usually reported to be higher than with any other method. One series reviewed 700 cases of hysterotomy and found 21 cases (3%) of thromboembolism, of which 13 had a pulmonary embolus, one with a fatal outcome (33). Because of this higher risk of complications, hysterotomy has most often been utilized only in combination with sterilization. But even in this case, it seems that, at least in the first trimester, a combination of vacuum aspiration or dilatation and curettage and a minilaparotomy or laparoscopy sterilization may carry a lower risk of complications than a laparotomy with a hysterotomy plus a tubectomy. In many centres, hysterotomy was also frequently used in primigravidae, particularly during the second trimester, but this practice has largely been discontinued where other methods are available.

3.4.8 Other methods

Many other methods (such as the instillation of irritant pastes or the insertion of coils) have been used, but anecdotal evidence does not suggest that any of these methods can compare in safety or effectiveness with the methods detailed above.

3.5 Choice of technique at particular stages of gestation

Table 10 attempts to summarize the discussions of the Scientific Group on the relative merits of some of the most commonly used methods at various gestational stages.

3.5.1 First trimester

3.5.1.1 Four to six weeks' pregnancy (i.e., 4-6 weeks after the last menstrual period). The techniques used during this early period are:

(1) the "menstrual regulation" or "endometrial aspiration" technique using a cannula of 4-6 mm in diameter, a 50-ml syringe or any
<table>
<thead>
<tr>
<th>Method</th>
<th>Stage of gestation (weeks)</th>
<th>6 or less</th>
<th>7-10</th>
<th>11-12</th>
<th>13-15</th>
<th>18 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Suction curettage only</td>
<td>Safe, simple method, requires no dilation. Not always effective</td>
<td>Safe</td>
<td>Safe method</td>
<td>High degree of manual dilation necessary. In skilled and experienced hands safe and effective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Dilatation and curettage</td>
<td>Safe and simple but does require a certain degree of dilation</td>
<td>Very safe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Curettage (a) or (b) plus preoperative cervical dilation</td>
<td>Not applicable</td>
<td>Reduces or avoids need for manual dilation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Prostaglandin, currently available preparations. In some countries only</td>
<td>Vaginal suppositories safe and simple. Not always effective</td>
<td>Currently less effective than methods (a)-(c)</td>
<td>Shorter interval between instillation and abortion than with (e) and (f)</td>
<td>Extra-amniotic technique simpler than intra-amniotic</td>
<td>Intra-amniotic and extra-amniotic both effective</td>
<td></td>
</tr>
<tr>
<td>(e) Saline or other hypertonic solutions</td>
<td>Not appropriate</td>
<td>Longer interval between instillation and abortion than with (d)</td>
<td>Safer than intra-amniotic prostaglandin, Safety in comparison with extra-amniotic prostaglandin not yet known</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(f) Ethacridine lactate extra-amniotic</td>
<td>Not appropriate</td>
<td>Lower sepsis rate than (d) and (e)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: (d), (e) and (f) can all be combined with oxytocin, for example, or with Laminaria tents to increase effectiveness and reduce interval.*
other vacuum source, no dilatation of the cervix, and usually no anaesthesia;
(2) curettage, which has the disadvantage of requiring cervical dilatation; and
(3) prostaglandin compounds administered intravaginally.

The percentage of unnecessary procedures is greater if the procedure is undertaken very early after the date of the missed period and if screening by pregnancy tests is not used. Data from almost 13,000 menstrual regulation procedures by suction, in which histopathological analysis and a urinary pregnancy test were performed in all cases (36), showed that about 77% of the patients undergoing menstrual regulation in the sixth week were in fact pregnant, but during the fifth week, this percentage was below 48%. Women younger than 20 years or older than 40 years and women using effective contraception are less likely to be pregnant if the menses are delayed. This would imply that, especially when women in those age groups are dealt with, it is more cost-effective and also less of a risk to health to postpone the decision to carry out the procedure until a positive diagnosis of pregnancy is established. This can be done either by giving a pregnancy test on the first visit and, if this is negative, by giving another, or by performing a repeat clinical examination at a later stage (if pregnancy tests are not available).

Both the failure rate and the recurettage rate are higher than if the procedure is done later. However, with experience it is possible to reduce the frequency of these complications.

3.5.1.2 Seven to twelve weeks' pregnancy. In this period of pregnancy, vacuum aspiration and dilatation and curettage are the methods of choice, since they carry a low risk of complications and are associated with a short duration of hospitalization and low cost. Controlled, comparative studies between the two methods indicate that vacuum aspiration is somewhat safer in the first half of the stated period; in the latter half the risks seem to be fairly equal.

Since the diagnosis of pregnancy can be more accurately performed by clinical examination after the sixth week and the accuracy of conventional pregnancy tests is high, unnecessary procedures rarely occur in this period. Continued pregnancy is also very rare.

In the latter part of this period, the use of preoperative cervical dilatation (as previously described) may be considered in high-risk cases (e.g., women with a tight cervix, especially primigravidae, or women with previous cervical trauma and scarring).
3.5.2 Second trimester

3.5.2.1 Early second trimester (13–15 weeks' pregnancy). Earlier it had been assumed in most clinics and medical schools that only the modern two-stage methods or hysterotomy were justified for abortions in the second trimester. Both dilatation and curettage vacuum aspiration were considered too difficult and risky to perform after the 12th week. In the period of 13–15 weeks, it is more difficult, however, to perform an amniocentesis and an intra-amniotic instillation of hypertonic solutions. In centres primarily using this technique, it has therefore often been accepted practice to postpone the abortion until after the 15th week. This approach carries considerable disadvantages, however, and many centres now increasingly choose to perform extra-amniotic infusions of prostaglandin or ethacridine lactate, or dilatation and evacuation, especially in parous women.

In one study of 12,000 abortions reported in 1975 in the USA, there was a total complication rate with vacuum aspiration of 3.1% before the 13th week, and 12% at more than 13 weeks. The latter, however, was still somewhat lower than the overall rate of 16% for saline abortions (37). The JPSA/CDC study (38) compares reported data on 6231 abortions at 13–20 weeks' gestation by dilatation and evacuation (using a combination of abortion forceps, suction cannula and curette) and 8662 saline abortions.

The comparative risks of prostaglandins and saline have been discussed earlier. It seems that the dilatation and evacuation technique is at least as safe as other methods in the period 13–15 weeks. But it must be kept in mind that the data are purely descriptive and were collected in a non-controlled fashion (they were derived from a select group of physicians who were both satisfied with the technique and skilled in its use). Consequently, the results do not lend themselves to any definite conclusions and should be used only for very cautious statements and for the formulation of further study hypotheses. The technique of dilatation and evacuation should be used only by the most skilled operators, while the saline method can be employed by people with considerably less skill. Also, a relatively high incidence of cervical injury could be a potentially more serious problem in this group of second-trimester abortions, in which the percentage of young primigravidae tends to be higher.

3.5.2.2 Late second trimester (16 weeks' pregnancy or more). The data available are insufficient to allow the determination of a method of choice from among the various two-stage methods.
Prostaglandin instillation (both extra- and intra-amniotic) seems to have a shorter instillation-abortion interval than saline or ethacridine lactate. The relative safety is still under investigation. There is some evidence of a lower sepsis rate with ethacridine lactate instillation.

Intra-amniotic injections should be performed by skilled operators, whereas extra-amniotic infusions (especially where one injection is sufficient) are easier to administer.

### 3.6 Abortion with concurrent sterilization

Complication rates and mortality rates are increased if sterilization is performed concurrently with termination of pregnancy. This is true whatever the gestational stage of the pregnancy, but the risk increases with advancing gestation, as does that of termination alone (see Table 11).

<table>
<thead>
<tr>
<th>Stage of gestation</th>
<th>Number of abortions</th>
<th>Number of deaths</th>
<th>Mortality ratio per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>With sterilization:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 weeks or less</td>
<td>8,400</td>
<td>2</td>
<td>24.0</td>
</tr>
<tr>
<td>9-12 weeks</td>
<td>40,000</td>
<td>21</td>
<td>52.0</td>
</tr>
<tr>
<td>13-15 weeks</td>
<td>24,800</td>
<td>13</td>
<td>53.0</td>
</tr>
<tr>
<td>17 weeks or more</td>
<td>6,800</td>
<td>6</td>
<td>89.0</td>
</tr>
<tr>
<td><strong>Without sterilization:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 weeks or less</td>
<td>121,000</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>9-12 weeks</td>
<td>326,700</td>
<td>14</td>
<td>4.3</td>
</tr>
<tr>
<td>13-15 weeks</td>
<td>99,800</td>
<td>12</td>
<td>12.0</td>
</tr>
<tr>
<td>17 weeks or more</td>
<td>23,400</td>
<td>12</td>
<td>51.0</td>
</tr>
</tbody>
</table>


Although postabortion sterilization is also more hazardous than interval sterilization alone, so far there is no answer to the question whether the total risks of the two procedures performed separately are higher than the risks when they are performed concurrently. This problem is being investigated in a study in Singapore within the programme of the WHO Task Force on the Assessment of the Sequelae of Abortion. The preliminary results suggest no difference, but they are not conclusive.
In addition, further research is required to establish the effectiveness and relative risks of various methods of concurrent sterilization (e.g., mini-laparotomy versus laparoscopy).

Later regrets about sterilization can occur irrespective of the context in which it is performed, but may be more common if the granting of abortion is, or is perceived by the woman to be, conditional upon the performance of sterilization. To reach a decision regarding sterilization may require more time for reflection than is available at an abortion consultation. An additional problem is that, in some settings, women are ill-informed about the nature and consequences of the sterilization operation.

It seems advisable that women who are sterilized at the time of abortion should receive adequate prior counselling appropriate to the cultural setting. It is recommended that further research should be carried out to evaluate counselling and to determine whether screening would make it possible to identify those women who would be more likely to have later regrets.

3.7 Postabortion insertion of intrauterine contraceptive devices (IUDs)

A number of studies have shown that insertion of an intrauterine device immediately after abortion in a medical setting is a safe and effective procedure, increasing neither the incidence of complications of the abortion nor the frequency of side-effects of the IUD (39, 40). The expulsion rate following insertion at the time of first-trimester abortion is comparable to that following postmenstrual insertion.

3.8 Research in progress

The Scientific Group was aware of the following investigations in progress:

1. Studies of the utility and safety of rigid compared with flexible cannulae for vacuum aspiration.
2. Studies of the utility and safety of syringes, and of hand- or foot-operated pumps versus electric pumps for vacuum aspiration.
3. Studies of the outcome of pregnancies subsequent to induced abortion, with special emphasis on premature delivery and low birth-weight as outcomes in second pregnancies following termination of the first pregnancy, and of variables associated with the antecedent abortion,
including length of gestation, method of termination, and degree of
dilatation of the cervix.

(4) Studies of relative and complete infertility subsequent to induced
abortion.

(5) Studies of new routes and vehicles for prostaglandin application
which may lead to a procedure requiring no skill, minimal (if any) medi-
cal supervision and acceptable efficacy and safety.

(6) Evaluation of different routes, compounds, vehicles and dosages
of prostaglandins for preoperative cervical dilatation.

(7) Studies of complications of abortion and sterilization performed
concurrently, or consecutively with an interval of at least several weeks.

(8) Development of simple, inexpensive, highly sensitive pregnancy
tests.

REFERENCES

1. TEITZE, C. & LEWIS, S. Mortality and fertility control. International journal of


4. SERVICES FOR INDUCED ABORTION

The problem of induced abortion in each population group must be seen against the background of the social norms which regulate sexual, marital and familial behavior and of economic constraints. These norms and constraints will affect the provision of services, and the knowledge of, attitudes to, and utilization of such services by pregnant women.

For maximal safety and efficiency, services should be available in such a way as to facilitate legal induction early in pregnancy by skilled operators. The greater the number of barriers to achieving this ideal, the greater is the potential hazard to the health of the woman. The evaluation of services for induced abortion may be accomplished by an examination of service statistics or may require specific research efforts.
The existence of a problem in either the provision or the use of services may be manifest by a high proportion of second-trimester abortions, the repeated use of induced abortion instead of the use of other effective fertility-regulating methods, or the continued use of illegal abortion services even when legal safe services are available and accessible.

Although the same problems may be observed in different countries or areas, it cannot be assumed that either their causes or their solutions are similar. For that reason, either a local situation analysis or specific health service research may be required. The following discussion therefore establishes a framework for examining service issues related to the provision and use of abortion services.

The constraints affecting the provision or use of services may be grouped into three categories: stipulations of the social and legal system, attitudes of the woman as a consumer of services, and policies of the health services themselves. The observations made in the following sections represent hypotheses derived from local experiences or research. Their importance and applicability to other countries or areas, though seemingly obvious at times, still remain to be tested.

4.1 Social and legal norms and constraints

Family, marriage and parenthood are such fundamental institutions in all societies that they are surrounded by strong sanctions. Neither group nor individual attitudes towards induced abortion can be understood without reference to the rules regulating sexual, marital and familial behaviour.

Many variations exist among societies in the detailed organization of these institutions. Patterns relating to age at marriage, sexual intercourse, and family building and maintenance vary among societies with differing historical and religious traditions. Abortion, and until recently contraception, have been regarded as threats to these established patterns. The rules have been upheld in three ways—by law, by religion and by custom.

The pressures of custom and social relationships are maintained through continuous and pervasive precept and example (socialization) and through the disapproval of peers, relatives, neighbours and friends. Changes in religious tenets, social customs and legislation do not necessarily coincide, and persons following a new official code may nevertheless sense social disapproval and experience guilt and self-condemnation. This applies equally to women seeking abortion and to professional health personnel providing abortion services.
Although during recent years there has been a marked tendency to liberalize abortion laws in many countries, about 36% of the world's women live in countries where abortion is still either illegal or permitted only for specified and limited indications (1). The effect of liberalization on the health services is a dual one. On the one hand, there is a need for abortion services to meet the increased demand for legal abortion, while, on the other, the widespread need for hospital beds to treat the complications of illegal abortions is greatly reduced.

When a liberal policy is changed for a more restrictive one, the consequences can be far-reaching (see Fig. 1 and Table 3). The provisions of the law can, and demonstrably do, affect the timing of abortions. The legal requirement of authorization by a statutory committee or of recourse to a second opinion usually leads to delays (thus increasing the risk to life and health). Another possible cause of delay is the need to obtain the husband's consent, or that of the parents in the case of minors or unmarried women. Such requirements are often merely local interpretations of the actual legal provisions.

Statutory limitation of abortion to the first trimester reduces the mortality and morbidity of legal abortion but may increase the frequency of high-risk illegal abortions. National abortion statistics from, for instance, Japan, the Scandinavian countries, the United Kingdom and the USA show that in those countries, in which second-trimester abortions are permitted, the percentage of such abortions has declined in the course of time (2) (Table 12).

There are many countries in which the law is restrictive but abortion is liberally practised in the health services. In this situation, it is often easier for well-to-do, well-educated and well-connected women to obtain abortions than it is for the poor.

4.2 The consequences of illegal abortion for health services

Illegal abortion (although itself unquantifiable) constitutes a problem for health services in the sense that treatment of its complications often absorbs a large proportion of hospital resources. If it is assumed that spontaneous abortion is a relatively constant and uniform phenomenon, high abortion admission ratios (per 1000 birth-related admissions) are usually taken to mean that a substantial proportion of the abortions are illegally induced. Very high ratios of this sort have been reported from many hospitals in developing countries (3); it cannot be directly taken for granted that they represent a very high rate of illegal abortion in the community, since they will also be influenced by a number of other
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* Residents only.
* Based on data from 14 states and 75% of all abortions reported to the Center for Disease Control (CDC).
* 1972-1975: Estimates based on the assumption that one half of the difference between numbers of abortions reported to CDC and the Alan Guttmacher Institute were performed in nonhospital clinics. These abortions were distributed by weeks of gestation proportionally to all abortions at 12 weeks or earlier reported to CDC. Abortion at 16 weeks (A16) were estimated by the following formula and transferred from the last to the next to last gestation category:

\[
A_{16} = \frac{1}{2}(2 \times A_{15} + 3 \times A_{16})
\]

\[
A_{15-16} = A_{15-16} - A_{16-17}
\]

* The distribution by age and gestation was estimated by iterative adjustment of a known distribution (AFSHA/CDC) population to marginal totals for the USA (Celen, Y., & Tiebel, C. Statistical analysis of the age, gestation period and race by year of the numbers of all induced abortions in the United States, 1972-1975). (Paper presented at the annual meeting of the Association of Planned Parenthood Physicians, Atlanta, GA, 12-15 October, 1977).
factors, such as the percentage of births occurring at home and the rate at which complicated births or abortions are admitted to hospital. These factors are in turn affected by economic, social, cultural and other constraints. At the present time, the effect of these constraints is impossible to evaluate, but it is widely reported that illegal abortion cases form a large proportion of obstetrical and gynaecological admissions (6), and that, once admitted, they require more bed-days, more surgery and more blood transfusions than spontaneous abortion cases, and thus may use up to 50% of the maternity hospital budget (3).

Monetary costs can be usefully evaluated only through a cost-benefit analysis in which the cost of preventive services (in this case contraceptive and legal abortion services) is compared with the cost of illegal abortion (i.e., the total costs, not the cost per case, which is impossible to ascertain). Such a cost-benefit analysis can offer only limited and tentative policy guidelines, since mortality, morbidity and other forms of suffering due to illegal abortion can be evaluated only partially in monetary terms.

4.3 Factors related to the abortion-seeking woman

The decision-making process facing single women with an unwanted pregnancy involves a constant interaction between individual psychology, social pressures and constraints and the willingness of service providers to grant abortion. The choices facing a pregnant married woman are different, but equally complex. In western industrial societies, where changes in sexual mores have increased the risk of unwanted pregnancy and where the status of unmarried mothers is still relatively unacceptable, a high proportion of the requests for abortion derive from unmarried women (7). In developing societies with strong kinship systems and intact social controls on the sexual, marital and reproductive activity of the young, demand for abortion is most likely to derive from married women with large families. The decision to seek abortion is a very individual one, and will depend on the relationships of the woman with her partner and family, the possible alternatives and the prevailing social pressures.

For the young unmarried woman, ignorance may be the first and major constraint (6). She may not be sure whether she is pregnant and is ashamed to turn to family or friends for advice. She is often unaware of other sources of help, even when these are available. Thus the delay in seeking an abortion is prolonged. Her age, education, social class and career expectations will clearly affect her decision. The possibility and desire to continue the pregnancy are subject to a variety of personal,
social and financial constraints. In some societies, the alternatives are or were infanticide or suicide—or even execution of the pregnant girl by her family should pregnancy be discovered. The availability of family support to continue the pregnancy, the possibility of marriage with the putative father, or conscientious objection to abortion are examples of circumstances that would militate against seeking abortion.

Ignorance of the chances of obtaining an abortion and of whom to approach, unwillingness to consult the local medical services, and a desire for privacy and anonymity are common factors affecting both married and unmarried women. They lead to delay and to the seeking of an illegal abortion. Further evaluation of these factors is required, and the research protocol summarized in Annex 2 was considered by the Scientific Group to be one worthwhile approach to such evaluation.

In some settings, special problems are presented in relation to two groups of women: those who seek abortion repeatedly (of whom some may use it as their main method of family planning) and those who request abortion and are refused. The incidence of repeat abortion may hypothetically be reduced by systematic provision of contraceptive information, instruction and services, including the dispensing of contraceptives at the time of the first abortion. In some women in the repeat abortion group—probably a small minority—special social or psychological problems may be identified; an effort could be made to alleviate these problems. The effectiveness of either of these approaches has not been documented.

The question of the outcome of refused abortion for the woman and child has been discussed above (section 3.2.2.2); when all available, economic aid and social services for women who have been refused abortion should have a high priority.

4.4 The provision of services for induced abortion

The types of abortion services available will depend on the prevailing health care system and the assumptions underlying it—e.g., whether it is a free service and available to all the population, a private fee-for-service system, or some intermediate form. The relationship between primary and secondary medical care, the geographical distribution of health care services, the amount of government control, the recruitment and training of staff, and the relative emphases placed on preventive and curative medicine may all affect the abortion services and the ways in which they are perceived by women.
Services for abortion should constitute an integral part of the maternity and family health services and not be organized as an independent system (7). In this way, the need for abortions can be reduced by health education and the provision of contraceptive services (6). Fragmentation of care of abortion complications can be avoided, and incidental gynaecological care (e.g., follow-up on cervical smears or vaginal infections) can be provided. Channelling of patients to the most appropriate treatment sites can be readily organized. An efficient records system can be developed, thus facilitating future planning. Such a records system can and should be maintained without infringement of confidentiality.

4.4.1 Organizational considerations

The actual organization of services will vary among and within countries depending on a number of factors, such as resources, legislation, sociocultural background and geographical conditions. The main organizational components, however, are the same in all settings. The following discussion attempts to raise, in relation to those components, some points that need consideration and possibly further local research before and during the development of services.

4.4.2 Planning

Planning is needed to provide the requisite quantity, quality and distribution of services, bearing in mind the demands on space and time of the other components of maternity care.

The demand for services is affected by changes in legislation. When an increase in the number of legal abortions precedes the liberalization of the law (as was seen, for example, in Great Britain, before the passage of the Abortion Act in 1967 (1)), a further gradual increase is usually observed thereafter, which does not present an insurmountable problem for the provision of services. However, where there is a sudden change from a very restrictive to a very liberal law, a transitional phase of considerable pressure upon services can be expected, during which some women who conceived before the law was changed are still giving birth to unwanted children, some women are obtaining legal abortions, and some women are still being admitted to hospital with complications due to illegal abortion (9).

4.4.3 Staffing

4.4.3.1 Selection of staff. The qualities desirable in the various staff involved in abortion work will vary considerably in different cul-
tures, and this factor might need exploring. There is evidence that unsympathetic or prejudiced doctors and nurses can cause physical and mental suffering for the woman during and after abortion procedures, so that, if staffing permits, some degree of self-selection of doctors and nurses for abortion work would seem to be in the best interests of both patients and staff (10).

4.4.3.2 Staff training. In setting up training programmes for those who will perform abortions, it is necessary to define the minimal levels of skills, knowledge and practice required. In India, for instance, general physicians undergo a three-week course comprising the technique of gynaecological examination, the diagnosis of pregnancy, performance of vacuum abortion, insertion of IUDs, and so on. Only after the successful performance of 25 suction abortions under supervision is the practitioner licensed to perform abortions on his own (11).

The caseload of the individual worker should be anticipated and facilities distributed accordingly. Experience shows that when more than 9 or 10 suction terminations are performed at one session, the complication rate increases with the fatigue of the operator (12). On the other hand, operating skills may not be maintained if abortions are performed infrequently.

The categories to be trained and the content of the training will vary, depending on, for instance, whether second-trimester abortions are permitted and whether counselling is required and by whom. The need for special training will depend on the structure of the basic training for doctors, nurses, social workers, etc. For instance, nursing and midwifery staff may have some special problems in working with abortion cases: they may not understand why abortion patients sometimes will have to take precedence over routine gynaecological admissions and bypass normal waiting lists; their training may have left them quite unprepared for the fact that many pregnancies are unwanted; they may have to nurse women without having been involved in the consultations which led to the abortion decision, and so on. Another research issue might be the determination of the best educational approaches to adopt and the training content needed to overcome such problems.

4.4.4 Characteristics of the services

4.4.4.1 Entry into the system. The aim of abortion services is to facilitate safe performance of all legal abortions by skilled staff with the minimum of delay. Failure to take advantage of available services by those who are desirous of utilizing such facilities, and are entitled to do
so, may be due to public ignorance and lack of information. Although
entry into the system, either by direct contact, or via a health auxiliary,
nurse or physician, should be simple, and the distribution of facilities
should be such as to make them easily accessible, such accessibility is
of no avail if it is in conflict with the woman’s need for privacy and
confidentiality. Indian experience suggests that some women will con-
tinue to use illegal abortion (both medical and nonmedical) rather than
free government services, either because the latter facilities are not suf-
ciently well known or because they entail delays and a lack of privacy.1
Similar experience has been noted in Hungary (13).

The need for referral is dependent on legal requirements. It often
causes delays which in themselves increase the hazards of the procedure
and the need for services for late abortions. Ways and means of reducing
delays caused by referral should be explored. One possible course of
action might be the development of simple and inexpensive but quick
and reliable methods for early pregnancy diagnosis. Another solution
might be to institute measures similar to the administrative arrangements
adopted in an English city, which abolished waiting lists created by mal-
distribution of cases among gynaecological units by declaring a common
catchment area and creating a central appointments bureau (14).

Payment for abortion is often a constraint. If it is not feasible to
offer completely free services, consideration might be given to health
insurance coverage or, at least, to the provision of partial financial
support.

4.4.4.2 Facilities required for the procedure. Apart from such obvious
requirements as facilities for examination and operation and adequate
staffing, there is usually need for an information and counselling service.
The activities normally carried out by such a service are as follows:

(1) The dissemination of information to the public at large and to
potential abortion-seekers (i.e., women attending antenatal clinics)
about the availability of the services and the nature of the procedures
performed.

(2) Where requested, moral support before the abortion if the
woman decides on termination and practical help if she decides to keep
the baby. Such counselling should not exert any pressure on the patient
to decide on one course or the other.

1 Cited in an unpublished report presented at the Workshop on Medical Termina-
ton of Pregnancy, National Institute of Family Planning, New Delhi, 7-9 December
1976.
(3) After the abortion, advice on family planning and contraception methods, including sterilization.

Certain congenital disorders and deformities can now be diagnosed in utero, before the fetus has reached viability, by various methods including maternal blood sampling, amniocentesis and ultrasound. Where resources permit, such facilities could be made available, particularly for women over 35 years of age and those who risk giving birth to children with congenital malformations or metabolic diseases, to facilitate the decision whether or not to terminate pregnancy. Where rhesus isoimmunization is a common problem—and if the means are available—arrangements can be made to administer anti-D serum to Rh-negative women after the abortion. A study might be required locally of the relative gain and the costs involved before such facilities are developed.

4.4.4.3 Type of procedure and where it is performed. The service structure will also be affected by the methods to be used. In most countries it is the consensus of the medical profession that abortions induced by prostaglandins, for instance, as well as all second-trimester abortions, require hospitalization, with the possibility of recourse to the services of skilled physicians. Abortions procured by suction or dilatation and curettage in the first trimester need not be performed in hospital.

A WHO-sponsored controlled study in Ljubljana and Singapore (15) has demonstrated conclusively the substantial savings in hospital-bed requirements that can be achieved without ill effects by the performance of first-trimester vacuum aspiration in outpatient departments.

Wherever abortions are performed, whether in hospital or in premises provided by charitable or commercial agencies, there is a need for supervision, in the interests of maintaining standards and of ensuring that the woman is not denied other services such as contraception or sterilization.

The choice of abortion procedure is usually made on medical grounds. However, where there is little difference in terms of efficacy and safety between two procedures (e.g., vacuum aspiration with general anaesthesia or with local anaesthesia), consideration should be given to the woman's wishes in the matter. Studies are required in different settings of women's immediate perceptions and later feeling about different procedures.

Within hospital outpatient or inpatient facilities, attention should be given to the psychological needs of abortion patients as well as to administrative convenience. For example, the placing of an abortion patient
in a maternity or infertility ward may be distressing for all concerned (16). Segregation of abortion patients may make it easier to ensure sympathetic surroundings, but, on the other hand, there is a risk that both staff and patients will be stigmatized. The experiences and preferences of women in this respect should be the subject of further study.

Finally, since medical science and clinical practice are continually changing, medical administrators should review new procedures from time to time and consider the implications for the health services of adopting these new techniques.

4.5 Research in progress

The Scientific Group was aware of the following investigations in progress:

1. Continued monitoring of service delivery in terms of geographical location, type of provider and type of service (inpatient or outpatient), the woman's age, parity, marital status and other characteristics, the period of gestation and the method of termination.

2. Evaluation of the effects of policy changes on the incidence of legal and illegal abortions, the period of gestation at which legal abortions are performed, child-bearing in and out of wedlock, and the economic and social consequences.

REFERENCES


5. RESEARCH RECOMMENDATIONS

Studies should be initiated or expanded in the areas listed below.

5.1 Epidemiology of induced abortion

(1) Incidence and demographic patterns of clandestine abortions, at various times, in all countries and regions. Use of the research protocol described in Annex I is recommended for appropriate settings.

(2) Incidence and demographic patterns of legal abortions, at various times, in countries in which these procedures are available and apparently performed in large numbers, but no statistics are collected or published. To accomplish this, it is necessary to develop and standardize definitions and registration systems in various countries.

(3) Socioeconomic correlates of legal and illegal abortions.

(4) Cohort analysis of abortion behaviour and its relation to the fertility behaviour of cohorts.

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5.2 Medical aspects of legal abortion

(1) Development of inexpensive and safe hygroscopic preparations to replace Laminaria tents for preoperative cervical dilatation.

(2) Development of a nonsurgical method of abortion, nontoxic to the woman and nonteratogenic in an effective dosage, reliably producing complete expulsion of the products of conception, suitable for application in a nonclinical setting, and economically accessible to women in all countries.

(3) Development of simple and inexpensive, but accurate, methods of determining duration of pregnancy.

(4) Evaluation (in terms of early and late complications) of the amount and speed of cervical dilatation, of the type of dilators used, and of the effect of local and general anaesthesia upon the ease of cervical dilatation, both before and after 12 weeks' gestation.

(5) Controlled studies of the efficacy and safety of methods of abortion for use in the second trimester.

(6) Evaluation of the health effects of repeated abortions, especially on fecundity and the outcome of subsequent pregnancies.

(7) Evaluation of women's preferences for general, local or no anaesthesia for first-trimester vacuum aspiration or dilatation and curettage.

5.3 Services for induced abortion

(1) Identification of patients who require counselling, and evaluation of different modes of counselling, in terms of, first, the importance of untoward psychological reactions and, secondly, the adoption of contraceptive practices.

(2) Identification of women who are sufficiently ambivalent to need an interval for further counselling before the abortion procedure.

(3) Evaluation of the extent to which delays in seeking abortion are due to ambivalence or to ignorance of health matters and of the abortion facilities available.

1 The research protocol described in Annex 2 could be used in dealing with items (1) to (6).
(4) Optimum location of abortion services from the geographical, organizational and patient's point of view, particularly in respect of the need for privacy, confidentiality and sympathetic treatment.

(5) Evaluation of different procedures as perceived by women.

(6) Comparison of psychological, economic and outcome variables between women obtaining abortion and women unable to obtain it.

(7) Training needs of medical and nursing personnel in abortion services.
Annex 1

ABBREVIATED PROTOCOL FOR STUDYING
THE HEALTH EFFECTS AND HEALTH SERVICE COSTS
OF ILLEGALLY INDUCED ABORTION *

Two studies, one prospective and based on hospital admissions, the other retrospective and based on a sample derived from household units in the community, have been designed to provide an estimate of the magnitude of the problem of illegal abortion in a community. Data derived from women hospitalized with the sequelae and complications of induced abortion provide only a minimal estimate of the problem. Data derived from direct interviews of women in the community provide an unmeasurable underestimation of the problem, the magnitude of the underestimation depending on the willingness or unwillingness of women to provide a history and details of an illegally induced abortion. By linking both studies as shown in Annex Fig. 1, an adjustment can be made in the community-based data according to the frequency of accurate reporting of pregnancy outcomes.

The hospital-based study

The primary object is to assess the impact of the practice of illegally induced abortion on the hospital services. Secondary objectives are to develop and evaluate data-collection methods for a subsequent field study of reproductive health conducted in the same community and to obtain data which will be cross-validated with the data obtained by the field study.

Description of project

The study is designed to examine prospectively all women of reproductive age admitted to the obstetrical and gynaecological facilities during a defined period of time. According to objective criteria, all

* The complete protocol and guidelines are available, on request, from the Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, 1211 Geneva 27, Switzerland.

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Annex Fig. 1
Flow diagram of hospital-based study and community-based study

HOSPITAL-BASED STUDY

Obstetrical and gynaecological admissions

Identify 100-200 patients classified as having had a probable induced abortion

Compare hospital costs, duration of hospitalization, etc.

COMMUNITY-BASED STUDY

Identify community sample of households

Add to community sample a sample of women who have had:
(a) a probable induced abortion
(b) a probable spontaneous abortion
(c) a live birth

Reproductive history and direct questions on spontaneous and induced abortion and other obstetrical events

Determine accuracy of reproductive history based on (a), (b) and (c)

Adjust community sample data accordingly
pregnancies ending before 28 weeks are classified into the following
categories:

1. legally induced abortion;
2. illegally induced abortion;
3. spontaneous abortion.

Criteria for classification of induced abortion must be locally adapted. However, one example of such a classification scheme is set out in Annex Table 1.

### Annex Table 1
Criteria for classification of induced abortion

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<th>Definite induced abortion</th>
<th>Probable induced abortion</th>
<th>Possible induced abortion</th>
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<tr>
<td>(a) Woman’s statement</td>
<td>+ (Including therapeutic)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(b) Other’s statement</td>
<td>+ (by physician in cases of (g) or patient died)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(c) Pregnancy unplanned</td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>(d) Contraception used during cycle of conception</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(e) Uterine septa (fetal and purulent discharge)</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(f) Peritonitis</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(g) Genital trauma</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(h) Foreign body</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(i) Age/parity/marital status scale</td>
<td>+ (total score and (g) and/or (f) +1)</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

Note: + indicates sign present or question answered affirmatively.
- indicates sign absent or question answered negatively.
+ indicates all three signs should be positive or questions answered affirmatively.
+ indicates condition to be considered positive.

The study is designed to examine the proportion of hospital resources absorbed by patients admitted on account of illegally induced abortion, comparing it with the proportion of resources absorbed by the other abortion and nonabortion obstetrical and gynaecological admissions. It is suggested that the study observation should extend over at least
one year and be continued until at least 200 cases of illegal abortion
have accumulated.

The features of this study designed to attempt an improvement in the
validity of data are as follows:

(1) the identification of research sites with definable catchment
areas;

(2) involvement of hospital staff in the research effort;

(3) establishment of objective criteria which should allow the classi-
fication of abortions independently of the patients' reasons for admission
or denial of induced abortion;

(4) subsequent cross-validation of the hospital data by data obtained
in a field survey in the same community.

Interviewing of the hospital patients included in the study should be
performed by a married parous woman with a knowledge of the local
culture, language, etc., with communication skills and with a sympa-
thetic attitude towards women who have had an abortion.

Types of data to be collected

The data required would include—for all obstetrical and gynaecologi-
cal admissions—the patient's socioeconomic and demographic character-
istics, a detailed reproductive history and the cause of the present hospital
admission. If the present admission is abortion-related, the stage of
gestation of the pregnancy and the type of abortion would be ascertained
both from the patient and from objective criteria, which would include
contraceptive history and clinical features of the case. The monetary
cost of hospitalization would be estimated and also bed occupancy and
the use of diagnostic treatment facilities.

For reasons of confidentiality, the research records must be separated
from hospital records and identification data kept in a locked file and
retained only until the cross-validation with the field survey is complete.
Informants should be reassured about the confidentiality of data.

Analysis of the data should allow an estimation of the proportion of
all obstetrical and gynaecological admissions due to each type of abor-
tion during the period of observation, and of the proportion of total
hospital resources absorbed by the abortion cases.

Retrospective survey of pregnancy-associated morbidity

The aim of this project is to study reproductive health in a community,
including the incidence, prevalence and distribution of complications of
pregnancy, alternative pregnancy outcomes (live birth, stillbirth, spontaneous abortion, induced abortion), complications of delivery and delivery outcomes, including perinatal mortality.

Description of the project

A random sample of women of reproductive age are interviewed. The timing of this survey should be arranged in such a way that the hospital admissions identified in the hospital-based study would be included in the retrospective reproductive history given by the women. Included in the community sample is a sample of the women classified in the hospital study, of whose identity interviewers have no knowledge.

New features

The innovations of this study are the emphasis on validation of information on induced abortion by linkage with the hospital study and inclusion of deliberate bias (interviewers should be trained in supportive empathy to maximize the willingness of respondents to discuss intimate and possibly culturally proscribed behaviour). The interviewers should have the same characteristics as those required of interviewers in the hospital-based study, but women in the retrospective study should not be interviewed by the same person as in the hospital study, since this would contaminate data on underreporting.

Types of data to be collected

The data required would include the socioeconomic and demographic characteristics of the woman, her menstrual history (including any action taken to bring on periods), her complete pregnancy history, her contraception history, her knowledge of and attitude to contraception and abortion, and the current health service care available to her in case of abortion and other reproductive complications.

Data analysis

All data collected can be appropriately analysed. The incidence of abortion can be calculated as follows: abortion ratios per 1000 pregnancies and per 1000 births, abortion rates per 1000 women and a cumulative rate of first abortions; these ratios and rates can be computed for the year one, five or ten years preceding the interview, as well as for the total life-span experience. The validity of the abortion reporting can be ascertained in several ways, including the use of the interview schedule for some women known to have aborted mixed with the random samples so that the interviewers will not know which respondents have had an induced abortion.
Annex 2

ABBREVIATED PROTOCOL FOR PATIENT/SERVICES
INTERACTION STUDY OF ABORTION *

The objectives of the study are as follows:

1. To investigate the problems faced by the abortion and maternity services and their staff in relation to the structure and functioning of the services and the populations with which they deal.

2. To discover how women’s knowledge and perceptions of specific aspects of the abortion and maternity services affect their use or non-use of the services.

3. To find out how different administrative and professional arrangements affect abortion-seekers' satisfaction with the services, their psychological responses and their subsequent fertility-related behaviour.

4. To explore the selection and decision-making processes which culminate in induced abortion as opposed to other possible outcomes of pregnancy; to assess the relative impact on these outcomes of the characteristics and circumstances of potentially abortion-seeking women as compared with features of the services and the service providers; and to identify the critical points in the women's pregnancy career at which decisions are made and the outcome of pregnancy is determined.

The emphasis in these studies is on the processes and interaction involving patients, services and providers of services. The temporal dimension must be taken into account and a career model used which traces the sequence of the women's course through the abortion system.

Types of data to be collected

The study is envisaged in two stages, of which the first could stand independently, but the second is contingent on the first having been performed.

Stage I. This consists, first, in the collection of data, either from pre-existing sources or from specially commissioned surveys or records analysis, on the legal and sociocultural context of abortion. Secondly,

* The complete protocol is available, on request, from the Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, 1211 Geneva 27, Switzerland.
attempts must be made to map and determine the relative importance of the different pathways that may be taken through the abortion/maternity care system. Such mapping would include the structure and functioning of official services and of alternative sources of care, the geographical distribution of services and the proportions of pregnant women who use different services and reach the various outcomes of pregnancy. Although in some settings much may already be known about existing pathways, a specially commissioned survey could ascertain whether the actual situation corresponds with the official view of how services function.

As a consequence of the analysis of the data at the first stage, the need for specific changes in the service system may become obvious. These changes can either be instituted outright or be tested operationally. In other circumstances, it may be necessary to proceed to the more detailed research approach set out in Stage II.

Stage II. The objective of this portion of the research is to examine the dynamics of the patient/service interaction. The design envisages the intake of two populations:

(A) Women who at any point request a termination, who would be identified and followed up from their earliest point of contact with the services and who would be subdivided into three groups:

(a) those proceeding to termination;
(b) those who change their mind about termination and either abort spontaneously or continue to term;
(c) those who are refused abortion, of whom some may seek abortion elsewhere, others will continue to term and others will abort spontaneously.

(B) A group of randomly selected women not known to have requested termination, similarly recruited at their earliest point of contact with the services. The purposes of studying this group are (a) to permit an assessment of the assumption that those proceeding to termination and to delivery are different from each other in terms of objective characteristics; (b) to examine women who might have wanted to seek abortion, but were deterred by ignorance, by the inaccessibility of services, by their perceptions of the services, or by advice; and (c) to study the variation in service providers’ attitudes and behaviour towards different outcomes of pregnancy.
With high abortion ratios, it would be appropriate to study all pregnant women during specified periods. Where births substantially outnumber terminations, however, groups of comparable size may be more appropriately obtained by including in the study all women requesting abortions but only a random selection of those not requesting abortions.

Data collection for Stage II

Group A: Abortion-seeking patients. Interviews with service providers and patients and observation of patient/service interaction should be performed at the point of first contact with the service at the decision stage, at the time of the abortion procedure and at follow-up at 3 months and 1 year after the outcome of the pregnancy.

Group B: Those who did not seek an abortion. Similar interviews and observations will be performed at the point of first contact with the service, at the outcome of the pregnancy and at follow-up at 3 months and 1 year after the outcome. The size of the sample will depend on the complexity of pathways established in Stage I of the study. A minimum sample size of 100 may be suggested for settings where only one pathway to abortion exists, but considerably larger numbers are required where pathways are many and various.

Research issues to be dealt with (in summary). Background socio-medical information and the patient's account of her prepatient pregnancy career will be obtained by retrospective interview. Information about referral, decision-making, abortion or contraception counselling and procedures will be obtained by interviews with patients and service providers and by observation. Records-based follow-up can be used to check discrepancies in findings and to record subsequent fertility-related events, but the main follow-up will consist of interviews with the patient to elicit her perceptions of the index pregnancy.

Where appropriate, open-ended rather than fixed-choice questions should be used, and statements recorded verbatim or tape-recorded, which will increase the validity of the analysis, since assumptions about categories of answers can be avoided and the original data can always be recategorized if necessary. Interviewers will need special skill and training in the use of questions to follow up responses to open-ended questions; they will also need special training in observation techniques.

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Analysis

(1) A detailed descriptive analysis will be made of the patient careers of the persons studied, and their interactions with services and service providers, outlining the factors influencing movement from one phase to another, and accounting for the different outcomes.

(2) Comparisons between Groups A and B can be made in respect of their sociomedical characteristics, their prepregnancy careers, their experience of the health system and the index pregnancy, their reproductive intentions, contraceptive knowledge and practice, and their later perceptions of the pregnancy experience. Comparison should also be made between different services and different service providers.

(3) The impact on outcomes of patient careers of the characteristics and situations of patients or potential patients, as well as the characteristics and practices of services and service providers, may be studied.

(4) Some of the analysis will be undertaken by conventional statistical techniques, but certain variables, such as perceptions, cognitions, and patterns of interaction, cannot properly be reduced to quantitative form for the purpose of analysis and of presentation. For complex social processes such as these, verbal reasoning and presentation are appropriate. Sets of propositions framed in verbally descriptive terms can be judged by the same canons as interpretations of numerical data. Probabilities can be assessed if there is sufficient detail to render the analysis feasible, and possibly conflicting explanations are ruled out.
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