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INSTITUTE OF MEDICINE

LEGALIZED ABORTION
AND THE PUBLIC HEALTH

**Report of a study by a committee
of the Institute of Medicine
May 1975**

**National Academy of Sciences
Washington, D.C.**

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SUMMARY AND CONCLUSIONS

The legal status of abortion in the United States became a heightened national issue with the January 1973 rulings by the Supreme Court that severely limited states' rights to control the procedure. The Court's decisions on the historic cases of *Roe v. Wade* and *Doe v. Bolton* precluded any state interference with the doctor-patient decision on abortion during the first trimester (three months) of pregnancy. During the second trimester, a state could intervene only to the extent of insisting on safe medical practices "reasonably related to maternal health." And for approximately the final trimester of a pregnancy--what the Court called "the state subsequent to viability" of a fetus--a state could forbid abortion unless medical judgment found it necessary "for the preservation of the life or health of the mother."

The rulings crystallized opposition to abortion, led to the introduction of national and state legislation to curtail or prohibit it, and generated political pressures for a national debate on the issue.

Against this background of concerns about abortion, the Institute of Medicine in 1974 called together a committee to review the existing evidence on the relationship between legalized abortion and the health of the public. The study group was asked to examine the medical risks to women who obtained legal abortions, and to document changes in the risks as legal abortion became more available. Although there have been other publications on particular relationships between abortion and health, the Institute's study is an attempt to enlist scholars, researchers, health practitioners, and concerned lay persons in a more comprehensive analysis of the available medical information on the subject.

Ethical issues of abortion are not discussed in this analysis, nor are questions concerning the fetus in abortion. The study group recognizes that this approach implies an ethical position with which some may disagree. The emphasis of the study is on the health effects of abortion, not on the alternatives to abortion.

Abortion legislation and practices are important factors in the relationship between abortion and health status. In order to examine legislation and court decisions that have affected the availability of legal abortion in the U.S., the study group classified the laws and practices into three categories: restrictive conditions, under which abortion is prohibited or permitted only to save the pregnant woman's life; moderately restrictive conditions, under which abortion is permitted with approval by several physicians, in a wider range of circumstances to preserve the woman's physical or mental health, prevent the birth of a child with severe genetic or congenital defects, or terminate a pregnancy caused by rape or incest; and non-restrictive conditions, under which abortion essentially is available according to the terms of the Supreme Court ruling.

Before 1967, all abortion laws in the United States could be classified as restrictive. Easing of restrictions began in 1967 with Colorado, and soon thereafter 12 other states also adopted moderately restrictive legislation to expand the conditions under which therapeutic abortion could be obtained. In 1970, four states (Alaska, Hawaii, New York, and Washington) removed nearly all legal controls on abortion. Non-restrictive conditions have theoretically existed throughout all fifty states since January 22, 1973, the date of the Supreme Court decision.

There is evidence that substantial numbers of illegal abortions were obtained in the U.S. when restrictive laws were in force. Although some of the illegal abortions were performed covertly by physicians in medical settings, many were conducted in unsanitary surroundings by unskilled operators or were self-induced. In this report, "illegal abortion" generally refers to those performed by a non-physician or the woman herself. The medical risks associated with the last two types of illegal abortions are patently greater than with the first.

A recent analysis of data from the first year of New York's non-restrictive abortion legislation indicates that approximately 70 percent of the abortions obtained legally in New York City would otherwise have been obtained illegally. Replacement of legal for illegal abortions also is reflected in the substantial decline in the number of reported complications and deaths due to other-than-legal abortions since non-restrictive practices began to be implemented in the United States. The number of all known abortion-related deaths declined from 128 in 1970 to 47 in 1973; those deaths specifically attributed to other-than-legal abortions (i.e., both illegal and spontaneous) dropped from 111 to 25 during the same period, with much of that decline attributed to a reduced incidence of illegal abortions. Increased use of effective contraception may also have played a role in the decline of abortion-related deaths.

Methods most frequently used in the United States to induce abortion during the first trimester of pregnancy are suction (vacuum aspiration) or dilatation and curettage (D&C). Abortions in the second trimester are usually performed by replacing part of the amniotic fluid that surrounds

the fetus with a concentrated salt solution (saline abortion), which usually induces labor 24 to 48 hours later. Other second trimester methods are hysterotomy, a surgical entry into the uterus; hysterectomy, which is the removal of the uterus; and, recently, the injection into the uterine cavity of a prostaglandin, a substance that causes muscular contractions that expel the fetus.

Statistics on legal abortion are collected for the U.S. government by the Center for Disease Control. CDC's most recent nationwide data are for 1973, the year of the Supreme Court decision. Some of those figures are:

- The 615,800 legal abortions reported in 1973 were an increase of approximately 29,000 over the number reported in 1972. These probably are underestimates of the actual number of abortions performed because some states have not yet developed adequate abortion reporting systems.
- The abortion ratio (number of abortions per 1,000 live births) increased from 180 in 1972 to 195 in 1973.
- More than four out of five abortions were performed in the first trimester, most often by suction or D&C.
- Approximately 25 percent of the reported 1973 abortions were obtained outside the woman's home state. In 1972, before the Supreme Court decision, 44 percent of the reported abortions had been obtained outside the home state of the patient, primarily in New York and the District of Columbia.
- Approximately one-third of the women obtaining abortions were less than 20 years old, another third were between 20 and 25, and the remaining third over 25 years of age.
- In all states where data were available, about 25 percent of the women obtaining abortions were married.
- White women obtained 68 percent of all reported abortions, but non-white women had abortion ratios about one-third greater than white women. In 1972, non-white women had abortion rates (abortions per 1,000 women of reproductive age) about twice those of whites in three states from which data were available to analyze.

A national survey of hospitals, clinics, and physicians conducted in 1974 by The Alan Guttmacher Institute furnished data on the number of abortions performed in the U.S. during 1973, itemized by state and type of provider. A total of 745,400 abortions were reported in the survey, a figure higher than the 615,800 abortions reported in 1973 to CDC. The Guttmacher Institute obtains its data from providers of health services, while CDC gets most of its data from state health departments.

Risks of medical complications associated with legal abortions are difficult to evaluate because of problems of definition and subjective physician judgment. Available information from 66 centers is provided by the Joint Program for the Study of Abortion, undertaken by The Population Council in 1970-1971.

The JPSA study surveyed almost 73,000 legal abortions. It used a restricted definition of major complications, which included unintended major surgery, one or more blood transfusions, three or more days of fever, and several other categories involving prolonged illness or permanent impairment. Although this study also collected data on minor complications, such as one day of fever post-operatively, the data on major complications are probably more significant. The major complication rates published by the JPSA study and summarized below relate to women who had abortions in local facilities and from whom follow-up information was obtained.

- Complications in women not obtaining concurrent sterilization and with no pre-existing medical problems (e.g., diabetes, heart disease, or gynecological problems) occurred 0.6 times per 100 abortions in the first trimester and 2.1 per 100 in the second trimester.
- Complications in women not obtaining concurrent sterilization, but having pre-existing problems, occurred 2.0 times per 100 in the first trimester and 6.7 in the second.
- Complications in women obtaining concurrent sterilization and not having pre-existing problems occurred 7.2 times per 100 in the first trimester and 8.0 in the second.
- Women with both concurrent sterilization and pre-existing problems experienced complications approximately 17 times per 100 abortions regardless of trimester.

The relatively high complication rates associated with sterilization in the JPSA study would probably be lower today because new sterilization techniques require minimal surgery and carry lower rates of complications.

The frequency of medical complications due to illegal abortions cannot be calculated precisely, but the trend in these complications can be estimated from the number of hospital admissions due to septic and incomplete abortion--two adverse consequences of the illegal procedure.

The number of such admissions in New York City's municipal hospitals declined from 6,524 in 1969 to 3,253 in 1973; most restrictions on legal abortion in New York City were lifted in July of 1970. In Los Angeles, the number of reported hospital admissions for septic abortions declined from 559 in 1969 to 119 in 1971. Other factors, such as an increased use of effective contraception and a decreasing rate of unwanted pregnancies may have contributed to these declines, but it is probable that the introduction of less restrictive abortion legislation was a major factor.

There has not been enough experience with legal abortion in the U.S. for conclusions to be drawn about long-term complications, particularly for women obtaining repeated legal abortions. Some studies from abroad suggest that long-term complications may include prematurity, miscarriage, or ectopic pregnancies in future pregnancies, or infertility. But research findings from countries having long experience with legal abortion are inconsistent among studies and the relevance of these data to the U.S. is not known; methods of abortion, medical services, and socio-economic characteristics vary from one country to another.

Risks of maternal death associated with legal abortion are low--1.7 deaths per 100,000 first trimester procedures in 1972 and 1973--and less than the risks associated with illegal abortion, full-term pregnancy, and most surgical procedures. The 1973 mortality rate for a full-term pregnancy was 14 deaths per 100,000 live vaginal deliveries; the 1969 rate for cesarean sections was 111 deaths per 100,000 deliveries. For second trimester abortions, the combined 1972-73 mortality ratio was 12.2 deaths per 100,000 abortions. (For comparison, the surgical removal of the tonsils and adenoids had a mortality risk of five deaths per 100,000 operations in 1969).

When the mortality risk of legal abortion is examined by length of gestation it becomes apparent that the mortality risks increase not only from the first to the second trimester, but also by each week of gestation. For example, during 1972-73, the mortality ratio for legal abortions performed at eight weeks or less was 0.5, and for those performed between nine and 10 weeks was 1.7 deaths per 100,000 legal abortions. At 11 to 12 weeks the mortality ratio increased to 4.2 deaths, and by 16 to 20 weeks, the ratio was more than 17 deaths per 100,000 abortions. Hysterotomy and hysterectomy, methods performed infrequently in both trimesters, had a combined mortality ratio of 61.3 deaths per 100,000 procedures.

Some data on the mortality associated with illegal abortion are available from the National Center for Health Statistics (NCHS) and from CDC. In 1961 there were 320 abortion-related deaths reported in the U.S., most of them presumed by the medical profession to be from illegal abortion. By 1973, total reported deaths had declined to 47, of which 16 were specifically attributed to illegal abortions. There has been a steady decline in the mortality rates (number of deaths per 100,000 women aged 15-44) associated with other-than-legal abortion for both white and non-white women, but in 1973 the mortality rate for non-white women (0.29) was almost ten times greater than that reported for white women (0.03).

Psychological effects of legal abortion are difficult to evaluate for reasons that include lack of information on pre-abortion psychological status, ambiguous terminology, and the absence of standardized measurements. The cumulative evidence in recent years indicates that although it may be a stressful experience, abortion is not associated with any detectable increase in the incidence of mental illness. The depression or guilt feelings reported by some women following abortion are generally described as mild and temporary. This experience, however, does not necessarily apply to women with a previous history of psychiatric illness; for them, abortion may be followed by continued or aggravated mental illness. The JPSA survey led to an estimate of the incidence of post-abortion psychosis ranging from 0.2 to 0.4 per 1,000 legal abortions. This is lower than the post-partum psychosis rate of one to two per 1,000 deliveries in the United States.

Psychological factors also bear on whether a woman obtains a first or second-trimester abortion. Two studies in particular suggest that women who delay abortion into the later period may have more feelings of ambivalence, denial of the pregnancy, or objection on religious grounds, than those obtaining abortions in the first trimester. It is also apparent, however, that some second-trimester abortions result from procedural delays, difficulties in obtaining a pregnancy test, locating appropriate counseling, or arranging and financing the procedure.

Diagnosis of severe defects of a fetus well before birth has greatly advanced in the past decade. Developments in the techniques of amniocentesis and cell culture have enabled a number of genetic defects and other congenital disorders to be detected in the second trimester of pregnancy. Prenatal diagnosis and the opportunity to terminate an affected pregnancy by a legal abortion may help many women who would have refrained from becoming pregnant or might have given birth to an abnormal child, to bear children unaffected by the disease they fear. Abortion, with or without prenatal diagnosis, also can be used in instances where there is reasonable risk that the fetus may be affected by birth defects from non-genetic causes, such as those caused by exposure of the woman to rubella virus infection or x-rays, or by her ingestion of drugs known to damage the fetus.

Almost 60 inherited metabolic disorders, such as Tay-Sachs disease, potentially can be diagnosed before birth. More than 20 of these diseases already have been diagnosed with reasonable accuracy by means of amniocentesis and other procedures. The techniques also can be used to identify a fetus with abnormal chromosomes, as in Down's syndrome (mongolism), and to discriminate between male and female fetuses, which in such diseases as hemophilia would allow determination of whether the fetus was at risk of being affected or simply at risk of being a hereditary carrier of the disorder.

In North America, amniocentesis was performed in more than 6,000 second-trimester pregnancies between 1967 and 1974. The diagnostic accuracy was close to 100 percent and complication rates were about two percent. Less than 10 percent of the diagnoses disclosed an affected fetus, meaning that the great majority of parents at risk averted an unnecessary abortion and were able to carry an unaffected child to term.

There are many limitations to the use of prenatal diagnosis, especially for mass screening purposes. Amniocentesis is a fairly expensive procedure, and relatively few medical personnel are qualified to administer it and carry out the necessary diagnostic tests. Only a small number of genetic disorders can now be identified by means of amniocentesis and many couples still have no way to determine whether or not they are to be the parents of a child with genetic defects. Nevertheless, the availability of a legal abortion expands the options available to a woman who faces a known risk of having an affected child.

Abortion as a substitute for contraception is one possibility raised by the adoption of non-restrictive abortion laws. Limited data do not allow definitive conclusions, but they suggest that the introduction of non-restrictive abortion laws in the U.S. has not lead to any documented decline in demand for contraceptive services. Among women who sought abortion and who had previously not used contraception or had used it poorly, there is some evidence that they may have begun to practice contraception because contraceptives were made available to them at the time of their abortion.

The health aspects of this issue bear on the higher mortality and morbidity associated with abortion as compared with contraceptive use, and on the possibility that if women rely on abortion rather than contraception they may have repeated abortions, for which the risk of long-term complications is not known.

The incidence of repeated legal abortions is little known because legal abortion has only been widely available in the U.S. for a few years. Data from New York City indicate that during the first two years of non-restrictive laws 2.45 percent of the abortions obtained by residents were repeat procedures. If those two years are divided into six-month periods, repeated legal abortions as a percent of the total rose from 0.01 percent in the first period to 6.02 percent in the last. Part of this increase is attributable to a statistical fact: the longer non-restrictive laws are in effect, the greater the number of women eligible to have repeated legal abortions. Perhaps, too, the reporting system has improved. In any case, some low incidence of repeated abortions is to be expected because none of the current contraceptive methods is completely failureproof, nor are they likely to be used with maximum care on all occasions.

A recent study has suggested that one additional factor contributing to the incidence of repeated abortions is that abortion facilities may not routinely provide contraceptive services at the time of the procedure. This is of concern because of recent evidence that ovulation usually occurs within five weeks and perhaps as early as 10 days after an abortion.

The conclusions of the study group:

- Many women will seek to terminate an unwanted pregnancy by abortion whether it is legal or not. Although the mortality and morbidity associated with illegal abortion cannot be fully measured, they are clearly greater than the risks associated with legal abortion. Evidence suggests that legislation and practices that permit women to obtain abortions in proper medical surroundings will lead to fewer deaths and a lower rate of medical complications than restrictive legislation and practices.
- The substantial differences between the mortality and morbidity associated with legal abortion in the first and second trimesters suggest that laws, medical practices, and educational programs should enable and encourage women who have chosen abortion to obtain it in the first three months of pregnancy.
- More research is needed on the consequences of abortion on health status. Of highest priority are investigations of
 - . long-term medical complications, particularly after multiple abortions
 - . the effects of abortion and denied abortion on the mental health and social welfare of individuals and families
 - . the factors of motivation, behavior, and access associated with contraceptive use and the choice of abortion.

Chapter 1

INTRODUCTION

This is the report of a committee appointed by the Institute of Medicine to examine the effects of abortion on the health of the public. A major emphasis is on the risks of death and medical complications to women obtaining abortions, and the documentable changes in these risks when the status of abortion shifts from essentially illegal to legal. The report also emphasizes the relative risks of early abortion--before 12 weeks gestation--and later abortion--usually in the second trimester of pregnancy. Both comparisons--legal as against illegal abortion, and first- as against second-trimester abortion--are highly significant to considerations of the consequences of abortion for public health.

Defining the Health Effects of Abortion

"Health effects" is a broad concept that could include almost all aspects of personal and social well being if health is defined as more than "merely the absence of disease or infirmity."¹ The health effects of abortion include physical, mental, emotional, and social outcomes of the procedure. The health of an individual woman obtaining an abortion is affected, but in a larger sense so also is the health of the family and of society. Further, the increased availability of abortion has led to alterations in the medical care system, in the roles of health professionals, and in certain demographic measures--each change affecting the public health to some degree.

A truly comprehensive analysis of the abortion-health relationship should deal thoroughly with all of these topics. However, the lack of data on many of these subjects precludes much detailed discussion. For example, information on the effects of abortion--obtained and denied--on family health and cohesiveness is only speculative, as is information on the impact of abortion on marital relationships. There are almost no data on the health outcomes resulting from innovation in women's health services, such as the creation of independent abortion and gynecology clinics. Similarly, it is difficult to assess the health impact of the research stimulated

by non-restrictive abortion legislation. Research on reproductive physiology, contraceptive methods, and the behavioral aspects of human sexuality has a clear relationship to health, but its relationship to abortion is not known.

The scope of this report, therefore, has been defined to a great extent by the availability of data. The study group decided that the potentially great number of topics in a consideration of the health effects of abortion should be limited as much as possible to those for which useful data are available. Further notes on specific data considerations appear at the end of this chapter.

Law and the Health Effects of Abortion

A common theme throughout this report is that the health effects of abortion are related to the legality of the procedure. However, there is no legal model, applicable to all jurisdictions, which can be used to evaluate the relationship between abortion laws and health. In some countries, for example, induced abortion is prohibited completely, despite considerable evidence that abortions will continue to be sought and obtained regardless of the risk or illegality. In some other countries abortions are illegal but can be easily obtained safely in licensed medical facilities staffed by qualified medical personnel. And in still other jurisdictions, abortions can be obtained legally, but only after the pregnant woman has satisfied medical and procedural requirements specified by legislation.

In an effort to bring these divergent models together, writers in the field often use the notion of a legal and procedural continuum. At one end, the law states that abortion may be easily obtained at the initiative of the woman; in the middle, legal abortion is available only under specified medical or socio-economic conditions and procedural requirements; and at the other end, the law prohibits abortion completely, with occasional exceptions if the life or health of the pregnant woman is seriously endangered.^{2/}

The study group found this legal classification spectrum useful and therefore adopted a set of terms and definitions, used with consistent meaning throughout this report, to reflect the continuum: non-restrictive legislation, moderately restrictive legislation, and restrictive legislation. These definitions can be applied with minimum difficulty to the more detailed discussions on health beginning in Chapter 2. Table 1 summarizes the definitions of each of these terms, and the various conditions and procedural requirements applying to each category. It also gives examples of countries where a particular type of legislation is currently in force.

TABLE 1

A Classification of Abortion Legislation

Characteristics	Restrictive Legislation	Moderately Restrictive Legislation	Non-restrictive Legislation
1. Alternative terminology	"Legally restrictive," "original [U.S.] laws" "illegal"	"Legal generally," "reform" legislation, "conditionally legal"	"Permissive" legislation, "abortion on request," "repeal" laws, "elective abortion," "legal on request," "abortion on demand"
2. Conditions under which abortion is permitted	Abortion is entirely prohibited or permitted only to save the life of the pregnant woman, or occasionally, in the case of rape or incest.	Abortion is permitted for various therapeutic reasons, i.e., to preserve the woman's physical or mental health, to prevent the birth of a child with fetal defects, to terminate a pregnancy caused by rape or incest, to comply with socioeconomic needs for an abortion.	Abortion is generally permitted at the request of the woman in the first trimester. Restrictions may be placed on second trimester abortions, on the location of abortions, and on the practitioners.
3. Procedural requirements or restrictions	Woman must apply for the abortion, usually to a committee of physicians, which reviews each case individually.	Usually the permission of two physicians or a hospital or regional panel must be obtained. Restrictions on length of pregnancy, residency requirements, and practitioner may also exist.	Usually not significant
4. Examples of locations	Before January 1973 most states in the United States, most of Africa and South America, Spain, and Italy (in Italy the Constitutional Court has recently ruled against the constitutionality of the old laws).	Most states in the United States between 1967 and January 1973, Great Britain, Japan, some countries in Eastern Europe, Denmark before 1973, and Sweden before 1975.	United States since January 1973, People's Republic of China, Denmark, Sweden, German Democratic Republic, U.S.S.R., Tunisia, Singapore, and France since 1975 (up to the tenth week of gestation).

-11-

Sources: Betty Sarvis and Hyman Rodman. The Abortion Controversy, 2nd ed., New York: Columbia University Press, 1974, pp. 27-46; Jean van der Tak. Abortion, Fertility, and Changing Legislation: An International Review, Lexington: D.C. Heath and Co., 1974, pp. 7-8 and 10; Christopher Tietze and Deborah A. Dawson, "Induced Abortion: A Factbook," Reports on Population/Family Planning, New York: The Population Council, December 1973; and Mary G. Kalis and Henry P. David. "Abortion Legislation: A Summary of International Classification, 1974," Henry P. David, ed., Abortion Research: International Experience, Lexington, Massachusetts: D.C. Heath and Co., 1974, pp. 13-31.

De Jure and De Facto Legal Status Abortion statutes often do not present an accurate picture of actual practices. In fact, the day to day implementation of the legislation may be quite different from the apparent intent of the law. Although legislation may be restrictive, abortion may be freely practiced by the medical profession in open disregard of the law and generally accessible to the majority of women. For example:

- . In the Netherlands, both the patient and the physician can legally be prosecuted for abortion, but the law is not enforced and eleven abortion clinics are currently in operation.3/
- . Abortion was technically illegal in Korea before January 1973, but it was generally available to all women. In a 1971 survey of Korean women who had obtained abortions, one-third thought that abortions were legal and one-third were unaware of its actual legal status.4/
- . In Greece, although induced abortion is illegal, it is still freely practiced "under the cover of false medical terminology such as... menstrual disorder."5/

Even when laws restricting induced abortion are generally observed by physicians, women with adequate financial resources are often able to obtain "illegal" but safe abortions, performed in the physician's private office. Women without such resources may obtain illegal abortions from non-medical practitioners, or attempt self-abortion. Examples of these conditions:

- . In Colombia, the Dominican Republic, and elsewhere in Latin America, illegal abortions are known to be widespread.6/ In El Salvador, one out of every five admissions to the San Salvador maternity hospital in 1965 was for complications from illegally-induced abortion.7/
- . In the Middle East and North Africa (with the exception of Tunisia) illegal but medically safe abortions are generally available to upper and middle class women from practicing physicians, although the vast majority of women who obtain abortions are presumed to obtain them illegally in unsanitary environments. A 1971 conference of the International Planned Parenthood Federation on induced abortion concluded that illegal, criminally induced abortion was widespread in the Middle East and North Africa and that legal restrictions were not effective in containing the demand for abortions.8/

Another variation of the difference between abortion legislation and practices is seen in jurisdictions with moderately restrictive abortion laws that are interpreted in a restrictive fashion. For example, although Romania's abortion legislation is only moderately restrictive, it is interpreted very narrowly and women find it difficult to obtain an abortion.9/ The state of Georgia adopted moderately restrictive laws in 1968 but actual practices

were relatively restrictive until 1972. There is evidence that many women did not shift from illegal to legal abortions until the second quarter of 1972, as indicated by a delayed decline in hospital admissions for medical complications of illegal abortions in Grady Hospital, Atlanta.10/

The situation is reversed in some countries with moderately restrictive abortion legislation but non-restrictive practices. For example, in Japan and Poland, abortion laws are moderately restrictive but abortion practices are virtually non-restrictive. Some Swedish women used to travel to Poland for abortions to avoid the delays caused by the procedural requirements of Sweden's moderately restrictive legislation.11/

And in some countries, non-restrictive laws coincide with non-restrictive practices, to make abortion widely available to most women. Women of lower socio-economic status, however, still may not be able to secure abortions in medical settings because fear or unfamiliarity about the abortion clinics limit their access, or because health facilities they rely on may be slow to provide abortion services. In the United States, there were considerable delays by the public hospitals, which traditionally serve low-income citizens, in responding to the 1973 Supreme Court decision. Only 17 percent of these facilities were providing abortion services in the first quarter of 1974.12/

In short, even where abortion legislation is restrictive, some women may be able to obtain them from licensed physicians in proper medical surroundings with risks similar to an abortion obtained through legal channels. On the other hand, even with moderately restrictive legislation (and to a lesser extent non-restrictive legislation) some women will still be unable to obtain abortions in a medical setting and will resort to self abortion or an illegal abortion from untrained individuals in an unsanitary environment. It can be assumed, but not proved, that most of the deaths and medical complications from illegal abortion cited in Chapters 3 and 4 derive from such abortions. In this report, reference to "health effects of illegal abortion" will imply this latter model of illegal abortion and not the technically illegal abortions provided by a medically trained person in a comparatively safe environment.

The Legal Status of Abortion in the United States

Before 1967, induced abortion was permitted in 42 states only if two or more physicians agreed that the abortion was necessary to preserve the life of the pregnant woman. Five states--Alabama, Oregon, Colorado, New Mexico and Maryland--and the District of Columbia permitted abortions under slightly broader rules concerning preservation of the woman's health. Three states--Massachusetts, New Jersey, and Pennsylvania--prohibited unlawful or unjustifiable abortion without specifically defining what was meant by those terms.13/

In 1957, the American Law Institute proposed an abortion statute as part of its Model Penal Code which expanded the conditions under which therapeutic abortions could be obtained. This code stated that

A licensed physician is justified in terminating a pregnancy if he believes there is substantial risk that continuance of the pregnancy would gravely impair the physical or mental health of the mother, or that the child would be born with grave physical or mental defect, or that the pregnancy resulted from rape, incest or other felonious intercourse. All illicit intercourse with a girl below the age of 16 shall be deemed felonious for purposes of this subsection. Justifiable abortions shall be performed only in a licensed hospital except in case of emergency when hospital facilities are unavailable.14/

Beginning with Colorado in 1967, thirteen states* adopted moderately restrictive abortion legislation that incorporated most of the conditions included in the American Law Institute's Model Penal Code. And, in 1970, four more states—Alaska, Hawaii, New York, and Washington—adopted non-restrictive legislation that removed nearly all restrictions on the conditions under which legal abortions could be obtained.

The legal status of abortion became an issue of heightened political controversy throughout the United States after a ruling by the Supreme Court on January 22, 1973 that greatly limited the extent to which the states could regulate abortion. In *Roe v. Wade* and *Doe v. Bolton*, the Court held abortion principally to be a matter of medical judgment for the pregnant woman and her attending physician during the first trimester of pregnancy. State intervention was permitted during the second trimester only to ensure that an abortion conform to safe medical practices. Subsequent to that time, the state could forbid abortion except in those cases where medical judgment deemed it necessary "for the preservation of the life or health of the mother." **15/

Following the Supreme Court decision, legal abortions theoretically became available to all pregnant women in the United States. In some states, however, the procedural requirements of hospitals and other related factors continue to limit the actual number of abortions performed, especially for the poor, even though many of these barriers are contrary to the intent of the Court's ruling. In terms of the classification system

*Arkansas, California, Colorado, Delaware, Florida, Georgia, Kansas, Maryland, New Mexico, North Carolina, Oregon, South Carolina, and Virginia.

**A more complete discussion of the Supreme Court's ruling is contained in Appendix A.

presented earlier, current U.S. abortion practices are classified as non-restrictive, although in some states and for selected sub-populations, implementation is moderately restrictive.

Data Limitations

Most of the medical literature on abortion relates to techniques of abortion or provides data on deaths, medical complications, and the mental health effects of the procedure. Data on subjects less directly connected with the abortion procedure itself are sparse or non-existent. For example, the study group would have wished to evaluate the impact of legalizing abortion on infant mortality rates, teenage marriage trends, and out-of-wedlock births. However, discussion of these and similar topics is constrained in three ways. First, non-restrictive abortion laws have been in effect for so short a time that it is difficult to establish valid trend data; second, differentiating the health and demographic effects of abortion from many other variables is difficult both theoretically and practically; and third, it is difficult to demonstrate the connections between demographic trends and health status. Inadequate data also preclude a discussion of the more general health effects of denying abortion to women including the social and psychological risks of carrying an unwanted pregnancy to term.

Another problem arises in determining when it is appropriate to apply foreign data to U.S. circumstances. In general, information from abroad has been used in this report only when the study group believed that the data could be compared transnationally, regardless of cultural factors or differences in medical procedures. European and Japanese abortion mortality data and figures on selected medical complications are used in the first several chapters of the report. But foreign data on such issues as post-abortion contraceptive use or the emotional impact of abortion are not presented because cultural factors unrelated to the quality of the research effort or the data collected may substantially limit their relevance. One exception is a reference to two foreign studies of children born to mothers denied abortion; no U.S. studies on this topic could be found.

The possible long-term medical complications of abortion provide another example of the problem with foreign data. Most studies conducted abroad on this subject have weaknesses in research design that limit the validity of the conclusions even for the country of origin. Transnational comparisons are hampered by different methods of pregnancy termination, varying systems for the delivery of medical care, and general cultural differences. However, because the U.S. has not yet collected adequate data on long-term complications, some foreign data are used in this report--with the shortcomings clearly identified.

Summary

The relationship between health and abortion has two main themes in this report. One is the health consequences of legal as against illegal abortions. The other is the difference in risks between first- and second-trimester terminations. Although the "health effects" of abortion can include a wide range of subjects, data constraints have limited the report's analysis to those topics on which there is useful information. Foreign data are presented and carefully qualified, only if there are no comparable U.S. data on a particular subject or if transnational comparisons seem valid. To bring some order to the wide variety of abortion laws and procedures, the study group has adopted a classification scheme of "restrictive, moderately restrictive, and non-restrictive" circumstances, taking into account the occasionally wide differences between the letter of the law and actual practice.

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Chapter 2

THE MEDICAL AND DEMOGRAPHIC ASPECTS OF LEGAL ABORTION IN THE UNITED STATES

The history of abortion as an illegal activity in the United States has resulted in a widespread lack of knowledge about the medical procedures used and the characteristics of women who obtain abortions. This chapter describes common methods of abortion, provides some medical definitions, and outlines the basic demographic features of women in the U.S. who undergo legal abortion. It concludes with a discussion of the trend in illegal abortions in recent years, the extent to which legal abortions have replaced illegal abortions, and a short summary of the demographic effects of the legalization of abortion in the United States.

Medical Definition and Methods of Abortion

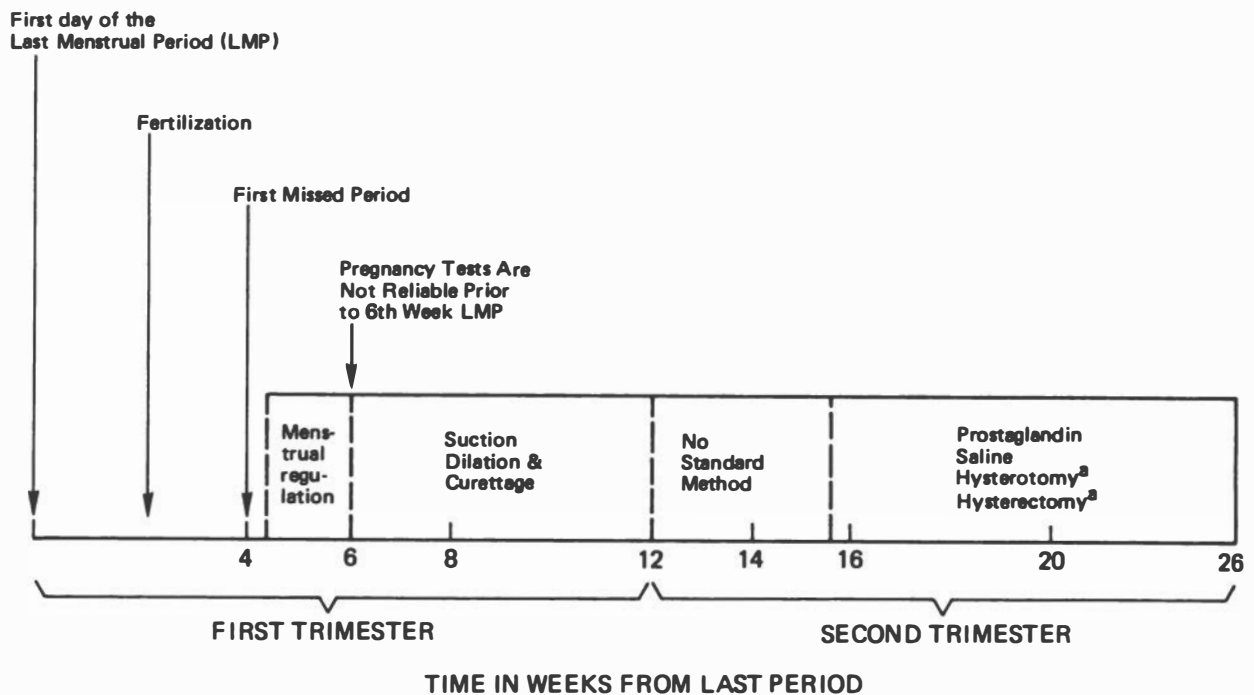
As generally defined in medical textbooks, abortion is the termination of a pregnancy before the fetus is viable, that is, before it is independently capable of sustaining life outside the uterus. In a number of textbooks, a non-viable fetus is defined as one weighing less than 500 grams, or just over one pound. Immature birth, not abortion, is generally used to describe the expulsion of a fetus weighing 500 to 999 grams (approximately 17 ounces to 2.2 pounds), whether it is born alive or dead.*

*A fetus of 500 to 999 grams usually does not survive, even with extraordinary life support measures. For an infant who does survive, however, improved medical technology offers a reasonable chance for maturation and normal life. For statistical purposes and international uniformity, the definition of a premature infant has been based on a weight of 1,000 to 2,499 grams (2.2 to 5.5 lbs). A more accurate measurement would take into account both birth weight and gestational age; there are medically important differences between infants of similar weight but different gestational ages.^{1/} The low birth weight of prematurity is a leading cause of infant mortality.

Abortion may occur spontaneously, in which case it is commonly referred to as a miscarriage, or it may be deliberately induced. Figure 1 summarizes the methods used to induce abortions at different stages of pregnancy. The three most frequently used methods in the United States are suction (vacuum aspiration) and dilatation and sharp curettage (D&C) for pregnancies in the first three months, and replacement of amniotic fluid with a concentrated salt solution (saline abortion) for second trimester pregnancies. In late 1973, the Food and Drug Administration approved the limited use (only in hospitals) of prostaglandins, as an alternative to a saline solution for second-trimester abortions. Hysterotomy, and hysterectomy with abortion, both of which involve major surgery, are not frequent methods of abortion in this country.

FIGURE 1

Methods of Induced Abortion By Weeks of Pregnancy



^{a/} These two methods can also be used in the first trimester.

Source: Adapted from Theresa van der Vlugt, and P. T. Piotrow. "Uterine Aspiration Techniques," Population Report, Series F, No. 3, Washington, D.C.: The George Washington University Medical Center, Population Information Programs, June 1973.

For a suction abortion, or vacuum aspiration, the cervical canal* is gradually forced open by the insertion of surgical instruments (dilators) until the opening is large enough for passage of a tube (cannula) into the uterine cavity. The fetus and placental tissue are then suctioned out by means of a vacuum pump connected to the cannula.**

In dilatation and sharp curettage, or D&C, the cervix is dilated to a greater extent and the fetal and placental tissue are scraped out of the uterus with a curette, which resembles a small spoon. Suction or D&C are performed almost exclusively in the first trimester, under either local or general anesthesia. At the end of the first trimester, approximately 13 weeks, the fetus is still very small, weighing approximately one-half ounce.

Intrauterine instillation of a saline solution, or saline abortion, is the most commonly used method in the second trimester, and is usually performed at or after sixteen weeks of pregnancy.*** A portion of the amniotic fluid that surrounds the fetus is withdrawn by means of a hollow needle inserted through the woman's abdominal wall into the uterine cavity.

*See the diagram of the reproductive organs under Ectopic Pregnancy in the Glossary.

**A procedure that may become of more importance in the U.S. is menstrual regulation. Menstrual regulation (also known as menstrual induction, menstrual extraction, and endometrial aspiration) is a suction procedure performed five to six weeks after the first day of the last menstrual period (i.e., during the two-week interval following the expected onset of a missed menstrual period). The procedure usually does not require anesthesia or dilatation of the cervix. A plastic cannula is inserted into the uterus and the contents of the uterus are pumped out. Menstrual regulation is performed before the time that pregnancy tests are reasonably reliable, which is six weeks after the beginning of the last menstrual period. Some physicians believe that menstrual regulation poses a small medical risk, which is unwarranted if the woman is not pregnant. (Dr. Elton Kessel, director of the International Fertility Research Program at the University of North Carolina, found no pregnancy in two-thirds of women whose menstrual periods were five days late, nor in one-third who were two weeks late.^{2/} If a woman is pregnant and menstrual regulation does not completely empty the uterus, there is a risk of continuing pregnancy or prolonged bleeding.^{3/}

***There is some medical disagreement about the best method of abortion for the gestational period between 12 and 15 weeks. Some physicians believe that no method of abortion is medically desirable during this time period and would wait to perform a saline abortion after 15 weeks gestation. Other physicians use a combination of vacuum aspiration and some mechanical manipulation involving the scraping of the uterus since the fetus is too large to be solely suctioned out.

This fluid is replaced with a concentrated salt solution, which induces labor and results in the expulsion of the fetus and placenta approximately 24 to 48 hours later. The fetus usually does not survive the procedure.

A prostaglandin abortion is similar in procedure to a saline abortion and also is performed in the second trimester. One type of prostaglandin, which causes strong muscular contractions, is injected in milligram doses into the uterine cavity without withdrawing any amniotic fluid. The interval between injection and expulsion of the fetus is generally of a shorter duration than with a saline solution.^{4/}

Hysterotomy, or surgical entry into the uterus, is performed in either the first or second trimester, but more usually in the second. In effect, it is a cesarean section that removes a fetus too small to survive.* Many physicians believe that any subsequent pregnancies will require cesarean section delivery. If no further pregnancies are desired, a hysterotomy abortion is often combined with tubal sterilization.

Hysterectomy for pregnancy termination consists of the removal of the uterus, with or without the fetus inside, and is usually performed when a pathological condition of the uterus, such as fibroid tumors, warrants its removal, or when the woman desires sterilization. Since hysterotomy and hysterectomy are major surgical procedures, they represent more of a risk to the woman than the other abortion methods and are not often used in the United States. (See Chapter 4 for further discussion.)

In both 1972 and 1973 about 83 percent of the abortions in the United States were performed in the first trimester,^{5/} most commonly by means of suction or D&C. During 1972, 65 percent of the abortions were performed by suction, 23 percent by D&C, and 10 percent by the saline method.^{6/} During 1973, the percentage of abortions performed by suction increased to 74 percent while those performed by D&C declined to 13 percent; the percentage of abortions performed by saline remained at 10 percent.^{7/}

Characteristics of Abortion in the United States

Most of the national data on legal abortion in this report were obtained from Abortion Surveillance Reports, published by the Center for Disease Control (CDC). CDC began collecting abortion statistics from 10 state public health departments beginning with 1969 data. By 1972, 19 states and the District of Columbia provided statewide data on the number of abortions performed in their jurisdictions, and eight other states provided partial data.

*There are a few known cases in which a physician has miscalculated the duration of the woman's pregnancy; viable fetuses have been removed and have survived.

Twenty-five states and the District of Columbia reported statewide abortion statistics for 1973 with partial reporting provided by hospitals in additional states. Table 2 summarizes the status of national abortion reporting as of April 1975.^{8/}

TABLE 2

Chronological Record of the Number of States Reporting to the Center for Disease Control, 1969-1973.

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Number of states from which statewide abortion data were reported <u>a/</u>	8	17	18	20	25
Additional states from which abortion data are reported from individual hospitals or facilities	2	7	7	8	26
Total Number of states from which partial or complete abortion data are reported <u>a/</u>	10	24	25	28	51
Total Number of abortions reported to CDC	22,670	193,491	485,816	586,760	615,831

a/ Including the District of Columbia, beginning in 1970.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control. Abortion Surveillance: 1973, issued May 1975.

There is no uniform national reporting system; states have established their own systems, or do not require reports of abortion. The number of legal abortions reported to CDC is less than the actual number performed nationwide, though it is probable that in 1972 the majority of legal abortions obtained in the United States were performed in the reporting states. The basis for this judgment is that 16 of 17 states with non- or moderately restrictive legislation in 1972 reported statewide data, and the other, New Mexico, reported partial data. Data were also reported from the District of Columbia, where a large number of abortions were performed in 1972.

Although the Supreme Court decisions that legalized abortion in all 50 states were handed down in January, 1973, many states have not yet developed adequate reporting systems for channeling abortion data to their public health departments, which in turn report to CDC. Therefore, the number of abortions reported to CDC for 1973 (25 states reported statewide data) continued to be lower than the actual number performed.

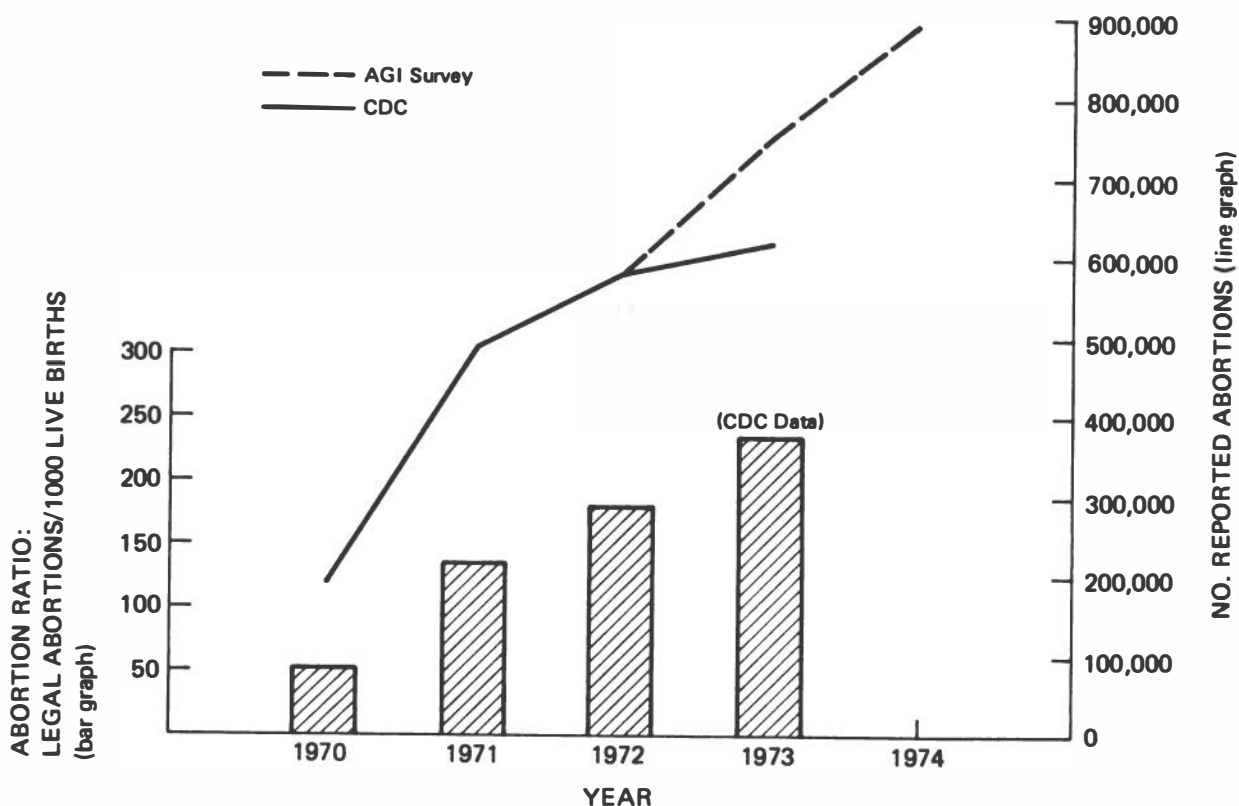
The Alan Guttmacher Institute, the research and development division of Planned Parenthood-World Population, conducted a nationwide survey of 1,642 providers (hospitals, clinics, and private physicians) that enables a more complete estimate of the number of legal abortions obtained in the U.S. during 1973.^{9/} Unlike CDC, which depends upon reports from the public health departments, this survey obtained its information directly from the providers of abortion services in all 50 states and the District of Columbia, and is therefore more comprehensive than the CDC reports. The survey also estimated the number of abortions that would occur in 1974 based on a straight-line projection of the last three quarters of 1973 and first quarter of 1974. No national abortion data for 1974 were available from CDC by May 1975.

Figure 2 shows the rise in the number of reported legal abortions since 1970 and the increase in the national abortion ratio since that year.* The increases in the number of reported abortions reflect two factors: (1) an increase in the number of states providing information to CDC; and (2) an increase in the frequency of legal abortions within the United States. The specific effect of each of these factors has not been identified in Figure 2, although the number of states that reported data in each of those years has been indicated.

*Two terms--abortion ratio and abortion rate--are used to measure the relative frequency of abortions. Abortion ratio generally refers to the number of abortions per 1,000 live births in the same year; abortion rate refers to the number of abortions per 1,000 women 15-44 years of age.

FIGURE 2

Number of Reported or Estimated Legal Abortions and Abortion Ratios
 United States, 1970-1973 a/



a/ The number of states reporting statewide or partial data to CDC in these years is given below. For those states reporting only partial data to CDC, there are no estimates of how many abortions were performed but were not reported.

1970 - 24 states	1972 - 28 states
1971 - 25 states	1973 - 51 states

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control. Abortion Surveillance: 1972, issued April 1974; Abortion Surveillance: 1973, issued May 1975; and Edward Weinstock, Christopher Tietze, Frederick S. Jaffe, and Joy G. Dryfoos. "Legal Abortions in the United States Since the 1973 Supreme Court Decisions," Family Planning Perspectives 7: 25 January/February 1975.

From 1971 to 1972, the number of abortions reported to CDC increased 21 percent, but from 1972 to 1973, the increase in reported abortions was only five percent, even though the number of reporting states nearly doubled. If the more complete survey data compiled by The Alan Guttmacher Institute are used, a 27 percent increase occurred in the number of abortions obtained in 1973 compared with the 1972 CDC data.

A direct causal relationship cannot be inferred between the increasing legalization of abortion (culminating with the Supreme Court decisions) and the increasing number of abortions shown by Figure 2. The Supreme Court decisions did not necessarily increase the number of abortions; many of those obtained under non-restrictive abortion practices would earlier have been obtained illegally. Legalization of abortion and the establishment of reporting systems has caused them to become visible. As the substitution effect diminishes over time the rate of increase in the number of reported abortions is likely to decline.* The abortion ratio per 1,000 births has continued to rise, not only because of the increase in the number of abortions, but also because of the decrease in the total number of births during this period.

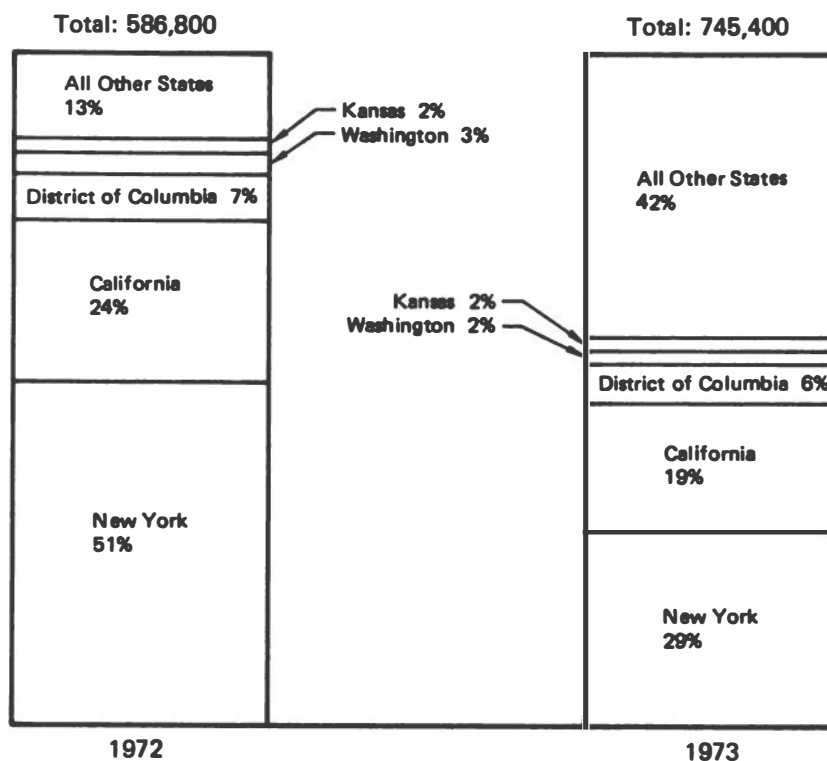
Geographic Location and Residency Status

During 1972, according to data reported to CDC from 28 states, the majority of legal abortions were performed in the non-restrictive jurisdictions of the District of Columbia, New York, Washington, Alaska, and Hawaii, and in some moderately restrictive states, such as California and Kansas, where abortions were obtained without great difficulty (Table 3). Seventy-five percent of the total abortions were performed in New York and California, and an additional 12 percent were obtained in the District of Columbia, Washington, and Kansas (see Figure 3). During that year, 44 percent of the abortions were obtained by out-of-state residents who traveled to states with non-restrictive practices to obtain their abortions.^{10/} Because of this migration, the abortion rates (numbers of total abortions per 1,000 resident women age 15-44) in states with non-restrictive practices were disproportionately high. For example, the District of Columbia had an abortion rate of 214 because women from Maryland, Virginia, and elsewhere in the South (where moderate or restrictive abortion legislation was in force) traveled to the District for their abortions.

*The substitution of legal for previously illegal abortions is discussed on p. 38.

FIGURE 3

**Percent Distribution of Reported Legal Abortions
by Place of Occurrence, 1972 and 1973**



Source: Table 3.

After the Supreme Court decisions on abortion in January 1973, the geographic distribution of legal abortions changed to reflect the growing number of abortions performed in states that had previously had restrictive abortion practices (Table 3 and Figure 3). According to The Alan Guttmacher Institute survey, the number of abortions in New York during 1973 was 216,000, a decline of 83,000 from the 1972 figure of 299,900 reported by CDC. A total of 86,900 abortions were obtained in Illinois, Michigan, and Ohio during 1973; none of these states reported any abortions to CDC in 1972, (all of these were states with restrictive policies in 1972). It is likely that part of the New York decline during 1973 can be attributed to the initiation of abortion services in these three mid-western states during that year.

TABLE 3

Number of Reported Legal Abortions in 1972 and 1973,
 By State, and Legal Status of Abortion in 1972

<u>Non-restrictive States</u>	1972 <u>a/b/</u> <u>Abortions</u>	1972 <u>c/</u> <u>Rates</u>	1973 <u>d/</u> <u>Abortions</u>	1973 <u>e/</u> <u>Rates</u>
Alaska	1,172	12.0	1,200	16.5
Hawaii	4,546	25.7	4,600	26.1
New York <u>f/</u>	299,891	75.9	216,000	53.7
Washington	17,767	23.8	17,200	22.5
District of Columbia <u>f/g/</u>	38,868	207.9	44,500	233.4
<u>Moderately Restrictive States</u>				
Arkansas	793	2.0	1,100	2.8
California	138,584	30.6	143,400	30.7
Colorado	5,260	10.3	7,600	14.3
Delaware	1,342	10.8	2,000	15.6
Florida	3,378 <u>i/</u>	2.4	23,600	16.4
Georgia	2,509	2.4	11,000	10.3
Kansas <u>f/</u>	12,248	26.6	12,600	27.0
Maryland	9,093	10.1	11,100	11.8
New Mexico <u>f/</u>	5,989 <u>h/</u>	26.7	4,600	20.3
North Carolina	8,365	7.4	12,100	10.7
Oregon	7,143	15.7	8,000	17.4
South Carolina	854	1.5	2,200	3.6
Virginia	4,496	4.3	9,000	8.5
<u>Restrictive States</u>				
Alabama	1,156 <u>h/</u>	1.5	4,500	6.1
Arizona	275 <u>h/</u>	.7	2,900	7.2
Connecticut	2,579 <u>h/</u>	3.9	6,800	10.1
Idaho	<u>k/</u>		300	2.0
Illinois	<u>k/</u>		32,500	13.4
Indiana	<u>k/</u>		1,800	1.6
Iowa	<u>k/</u>		3,400	5.9
Kentucky	<u>k/</u>		2,600	3.8
Louisiana	<u>k/</u>		<u>m/</u>	<u>m/</u>
Maine	<u>k/</u>		600	3.5
Massachusetts	3,394 <u>j/</u>	2.8	14,100	11.5
Michigan	<u>k/</u>		37,200	18.6
Minnesota	<u>k/</u>		7,600	9.2
Mississippi	61	.1	100	0.2
Missouri	<u>k/</u>		3,200	3.4
Montana	<u>k/</u>		400	2.8
Nebraska	789 <u>h/</u>	2.6	2,100	7.1
Nevada	<u>k/</u>		1,200	9.9

Restrictive States (con` t)

New Hampshire			k/	700	3.7
New Jersey			k/	10,000	6.4
North Dakota			k/	m/	m/
Oklahoma			k/	700	1.1
Ohio			k/	17,200	7.2
Pennsylvania	8,540	h/	3.5	29,800	12.1
Rhode Island			k/	1,100	5.6
South Dakota			k/	1,700	12.2
Tennessee			h/m/	3,700	4.2
Texas			k/	17,600	7.1
Utah			k/	100	0.4
Vermont	231		2.4	1,200	15.8
West Virginia			k/	m/	m/
Wisconsin	7,427	h/	8.3	8,200	8.6
Wyoming			k/	300	4.3
U.S. Total	586,800			745,400	16.5

- a/ Includes all states that reported information to CDC. Other states may have performed abortions but did not report them to CDC.
- b/ Data from state health departments unless otherwise noted.
- c/ Data to calculate abortion rates on women aged 15-44 were obtained from U.S. Census Bureau population projections for 1972.
- d/ Based on The Alan Guttmacher Institute survey.
- e/ Abortion rates were calculated using the number of abortions by state of occurrence as the numerator, and the number of women aged 15-44 as of July 1, 1973, by state of residence (based on U.S. Census Bureau projections) as the denominator. The quotient is multiplied by 1,000 to obtain the abortion rate per 1,000 women aged 15-44.
- f/ These states performed at least one-half of their abortions on out-of-state residents in 1972.
- g/ Technically, non-restrictive legislation was not in force in the District of Columbia, but a series of court decisions had voided the previous restrictive legislation and de facto non-restrictive practices were in force.
- h/ Reported from one or more hospitals in the state.
- i/ April-December 1972.
- j/ October 1971-September 1972.
- k/ States that did not report abortions to CDC or did not perform abortions during 1972.
- m/ States performing less than 50 abortions.

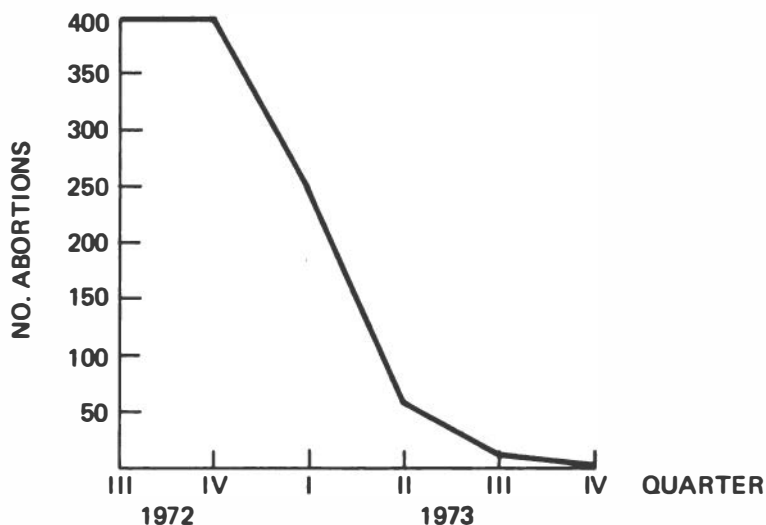
Note: 1973 abortion numbers are rounded to nearest hundred.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control. Abortion Surveillance: 1972 issued April 1974; Abortion Surveillance: 1973, issued May 1975; Edward Weinstock, Christopher Tietze, Frederick S. Jaffe, and Joy G. Dryfoos. "Legal Abortions in the United States since the 1973 Supreme Court Decisions," Family Planning Perspectives 7:25 January/February 1975.

The change in geographic distribution of abortions following the Supreme Court decisions also can be illustrated by examining the abortion statistics for upstate New York and Georgia itemized by state of residence. In 1972, upstate New York reported an average of 19,000 abortions per quarter, with 60 percent obtained by out-of-state residents. Georgia residents obtained an average of 400 abortions per quarter in upstate New York. After January 1973, however, access to abortion improved in Georgia and the number of abortions obtained in upstate New York by Georgia women declined from 248 in the first quarter of 1973 to only one in the fourth quarter of that year. Figure 4 illustrates this trend.11/

FIGURE 4

Number of Abortions Obtained in Upstate New York by Georgia Residents by Quarter, 1972 - 1973



Source: Jack C. Smith, Ronald S. Kahan, and Winthrop A. Burr. "Abortions in the United States: Before and After the Supreme Court Decision," paper presented at Twelfth Annual Meeting, Association of Planned Parenthood Physicians, Memphis, Tennessee, April 1974, pp. 9-10.

One effect of the Supreme Court decisions was the more equal distribution of abortion accessibility and, at least for some women, the increased opportunity to obtain abortions closer to home. There are positive health benefits in obtaining abortions nearer a woman's home: If a complication should arise, she has access to the same facility that performed the abortion, where her medical history is available to facilitate care.

Type of Health Care Facility Information on the type of health care facility where abortions are performed is available for New York City during a two-year period from July 1, 1970 through June 30, 1972. Some nationwide data are available from the survey conducted by The Alan Guttmacher Institute.

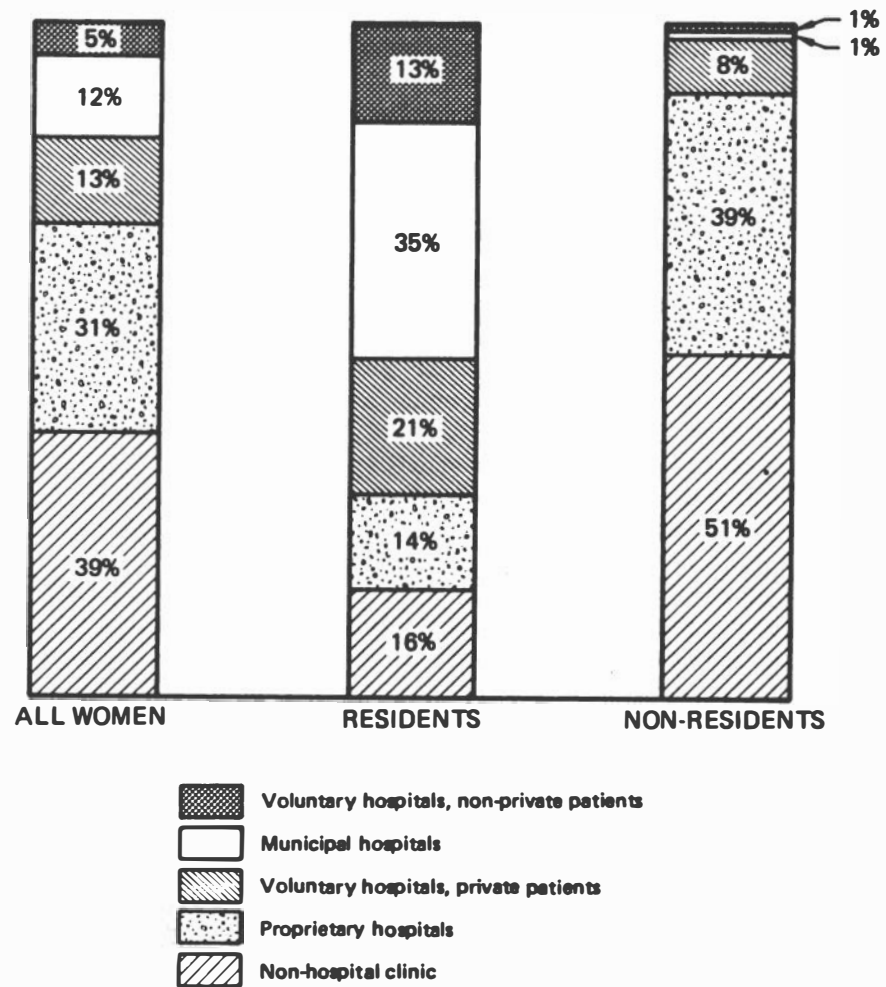
From 1970-1971 to 1971-1972, non-hospital clinics performed 39 percent of the abortions in New York City, with the remainder distributed among various types of hospital facilities (Figure 5). When examined by place of residence, 51 percent of non-residents (112,070 women) obtained their abortions in non-hospital clinics while only 16 percent of New York residents (18,100 women) obtained their abortions in those clinics.^{12/} Possible reasons for this difference are that the resident woman either has her own doctor, who will recommend her to an affiliated hospital, or she seeks her medical care at a municipal hospital. The largest number of abortions obtained by New York City residents, by facility, was the 40,246 abortions performed in the municipal hospitals.

According to The Guttmacher Institute survey of clinics, hospitals, and private physicians, the public hospitals have been the slowest to respond to the mandate implied in the Supreme Court's decision. Of 2,144 public hospitals identified by the American Hospital Association in 1972, only 17 percent (362 hospitals) provided abortions during 1973 and the first quarter of 1974.* This may have restricted the availability of abortions to low-income women who are more likely to obtain their medical services in these facilities than middle or upper class women. The number of abortions performed in all hospital settings declined throughout 1973 from 102,600 in the first quarter to 92,000 in the fourth quarter, while the abortions performed in non-hospital-based clinics increased steadily during this period.^{13/} By the first quarter of 1974 the number of abortions performed in free-standing clinics was greater than those performed in hospitals.

*The relative paucity of abortion services in public hospitals may reflect not only their reluctance to respond to the Supreme Court decisions, but also a lack of funds to provide the necessary facilities and personnel.

FIGURE 5

Percent Distribution of New York City Abortions by Type of Provider and Residency Status, July 1, 1970 - June 30, 1972



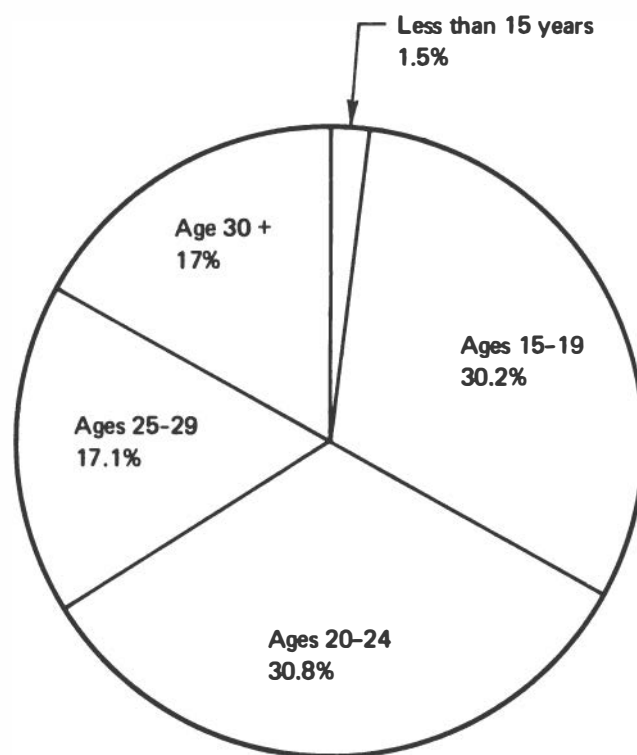
Source: Jean Pakter, Donna O'Hare, Frieda Nelson and Martin Svirig. "Two Years Experience in New York City with the Liberalized Abortion Law - Progress and Problems," American Journal of Public Health 63: 526, June 1973.

Characteristics of Women Obtaining Abortion in the United States

Age Of abortions for which the age of the patient was known, approximately one-third of the women obtaining abortions in the United States in 1972 were less than 20 years old, another third were between 20 and 25 years of age, and the rest were 25 or older. Data for 1973 (Figure 6) show that the age distribution for women obtaining abortions almost exactly parallels the distribution by age during 1972.

FIGURE 6

Percent Distribution of Reported Legal Abortions by Age, Selected States, 1973^{a/}



^{a/} There were 489,735 abortions, out of a total of 615,831, for which age was reported. The percentages do not equal 100 because 3.5 percent of the ages were unknown.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control. Abortion Surveillance: 1973, issued May 1975.

Race Race was specified for 489,446 women obtaining abortions in 1972, of which 76 percent (370,644) were white and 24 percent were black or other non-white. Slightly fewer abortions were identified by race in the CDC reports for 1973; of these 27 percent were obtained by black and other non-white women.14*

A comparison of the number of abortions and abortion rates for non-white women (residents and non-residents) in certain states during 1972 and 1973 suggests that these rates tend to be higher when non-restrictive abortion practices are in effect (Table 4). During 1972, for example, California and Kansas experienced higher non-white abortion rates than Georgia and North Carolina. New York state had the highest rate, probably reflecting both the ease with which resident women could obtain abortions in New York, and the influx of non-white women from out of state. From July 1, 1971 to June 30, 1972, about 18,000 abortions were provided to this latter group of women in New York City.15/ During 1973, however, both the number and the rate of abortions obtained by non-white women declined in New York state, part of which can undoubtedly be explained by the reduction in abortions obtained by out-of-state residents in that year. The higher rates observed in Georgia, North Carolina, Virginia, and South Carolina during 1973 must reflect improved access to legal abortions for non-white women in these states, some of which may have been obtained in New York in previous years.

In most states, an examination of the incidence of abortion between white and non-white women during 1972 (and to a lesser extent, during 1973) requires a comparison of abortion rates for resident women only. In states with moderate or restrictive legislation prior to the Supreme Court decisions (Georgia, Maryland, North and South Carolina and Virginia), many more white women tend to leave their state for an abortion than non-white women, thereby artificially lowering the abortion rates for white women. In non-restrictive states, there was no distortion in the rates for residents, but the inclusion of non-residents in the total rates tended to cause an upward distortion for white women.**

*CDC does not provide data on race at a more disaggregated level. The category, "black and other," contains Negro, American Indian, Chinese, Japanese, Hawaiian, part Hawaiian, and other.

**In their article on illegitimacy rates in Science, Sklar and Berkov point to the greater use of out-of-state abortion by white women in non-abortion states as one factor purporting to explain their declining illegitimate birth rates.16/

TABLE 4

Reported Legal Abortions a/ and Abortion Rates for
Non-White Women, Selected States, 1972 and 1973

<u>State</u>	<u>1972</u>		<u>1973</u>	
	<u>Reported Abortions</u>	<u>Rates c/</u>	<u>Reported Abortions</u>	<u>Rates c/</u>
Alaska <u>b/</u>	271	21.0	287	22.2
California	26,913	52.2	23,078	44.8
Colorado	501	22.8	584	26.5
Georgia	1,263	4.9	4,084	15.9
Hawaii <u>b/</u>	2,743	26.4	2,936	28.2
Kansas <u>b/</u>	1,432	55.3	1,819	70.3
Maryland	4,419	26.6	4,680	28.1
New York State <u>b/</u>	67,310	112.4	60,090	100.3
North Carolina	2,729	10.8	4,233	16.8
South Carolina	297	1.8	611	4.0
Virginia	2,181	11.6	3,108	16.6

a/ Includes abortions obtained by both resident and non-resident women.

b/ State with non-restrictive legislation in 1972.

c/ The number of women aged 15 to 44 is from 1970 Census data.

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control. Abortion Surveillance: 1972, issued April 1974; ASR, 1973, issued May 1975; and U.S. Department of Commerce, Social and Economics Statistics Administration, Bureau of the Census, Age and Race of the Population of the United States, by States, 1970.

An illustration of non-residents distorting the distribution is provided by New York, where 61 percent of all abortions in 1972 were obtained by non-residents. Most of those were obtained in New York City. Of the 132,040 abortions provided to non-residents of New York City during the period July 1, 1971 to June 30, 1972, about 114,000 (86 percent) were obtained by white and Puerto Rican women, and only 14 percent by non-white women. But among residents, about 51,500 abortions (55 percent of the total) were obtained by whites.17/

Table 5 provides data on the number of induced abortions and rates, by race, during 1972 for residents of three localities. In all three places, the rates for blacks and other non-whites were approximately twice as high as for whites. To some extent this may reflect an under-reporting of white abortions because private practitioners, to whom whites would go more frequently than would non-whites, probably report less completely than do public facilities. Although there are few scientific studies available to explain this differential, it is possible that poverty, cultural attitudes, and ignorance about reproduction may have limited the access by non-white women to family planning methods, particularly before Federal funds became available in the early 1970's. This may have led historically to a greater reliance on illegal abortion as a method of birth control, which has continued to be reflected in the reported data on legal abortion.^{18/} A 1968 survey in North Carolina estimated that one conception in seven among white women resulted in an illegal abortion, compared with one out of three among black women.^{19/*} If non-white women are more likely to resort to abortion but are less likely to take advantage of out-of-state abortion opportunities, it would appear that non-white women have easier access to legal abortion only when all legal obstacles to abortion are reduced in their home states.

Marital Status and Number of Living Children Approximately 28 percent of the women whose abortions were reported to CDC in 1973 were married at the time of the procedure, and the remaining 72 percent were single, separated, divorced or widowed.^{21/**} Data for 1972 from CDC parallel the 1973 proportions. These statistics indicate the woman's marital status at the time of abortion, which does not necessarily reflect her marital status at conception. A sizeable number of women who conceive out of wedlock married their partners and did not obtain abortions. According to Sklar and Berkov, the legalization of abortions not only helps to prevent out-of-wedlock births, but also helps reduce the incidence of pregnancy-related marriages.^{22/} Fifty percent of the women obtaining abortions in 1973 had one or more children at the time of the abortion.^{23/}

*A study done by Bauman and Udry in the early 1970's found a higher percentage of unwanted pregnancies and births among blacks than among whites. This statistic was associated with blacks' lesser use of non-physician-administered contraceptive methods, greater non-use of contraception, higher failure rates with pills or IUD's and lower family size desired. The study was based on a 1969-1970 survey of low income, married or formerly married women in seventeen U.S. cities and comparable data from the 1965 and 1970 National Fertility Studies.^{20/}

**Approximately seven percent of the abortions were reported with marital status unknown, and were distributed proportionately.

TABLE 5

Number of Legal Abortions and Abortion Rates by Race for
Residents of New York City, California, and Maryland

Locality	<u>Number of Abortions</u>		<u>Abortion Rates</u>	
	<u>White</u>	<u>Non-White</u>	<u>White</u>	<u>Non-White</u>
New York City (1971/72)	39,700	35,400	31.7	71.8
California (1971/72)	85,780	17,356	21.9	51.2
Maryland (1971)	7,711	3,545	10.9	19.9

Sources: New York City - Christopher Tietze and Deborah Dawson. "Induced Abortion: A Factbook," Reports on Population/Family Planning, New York: The Population Council, December 1973, p. 11.

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Legalization of Abortion and the Trend in Illegal Abortions

Even though abortions were illegal in a majority of states before the Supreme Court decisions in January 1973, many women were able to obtain them. But illegal abortions are not reported to public health authorities and almost never to the police. Estimates of their numbers have to be based on occasional surveys and extrapolations from hospital admission and discharge data, which makes impossible a calculation of illegal abortion ratios or rates, or the development of trend data on the incidence.

The most widely quoted figure on the number of illegal abortions comes from a committee established after a 1955 Arden House conference on abortion, sponsored by Planned Parenthood. The committee concluded that "a plausible estimate of the frequency of induced abortion in the United States could be as low as 200,000 and as high as 1,200,000 per year... [with] no objective basis for the selection of a particular figure between the two estimates as an approximation of the actual frequency."^{24/} Another estimate by two authors was that in 1955 there were probably 699,000 illegally induced abortions and in 1967, 829,000 illegally induced abortions. These figures were based on randomized response estimates of induced abortion in women aged 15-44 in North Carolina, and then applied to the United States as a whole. The estimates are in the mid-range of the Arden House estimate cited above.^{25/} Evidence provided in Chapters 3 and 4 show that the medical indicators of the frequency of illegal abortions, i.e. hospital admissions for incomplete or septic abortions and deaths from other-than-legal abortions, have declined significantly in locations with non-restrictive abortion practices. These data suggest that the number of illegal abortions has declined in recent years and that most women will choose a legal abortion over an illegal abortion when that choice is available. Tietze has calculated that 70 percent of the legal abortions obtained in New York City from July 1, 1970 to June 30, 1972 by resident women replaced illegal abortions which had previously taken place, and that the remainder was responsible for about one-half of the decline in live births that occurred between 1970 and 1972.^{26/}

Other Demographic Effects of the Legalization of Abortion

Although Tietze has argued that the predominant effect of the legalization of abortion has been a substitution of legal abortions for what otherwise would have been illegal abortions, he and other authors agree that there has been a demographic effect as well, namely that there has been a more rapid decline in the birth rate in states with non-restrictive abortion practices than in other states, and particularly in the rates of out-of-wedlock births.^{27/}

Pakter and Nelson have shown that the continued rise in the number of out-of-wedlock births in New York City during the 1960's (from 16,412 in 1962 to 31,903 in 1970) was not reversed until 1971, the first full year of New York's non-restrictive abortion law. In that year, out-of-wedlock births declined by 12 percent to 28,099,^{28/} the first decrease since illegitimate births began to be recorded in 1954.^{29/} The authors conclude that "it was only after abortions became available that the number of out-of-wedlock births began to diminish. Two-thirds of the terminations of pregnancy for New York City residents were among the unmarried, and 90 percent of the teenagers undergoing abortions were unmarried."^{30/}

Similar data have been reported from California, where the out-of-wedlock fertility rate fell 16 percent, from 27 to 22.6 per 1,000 unmarried women between 1970 and 1971, the first year that non-restrictive abortion practices were widely adopted. Again, this was the first decline since 1966 when records on legitimacy status began to be kept. Concomitant with this decline was an increase in the teenage abortion rate from 30.8 per 1,000 women aged 15-19 during July 1970-June 1971, to 41.2 per 1,000 in 1971-1972, an increase of 22.8 percent.^{31/} From a detailed analysis of the relationship between legal abortion and out-of-wedlock births in California since 1970, Sklar and Berkov have concluded that the availability of legal abortion was a significant factor in the decline in illegitimacy for California between 1970 and 1972.^{32/}

A comparison of out-of-wedlock birthrates from 1965 to 1971 for the United States as a whole and for those states that had introduced less restrictive abortion legislation suggests that abortion may have had an immediate downward push on illegitimacy (Table 6). From 1965 to 1970, out-of-wedlock birthrates in all states had an annual average increase of approximately three percent. After 1970, however, when a dozen states had adopted moderately restrictive or non-restrictive legislation, out-of-wedlock birthrates declined 12 percent in states with liberalized abortion laws and only two percent in states with restrictive laws.^{33/}

Although these data can be interpreted as showing some relationship between the legalization of abortion and a decline in out-of-wedlock births in the subsequent year, no conclusions can be drawn with respect to the long-term trend in out-of-wedlock births in an area with non-restrictive abortion legislation. In New York, the number of out-of-wedlock births reversed its two-year decline and increased in 1973 from 27,619 to 28,292.^{34/} For the U.S. as a whole, the illegitimate birthrate increased in 1972 and then dropped slightly in 1973, but not to the low level achieved in 1971. Too many other factors affect the decision to bear a child, and particularly an out-of-wedlock child, to allow conclusions about the demographic effects of legal abortion.

TABLE 6

Estimated Out-of-Wedlock Birthrates for Women Aged 15 to 44
 in States by Type of Abortion Legislation, United States, 1965-1973

Out-of-Wedlock Births per 1,000 Unmarried Women Aged 15-44

<u>Year</u>	<u>All States</u>	<u>States with Moderate and Non-restrictive Legislation a/</u>	<u>States with Restrictive Legislation</u>
1965	22.2	23.5	21.5
1966	22.2	23.7	21.4
1967	22.7	24.4	21.7
1968	23.2	25.0	22.3
1969	24.1	25.9	23.1
1970	25.7	27.1	24.9
1971	24.2	23.7	24.5
1972	24.9	NA	NA
1973	24.5	NA	NA

Average Annual Percent Change

1965-1970	+3.0	+2.9	+3.0
1970-1971	-5.8	-12.4	-1.9
1971-1972	+2.9	--	--
1972-1973	-1.7	--	--

a/ Includes the following states: Alaska, Arkansas, California, Colorado, Delaware, Hawaii, Kansas, Maryland, New Mexico, New York, North Carolina, Oregon, South Carolina, Virginia, and Washington.

Source: June Sklar and Beth Berkov. "Teenage Family Formation in Postwar America," Family Planning Perspectives 6: 86, Spring 1974; and U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics. Monthly Vital Statistics Report, Summary Report, Final Natality Statistics, 1973, Vol. 23, No. 11, Supplement, January 30, 1975.

Another public health issue related to the legalization of abortion are the effects, if any, on the birthrates of women (e.g., teenagers) at high risk of bearing a child that is premature and of low birth weight. Infants with these characteristics have a greater risk of mortality than normal birth weight children.^{35/} Although it should be possible to prove an effect of increased frequency of teenage abortions on the total proportion of newborns weighing less than 2,500 grams, the data to analyze this issue are not now available to the study group. However, there are data on overall infant mortality rates for the United States and selected states with non-restrictive abortion practices during part of that period. If women at high risk of having a premature birth are obtaining abortions disproportionate to their representation in the population of women having children, there should be a greater decline in infant mortality rates in states with non-restrictive practices than for the remainder of the U.S. The data presented in Table 7 show that this difference is demonstrable.

TABLE 7

Infant Mortality Rates for United States and Selected States: 1968-1972
(Deaths per 1,000 Live Births)

Area	1968	1969	1970	1971	1972	Percent Decline 1970-1972
United States <u>a/</u>	22.3	21.2	20.4	19.5	19.0	-6.9
California	19.0	18.3	17.2	16.4	15.6	-9.3
New York	0.9	21.2	19.4	18.3	17.6	-9.3
Washington	19.7	18.9	18.7	18.3	17.1	-8.6

a/ Excludes California, Kansas, New York, and Washington

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics. U.S. Vital Statistics, Vol. 1, Natality, 1968, 1969. Individual state statistics for 1970-1973 are unpublished.

Summary

During 1972 and 1973 more than 1.2 million legal abortions obtained in the United States were reported to the Center for Disease Control. The three major methods of abortion used were suction, D&C and saline. About 83 percent of the abortions were performed in the first trimester with suction as the predominant method of termination.

The majority of abortions during 1972 were obtained in New York, California, and the District of Columbia all of which had non-restrictive abortion practices which attracted a large number of out-of-state residents. Forty-four percent of the abortions obtained in 1972 were obtained outside of the home state of the patient. After the Supreme Court decisions on abortion in January 1973, legal abortions began to be distributed more evenly throughout the students.

During 1973, one-third of the women obtaining abortions were less than 20 years of age, another third were between 20 and 25 years of age and the remaining third were over 25. Nearly 30 percent of the women were married; the rest were single, divorced, separated, or widowed. An examination by race shows that 73 percent of the women obtaining abortions were white and 27 percent were black or of other non-white origins, although in 1972 non-white women had legal abortion rates more than twice as great as those of white women.

A national survey of abortion providers conducted by The Alan Guttmacher Institute in 1974 provides comprehensive data on the number of abortions performed in the U.S. during 1973 by State and type of provider. A total of 745,400 abortions were reported in the survey, 53 percent of those in physicians' offices. Many public hospitals did not provide any abortion services even though many low-income women rely on these instructions for most of their health care needs.

A comparison of the 1972 and 1973 data on abortion supports the conclusion that nonrestrictive abortion practices lead to:

- 1) an increase in the number of reported legal abortions;
- 2) a decline in the number of women traveling outside their home state to obtain an abortion; and
- 3) a significantly greater use of legal abortion by non-white women within their state of residence as compared to white women.

Although there are no data on the trend in the number of illegal abortions, one study has shown that 70 percent of the abortions in New York City during 1970-1971 and 1971-1972--the first two years of New York's non-restrictive legislation--replaced illegal abortions which would have been performed illegally, and that the remaining 30 percent accounted for

about one-half of the decline in births that occurred from 1970 to 1972. One aspect of birthrate trends is the number of out-of-wedlock births. In New York City and California legalization of abortion has been followed the next year by a decline in the number of these births, representing a reversal of previous upward trends in the number of children born out-of-wedlock in these areas. Similarly, legalization of abortion has not been shown to result in a dramatic reduction in infant mortality. However, no final conclusions on the causal relationship between non-restrictive abortion legislation and the trend in out-of-wedlock births or infant mortality rates can be drawn at this time.

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Chapter 3

ABORTION AND THE RISK OF MEDICAL COMPLICATIONS

This chapter describes the medical complications associated with legal abortion in the United States and examines the recent trend in reported complications from illegal abortion. The chapter first discusses the difficulties encountered in defining medical complications and then presents data on complication rates from a national study carried out by The Population Council in 1970-1971. A brief review of the reports on long-term complications of legal abortion also is provided, largely based on foreign studies.

Defining Medical Complications

Data on medical complications associated with legal abortion are more difficult to assess and compare than are those on maternal mortality. Although the medical community might agree in a general way on a definition of "medical complication," in any given situation physicians' subjective judgments may vary widely as to whether a complication does or does not exist. Some bleeding is expected with every surgical procedure, and certainly with every birth; whether the blood loss is defined as a complication is generally left up to each physician. Furthermore, even if a complication of induced abortion is defined as "when a certain number of sutures must be taken in the cervix," two physicians may have different thresholds for deciding when to suture and when to apply other treatment. Consequently, what may be termed a complication by one physician may not be so regarded by another, and what may be interpreted as a normal occurrence in one instance may be judged as a minor complication in another.

The time at which the complication occurs must also be considered. Guidelines for dealing with this factor have been provided by Christopher Tietze:

Complications can be divided into two categories--early, ... within ... 30 days after the abortion, and late, ... occurring more than 30 days after the procedure. Early complications may be further subdivided into immediate complications, defined as those occurring (although not necessarily discovered) during the procedure or within three hours after the procedure; and delayed complications, developing later, but still within 30 days.1/

Using these guidelines, immediate complications for suction and D&C would include an adverse reaction to anesthesia, perforation of the uterus (with or without injury to the other organs), hemorrhage, and laceration of the cervix. Early detrimental effects from saline abortion would include possible damage to the central nervous system if the saline solution entered the blood stream, and disturbances of the blood clotting mechanism.

The use of prostaglandins to induce second-trimester abortions was approved in 1973 by the Food and Drug Administration. Some preliminary information on the types of medical complications resulting from prostaglandin use is now available. In general, these tend to be less serious than those from saline abortion, and include such minor complications as vomiting and diarrhea. There appears to be little or no damage to the central nervous system if the prostaglandins enter the blood stream, although there may be a temporary change in blood pressure. Labor generally tends to be of a shorter duration than with saline abortion.^{2/}

The most frequent delayed complications from any induced abortion include retention of fragments of the placenta in the uterus, resulting in subsequent bleeding, various degrees of infection in the pelvic area, and thrombosis, which may lead to an embolism. All of these complications are relatively rare with legal abortion except for the retention of placental fragments in the uterus.

It is often difficult to determine the extent to which any complications are actually abortion-related. Since pre-existing conditions may also contribute to post-surgical complications, it is often not correct to ascribe all post-abortal complications to the abortion procedure itself. Similarly, when such surgery as sterilization accompanies an abortion, it is difficult to isolate the complications arising from the surgery from those attributable solely to the abortion procedure.

Complication Rates Associated with Legal Abortion

The lack of a consistent definition of "complication" makes it difficult to compare data on abortion-related complications collected by different investigators from different localities. Consequently, most of the findings reported in this chapter are drawn from the Joint Program for the Study of Abortion (JPSA) which provides a fairly consistent data base for assessing the incidence of immediate and delayed abortion-related complications in the United States.

Joint Program for the Study of Abortion (JPSA). The Joint Program for the Study of Abortion was a coordinated effort sponsored by The Population Council in 66 institutions (60 teaching hospitals and six abortion clinics) from July 1, 1970 to June 30, 1971,

for the purpose of collecting information on early medical complications associated with abortion.^{3/} The study surveyed almost 73,000 abortions, or about 1/7 of those performed legally in the United States during that period. Thirty-four of the reporting institutions were in New York state and the rest in 12 other states.*

The JPSA study computed complication rates for total patients and for local patients with follow-up. Follow-up was defined as any contact with the woman 10 or more days after the abortion. The complication rate for total patients is a minimum estimate of the incidence of complications because follow-up was not available for all patients. Because patients with complications are more likely to return for care than those without complaints, and since the proportion of non-private patients (who had more complications) was higher among local patients than among non-residents, the complication rate for local patients with follow-up approaches a maximum estimate of the incidence of complications.

Table 8 summarizes the findings of the JPSA study for all abortion patients and for local patients with follow-up. Complication incidence is itemized according to gestation, abortion procedure, pre-existing complications** and concurrent sterilization. The complication rates (number of women with one or more complications per 100 women obtaining abortions) are further distributed in terms of both total and major complications. "Total" complications include all complaints registered by the patient, as well as diagnoses made by the physician. Minor problems, such as a single day of fever or vomiting, would be included in total complications, while the need for major surgery, one or more blood transfusions, prolonged illness, and sustained fever would be classified as "major" complications.

*The other institutions were situated as follows: California (9), Pennsylvania (6), District of Columbia (5), Maryland (3), Massachusetts (2), and one each in Arizona, Connecticut, Hawaii, Kansas, North Carolina, Oregon, and Washington.

**Types of pre-existing complications identified in this study include diseases of the circulatory system (heart disease, hypertension), diseases of the reproductive system (uterine fibroid tumors), asthma, diseases of the urinary tract, anemia, diabetes, mental disorders, and epilepsy. Diseases of the circulatory system and the reproductive organs represented almost one-half of the conditions presented as pre-existing complications. As would be expected, the number of women with pre-existing complications increased with age and parity.

TABLE 8

Total and Major Postabortal Complications per 100 Women Obtaining Abortions by Gestation, Procedure, Pre-existing Complications, and Concurrent Sterilization, Total Patients and Local Patients with Follow-up (FU)
 JPSA, July 1, 1970 - June 30, 1971

<u>Type of Abortion</u>	<u>Total Complications</u>		<u>Major Complications</u>	
	<u>Total patients</u>	<u>Local patients with FU</u>	<u>Total patients</u>	<u>Local patients with FU</u>
All patients	<u>Complication Rates Per 100 Women Obtaining Abortions</u>			
12 weeks or less	5.2	7.8	0.6	1.1
13 weeks or more	22.2	26.1	2.2	3.0
Patients without pre-existing complications, by procedure				
Suction <u>a/</u>	4.2	6.1	0.4	0.6
D&C <u>a/</u>	6.0	8.2	0.5	0.8
Saline <u>a/</u>	23.4	27.2	1.7	2.4
Hysterotomy <u>b/</u>	33.4	32.9	6.7	6.9
Hysterectomy	49.9	50.9	14.3	15.6
Patients without complications or sterilization				
12 weeks or less	4.2	6.2	0.4	0.6
13 weeks or more	20.6	26.0	1.6	2.1
Patients with pre-existing complications, without sterilization				
12 weeks or less	12.7	17.1	1.4	2.0
13 weeks or more	29.9	35.1	4.6	6.7
Patients without pre-existing complications, with sterilization				
12 weeks or less	25.9	28.0	6.1	7.2
13 weeks or more	35.8	35.4	8.2	8.0
Patients with pre-existing complications and sterilization				
12 weeks or less	43.0	46.2	14.9	17.1
13 weeks or more	56.5	60.4	13.8	17.4

a/Without tubal sterilization
b/With tubal sterilization

Source: Christopher Tietze and Deborah Dawson. "Induced Abortion: A Factbook," Reports on Population/Family Planning 14, December 1973.

As shown in Table 8, abortions performed in the first twelve weeks had a lower complication rate than did those performed subsequently, regardless of whether or not the patient had pre-existing complications or whether she obtained sterilization at the same time as the abortion. Those women who were aborted with suction or D&C, both of which are first trimester methods, experienced the lowest total complication rates and the lowest rates for major complications. The risk of medical complications increases with the length of gestation, even within the first trimester.

Women with pre-existing complications and women who underwent concurrent sterilization had substantially higher complication rates than did women who were subject only to the complications of the abortion procedure itself. A woman with pre-existing complications obtaining a first trimester abortion was more than three times as likely to develop post-abortal complications as was a healthy woman (a woman going to term with pre-existing complications is also at greater risk). A woman without pre-existing complications who obtained concurrent sterilization during a first-trimester abortion was more than six times as likely to develop complications as was a comparable woman who was not sterilized at the time of abortion. A woman with both pre-existing complications and concurrent sterilization at the time of first-trimester abortion was more than 10 times as likely to develop complications as was a woman without pre-existing complications or sterilization. In terms of major complications, the risk was more than 35 times as great for the woman with both pre-existing complications and concurrent sterilization. The same patterns are seen in second-trimester abortions, although the differences generally are not as great.

The high complication rates reported in the JPSA survey for women undergoing concurrent sterilization reflect the fact that many of these sterilizations required abdominal surgery with general anesthesia either to remove the uterus (hysterectomy) or to perform a tubal ligation. Since the JPSA study, more sterilizations are being performed by laparoscopy, which does not require as extensive surgery and has significantly less morbidity than other sterilization methods.* In a recent study^{4/} complication rates were compared between a group of 108 patients obtaining a combined suction abortion and laparoscopic sterilization, and a group of 195 patients obtaining only a suction abortion. Anesthesia was either local or light general anesthesia in both groups and there were no deaths reported. The complication rates for the two groups were 9.2 and 7.2 respectively, a significantly smaller differential than in the JPSA study and much lower rates than the rates reported with other sterilization techniques.

*A laparoscopy is a procedure in which a slender instrument with a lens at the end is inserted into the abdominal cavity through a very small incision, permitting visualization of the organs contained therein and the performance of various surgical procedures, including tubal ligation.

If complication rates in JPSA are analyzed by the type of facility in which the abortion was performed, total complication rates associated with the method of suction are substantially lower for clinic patients than for either outpatients or inpatients in hospitals (Table 9).

Except for "fever only," where the complication rate was highest among clinic patients, and the category for "all other" complications, where it was marginally higher for outpatients, clinic patients had the lowest incidence of each specific type of complication, and hospital inpatients had the highest. The high rates of "fever only" for clinic patients, combined with low rates of pelvic infection, reflect the dependence of clinics on reports directly from patients rather than from physicians who would have made more specific diagnoses.^{5/}

To some extent, this difference in complication rates can be explained by the fact that more patients with pre-existing complications are likely to be handled in a hospital setting. Clinic physicians, who usually perform a higher number of abortions, may be more experienced than other physicians in performing abortions; and there may be less complete reporting of delayed complications for clinic patients than for those treated in hospitals.

TABLE 9

Number and Complication Rates of Local Patients with Follow-up
 Who were Aborted by Suction, by Type of Facility

<u>Type of Complication</u>	<u>Type of Facility</u>		
	<u>Hospital Inpatients</u>	<u>Hospital Outpatients</u>	<u>Free-Standing Clinic Patients</u>
<u>Number of Patients a/</u>	5,350	11,538	6,968
	<u>Rates per 100 women</u>		
Perforation of uterus	0.6	0.3	0.2
Other Injury	1.8	1.2	0.2
Hemorrhage	2.0	1.2	0.6
Pelvic infection	1.4	1.1	0.3
Hemorrhage and Infection	0.4	0.3	0.1
Fever only	0.9	0.4	2.0
All other	0.7	1.0	0.4

a/Excludes patients with pre-existing complications and/or sterilization

Source: Christopher Tietze and Sarah Lewit. "Joint Program for the Study of Abortion (JPSA): Early Medical Complications of Legal Abortion," Studies in Family Planning 13: 116, June 1972.

The Ljubljana Study Information on complication rates associated with first-trimester abortions also is available from a study undertaken in Ljubljana, Yugoslavia, during 1971 and 1972.^{6/} The study covered 4,700 women aborted for "social" reasons who were randomly assigned to suction or D&C. The duration of the pregnancy was seven to 12 weeks in 95 percent of the cases. Abortions were performed on an inpatient basis with general anesthesia; hospitalization was required for 48 hours following the procedure. Table 10 summarizes the complication rates experienced in this study. For every complication, women obtaining suction abortions experienced lower rates than those obtaining D&C abortions. While low, these rates are consistently higher than those reported from the JPSA study.

TABLE 10

Complications of First Trimester Abortions, Ljubljana, 1971-1972

<u>Type of Complication</u>	<u>Rates per 100 Women Obtaining Abortions</u>	
	<u>Suction</u>	<u>D&C</u>
Perforation of uterus	0.0	0.6
Laceration of cervix	0.7	0.7
Complications of anesthesia	2.9	3.7
Heavy bleeding requiring agents to tighten the uterine walls <u>a/</u>	3.9	6.0
Blood loss exceeding 300 ml <u>b/</u>		
-at abortion	1.9	3.3
- total first 48 hours	5.4	8.9
Post abortion bleeding		
- requiring treatment	9.6	10.0
- requiring hospitalization	1.5	1.9
Retention of tissue	0.9	1.3
Pelvic Infection or fever <u>c/</u>		
during hospitalization	2.0	1.6
-requiring readmission <u>a/</u>	0.7	1.3

a/Statistically significant difference (P=.01)

b/These data based on a subsample of 530 cases.

c/Includes endometritis, salpingitis, temperature rise to 37.6 degrees centigrade for more than two days.

Source: L. Andolsek and M. Owen. "The Operation and the Operator"; L. Andolsek. "Operative Events"; L. Andolsek and M. Owen. "Blood Loss"; and L. Andolsek. "Infection"; in L. Andolsek. The Ljubljana Abortion Study, 1971-1973, Bethesda: National Institutes of Health, 1974.

Saline Abortions As indicated by the JPSA data in Table 8, the complication rates associated with second-trimester abortions, usually performed by the saline method, are considerably higher than those performed by D&C or suction. Since second-trimester abortions will continue to be needed, methods are needed to reduce these complication rates.*

In a recent paper, Berger and Kerenyi reported that hemorrhage and/or infection accounted for 97 percent of all complications associated with saline abortion.^{7/} Factors such as age, pre-existing complications, and a history of previous pregnancies—all associated with an increased risk of hemorrhage—cannot be controlled by the physician. However, prolonged retention of the placenta after delivery of the fetus, which is frequently responsible for subsequent hemorrhaging, is subject to physician control. The study concluded that hemorrhage from saline abortion can be markedly reduced if the placenta is removed within one hour after the fetus is delivered, and infection and fever can be reduced if the highest standards of asepsis are maintained.^{8/}

Long-Term Complications

Much concern and controversy have arisen over the potential long-term effects of legal abortion on the reproductive capabilities of women obtaining such abortions. Cervical incompetence, scar tissue from infection, or other trauma to the reproductive organs following abortion have been suggested as long-term complications which might result in subsequent spontaneous abortion or prematurity, in subsequent ectopic pregnancies, or infertility. Various studies have been published dealing with these problems, but in most cases methodological shortcomings seriously limit validity of the findings and prevent definitive conclusions about the existence of these long-term complications.

Among the problems encountered in these studies is the difficulty of correlating long-term complications with a particular abortion, because

*For example, the procedure of amniocentesis, which is used to detect certain fetal defects, can rarely be performed prior to the 15th week of pregnancy. In this procedure, a portion of amniotic fluid is withdrawn from the uterus and the fluid or fetal cells obtained from it are cultured for two to four weeks and are subjected to tests for fetal defects. By the time the diagnostic procedures are completed, the woman is well into the second trimester of pregnancy. If fetal disorders are identified and the patient elects abortion, a second-trimester method, usually saline, must be used. Chapter 6 has further information on birth defects and the use of selective abortion.

intervening full-term pregnancies or miscarriages may also have contributed to the complications. In addition, without complete medical records, it has often proved difficult to conduct retrospective studies, i.e., to identify previous abortions in the medical history of women who incur complications that could potentially be related to prior abortions. Without complete medical records, full documentation on a woman's previous reproductive history may not be obtained, which means that a researcher may have to rely on the woman's memory and willingness to admit previous abortions. There is some evidence that a woman will more readily admit to having had a previous abortion if she has subsequently experienced a premature delivery, still-birth, or neonatal death, than if she subsequently experienced a normal birth.^{9/}

Other problems include the lack of an appropriate control group to compare with women who have had prior abortions, and the possible invalidity of comparing long-term complications from abortions performed by different methods, in different types of health care delivery systems, and on women of different ages or socio-economic classes. Few studies have provided specific details on the extent to which they controlled for these factors, thereby limiting the applicability of their conclusions. And when significant differences of these types exist between countries, trans-national comparisons must be made with great caution. This seriously affects the ability to draw conclusions about long-term complications from induced abortion in the United States, since legal abortion has been available for too short a time to enable the publication of American studies on this subject. All the data presented in this discussion are from foreign studies and their direct applicability to the United States is not known at this time.

A World Health Organization task force has initiated prospective studies in European countries to examine the effects of induced abortion on the outcomes of subsequent pregnancies. The WHO Task Force will identify the reproductive history, including abortion history of pregnant women when they register for prenatal care. Subsequently, the pregnancy outcomes of women who have had a prior abortion and who are pregnant for the second time will be compared with those of women pregnant for the second time with one prior birth, and those of women pregnant for the first time. The Task Force Report should be available in 1977.^{10/}

Premature Births A review of much of the currently available data on the relationship between legal abortion and subsequent premature births indicates that many of the studies did not control for smoking, age of mother, overall maternal health, or socioeconomic status. Many of the studies also did not identify differences in the method of pregnancy termination or indicate whether prior abortions had been obtained illegally or in a medical setting. And in some cases, the existence of prior spontaneous as well as induced abortions was not taken into account. All of these factors are likely to be closely related to the causes of premature births, and a desire to isolate the impact of abortion from these other factors would seem to be a high priority for researchers in the field.

A positive relationship between prior induced abortions and the percent of premature infants, defined as weighing 2,500 grams or less, was reported in an Hungarian study of 20,400 births occurring in the second half of 1970.^{11/} The proportion of premature infants born to second pregnancy women with a prior abortion was nearly 15 percent of total births to that group, and for second pregnancy women without any prior induced abortions, the proportion was only eight percent of the total births. The percentage of low weight births increased as the number of previous pregnancies increased, regardless of prior abortions, but the abortion group consistently had higher prematurity rates. All abortions can be assumed to be legal, first-trimester abortions performed by D&C. Unfortunately, no data are presented on the age or socioeconomic characteristics of the women in the different groups or whether these factors might have affected the outcomes. Moreover, since D&C is used in only 13 percent of first-trimester American abortions and involves more surgical trauma to the cervix than suction, the relevance of these findings to the United States cannot be assessed.

A Greek study by Pantelakis et al. ^{12/} provides data on more than 13,000 women registering for prenatal care at Alexandra Maternity Hospital between October 1, 1966 and September 30, 1968. The women were asked to supply information on previous pregnancies, including those terminated by induced abortion. The frequency of premature births to women in the study was then examined for women who had had no previous abortions, previous induced abortions, previous spontaneous abortions, or a combination of the latter two types. Premature birth rates for women with previous abortions were found to be twice those of women without any abortions (17 percent of the total and eight percent of the total, respectively).^{13/}

Although Pantelakis' results are interesting, they are seriously limited by important methodological shortcomings. First, the women in the study were asked to supply the data on previous pregnancies themselves, making these data subject to incorrect recall. (The authors cited studies in which there had been difficulty in getting women to admit accurately a history of prior abortions.)^{14/} Second, although abortions were theoretically illegal in Greece during the period under study, the authors did not seek to determine whether prior induced abortions had been obtained in a medical setting or in another environment. Third, the study was not adequately controlled for either the number of prior births or the pregnancy order. And finally, the method of termination of previous induced abortions was not identified. These factors considerably weaken the conclusions of the study, and once again, the extent to which the medical experience of Greek women can be applied to the United States is unknown.

A different conclusion was made by Roht and Aoyama,^{15/} who obtained reproductive histories of nearly 2,800 Japanese women through a mail survey (2,170 respondents) and interviews (609 respondents) in April 1971. Premature births (defined as live birth less than 2,500 grams) for the first post-abortion pregnancies in 587 women with prior abortions were compared with the premature births for women without prior abortions (both birth order and maternal age at completion of pregnancy were controlled for). The authors concluded "that women in their most active reproductive years, i.e., 20 to 39, do not seem to be at excess risk of prematurity due to a previous induced abortion."^{16/} However, this study also is flawed by the fact that the women participating were asked to provide not only their prior reproductive history, but also the birth weights of their children. The authors indicated that attempts to verify the data will continue.

Several studies have concluded that there is no significant difference in the prematurity rates of women with prior induced abortions compared with other women. In a carefully controlled historical prospective study of 948 Yugoslavian women whose first pregnancies were terminated by induced abortion (222) or delivery (726) during 1968-1969, Hogue did not find any evidence of greater prematurity or other reproductive problems among women who had had abortions compared with other groups of women.

There was no evidence of impaired fertility among aborters or of an increased incidence of first- or second-trimester spontaneous abortions. When second-pregnancy deliveries were compared, deliveries following induced abortion had a higher prematurity rate than did those following another delivery (approaching statistical significance), but there was no difference when first-pregnancy deliveries were compared with first deliveries subsequent to induced abortion. The pregnancy-order differential is thus due to the known higher risk of prematurity among first-order births. Apparently induced abortion when it precedes such pregnancies neither increases this risk nor protects against it.^{17/}

Spontaneous abortions A few studies have addressed independently the relationship between induced abortion and subsequent spontaneous second-trimester abortion. The explanation for this concern is that cervical incompetence may result from forced dilatation of the cervix during vaginal abortion. The longer the gestation, the larger the cervix must be dilated, and the greater the risk of cervical laceration and subsequent inability of the cervix to bear the pressure of a full term pregnancy.

Wright et al 18/* studied 3,314 patients who completed a pregnancy at Queen Charlotte's Maternity Hospital in London during 1971. Patients were asked to provide detailed information on their obstetric history, including whether any therapeutic abortion was obtained, the length of gestation, method of termination and the hospital in which termination was performed. Ninety-one patients were identified with a therapeutic abortion immediately prior to their current pregnancy (Group A) and were matched by age with a control group of patients who had had one spontaneous abortion before the current pregnancy (Group B). Pregnancy outcomes on 3,223 other women were also examined (Group C). More than 90 percent of the women in the abortion group had had no prior pregnancies than the one originally terminated.

Those pregnancies ending in second-trimester spontaneous abortion are summarized below.

	<u>Total Pregnancies</u>	<u>Spontaneous Abortions</u>	
		<u>Number</u>	<u>Percent</u>
Group A (Prior Induced abortion)	91	8	9
Group B (Prior Spontaneous abortion)	91	1	1
Group C (Other Deliveries and abortions)	3,223	30	1

Based on these data the authors concluded that

temporary or permanent cervical incompetence is induced by the procedure of dilatation of the cervix during termination. This is further suggested by the fact that a control group had significantly fewer second-trimester abortions. The only important difference between the two groups was that the previous-termination patients had had forcible dilatation of the cervix.19/

*Spontaneous abortion in the second trimester is often dealt with as part of the prematurity problem. Data on first-trimester spontaneous abortion do not seem to be available, perhaps because so many of these abortions occur without the woman knowing she was pregnant.

Considerable caution must be taken in accepting these conclusions since the methodology used in this study has definite limitations. First of all, as stated earlier, use of retrospective recall by the patient usually results in an incomplete and sometimes incorrect obstetrical history. Wright *et al.* admit that even their own experience has shown this to be true. Second, the differential effect of repeated terminations (or pregnancies) is not mentioned, although the authors indicate that three of the patients experiencing spontaneous second-trimester abortions had had two or more previous pregnancies. No data are provided in this area on Group A women going to term. Third, the timing of termination is not provided for all patients in Group A. Only one of the 13 patients with apparent cervical incompetence was terminated prior to 10 weeks gestation in her earlier pregnancy, and one was terminated vaginally as late as 18 weeks gestation. Though this is mentioned as a possible contributing factor to spontaneous abortion, data are not provided on the lengths of gestation of the earlier pregnancies of the other women in Group A. Fourth, as Liu *et al.* have pointed out,^{20/} the authors neglected to take into account the normal rate of cervical incompetence (1-2 per 1,000 deliveries). Finally, Liu questions the validity of the results given that the spontaneous first-trimester abortion rate was only one percent in the Wright sample, and in a normal population this rate is usually between 10-20 percent. This suggests that Wright's sample may not be a representative group of women for obstetrical comparisons.

Roht and Aoyama also examined the spontaneous abortion rates following induced abortion in their 1971 sample. Although their methodology also has important weaknesses, some of which are similar to those mentioned about the Wright study, their conclusions are exactly the opposite. Roht and Aoyama found no difference in the spontaneous abortion rates for "no abortion" and "post-abortion" women of the same age group. Their data demonstrated only that there was an increasing risk of spontaneous abortion with older maternal age.^{21/}

Ectopic Pregnancies Existing data on the relationship between legal abortion and subsequent ectopic pregnancies are also limited but seem to suggest that no negative effects are likely to occur. This conclusion follows from a review of Eastern European literature by Emily Moore-Cavar^{22/} and from a controlled study conducted in Ljubljana, Yugoslavia.^{23/}

In a study conducted in 1971 in Novi Sad, Yugoslavia, Beric and Kupresanin found that from 1960 to 1970, there was an increase in deliveries, an increase in legal abortions, a decrease in hospital admissions for "other" abortions (spontaneous and illegal), and a slight overall decrease in ectopic pregnancies. In another Yugoslavian study conducted in 1972, Masic noted a "relation between ectopic pregnancy and provoked criminal abortion, but not between ectopic pregnancy and legal artificial abortion."^{24/}

A carefully controlled study undertaken in Ljubljana, Yugoslavia between January 1971 and July 1973 developed data from a sample of 200 women with ectopic pregnancies, and a pooled sample of 600 women having full-term intrauterine pregnancies and 240 women who sought induced abortions during the time of the study. The risk of having an ectopic pregnancy for women with a positive history of induced abortion was then compared with the risk of ectopic pregnancies among the women in the pooled sample. The data indicated that the risk of ectopic pregnancy for women with one previous induced abortion was exactly the same as for women with no history of induced abortion. For those women with two or more induced abortions, the risk of ectopic pregnancy was only 80 percent as great as it was for women without prior abortions.25/ These data led the authors to conclude the following:

We believe that our data do not support the hypothesis that induced abortion leads to an increased risk of subsequent ectopic pregnancy. In this study, women with several induced abortions are in fact at slightly reduced risk of subsequent ectopic pregnancies. This is not surprising, since having had several induced abortions indicates a normally functioning reproductive system.26/

Infertility Data concerning infertility following induced abortion are sparse, extremely poor, and generally inconclusive. In a review of the existing literature, Moore-Cavar concluded:27/

Methodological problems abound in any effort to establish statistical probabilities of infecundity attributable to abortion. "Abortion makes you sterile" is generally not accompanied by an explanation of the type of abortion (legal, illegal, or spontaneous, single or repeated) which is presumed to have this effect, nor is there usually any mention of the proportion of comparable non-aborting control women who are found to be infecund because of aging or because of earlier pregnancies carried full term. To date, it can be said that there is no conclusive evidence of an increased risk of reduced fecundity from terminating a pregnancy by abortion.

Even if data were developed with reasonable accuracy, they may not be relevant to the United States since the data base may be old, and may reflect medical complications arising from abortion methods such as hysterotomy, which are rarely used in the United States today.28/

Teenage Abortions and Long-Term Complications Teenage women constitute a special case, in that any pregnancy, be it terminated by abortion or by a full-term birth, seems to increase the risk of prematurity in subsequent pregnancies.29/ Russell reported on the first pregnancy outcome and subsequent reproductive history of 62 pregnant women under 16 whom he treated between January 1960 and December 1971. Fifty of these pregnancies were terminated by therapeutic abortion, 11 continued to term, and a single one ended in spontaneous abortion at 10 weeks gestation. The majority (46)

of the induced abortions were performed by suction (30) or D&C (16); two each were performed by hysterotomy and prostaglandins. Only 38 of the pregnancies were terminated at less than twelve weeks gestation; nine pregnancies were terminated between 12 and 14 weeks.^{30/} Length of gestation was not matched with method of termination in the article cited so that it was not possible to determine whether first-trimester methods were used to terminate second-trimester pregnancies.

Significant immediate complications were reported from the 50 abortions, and cervical laceration requiring sutures was reported in five cases. Russell explained that "the cervix of the young teenager, pregnant for the first time, is invariably small and tightly closed and especially liable to damage on dilatation."^{31/}

Of 53 subsequent pregnancies experienced by this cohort of women, a substantial number ended in either fetal, neonatal, or childhood death. The outcomes of these pregnancies are shown below.^{32/}

<u>Outcome of Pregnancy</u>	<u>Number</u>	<u>Percent of Total</u>
Therapeutic abortion	6	11
Spontaneous abortion	19	36
Stillborn (30 weeks gestation)	1	2
Premature Delivery	7	13
Term delivery	<u>20</u>	<u>38</u>
Total pregnancies	53	100

Two of the premature babies died, one at three days and one at three months. Four of the term birth deliveries died, one during the neonatal period and three within the subsequent 30 months. Of the 11 teenagers whose initial pregnancies had been carried to term, nine subsequent pregnancies were reported, all of which went to term and all of whose babies survived.

The data provided in this study are not adequate grounds on which to draw conclusions about the relationship between induced abortion in teenagers and subsequent reproductive impairment. There is no matched control group for the women undergoing therapeutic abortions. The age at first and subsequent pregnancies is not specified, nor is the interval of time between pregnancies. The pregnancy order of women having the 53 subsequent pregnancies is not examined, although Russell provides anecdotal evidence that two women have had three and four spontaneous abortions, respectively, without being able to have a successful pregnancy.^{33/}

Finally, neither the method of abortion nor the existence of immediate post-abortal complications is compared with future reproductive history. It is impossible to know, for example, whether the women suffering cervical lacerations were a significant proportion of those having subsequent spontaneous abortions or premature deliveries.

Perhaps recognizing these difficulties, Russell does not conclude a causal relationship between therapeutic abortion and subsequent reproductive difficulties. He cites the higher complication rates for teenagers undergoing full-term pregnancies (including subsequent prematurity, fetal deaths, and perinatal mortality), and the serious social, familial and psychological difficulties faced by teenage mothers. He concludes that teenage "pregnancy...clearly carries medical hazards for the girl and her baby. But the full significance of these early pregnancies will only be established by carefully planned prospective studies involving several disciplines--obstetrics, pediatrics, psychiatry and sociology."34/

An example of the complications arising from teenage pregnancies is provided by a study during 1967-1969 of 180 first pregnancies of school age women in New Haven who terminated their first pregnancies with a birth. A significantly higher risk of prematurity and perinatal death was found in subsequent pregnancies. Only 12 percent of the first pregnancies ended in premature birth (defined as less than 2,500 gram), but 27 percent of the 103 subsequent pregnancies resulted in premature births. Increasing birth order was associated with increased risk.35/

Although Roht and Aoyama focused primarily on women 20-39 years of age, some data were reported on teenagers in their study. The sample size is too small to represent conclusive findings, but the data show that teenage women had higher rates of prematurity than other women, whether or not the birth occurred post-abortion. The number of completed pregnancies in the sample is too small to assess whether induced abortion increases this risk.36/

In conclusion, the fact that teenage pregnancies have a greater risk of death and medical complications than pregnancies of older women has been documented extensively in the literature and has been repeated here. What is not yet clear, however, is under what conditions and to what extent induced abortion aggravates that risk in subsequent pregnancies. Since nearly one-third of the legal abortions in the United States are obtained by teenage women, it would seem that further research in this area would merit high priority.

Rh Immunization One other potential long-term complication of induced abortion is the sensitization of women with Rh-negative blood by Rh-positive red blood cells from the fetus during abortion (or during miscarriage, full-term birth, or even amniocentesis). This process will cause the formation of antibodies, which could be harmful to the health of fetuses in future pregnancies. However, it is possible to prevent the formation of the antibodies in Rh-negative women by injecting them with Rh immune globulin (commercially distributed as RhoGAM), which essentially neutralizes that part of the Rh-positive blood of the fetus that would otherwise have stimulated the production of maternal antibodies. If Rh-negative women undergoing abortions are injected with immune globulin, there should not be any complications in a subsequent pregnancy.

To summarize, no definitive conclusions can be drawn from the diverse data obtained from the studies cited above about the long-term complications of legal abortion in the United States. Not only is there contradictory evidence, but many of the studies have serious problems of method. Reliance on retrospective methodology may lead to biased recall; poorly designed hypotheses and poor sampling, with or without controls, lead to inaccurate cause and effect conclusions. Finally, it is extremely difficult to isolate the many factors that can have a long-term effect on a person's health status. Not only is the method and trimester of abortion important, but also the woman's physical health, her socioeconomic status, and condition of intervening pregnancies may be as important or more important than the abortion itself in affecting a woman's reproductive capabilities in the long term.

Illegal Abortion and Medical Complications

In countries with laws that prohibit or greatly restrict legal abortion, induced abortions that are performed by physicians outside the strict limitations of the law, or those performed by non-medical personnel or by the woman herself are illegal. In the discussion below, illegal abortion is generally meant to refer only to those cases where abortion is performed by non-medical personnel or by the pregnant woman in a setting which is outside the formal health care system.

Among the non-medical procedures used for inducing abortion are eating or drinking quinine or other drugs, introduction of chemicals into the vagina, and mechanical methods such as inserting blunt or sharp instruments into the uterus through the vagina. The drugs quite often lead to poisoning, or vomiting so intense that it results in dehydration and eventual death unless fluid replacement compensates the loss. Intense vomiting is sought because it might cause contractions and thus expel the fetus. Inserting chemicals or implements in the vagina or uterus can lead to (1) infection; (2) injury to the membranes of the vagina; (3) perforation of the uterus with the possibility of injuring other organs in the abdominal area; (4) bleeding due to retained fetal or placental tissue and (5) air embolism. These medical complications have resulted in numerous deaths, and serious illnesses requiring lengthy hospitalization. They represent, therefore, a serious public health problem, although one that has declined in importance as legal abortion has become more accessible.

A septic abortion is an infection of the uterine cavity or of the retained products of conception following an abortion. If not treated promptly, the infection may extend to the area surrounding the uterus (peritonitis) or the blood stream (septicemia) and may result in death. Septic abortion can occur following spontaneous and legal abortion, but it most commonly results from illegal abortion. An incomplete abortion occurs when the placenta is not completely expelled from the uterus. This may cause severe bleeding until the remaining tissue has been removed, and also predisposes the uterine cavity to infection.

The frequency of medical complications due to illegal abortions is difficult to determine. One measure that has been used is the number of hospital admissions due to incomplete or septic abortions.* Although admissions due to incomplete/septic abortions are often recorded as miscarriages (as some actually are), or of an "unknown" origin, it is believed that the majority of abortions leading to major complications, and especially those with fatal outcomes, are illegally induced.**

*Not all illegally induced abortion complications are admitted to the hospital. Many injured women are treated on an outpatient basis or by a private physician. Additionally, some women probably resort to self-treatment with varying degrees of success. The number of hospital admissions due to incomplete/septic abortion can only be used as a partial indicator to measure the incidence of illegal abortion.

**See for example, David N. Danforth, ed. Textbook of Obstetrics and Gynecology, 2nd ed., New York: Harper & Row, 1971, p. 345; and J. P. Greenhill and Emanuel A. Friedman. Biological Principles and Modern Practice of Obstetrics, Philadelphia: W. B. Saunders Co., 1974, p. 380.

With the introduction of non-restrictive abortion laws, the number of hospital admissions for incomplete and septic abortion has declined sharply. For example, municipal hospitals in New York City have reported a steady decline in the number of admissions due to incomplete abortions (Table 11). In 1969, the year before the non-restrictive legislation was implemented, 6,524 incomplete abortions were reported; in 1971, the first year after the new legislation went into effect, this number declined by 31 percent. In 1973, 3,253 admissions were reported, or a rate of 133 per 1,000 deliveries.

TABLE 11

Admissions to Municipal Hospitals in New York City for
Incomplete Abortions, 1969-1973

<u>Years</u>	<u>Number of Admissions</u>	<u>Number of Births</u>	<u>Incomplete Abortion Admissions per 1,000 Births</u>
1969	6524	27,842	234
1970	5293	31,308	169
1971	3643	27,998	130
1972	3538	24,989	142
1973	3253	24,502	133

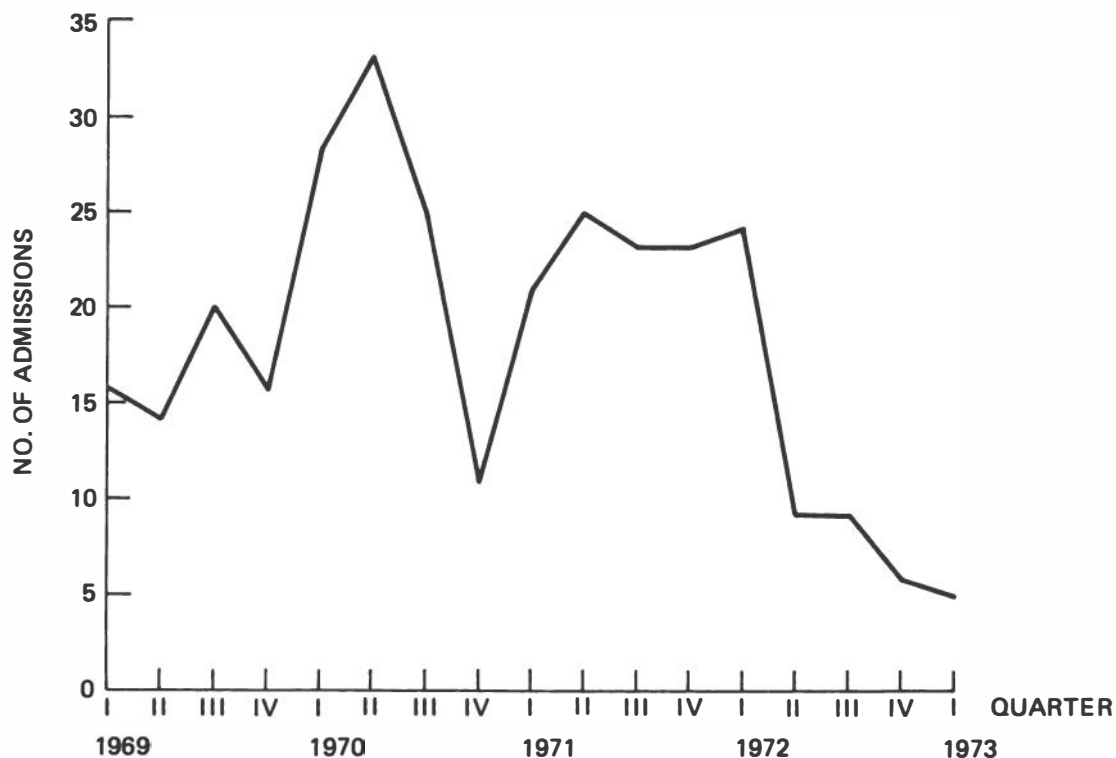
Source: Personal communication to Emily Moore-Cavar from Jean Pakter, Director, Bureau of Maternity Services and Family Planning, Department of Health, New York City and published in International Inventory of Information on Induced Abortion, New York: International Institute for the Study of Human Reproduction, Columbia University, 1974, p. 642.

Data from Brooklyn, Atlanta, Los Angeles and San Francisco also show that a decline in the number of hospital admissions for incomplete abortion is related to the growing availability of legal abortion, with its lower frequency of medical complications. A study done at Kings County-State University Hospitals in Brooklyn during 1967-1971 reported that the number of "spontaneous" abortions fell to 20 percent during this period. The authors attributed this decline in part, to "a decline from the previous number of abortions initiated illegally outside a hospital and then brought for completion to the hospital, where for the lack of better information the abortion was classed as spontaneous."^{37/} Other factors mentioned were elective abortion of pregnancies which might have subsequently resulted in a spontaneous abortion, and a general decline in the number of pregnancies.^{38/}

A study of the frequency of admissions due to complications resulting from illegal abortion was undertaken at Grady Hospital in Atlanta from 1969 to 1973. Only those women who actually admitted having had an illegal abortion were included in the study. Its results, shown in Figure 7, indicate a decline in the number of admissions for complications due to illegal abortion--from a high of 33 in the last quarter of 1970, to five in the first quarter of 1973. However, a dramatic drop in this series--from 24 to nine admissions in one quarter--did not occur until the second quarter of 1972. This correlates with the changes in Georgia's abortion laws during this period. Georgia adopted a moderately restrictive abortion law in 1968, but procedural requirements did not become less cumbersome until 1970, and access to abortion on request did not become readily available until 1973. The number of legal induced abortions at Grady Hospital during this period increased from 30 in all of 1969 to 498 in the first quarter of 1973.^{39/} These data suggest that there may be a time lag in women's awareness of changed laws, and that both abortion legislation and practices must be non-restrictive before some women turn from illegal abortions to legal abortions.^{40/}

FIGURE 7

Number of Hospital Admissions for Complications due to
Illegal Abortions, Grady Hospital, Atlanta, 1969-1973



Source: Ronald S. Kahan, Lawrence D. Baker and Malcolm G. Freeman.
"The Effect of Legalized Abortion on Morbidity Resulting from
Criminal Abortion," American Journal of Obstetrics and Gynecology
121:115 January 1, 1975.

Summary

Medical complications associated with legal abortion may occur at the time of the abortion (immediate), within thirty days following the procedure (delayed), or at some later time (late). The frequency and severity of complications vary as a function of the trimester in which the abortion is obtained, the method used, and whether or not pre-existing complications or sterilization are also present. As presented by the JPSA study, major complications in women undergoing first-trimester abortions by suction or D&C are rare. More frequent and serious complications occur in women undergoing second-trimester abortions and/or concurrent sterilization, and in those having pre-existing complications.

The impact of legal abortion on long-term complications is more difficult to evaluate, particularly in the United States, where the history of non-restrictive abortion practice is too short to provide longitudinal data. Although there is some evidence from Hungary and Greece associating a history of repeated abortions with subsequent premature births, different studies from Japan and Yugoslavia conclude that prior induced abortions cannot be statistically linked to prematurity. Similar contradictory evidence is found on infertility. The data on ectopic pregnancies, particularly from the Ljubljana study, are somewhat more reliable and lead to the tentative conclusion that induced legal abortion does not lead to a greater risk of ectopic pregnancy post-abortion. There is evidence that spontaneous second-trimester abortions may be related to previous induced abortions, particularly for teenagers. But it also appears that a teenager is at risk if she carries a pregnancy to term.

The length of gestation, method of termination, and other characteristics relating to the pregnant woman are not adequately sorted out at this time. Thus, the inconsistent findings of these diverse studies do not permit definitive conclusions to be drawn on the long-term complications of legal induced abortion in the United States, and particularly if that abortion is an early, first-trimester abortion performed by suction.

Although it is impossible to estimate the frequency of medical complications due to illegal abortions, one indicator that has been used for this purpose is the number of hospital admissions due to incomplete or septic abortions. Existing trend data on hospital admissions and discharges indicate that abortion-related complications have declined over the past several years; in several hospitals the numbers and rates of women admitted for treatment of incomplete septic abortions fell sharply after the states in which the hospitals were located had introduced nonrestrictive abortion legislation or practices. These data lead to the conclusion that many women who previously relied on illegal abortions are now obtaining their abortions legally with a lesser risk of severe medical complications.

In San Francisco, the number of septic abortions per 1,000 deliveries dropped by 68 percent between 1967 and 1969.⁴¹ The Los Angeles County/University of Southern California Medical Center reported a comparable decline of 78 percent from 1967 to the first nine months of 1971.⁴² Although other factors, such as the increased use of effective contraception and a declining number of unwanted pregnancies might have contributed to the decline in high risk abortions, it is likely that the introduction of less restrictive legislation in 1967 was a major factor in reducing total illegal abortion-related complications in California.

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Chapter 4

ABORTION AND THE RISK OF DEATH

This chapter describes the risk of death faced by a woman obtaining an abortion. It documents that the method of abortion and the trimester in which it is obtained are important determinants of the mortality. There is a comparison of the mortality risk from legal abortion with that from full-term pregnancy and other surgical procedures. Data available on mortality associated with illegal abortion also are presented, along with an explanation for the declining trend in deaths from illegal abortion.

United States

Annual data on deaths associated with abortion (legal and other) are collected by two agencies within the Department of Health, Education, and Welfare--the National Center for Health Statistics (NCHS) and the Center for Disease Control (CDC). NCHS has compiled annual data on the reported cause of death from death certificates as part of its vital statistics function; data are now available through 1973. Since 1972, the Center for Disease Control has also collected mortality data, in cooperation with the state public health departments, in an effort to obtain more comprehensive and specific information. Both of these data sources have been used in preparing this chapter.

Deaths related to legal abortion are reported in two ways. Deaths "attributed" to abortion exclude deaths assigned to causes other than abortion; deaths "associated" with abortion include deaths resulting from pre-existing complications. Data from NCHS are based on attributed deaths and CDC data are based on associated deaths. Thus, except for data before 1972, the analyses in this chapter are based on deaths associated with legal abortion--the category that includes the greatest possible number of deaths.

Very few deaths are associated with legal abortion in the United States: 20 in 1972 and 22 in 1973.^{1/} The total number of legal abortions reported to the Center for Disease Control during these two years was approximately 1,202,600, which yields a mortality ratio (the number of deaths per 100,000 abortions) of 1.7 in the first trimester and 12.2 in the second trimester.^{2/} However, the number of reported deaths is so small that

a shift of a death from one week to the next, or the addition of another death, may have a marked effect on the size of those ratios. For this reason, comparisons among mortality ratios must be treated with care.

As shown in Table 12 the risk of death associated with abortion increases dramatically with the duration of pregnancy, from 0.5 per 100,000 abortions obtained at eight weeks or less, to 16 deaths per 100,000 abortions obtained at 16 weeks or later. When examined by method of termination, the combined mortality ratio for suction and D&C during 1972-1973 was 1.6 deaths per 100,000 legal abortions, and for saline, 15.4 deaths per 100,000 abortions.^{3/} The former ratio is substantially lower than, and the latter about equal to, the maternal mortality ratio from complications of pregnancy and childbirth (excluding abortion) which in 1973 was 14.1 deaths per 100,000 live births.^{4/} The mortality ratio for hysterotomies and hysterectomies combined was 61.3 per 100,000 such procedures, four times as great as the saline ratio. However, hysterotomy is infrequently used, is usually performed on high-risk women (women with pre-existing complications, who are older and of high parity), and is used only when the other methods cannot be applied. It also is performed when a saline abortion fails to expel the fetus. Thus, higher mortality ratios would be expected with hysterotomy.

Table 12

Reported Deaths Associated with Legal Abortion
in the United States, by weeks of Gestation
and Method of Abortion, 1972 and 1973

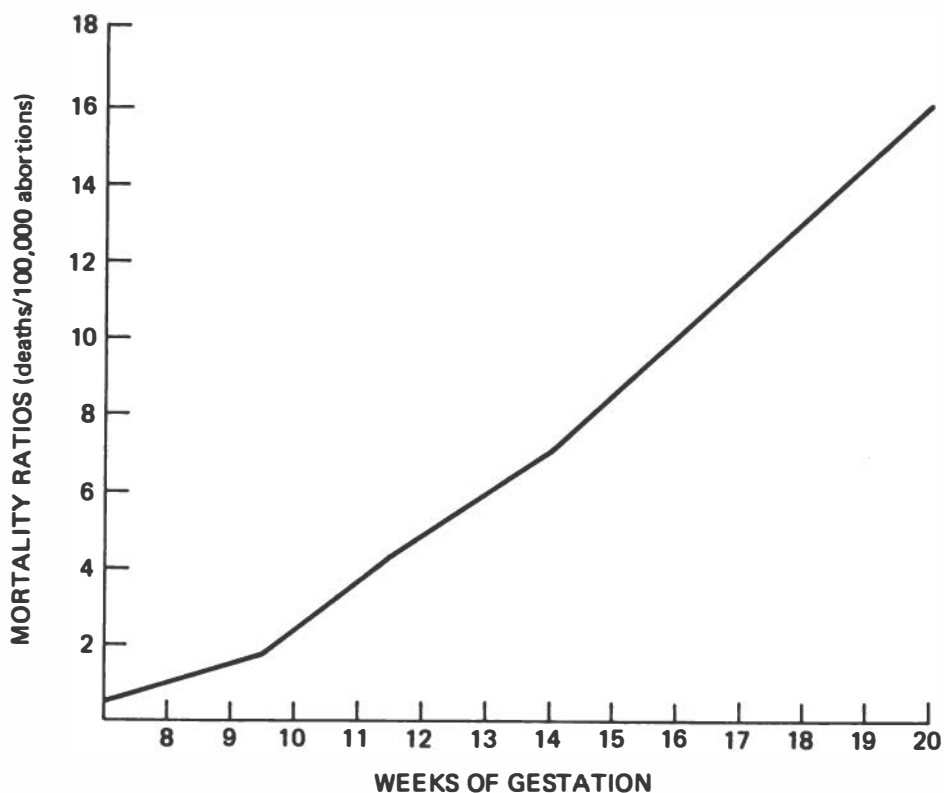
	Number of Abortions	Number of Deaths	Mortality Ratio (Deaths per 100,000 abor- tions)
Total	1,202,563	42	3.5
<u>Weeks of Gestation a/</u>			
8 or less	421,896	2	0.5
9-10	361,885	6	1.7
11-12	212,981	9	4.2
13-15	87,573	6	6.9
16 or more	118,228	19	16.1
<u>Method of Abortion</u>			
Suction/D&C	1,065,338	17	1.6
Saline	123,684	19	15.4
Hysterotomy/hys- terectomy	8,161	5	61.3
Other	5,380	1	18.6

a/ Distribution of abortions based on gestation of pregnancy known for 449,709 abortions reported during 1972 (77 percent of the total for that year) and for 453,535 abortions reported for 1973 (74 percent of the total for that year).

Source: U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control. Morbidity and Mortality Weekly Report 24, January 24, 1975.

FIGURE 8

Abortion Mortality Ratios by Weeks of Gestation, United States,
Combined 1972-1973 Data



Source: Table 12.

New York State The non-restrictive abortion statute that went into effect in New York on July 1, 1970, combined with a comprehensive reporting system, has made New York state a valuable source for data on the health effects of legal abortion. The Supreme Court's decision in January, 1973, was guided, in part, by the low number of abortion-related deaths from legal abortion reported from New York after the enactment of its non-restrictive laws.

In New York state (including New York City) from July 1, 1970 to June 30, 1972, 446,052 abortions were reported. Forty percent were obtained by state residents and 60 percent by non-residents, with the majority of non-resident abortions being performed in New York City.

During this two-year period 29 deaths were reported,* including four which occurred in other states. Ten of these deaths followed abortions performed in the first trimester** (2.9 deaths per 100,000 abortions) and 19 deaths followed abortions performed in the second trimester (21.1 deaths per 100,000 abortions).5/

International Data

A comparison of recent abortion mortality ratios from selected foreign countries with the 1972-1973 abortion mortality ratios of the United States provides further evidence of the differential between first- and second-trimester mortality ratios. Although only 25 abortion deaths were reported during 1970-1971, England and Wales experienced higher abortion mortality ratios than other developed nations, with a first-trimester ratio of 10 deaths per 100,000 abortions and a second-trimester ratio of 31 deaths. During 1972-1973 the first-trimester mortality ratio declined to 2.7 deaths per 100,000 abortions--a ratio that is comparable with data from the United States. The major reasons for the much higher mortality ratios from England and Wales in the 1970-1971 period are as follows:

- 1) A higher proportion of second-trimester abortions were performed in England because of bed shortages and procedural delays arising from the need to have authorization from two physicians;
- 2) First-trimester methods (suction and D&C) were often used to terminate second-trimester pregnancies, which sometimes resulted in retained fetal and placental tissue, leading to infection and hemorrhage;
- 3) More pregnancies in England were terminated by hysterotomy (with its attendant high mortality ratio) than in the United States;

*The quality of the mortality data associated with these abortions is considered to be good because non-resident as well as resident deaths were accurately identified in this study. A questionnaire was sent to all gynecologists in the United States to ascertain the number of abortion-related deaths of women who had received abortions in New York but who lived in other states. Physicians reporting deaths from abortions performed in New York were contacted personally to verify the death and eliminate duplication, and clinical and/or autopsy records were reviewed in all cases. Because most deaths in this intensive survey were reported by several physicians, the investigators concluded that all deaths from abortions performed in New York were probably identified. There is no way to verify whether, in fact, this assumption is correct and all abortion deaths were reported by all physicians.

**Includes one suicide of a young woman who was falsely diagnosed as pregnant and killed herself before that information could be relayed to her after the surgical procedure.

- 4) More sterilization was performed concurrently with the abortion procedure in England than in the United States; and
- 5) Most first-trimester methods were performed with general anesthesia, which increases the risks.^{6/}

Sweden and Denmark have also experienced relatively high abortion mortality ratios until recent years, (Table 13)* reflecting to a large extent the procedural requirements which have tended to delay many abortions until the second trimester where the risk of medical complications is much greater.** In Denmark, the 1966-1970 abortion mortality ratio was six for all trimesters, and in Sweden, seven deaths were reported during 1964-1971, for an abortion mortality ratio of eight deaths per 100,000 abortions.^{7/} As the procedural requirements have been relaxed in Sweden and the number of abortions has increased, the percentage of abortions obtained in the first trimester has also increased, rising from nearly 10 percent in 1964 to 80 percent in 1973.^{8/} Reflecting this change, the abortion mortality ratio has declined significantly; for the period 1954-1963 it was 60, decreasing to eight in the period 1964-1971. Factors other than trimester that also have affected abortion mortality ratios include differences in the type of patient, improvements in the techniques of abortion, and greater skill and experience of physicians.***

The lowest mortality ratios associated with legal abortion are found in Czechoslovakia and Hungary. Czechoslovakia reported only 18 deaths out of almost 800,000 legal abortions from 1962 to 1970, and Hungary reported only 17 deaths from approximately 1.5 million abortions

*Because the mortality ratios in this table are not itemized by trimester, the significant difference in mortality risk between the first and second trimesters is not shown for individual countries. However, since the majority of abortions performed in Denmark and Sweden before the mid 1960s were in the second trimester, and those in Czechoslovakia and Hungary during all the periods shown in the table were first-trimester abortions, a comparison among these countries permits a crude approximation of this differential.

**Denmark legislated abortion on request during the first trimester in 1973; similar legislation became operative in Sweden in January, 1975.

***Data reported by Tietze and Dawson, and by Moore-Cavar help explain the secular decline in abortion mortality ratios. From 1963 to 1972 the abortion mortality ratio in the U.S. declined from 72 to three. Since only therapeutic abortions (usually associated with high risk patients) could be performed until the late 1960s, the abortion mortality ratios were correspondingly high. When non-restrictive laws were passed, allowing more first-trimester abortions to be performed, the proportion of low-risk to high-risk abortions increased and the maternal mortality ratios declined. The JPSA study on early medical complications of legal abortion suggest that increased experience on the physician's part in performing abortions also contributed to the decline.

TABLE 13

**Historical Trends on the Number of Legal Abortions, Number of Deaths,
 and Mortality per 100,000 Abortions, Selected Areas and Periods**

	<u>Legal Abortions</u>	<u>Number of deaths</u>	<u>Mortality Ratio (Deaths per 100,000 abortions)</u>
<u>Denmark</u>			
1956-1960	19,900	18	90.5
1961-1965	21,800	9	41.3
1966-1970	34,700	2	5.8
<u>Sweden</u>			
1949-1953	28,000	27	96.4
1954-1963	35,200	21	59.7
1964-1971	87,900	7	8.0
<u>Czechoslovakia</u>			
1957-1961	330,400	19	5.8
1962-1966	400,900	9	2.2
1967-1970	398,600	9	2.3
<u>Hungary</u>			
1957-1969	421,400	23	5.5
1960-1963	669,700	21	3.1
1964-1967	739,000	9	1.2
1968-1970	787,600	8	1.0
<u>United States</u>			
1963-1968	9,700 <u>a/</u>	7	72.2
1972	586,800	20	3.4
1973	615,803	22	3.6

a/ Hospitals participating in PAS (Professional Activity Survey).

Source: Christopher Tietze and Deborah Dawson. "Induced Abortion: A Fact-book," Reports on Population/Family Planning, New York: The Population Council, December 1973, pp. 45-46, and U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control. Morbidity and Mortality Weekly Report 24, January 24, 1975.

during 1964-1970.^{9/} Although some skepticism could be expressed at the low level of the mortality ratios in these countries--2.3 and 1.0 respectively--part of the explanation for these figures is the fact that more than 99 percent of the legal abortions in these countries are performed during the first 12 weeks of pregnancy; second-trimester abortions are permitted only when the mother's life is in danger.^{10/} The recent experience of both the United States and England and Wales with first-trimester abortions serves as a partial confirmation of the low figures reported from Eastern Europe; the 1972-1973 first-trimester mortality ratio for the U.S. was 1.7 deaths per 100,000 abortions and for England and Wales, 2.7 deaths per 100,000 abortions.

A Comparison of the Mortality from Abortion, Full-Term Pregnancies, and Other Surgical Procedures

The above data indicate that the risk of death for a woman obtaining a legal abortion under nonrestrictive legislation is very low on an absolute scale. Also, legal abortion in the first trimester is far less dangerous to a woman's life than is carrying a pregnancy to term or undergoing most common surgical procedures. During 1973, the number of deaths in the United States from complications of pregnancy and childbirth (excluding abortion) was 441; the mortality ratio per 100,000 live births was 14.1.^{11/}

Table 14 compares the mortality risks of legal abortion with those of eight other commonly performed operations in the United States. A first-trimester legal abortion carries about the same risks as a tonsillectomy with or without adenoidectomy, both of which are less risky than the other surgical procedures listed. Although these comparisons are somewhat crude, inasmuch as they do not take into account the physician's skill and experience, the equipment used, or the condition of the patient at the time of the operation (abortion is usually an elective procedure and the others are performed for therapeutic reasons), they do serve to illustrate the very minor risk of death from legal abortion in contrast with other operations.

TABLE 14

Mortality Ratios of Selected
Surgical Procedures
United States, 1969

<u>Operation</u>	<u>Mortality Ratio</u> (Number of Deaths per 100,000 procedures)
Legal Abortion	
First trimester	1.7 _a /
Second trimester	12.2 _a /
Tonsillectomy without Adenoidectomy	3
Tonsillectomy with Adenoidectomy	5
Ligation and Division of Fallopian Tubes	5
Partial Mastectomy	74
Cesarean Section (low cervical)	111
Abdominal Hysterectomy (not abortion)	204
Appendectomy	352

a/Based on 1972-1973 data from the Center for Disease Control.

Source: Charles G. Child III. "Surgical Intervention", Life and Death and Medicine, San Francisco: W. H. Freeman and Company, 1973, p. 65. This book originally appeared as the September 1973 edition of Scientific American.

Illegal Abortion

It is difficult to find credible estimates of the number of deaths associated with illegal abortion. One estimate, which has been frequently quoted, is between 5,000 and 10,000 deaths per year.¹²/ That is hardly plausible, considering that the total number of deaths of women aged 15-44 from all causes in the United States is approximately 50,000 annually, and the total number of deaths due to abortion reported by the National Center for Health Statistics (NCHS) has been below 500 since 1958 and below 100 since 1971.

The NCHS data reflect under-reporting, and represent a minimum estimate of mortality due to all types of abortion—spontaneous, legal, and illegal.

Figure 9 compares the number of deaths due to legal abortions with those due to "other" abortions over the past 18 years in the United States. While the "other" category includes miscarriages and abortions of undetermined origin, various observers conclude that most of the deaths included in the "other" category are from illegally induced abortions.* For example, of the 47 deaths reported in 1973, 22 were from legal abortions, 16 were from illegal abortions, seven were from spontaneous abortions, and the remaining two deaths were from unknown causes.^{13/}

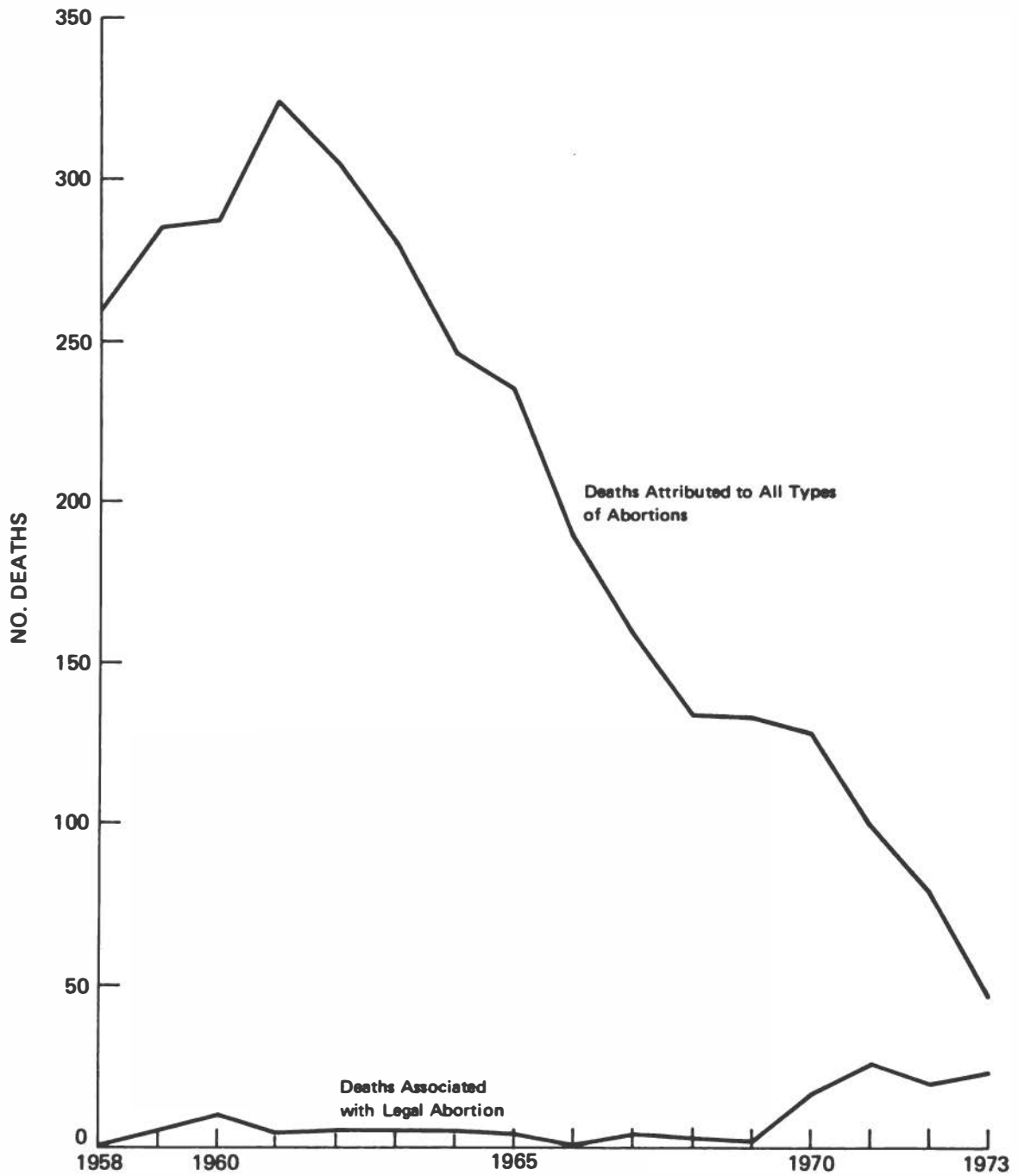
The total number of reported deaths due to abortion has steadily declined from 324 in 1961 to 47 in 1973. Contributing to this decline were the advances in medical treatment of gynecological complications of abortion. These advances also affect non-abortion statistics: maternal mortality in general has dropped from 30 deaths per 100,000 live births in 1958-1962 to 19 deaths per 100,000 live births in 1973, (standardized for age and delivery) a reduction of 37 percent over a 15-year period.^{14/} Another factor could be a reduction in the number of unwanted pregnancies in the United States because of more effective use of contraception.^{15/} A national decline in deaths due to "other" abortions accelerated as women began to shift to legal abortions after the changes in abortion laws and practices which occurred around 1970.

New York City Figures from New York City also indicate a decline in "other" abortion deaths, most sharply between 1970 and 1972 following the implementation of non-restrictive abortion practices in New York in July 1970. These data are shown in Table 15. As the table indicates, the performance of legal abortions has caused some maternal deaths, but the legalization of abortion itself has led to a very sharp decline in the total number of deaths related to pregnancy termination.

*See, for example, Donald P. Swartz, "The Harlem Hospital Center Experience," The Abortion Experience, Howard J. Osofsky and Joy D. Osofsky, eds., Hagerstown, Md: Harper and Row, 1973; and Emily Moore-Cavar. International Inventory of Information on Induced Abortion, New York: International Institute for the Study of Human Reproduction, Columbia University, 1974.

FIGURE 9

Abortion Deaths By Type of Abortion 1958-1973



Source: U.S. Department of Health, Education, and Welfare. Vital Statistics of the United States, Mortality, Part A.; 1972 and 1973 data are from U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control. Morbidity and Mortality Weekly Report 24: January 24, 1975.

TABLE 15

Abortion-Related Deaths in
New York City, Resident Women,
July 1966 - June 1974

<u>Period</u>	<u>Legal</u>	<u>Other</u>	<u>Total</u>
1966-1968	-	46	46
1968-1970	-	45	45
1970-1972	11	14	25
1972-1974	6	5	11

Source: Christopher Tietze, Jean Pakter, and Gary S. Berger. "Mortality with Legal Abortion in New York City, 1970-1972," Journal of the American Medical Association 225: 507-509, July 30, 1973. Jean Pakter, Donna O'Hare, M. Halpern, and Frieda Nelson. "Impact of the Liberalized Abortion Law in New York City on Deaths Associated with Pregnancy: A Two-Year Experience," Bulletin of the New York Academy of Medicine 49: 804-818, September 1973. Supplemented by unpublished data obtained from the New York City Department of Health.

Romania Data from Romania show that when non-restrictive abortion laws are tightened, deaths associated with illegal abortion increase. Abortion on request was legal in Romania from 1957 to October 1966, when restrictive legislation was adopted.^{16/} After this change there was a substantial increase in the number of deaths associated with abortion (Table 16), most of which after 1966 are attributed to illegal abortions; nearly all abortions were illegal after late 1966. The number of abortion-related deaths in Romania during 1971 was greater than the 324 abortion deaths reported in the United States during 1961, notwithstanding that the U.S. population in 1961 was nine times greater than the Romanian population of 20,000,000 in 1971.

TABLE 16

Deaths Attributed to Illegal Abortion in Romania
1965-1971

<u>Year</u>	<u>Number of Deaths</u>
1965	64
1966	83
1967	170
1968	221
1969	258
1970	314
1971	364

Source: World Health Organization. Statistics Annual, Selected years, 1966-1971.

Mortality Risks by Race Differences in the mortality risks by race for other-than-legal abortions can be seen in Table 17. Although abortion mortality ratios cannot be defined (there is no reliable estimate of the number of spontaneous and illegal abortions), abortion mortality rates—number of deaths per 100,000 women aged 15-44 years—can be computed. It should be noted that these figures are based only on the illegal abortion deaths reported to the National Center for Health Statistics, which are an under-estimation of the actual number of deaths caused by illegal abortions. Rates were not computed for deaths associated with legal abortion because the absolute number of deaths was so small.

TABLE 17

Abortion Mortality Rates Associated with Other-than-Legal
Abortions, by Race, United States, 1968-1973
(Deaths per 100,000 women aged 15-44)

<u>Year</u>	<u>All Women</u>	<u>White Women</u>	<u>Other than White Women</u>
1968	0.30	0.16	1.29
1969	0.31	0.18	1.23
1970	0.28	0.14	1.21
1971	0.18	0.07	0.84
1972	0.14	0.09	0.40
1973	0.06	0.03	0.29

Source: U.S. Department of Health, Education, and Welfare. National Center for Health Statistics. Vital Statistics of the United States, Morbidity Part A.; and U.S. Department of Commerce, Bureau of the Census. Estimates of the Population of the United States, by Age, Sex and Race: April 1, 1960 to July 1, 1973. Series P-25, No. 519, April 1974.

The mortality rate associated with illegal abortion declined about 80 percent for white women and about 78 percent for non-whites from 1968-1973. For non-whites, however, there has been a larger absolute decline in the rate, which may represent a greater shift of non-white women away from illegal abortions to the medically safer abortions provided in clinics and hospitals, particularly after 1970. Nevertheless, non-white women still face a much higher risk of death from other-than-legal abortion.

Summary

Two alternatives are available for a woman who is pregnant and wishes to terminate her pregnancy--legal abortion or illegal abortion. As shown by the preceding data, legal abortion in the first trimester carries a relatively small risk of death. In the United States and other countries that have nonrestrictive abortion statutes, the risk of death associated with legal abortion in the first trimester is markedly lower than that associated with carrying a pregnancy to term, and much lower than the risk associated with frequently performed surgical procedures. Although data limitations preclude a direct comparison of the mortality ratios associated with legal and illegal abortion, available statistics from the United States indicate that the number of reported deaths from other-than-legal abortions declined steadily as less restrictive abortion legislation was passed and implemented throughout the country.

The major factors that affect legal abortion mortality ratios are the trimester in which the abortion is performed and the method of abortion. The risk of death associated with first-trimester abortions performed by suction and D&C is low compared with that associated with saline abortions or carrying a pregnancy to term; the risk associated with hysterectomy or hysterotomy is substantially higher than any of the other methods, although still lower than the risk associated with surgical procedures such as cesarean delivery, for which the 1969 mortality ratio was 111.

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Chapter 5

THE PSYCHOLOGICAL EFFECTS OF ABORTION

There probably is no psychologically painless way to cope with an unwanted pregnancy whether it is voluntarily interrupted or carried to term. While an abortion may elicit feelings of guilt, regret, or loss, such alternatives as entering a forced marriage, bearing an out-of-wedlock child, giving up a child for adoption, or adding an unwanted child to a family may also be accompanied by psychological problems for the woman, the child, and the family.

This chapter reviews the available evidence on the psychological consequences of legally induced abortion. The term "psychological" refers in a general way to an individual's emotional or mental condition; the term "psychiatric" relates to mental disturbance or illness. Two questions are asked. First, what is the effect of a legal abortion on the mental health of a woman obtaining an abortion? Second, what are the effects of denying a requested abortion on the woman, on the child then born, and on the larger family? In addition, the research design problems associated with many of the studies cited are discussed in light of their effects on the data generated. Also examined are some of the current studies on the psychological and social factors involved in the decision to delay an abortion until the second trimester, when the medical risks associated with the termination are greater. Much of the research on psychological aspects of abortion is limited, not only because many of the studies are poorly designed and executed, but also because the whole field of mental health research is relatively undeveloped.

Due to a lack of data, this chapter does not address the effect of abortion on such subjects as marital relationships, family cohesiveness, or child abuse. Nor does it address the differential impact of legal and illegal abortion on mental health. The only data available on this subject are anecdotal materials, which, as expected, portray an illegal abortion as more traumatic than a legal one. Data are also almost nonexistent on the differential emotional impact associated with various abortion techniques or the trimester in which the abortion is obtained, although psychiatric opinion supports the obstetrical judgment that first-trimester abortions are less hazardous than later procedures.

Definitional and Methodological Problems

Most studies on the psychological effect of abortion are clouded by significant problems of definition and method. The uneven quality of the research is evidenced by the lack of consensus on the mental health consequences of abortion, especially for women with no obvious psychiatric disorders prior to the operation. Opinion ranges from the view that abortion is always followed by feelings of regret, loss and depression, to the opposite view that abortion results in feelings of obvious emotional relief.^{1/}

Among the more frequent methodological problems found in many studies on this subject are:

- . failure to examine the psychological status of the woman before the abortion so as to measure any change caused by the abortion;
- . poor sampling techniques, and lack of attention to possible interviewer bias;
- . failure to distinguish or identify the differential effects of legal, illegal, or spontaneous abortion; and
- . scheduling of follow-up interviews too soon after the abortion to measure long-term psychological effects.

An even more serious problem is that many studies do not provide a control group to compare with the women obtaining abortions. Although the absence of such controls may be attributed in part to inadequate research design, it also stems from the difficulty of determining an appropriate comparison group. Is the emotional impact of induced abortion to be compared to the sequelae of term delivery, term delivery followed by adoption, spontaneous abortion, or to the absence of pregnancy? Should women be selected as controls on a random basis or matched on a one-to-one basis in accordance with certain characteristics of women in the abortion group? Each alternative raises issues of research methodology and value judgment that are largely ignored by the studies noted below. With rare exceptions, most inquiries never address the question of the appropriate comparison group to be examined when studying the psychological impact of abortion.

The wide range of opinion on the emotional consequences of abortion is also partly explained by the problems of definition that trouble all psychological research. What one evaluator sees as "normal transient depression" following an abortion might be labeled an "adverse reaction" by another. Similarly, "depression" or "guilt" are general terms that do not specify whether such feelings are appropriate, how long they last, or how severe they might be. Inconsistent terminology, therefore, makes a comparison among studies very difficult and also weakens the validity of any single study.

Somewhat related to the definition problem is the lack of uniform measurement instruments to gauge the effect of an abortion on the mental health of a woman. Many of the studies classify "seeing a psychiatrist" at some time after the abortion as a negative reaction. Similarly, "being in therapy" either before or after an abortion is presented as evidence of mental illness, although the absence of psychiatric visits is not necessarily considered indicative of mental health. The counseling process can be interpreted alternatively either as an early intervention which is as much preventive as remedial, or as evidence of mental distress. Furthermore, such criteria as "seeing a psychiatrist", are clearly not standardized and vary among studies. Recording three visits a week for the two months directly following an abortion is clearly not comparable in time or intensity to a few visits several months after the procedure. Yet much of the research fails to define adequately the measurement criteria employed.

One additional factor that contributes to the wide variations in conclusions is that the legal status of abortion has not remained constant during the last 50 years when the bulk of research was conducted. Abortion in the United States has only recently begun to gain acceptance by a significant segment of the population. Because psychiatric research often reflects the bias of the investigator and of the culture (whether consciously or subconsciously), many earlier findings conflict with current data generated in an atmosphere increasingly tolerant of legal abortion.* The linkage between the legal and cultural status of abortion and its psychological effects poses a complex problem for researchers hoping to isolate the consequences of abortion. If adverse reactions are clearly present, it is difficult to determine whether they arise more from the abortion itself or from other factors, such as social embarrassment, that relate more to general cultural values or legal norms.

The Recent Evidence on Psychiatric Consequences of Abortion

This section relies primarily on U.S. data gathered since the late 1960s when the laws governing abortion became less restrictive. Although the studies cited do not represent an exhaustive review, they do constitute an illustrative sample of recent work in this field. Data from the JPSA survey will be presented followed by several major studies completed in the last five years.

*A Gallup poll conducted in 1972 recorded that over 60 percent of the people interviewed favored the proposition that abortion should be a choice for a woman and her doctor to make. In 1969, only 40 percent of the people interviewed agreed with this same statement.2/

Recent data on the psychiatric complication rate of abortion have been compiled by the Joint Program for the Study of Abortion (JPSA), described in more detail in Chapter 3. From July 1, 1970 to June 30, 1971, the 66 participating institutions reported a total of 16 major psychiatric complications from a pool of 72,988 abortions, including two suicides and five depressive reactions associated with major hemorrhage or protracted fever.* The complications recorded in the JPSA data yield a psychiatric complication rate of 0.2 per thousand abortions (without other concurrent surgeries), and 0.4 per thousand abortions for local women obtaining abortions who were later seen for follow-up evaluation.**4/ As similarly noted in the several studies below, the JPSA figures indicate that abortion does not carry a significant risk of psychiatric trauma.

In a recent study by Levene and Rigney (1970), follow-up questionnaires were sent to a consecutive series of 70 patients several months after they obtained therapeutic abortions under the moderately restrictive California abortion law (1968).5/ These women were asked to describe their feelings immediately following abortion and three to five months later. The measurements used were scores on the Depression Rating Scale and the Multiple Affect Adjective Check List, plus a brief statement of each woman's overall reaction to the procedure. Based on a follow-up sample of 80 percent of the original group, the study compared these ratings with the pre-abortion status recorded in the psychiatric evaluation required of all women requesting abortions at this particular facility. The authors noted that pre-abortion depression was significantly reduced for the great majority of women at time of follow-up as compared with the immediate pre- and post-operative condition. Most of the women recorded positive reactions toward the abortion, although seven of the 56 women contacted claimed that they would not seek abortion again.6/ There were no reports of psychiatric hospitalization from those women reached for follow-up. Although five reported that they had seen a psychiatrist in the interim, two of these had been in therapy prior to becoming pregnant. These data suggest that the emotional impact of abortion is, on balance, positive, although the absence of any control group and the brief interval between abortion and follow-up limit the validity of the conclusions.

*One of the women committing suicide had a history of psychiatric hospitalization before and after the abortion and it was clear that the abortion itself was not the cause of the suicide. The other suicide was of a young woman who was falsely diagnosed as pregnant and committed suicide before that information could be relayed to her after the surgical procedure.3/

**As elsewhere in JPSA data, the complication rates for "all cases" represent a minimum estimate, and the rates based on local patients with follow-up a maximum estimate of the true incidence of complications.

Margolis et al. (1971) attempted to study 50 women who obtained therapeutic abortions at the University of California/San Francisco hospitals between November 1967 and July 1968.^{7/} At the time of initial application for the abortion, a Minnesota Multiphasic Personality Inventory (MMPI) profile was obtained from each woman in conjunction with the required psychiatric evaluation. Of the 43 women reached for follow-up, 29 expressed a positive reaction toward abortion, 10 reported neutral feelings and four responded negatively. Thirty-seven of these women said they would repeat the abortion under similar circumstances; two said they would not. An evaluation of 36 pre- and post-abortion MMPI profiles indicated that 15 of the 27 previously abnormal tests became essentially "normal" after the abortion. Like Levene and Rigney, the investigators concluded that abortion does not aggravate mental illness or necessarily have a negative impact. However, this study also is without a control group and relies largely on self reports that use very general terms and measurement scales. Furthermore, not all of the women obtained a simple D&C; nine obtained a saline abortion, one had a hysterotomy, and nine were sterilized. By not distinguishing these subgroups in reporting the follow-up results, the data lose much of their usefulness.

Barnes et al. (1971) conducted a retrospective study of a group of 114 women who obtained therapeutic abortions at Massachusetts General Hospital between January 1968 and June 1970.^{8/} Of this group, 99 participated in a follow-up interview. Nine of these 99 women sought some form of psychiatric counseling in the year following the abortion; two women with extensive histories of previous psychiatric hospitalization were readmitted to a mental hospital following the abortion. Those patients aside, the study found that "the patients' experience with therapeutic abortion produced little handicap in most and constructive gains in many".^{9/} The lack of information on pre-abortion mental health status, however, leaves the study unable to assess scientifically the actual effect of the termination. That is, there must first be baseline data against which to measure any subsequent changes.

Niswander and Patterson studied a group of women obtaining abortions between 1963 and 1965 at the hospital affiliated with the State University of New York at Buffalo.^{*10/} From an original pool of 170 women, 116 eventually returned a follow-up questionnaire. About 66 percent of these women reported that they "felt better" immediately following the abortion-- a figure that rose to 83 percent eight months or more post-operatively; 80 percent said they were "better off emotionally" at time of follow-up. The authors reported that when confronted directly with the question was "therapeutic abortion the best answer for you?" only six of the 116 patients failed to respond in the affirmative.^{11/} Although "minor doubts"

*This study, and the Patt study that follows are included as examples of research conducted in the middle 1960s when attitudes towards abortion were beginning to be less restrictive.

were fairly common, the study noted that these feelings were always accompanied by the expressed belief that, under the circumstances, the decision to abort had been a good decision. Patt et al. (1969) obtained follow-up data on 35 of 48 women who obtained abortions for psychiatric reasons from 1964-1968 at Michael Reese Hospital in Chicago.^{12/} The data collected came from direct interviews with the women or their psychiatrists and from hospital records. The study concluded that for 20 women, the short-term impact of abortion was very favorable; the remaining 15 exhibited some negative reactions, including depression, for a period of two to six months following the abortion. The long-term effects recorded were considerably more favorable; more than three-fourths of the women studied reported improved "life functioning" several years after the abortion, although five women regarded themselves as "harmed", and four felt unchanged. The study concluded quite simply that "with rare exceptions, abortion was genuinely therapeutic."^{13/}

Both of these studies contain various methodological shortcomings, most of which have been mentioned in connection with other studies reviewed, e.g. absence of accurate pre-abortion data or a control group, and lack of standardized follow-up measures. Yet the data from all these studies show a general agreement: While abortion may elicit feelings of guilt, regret or loss in some women, these reactions tend to be temporary and appear to be outweighed by positive life changes and feelings of relief. Moreover, these studies indicate that although abortion may indeed be followed by some minor negative feelings, major psychiatric trauma is essentially non-existent. From their review of the recent literature, Osofsky, Osofsky, and Rajan (1973) concluded:

For most women, abortion has had few, if any [negative] psychological sequelae [consequences]. In the limited number of cases where feelings of guilt or depression have been present, they have tended to be mild and transient in nature. On the whole, the experience has led to further emotional maturation and resolution of conflict. In the rare instances where psychiatric disturbances have been noted post-abortion, they have appeared related to existent psychopathology rather than to the procedure.^{14/}

Early Research on the Psychiatric Consequences of Legal Abortion

Research before the middle 1960s on the psychiatric consequences of abortion was conducted in a different social and legal context than currently exists. The restrictions placed on the availability of abortion were compounded by the stresses on the woman seeking a legal abortion--social stigma, uncertainty as to whether the abortion could be obtained, ethical doubts, insensitivity and even contempt from

hospital staff,* and the play-acting sometimes necessary to obtain psychiatric approval for the abortion. The prevalent psychoanalytic theory of woman defined her traditional maternal role as instinctive, and concluded that any attempt to thwart this role would cause psychiatric problems. Accordingly, abortion was often viewed as a violation of woman's natural character as "giver, nurturer, and protector of life."15/ The law supported this attitude by restricting the availability of abortion to medical or psychiatric necessity. Reflecting this general situation, the psychiatric research from the period placed the whole abortion issue in the realm of mental illness, primarily because psychiatry was charged with determining the mental health indications for and consequences of abortion.

A review of the early literature was conducted by Simon and Senturia (1966) in an effort to establish not only what had been done in the field, but also to examine the validity of the research designs and the associated conclusions.16/ In their analysis of the 25 principal studies conducted between 1934 and 1965 they concluded that the research methods were grossly inadequate. They note how sobering it is

to observe the ease with which reports can be embedded in the literature, quoted, and requoted many times without consideration for the data in the original paper. Deeply held personal convictions frequently seem to outweigh the importance of data, especially when conclusions are drawn.17/

Simon and Senturia also conclude from their review, however, that "there is some agreement that women with diagnosed psychiatric illness prior to abortion continue to have difficulty following abortion."18/ That is, women who have a history of instability prior to the pregnancy are more likely to manifest psychiatric problems after an abortion than women with no prior psychiatric history, regardless of the procedure used.19/ By the same token, for these women abortion cannot be viewed as a solution for psychiatric disturbance, and may perhaps exacerbate the condition.

Simon and Senturia do not offer any further conclusions on the psychological consequences of abortion from their review of these early studies, since the quality of the data reported in these studies limits further analysis. Most important, however, is that even if these early studies had, in fact, outlined the emotional impact of abortion conclusively, the recently changed status and availability of legal abortion in this country would probably make these earlier findings out of date and somewhat irrelevant.

*Although many of these conditions persist, it can be assumed that they were more acute prior to the widespread legalization of abortion.

Psychological Consequences of Abortion and Birth

The psychiatric consequences of abortion also need to be viewed in comparison to alternative outcomes of unwanted pregnancy. For example, what are the relative emotional impacts of "post-partum blues" (depression, following childbirth, that is considered normal rather than pathological 20/) and "post-abortion blues?"

In 1970, Fleck reported that there are some 4,000 documented post-partum psychoses requiring hospitalization in the U.S. per year, about one to two per 1,000 deliveries.21/ If these rates are compared to the estimated post-abortion psychosis rates compiled by the JPSA study cited earlier (between 0.2 and 0.4 per 1,000 abortions), one might conclude that abortion is substantially less traumatic than childbirth. However, without more complete information on the pre-abortion/delivery status of these women, the two data sets can only be presented for preliminary consideration. Definitive conclusions, either about the comparative status of the two complication rates, or about the role of abortion and childbirth in precipitating mental illness, must await further research. But there is no evidence here that abortion is significantly more hazardous psychologically than is term delivery.

A recent study attempted to relate the psychiatric sequelae of abortion to other pregnancy related events. As such, the study is one of the few that has tried to establish a control group in a study of abortion. Between October 1970 and February 1972, Athanasiou et al. studied three matched groups of women, one group planning term deliveries, one obtaining suction curettage abortion and the third obtaining second-trimester saline abortions.22/ Findings were based on detailed interviews and administration of several standardized questionnaires during pregnancy and about one year after the abortion or delivery. Of the original sample of 373 women, three matched samples totaling 114 women were eventually included in the follow-up evaluation. The only statistically significant difference among the three groups occurred on the paranoia scale of the Minnesota Multiphasic Personality Inventory (MMPI); term birth patients apparently had more extreme scores than either first- or second-trimester abortion patients. Athanasiou states that "if any conclusion were to be drawn ..., it would be that early abortion by suction curettage was possibly more therapeutic [with respect to this indicator] than carrying a pregnancy to term."23/ Although the follow-up information was clearly incomplete, these data continue to support the findings of other recent studies that abortion is not a damaging procedure leading to or aggravating mental illness. Indeed, Kummer has suggested that the whole concept of post-abortion psychiatric illness is a myth.24/

The Consequences of Denied Abortion

A parallel issue to the psychiatric consequences of legal abortion is whether denying abortion to a woman requesting such a procedure has adverse effects. For the pregnant woman denied abortion, the stresses are clearly different than for a woman who obtains an abortion. Beyond any private distress or depression, the pregnancy is obvious to all with whom she comes in contact, her education or career may be interrupted for at least some time, and responsibility for the child may last for decades unless adoption is elected. Studies of women to whom legal abortions were denied are complicated by the observation that a large percentage of such women eventually manage to obtain an abortion--legally or illegally--after initial refusal. Thus, the residual group who continue their pregnancy are a specific subset of the original group and are not necessarily representative of all women who are denied abortions.

Although not nearly enough is known about the decisions and problems that face women with unwanted pregnancies, or how they cope with the children who were unwanted at the time that the abortion was sought, some recent research has begun to examine these issues. Illsley and Hall (1972) surveyed published reports and concluded that "although many women who are refused abortions do adjust to their situation and grow to love the child, about half would still have preferred an abortion, a large minority suffer considerable distress, and a small minority [eventually] develop severe disturbance."^{25/} The problem of unwanted pregnancy is important; estimates from the 1970 National Fertility Survey indicate that 15 percent of all recent births to married couples were "never wanted" and that the percentages unwanted were much greater among couples who had already had three children or who were in the near-poor and poor populations.^{26/}

The effects on the child born of an unwanted pregnancy are even more difficult to evaluate than the effects on the mother. The literature is sparse on the relationship of "unwantedness" or "wantedness" to specific, objective criteria of physical, mental, or social health.^{27/} Evidence that planned pregnancies more frequently produce psychologically healthy children is mostly inferential. What little is known about discernible differences between matched samples of "wanted" and "unwanted" children from birth through early childhood comes from two studies that compared children born after their mothers were denied abortions to children who were ostensibly "wanted."

One such study was conducted in Sweden by Forssmann and Thuwe (1966). This 20-year follow-up study of 120 children born to Swedish women who were denied abortion showed that, in comparison with a matched group of children born at the same time, the "unwanted children" were registered more often with psychiatric services, had engaged in more antisocial and criminal behavior and had received more public assistance. Also, many more of the unwanted than control children had not had the advantage of a secure family life during childhood. Out-of-wedlock birth and/or death or divorce of

parents during early childhood were more frequent among the unwanted children, many of whom were reared under difficult social circumstances. Unfortunately, this study is flawed by major social and economic differences between the two groups of children being compared and between their mothers, thereby making the comparative observations less sound.^{28/}

Additional data are available from Prague on a follow-up study of the first seven to nine years of life of approximately 200 children born during 1961-1963 to women denied abortion both on initial request and on subsequent appeal. These children were compared with about 200 control children who were born to women who did not seek abortion and who were carefully matched to the subject group by grade in school, sex, birth order, number of siblings, mother's marital status, and father's occupation. Although the initial differences noted between the Czech experimental and control children are not dramatic, they do suggest that the "unwanted" boys in particular, now entering adolescence, suffer a greater incidence of illness, have poorer grades in school, have more difficulty with peer group relationships and are at seemingly greater risk for future delinquency.^{29/} Continuing observations will be needed to assess the validity of these predictions.

Psychological Aspects of First- and Second-Trimester Abortions

Increasing interest in why some women obtain abortions in the second trimester rather than the first has stimulated new research on the psychological, sociological, and cultural factors involved in the decision to seek abortion.^{30/} Recent work of Kaltreider (1973) examined the psychological factors involved in the delay of the decision to seek abortion until the second trimester when the more risky saline method must be used. Kaltreider noted that a first-trimester group of ten women moved swiftly into the process leading to abortion, while the eight women obtaining second-trimester abortions--similar to the first group in age, race and marital status--underwent a period of denial of suspected pregnancy, procrastination, and general emotional confusion. The latter group was more ambivalent about the termination of their pregnancies and, prior to conception, seemed to have less effective abilities for coping with stress. After abortion, the second-trimester group spoke of the termination in such terms as "labor", "delivery" and "childbirth" and also referred to the "baby" or "child" rather than "the fetus" or "the pregnancy"--terms that the first-trimester group used. The mid-trimester group also appeared to undergo more of a mourning period after the abortion than the women obtaining D&Cs. Whether such post-abortion phenomena are a simple function of experiencing a saline rather than a curettage abortion or evidence of psychological differences between the two groups of women prior to the abortion is not clear. The evidence is consistent, however, with the view that the longer the period of gestation, the more the fetus will be viewed as a "baby", and the more likely that an abortion will be accompanied by a grief or loss reaction.^{31/}

In a study with a similar purpose, Kerenyi et al. interviewed random samples of 200 women obtaining D&Cs and 200 women obtaining saline abortions in a New York City hospital from late 1971 to the middle of 1972. Kerenyi found that the second-trimester women were on the average 3.4 years younger than the D&C group, less educated, more frequently single, less often employed, and were more likely to be students. The women obtaining saline abortions were also more frequently pregnant for the first time (65 percent versus 44 percent), and thus less experienced at detecting and coping with pregnancy. While both groups expressed similar emotional reactions to the discovery of being pregnant, the women obtaining second-trimester abortions were slower to master their feelings and proceed to action. Like Kaltreider, Kerenyi notes that in addition to ambivalence, denial of the pregnancy also seemed to contribute to the delay in seeking early abortion. Even though a large majority of both groups of women had regular menses, twice as many of the women obtaining D&Cs as salines consulted a physician after missing only one period.^{32/}

In addition to the problems described by Kaltreider and Kerenyi, delays in obtaining an abortion may also be related to ethical or religious conflicts. Social barriers may also play a role in the postponement. For example, if access to medical care is limited by age, ignorance, or poverty, abortion may be delayed into the second trimester while the woman attempts to master the necessary steps to obtain it. To the extent that pregnancy tests are difficult to arrange, information on abortion is limited, medical facilities are inaccessible, or pregnancy counseling is unavailable, some women will require the later procedure through no ambivalence or reluctance of their own. To date, though, no research has sorted out the extent to which such factors in the health care system influence the delay in obtaining an abortion.

Further research on the social and psychological dimensions of second-trimester abortion is needed. Because the medical risks associated with later abortion are greater, an improved understanding of the processes leading to later abortion could contribute to a reduction in the number of women obtaining such procedures and, therefore, to a lowering of the mortality and morbidity risks associated with abortion.

Summary

Certain trends emerge from a review of the scientific literature on the mental health effects of abortion. Emotional stress and pain are involved in the decision to obtain an abortion, and there are strong emotions that surround the entire procedure. However, the mild depression or guilt feelings experienced by some women after an abortion appear to be only temporary, although for women with a previous psychiatric history, abortion may be more upsetting and stressful.

There are many methodological problems in abortion research, more serious in the studies conducted prior to the mid-1960s than in later studies. In the early studies, the design shortcomings, in combination with a legal and social climate hostile to objective discussion of the subject, probably account for a wide variety of findings that range from abortion having no negative psychological consequence to its being an emotionally damaging experience. The more recent studies generally agree that the feelings of guilt, regret, or loss elicited by a legal abortion in some women are generally temporary and appear to be outweighed by positive life changes and feelings of relief.

The effects of denied abortion are also not completely documented, although two studies indicate that the children subsequently born to women who have been denied abortion exhibit more social-psychological problems than the "wanted" children. The impact of denied abortion on the woman and her family is even less defined, and is not addressed in this chapter.

The last two studies presented discuss certain psychological aspects of first- as against second-trimester abortion. Research defining the psychological differences between women obtaining second- rather than first-trimester abortions, coupled with research on the social and economic barriers to earlier abortions, may suggest ways to encourage women seeking abortion to do so in the first trimester, thereby avoiding the higher mortality and morbidity associated with later abortion.

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Chapter 6

BIRTH DEFECTS AND SELECTIVE ABORTION

Until recently, a decision to forego childbearing was the only way in which a couple at risk of having a child with a severe genetic disorder could avoid that possibility.* Within the past decade, however, amniocentesis and other diagnostic techniques have been used to identify an increasing number of severe genetic and congenital disorders of the fetus during the second trimester of pregnancy. With prenatal diagnosis, and the opportunity to terminate an affected pregnancy by means of a legal abortion, many women who would otherwise have refrained from becoming pregnant can be helped to bear healthy children. Abortion also can be used with or without prenatal diagnostic procedures in cases for which there is reasonable risk that the fetus is affected or malformed from non-genetic causes. These include exposure of the woman to certain infectious diseases early in pregnancy (e.g., rubella), ingestion of drugs or other substances harmful to the fetus (e.g., thalidomide), or inadvertant exposure of the fetus to x-rays. As knowledge accumulates in this area, the indications for selective abortion will expand.

The Use of Prenatal Diagnosis

Amniocentesis is a procedure by which a small sample of the amniotic fluid that surrounds the fetus is withdrawn from the uterine cavity via a needle inserted through the abdominal wall after the fourteenth week of pregnancy. (Before that time, there is usually not enough amniotic fluid to obtain an adequate sample and injury to the fetus may be more difficult to avoid.)

*There are a number of articles providing data on the reluctance of parents with one genetically defective child to undertake the burden of having a second such child. When the risks were great (more than 10 percent), the majority of the patients interviewed elected not to become pregnant again. (See C. O. Carter, K. A. Evans, J. A. Fraser Roberts, and A. B. Buck. "Genetic Clinic: A Follow-up," The Lancet 1: 281-285, February 6, 1971; Alan E. H. Emery, Muriel S. Watt, and Enid Clack. "Social Effects of Genetic Counselling," British Medical Journal, March 24, 1973, pp. 724-726; and Claire O. Leonard, Gary A. Chase, and Barton Childs. "Genetic Counselling: A Consumers' View," New England Journal of Medicine 287: 433-439, August 31, 1972.

The fluid is analyzed directly for some disorders, such as those relating to certain developmental defects of the central nervous system. In other cases, the fetal cells contained in the fluid are grown in cell culture for two to four weeks to obtain enough cells of unquestioned fetal origin with which to perform diagnostic tests designed to detect the presence of chromosomal or other genetic disorders. Additional prenatal diagnostic techniques now in use include contrast radiography and ultrasonic imaging. Still experimental is direct fetal visualization (fetoscopy), which can be used to diagnose gross anatomical deformities in the fetus, and to facilitate retrieval of fetal tissue, such as blood samples, for diagnosis of other genetic disorders, including sickle cell anemia.^{1/}

Almost two thousand genetic defects have been catalogued. They occur either as chromosomal abnormalities, or as defects at more pinpointed gene locations.^{2/} Chromosomal abnormalities are estimated to occur about one in every 200 live births. In the United States between 15,000 and 20,000 births with chromosomal disorders occur every year,^{3/} 4,000 of them with Down's Syndrome ^{4/} (once known as Mongolism). The great majority of fetuses with chromosomal abnormalities are spontaneously aborted early in pregnancy; it is estimated that 65 percent of pregnancies in which the fetus has Down's Syndrome terminate in this way.^{5/}

Types of more pinpointed genetic disorders include X-linked defects, which are located on the female sex chromosome, and autosomal disorders, which are caused by defective genes on one of the other 22 pairs of chromosomes. With rare exceptions, X-linked defects are expressed only in males. A common example is hemophilia.* In most of these cases, fetal diagnosis of the specific disease cannot be made, but the possibility that a certain X-linked condition might be present can be narrowed through identification of the sex of the fetus; if the woman is known to be a carrier, a male fetus would have a 50 percent probability of having the disease and a female fetus would have an equal chance of being a carrier or a normal infant. Autosomal defects include recessively inherited metabolic disorders, such as Tay-Sachs disease or phenylketonuria (PKU),** in which an abnormal gene has been inherited from each parent, as well as dominant disorders, in which only one defective gene must be inherited to manifest the disease.

*In the human, a female has two X chromosomes and a male has one X and one Y. If the female fetus inherits a defective X chromosome from her mother, the normal X inherited from the father usually counteracts the deleterious effects of the defective X. In the male, the one defective X chromosome is expressed because the Y chromosome does not contain genetic material corresponding to that in the X.

**See the glossary for a description of these disorders.

Approximately one percent of all infants are born with definable metabolic disorders^{6/} although not all are of a serious nature and some can be treated with varying degrees of success.*

More than 20 metabolic disorders have been identified by prenatal diagnosis and nearly 40 more are potentially discoverable in utero.^{7/} Prenatal diagnosis is increasing for the detection of developmental malformations of the central nervous system, which may represent some of the most common types of congenital abnormalities.^{8/**} Between 1972 and 1974, 211 amniocenteses were performed at a laboratory in Cardiff, Wales, of which 104 were performed for suspected neural tube malformations,^{***} 88 for suspected chromosomal disorders including 49 for high maternal age, and the rest for other reasons.^{10/} In Edinburgh, 58 percent of 217 pregnancies monitored by prenatal diagnosis were suspected at risk of neural tube defects; only 36 percent were for chromosomal defects.^{11/}

More than six thousand pregnancies have been monitored in the United States and Canada by means of amniocentesis and prenatal diagnosis, most of them for suspected chromosomal disorders related to advanced maternal age. A survey by Milunsky of American and Canadian experience with amniocentesis for prenatal genetic diagnosis is summarized in Table 18. Of 1,663 cases studied, 1,368 were examined for chromosomal disorders, 115 for X-linked disorders, and 180 for other metabolic disorders. Of those performed for possible chromosomal defects, 485 were requested because a Down's Syndrome child had already been born to the pregnant woman. Affected fetuses were found in five of these pregnancies. An additional 602 cases were examined because the pregnant woman was more than 35 years old. Among these, 13 affected fetuses were diagnosed and 10 of the pregnancies were terminated by abortion.^{12/}

*Diagnosis of an inherited metabolic disorder requires biochemical tests to determine whether there is a deficient activity of a specific enzyme or an abnormal concentration of certain substances in the tissue.

**The combined incidence of neural tube defects in Britain is 4-5 per 1,000 births. After the birth of one child with these defects, the risk of the second child also being affected is one in twenty, and after two such births, the risk becomes one in ten. Infants delivered with this type of defect usually are stillborn or die within a day.^{9/}

***Neural tube defects, such as spina bifida, often cause an increased concentration of alpha-fetoprotein in the amniotic fluid, permitting diagnosis of the malformation.

TABLE 18

Milunsky Survey of North American Experience with Amniocentesis
 for Prenatal Genetic Studies

Indications	Cases Studied	"Affected Fetus"	Ratio of "Affected" Fetuses to Cases Studied	Therapeutic Abortions	Prenatal Diagnosis Confirmed	Normal Births Delivered
A) Chromosomal Disorders	1,368	36	.026	32	31	745
B) X-Linked Disorders	115	54	.47 <u>a/</u>	40	34	39
C) Metabolic Disorders	<u>180</u>	<u>37</u>	<u>.21</u>	<u>30</u>	<u>26</u>	<u>109</u>
TOTAL	1,663	127	.08	102	91	893 <u>b/</u>

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a/ The proportion of affected fetuses with possible X-linked disorders is much higher than in the other classes of disorders. This is partly due to the assignment of all male fetuses as "affected" in those X-linked disorders in which the disease itself cannot be detected in fetal cells. The presence of a male fetus thus indicates a 50 percent risk the fetus has the disease. When both parents are carriers, the probability of conceiving a fetus with an autosomal recessive metabolic disorder is one in four, close to the 21 percent rate observed in the table. On the other hand, the risk of a chromosomal disorder is much lower, even in the group of selected pregnancies represented in the table.

b/ Not all of 1,663 pregnancies had been completed at the time of publication.

SOURCE: Aubrey Milunsky. The Prenatal Diagnosis of Hereditary Disorders. Springfield, Illinois: Charles C. Thomas Publishers, 1973, p. 37.

Noteworthy in Table 18 is that at the time of publication of the Milunsky survey 893 normal births had occurred from the original group of 1,663 cases studied (643 births had not yet been accounted for). This supports the view that a major advantage of prenatal genetic diagnosis is its preservation of normal fetuses that might otherwise be aborted because of a feared genetic risk.13/

All pregnant women are not considered candidates for screening for genetic disorders in the fetus, but only those who can be identified at risk of giving birth to an infant with a severe genetic disorder and who would consider an abortion if an affected fetus were identified. Logical candidates for amniocentesis if they so choose are pregnant women who 1) previously had a child with a severe genetic defect if it is recognizable in utero; 2) have been identified as carriers of a chromosomal aberration or whose husbands have been identified as such; 3) have been identified as carriers of a severe metabolic disorder and whose husbands are also carriers; 4) have been exposed to infectious diseases, drugs, or radiation that might be harmful to the fetus; and 5) are beyond 35 or 40 years of age and therefore run a greatly increased risk of having a child born with Down's Syndrome or other defects. At age 40-44, a woman's risk of having a Down's Syndrome baby is 23 times greater than the risk faced by a woman less than 20 years of age. After age 45, the relative risk becomes 51 to 1, and the probability of a Down's Syndrome child becomes one out of every 50 births.14/ Generally, as maternal age increases, the risk of one or another type of chromosomal aberration also increases.

The Economics of Prenatal Diagnosis

Prenatal diagnosis in combination with selective abortion could help reduce severe childhood morbidity resulting from genetic defects and the financial costs associated with it. Approximately 10 percent of all admissions to U.S. pediatric services are due to genetic defects; of patients currently in institutions for the mentally retarded, five percent have inherited metabolic disorders, more than 10 percent have Down's Syndrome and 25 percent have central nervous system defects, many of which may be inherited.15/ Some of the disorders suffered by these children could now be detected with prenatal diagnosis.

The financial outlays associated with the care of children with severe genetic disorders are in the millions of dollars. It takes about \$5,000-\$6,000 per year to pay the costs of institutional care for retarded individuals. The 50,000 persons now receiving institutional care for Down's Syndrome alone represent an expense of some \$250-\$300 million per year.16/

There have been efforts to estimate and compare the direct financial costs of widespread prenatal diagnosis and selective abortion with the lifetime costs of treatment and care for individuals with severe genetic disorders born to women who might have elected to abort the fetuses if screening had been made available.^{17/} Some argue that the high costs of amniocentesis, laboratory testing, and selective abortion for certain groups (such as pregnant women over 35 years) are offset by the even greater costs associated with medical and institutional care for those individuals born with severe genetic disorders.

All of these sets of costs are known to be large, but there are no adequate data from which to develop accurate estimates of cumulative annual outlays over time.* Also, changes are taking place in the way that society treats mentally retarded individuals; many children who once might have ended up in institutions for the rest of their lives are being cared for today in their homes or day-care centers where they are much less of a financial burden to their families and to society as a whole.^{18/} Shifting patterns of care make it difficult to develop cost estimates based on "average lifetime" costs of children disabled by genetic disorders. Furthermore, a fiscal balance sheet for rearing a child with a severe genetic defect does not take into account the non-monetary considerations that will be faced by the individual family making its own decision whether or not to undergo amniocentesis and selective abortion.

Procedural Problems and Medical Risks of Prenatal Diagnosis

Limits on the use of prenatal diagnosis are based not only on its costs and the relative scarcity of medical personnel skilled in performing it, but also on the incompletely defined medical risks associated with amniocentesis. To obtain the kind of comprehensive information needed to identify and evaluate these risks, the National Institute of Child Health and Human Development is sponsoring a collaborative project in nine medical centers. One thousand women undergoing second-trimester amniocentesis will be matched with pregnant women not undergoing the procedure. The pregnancies in both sets will be monitored until completion, and children born to these women will receive follow-up examination for up to one year.

One potential risk is that amniocentesis will not be successful on the first attempt. The needle inserted in the uterine cavity may not remove sufficient fluid for analysis or for adequate culture of fetal cells, which would necessitate a re-sampling and a consequent increase in possibility of injury. However, the success rate of experienced obstetricians has been reported as greater than 95 percent, and in some major centers the success rate on the first attempt is nearly 100 percent.^{19/}

*Mass screening for all pregnant women over thirty-five, for example, would entail screening of more than 180,000 women each year at an average cost that may exceed \$200 per patient, or \$36 million per year.

There also is a risk of faulty diagnosis following amniocentesis and cultivation of the fetal cell mass. In Milunsky's survey of 1,663 cases, only three diagnostic errors were made. (An additional seven errors of incorrect sex determination were made but in none of these cases was the possibility of an X-linked disorder the basis for the amniocentesis.) In one pregnancy for which the prenatal diagnosis had specified a normal fetus, an infant with a metabolic defect was born. Of the total pregnancies in which the prenatal diagnosis could be confirmed, however, the diagnostic accuracy was very high (greater than 98 percent).²⁰* Diagnostic errors can also be made in attempting to identify the presence of neural tube defects. High concentrations of alpha-fetoprotein will not be found in the amniotic fluid when the neural tube lesions are closed. This may occur in 10 percent of disabling neural tube malformations in which the infants survive.²¹

Direct medical risks of amniocentesis can be classified into three categories. Immediate or early complications are defined as those occurring within two weeks, i.e., vaginal bleeding, infection, abdominal pain, leakage of amniotic fluid through the vagina, ruptured membrane, spontaneous abortion, or fetal death. In Milunsky's survey there were four fetal deaths, three spontaneous abortions, and a variety of lesser complications.²²

Short-term or intermediate complications are defined as those occurring later than two weeks after the amniocentesis and prior to the third trimester. These include spontaneous abortions and vaginal bleeding followed by spontaneous abortion. Sixteen spontaneous abortions during this period were reported in Milunsky's survey and two abortions occurred after vaginal bleeding.²³ Kaback would also include premature birth as a possible short-term complication,²⁴ although Milunsky classified this as a late complication of the third trimester. Other short-term risks faced by the woman are those associated directly with a second-trimester abortion (See Chapter 3).

*Accurate laboratory results are heavily dependent on a laboratory's experience in cell cultivation for certain disorders. Centralization of amniocentesis labs may enhance diagnostic accuracy.

Finally, there are long-term complications associated with amniocentesis, usually defined to include permanent damage to the fetus, such as injury, deformity, or long-term mental impairment.^{25/} The woman also may face certain long-term risks from second-trimester abortion, as discussed in Chapter 3. Beyond this limited information, however, the long-term risks of amniocentesis are not known.

In a study of 100 pregnancies examined by amniocentesis at the Prenatal Detection Center, University of California Medical School, San Francisco, early and short-term complication rates were comparable to those of the Milunsky survey.^{26/} To determine long-term complications, follow-up examinations were made soon after birth on 62 of the 78 infants delivered of the original 100 pregnancies. Three of these infants (plus another examined only from a photograph) had small linear scars, possibly from having been scratched by the amniocentesis needle.^{27/} Although complications were minor, the complexity of the entire process from both a technical and social point of view led these authors to conclude "that prenatal diagnosis should be carried out only in centers where there are adequate facilities and trained personnel to handle the special techniques and gain the experience necessary to provide this service."^{28/}

Recognizing that the evidence is still very preliminary, Kaback concludes that, "it is...too early to give an absolute answer to the overall risks but we can say that the serious complication rate of amniocentesis, at least the immediate or short-term frequency, is not greater than one percent," provided it is performed at medical centers with experience in the procedure.^{29/}

Alternatives to Abortion

At the present time there is a limited number of alternatives to selective abortion for couples faced with the prospect of a severely disabled child. A few metabolic diseases such as methylmalonic aciduria can be treated while the fetus is still in the uterus.^{30/} This disease can also be successfully treated with doses of Vitamin B-12 after birth.^{31/} PKU and galactosemia are examples of diseases that can be treated with diet restrictions to limit the amount of mental retardation suffered by those children. Other potential techniques, including organ transplants to produce a deficient enzyme, may turn out to be successful means of therapeutic intervention.^{32/} However, parents still may elect to abort an affected child rather than cope with major treatment programs.^{33/} And for couples who choose not to risk an affected pregnancy, adopting a child or obtaining artificial insemination with donor sperm are possible options.

In the present state of medical practice, prenatal genetic diagnosis and selective abortion will probably continue to be used by families to prevent the birth of children with severe genetic disorders and to help ensure the birth of unaffected children. Pending the availability of techniques for earlier detection of a fetus with severe genetic disorders, prevention of the birth of children with these disorders will remain an important reason for second-trimester abortions.

Summary

Recent developments in the techniques of amniocentesis and cell culture have made an increased number of genetic defects and other congenital disorders detectable in the second trimester of pregnancy. The possibility of prenatal genetic diagnosis with selective abortion may encourage families at risk of having a child with a severe genetic disorder to become pregnant with the likelihood that their child will not suffer from that disorder. More than 6,000 such pregnancies have now been monitored in the United States and Canada.

There are significant limitations on the use of amniocentesis. It is still a relatively expensive procedure with a small, but growing group of medical personnel qualified to administer it and to carry out necessary tests on fetal fluid and cells. Personnel and facilities are too limited for mass screening. There is also some degree of risk in the procedure, and only those women who can be identified as having a high possibility of an affected pregnancy should be considered candidates for the procedure. And, although about 60 genetic disorders can now be identified before birth, other defects exist for which there is yet no prenatal diagnosis to confirm or deny a suspected risk. The possibility of obtaining a legal abortion expands the options available to a couple who face known risks in becoming pregnant.

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Chapter 7

CONTRACEPTION AND ABORTION

This chapter examines the possibility that women who would otherwise use contraception may begin to rely instead on abortion after restrictive abortion laws are relaxed. A major interest in this possibility stems from its implications for repeated abortions and their potential long-term medical complications. An examination of the substitution question is followed by data on the prior patterns of contraceptive use of women obtaining abortions (including repeated abortions), especially teenage women who often have had little experience with contraception. Finally, there is a discussion of the effect of contraceptive counseling on post-abortion contraceptive use, and on the importance of providing contraceptive devices along with counseling services at the time of the abortion.

The Substitution of Abortion for Contraception

Because contraceptive practice and induced abortion share the common objective of regulating fertility and preventing unwanted births, it has been suggested that legalization of abortion could lead to a growing reliance on abortion rather than contraception to control fertility.^{1/} In the United States, only very limited data exist for an analysis of this substitution effect primarily because abortion has been widely available only since January 1973. Moreover, the relationship between abortion and contraception as alternate means of fertility regulation is sufficiently complex as to preclude definitive conclusions at this time.

What evidence is available on substitution phenomena comes primarily from New York City for the period July 1970 through June 1972. As discussed in Chapter 2, Tietze has estimated that the increment in the number of legal abortions obtained by resident women in New York City could account for less than 40 percent of the decline in the number of births from 1971 to 1972. His conclusion was that "overall, contraceptive practice improved markedly between the first and second years of the liberalized abortion law."^{2/} Consistent with this finding, reports from

the Harlem Hospital Center indicate that the initiation of a voluntary abortion program at the Center was accompanied not by a reduction in demand for family planning services but by an increase of about 25 percent in patient visits for family planning during the next 12 months.3/ On a nationwide basis, Planned Parenthood has indicated that there continues to be a strong increase in demand for contraceptive services at all of its family planning clinics.4/

Such trend data, though, do not necessarily indicate that abortion is not being relied on as a substitute for contraception in some instances. It is possible, for example, that the demand for family planning services might have increased at an even greater rate if abortion were not easily available. All that may be accurately stated is that where legal abortion has been readily available, there has been no documented decline in the demand for contraceptive services.

An examination of a possible substitution effect must be made within the context of the U.S. preference for contraception rather than abortion as the primary means of limiting unwanted births.5/ At very least, the reasons for this preference include traditions, cultural values, convenience, and moral or ethical considerations. The relative availability of abortion and contraception also weigh in the choice of each; family planning and abortion services are not uniformly distributed geographically and are not of equal cost or legality. That is, in some instances, the "choice" of abortion or contraception may be based on circumstances over which the woman has no control.6/

The data in Table 19 suggest that the U.S. preference for contraception is not tied exclusively to health considerations. The lowest mortality is incurred when legal abortion is used to back up failures of only moderately effective contraception (i.e., condom or diaphragm), while a greater mortality accompanies the exclusive use of highly effective contraception (i.e., the pill or IUD) with no abortion backup.7/

Table 19

Estimated Annual Number of Pregnancies and Pregnancy-Related Deaths
Per 100,000 Women a/ For Selected Combinations of Abortion and Contraception

Methods used	Number of pregnancies expected	Number of deaths expected
No contraception, no induced abortion	40,000-60,000	8-12
Use of moderately effec- tive contraception; induced abortion for all pregnancies	14,300	0.4
Use of highly effective contraception, no induced abortion	100	3

a/ Includes only women of reproductive ages (15-44) in fertile unions.

Source: Christopher Tietze. "Mortality with Contraception and Induced
Abortion," Studies in Family Planning 45: 6-8, September 1969.

A similar comparative analysis of the medical complications associated with
varying combinations of contraception and abortion is also possible,
and clearly related to health. However, because of the extensive and
somewhat inconclusive literature on medical complications associated
with contraceptive use, this topic will not be addressed here.8/

Repeated Abortions as an Indicator of Substitution

A more specific measure of the substitution of legal abortion for con-
traception use is the incidence of repeated abortions. If abortion rather
than contraception is increasingly relied on for birth control, one would
expect the number of recorded repeated abortions to rise rapidly. Though
U.S. data on this subject are scanty, a recent New York report provides
some evidence of trends in the frequency of repeated abortions. During
the period July 1, 1970 to June 30, 1972, 2.5 percent of the abortions

obtained by New York City residents were repeated abortions.* If that two-year period is divided into six-month periods, repeated abortions as a percent of the total rose from 0.01 percent in the first period, to 0.95 percent in the second, 2.27 percent in the third, and 6.02 percent in the fourth period. This increase may be due in part to a substitution effect, but it also may result from an improved reporting system and more truthful disclosure of previous abortions. From a statistical standpoint, the number of repeated abortions can be expected to increase along with the increase in the number of women who have obtained legal abortions and the amount of time they are at risk of another unwanted conception. And, since none of the current contraceptive methods is completely failure proof, nor likely to be used with maximum care on all occasions, there is a minimum level of repeated abortions that is expected to occur for reasons of contraceptive failure alone.10/

A recent study by Rovinsky (1972) of a group of 82 women seeking repeated legal abortions at a New York hospital between January and August 1971 attempted to classify the reasons for the additional unwanted pregnancies. All of the women had obtained their prior abortions at the same facility and had received contraceptive counseling and contraceptive methods at that time. The reasons they offered to explain their subsequent pregnancy were classified into three categories. The "patient failure" group--61 percent of the sample--included women who had difficulty practicing effective contraception for various psychological or emotional reasons. Reported "method failures" accounted for an additional 24 percent of the pregnancies. "Institutional failures" accounted for 15 percent of pregnancies; and included procedural problems in obtaining contraception from the hospital or difficulties in obtaining a preferred method. Interviews with the women disclosed no evidence of reliance on abortion rather than contraception to regulate fertility. Laxity in contraceptive use seemed to be based more on personality or circumstantial factors than on a new or increasing dependency on abortion for birth control.11/

Until more complete data are available, definitive conclusions cannot be made concerning the possible substitution of abortion for contraception, particularly as measured by the incidence of repeated abortions. There are some data from abroad on the relationship of contraceptive practices and induced abortion, but the lack of comparability in cultural, economic, and social factors limits the applicability of those findings to the United States.12/

*"Repeated abortions" refers to repeated legal abortions. Data on repeated illegal abortions or legal abortions preceded by illegal abortions are unavailable.

Prior Contraceptive Use Patterns of Women Obtaining Abortions

A number of studies have attempted to identify the contraceptive histories of women obtaining abortions. As might be expected, most of these women report sporadic or no contraceptive use during the month that conception occurred. However, the vagueness with which they relate their contraceptive experience and the inaccuracies of memory yield data that are generally inadequate. Moreover, the distinction between "using contraception" and "not using contraception" is a somewhat artificial division of behavior that in reality exists on a continuum. Contraception can be "used" but used carelessly, and "no contraception" often means a haphazard use of the rhythm method, which still can be interpreted as some attention to birth control. Such problems notwithstanding, data collected from the various studies agree that most women obtaining abortions have become pregnant due to poor contraceptive vigilance rather than to contraceptive failure.

In his review of the literature on contraceptive use prior to abortion, Lerner notes that most studies quote between 40 and 80 percent as the proportion of women obtaining abortions who were not using any means of contraception at the time they became pregnant.^{13/} For example, a study of 1,022 women obtaining abortions at a proprietary hospital in a suburb of New York City in 1971-1972 found that only 46 percent of the sample had used any method of contraception during the prior 12 months.^{14/} At the time of conception, less than 20 percent of the total sample was practicing any form of contraception.^{15/} This unusually low figure is probably explained by the fact that the sample was disproportionately young and with no living children.

Teenage Contraceptive Use Contraceptive use is closely related to age, in that younger women are less likely to have practiced contraception at all, or if they have used some method, to have used it less carefully and consistently than older women. As shown in Figure 6 more than 31 percent of all induced abortions in the United States during 1973 were obtained by women less than 20 years old.

Recent information confirms the general impression of poor contraceptive use among young women. Using data collected in 1971 by means of a national probability sample survey of 4,611 females 15-19 years of age, Zelnik and Kantner reported that 30 percent had engaged in premarital intercourse.^{16/} Among this group of sexually active women, only 47 percent had used any kind of contraception the last time they had intercourse, and among the 15-year-olds, only 29 percent had used any contraception during their last sexual encounter. The proportion of sexually experienced teenagers who consistently used contraception was even lower--19 percent.^{17/} And further, nearly three of every 10 teenage women in the sample who engaged in premarital intercourse experienced a premarital first pregnancy. Although some of these conceptions were intended, the majority (73 percent) were not. The study found that of those pregnant

teenagers who did not intend to become pregnant, only about 15 percent had used any kind of contraception to avert it.18/*

A recent survey by Lubin-Finkel (1974) of 421 male adolescents revealed that patterns of contraceptive use in this group are also uneven, though seemingly better than the Kantner-Zelnik reports on teenage women. Within this group, 69 percent reported themselves to be sexually experienced. At last intercourse, 29 percent of the sexually active young men reported use of birth control methods which are regarded as poor methods (withdrawal, douche); 29 percent used a condom at last coitus, 18 percent reported that their partner had used some method, and 24 percent claimed that no birth control was used at all by either partner.20/ Even a preliminary profile of male contraceptive use is important in that it calls attention to the joint responsibility for birth control. Traditional emphasis has been on female use of contraception, but both female and male roles in the decision and use processes need to be explored if a complete picture of adolescent contraceptive use is to emerge.

Many reasons have been offered to explain the poor use of contraception, particularly among teenagers. Ignorance about conception and the human reproductive cycle is one factor contributing to unintended teenage pregnancy.21/ In addition, a wide variety of psychological and psychosocial variables relating to adolescent development influence fertility behavior. The lack of family planning services for teenagers is also a factor in the volume of teenage pregnancy and, ultimately, the number of teenage abortions. Morris has estimated that in 1972-1973, between 1.3 and 2.2 million teenagers were in need of contraceptive services. Although some private physicians, several public facilities and Planned Parenthood affiliates are providing services for teenagers, an estimated 70-80 percent of the need is still unmet.22/ This lack of services for teenagers persists notwithstanding a June 1972 Gallup Organization national survey which indicated that nearly three-fourths of those questioned believed "professional birth control information, services and

*As has been indicated above, many teenagers have chosen abortion to deal with unwanted pregnancy. In Zelnik and Kantner's survey 35 percent of the women surveyed who experienced a premarital first pregnancy married before the outcome of that pregnancy. Among white teenagers, 51 percent married prior to delivery; among blacks nine percent married. Twenty percent of those who did not marry obtained abortions. Among white teenagers, the percent was 42 percent; among blacks it was 6 percent.19/ However, at the time of the survey (1971) abortion was not readily available in all states, and certainly not to most minors. The impact that the 1973 Supreme Court decision has had on the number of premaritally pregnant teenagers who do not marry and seek abortion is still unknown.

counseling should be made available to unmarried teenagers who are sexually active."^{23/} If teenage-centered family planning services were increased, it is possible that the number of teenagers obtaining abortions would decline. As the situation now exists, however, a certain proportion of teenage women are introduced to contraception through the instruction and devices provided them at the time of their abortion. For many, this interaction serves as the primary entry point into the system of fertility regulation, an entry otherwise denied them by virtue of relatively inaccessible or unavailable services.

The Impact of Contraceptive Counseling

Many facilities providing abortions offer some form of contraceptive counseling and, more importantly, supply contraceptive methods to their patients in order that they may avoid future unwanted pregnancies. Several recent studies have attempted to evaluate the impact of these services on subsequent contraceptive use. For example, a major study on this subject was conducted in 1972 at Preterm, an abortion and vasectomy clinic in Washington, D.C. that emphasizes a contraceptive counseling program. In a sample of 303 women obtaining first-trimester abortions, Margolis *et al.* found that 93 percent obtained a method of contraception at the time of their abortion, and 91 percent reported they were still using contraception six months later. The follow-up interview found that nearly four-fifths of the women were using a technically effective method (pill, IUD). More dramatic was the continued use of effective contraception among single teenagers. Only 56 percent of those less than 20 years of age had indicated they had used any contraception before their abortion; at follow-up, 86 percent were still using some method, and 75 percent were using the pill or IUD.

The Preterm study also noted, however, that the use of contraception at some time prior to the abortion by 84 percent of the total sample calls for caution in attributing the high level of post-abortion contraceptive use to the pregnancy, abortion, or counseling experience.^{24/} There also are defects in the design of the study that seriously limit the utility of its conclusions. From an original pool of 664 women only 303 (46 percent) participated in the follow-up phase. These follow-up subjects were self-selected in that only those women who consented at the time of their abortion to be interviewed and were successfully reinterviewed several months later were included in the study. Also, the women who were available for the subsequent phone interview were disproportionately older, married women, who were more likely to have used contraception previously and to have had children.^{25/} The most significant drawback of this study, though, and others like it (for example, Lal *et al.*, 1973 ^{26/}) is the absence of a control group. Without a group for comparison, there is no way of determining whether observed behavior changes were due to the abortion itself, contraceptive counseling, or some other unknown variable.

A study by Daily et al. of women experiencing repeated (legal) abortions in New York City provides additional data on the effect of contraceptive counseling. In an examination of 355 women obtaining repeated abortions in the first half of 1972 at 12 of the 14 New York City municipal hospitals that were performing abortions, the authors found that nearly 90 percent of these women had received contraceptive counseling at the time of their previous abortion and, since then, had increased their use of contraception substantially (i.e. while only 47 percent of the women sampled had used contraception in the year before their previous abortion, 74 percent had practiced some form of birth control in the period between abortions).27/ More significant, though, is that in spite of the earlier contraceptive counseling, nearly half of the women in the repeated abortion sample were not using any contraception at all in the menstrual cycle immediately before the latest conception, and 26 percent had failed to use birth control at any time in the interval between abortions.28/

The investigators explain this circumstance, in part, by reporting that the provision of contraceptives immediately following the abortion was inadequate. Although 86 percent of the respondents requested contraceptives at the time of their previous abortion, 59 percent were discharged without having been started on their requested method. Nearly half were given no method at all, and an additional 13 percent were given a less effective method than they requested. Of the 31 women who requested tubal ligation, only three were sterilized and 19 received no method. Half of those requesting IUDs did not receive them.29/

These findings gain importance in light of recent research indicating that many women are able to conceive again very soon after an abortion and therefore require immediate attention to contraceptive protection. Boyd and Holmstrom studied the ovulation patterns of 61 women following abortion and found that all but one of them ovulated within five weeks of the termination. Although the average number of days was 22, the earliest verified ovulation occurred ten days following the abortion.30/ These figures suggest that abortion facilities should be equipped to provide contraceptive devices themselves, or to refer their patients to effective family planning services within one week after the abortion to prevent the risk of repeated conception before contraceptives are obtained. Rovinsky has suggested that the critical variable in preventing future unwanted pregnancies is not contraceptive counseling, but the actual provision of the contraceptive devices themselves.31/

A report by Lerner et al. on the level of contraceptive services for abortion patients in New York City argues that the importance of providing methods of contraception immediately after abortion has not been realized by many institutions. In 18 New York City freestanding clinics and 60 hospitals reporting data in 1972, only seven clinics and 31 hospitals provided comprehensive family planning services at no extra cost to their abortion patients. Four clinics and 13 hospitals had reduced programs, and an additional four clinics and three hospitals provided information only. Private patients had even fewer opportunities to obtain family planning services at the abortion facility and were presumably dependent upon their private physician for contraceptive advice. Whether or not this situation has improved since 1972 is not known.32/

Summary

Data on the relationship of contraception to abortion are limited, and preclude firm conclusions on many aspects of the topic. What information is available on the possible substitution of abortion for contraception indicates no documented decline in the U.S. demand for family planning services as abortion has become more readily available. When the substitution effect is assessed on the evidence of repeated abortions, limited data suggest that although there may be an increase in the number of repeated abortions being reported (in New York City, specifically), many explanations other than substitution could plausibly account for the trend.

A review of information on the contraceptive use of women obtaining abortions reveals poor patterns of effective birth control practice, especially among teenagers. These data underscore the importance of abortion facilities paying greater attention to the future contraceptive needs of their patients. The timing of such post-abortion contraceptive services is particularly significant, since some data suggest that ovulation usually occurs within five weeks of an abortion and may occur as early as 10 days later.

The behavioral impact of contraceptive counseling was also reviewed, but in this area, the information is particularly inconclusive. The psychological and motivational issues associated with contraceptive use and with the abortion choice are sufficiently complex that no studies have yet defined their exact relationship when both are equally available and accessible.

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A P P E N D I C E S

Appendix A

SUMMARY OF THE SUPREME COURT DECISIONS ON ABORTIONS ROE v. WADE AND DOE v. BOLTON JANUARY 22, 1973

On January 22, 1973, the Supreme Court of the United States announced two decisions on abortion, Roe v. Wade ^{1/} and Doe v. Bolton ^{2/}, which together, struck down most prohibitive or restrictive state abortion statutes. The Texas statutes that the court overturned in the Roe case were typical of state legislation on abortion then in existence in a majority of the States. The Texas Penal Code made it a crime to seek an abortion, or to attempt one, except when done as the result of medical advice for the purpose of saving the life of the pregnant woman.^{3/} The Georgia statutes at issue in Doe v. Bolton had been enacted in 1968 and were based on the American Law Institute's Model Penal Code. The Georgia laws imposed procedural requirements on physicians and hospitals in the performance of abortions. While the Roe decision invalidated most criminal abortion statutes as being unconstitutional and prohibited state intervention during the first trimester of pregnancy, the Doe decision went on to outline what the states could do under the Constitution to regulate abortion procedures during the second trimester.

In Roe v. Wade, the Court held that it would henceforth be legal for women to obtain abortions during the first trimester of pregnancy without intervention by the state. The Court's opinion stated:

- (a) For the stage prior to approximately the end of the first trimester, the abortion decision and its effectuation must be left to the medical judgment of the pregnant woman's attending physician.
- (b) For the stage subsequent to approximately the end of the first trimester, the State, in promoting its interest in the health of the mother, may if it chooses, regulate the abortion procedure in ways that are reasonably related to maternal health.
- (c) For the stage subsequent to viability, the State, in promoting its interest in the potentiality of human life, may, if it chooses, regulate, and even proscribe, abortion except where necessary, in appropriate medical judgment, for the preservation of the life or health of the mother.^{4/}

The Roe v. Wade decision was based on the Court's conclusion that there is a fundamental, constitutionally guaranteed right to privacy which is broad enough to encompass a woman's decision whether or not to terminate her pregnancy. The Court observed:

The detriment that the State would impose upon the pregnant woman by denying this choice altogether is apparent. Specific and direct harm medically diagnosable even in early pregnancy may be involved. Maternity, or additional offspring, may force upon the woman a distressful life and future. Psychological harm may be imminent. Mental and physical health may be taxed by child care. There is also the distress, for all concerned associated with the unwanted child, and there is the problem of bringing a child into a family already unable, psychologically and otherwise, to care for it. In other cases, as in this one, the additional difficulties and continuing stigma of unwed motherhood may be involved. All these are factors the woman and her responsible physician necessarily will consider in consultation.^{5/}

The majority of the Court lodged this right in the due process clause of the Fourteenth Amendment which forbids the states to "deprive any person of life, liberty, or property without due process of law." In the Court's opinion, the Texas and Georgia statutes limiting abortion operated to deprive pregnant women of liberty without due process, in violation of the Fourteenth Amendment. The Court pointed out that the right of the pregnant woman is not absolute; while the state cannot override that right without compelling reason, it does have compelling interests in protecting the health of the pregnant woman, and in protecting the "potentiality of life," each of which interests reaches a compelling point as the woman approaches term.^{6/} The Court concluded that the potential life is not itself a person, implying that it is not entitled to precisely the same Fourteenth Amendment guarantees as the pregnant woman. Nevertheless, the Court recognized the state's interest in protecting the potential life, and held that the state could protect that interest by severely restricting abortion in the final stages of pregnancy.

By focusing on the "potentiality of life" as the point at which a legitimate state interest in the fetus may arise, the Court was able to sidestep the controversial issue of defining when life begins. Recognizing the difficulty of arriving at an agreement on this issue, the Court stated that "we need not resolve the difficult question of when life begins. When those trained in the respective disciplines of medicine, philosophy, and theology are unable to arrive at any consensus, the judiciary, at this point in the development of man's knowledge, is not in a position to speculate as to the answer."^{7/} Thus, while on the one hand the Court rejected the position that the states have an interest in protecting human life from conception on the basis that "the unborn have never been recognized in the law as persons in the whole sense,"^{8/} at the same time the Court recognized the potential rights of the fetus, in its statement that the state may proscribe abortion in the third trimester "except when it is necessary to preserve the life or health of the mother."^{9/}

Two dissenting opinions accompanied the majority opinion in Roe v. Wade. In his dissent, Justice White maintained that the abortion issue should not be decided by "raw judicial power" but rather by the people through their state legislatures. Justice Rehnquist's dissent was based on three factors: (1) the plaintiff (Roe) was not legally capable of litigating the issue, because it had not been established that she was in her first trimester of pregnancy when the suit was initiated; (2) the issue was not one of "privacy" (which may be infringed only by a compelling state interest), but rather one of "liberty" (which may be infringed by state law if it merely bears a rational relationship to a valid state function); and (3) even if the majority opinion were correct, the Texas laws were not totally unconstitutional, but rather unconstitutional only with regard to the earlier stages of pregnancy.

In Doe v. Bolton, the Court declared unconstitutional four procedural requirements in the Georgia abortion law. The requirements were that: (1) abortions had to be performed in a hospital accredited by the Joint Commission on the Accreditation of Hospitals; (2) abortion procedures, in all hospitals, had to be approved by a hospital staff abortion committee; and (3) the performing physician's judgment had to be corroborated by independent examinations of the patient by two other licensed physicians. The Court also struck down a fourth section of the law which required that a woman had to be a resident of Georgia in order to obtain a legal abortion within the state, but since Roe v. Wade made legal abortion available in all of the states, the residency decision was of lesser importance. All of these requirements were declared unconstitutional violations of the Fourteenth Amendment. The Court ruled that none of the requirements could be shown to relate reasonably to valid state objectives. In addition, the Court noted that both the second and third procedural requirements were not applied to other types of surgical procedures; and, that the requirements, if complied with, would unduly restrict the right of the physician to practice medicine.

FOOTNOTES

1. 410 U.S. 113, 93 S. Ct. 705 (1973).
2. 410 U.S. 179, 93 S. Ct. 739 (1973).
3. 410 U.S. 113, at 117-8.
4. 410 U.S. 113, at 164-5 (1973). The Court's decision to allow state regulation of abortion only after the first trimester of pregnancy was based, in large part, on New York state data from 1970-72, which indicated that maternal mortality associated with first trimester abortions was extremely low. According to the Court's reasoning, since the medical procedures associated with first trimester abortions were so safe, there was no longer valid reason for the states to continue to regulate these abortions.
5. 410 U.S. 113, at 153.
6. Ibid., at 114.
7. Ibid., at 159.
8. Ibid., at 162
9. Ibid., at 164.

Appendix B

GLOSSARY

ABORTION

The termination of a pregnancy before the fetus is viable, that is before the fetus is independently capable of sustaining extrauterine life. As generally used by the medical profession, abortion is the expulsion or removal of a fetus weighing less than 500 grams. In the absence of known weight, an estimated length of gestation of less than 20 completed weeks, calculated from the first day of the last normal menstrual period may be used.

Abortion, Incomplete

Expulsion or removal of some but not all of the products of conception before a fetal weight of 500 grams is attained. This results in various degrees of continued bleeding. An incomplete abortion can result from an induced legal, illegal or spontaneous abortion.

Abortion, Septic

An abortion in which the uterine cavity, and/or its contents, or other abdominal organs become infected. There are degrees of infection ranging from fever to septicemia. Septic abortion can result from an induced legal or spontaneous abortion, but probably most often results from illegally induced abortion.

Abortion, Spontaneous

An abortion that occurs naturally, without being deliberately induced; also known by the non-medical term of miscarriage. Spontaneous abortion may be caused by such internal causes as hormonal imbalance or the presence of a defective fetus. External causes such as high fever, falling, other trauma, or psychological stress may likewise

cause spontaneous abortion. A woman can miscarry in the first or second trimester. In the early part of the first trimester, miscarriage may be accompanied by comparatively minor symptoms and may occur as a heavy menstrual flow. The woman may not even be aware that she was pregnant and has miscarried. Late first trimester or second trimester miscarriage will often be accompanied by severe cramping and bleeding. Without medical attention, infection can result.

Abortion, Therapeutic

Therapeutic abortion was originally defined as an induced abortion required to save the life, or at the very least the health, of the pregnant woman. (A few states and physicians interpreted health to include mental well-being in addition to physical health.) In 1957, the American Law Institute redefined therapeutic abortion in its Model Abortion Law as follows: "A licensed physician is justified in terminating a pregnancy if he believes that there is substantial risk that continuance of the pregnancy would gravely impair the physical or mental health of the mother or that the child would be born with grave physical or mental defect, or that the pregnancy resulted from rape, incest or other felonious intercourse." The current definition used by the American College of Obstetricians and Gynecologists defines a therapeutic abortion as the interruption of pregnancy before the 20th completed week of gestation for legally acceptable or medically approved indications.

These different definitions of therapeutic abortion evolved as the laws regulating abortion became less restrictive. The first definition was applicable nationwide until the late 1960s and early 1970s when several states adopted the American Law Institute Model Abortion Law. Since the January 1973 Supreme Court decision, abortion on request has been theoretically available to all women prior to the stage of fetal viability.

ABORTION RATE	The annual number of abortions per 1,000 women 15-44 years of age during a specified period of time.
ABORTION RATIO	The number of abortions per 1,000 births occurring during the same period of time. A more accurate measurement is the number of abortions per 1,000 births occurring six months later. Some demographers employ this latter form of measurement.
AFTERBIRTH	See Placenta.
AMNIOCENTESIS	A procedure in which a needle is inserted through the abdominal wall into the uterine cavity of a pregnant woman and a sample of amniotic fluid is withdrawn. The cell and liquid components within the amniotic fluid are analyzed for constituents indicating fetal disease, sex; and fetal and lung maturity. This procedure is usually performed after 14 weeks of pregnancy under local anesthesia.
AMNIOTIC FLUID	The fluid within the amniotic sac that surrounds and cushions the fetus.
AUTOSOMAL DISORDER	A disorder due to a genetic defect in a chromosome other than the X or Y (sex) chromosome.
BIRTH RATE	The annual number of live births per 1,000 population (known as the crude birth rate).
CHROMOSOMAL ABNORMALITY	An abnormal chromosomal pattern resulting from the loss, duplication, or rearrangement of genetic material.
CHROMOSOME	A structure in the cell nucleus composed of nucleic acids and protein. The deoxyribonucleic acid (DNA) in chromosomes is responsible for the determination and transmission of all hereditary characteristics, including a wide variety of diseases.
COLPOTOMY	See Sterilization.
DILATATION AND CURETTAGE	See Methods of Abortion.

DOMINANT CONDITION

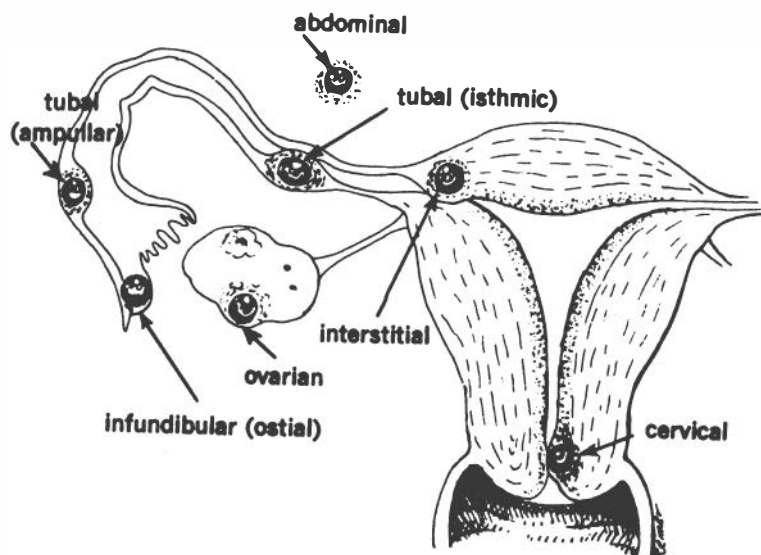
A genetic factor that must be acquired from only one parent to be expressed in the offspring. Each conception has a 50 percent chance of being affected by a dominant genetic condition, whether it is a gene for brown eyes or for muscular dystrophy.

**DOWN`S SYNDROME
(Mongolism)**

A disease due to the presence of an extra chromosome; instead of two number 21 chromosomes, there are three. Women who become pregnant after age 35 have a higher probability of conceiving a fetus with Down`s syndrome. A child born with this syndrome is usually mentally retarded, suffers from the malformation of one or more vital organs, and has an accelerated aging process and reduced life expectancy.

ECTOPIC PREGNANCY

A pregnancy that results from the implantation of a fertilized ovum (egg) outside the uterine cavity, usually in the fallopian tube and much more rarely in the abdominal cavity, ovary, or cervix. Such pregnancies frequently terminate by rupturing, and if appropriate medical care is not obtained, death may result. (See diagram below.)



EMBOLISM	The sudden blocking of a blood vessel obstructing the flow of blood. The obstructing material (embolus) is most often a blood clot, but may be a fat globule, air bubble (air embolism), piece of tissue or clump of bacteria.
Embolism, Pulmonary	The obstruction of one or more of the pulmonary arteries, which are the blood vessels leading from the heart to the lungs.
EMBOLUS	A clot of blood or plug of material that can obstruct the flow of blood in a vein or artery.
EMBRYO	The products of conception from two weeks after conception until approximately eight weeks development, at which time they are known as a fetus. This distinction between fetus and embryo is becoming less common.
ENDOMETRITIS	Inflammation of the endometrium, which is the mucous membrane that lines the cavity of the uterus. This is one of the more frequent forms of pelvic infection.
ENDOMETRIUM	The lining of the uterus.
FALLOPIAN TUBES	Two hollow muscular passages connected to both sides of the uterus that transport ova (eggs) from the ovaries to the uterine cavity.
FERTILITY RATE	The annual number of births per 1,000 women of reproductive age, usually defined as age 15 to 44.
FETAL DEATH	A pregnancy beyond 500 grams weight which terminates in death of the fetus prior to birth.
FETOSCOPY	Direct visualization of a fetus <u>in utero</u> by means of a miniature lens attached to a needle inserted through the abdominal wall, or through the cervix.
FETUS	The products of conception from eight weeks development until birth.
GENE	A biologic unit of heredity located on the chromosome. Acting with the environment and other genes it produces one or more characteristics of the organism.

GRAVID	Pregnant.
HEALTH	As defined by World Health Organization, " <u>health</u> is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."
HYSTEROTOMY	See Methods of Abortion.
HYSTERECTOMY	See Methods of Abortion and Sterilization.
IMPLANTATION	The attachment of the fertilized egg to the endometrium (the wall of the uterus) which usually occurs six to seven days after fertilization.
INBORN ERROR OF METABOLISM	A genetically determined biochemical disorder resulting in an enzyme defect that produces a metabolic block having pathological consequences.
INCOMPLETE ABORTION	See Abortion, Incomplete.
INFANT DEATH	The death of a liveborn infant at any time from the moment of birth to the end of the first year of life.
JURIDICAL INDICATION	A legal term that denotes the condition or termination of a pregnancy resulting from rape or incest.
LAPAROSCOPE	An instrument with a series of lenses running the length of a long slender tube. When inserted into the abdominal cavity through a very small incision in the abdomen, it permits visualization of the cavity for diagnosis of tumors or disease. Tubal ligation and other operative procedures can be performed through the laparoscope.
Laparoscopic Sterilization	See Sterilization.
<u>LEGAL TERMS</u>	
Restrictive Legislation	Legislation that prohibits all induced abortion <u>or</u> only allows it to save the life of the pregnant woman, or to terminate a pregnancy resulting from rape or incest.

**Moderately Restrictive
Legislation**

Legislation that permits abortions for various therapeutic reasons, e.g. to save the life or health of the woman, to preserve the woman's physical or mental health, to prevent the birth of a child with fetal defects, to terminate a pregnancy caused by rape or incest, or to comply with socio-economic needs for an abortion. Requirements such as psychiatric endorsements or the approval of more than one physician are generally needed.

**Non-restrictive
Legislation**

Legislation that allows abortion on request in the first trimester or permits abortion under such broad conditions that, in practice, it approximates abortion-on-request. In some countries, first-trimester abortion may be allowed only to save the life of the pregnant woman, but in other countries second-trimester abortion is permitted under certain extenuating circumstances such as age or parity of the woman. (Non-restrictive legislation is also known as elective abortion or abortion-on-request.)

METHODS OF ABORTION

**Dilatation and
Curettage**

(Also known as D&C, surgical curettage or sharp curettage.) Induced abortion, usually performed in the first trimester by dilatation of the cervix as in suction, although usually to a larger diameter. The fetal and placental tissues are then scraped out with a curette, which resembles a small spoon.

Hysterectomy

This method of abortion is performed in the first or second trimester. It removes the uterus either with the fetus inside or after the fetus is removed. It is usually performed only when a pathological condition of the uterus, such as fibroid tumors, warrants its removal or when a woman desires sterilization.

Hysterotomy

Induced abortion performed in the first or second trimester. It involves surgical entry into the uterus, as in a cesarean section, that removes a fetus that is too small to survive even with extraordinary life support measures. It is usually performed only if other abortion procedures fail.

Menstrual Regulation

(Also known as menstrual induction, menstrual extraction, or endometrial aspiration.) A type of suction abortion, usually performed five to six weeks after the last menstrual period (i.e. during the two week interval following the expected onset of a missed menstrual period). Current pregnancy tests are not accurate until six weeks after the first day of the last menstrual period. During the procedure, which usually does not require anesthesia or dilatation of the cervix, a flexible plastic tube is inserted into the uterine cavity through the cervix, connected either to a hand operated syringe or to an electric pump, and the contents of the uterus are suctioned out.

Prostaglandin Abortion

A second-trimester abortion induced usually by injecting a prostaglandin--a substance with hormone-like activity--into the uterine cavity through a needle inserted through the abdominal wall. (Other routes of application are being explored.) The interval between injection and expulsion of the fetus tends to be shorter than in a saline abortion.

Saline Amniotic Fluid Exchange

(Also known as saline abortion and intra-amniotic instillation.) The most frequently used second-trimester method of induced abortion, usually performed at or after 15 weeks of pregnancy. It entails withdrawing a portion of the amniotic fluid from the uterine cavity by a needle inserted through the abdominal wall and replacing this fluid with a concentrated salt solution. This process induces labor, which results in the expulsion of the usually dead fetus approximately 24 to 48 hours later.

Suction

(Also known as vacuum aspiration, or suction curettage.) Induced abortion usually performed in the first trimester. The cervical canal is dilated by the successive insertion of instruments of increasing diameter, called dilators. When the opening is large enough, a flexible tube (cannula) is inserted into the uterine cavity and the fetal and placental tissue are then suctioned out by an electric vacuum pump.

MISCARRIAGE	See Abortion, Spontaneous
MODERATELY RESTRICTIVE LEGISLATION	See Legal Terms
MONGOLISM	See Down`s Syndrome.
MORTALITY RATE	The annual number of deaths per 1,000 population.
MORTALITY RATIO	The number of deaths from a specific cause per 100,000 cases or procedures. In this report, abortion mortality ratio is used to refer to the number of deaths per 100,000 induced abortions.
MULTIGRAVIDA	A woman who has been pregnant more than one time.
MULTIPAROUS OR MULTIPARA	A woman who is giving birth for the second or third time or who has given birth to two or more children. The term usually refers to a woman who has borne several children.
NEONATAL	Pertaining to the period in the infant`s life from birth to the 28th day of life.
NEONATAL DEATH	The death of a live-born infant within 28 days of birth.
NEURAL TUBE DEFECTS	Developmental defects of the central nervous system in a fetus, e.g., spina bifida.
NON-RESTRICTIVE LEGISLATION	See Legal Terms
NULLIPAROUS	A woman who has never given birth to a fetus over 500 grams.
OVULATION	The release of an unfertilized egg from one of the ovaries which usually occurs approximately once a month in women during their reproductive years.
OVUM	The female reproductive cell or "egg" which is produced in the ovaries.
OXYTOCIN	A hormone that stimulates uterine contractions. It is sometimes used in saline abortion to hasten the expulsion of the fetus.

PARITY	A word used to indicate the number of children beyond 500 grams borne by a particular woman. High parity indicates a woman who has borne a large number of children and low parity is used to describe a woman who has had only one or two children.
PAROUS	A woman who has given birth.
PERINATAL	The time period from approximately a fetal weight of 500 grams to the first 28 days after birth.
PERINATAL DEATH	Death of a fetus or newborn occurring during the period of time from a fetal weight of about 500 grams to 28 days after delivery.
PERITONEUM	The membrane which lines the interior of the abdominal cavity and the organs contained therein.
PERITONITIS	Inflammation of the peritoneum (the membrane which lines the interior of the abdominal cavity), attended by abdominal pain, vomiting, and fever.
PHENYLKETONURIA (PKU)	A hereditary recessive condition involving an inborn error of metabolism in which the metabolism of the amino acid phenylalanine-- a constituent of most proteins--is blocked by a deficiency or defects in phenylalanine hydroxylase. This enzyme catalyzes the conversion of phenylalanine to tyrosine, another amino acid. Children born with this enzyme block are likely to become mentally retarded as phenylalanine accumulates in the brain. However, if recognized in time (as it can be by the routine testing of the urine or blood of newborn infants), a diet as free as possible of phenylalanine can mitigate most of the ill effects.
PLACENTA	The organ of metabolic interchange between the fetus and mother (also known as afterbirth). The woman provides nourishment and oxygen for the fetus through the placenta, which also aids elimination of carbon dioxide and nitrogenous waste from the fetus.
POSTPARTUM	Pertaining to, or occurring during, the period following childbirth and delivery.

PRODUCTS OF CONCEPTION	This term includes all the organic/biological parts of the conceptus such as the fetus, placenta, amniotic fluid and cells, and the amniotic sac.
PROSTAGLANDINS	These compounds, which are formed from fatty acids, are present in many human organs, with the highest concentration in human semen. They are known to have pharmacological effects on the reproductive system, causing contractions of the uterus, as well as in the nervous, cardiovascular, respiratory, gastrointestinal and renal system.
PROSTAGLANDIN ABORTION	See Methods of Abortion.
PSYCHIATRIC	Referring to mental disturbance or illness.
PSYCHOLOGICAL	Referring in a general way to a patient's emotional or mental condition.
PUERPERAL DEATH	Death of a woman due to the complications of pregnancy, labor or childbirth.
PUERPERIUM	The time period from the termination of labor to when the uterus regains its original size and shape--usually defined as 42 days.
PULMONARY EMBOLISM	See Embolism, Pulmonary.
RECESSIVE CONDITION	A condition in which the gene responsible for a particular hereditary disease must be obtained from both parents in order for the child to be affected. Both parents are carriers but are usually clinically unaffected. There is a 25 percent risk that each fetus or child of such a couple will be affected.
RESTRICTIVE LEGISLATION	See Legal Terms.
SALINE AMNIOTIC FLUID EXCHANGE	See Methods of Abortion.
SALPINGITIS	Inflammation of a fallopian tube. It may lead to occlusion of a tube and if bilateral, to sterility.
SEPSIS	Infection caused by the presence of various microorganisms and/or their toxins which enter the bloodstream or tissues.

SEPTIC ABORTION	See Abortion, Septic
SEPTICEMIA	The severest form of sepsis which results when the toxic bacteria and their poisons enter the bloodstream or other organs with the possibility that they will further multiply in the bloodstream. Results are usually high fever, chills, prostration, and possible death.
SEQUELA (SEQUELAE, pl.)	Consequences, or aftereffects. This term is usually used to describe changes after a disease, injury, or medical procedure.
SICKLE-CELL ANEMIA	An inherited recessive form of anemia due to production of abnormal hemoglobin which causes rapid destruction of red blood cells. In the U.S. sickle cell anemia is found predominantly among the Black population. An infant born with this disease suffers acute pain called sickle-cell "crises," anemia, jaundice, malfunctioning organs, leg ulcers, lowered resistance to infections, and sometimes death.
SPINA BIFIDA	A developmental defect in the boney vertebrae that normally encases and protects the spinal cord.
SPONTANEOUS ABORTION	See Abortion, Spontaneous
STERILIZATION	Any surgical, chemical or radiological procedure by which an individual is made incapable of reproduction.
Colpotomy	A method of sterilization in which an incision is made in the vagina to gain access to the abdominal cavity. Tubal ligation may be performed through this incision. Hospital stay is minimal (some colpotomies are performed on an outpatient basis), and only five to fifteen minutes is normally required for the operation.
Laparoscopic	A method of sterilization using a laparoscope, an instrument which enables the physician to look directly into the abdominal cavity to observe the abdominal organs and perform a method of tubal sterilization. The technique can be done on an outpatient basis under local or general anesthesia.

Hysterectomy	Major abdominal surgery involving the removal of the uterus (but not necessarily the ovaries or fallopian tubes).
Tubal Ligation	Any method of surgery that either ties, blocks, cauterizes, cuts, or clips the fallopian tubes so that the egg which is released each month by the ovary cannot be reached and fertilized by the sperm.
SUCTION	See Methods of Abortion.
TAY-SACHS DISEASE	An inherited recessive disease due to an inborn error of metabolism in which lipids accumulate in the brain. It is most frequently found in Jews of Eastern European descent. An infant born with this disorder appears "normal" at birth but begins to deteriorate about age one, becoming blind and deaf, suffering from seizures, retardation and spasticity. Death occurs before age five.
THERAPEUTIC ABORTION	See Abortion, Therapeutic.
THROMBUS	A clot of blood that forms in one of the blood vessels or cavities of the heart blocking the flow of blood.
TUBAL LIGATION	See Sterilization.

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