Legal Abortion: The Public Health Record

Willard Cates, Jr.

Summary. The increasing availability and utilization of legal abortion in the United States had several important effects on public health in the 1970's. It reduced deaths and surgical complications among women of childbearing age; it made possible the development of safer surgical procedures for pregnancy termination; and it increased the provision of low-cost outpatient gynecologic services. There is some concern about potential adverse outcomes in future desired pregnancies and possibly higher risks of breast cancer in certain women.

In the public health annals of the United States, the chapter on developments in abortion over the last decade is a record of exceptionally rapid change. In that time, during which abortion ceased to be a clandestine procedure and began to be practiced under normal medical conditions, we have come to know more about it than any other surgical operation.

The purpose of this article is to describe objectively what we know about the effect on public health of the increased availability of legal abortion. The morality of abortion is a controversial topic, and the statistical data brought together here do not address that issue.

No direct count of the number of illegal abortions has ever been possible. Estimates have been made by various means, such as local surveys with the randomized response technique (*1*), extrapolations from deaths and hospitalizations (*2*), and retrospective projections based on numbers of births and legal abortions (*3, 4*). Through these approaches, most estimates of illegally induced abortion in the United States in the 1960's range between 200,000 and 1,200,000 a year. In Fig. 1 the midpoint of this range is taken arbitrarily for the year 1969, and the estimates for subsequent years have been extrapolated from similar data (*5*).

Deaths and Complications

Illegal abortions caused sizable numbers of deaths and complications among American women. For example, in 1965, 235 deaths, or 20 percent of all deaths related to pregnancy and childbirth, were attributed to abortion (*6*). Complications from abortion accounted for nearly 20 percent of pregnancy-related admissions to municipal hospitals in New York and California during the 1960's (*6*); the average length of stay of these patients was 4 days (*6*).

During the 1970's the United States passed through three stages with regard to the availability of legal abortion: until the middle of 1970 legal abortion was generally not available; from mid-1970 through early 1973 it was available in some regions; since 1973 it has been generally available throughout the nation. The number of reported legal abortions increased from approximately 22,000 in 1969 to over 1.5 million in 1980 (*7, 8*). Initially the increase in legal abortions was accompanied by a progressive decline in the estimated number of illegal abortions (Fig. 1). Thus, most of the initial increase in legal abortions was due to a corresponding drop in illegal abortions (*3, 4, 9*).

This shift from illegal to legal abortions has had a documented effect on deaths of women of reproductive age (*10*). In 1965, even before the availability of legal abortion, deaths of women from all types of abortion began to decline more rapidly than other causes of death related to pregnancy and childbirth (Fig. 2). One reason may be the introduction of more effective contraception at that time. Between 1965 and 1970 oral contraceptives and intrauterine devices were used by an increasing percentage of married women (*11*), and this was associated with a decline in unwanted fertility during those years (*12*). Another possibility, suggested by Tietze (*3*), is that illegal abortions may have shifted from the nonmedical to the medical sector and become safer.

The decline of abortion mortality rapidly accelerated in 1970 and generally continued through 1976 (Fig. 2). This accelerated decline further suggests that legal abortions were primarily replacing illegal abortions. If legal abortions had been replacing term births, then deaths to women from abortion should have increased relative to deaths from other pregnancy-related causes. Instead, the opposite occurred.

A clearer view of these trends appears in Table 1, based upon records started in 1972 by the Centers for Disease Control (CDC) in which abortion-related deaths are separated into three categories—legally induced, illegally induced, and spontaneous. In 1972 there were 90 abortion-related deaths; in 1979 there were 29. Through 1976 the highest proportion of the decline was in the illegal category, where the number of deaths decreased from 39 to 2. The reduction in illegal-abortion mortality had a distinct temporal association with the increasing availability of legal abortion.

During the initial years of CDC's surveillance of abortion-related mortality, the number of deaths after legally induced abortion increased slightly (Table 1), consistent with the increasing number of such abortions performed. In 1976, however, the number of deaths from legally induced abortion decreased precipitously, and it has remained lower than in the initial years despite a continuing increase in the number of legal abortions performed. Thus, the death-to-case rate for legal abortion has declined (Fig. 3).

Morbidity trends for abortion in recent years parallel mortality trends. Studies performed at national, state, and local levels show that hospitalization of women with complications resulting from abortion has decreased. Estimates based on the Hospital Discharge Survey from 1970 to 1977 show a general decline in number of patients with complications from other-than-legal abortions; the greatest part of this decline occurred in 1973, the year of the Supreme Court decisions striking down state laws prohibiting abortion (*13*). Individual hospitals on both the east and the west coasts have registered similar declines (*14*).

The author was until recently deputy director of the Family Planning Evaluation Division, Centers for Disease Control, Atlanta, Georgia 30333, and is now with the Venereal Disease Control Division, Center for Prevention Services, of the same agency.

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Legal abortion has lower morbidity (*15, 16*) and mortality (*17*) rates than does pregnancy continued to term. From 10 to 15 percent of term births are by cesarean section (*18*), whereas only .07 percent of first-trimester abortions entail intra-abdominal operations (*19*), and second-trimester abortion methods lead to major surgery in only .1 to .2 percent of cases (*20*). Thus, the risk of having to undergo major surgery for a complication of a legal abortion is approximately 1/100 that of carrying a pregnancy to term. The rates of severe psychiatric sequelae are lower for women who obtain legal abortions than for those who have normal pregnancies and a live birth (*21, 22*). The risk—adjusted for age and race—of dying from an abortion induced during the first 15 weeks of pregnancy is one-seventh the risk of dying from pregnancy and childbirth (Fig. 4).

The risk to the woman of continuing rather than terminating her pregnancy may be still greater when the pregnancy is unwanted. Women with negative attitudes toward their pregnancies have higher postpartum infection and hemorrhage rates than women with more favorable attitudes (*16*). Possible mechanisms for the poorer obstetric outcomes associated with unwanted pregnancies include a direct stress-mediated influence on catecholamines (*23*), less concern by the woman for proper prenatal care, and differences in clinical management of labor and delivery (*16*).

Development of Abortion Techniques and Expertise

The increased availability of legal abortion since 1970 has influenced the safety of abortion methods and the skill of clinicians. The sixfold increase in the number of legal abortions performed has led to rapid development of technology (*24*). The most influential change has been the widespread adoption of the vacuum aspiration technique (suction curettage) (*25*), which replaced the traditional scraping technique (sharp curettage) as the primary means of terminating pregnancies. In 1970 suction was used in 54 percent of cases, sharp in 46 percent (*19*). By 1978 suction curettage accounted for 90 percent of all abortions by curettage; of curettages done at 12 weeks or earlier, 96 percent were by suction (*7*).

Another improvement has been the recognition that curettage techniques can terminate pregnancies at 13 weeks' gestation or later more safely than the alternative methods (*26*); thus, delaying an abortion through the 13- to 16-week interval, as is required for the instillation of abortifacients into the uterus, is no longer considered necessary. Before legal abortion was available, performing curettage on a pregnant uterus after 12 weeks was thought to be too dangerous. Once abortion became legal, comparative studies could be undertaken, from which we have learned that curettage techniques, especially through 16 weeks' gestation, are safer than instillation procedures (*26, 27*).

The legalization of abortion has given clinicians the opportunity to learn different surgical techniques and to manage the immediate complications associated with these techniques. Before legalization very few pregnancy-termination procedures were taught in routine obstetric and gynecologic training programs (*28*). The only experience with uterine evacuation for residents in training usually came from performing sharp curettage on a nonpregnant uterus for diagnostic purposes or when removing residual uterine tissue after a routine miscarriage. These procedures are different from those required for evacuating a pregnant uterus.

Table 1. Deaths related to legally induced, illegal, and spontaneous abortions in the United States, 1972 to 1979. [Data from (*76*)]

Year	Abortion category			
	Legally induced	Illegal	Spontaneous	Unknown
1972	24	39	25	2
1973	26	19	10	2
1974	26	6	21	1
1975	31	4	14	0
1976	11	2	13	1
1977	18	4	16	0
1978	11	7	9	0
1979*	20	0	9	0

*Data are provisional.

The increase in physician training and experience may be one factor (*28, 29*) in the decrease in deaths related to legally induced abortion after 1975 (Fig. 3). The death-to-case rate for legal abortion has decreased from 6.2 per 100,000 in 1970 to 1.5 in 1979. Improvements in anesthesia technique, use of better methods of dilatation, reductions in the use of hysterotomy or hysterectomy for purposes of abortion, greater willingness to reevacuate a uterus if retained tissue is suspected, and physician familiarity with other abortion complications all may have contributed.

Delivery of Abortion Services

The increasing availability of and requests for abortion services have also led to two changes in when and where they are rendered: first, women obtaining legally induced abortions are doing so at progressively earlier gestational stages (*7*); second, most abortions are now being performed in nonhospital facilities, the so-called freestanding clinics (*8*). These two factors concurrently influence the safety, convenience, and cost of abortions.

Gestational stage is an important factor in complications after induced abortion (*15*). In 1970 nearly one-fourth of all abortions were performed at 13 weeks or later. By 1978, fewer than one in ten were performed at later than 13 weeks, and more than half were done before 8

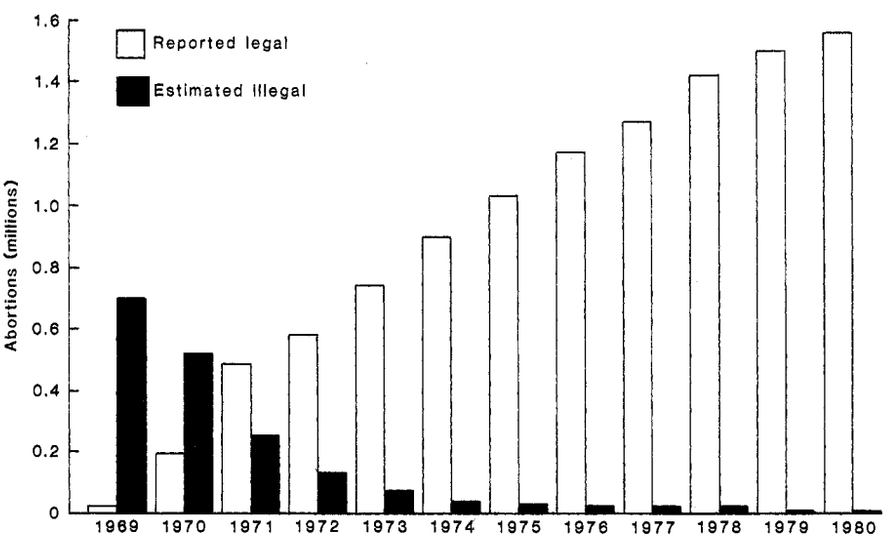


Fig. 1. Legal and illegal abortions in the United States, 1969 to 1980. Data for legal abortions are from (*7*) and (*8*). For method of estimating illegal abortions see (*5*).

weeks (*7*). This trend has contributed to reducing the number of deaths and complications.

Before the legalization of abortion, the term "in-hospital" was generally used to refer to legal abortion procedures (*30*). In 1970 having a legally induced abortion frequently required at least 2 days in hospital, the first for preoperative evaluation, the second for postoperative recovery (*31*). Even in 1973 more than 60 percent of all abortions were performed in hospitals. During the last 6 years the situation has reversed itself (*8*). By 1980 more than 70 percent of abortions were performed in freestanding clinics, without any hospitalization, and about half of those performed in hospitals were on an outpatient basis (*8*).

Costs of Medical Care

Before 1969, if it could be obtained a medically indicated abortion performed in a hospital was likely to cost more than $500 (*32*). For this reason women of high economic status were more likely than other women to obtain such abortions (*30*). Today the charge for a uterine evacuation performed in a clinic is usually no more than $150 (*33*). The average room charge for 1 day in a hospital (*34*) is alone more than the cost of an abortion by suction curettage in a clinic (*33*). Curettage to terminate pregnancies of more than 12 weeks' duration costs approximately one-half as much as the instillation procedures formerly used.

The increased availability of legal abortion has also reduced the cost to society of treating abortion complications. The saving in public expenditures for treating infected or incomplete abortions is estimated at $30 per abortion (*35*). Assuming a national decrease in morbidity similar to that in mortality, we may estimate a 75 percent reduction in complications and a saving thereby of approximately $20 million annually (*36*).

Formation of American Families

Marriage and childbearing patterns have been measurably influenced by legal abortion; so has the formation of American families. Before 1969 trends in marriage rates among states with different levels of legal abortion services were similar (*37*). Beginning in 1970, states with high ratios of legal abortions to live births began exhibiting significant declines in marriage rates, especially among teenage women, which were not experienced in states with lower legal-abortion ratios (*37*). Liberalized abortion policies apparently provided teenagers with a new alternative to marriage precipitated by premarital pregnancy. Such marriages are less stable than those of their contemporaries who postpone childbearing (*38*).

Legalization of abortion has been found to be temporally associated with a decline in out-of-wedlock birth rates in New York City (*39*), California (*40*), Oregon (*41*), and the United States as a whole (*42*). More than 85 percent of teenagers obtaining abortions were unmarried (*7*). States with the highest teenage and overall childbearing rates had the lowest abortion-to-live-birth ratios (*43*).

In American families at known risk of genetic anomalies, the availability of amniocentesis and selective abortion has allowed couples to undertake pregnancies they might not otherwise have considered or to continue pregnancies that they would otherwise have terminated.

Decision-Making About Reproduction

Many family planning providers have developed elaborate counseling protocols to aid women with unwanted pregnancies in making decisions about them (*33, 44*). In a survey of a random sample of abortion providers in 1976, 98 percent of clinics and 60 percent of hospitals reported offering pregnancy counseling services (*33*); 100 percent of clinics and 60 percent of hospitals provided contraceptive counseling.

The increasing use of legal abortion is associated with an increasing use of contraception beyond that related to increased sexual activity. Four different methodologic approaches have supported this inference. First, longitudinal studies of women who have had abortions show that the percentage using contraception increases immediately after abortion, and contraception is still being used at least 6 months afterwards (*45*).

Second, national studies of reproductive behavior conducted between 1965 and 1975 found an increasing percentage of married women using contraception even as legal abortion was becoming more widely available (*46*). The largest incremental annual increases, 3 percent per year, occurred between 1973 and 1975.

Third, the national patterns of increasing sexual activity (*47*) and declining birth rates (*48*) indicate that women are becoming increasingly able to control their fertility through either contraceptive practice or abortion. The proportion of never-married teenagers having unprotected intercourse decreased by one-half between 1971 and 1979 (*47*). In 1976, among young unmarried women who became pregnant unintentionally those who had an abortion were more likely to have been using contraception than were those who did not have an abortion (*49*).

Fourth, between 1960 and 1974 the national conception rates actually decreased, if allowances are made for the number of illegal abortions performed in earlier years (*50*). A study in New York City showed a decline in the conception rate also during the first 3 years that legal abortion was available (*51*).

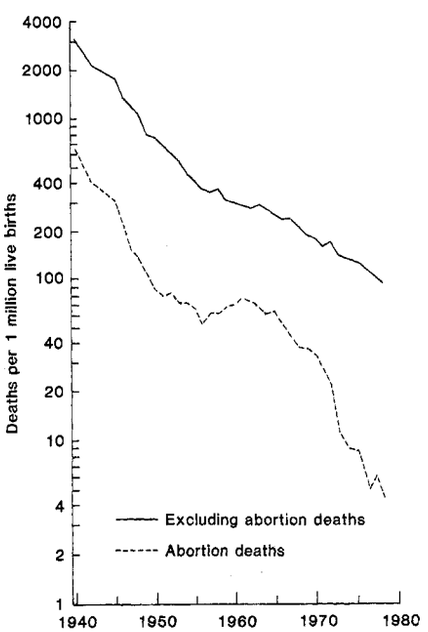


Fig. 2. Maternal mortality ratios (excluding abortion deaths) and abortion mortality ratios, 1940 to 1978. [Data from (*75*)]

Unethical Practices

The extent of shady practice in the abortion field is not precisely known, but the relatively low overall rates of morbidity and mortality after legal abortion would indicate that it is not widespread (*15*). Nevertheless, isolated examples of questionable clinical practices have received media attention.

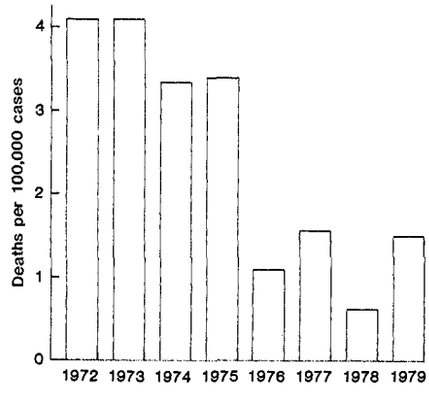
Investigations in four cities (Detroit, Los Angeles, Chicago, and New York) have found occasional instances such as "pregnancy counseling" agencies that use high-pressure tactics and false information to induce women to go to a subsidiary abortion facility; "abortion" procedures performed on women who are not pregnant; operations performed by unlicensed personnel—either nonphysicians masquerading as physicians or physicians who have lost their license to practice; and facilities operating with-

out state licenses and falsifying required medical records.

One practitioner allegedly performed intentionally incomplete abortions which would require a second procedure, so that he could bill for two separate operations; a patient died of infection resulting from retained products of conception (*52*). Another physician performed vaginal hysterotomy procedures in his private office; he was not equipped to handle operative emergencies that occurred and two women died from these procedures (*53*). Both physicians were found guilty of criminal offenses.

Early in the 1970's, use of outdated or unproven methods by some clinicians led to sporadic clusters of deaths and complications (*54, 55*). For example, intrauterine placement of a "super coil" to terminate second-trimester pregnancies had high complication rates (*54*). This specific procedure was abandoned, but as late as 1977 a death was reported from implantation of a foreign body in a legal abortion attempt (*56*).

Shady practices and incompetence have been attacked by both abortion providers and those opposed to abortion. Responsible abortion providers have cooperated with investigative organizations to identify the problem practitioners (*57*) and have developed model standards to improve their already relatively safe procedure (*58*). Groups opposed to abortion have highlighted the isolated events as representative of the quality of medical care given by abortion providers and have used them to promote regulation of all abortion services (*59*).



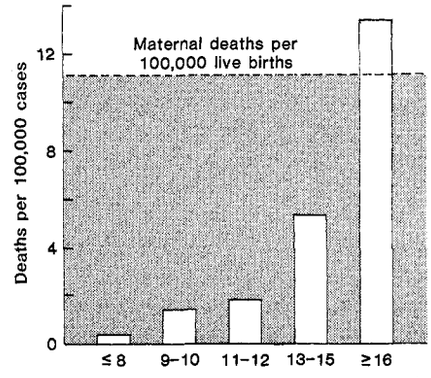


Fig. 3 (left). Death-to-case rates for legal abortions, 1972 to 1979. [Data from (*76*)] Fig. 4 (right). Death-to-case rates for legal abortion by weeks of gestation, and birth-related mortality rate, 1972 to 1978. [Data from (*7*) and (*75*)]

Future Childbearing

Recent headlines have reported that women who have had induced abortions, especially those who have had multiple abortions, have an increased risk of adverse events in future desired pregnancies. These preliminary reports have led some to predict an epidemic of miscarriages, prematurity, and low-birthweight infants (*60*).

Unfortunately, the best available data addressing this issue do not enable us to estimate the risk, if any (*61, 62*). Scientific studies in the United States are inconsistent about whether one abortion or even multiple abortions were associated with increased rates of adverse reproductive outcomes in subsequent desired pregnancies. Of the eight studies currently published, two (*63*) have found a significant association of a single induced abortion with undesirable features of subsequent childbearing; the others (*64–66*) have found either no association or such a small one that chance could have accounted for it. Two published studies (*65, 66*) have related multiple induced abortions to a threefold higher ratio of miscarriage, but one preliminary report from Hawaii (*67*) says that this finding could not be confirmed.

Several studies outside the United States (*68*) have demonstrated significant associations implicating a particular abortion procedure, especially the practice of sharp curettage. Since variations in abortion methods produce different short-term complications, they might also be expected to have different effects on long-term obstetric sequelae. For example, traditional sharp curettage frequently involves wider dilatation than current suction procedures (*22*). If the manner or width of dilatation, rather than the number or method of evacuation procedures, influences future pregnancies, use of laminaria for preoperative cervical dilatation might reduce risks (*66*).

Differences among the characteristics of women studied also produce conflicting results (*62*). For example, parity has an important effect on pregnancy outcome (*69*), with first births being at higher risk of preterm delivery than subsequent births. Thus, investigations in which first births to women with a previous abortion are compared with second births to women with a previous term birth will tend to find more complications among the abortion group, because of the difference in parity (*62*).

Breast Cancer

Whether induced abortion is associated with subsequent development of breast cancer is another question about which there is growing concern (*70*). Previous international investigations have shown that a woman is at lower risk of developing breast cancer if she gives birth at a young age (*71*). However, only full-term pregnancies afford this protection. With first pregnancies that terminate within 4 months there appears to be an increased risk of breast cancer (*72*). Unfortunately, these earlier studies did not differentiate between induced and spontaneous abortion.

A recent investigation in Los Angeles (*70*) found that in certain circumstances the risk of breast cancer in young women was more than doubled if they had had either an induced or a spontaneous abortion. Two specific conditions were involved: (i) the abortion had occurred before 3 months' gestation and (ii) the women were nulliparous at the time of the abortion. A biologic explanation for a possible positive association between early abortion and breast cancer, and a negative association between early age at first childbearing and breast cancer, might involve variations in breast tissue during different intervals of pregnancy (*73*). Early in pregnancy, rapid proliferation of breast tissue might render more cells susceptible to neoplastic stimuli (tumor initiation) or might hasten the growth of malignant cells (tumor promotion). The protective effect of continuing a pregnancy to term could be due either to breast cell differentiation later in pregnancy or to a permanently altered estrogen profile during the later stages (*74*), or both.

While data from this investigation are consistent with earlier findings, the case-control designs raise questions of ascertainment bias. Specifically, might women with breast cancer be more likely to remember or admit previous abortions than a comparison group would be? Also, women in the Los Angeles study had their cancers diagnosed before age 32 (*70*). The incidence of breast cancer at this age is very low, about 20 per 100,000 women (*73*). Whether or not any associa-

tion between abortion and breast cancer occurs later in life has not been ascertained. If that association is not found, then the effect of abortion on breast cancer incidence, if any, would be very small. Further investigations may cast light on these important questions.

Conclusion

To summarize, the increasing availability and utilization of legal abortion in the United States has had an important public health impact. The data clearly indicate that the legalization of abortion has been accompanied by a decline in deaths and complications among American women of childbearing age. It led to the rapid development of technological advances and clinical expertise in pregnancy-termination procedures. It stimulated development of more convenient, low-cost outpatient health services. Legal abortion has also brought with it new concerns—for example, about whether abortion has adverse effects on future desired pregnancies and whether it increases the risk of breast cancer in certain women. Accurate information will help policy-makers, medical practitioners, and those most directly concerned—women of childbearing age—to make rational decisions about this subject.

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