

### BACKGROUND

Abortion is one of the oldest methods of preventing unwanted births and until recently one of the most hazardous. Among preliterate people, use of abortion and infanticide exceeded the use of measures to prevent conception (193). The earliest written reference to any method of fertility control, according to Norman Himes in *Medical History of Contraception*, was a recipe for an oral abortifacient. This concoction, which may have included quicksilver, is found in the ancient Chinese medical text written by the Emperor Shen Nung in the period 2737-2696 BC (193).

Abortion was common in ancient Greece and Rome. A 1922 review of Greek practices included 12 pages listing abortifacients plus instruments, injections, and medicated pessaries or tampons (292). Hippocrates reportedly advised one woman to jump in the air, striking her heels against her hips, to induce abortion (473). In ancient Rome also abortion was a frequent practice. The methods used included oral agents (usually strong purgatives), douches (often caustic), and curettage (473).

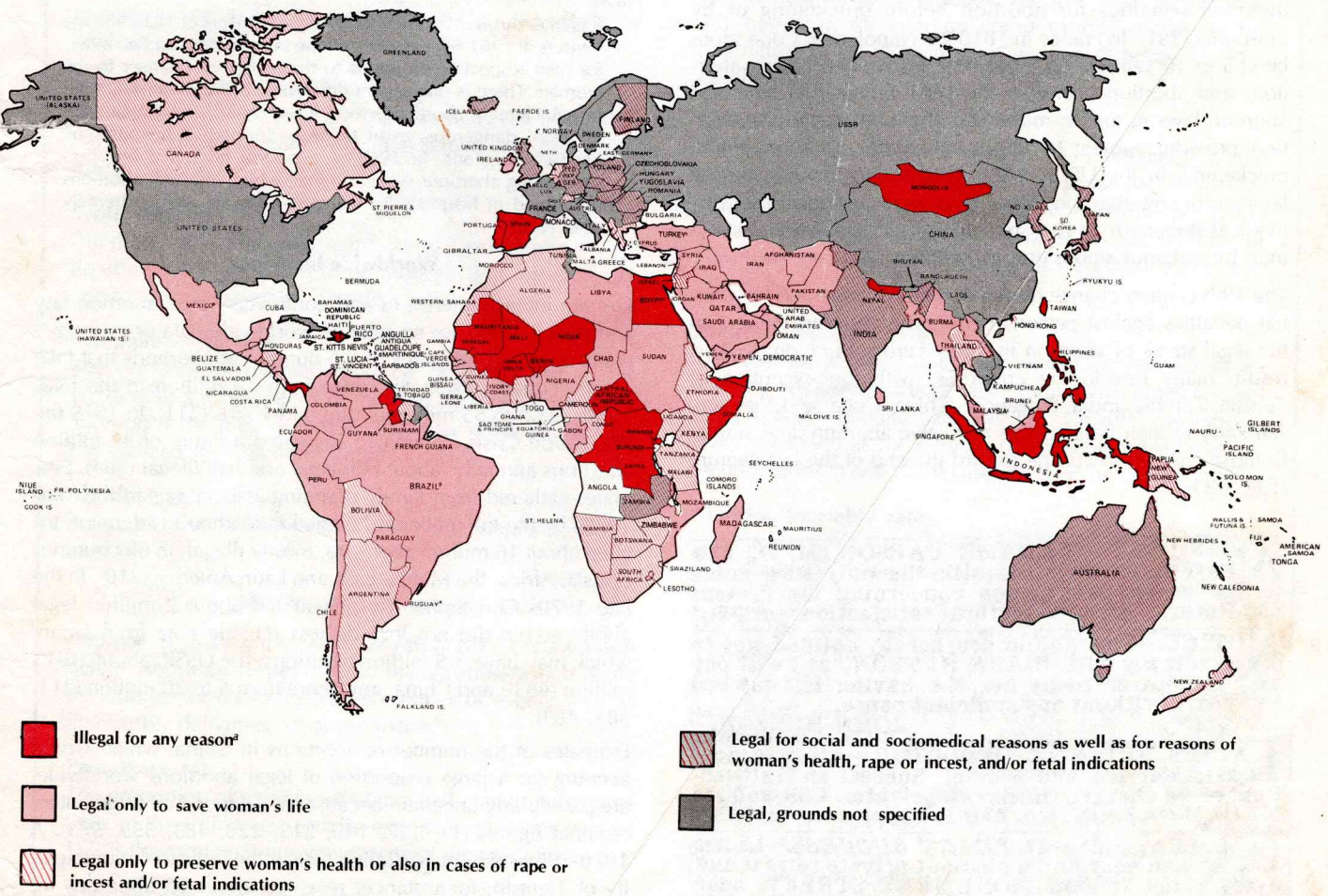
Although there are no data to determine the hazards — or the efficacy — of these methods, clearly they were risky. Purgatives and caustic agents were often administered until either abortion or death resulted. As a result of curettage procedures, perforation and sepsis were not uncommon (473).

Religious criticism of abortion is noted in the Old Testament but became stronger in the Christian era (335, 426). During the Middle Ages abortion was condemned and, as the procedure was performed in secret, medical information about methods and complications was not readily available. Drugs and herbs were widely used, especially materials from trees that did not bear fruit, such as the willow (473). Ergot, from fungus on cereal plants, was used both to hasten labor and to induce abortion; for abortions five or seven grains were recommended (38). Until very recently little distinction was made between drugs that were believed to cause sterility and those which were believed to provoke abortion. The limited information available suggests that these abortifacients were usually not effective, and, if they were effective, they were also toxic to the woman.

### Legal Status

Under principles of common law, inducing abortion before quickening — that is, before the first perceptible movements of the fetus — was not an offense (278, 291). In fact, early abortion

Figure 1. Legal Status of Induced Abortion, 1980



<sup>a</sup>Abortion to save women's life may be authorized under general principles of criminal law.  
<sup>b</sup>Legal to save women's life and in cases of rape  
<sup>c</sup>Legal to save women's life, in cases of rape, and for fetal indications  
 Source: Tietze (589), UNFPA (501)

<sup>a</sup>Abortion permitted for fetal indications and, under general provisions of criminal law, to preserve the woman's life and health  
<sup>b</sup>Legal to save women's life and in cases of rape or incest, but in other cases penalty for first trimester abortion may be waived because of serious economic hardship

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was often viewed as nothing more than bringing on delayed menses. Even abortions in the second trimester of pregnancy or later were rarely considered cause for legal action (291). More often they were regarded as a desperate but understandable alternative for unfortunate girls or women who became pregnant out of wedlock (291).

Throughout the 19th century, however, in Europe and the United States abortion became more common as married women began to try to limit family size (278, 291). Many unlicensed practitioners openly advertised the abortion services they provided (see photograph, this page). Home medical manuals often discussed ways to bring on delayed menses, sometimes called "stoppages." Oil of juniper was widely recommended (367). A study of 2,000 women in Manchester, England, in the 1890s found a ratio of one abortion to 7 births, and a German study estimated one abortion in 8 to 10 term deliveries (367). Abortion mortality was unmeasured but probably high (367).

During the 19th century, as abortion became more common and widely publicized, the dangers of the procedure also received more attention. At the same time, scientific research indicated that embryonic development was a continuous process in which quickening was only one stage (291). To protect women from injury and to discourage abortion as a practice, many Western nations began to enact restrictive abortion legislation. The first change in the common law doctrine came in an 1803 consolidation of the British penal code which included penalties for abortion before quickening or by poisoning (291). In France in 1810 the Napoleonic Code stipulated 5 to 10 year prison terms both for women having abortions and abortion providers. By 1861 Britain had amended abortion laws further to make both the woman and the abortion provider subject to imprisonment for abortion before quickening. In the US by 1868 almost all states had passed laws restricting abortion; these laws were prompted more by medical doctors trying to strengthen their professional status than by religious opposition to abortion (291).

The 19th century change from a permissive approach to criminal penalties against persons performing abortion influenced the legal status of abortion in many European colonies. As a result, many developing countries, with the exception of Tunisia, Zambia, India, Singapore, China, Cuba, and Vietnam, still carry in their penal codes restrictive abortion laws similar to those enacted in Europe toward the end of the last century (196, 483).

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Nineteenth century abortion providers openly advertised their services in US newspapers. The March 20, 1867, edition of the *Baltimore Sun* carried thinly disguised advertisements for Dr. Sea, a medically trained practitioner, and Madame Carson, a folk practitioner.

Beginning in the last few decades, however, the 19th century laws have been modified in various ways. The trend is toward less restrictive legislation. Since 1950 more than 30 countries have amended legislation to permit abortion for social or sociomedical reasons, while five have enacted prohibitions (121, 483, 544). These five, mainly Communist countries in Eastern Europe, are trying to promote population growth. The major justifications given for legalizing abortion are concern for the health and welfare of the woman, and, in the US Supreme Court decisions of 1973, an individual's right of privacy (483, 507, 508). A few countries, such as Singapore and Tunisia, also cite the need to reduce population growth (483). The major opposition to legal abortion in countries where restrictions have been questioned or lifted comes from conservative groups, mainly on moral and religious grounds (483). As Figure 1 shows, in about 10 percent of countries abortion is now legal under any circumstance; in about 45 percent of countries abortion is legal either to protect the woman's health or for health and other reasons including rape, incest, and possible fetal deformity or disease, and broad sociomedical indications; and in another 45 percent abortion is either completely illegal or permitted only to save the woman's life.

Ironically, both in the 19th century, when legislation restricting abortion was enacted, and in the past three decades, when legislation revising some of these restrictions was enacted, legal attention focused on the same question: the safety of the procedure. As Cyril Means puts it with respect to the New York law,

It is thus curious but true that both the Revisers of 1828 and the revisers of 1961-65 give one and the same reason, and no other, for their respective proposals to the legislature: danger to the woman. There is one salient difference, however. In 1828, all pre-quickening abortions were, if nonfatal, non-criminal; but all were dangerous, even those performed in hospitals by licensed surgeons. In 1965, *e contrario* all but a few pre-quickening abortions were criminal, while any such abortions performed in hospitals by licensed surgeons were extremely safe. (278)

### Worldwide Incidence

Despite intense interest in and controversy over abortion law and policy, there are no reliable worldwide data or even generally accepted estimates of the number of abortions that take place annually. Estimates range from 30 million in the mid-1960s (232) to 55 million in the mid-1970s (211). In 1979 the Population Crisis Committee suggested a figure of 40 million abortions annually, about half legal and half illegal (364). Estimates gathered from family planning associations in the mid-1970s by the International Planned Parenthood Federation totaled about 16 million abortions, mostly illegal, in 65 countries of Asia, Africa, the Middle East, and Latin America (210). In the late 1970s Christopher Tietze counted about 2 million legal abortions but did not include less reliable data from Japan, which may have 3-5 million abortions; the USSR, about 10-13 million (483); and China, anywhere from 5 to 20 million (211, 383, 483).

Estimates of the number of abortions in China, which would account for a large proportion of legal abortions worldwide, are particularly uncertain because they depend on fragmentary regional figures (11, 127, 140, 215, 228, 483, 555, 573). A 1978-1979 study by Katherine Lyle in the industrial municipality of Tientsin, for instance, revealed about 65 abortions for every 100 live births (555), a figure which, if projected nationally, would total about 12 million abortions. By contrast, 1977 data gathered by Pi-Chao Chen in Guangdong Province would, if projected nationally, suggest about 5 million legal abortions (555).

This issue of *Population Reports* deals primarily with the impact of illegally induced abortion on the health of women, especially in developing countries, with the medical treatment of abortion complications, and with contraceptive use and abortion. Legal and demographic aspects of abortion are not discussed except as necessary to measure and assess potential risks to the life and health of women.

### RISKS TO LIFE AND HEALTH

When performed by competent providers in aseptic conditions, abortion is a relatively safe procedure, the short-term risks of which can be easily measured. When performed by

inexperienced people or under unhygienic conditions, as is often the case with illegal abortion, then mortality, morbidity, and long-term complications are much greater, and, at the same time, much more difficult to evaluate fully.

In addition to the general health of the individual woman, four major factors determine the mortality and morbidity from both legal and illegal abortion:

- the method of abortion
- the skill of the provider
- the duration of pregnancy
- the accessibility and quality of medical facilities to treat complications of abortion.

Theoretically, the far greater mortality and morbidity of illegal than of legal abortion should be attributable to differences in these four factors. But because data on illegal abortions are so difficult to gather, it is difficult to determine which factors contribute most to the higher risks of illegal abortion.

### TERMS USED IN ABORTION RESEARCH

#### Abortion

The termination of a pregnancy before the fetus is capable of extrauterine life (medical definition).

#### Induced abortion

Deliberate interference with a pregnancy, with the intention of terminating it, by the pregnant woman herself or by another person.

#### Spontaneous abortion

All abortions not induced are spontaneous even if an external cause such as trauma or disease is involved. Also called miscarriage.

#### Septic abortion

Abortion that is followed by infection. The majority of septic abortions are thought to be induced, but infection can occur after spontaneous abortion.

#### Incomplete abortion

The presence of retained products of conception in the uterus after a spontaneous or induced abortion. Incomplete abortion is the most common diagnosis when women are hospitalized for abortion complications.

#### Abortifacient

A drug or other substance used to cause a pregnant woman to abort.

#### Abortion Measurements

Abortion is usually measured by **rates**, which relate numbers of abortions to population, or by **ratios**, which relate the number of abortions to the number of events such as live births, deliveries, or pregnancies.

#### Prevalence rate

The proportion of women who have had one or more abortions in their lifetimes, usually expressed as a percentage. This is the most common measurement reported by surveys.

#### Abortion rate (Incidence rate)

The number of abortions in a given period, usually a year, relative to a whole population or to a population of women.

This measure of incidence is usually expressed as a number of abortions per 1,000 women of reproductive age, 15-44 or 15-49. Incidence rates can also be age- or parity-specific.

#### Hospitalized abortion rate

The number of women hospitalized in a given period, usually one year, for abortion complications relative to the population of all women or of women of fertile age in a specific area.

#### Abortion ratio

The number of abortions relative to the number of live births, pregnancies, or deliveries in a given period, usually one year, expressed as the number of abortions per 1,000 events. Sometimes ratios are reported as the number of abortions in women's lifetimes per 1,000 lifetime live births.

#### Abortion mortality ratio

The number of deaths associated with or attributed to abortion per 100,000 abortions (also known as a death-to-case rate). When complete data are not available, the ratio is often expressed as the number of in-hospital deaths attributed to abortion per 1,000 cases of abortion complications.

#### Abortion mortality rate

The number of deaths associated with or attributed to abortion per 100,000 women of fertile age.

The distinction between rates and ratios is important, as the following example shows. Assume two countries, each having a population of one million; women in one country have 9,000 abortions and 45,000 live births in a year and women in the other have 6,000 abortions and 15,000 live births. The first country will have an abortion rate of 9 per 1,000 population and an abortion ratio of 200 per 1,000 live births. The abortion rate in the second country will be 6 per 1,000 population, and the ratio, 400 per 1,000 live births. Thus, one country has a higher abortion rate while the other has a higher ratio. The lower birthrate (denominator) in the second country yields the higher abortion ratio (483).

Source: Grebnik & Hill (173), International Planned Parenthood Federation (207), Moore-Čavar (299), Tietze (483), World Health Organization (532)

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### Mortality

Even without trying to determine direct and indirect causes, simply measuring mortality due to illegal abortion is difficult enough. Based on a computer model simulating reproductive events, Christopher Tietze has estimated that where most abortions are either self-induced or performed by unskilled providers in areas with poor medical care systems, mortality from illegal abortion may be as high as 1,000 deaths per 100,000 illegal procedures (or 1 per 100 procedures). In most countries, Tietze estimates, mortality, while still high, is probably much lower — no more than 50 to 100 deaths per 100,000 illegal abortions (or one per 1,000 to 2,000 procedures) (483).

To calculate directly abortion mortality ratios (sometimes called death-to-case rates), two sets of data are necessary: (1) the number of abortion deaths in a given area during a specific period and (2) the total number of abortions performed in the same area during the same period, which serves as a denominator. In the case of illegal abortion, it is impossible to determine precisely either the number of abortions or the number of deaths in any area. Therefore most estimates are derived from rough approximations of either abortions or deaths, which are multiplied by estimated rates or ratios derived from other data. For example, based on the IPPF estimate of 16 million abortions, mostly illegal, occurring in 65 coun-

**Table 1. Deaths in Hospital Attributed to Complications of Induced and Spontaneous Abortion as a Proportion of All Maternal Deaths in Hospital, Selected Developing Country Studies, 1969-1979**

Region & Country	Ref. No.	Period & Place of Study	No. of Maternal Deaths Attributed to Abortion Complications	% of Maternal Deaths Attributed to Abortion Complications	Region & Country	Ref. No.	Period & Place of Study	No. of Maternal Deaths Attributed to Abortion Complications	% of Maternal Deaths Attributed to Abortion Complications
AFRICA Nigeria	340	Jan. 1962-Dec. 1971, University College Hospital, Ibadan	12	6.6	Malaysia	333	Mar. 1968-Feb. 1974, University Hospital, Kuala Lumpur	4	30.8
	13	1966-1972, Lagos University Teaching Hospital	18	51.4	MIDDLE EAST Iran	119	1963-1969, Saadi Hospital, Pahlavi University, Teheran	7	7.3
		1966-1972, Lagos Island Maternity Hospital	63	6.1		Iraq	161	1964-1970, Karkh Maternity Hospital, Baghdad	5
Sierra Leone	597	1970-72, Maturity and Connaught Hospitals, Freetown	13	10.7	WESTERN HEMISPHERE Brazil	355	1955-1977, Hospital das Clínicas, Faculdade de Medicina de Ribeirão Preto	30	44.1
Uganda	174	July 1966-June 1967, all hospitals/maternity centers with facilities for delivery	15	3.6				30	44.1
ASIA Bangladesh	95	Dec. 1967-Nov. 1968, field surveillance, Matlab Thana	3	7.3		Chile	167	1968, All hospital discharge records	NA
	India	379	1960-1972, Government Erskine Hospital, Madurai	101	8.1		545	1963-1973, National Health Service hospitals	2,523
223		Jan. 1977-Dec. 1978, Government Erskine Hospital, Madurai	33 <sup>a</sup>	26.6	Colombia	572	1970-78, Maternal and Child Institute, Bogotá	239 <sup>a</sup>	40.3
351		1973-1977, LNJP Hospital, New Delhi	17 <sup>a</sup>	21	Jamaica	203	1971, Victoria Jubilee Hospital, Kingston	5	33.3
446		1976, Eden Hospital, Calcutta	13 <sup>b</sup>	15.7	Venezuela	4	1973, Concepción Palacios Maternity Hospital, Caracas	NA	70

\*Mortality due to septic abortion only

<sup>b</sup>Illegal induced abortions only

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tries in Africa, the Middle East, Latin America, and Asia and an estimated mortality ratio of 500 deaths per 100,000 illegal abortions (or one per 200 procedures), Roger Rochat inferred that in these countries close to 84,000 women die every year from complications of illegally induced abortions (396).

Because of the lack of better data, information about illegal abortion mortality is sometimes derived indirectly or partially derived from two sources: hospital records and death certificates. Both sources are highly inaccurate. Hospital records rarely distinguish between spontaneous and illegally induced abortions; thus mortality from illegally induced abortions alone cannot be specifically determined. (Complications from spontaneous abortions are rarely fatal, however, so most abortion-related hospital deaths presumably follow illegally induced abortions (484).) Furthermore, hospital records underestimate the total number of deaths from abortion since they exclude women who die outside of hospitals. Mortality figures derived from death certificates are also underestimates because they exclude many concealed or misregistered abortion deaths (366, 484). (See box, "Problems of Data Sources," p. F-137).

The following measures are used to estimate death from abortion in developing countries:

- hospital abortion deaths as a proportion of all maternal deaths occurring in hospitals
- abortion deaths per 1,000 hospital admissions for abortion complications
- annual number of registered abortion deaths as a proportion of all maternal deaths on registered death certificates
- maternal and abortion deaths per 10,000 live births.

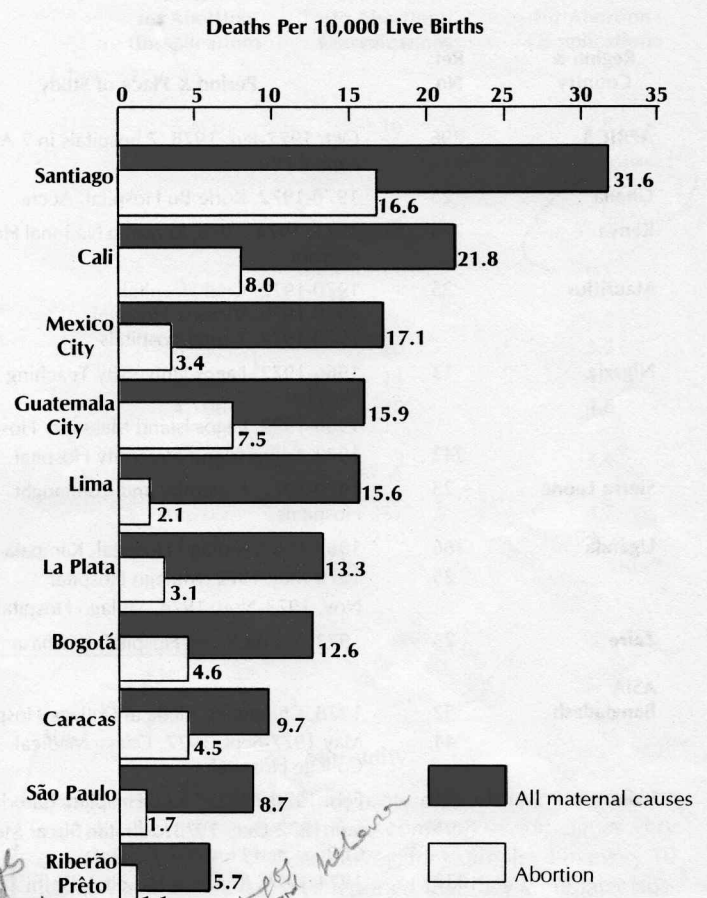
None of these measures can be extrapolated to a mortality estimate for a total population, but they do suggest the magnitude of the risk.

As Table 1 shows, abortion is a major cause of maternal mortality in developing countries. In Latin America, where research has been most extensive, even though abortion is illegal everywhere, over 30 percent of maternal deaths in a number of hospitals are due to abortion complications (2, 167, 203, 355). In Chile, for example, abortion deaths in national health service hospitals from 1963 to 1973 ranged from 30 to 41 percent of all reported maternal deaths (545). In Colombia, septic abortions alone caused 40 percent of all maternal deaths in the Maternal and Child Health Institute in Bogotá between 1970 and 1978 (572). In Asia and Africa, hospitals report that abortion causes between 4 and 51 percent of all maternal deaths (see Table 1).

Abortion mortality in hospitals is sometimes measured in relation to the number of women admitted to hospitals for abortion complications. These ratios range from zero to about 300 deaths per 1,000 admissions for abortion complications (see Table 2). In Santiago, Chile, during the 1960s approximately 5 women died for every 1,000 women admitted for abortion complications (518). Similar ratios are reported in other Latin American urban hospitals (37, 130, 392, 512) as well as in African and Asian hospitals. Exceptions are hospitals in Bangladesh, Nigeria, and Sierra Leone, which have reported mortality ratios as high as 12.5 to 19.4 per 1,000 admissions for abortion complications (13, 25, 44, 52).

Since hospital admissions for abortion complications include women with either spontaneous or induced illegal abortions and since spontaneous abortion is less likely to be life-threatening than illegal abortion, these hospital mortality ratios

Figure 2. Rates of Maternal Mortality Due to Abortion and Due to All Causes, 10 Latin American Cities, 1962-1964



Source: Puffer & Griffith (1967)

underestimate mortality from induced illegal abortions. Hospitals in India, Colombia, and Thailand, however, report mortality among women with admitted or presumed illegal abortions only, and these ratios are very high, ranging from 8 to 307 deaths per 1,000 admissions for complications of illegal abortion (51, 94, 223, 269, 360, 568, 569).

Death certificates confirm these hospital data. As Table 3 shows, between 1970 and 1978 abortion complications as recorded on death certificates caused 20 percent or more of all maternal deaths in eight countries — Argentina, Chile, Cuba, Mauritius, Nicaragua, Singapore, Trinidad and Tobago, and Uruguay. These percentages can be misleading; in countries where overall maternal mortality is low, a few deaths attributed to abortion may constitute a large proportion of all maternal deaths. Also, many deaths are not registered at all.

Information on abortion deaths and on all maternal deaths in relation to the number of live births comes solely from Latin America (see Figure 2, this page). In the period 1962-1964, maternal mortality ranged from 5.7 deaths per 10,000 live births in Riberão Preto, Brazil, to 31.6 deaths per 10,000 live births in Santiago, Chile. Mortality from abortion accounted for 34 percent of all maternal deaths in the 10 Latin American cities studied (371). In three cities, Santiago, Caracas, and Guatemala City, abortion caused close to half of all maternal deaths (371).

*Most data comes from studies conducted 1960-1970 + a study before + a study proposed changes in response to them*

*Method*

*1960-1970*

*780 Paulo 1980 12/10*

Table 2. Deaths in Hospital Attributed to Complications of Induced or Spontaneous Abortion as a Proportion of All Hospital Admissions for Complications of Abortion, Selected Developing Country Studies, 1965-1979

Region & Country	Ref. No.	Period & Place of Study	No. of Admissions for Abortion Complications	No. of Deaths due to Abortion Complications	No. of Deaths per 1,000 Admissions for Abortion Complications
<b>AFRICA</b>	296	Oct. 1977-Jan. 1978, 7 hospitals in 7 African capital cities	1,861 <sup>a</sup>	10	5.3
<b>Ghana</b>	25	1970-1972, Korle Bu Hospital, Accra	9,457	46	4.9
<b>Kenya</b>	275	1971, 1974, 1975, Kenyatta National Hospital, Nairobi	6,956	19	2.7
<b>Mauritius</b>	25	1970-1972, Civil Hospital	2,372	20	8.4
		1970-1972, Victoria Hospital	2,289	30	13.1
		1970-1972, 7 rural hospitals	1,516	19	12.5
<b>Nigeria</b>	13	1966-1972, Lagos University Teaching Hospital	1,238	18	14.5
		1966-1972, Lagos Island Maternity Hospital	14,150	63	4.5
	242	1972, Lagos Island Maternity Hospital	1,990	8	4.0
<b>Sierra Leone</b>	25	1970-1972, Maternity and Connaught Hospitals	670	13	19.4
<b>Uganda</b>	266	1967-1969, Mulago Hospital, Kampala	5,468	11	2.0
	25	1970-May 1972, Mulago Hospital	5,126	9	1.8
		Nov. 1973-Nov. 1974, Mulago Hospital,	1,377 <sup>b</sup>	3	2.2
<b>Zaire</b>	25	1972, Mama Yemo Hospital, Kinshasa	3,182	11	3.5
<b>ASIA</b>					
<b>Bangladesh</b>	52	1978, Chittagong Medical College Hospital	640	8	12.5
	44	May 1977-Sept. 1977, Dacca Medical College Hospital	479	6	12.5
<b>India</b>	51	Feb. 1970-1972, S.S.G. Hospital, Baroda	75 <sup>c</sup>	3	306.7
	94	Jan. 1972-Dec. 1973, Nilratan Sircar Medical College and Hospital, Calcutta	221 <sup>c</sup>	34	153.8
	233	1974-1979, Kasturba Hospital, Delhi	317 <sup>d</sup>	20	63.1
	269	July 1969-Dec. 1971, "P.G.I.," Chandigarh	88 <sup>d</sup>	12	136.4
		July 1973-Dec. 1975, "P.G.I.," Chandigarh	133 <sup>d</sup>	23	172.9
	360	1971-1973, Government Erskine Hospital, Madurai	393 <sup>e</sup>	79	201.0
	379	1960-1972, Government Erskine Hospital, Madurai	2,045 <sup>f</sup>	95	46.5
	223	Jan. 1977-Dec. 1978, Government Erskine Hospital, Madurai	380 <sup>e</sup>	33	86.8
<b>Indonesia</b>	47	1972-June 1974, Department of Ob/Gyn, University of Indonesia, Jakarta	1,069	6	5.6
<b>Malaysia</b>	479	1960-1972, government hospitals, peninsular Malaysia	142,795	259	1.8
<b>Thailand</b>	568, 569	1968-76, Siriraj Hospital, Bangkok	3,188 <sup>f</sup>	25	7.8
	235	Jan. 1972-Dec. 1973, Siriraj Hospital	3,530	3	0.86
	381	May 1969-Feb. 1970, Ramathibodi Hospital, Bangkok	144	1	6.9
<b>MIDDLE EAST</b>					
<b>Egypt</b>	47	1971-1973, Kasr-El-Aini Hospital, Cairo	736	0	0
	222	1969, Kasr-El-Aini Hospital, Cairo	1,620	1	0.6
	137	1973, Tanta University Hospital	913	8	8.8
	136	[1973-74], El Galaa Hospital, Cairo	388	1	2.6
<b>Kuwait</b>	576	1973-1977, Kuwait Maternity Hospital	21,018	2	0.1
<b>Lebanon</b>	54	1961-1971, American University Hospital, Beirut	3,190	15	4.7
<b>Sudan</b>	410	Mar.-Dec. 1974, 3 hospitals, Khartoum	1,191	0	0

<sup>a</sup>Sample selected from a total of 19,594 admissions

<sup>b</sup>Excludes patients admitted on weekends or public holidays

<sup>c</sup>Induced

<sup>d</sup>Induced septic

<sup>e</sup>Septic

<sup>f</sup>Illegal

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Table 2 (Cont.)

Region & Country	Ref. No.	Period & Place of Study	No. of Admissions for Abortion Complications	No. of Deaths due to Abortion Complications	No. of Deaths per 1,000 Admissions for Abortion Complications
<b>WESTERN HEMISPHERE</b>					
Chile, Colombia, El Salvador, Guatemala	146	Feb. 1974-May 1975, various hospitals	5,470	16	2.9
Brazil	327	1944-1962, Ob/Gyn department of unidentified hospital, São Paulo	2,016	74	36.7
Chile	513	May-Oct. 1974, Felix Bulnes Hospital, Santiago	602	1	1.7
Colombia	37	1968-1969, 11 hospitals	6,292	20	3.2
	392	Feb. 1974-Mar. 1975, 9 hospitals	2,923	14	4.8
	130	Jan. 1969-Dec. 1971, University Hospital of Barranquilla	4,106	20	4.8
	512	Jan. 1966-Dec. 1969, Caldas University Hospital	1,229	3	2.4
	572	1970-78, Maternal and Child Institute, Bogotá	54,705 2,020*	257 210	4.7 104

\*Septic

Mortality data from countries where abortion is legal are usually more complete but may still underestimate both the number of abortions performed and subsequent deaths (299, 367). It is clear, however, that mortality from legal abortion is much lower than mortality from illegal abortion (536). In the United States the mortality ratio for legal abortion is lower than for any other surgical procedure (81). The United States Center for Disease Control (CDC) reported 15 deaths associated with legal abortion in 1977, for a mortality ratio of 1.4 deaths per 100,000 legal abortions (502), compared with 12 maternal deaths from all causes per 100,000 live births in 1972 to 1975 (83), and 16 deaths per 100,000 tonsillectomies in 1977 (125, 506). In Cuba, where abortion is now legal and freely available in most hospitals, the mortality ratio for hospital abortions from 1968 to 1974 was 1.0 per 100,000 abortions (196, 483).

The difference in mortality that the legal status of abortion may make can be seen most clearly in countries that have changed their abortion laws. In the United States abortion was legalized nationwide in 1973. In 1972, 90 women died from postabortion complications; in 1974, 53 (502). The difference was due almost entirely to a decline in deaths from illegal abortion (82).

In England and Wales, before passage of the less restrictive Abortion Act in 1967, approximately 50 abortion-related deaths were reported annually; in 1978 only 5 such deaths occurred (256). A decline in mortality after legalization of abortion has also occurred in developing countries. Singapore liberalized its abortion legislation in 1970 and in 1974 made abortion available on request. Despite large increases in the number of abortions performed annually after 1974, abortion deaths dropped from 51 in 1968-1970 to 26 in 1974-1976. The decrease was due to fewer illegal abortions (258). By contrast, in Romania tightening of the abortion law in October 1966 caused an increase in the number of deaths attributed to abortion from 64 in 1965 to 170 in 1967, with further increases to 432 in 1976 (483, 533, 534).

*but in some common*

**Morbidity**

Complications of abortion are more difficult to measure than mortality but of course far more common — sometimes very common. In a 1962 Chilean survey, for example, 4 in every 10 women aborted by catheter reported that they were later hospitalized for treatment (35). According to more recent surveys in El Salvador, Guatemala, Paraguay, Chile, and Brazil, between 20 and 48 percent of the women who had ever had abortions required hospitalization after their last spontaneous or induced abortion (31, 124, 307, 316, 361, 422). While comparisons among studies are difficult, it is apparent that the same factors that influence abortion mortality — method, provider, duration of pregnancy, and availability of later care — also influence abortion morbidity.

Worldwide, the most frequent complication of legal and illegal abortion is incomplete abortion, or retained products of conception (482), which requires evacuation of the uterus. The most frequent major complications of illegal abortion are pelvic infection, hemorrhage, and shock (536). Another very frequently reported complication is trauma to the pelvic organs — cervical lacerations, uterine perforation, and damage to the bladder and intestines. In sub-Saharan Africa and India, tetanus is a major complication and is usually fatal (10, 15, 16, 25, 51, 269, 378).

*Septic after + severe bleed*

The method for inducing abortion influences both the extent and the type of complications. The types of drugs and techniques used to attempt illegal abortion are many, ranging from herbal teas to modern surgery, and each has its own dangers. Potassium permanganate tablets and other chemical substances inserted into the cervical os cause chemical burns and bleeding and may even lead to the formation of bladder or rectal fistulas (367, 426). Abdominal massage, which is practiced in Southeast Asia, Africa, and the Middle East, can cause internal bleeding and organ damage (116, 156, 312, 415).

**Table 3. Registered Deaths Attributed to Complications of Induced and Spontaneous Abortion as a Proportion of All Registered Maternal Deaths, Annual Average Based on Death Certificates, 1970-1978\***

Region & Country	Average Annual No. of Registered Deaths Attributed to Abortion Complications	Average Annual Percentage of All Registered Maternal Deaths Attributed to Abortion Complications
<b>AFRICA</b>		
Mauritius	14	46
<b>ASIA</b>		
Hong Kong	1	12
Philippines	120	7
Singapore	4	35
Thailand	102	8
<b>MIDDLE EAST</b>		
Egypt	65	6
Kuwait	1	8
<b>WESTERN HEMISPHERE</b>		
Argentina	188	28
Chile	127	36
Colombia	213	19
Costa Rica	6	18
Cuba	25	20
Dominican Republic	9	6
El Salvador	16	10
Guatemala	33	9
Jamaica	7	9
Mexico	176	6
Nicaragua	5	39
Panama**	5	13
Paraguay	25	17
Peru	63	6
Trinidad and Tobago	14	39
Uruguay	8	21
Venezuela	68	19

\*Not all years available for all countries

\*\*Does not include Canal Zone

Source: Tietze (589)

Mechanical methods — the insertion of a twig or other object into the cervix — may lead to uterine and intestinal perforation and subsequent peritonitis (266, 360). Other nonmedical methods to induce abortion include eating or drinking quinine, laundry bluing, or any of a host of other chemicals. These can lead to poisoning, renal failure, or intense vomiting causing dehydration, and eventual death unless proper therapy is instituted (168, 170).

Inserting a foreign object, sometimes a urinary catheter, or *sonda*, into the vagina and cervix may be the most common method of illegal abortion worldwide (483). A survey in Santiago, Chile, found that this method was more likely to lead to hospitalization than any other (35) (see Table 4). The least dangerous method, according to this study, was curettage, generally used only by physicians and graduate midwives. The nonmedical abortion provider and the pregnant woman herself were more likely to use a catheter (35).

Even in countries where abortion is legal and complication rates are much lower, the method used affects complication rates. A large study by the Joint Program for the Study of Abortion and the Center for Disease Control (JPSA/CDC) in the US found that curettage during the first trimester of pregnancy is the safest abortion technique. Of curettage techniques, suction

curettage (vacuum aspiration) caused fewer major complications than sharp curettage (D&C). Other techniques used later in pregnancy, such as instillation of substances into the uterus and major surgical procedures such as hysterotomy and hysterectomy, have higher major complication rates (175).

The legal status of abortion in a country usually influences the specific abortion technique used and thus the subsequent risks to the woman. Where abortion is legal, the safest effective technology that is available can be employed. Where abortion is illegal, the choice of method is much more limited by a woman's ability to learn of providers, the type of provider accessible, the means at the provider's disposal, and the cost of the procedure. As a result safety considerations often play little part in determining the method of illegal abortion.

The medically trained abortion provider is likely to use safe and effective methods, particularly suction or sharp curettage. Even where abortion is illegal, physicians can perform relatively safe procedures. In the urban areas of Tanzania, for example, many abortions are induced by physicians in their private offices. Using sterile instruments, they rupture the amniotic sac and then instruct the woman to report to a hospital as soon as bleeding has begun for treatment of an incomplete abortion. In these circumstances, infection is rare (434). Similar practices undoubtedly prevail in many other developing countries.

Skilled practice and safety precautions are not the province of physicians only. In rural Thailand, a survey of 81 abortion providers, none of whom were physicians, found that one-third routinely give their clients antibiotics, thereby reducing the likelihood of sepsis (478). In several hospitals in Brazil fewer women have been hospitalized for septic abortion in recent years in part because the trained midwives, who perform most illegal abortions, have grown more skilled and experienced and now give their clients antibiotics after the procedure (117, 263).

Yet, on the whole, abortions performed by nonphysicians are more hazardous than abortions by physicians, whether legal or illegal. The untrained provider or traditional practitioner is likely to use traditional methods of varying safety and efficacy. Generally, traditional methods that are potentially dangerous to the woman may be either effective or ineffective in inducing abortion, but those that are safe are rarely effective.

Morbidity varies with the duration of gestation. A study of 1,890 women in Santiago, Chile, found that 47 percent of abortions performed in the third to fifth months of pregnancy led to hospitalization, compared with 18 percent of abortions performed in the first month of pregnancy (35). Similarly, in the US, complication rates of legal abortion in the second trimester, as assessed in the JPSA/CDC study, were four to five times higher than complications in the first trimester (175). Mortality as well as morbidity associated with legal abortion increased with length of gestation, from 1.7 deaths per 100,000 abortions in the 9th and 10th weeks to 14.6 in the 16th to 20th weeks (502).

Although complication rates for illegal abortion cannot be determined because of the lack of data, some suggestion of the extent of complications, like the extent of mortality, can be obtained by observing changes in hospital admissions for septic or incomplete abortions in areas that have eased restrictions on abortion. In New York City, for example, where abortion laws were made less restrictive in 1970, hospitals reported a decline of nearly 50 percent in admissions due to incomplete abortions, from 6,524 in 1969 to 3,253 in 1973 (299). Similar



declines in hospital admissions for postabortion complications have been reported in other cities in the United States (221, 245, 437), in Yugoslavia (588), and in England (455).

### Long-Term Complications

The fear is often expressed that abortion, even when performed by a physician, may have adverse effects subsequently, for example, by increasing the risk of spontaneous abortion (565). Whether this is true is difficult to determine. As in studying other potential hazards of abortion, there is a great difference between studying long-term complications of legal abortions (or those performed by medical practitioners) and of illegal abortions performed by unskilled persons. Long-term complications of legal abortion have been studied extensively with conflicting results. The most recent research suggests that increased risks of subsequent fertility problems after legal abortion are probably confined to nulliparous women, women having repeat abortions, or women aborted using techniques that may injure the cervix. By contrast, no systematic studies have measured the long-term complications of illegal abortion, but anecdotal evidence indicates that not only fertility but also other aspects of a woman's health may be seriously impaired in the long term by illegal abortion.

Some studies of legal abortion suggest that abortions may affect subsequent pregnancies by increasing the risk of prematurity, ectopic pregnancy, spontaneous abortion, or low birth weight infants (42, 131, 262, 304, 394, 442, 579, 580, 587, 585). Others have failed to find any association with fertility problems (561, 562, 567, 587). The risks, if any, may be greater with repeat abortions (42, 538, 565, 585). For example, a WHO study in one Asian and seven European countries compared subsequent pregnancies of women who had had two or more abortions with those of women who had had one or no abortions. Repeat abortion was associated with a 2½ times higher rate of low birth weight infants and infants of less than 37 weeks gestation (538).

The abortion technique used and whether or not a woman has previously given birth, along with the number of abortions she has had, may influence the risk of miscarriage in future pregnancies. A recent study from Walnut Creek, California, found that abortion did not lead to greater risk of spontaneous loss either in the first trimester or among parous women. It did find that the risk of midtrimester loss for a nulliparous woman who had had two or more induced abortions was about three times that for a nulliparous woman with no previous abortions, or about 76 cases per 100,000 women compared with 24 per 100,000 (565). After 1973 laminaria were substituted for instrumental dilation in most procedures. A comparison of midtrimester miscarriage rates in women undergoing abortions before and after 1973 found a 50 percent lower rate in the later group (565).

Much of the research on long-term complications of legal abortion is plagued by methodological problems, for example, inadequate abortion histories and failure to control for all factors that could influence both pregnancy outcome and abortion history (175). Thus few conclusions can be drawn from the research so far (33, 80, 134, 195, 483, 537). Additional research is necessary to identify more precisely the complications, if any, associated with different techniques used in legal abortion and which women might be particularly at risk.

Long-term complications of illegal abortion have not been studied as extensively as those of legal abortion, but, to the extent that the providers of illegal abortion are unskilled, the methods crude, and conditions unclean, any hazards are

clearly much greater than for legal abortion. For example, infections can lead to subsequent blockage of the fallopian tubes, causing infertility (231).

Most of the studies of illegal abortion and pregnancy outcome have found an adverse effect on subsequent pregnancies. One Greek study found subfecundity over three times more common in women who had had abortions than in those who had not (591). Another found that women who had had ectopic pregnancies were twice as likely to have had previous abortions as similar women who had normal pregnancies (579), while a third study found that premature births and stillbirths occurred more often to women who had had abortions than to those who had not (580, 581). By contrast, a study in Taiwan, after accounting for other factors influencing pregnancy outcome, found that a history of abortion was not associated with spontaneous abortion (561). Relying on anecdotal evidence, several researchers cite illegal abortion as one possible cause of secondary infertility in parts of Africa (9, 20, 25, 27, 178, 342, 358). Other long-term complications which may stem from illegal abortion include chronic pelvic infection, higher risk of ectopic pregnancy, and parametritis (24, 54).

For any woman, illegal abortion can be hazardous and painful, carrying immediate risks to life and health and impairment of later fertility as well as other long-term complications. Undoubtedly many women are not aware of these dangers, while others face the dangers knowingly, determined or desperate to avoid an unwanted birth. For an individual, the risks and costs are high. For the community also, illegal abortion incurs both human and financial costs by placing a heavy burden on limited health care resources.

### Risks of Abortion Versus Risks of Contraception

The risk of dying from an illegal abortion far exceeds the risk of dying from any method of contraception. Oral contraceptives and IUDs are from 10 to several hundred times safer than abortion. Sterilization is also many times safer than illegal abortion although comparisons are more difficult to make.

Roger Rochat estimates that, in the 65 countries with affiliates of the International Planned Parenthood Federation, roughly 84,000 women die annually from illegal abortion, while among 3 million women served by IPPF programs, 52-89 may die from complications of contraceptive use (396).

Statistics on mortality due to contraceptives in developing countries are as difficult to gather as statistics on mortality from

**Table 4. Methods of Induced Abortion and Subsequent Hospitalization, Santiago, Chile, 1962**

Method	Number of Induced Abortions		Percentage Hospitalized
	No. of Abortions	No. Admitted to Hospital	
Curettage	504	96	19.0
Drugs	119	41	34.5
Catheter	581	243	41.8
Douches and other	55	20	36.4
Not stated	63	17	27.0

Source: Armijo & Monreal (35)

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illegal abortion. Therefore comparisons of the risks associated with various methods of preventing unwanted births are derived from models based on various separate studies of fertility and mortality, many conducted in developed countries. Christopher Tietze and colleagues have developed such a model for developed countries (485, 586), and Malcolm Potts, J. Joseph Speidel, and Elton Kessel have adapted the model to apply to developing countries (368). Potts and colleagues have estimated the number of deaths per 100,000 women using various fertility control methods in each 5-year age group both in moderately developed countries, such as Taiwan and Korea, and in the least developed countries, such as Bangladesh, Ethiopia, India, and Indonesia. This model can be used to compare the risks of illegal abortion and contraception.

If the abortion mortality ratio in moderately developed countries is 50 deaths per 100,000 procedures (483) (see p. F-110), mortality associated with using illegal abortion to control fertility for a year ranges from 50 to 83 deaths per 100,000 women. The risk varies with the woman's age, which influences both the number of abortions needed to prevent all births during each year and her ability to recover from complications of abortion. Illegal abortion would be least risky for women age 15-19, who are estimated to require an average of one abortion per year to prevent all births. Women age 30-34 would face the highest annual risk because their fertility remains high, requiring on the average more than one abortion per year to avoid all births, while their older age increases the risks of the abortion procedure. After age 35 declining fertility lowers the annual risk of abortion to a rate of 63 deaths per year per 100,000 women age 40-44. If in the least developed countries the mortality ratio is 100 deaths per 100,000 procedures (483), mortality rates rise from 100 deaths per 100,000 women age 15-19 to 168 deaths per 100,000 women age 30-34 and then decline to 123 per 100,000 women age 40-44.

The risks of contraceptive methods are a fraction of these figures. For the moderately developed countries, oral contraceptives (OCs) are 5 to 125 times safer than illegal abortion. For the least developed countries the difference is even more dramatic: OCs are 10 to 250 times safer. IUDs are 20 to 40 times safer than illegal abortion in moderately developed countries and 5 to 125 times safer in the least developed countries. The relative safety of these contraceptive methods is greatest for the

youngest women (age 15-19) and least for the oldest women (age 40-44) because the risks associated with OCs and IUDs are estimated to increase with age, although much more sharply for OCs than for IUDs (368).

Comparisons with the risk of sterilization are more difficult because all the risks occur at the time of the procedure, but the contraceptive effects continue through all subsequent years of potential fertility. Even in the least developed countries, undergoing a sterilization procedure would be 1.5 to 3 times safer than using illegal abortion to control fertility for one year. When the risk of a sterilization procedure is averaged over the number of years of contraceptive protection it provides, sterilization is up to 75 times as safe as illegal abortion, depending chiefly on the age of the woman when she is sterilized.

### COSTS

Complications of illegal abortion burden not only individual women but also medical institutions and society as a whole. Treating abortion complications consumes substantial quantities of scarce resources — hospital beds, blood supplies, and the time of trained medical personnel. In some developing countries the cost of treating abortion complications accounts for up to 50 percent of the budgets of maternity hospitals (222, 375).

While many have acknowledged that illegal abortion is a major public health problem, few have attempted to estimate the full cost. Since it is often impossible to distinguish between illegally induced abortions and spontaneous abortions, the cost of treating illegal abortions cannot be exactly determined. It is clear, however, that the bulk of abortions with complications are illegally induced and that complicated cases are more costly than uncomplicated cases. The following measurements have been used to gauge the costs of abortion:

- abortion complication cases as a percentage of all hospital admissions
- abortion complication cases as a percentage of all obstetrical and gynecological admissions
- abortion complication cases per 1,000 deliveries in hospital
- amount of blood used to treat abortion complications
- number of days of hospitalization per patient admitted with abortion complications.

#### Hospital Admissions and Use of Hospital Resources

Abortion complication cases comprise a significant proportion of all hospital admissions. In studies from hospitals in developing countries, the percentage of admissions attributed to abortion complications is as high as 45 (see Table 5). Health services specifically for women report the highest percentages of course; maternity and women's hospitals are overburdened with abortion cases (see Table 5). In the Maternal and Child Institute in Bogotá, Colombia, for example, almost one of every five patients is admitted for abortion complications (187, 572). Some maternity hospitals in Iran and Mexico have treated one abortion case for every seven or eight patients (217, 347). In Rangoon, Burma, 40-45 percent of admissions at the Central Women's Hospital are abortion-related (313).

Obstetrical and gynecological services report even higher rates (see Table 6). In some Nigerian and Ethiopian hospitals, abor-



**Overburdened with abortion complication cases, many hospitals in developing countries have insufficient resources to provide adequate care to all women, including those having term deliveries. In this maternity ward in Jamaica, each bed holds two mothers and their babies. The women must leave the hospital after 24 hours. (Pickerell/World Bank)**

**Table 5. Admissions for Complications of Illegal and Spontaneous Abortion as a Proportion of All Hospital Admissions, Selected Studies, 1963-1979**

Region & Country	Ref. No.	Period & Place of Study	No. of Admissions for Abortion Complications	% of All Hospital Admissions Attributed to Abortion Complications
<b>AFRICA</b>				
Kenya	286	Annual average, Kenyatta National Hospital, Nairobi	5,050 <sup>a</sup>	5
Nigeria	242	1970-1972, Lagos Island Maternity Hospital	6,110	7.9
Tanzania	93	Annual average, Bugando Hospital, Mwanza	1,250	.5
<b>ASIA</b>				
Burma	313	Annual average, Central Women's Hospital, Rangoon	7,765 <sup>a</sup>	40-45
India	377	Jan. 1969-June 1969, Vani Vilas Hospital, Bowring and Lady Curzon Hospital, K.C. General Hospital, Malleswaram, Bangalore City	981	9.32
<b>MIDDLE EAST</b>				
Iran	217	1960-1967, Farah Maternity Hospital, Teheran	37,592	14
<b>WESTERN HEMISPHERE</b>				
Brazil	398	1968, large hospital in Belo Horizonte	4,000 <sup>b</sup>	40
Chile	363	1958-1960, National Health Service hospitals	NA	8.1
Colombia	187	Annual average, Maternal and Child Institute, Bogotá	6,000	20
	282	1965, Maternal and Child Institute	5,738	19.3
	572	1970-78, Maternal and Child Institute	54,705	18
El Salvador	308	1969-1973, hospitals and health centers	42,353 <sup>c,d</sup>	4.8
Mexico	347	5 years, 3 large Mexican Social Security Institute Maternity hospitals in Federal District	61,964	14
	390	Annual average, Hospital Gineco Obstetrica No. 2, Mexican Social Security Institute	2,020 <sup>a</sup>	15 <sup>a</sup>

<sup>a</sup>Estimate; includes admissions for therapeutic abortions performed in hospital

<sup>b</sup>Only admissions for abortions induced outside the hospital

<sup>c</sup>Discharges

<sup>d</sup>Excludes legally induced abortions

**Table 6. Treatment of Spontaneous and Induced Abortions as Proportion of Gynecological Services: Operations, Admissions, or Beds, Selected Studies, 1970-1977**

Region & Country or Area	Ref. No.	Period & Place of Study	Percentage of Services Committed to Abortion Complication Cases
<b>AFRICA</b>			
Ethiopia	16	1965, Adeoyo Hospital, Ibadan	43% of 1,055 admissions
		1966	48% of 1,288 admissions
		1967	57% of 1,317 admissions
Ghana	28	1967-68, University Teaching Hospital, Addis Ababa	31% of 666 admissions
		Korle Bu Hospital, Accra	39.47% of 76 beds
Nigeria	16	1964, Lagos University Teaching Hospital	18% of 951 admissions
		1965	20% of 967 admissions
		1966	15% of 804 admissions
Nigeria	342	1967	14% of 953 admissions
		July 1974-Feb. 1975, University of Benin Teaching Hospital, Benin City	25% of 555 admissions
<b>MIDDLE EAST</b>			
Jerusalem	310	1970, 2 hospitals, West Bank	50% of 702 operations
<b>WESTERN HEMISPHERE</b>			
Jamaica	436	All hospitals	20% of beds

**Table 7. Average Amount of Hospital Blood Supply Used Annually to Treat Abortion Complications, Selected Studies, 1963-1973**

Region & Country or Area	Ref. No.	Period & Place of Study	Average No. of Abortion Cases	Volume of Blood Used for Abortion Cases (liters)	Percentage of Hospital Blood Supply
<b>AFRICA</b>					
Ghana	28	1968-1969, Korle Bu Hospital, Accra	NA	1,023.1	41.3
	25	1970-1972, Effia-Nkwanta Hospital (semi-rural area)	848 <sup>a</sup>	42.7	8.9 <sup>b</sup>
		1970-1972, Koforidua Hospital	336 <sup>a</sup>	6.6	2.7 <sup>b</sup>
Mauritius	25	1970-1972, 2 urban and 7 rural hospitals	2,059 <sup>a</sup>	NA	~18 <sup>b</sup>
Uganda	25	1970-1972, Mulago Hospital, Kampala	1,709 <sup>a</sup>	170.1	3.4 <sup>b</sup>
<b>MIDDLE EAST</b>					
Jerusalem	310	1970, 2 major Jordanian hospitals	351	30	
		hospital in Nablus, West Bank	695	.5-1	
<b>WESTERN HEMISPHERE</b>					
Chile	363	1962, emergency departments in all hospitals, Santiago	NA	NA	26.7
Colombia	512	1966-1968, University Hospital of Caldas	1,229	NA	4.6

NA = not available

<sup>a</sup>Includes some therapeutic induced abortions

<sup>b</sup>Percentage of blood used in period rather than percentage of supply

tion cases account for 25 to 57 percent of all gynecological admissions (16). In Jamaican hospitals septic abortion cases alone occupy 20 percent of the beds in gynecological wards (436).

Abortion complications can also be measured in relation to the number of deliveries in a hospital. Even where birthrates are high, the ratio of hospitalized abortion complications to hospital deliveries is substantial. Hospitals in Lebanon, Kuwait, and Morocco, for example, treat 100-200 abortion cases for every 1,000 deliveries (54, 162, 188, 246). The ratios in Chile, Colombia, Mexico, and several African countries are even higher (25, 513, 547, 572). In 1972, Kenyatta National Hospital, Nairobi, Kenya, admitted 437 abortion cases for every 1,000 deliveries (25). While these figures provide a rough indication of the proportion of hospital costs that can be attributed to abortion complications, they do not provide a full picture because abortion complications may require more care and more expensive treatment than normal delivery or other obstetrical and gynecological care.

#### Blood Supply

Since hemorrhage is a frequent and major complication of illegal abortion, treatment of complicated abortions often uses large quantities of blood. In many developing countries, blood is costly and in short supply (112). In African and Latin American hospitals anywhere from 3 to 41 percent of all blood used goes to illegal abortion cases (see Table 7). In the emergency services of all Santiago, Chile, hospitals in 1961, for example, women with abortion complications, the largest group of patients seeking emergency care, received 18 percent of all transfusions and used 27 percent of emergency blood reserves (363).

Blood transfusions account for much of the cost of treating abortion complications. A World Health Organization (WHO) study in Turkey and Venezuela attributed 49 percent of the expense of treating illegal abortion cases to transfusions. Transfusions were the single most expensive aspect of treatment—more costly than surgery, anesthesia, laboratory studies, medication, intravenous fluids, or other procedures. In an Ankara, Turkey, hospital the average cost of blood alone for an illegal abortion case was 2.5 times the cost of a legal therapeutic abortion (537).

#### Hospital Stay

Hospital stays for abortion complications average two to four days (see Table 8) but vary greatly, depending upon the extent of complications. Women with incomplete abortions (often spontaneous) without other complications may stay two days or less (234, 275, 392), but where complications are more frequent and severe, mean hospitalization may be as long as seven days, as reported by one Nigerian hospital. The Nigerian patients studied, all women under age 20, had high rates of tetanus and other serious complications (15). Sepsis, the most frequent major complication of illegally induced abortion, often causes prolonged hospital stays. In a hospital in San Salvador, El Salvador, for example, the average hospital stay for 525 patients treated for septic abortions between 1974 and 1978 was 6.4 days (206).

Extended hospitalization of course adds to costs. In a Santiago, Chile, hospital, for example, the cost of beds for all abortion patients during six months in 1974 was approximately \$23,690 (US). According to an estimate by Rafael Viada and colleagues, if the 80 percent of the patients whose abortions were presumed to have been illegally induced had undergone abortions performed by physicians, the total hospitalization required

Table 8. Mean Hospital Stay for Abortion Complication Cases, Selected Studies, 1970-1980

Region & Country	Ref. No.	Period & Place of Study	No. and Type of Abortion Cases	Mean Hospital Stay or Percentage Distribution
<b>AFRICA</b>				
Ghana	99	Feb. 1972-May 1973, University of Ghana Medical School, Accra	104 septic 1,021 nonseptic	3.9 days 1.9 days
Nigeria	15	1963-1967, Lagos University Teaching Hospital, Benin City	134 spontaneous and induced for women less than age 20	7.1 days
	342	July 1974-Feb. 1975, University of Benin Teaching Hospital	59 induced	11.9% 1-2 days 33.9% 3-6 days 47.4% 7-21 days 6.8% approximately 42 days
	242	1972, Lagos Island Maternity Hospital	1,990 spontaneous and induced	90.4% 1-5 days 6.6% 6-10 days 3.0% 11-30 days
Uganda	266	Nov. 1973-Nov. 1974, Mulago Hospital, Kampala	1,377 spontaneous and induced	92.7% 1-5 days 5.5% 6-10 days 1.5% 11-35 days 0.3% 36 or more days
<b>ASIA</b>				
Bangladesh	52	1978, Chittagong Medical College Hospital	266 spontaneous and induced	3.9 days
	214	Nov. 1978-Aug. 1979, Sir Salimullah Medical College Hospital, Dacca	607 spontaneous and induced	2.2 days
India	360	1971-1973, Government Erskine Hospital, Madurai	393 septic	72% 1-7 days 20% 2 weeks 8% 3-5 weeks
	223	Jan. 1977-Dec. 1978, Government Erskine Hospital, Madurai	380 septic, induced	55% less than 7 days 30.5% 7-15 days 14.5% more than 15 days
	351	1973-1977, L.N.J.P. Hospital	190 septic	9.3 days
Indonesia	47	1972-1974 (about 28 months), University of Indonesia at Jakarta	158 septic 270 nonseptic	2.5 days 3.0 days
Thailand	568, 569	1968-1976, Siriraj Hospital, Bangkok	3,182 induced	79.4% less than 6 days 16.7% 6-10 days 3% more than 10 days
	381	May 1969-Feb. 1970, Ramathibodi Hospital, Bangkok	144 spontaneous, induced, and therapeutic	4 days
<b>MIDDLE EAST</b>				
Egypt	47	June 1971-June 1973, Kasr-el-Aini Hospital, Cairo	16 septic 511 nonseptic	2.8 days 1.5 days
	222	1969, Kasr-el-Aini Hospital, Cairo	1,620 spontaneous and induced	6.4 days
Jordan	310	1970, 2 general hospitals in Jerusalem, West Bank 1970, Nablus Hospital, West Bank	351 spontaneous and induced 695 spontaneous and induced	36-48 hours 36-48 hours
Sudan	410	Spring 1974-Dec. 1974 (about 8 months), Omdurman Maternity Hospital, Khartoum North Obstetrics Section and Khartoum General Obstetrics Section	1,117 spontaneous and induced	1.3-2.6 nights
<b>WESTERN HEMISPHERE</b>				
Chile	513	May 1974-Oct. 1974, Felix Bulnes Hospital, Santiago	602 incomplete abortions*	2.5 nights
	69	1967, San Francisco de Borja Hospital	49 septic 51 nonseptic	4-8 days 2-3 days
Colombia	392	1974-1975, 10 hospitals	2,423 spontaneous and induced	1.5-5.8 days
Jamaica	203	1971, Victoria Jubilee Hospital, Kingston	259 septic 1,500 incomplete	almost 6 days almost 2 days
Venezuela	537	NA	12 induced 329 probably induced 139 possibly induced 412 spontaneous	4.5 days 3.5 days 2.8 days 2.5 days

\*3% hydatidiform mole (1 case) and threatened abortion (17 cases)

Table 9. Price of Illegal Abortion to Individual, Selected Developing Countries

Region & Country	Ref. No.	Period	Type of Abortion or Abortion Practitioner	Price		Per Capita National Disposable Income <sup>a</sup>
				Local Currency	\$ (US)	
<b>AFRICA</b>						
Ghana	24	1970	Instrumentation "Twig" dilators	6-40 new cedis 3 new cedis	\$2.00-14.50 <sup>b</sup> \$1.00	\$396 (1974)
Nigeria	367	NA	Lay abortionist	"a few naira"		NA
Kano		NA	Physician	15 naira	\$46.50	
Lagos		NA	Physician	50-80 naira	\$155-248	
Tanzania						
Dar es Salaam	434	1979	Physician in private hospital		\$150-200	\$168 (1976)
<b>ASIA</b>						
Bangladesh	403	1979	Traditional midwife	60 taka	\$4.00	NA
			Nurse or midwife	111 taka	\$7.00	
			Registered physician	249 taka	\$16.50	
Hong Kong	1	1977	Private physician		\$200.00	NA
Indonesia	416	NA	Traditional midwife	0	\$0	\$66 (1970)
			Private physician or trained midwife	10,000-75,000 rupiahs	\$25-175	
Korea						
Seoul	197	1977-1978	1st trimester	15,000 won	\$30	\$652 (1976)
			2nd trimester	50,000 won	\$100	
Pakistan						
Lahore	405	NA	NA	0-399 rupees	\$0-100 <sup>b</sup>	
Philippines	155	1979	Catheter insertion	20-700 pesos (average 185)	\$2.50-94.00 (\$24.50)	\$369 (1976)
			Massage	2-250 pesos (average 52)	\$.50-33.50 (\$7.00)	
			D&C	600-2,500 pesos (average 850)	\$80.50-336.00 (\$114.50)	
Cavite Province	146	1976	Traditional midwife	0-80 pesos <sup>c</sup>	\$0-10.50 <sup>b</sup>	NA
			Licensed midwife providing tablet	0-1 pesos	\$0-.50 <sup>b</sup>	
			Nurse providing tablet	0-4 pesos <sup>c</sup>	\$0-.50 <sup>b</sup>	
			Physician providing D&C	100-300 pesos <sup>c</sup>	\$13.50-40.50 <sup>b</sup>	
Taiwan	101	NA	Physician		\$10-20	NA
Thailand	318	1978	NA		\$0-300	\$351 (1976)
	111	NA	Physician providing D&C	1,000-1,600 baht	\$50-80	
			Nurse, midwife, injection seller, various laymen providing injection	800 baht	\$40	
			"Cruder methods"	300-500 baht	\$15-25	
<b>MIDDLE EAST</b>						
Jordan	116	NA	NA	25-30 (English) pounds	\$56.00-67.00	NA
Lebanon	54	NA	Physician	100-600 pounds	\$29.50-176.00	NA
Turkey	226	NA	General practitioner	3,000 liras	\$50	NA
			Obstetrician-gynecologist	10,000 liras	\$150	
<b>WESTERN HEMISPHERE</b>						
Chile	208	1980	Physician		\$100	\$659 (1975)
Ecuador	432	NA	Nurse-midwife	Minimum	\$10	\$623 (1976)
			Physician	200 sucres		
				Maximum	\$40	
				800 sucres		
Jamaica	202	1971	NA		\$0-30+	\$1,307 (1976)

NA = not available

<sup>a</sup>Data from UN Statistical Yearbook 1977 (596)<sup>b</sup>Based on exchange rates on June 10, 1980<sup>c</sup>Dependent on type of abortion

would have been only 200 nights in contrast to the 1,517 nights actually spent and would have cost only \$3,123 (US), a savings of 87 percent (513).

In addition to the longer use of a bed, complicated cases require more laboratory and pharmaceutical resources and more attention from health care personnel. Using records from a hospital in the Dominican Republic, Antonia Ramírez and Ezequiel García calculated that treating a complicated abortion cost \$176 (US) — more than twice as much as treating an incomplete but otherwise uncomplicated abortion and more than 12 times as much as a normal birth (375). In Kasr-el-Aini Hospital in Egypt the daily cost of treating a complicated abortion case in 1968 was five times the cost of treating an uncomplicated abortion case (222).

Many developing countries lack the resources to pay these costs and at the same time to meet basic needs in maternal and neonatal health. Under the combined impact of high birthrates and high rates of hospital admission for abortion complications, hospitals are hard pressed to provide quality care. When the volume of abortion-related cases requiring special attention is heavy, fewer beds, less staff time, and fewer supplies are available for women needing other obstetrical and gynecological care, including family planning services.

One result is that both the women giving birth and the women with abortion complications may be discharged too soon. Commenting on the shortage of hospital beds in Latin America, Benjamin Viel noted that women giving birth were forced to leave the hospital shortly after delivery and to resume household chores before they were fully recuperated, possibly contributing to maternal and neonatal morbidity and mortality and to subsequent gynecological problems (514). In some hospitals in Africa and the Middle East, hospital policy requires that abortion patients be discharged 24 to 48 hours after admission (28, 222, 266, 310). Ironically, the current high volume of abortion complications and deliveries makes it difficult for hospitals to allocate the space and time needed for family planning services that could in the long run ease the burden of illegal abortion complications (see "Abortion and Contraception," p. F-126).

### The Price of Abortions

The cost of illegal abortion falls on individual women as well as on hospitals and public facilities, and paying for an illegal abortion can create enormous personal hardship. The price of an illegal abortion varies widely, from no fee to \$300 (US) (see Table 9). Traditional birth attendants and other nonmedical abortionists often charge fairly low fees and at times accept goods in exchange for the abortion (146, 416, 367, 448). Medical professionals, on the other hand, may exact high fees. In Dar es Salaam, Tanzania, a country where the per capita national disposable income is \$168 per year (596), physicians charge between \$150 and \$200 for dilatation and curettage (D&C) (434). Physicians in Chile, Hong Kong, Indonesia, Jordan, Thailand, and Turkey charge between \$100 and \$300 (1, 116, 208, 226, 318, 416). The safest and most effective abortions are the most costly; for poor women, only the more dangerous methods and less trained practitioners are affordable (515).

The price of an illegal abortion is not limited to the provider's fee. Added is the cost of any drugs or preparations used to alleviate subsequent complications and the price of transportation to a hospital. In addition, there are the indirect costs of the abortion—the loss of pay from missed work days, the loss of a

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woman's services to her family for the period of her hospitalization, and the permanent loss if she dies. Thus, the economic and social burden of abortion complications is substantial even without the cost of hospitals and medical services.

### CLINICAL MANAGEMENT

The most frequent major complications of illegal abortion are excessive blood loss, pelvic infection, and shock (536). Trauma to the reproductive organs is also common. Since many illegal abortions, particularly in South Asia, are induced with twigs or sticks (396, 403), major uterine and intestinal perforations are often reported (25, 50) (see photo, p. F-122). Unlike uterine perforations resulting from abortions performed by trained medical personnel (149, 320), tears caused by twigs or other instruments often cannot be managed conservatively and may require immediate laparotomy (279) and sometimes hysterectomy (482).

The incidence of hemorrhage requiring transfusion among women hospitalized for abortion complications varies widely, ranging from only 2 percent reported in hospitals in Thailand and Ghana (25, 234) to 45 percent reported in a Bangladesh hospital (214). Hemorrhage is more frequent after illegally induced abortions than after spontaneous abortions, and, in fact, is often used as a criterion for determining whether an abortion is illegally induced (44, 214). The role of hemorrhage in mortality is difficult to assess. Many investigators do not specify the cause of death in abortion cases; when they do, infection, septic shock, and tetanus are more frequently mentioned. Procedures for transfusion are well established, but the lack of sufficient blood supplies remains a major difficulty. Other complications — particularly septic abortion, septic shock, and renal failure — pose more complex problems of management.

### Septic Abortion

Septic, or infected, abortion is one of the most commonly treated conditions in obstetrical and gynecological services in developing countries. The vast majority of cases of infection stem from induced abortion, although sepsis can also result from premature rupture of the fetal membranes (60, 418), from spontaneous abortions, particularly in areas where medical treatment is inaccessible (16), and from chronic renal disease. Nonsterile instruments used by unskilled abortion providers contribute to the incidence of infection in illegal abortion (10, 187, 266, 483), thereby increasing the risk of death. A recent US study reports that the risk of dying from sepsis after illegal abortion is over 50 times greater than after legal abortion (176).

Although clinical criteria vary, abortion is usually considered septic when there is:

- a fever of at least 38°C for 24 hours or more
- foul smelling or purulent vaginal or cervical discharge, and
- other evidence of pelvic infection such as lower abdominal pain and rebound (58, 87, 137, 189, 303, 329, 342, 381, 418, 429, 551).

The amount of bleeding does not indicate sepsis; uterine bleeding may be slight or heavy. In cases where uterine perforation has occurred, there may be internal hemorrhage (87, 551). The patient's pulse is full, rapid, and bounding (551). During pelvic examination, manipulation of the cervix usually produces severe pain, while in a woman with spontaneous abortion the same procedure causes little discomfort (87). Evi-

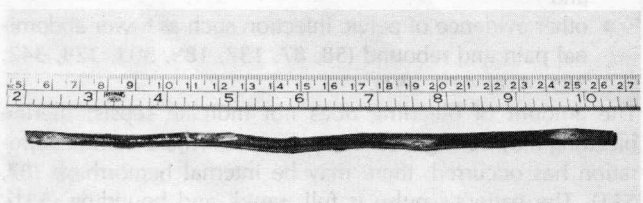
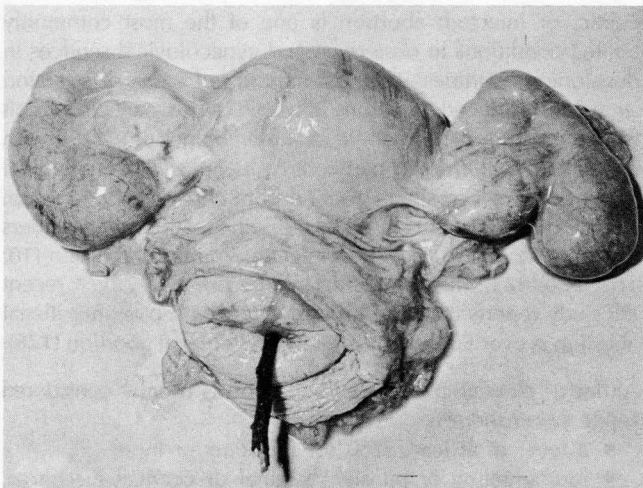
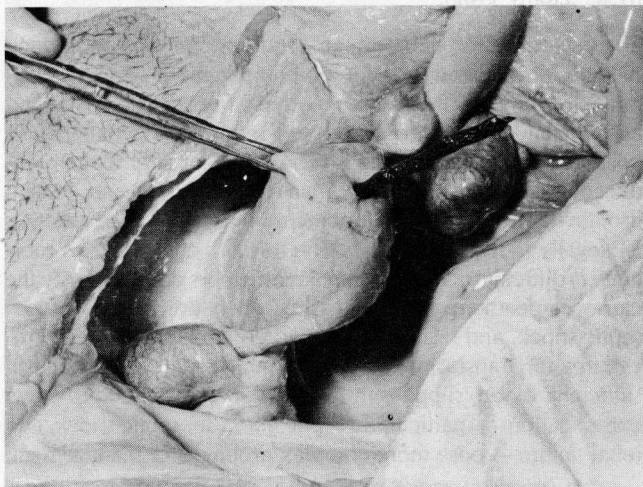
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dence of interference — tenaculum marks on the cervix or vaginal lacerations, for example — may be observed (87, 551).

The severity of septic abortion depends in part on the extent of the infection. The prognosis is most favorable when infection is limited to the uterus and its contents and least favorable when infection has spread beyond pelvic structures. The most serious complication of septic abortion is septic shock, acute circulatory failure associated with infection (524), which accounts for the majority of abortion-related deaths. Thus, the physician's major concern in treating septic abortion is to prevent septic shock (253).

Management of septic abortion calls for:

- large doses of antibiotics to control infection
- monitoring and correcting blood volume, and
- early removal of the source of infection (20, 60, 71, 87, 137, 253, 402, 427, 430, 525).



A twig inserted into the cervix to induce abortion may perforate the uterus and also the intestines, necessitating laparotomy and sometimes hysterectomy, as in this case in India. (Courtesy of Rohit Bhatt)

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Where facilities are available, laboratory tests for diagnostic purposes are recommended, including smears and cultures from the uterus, cervix, and blood to identify the dominant microorganisms and to check for sensitivity of the microorganisms to antibiotics; complete blood counts; urinalysis; evaluation of serum electrolytes; and coagulation studies. An upright X-ray of the abdomen and pelvis is advisable (87, 253, 426) to check for the presence of catheters or other foreign bodies within the uterus or peritoneal cavity and to help identify uterine perforation or peritonitis.

#### Use of Antibiotics

The practitioner's initial choice of antibiotic is based on a knowledge of the pathogens normally associated with septic abortion, usually a mixture of two or three microorganisms (406). Generally these microorganisms are the gram-negative bacilli (that is, bacilli not retaining a stain in the Gram method of staining). Particularly common are *Escherichia coli* (60, 78, 109, 128, 137, 176, 218, 430, 525) and *Bacteroides fragilis* (252, 253, 406). Gram-positive cocci, particularly enterococcus and beta hemolytic streptococcus are also frequent (430, 572, 577). Since some of these pathogens are aerobic (oxygen-requiring) and some anaerobic (requiring no oxygen) organisms, initial antibiotic selection must include broad-spectrum drugs which cover both types of bacteria. If culture and sensitivity tests can be conducted to identify the particular bacteria causing the infection, more specific drugs can then be selected.

When the gram-stained smear detects gram-positive drumsticks, infection by *Clostridium perfringens* (*Clostridium welchii*) or *Clostridium tetani*, bacteria which cause gas gangrene and tetanus, respectively, is a possibility. While some practitioners advocate immediate hysterectomy in such cases (60, 71, 551), particularly when tetanus is suspected, others recommend deferring radical surgery unless symptoms such as parametrial tenderness, abdominal or intrauterine gas formation as seen by X-ray (see photo, p. F-123), or evidence of red blood cell lysis (separation of hemoglobin from the red blood cells) or coagulation occur (253, 430). Gas formation can also be detected by physical examination. During a pelvic exam, the attendant will be able to palpate gas while pressing against the pelvic organs with the abdominal and vaginal examining fingers.

Initial antibiotic therapy should always be parenteral and intensive. High doses should be continued unless the woman's clinical response or culture and sensitivity tests provide an indication for changing the initial antibiotic regimen.

Penicillin is the antibiotic most frequently used for septic abortion, with dosages ranging from 20 to 30 million units given intravenously daily (189, 551). Traditionally, penicillin has been administered alone (78, 329, 411, 418, 461) or in combination with streptomycin (118, 169, 218, 220, 260, 261, 381, 450, 480). Since the involvement of *B. fragilis* in septic abortion has been recognized, drugs specifically effective against this microorganism and other gram-negative anaerobes have been used. These drugs include chloramphenicol (86, 428, 430, 491, 525), clindamycin (243, 293, 428, 563), and the newer tetracyclines such as doxycycline (252, 253). Kanamycin and gentamycin also are useful for gram-negative organisms (253, 290, 406, 430). Recommendations for specific dosages of antibiotics may be available from package inserts and labeling or from pharmaceutical manufacturers and distributors in each country.



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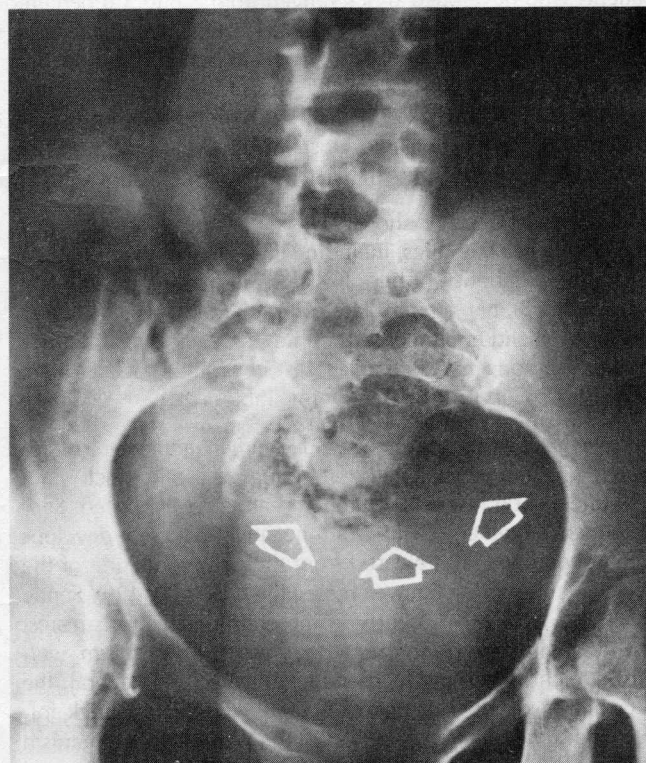
Thirty thousand units of tetanus antitoxin should also be given intramuscularly after skin testing if the woman has not already been immunized (87, 551).

Two randomized clinical trials conducted in the United States have compared the effectiveness of different antibiotic regimens in the management of women with septic abortions. Evaluating the patients' duration and persistence of fever after evacuation of the uterus, Donald R. Ostergard found no significant differences between a group of women treated with penicillin and chloramphenicol and a group treated with cephalothin and kanamycin (349). By contrast, Anthony W. Chow and colleagues found significant differences between treatment regimens of penicillin with chloramphenicol and of clindamycin alone. While hospital stay and duration of fever were similar in the two groups, women given penicillin with chloramphenicol had significantly fewer major complications than women given clindamycin (102).

### Monitoring Blood Volume

To assure adequate blood circulation to all body organs and thus prevent circulatory shock and renal failure, monitoring of blood volume should be started as soon as a woman arrives for treatment; any fluid and electrolyte imbalance should be corrected. If blood is available, in cases of severe blood loss—500 ml or more—blood transfusions should be carried out before any surgery is attempted (87). Both urine output and, if equipment is on hand, central venous pressure (CVP) should be monitored.

The results of fluid monitoring govern volume replacement therapy. If urine output, as measured by a Foley catheter, exceeds 30 ml per hour, blood circulation to the tissues is adequate (551). If urine output drops below 30 ml per hour, the attendant must consider whether or not to begin fluid therapy.



**Intramymetrial gas in a septic abortion, caused by gas-producing microorganisms, often *Clostridia*. Some advocate immediate hysterectomy in such cases.** (Courtesy of Theodore M. King)

CVP, an accurate measure of circulatory blood volume, provides a guide for fluid replacement. When CVP is low—zero to 5 cm of water—fluid replacement therapy is necessary to correct hypovolemia (decreased volume of circulating blood). When CVP is above the normal range of 6 to 12 cm of water, overhydration and subsequent pulmonary edema are possible, and intravenous fluids should be sharply restricted (87, 110, 189, 411).

When CVP is not available, several clinical signs can indicate a woman's fluid level. When there is too much circulating fluid, the jugular veins in the neck often are distended. In addition, the attendant may be able to hear moist rales (abnormal sounds indicating the presence of fluid) at the base of the lungs, signifying pulmonary edema and potential congestive heart failure. When there is too little circulating fluid, there is reduced urine output and increased specific gravity of the urine. A specific gravity of 1.020 or more indicates inadequate fluid volume (230). Tachycardia (rapid heart beat) and a thready pulse also will be present.

Monitoring fluid balance is essential to early detection of renal failure, one of the most serious complications of septic abortion. Renal failure usually stems from the effects of the infection, although it can also be caused by toxic compounds used to induce abortion, such as soap or household antiseptic solutions (189). Early detection and treatment of renal failure are essential to prevent death. Treatment should be aimed at maintaining fluid and electrolyte balance. Without dialysis, however, managing renal failure is very difficult. The following measures may be useful in treatment:

- limit fluid intake to insensible loss (the amount of fluid lost through respiration and perspiration) (189)
- monitor fluid intake and output and the patient's daily weight to manage water balance (560)
- initiate procedures to maintain low levels of potassium
- provide carbohydrates to retard elevation of nitrogen levels (560).

### Evacuation of the Uterus

Surgery is the third major element of treatment for septic abortion. In the West surgical management of septic abortion has been a subject of controversy: whether the uterus should be evacuated as soon as antibiotic therapy is begun or only after the infection has been controlled. Delaying curettage increases the likelihood of septic shock and hemorrhage (176, 426, 456), but the surgical intervention itself may lead to transient septicemia ("blood poisoning") and hypotension (low blood pressure) immediately after surgery (253). Randomized clinical trials comparing the medical consequences of the two treatment approaches have not been reported, but over the last 30 years the philosophy of treatment has changed dramatically. Whereas immediate evacuation of the uterus once was discouraged, it now is favored. By the early 1970s most US and European clinicians had adopted an aggressive approach and now intervene surgically within 24 hours of a woman's hospital admission, irrespective of fever (68, 88, 253, 411, 418, 426, 463, 554).

This shift in practice is illustrated by changes in successive editions of *Williams Obstetrics*, a widely used US textbook (426). In 1941 the text advised:

... if infection has supervened the less we disturb bodily defense mechanisms, the better our results. In the very exceptional case, however, the febrile reaction to infected abortion is so marked as to indicate that the inflammatory process is not being

properly controlled by the tissues, and it may then become advisable to empty the uterus by the most conservative and atraumatic means. (458)

By 1966, the recommendations had changed significantly:

In our experience, infection confined to the uterus is best treated by immediate evacuation of the uterus although as stated there is a more conservative school of thought. (132).

In developing countries, surgical practices vary widely among hospitals. In Colombia, for example, the university hospitals prefer immediate uterine evacuation, while some other hospitals delay curettage for 12 to 24 hours after admission (391). In other countries, current practices range from evacuation within 2 to 6 hours of admission, as in some hospitals in Brazil and Mexico (117, 301), to delays of 24-48 hours after initiation of antibiotic therapy, as in some hospitals in India, Ghana, Zambia, and Nigeria (22, 279, 357, 402), or until the infection is controlled, as in some hospitals in India, Burma, and Bangladesh (213, 218, 225, 313, 360, 529).

Delaying curettage may increase the risk of death from infection. In a recent US study of 36 women who died from septic abortion between 1975 and 1977, 66 percent were found to have retained products of conception. The death-to-case rate for women with incomplete abortion was over 50 times higher than for those whose uteri were adequately evacuated. Retained fetal tissue provides a focus for the development of local infection which then leads to generalized sepsis (176).

Delaying curettage leads to longer hospital stays and higher costs (426). In a clinical study at the University Hospital of St. Vincent de Paul in Colombia, 615 septic abortion cases were randomly divided into two groups; the first was treated by immediate curettage and antibiotics, and the second by curettage 24-48 hours after the start of antibiotic therapy. The mean hospital stay for the group of women with delayed curettage was 6.8 days compared with 4.9 days for the women with immediate curettage. With delayed curettage, the cost of treatment was 31 percent higher (220).

At a May 1980 seminar on the Diagnosis, Management, and Prevention of High Risk Pregnancy, jointly sponsored by the International Fertility Research Program and Tulane University Medical School, Hiram W.J. Batson summarized the essentials of treatment of septic abortion:

The hazards of incomplete early abortion are hemorrhage, sepsis, renal failure and acute septic shock. The management of incomplete early abortion should be directed toward the control of bleeding and the prevention of infection by prompt evacuation of the uterus. A first trimester abortion should usually be considered incomplete until the uterus has been curetted.

In septic abortion, especially with septic shock, medical management is vitally important, but the need for surgical intervention is frequent. Preoperative preparation by a medical regimen is mandatory, and it must be thorough. A medical and surgical approach should complement each other, but an unnecessary delay before surgery may be fatal. (551)

### Septic Shock

If untreated, septic abortion can lead to septic shock, one of the gravest complications in obstetrics and gynecology. Extensive research, much of it with animals, has shown that septic shock is generally associated with the endotoxin of gram-negative bacilli. It is characterized by reduced blood circulation, inadequate tissue perfusion (blood circulation through the tissues and organs of the body) resulting in deficient oxygen supply to cells, and metabolic acidosis (shift in the pH status of the body toward excess acidity) (85, 265, 418). Septic shock may arise

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Table 10. Mortality from Septic Shock, Selected Studies, 1965-1979

Country	Ref. No.	Cases of Septic Shock	Deaths	
			Number	%
<b>DEVELOPING COUNTRIES</b>				
Brazil	327	42	18	43
Chile	123	26	5	19.2
	510	28	6	21.4
Egypt	137	22	5	22
India	223	54	22*	41
	225	6	2	33.3
	218	9	6	66.6
	378	122	54	44
Nigeria	339	14	2	14.3
Venezuela	271	30	6	20
<b>DEVELOPED COUNTRIES</b>				
United States	89	39	4	11
	412	19	9	47.3
	128	50	11	22
	429	36	12	33
	122	27	6	22

\*Died in hospital or discharged moribund

from other infectious processes, such as chorioamnionitis (infection of fetal membranes) and pyelonephritis (infection of the kidney), as well as from septic abortions.

The incidence of septic shock varies widely among women with infected abortions and depends partly on how soon the woman obtains medical care after the abortion and partly on the virulence of the infecting organism. Before abortion was legalized in the United States, the percentage of septic abortion patients who developed shock ranged from 1.8 to 3.8 percent (128, 418, 461). The incidence in developing countries can be considerably higher. In a sample of 141 septic abortion patients at Tanta University Hospital, Egypt, in 1973, 15.6 percent developed shock (137). In 1,190 septic abortion cases seen at Government Erskine Hospital, Madurai, India, 10.25 percent developed septic shock (378).

With the onset of septic shock, the patient's prognosis depends on a number of variables, including the extent of tissue trauma (252), the experience of her physicians in treating this clinical syndrome (88), her general state of health (243, 418, 444), and the supplies and equipment available. In developing countries mortality among hospitalized cases of septic shock is high, sometimes close to 50 percent (see Table 10).

Despite extensive experience with women and years of research with animals, the pathophysiology of septic shock is not well understood nor is the optimal treatment established. Septic shock associated with gram-negative bacteria develops when endotoxins are released from the cell membrane of the microorganisms which have entered the host (380, 429). Septic shock may also be caused by some gram-positive organisms, however, notably *Clostridium perfringens* (*Clostridium welchii*), which do not produce endotoxins (265). In general, the interruption of normal blood circulation in septic shock follows the same pattern regardless of the type of microorganism (290).

The main features of septic shock are (1) reduced circulating blood volume and (2) deficient tissue perfusion. Some re-

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searchers have suggested that these symptoms are caused by vasoconstriction (429), while others have contended that disseminated intravascular coagulation (widespread clotting in the capillaries) is the major reason for reduced blood flow (277). It is now apparent that both mechanisms are at work (243, 380). Reduced blood circulation leads to tissue damage from hypoxia (deficient oxygenation) and causes widespread capillary leakage, systemic acidosis, and death (243).

While the precise physiological process is not fully understood, physicians have recognized the clinical sequence of septic shock (243, 290, 563). During the first phase, "warm shock," the patient is alert and hypotensive; systolic blood pressure is 85-95 mm Hg. Her skin is warm and moist, and her face may be flushed. Her temperature is usually over 39°C and there is moderate tachycardia — 100-120 beats per minute. Cardiac output is normal or increased and peripheral vasodilation is present. The second stage, "cold shock," is associated with vasoconstriction, decreased cardiac output, acidosis, and reduced urine output. The patient's temperature is often subnormal, her skin is pale and clammy, and she gradually becomes less alert. Unless treatment is instituted, irreversible shock, characterized by coma, cardiac and respiratory distress, and anuria (no urine output), will ensue (109, 411).

Since the abortion attempt and start of infection may precede the onset of symptoms of shock by several days (122, 384, 418), the infection may be far advanced before the woman seeks treatment. Careful monitoring of the patient is mandatory. Manuel Comas and Denis Cavanagh have suggested that the following monitoring schedule be followed if the necessary equipment is available (110):

Clinical Measurement	Frequency
Pulse rate	every 15 minutes
Blood pressure and pulse pressure	every 15 minutes
Central venous pressure (or pulmonary artery wedge pressure)	every 30 to 60 minutes
Urinary output via Foley catheter	every hour
Blood volume	early in course

In addition, all of the laboratory tests recommended for the diagnosis of septic abortion should be conducted.

### Treatment of Septic Shock

Aggressive treatment is required as soon as shock is diagnosed. Such treatment has two primary objectives: to control the infection and to normalize the patient's blood circulation. Both medical and surgical techniques are used. The major elements of medical management are:

- antibiotics
- fluid therapy
- steroids
- vasoactive drugs.

As in the treatment of septic abortion, controlling infection is crucial. Antibiotic therapy should be started immediately (see p. F-122). The administration of intravenous fluids is also essential. In septic shock a substantial portion of the total volume of blood no longer circulates through the body. Thus there is a reduction in the amount of blood returned to the heart (524). To correct this situation, enough fluid should be given to fill the vascular space and produce an adequate venous return to the heart, thereby enabling the heart to pump an adequate cardiac output and begin restoring normal circulation (182).

The amount of fluid required to restore adequate cardiac output and tissue perfusion can be determined by urinary output

measured by a Foley catheter and central venous pressure (CVP) or pulmonary artery wedge pressure (see p. F-123). Peripheral cuff blood pressure measurements are unreliable in shock (290).

The type of fluid administered depends on the need of the particular patient and the availability of various types of fluid. In cases of hemorrhage, whole blood is required. When there has been no significant blood loss, saline solution, plasma, protein solution, 5 percent dextrose in water, Ringer's lactate solution, and other electrolyte-containing fluids have been used (86, 182, 243, 290, 444).

The use of drug therapy for septic shock, particularly steroids and vasoactive agents, has been a source of controversy. With steroids, there is now increasing agreement that they are useful and should be given (411), although their mode of action is still not clearly understood (19, 21, 71, 79, 86, 107, 137, 182, 243, 265, 271, 290, 378, 381, 425, 426, 444, 456, 491, 563). Steroid therapy performs three major functions:

- It improves blood circulation and tissue perfusion (21, 79, 86, 182, 290, 425, 443).
- It preserves cell and lysosomal membranes, thereby preventing cellular damage (21, 79, 182, 290).
- It extends the woman's life long enough to allow other forms of treatment, especially antibiotics, to act (21, 182).

Steroids are most effective when given in pharmacologic doses early in shock (182, 290). The most frequently recommended steroids are methylprednisolone (21, 79, 86, 182, 290, 426) and dexamethasone (21, 86, 265).

A randomized double-blind study in the US supports the use of steroids in septic shock. The study, which involved male pa-



Hospitals are inaccessible to most rural communities, and small health posts like this one are not equipped to treat complications of illegal abortion such as hemorrhage and septic shock. (PAHO)

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tients at a Veterans Administration Hospital, showed greatly reduced mortality with steroid treatment. Control patients were treated with saline solution, and 33 of the 86 patients died (38 percent). Patients in the study groups received either dexamethasone (DMP) or methylprednisolone (MPS) at the time shock was diagnosed. Only 9 of 86 patients died (10 percent). There was no significant difference in mortality between the DMP- and the MPS-treated groups (425).

Vasoactive drugs have been used extensively in the treatment of septic shock but are now used sparingly. Formerly both vasodilators and vasopressors were central features in treatment regimens. While some still advocate wide use of vasopressor agents (86, 123, 563), others believe these drugs should not be routinely prescribed (182, 243, 444). Currently, clinicians use these drugs only if volume replacement fails to increase tissue perfusion (79, 243, 298, 444).

Dopamine, a naturally occurring catecholamine, has been found to increase coronary, renal, cerebral, and mesenteric blood flow, raise cardiac output, and increase blood pressure (163, 243, 290, 444). A number of clinicians are now advocating its use in septic shock (79, 243, 290, 298, 444, 530).

The second major focus of treatment for septic shock is surgical — removing the source of infection. In the past, surgery was sometimes delayed until medical treatment controlled shock (137, 239, 271). More recent studies indicate that prognosis in septic shock — as in septic abortion in general — is improved if the uterus is evacuated as soon as possible (86, 123, 426, 430). If curettage and early antibiotic treatment do not improve the patient's condition within hours, hysterectomy is recommended (71, 78, 86, 123, 128, 277, 384, 411, 426, 456). Other frequently cited indications for hysterectomy include perforation of the uterus (86, 378, 381, 435, 551), pelvic or myometrial abscesses (60, 86, 426), a uterus larger than 16 weeks gestation (86, 128, 456), the presence of intrauterine *Clostridium perfringens* (60, 71, 86, 378, 384), and the presence of detergent or caustic material in the uterus (60, 86, 265, 551).

Women with septic shock are often the most seriously ill patients any obstetrician or gynecologist treats. Complex medical and surgical decisions as well as costly equipment and supplies are required to save lives. Even in the most advanced hospitals mortality is high. Prevention, then, is the only way to reduce mortality substantially. Providing adequate family planning counseling services and contraceptive supplies is one way that hospitals and medical practitioners can help to accomplish this goal.

## ABORTION AND CONTRACEPTION

The relationship between the use of abortion and the use of contraception is complex. On one hand, both are used by women to prevent unwanted births. On the other hand, studies of national trends and of individuals suggest that use of abortion or contraception is influenced by the availability of various methods and by such personal characteristics as age and parity. In general, if contraceptives are made available, more women hospitalized for abortion complications will use contraception and use more effective methods of contraception than before their abortions. Many physicians and institutions, however, do not yet provide contraceptives to hospitalized

women (206, 528), even though the major modern contraceptive methods — OCs, IUDs, and sterilization — appear to be effective and safe for use immediately after abortion.

### National Trends

On a regional or national level the relationship between contraception and abortion varies in different areas. With the introduction of intensive family planning programs, abortion rates may rise, remain the same, or decline, depending on the relative availability of abortion and contraception and on previous fertility control patterns. In Korea and Taiwan family planning programs were introduced at a time when fertility was high and rates of both contraceptive use and abortion were relatively low. Thus, as the desire for smaller families increased, women turned to both abortion and contraception. In Taiwan, for example, with the development of a national family planning program, the percentage of married women age 22-39 who had ever practiced contraception rose from 28 in 1965 to 76 in 1976. At the same time, the percentage of women in national surveys reporting ever having had an induced abortion also rose, from 9 to 21 (469).

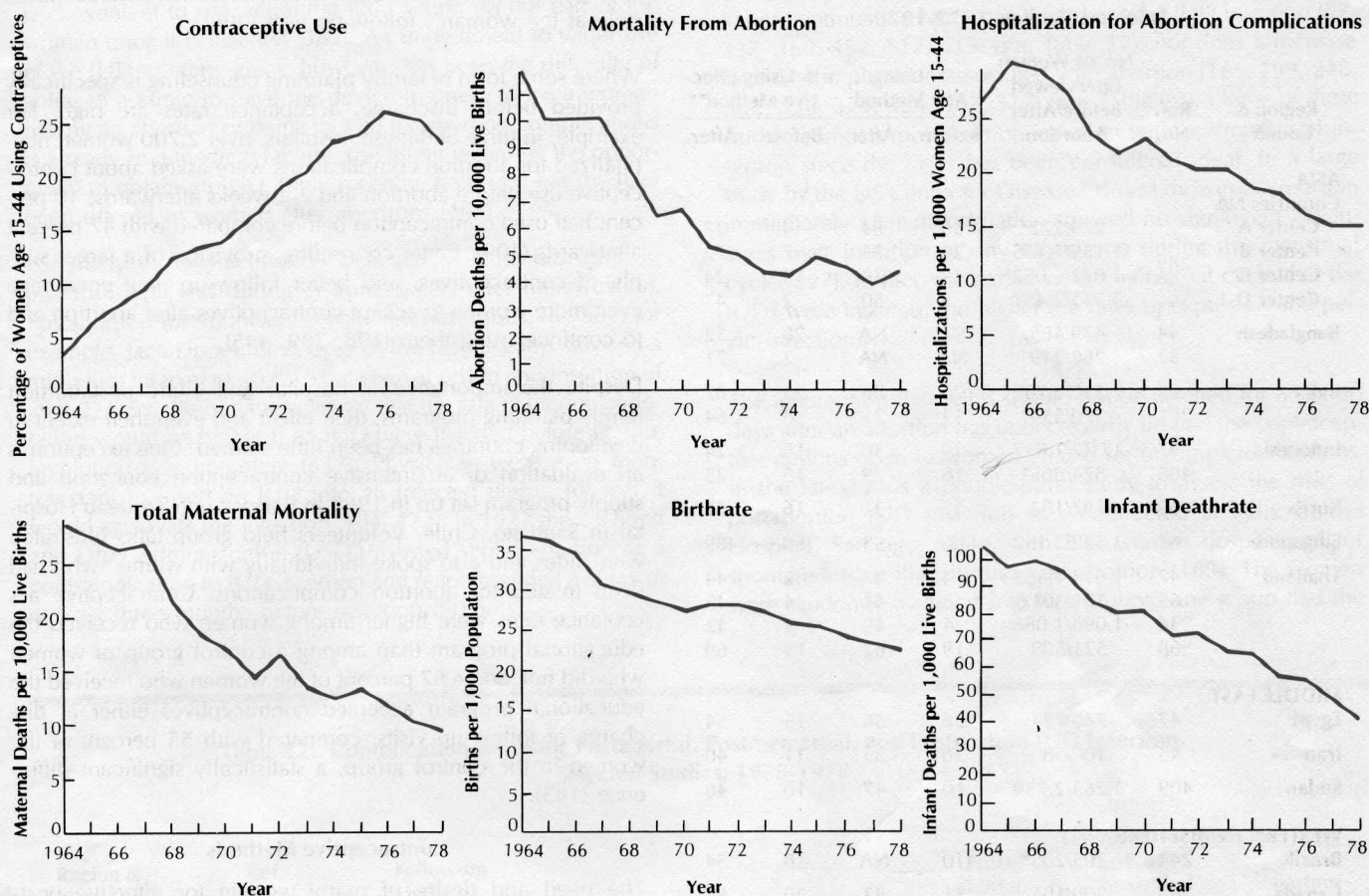
By contrast, in Chile an intensive family planning program began at a time when illegal abortion was apparently very common (see p. F-144) and contraceptive use very low. The program seems to have led to significant declines in hospitalization and mortality from abortion complications as well as to lower birthrates and improved maternal and child health. Thus, in Chile the increasing availability of contraceptives made it possible for women who already strongly desired to control their fertility to use contraception instead of abortion for that purpose. Between 1964 and 1978 the percentage of women age 15-44 using contraceptives increased sevenfold, from 3.2 to 23. During the same period the number of women admitted to Chilean hospitals for abortion complications declined from over 56,000 to 37,900. Maternal mortality from abortion decreased markedly, from 11.8 per 10,000 live births to 4.2 per 10,000 live births (345). While this decline in abortion complications may have occurred in part because more abortions are being performed by physicians, the size of the decrease, occurring simultaneously with declines in the birthrate, the neonatal and infant mortality rate, and the overall maternal mortality rate (see Figure 3), suggests that the number of women relying on contraception rather than abortion to control their fertility has increased and the number relying on abortion has decreased.

### Studies of Individuals

On the individual level, women who are highly motivated to control their fertility will use both abortion and contraception (367). Women who have used contraception are more likely to have had abortions than women who have not used contraception, and vice versa. These relationships have been documented in surveys of women from Korea (198), Brazil (204), Israel (39), Taiwan (103), the Philippines (146), Singapore (471), Turkey (144), and the United States (543).

Having an abortion influences subsequent contraceptive use. More than 20 studies from different parts of the world of women hospitalized for abortion or abortion complications show that, in virtually every case, the number of women who use contraception increases dramatically after an abortion, sometimes as much as tenfold (see Table 11). The percentage using an effective method of contraception also increases, sometimes to an even greater degree. A dramatic example comes from one Asian center, monitored by the International

Figure 3. Rates of Contraceptive Use, Abortion Mortality and Hospitalizations, and Other Public Health Measures, Chile, 1964-1978



In Chile the rapid increase in contraceptive use since 1964 has been linked with a sharp decline in mortality from abortion and in hospitalizations for abortion complications. The decline in abortion mortality has contributed substantially to the drop in maternal mortality. Contraceptive use has lowered the birthrate markedly, and infant death rates also have fallen.

Source: Onetto (345)

Fertility Research Program (IFRP), in a country where abortion is legal. Only 7 percent of 1,159 women were using effective methods of contraception — sterilization, IUDs, or orals — before their abortions, whereas 72 percent chose one of these methods after abortion (289).

The woman most likely to accept contraceptives after abortion is married and has several children. Although the number of unmarried women included in abortion studies in developing countries is often very small, where meaningful comparison is possible, married women usually are more likely to accept birth control than unmarried women (5, 183, 194, 234, 288, 289). This may reflect women's differing perceptions of their immediate need for contraception as well as cultural attitudes about the acceptability of contraceptive use and sexual activity among unmarried women. An exception to the usual pattern is reported in a study of women discharged from 39 hospitals in nine Latin American countries. Among women under 20, the same percentage of married as unmarried women were using contraception when interviewed several weeks after treatment for abortion complications (206).

Maternal age, possibly in part because it is associated with marital status and parity, also affects contraceptive acceptance both before and after abortion. In both developed and developing countries women under age 20 accept contraceptives after abortion less frequently than women over age 20 (2, 5, 183,

206, 268, 270, 288, 289). Contraceptive acceptance among women over 20 varies. In some areas it increases with age (194, 408), while in others little difference is found (194, 289).

Education appears to be less important to postabortion contraceptive acceptance than other personal characteristics. Studies in India (65), four Asian hospital centers (289), Canada (172), and the US (433) have shown no correlation between a woman's education and use of contraception after abortion. By contrast, research in Asia, Sudan, and the Middle East has found a slight decrease in contraceptive acceptance at the hospital as education increased (65, 194, 408). Hamid Rushwan suggests that in Sudan educated women are more likely to obtain their contraceptives elsewhere (408, 409).

While most hospital studies do not separate spontaneous from induced abortion, occasionally researchers have made the distinction. Not surprisingly, women who have had induced abortions have higher rates of contraception both before and after abortion than women aborting spontaneously (44, 234, 289), many of whom may have wanted their pregnancies. A hospital study in Bangladesh, for example, found that 67.2 percent of women with induced abortions used contraceptives before their abortions and 96.2 percent accepted contraceptives at the time of hospital discharge. Among women with spontaneous abortions, 13.8 percent used contraceptives before the abortion and 32.4 percent afterwards (44).

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**Table 11. Contraceptive Use Before and After Hospitalization for Abortion or for Treatment of Abortion Complications, Selected Studies, 1972-1979**

Region & Country	Ref. No.	No. of Women Interviewed Before/After Abortion	% Using Any Method		% Using Effective Method**	
			Before	After	Before	After
<b>ASIA</b>						
<b>Countries NA</b>						
Center A		279/272*	50	84	4	27
Center B	289	1,159/1,155	29	75	7	72
Center C		1,072/1,052	19	30	15	24
Center D		3,533/2,452	3	50	2	47
<b>Bangladesh</b>	44	479/465	NA	NA	28	52
	52	266/249	NA	NA	2	71
<b>India</b>	65	2,230/2,230	25	88	23	87
	281	570/554*	13	71	8	64
<b>Indonesia</b>	47	1,072/1,057	19	30	15	24
	408	874/865*	18	29	15	23
<b>Korea</b>	65	187/184	35	31	16	22
<b>Singapore</b>	65	3,152/3,152	66	93	60	89
<b>Thailand</b>	47	1,613/1,463	4	47	2	44
	65	301/301	5	44	4	43
	234	1,098/1,086	4	45	3	42
	568	521/509	19	82	13	69
<b>MIDDLE EAST</b>						
<b>Egypt</b>	47	740/724	28	56	15	54
<b>Iran</b>	45	100/58	36	55	11	40
<b>Sudan</b>	409	3,263/2,739	10	47	10	46
<b>WESTERN HEMISPHERE</b>						
<b>Brazil</b>	244	205/205*	10	NA	8	54
<b>Canada</b>	268	200/105	51	83	20	83
<b>Chile</b>	513	597/225	22	75	16	69
<b>Colombia</b>	392	2,915/2,284*	20	54	13	50
<b>El Salvador</b>	373	1,273/874	7	39	7	38
<b>United States</b>	270	303/301*	84	91	NA	NA
	288	5,883/3,518*	48	93	45	93

Note: Most studies do not differentiate among women hospitalized for complications of illegal abortion, for complications of spontaneous abortion, or for legal abortion. Inquiries about contraceptive use before hospitalization specified use in the month of conception in most countries, but some studies did not specify. Inquiries about contraceptive use at the time of follow-up were made 2-4 weeks after hospitalization in most studies, but in some studies followed hospitalization by as much as 3 or 6 months.

NA = not available

\*Family planning counseling and/or services provided. For other studies, information not available.

\*\*Effective methods include sterilization, oral contraceptives, IUD, condom, diaphragm, spermicides, and injectables. Some authors report all infrequently used methods, whether effective or ineffective, in a single category; percentage shown in table excludes this category and so slightly underreports actual use of effective methods.

### Availability of Contraception

A woman's willingness to contracept after abortion and her choice of specific methods is influenced not only by her personal situation, but also by the information, supplies, and services available to her at the time of treatment for complications of abortion. Unless the hospital or clinic providing treatment offers contraceptive supplies and services, women may be unable to acquire contraceptives no matter how motivated they are to use them. In many areas, women hospitalized for abortion complications are treated and discharged as rapidly as possible (367), often within 24 hours or less (222, 266, 310),

and their opportunity to acquire advice, information, and supplies is slight. Furthermore, the hospital may have no counseling or referral services at all or may prescribe contraceptives only at the woman's follow-up visit (206).

Where some form of family planning counseling is specifically provided before discharge, acceptance rates are high. For example, in three Sudanese hospitals, over 2,700 women hospitalized for abortion complications were asked about contraceptive use before abortion and 2-4 weeks afterwards; 10 percent had used contraception before compared with 47 percent afterwards (409). Better counseling, provision of a larger supply of contraceptives, and better follow-up may encourage even more women to accept contraceptives after abortion and to continue using them (198, 289, 445).

Despite the importance of hospital and clinic postabortion family planning programs, their effect and even their extent in developing countries has been little studied. One exception is an evaluation of an intensive contraception education and supply program set up in 1969 in Barros Luco-Trudeau Hospital in Santiago, Chile. Volunteers held group talks illustrated with slides and also spoke individually with women who had been treated for abortion complications. Contraceptive acceptance rates were higher among women who received the educational program than among a control group of women who did not. Some 67 percent of the women who received the educational program accepted contraceptives either at discharge or follow-up visits, compared with 55 percent of the women in the control group, a statistically significant difference (183).

### Contraceptive Methods

The need and desire of many women for effective post-abortion contraception raises the question of which methods are most appropriate after abortion and, more specifically, after complicated abortions. Considerable research shows that the major effective methods of contraception — the IUD, oral contraceptives, and sterilization — all are safe and effective immediately after legal abortion. By contrast, the further issue of appropriate methods for use after complicated abortion — an issue of importance to many developing countries — has received little attention.

Even in hospitals where family planning programs do exist, physicians often wait two to six weeks after abortion before they will insert an IUD, perform tubal ligation, or prescribe oral contraceptives (206). Evidence to date does not justify the delay. Unless a woman uses a barrier method successfully in the interim, such a delay can pose greater risks for the woman than any dangers associated with immediate postabortion contraception. The possibility of an unwanted pregnancy, while slight, clearly exists. It has been estimated that roughly 75 percent of women ovulate within 20 days after an abortion (62), and approximately 6 percent of women will conceive within four to six weeks after abortion unless they are using contraception (365).

Furthermore, a substantial proportion of women do not return to hospitals for follow-up and so will miss the opportunity to obtain contraceptives. In one Peruvian hospital, for example, as few as 25 percent of the women returned for postabortion checkups (206). Other studies also report low follow-up rates for both postabortion and postpartum patients (133, 199). If a woman is to be fully protected from the risk of another unwanted pregnancy, contraception must be made available before hospital discharge (164).

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**IUD**

The IUD is an effective method of reversible contraception that is convenient to use, requiring little action on the part of the woman once it is inserted (362). An impediment to wider use of the IUD in many areas, however, has been the difficulty of going to a clinic to have the device inserted. Since a woman having an abortion or being treated for abortion complications is already in a medical facility, she might welcome the opportunity to obtain an IUD. Only recently, however, has the IUD been offered to women after abortions (404).

For many years practitioners believed that the best time to insert an IUD was during or immediately after menstruation. Postabortion insertion was considered hazardous. In 1962, for example, Jack Lippes, developer of the Lippes Loop, advised a minimum interval of 60 days between abortion and insertion of an IUD (259). Physicians believed that the rate of uterine perforation would be higher if an IUD were inserted before uterine involution was complete (337). Physicians were even more reluctant to insert an IUD into an infected uterus, for fear it would aggravate the infection (404, 472). In 1977 the US Food and Drug Administration (USFDA) listed septic abortion as a contraindication to IUD insertion and recommended a delay of at least three months before insertion (505).

These assumptions have been challenged by research findings over the past decade. Studies in various countries have shown that postabortion IUD insertion does not lead to significantly lower continuation rates than postmenstrual IUD insertion (57, 337, 369, 452, 517, 519) (see Table 12), nor does it increase rates of complication associated with abortion (165, 199, 248, 332, 336, 374, 454, 487, 517) (see Table 13). (Some of these studies compare postabortion insertion with postmenstrual insertion since the latter has been considered ideal. In a large study by the US Center for Disease Control, however, insertion immediately after menstruation showed no significant advantages over insertion at any other time during the menstrual cycle (527). In fact, the earlier in the menstrual cycle that the IUDs were inserted, the higher the rates of expulsion and pelvic infection.)

The assumption that IUDs should not be inserted for 60 to 90 days after an abortion has unnecessarily limited the contraceptive options open to women treated for incomplete abortions. In the late 1960s a double-blind study to assess the risks of postabortion IUD insertion was conducted at Felix Bulnes Hospital, Santiago, Chile, with 584 women hospitalized for spontaneous or illegally induced abortion (165). The women were randomly assigned into two groups: one group had the

**Table 12. Complication Rates for Postabortal, Postmenstrual, and Postpartum IUD Insertion, Selected Studies, 1975-1978**

Region & Country	Ref. No.	Follow-up Interval		Timing of Insertion			
				Post-abortal	Post-menstrual	Post-partum	
ASIA India	369	1 year	No. of women	238	250	254	
			% followed up	94	95	95	
			Event Rates <sup>a</sup>	Pregnancy	0.5	0.9	0.0
				Expulsion rate	5.2	2.7	9.4
				Removal (medical)	5.2	5.2	3.1
Continuation rate	73.5	81.2		74.5			
EUROPE Denmark	452	3 months	No. of women	71	78		
			% followed up	86	87		
			Continuation rate <sup>a</sup>				
Sweden	337	1 year	No. of women	245	368		
			% followed up		96		
			Event Rates <sup>a</sup>	Pregnancy	0.4	2.7	
				Expulsion rate	5.3	2.4	
				Removal (medical)	13.9	8.7	
Continuation rate	78.8	82.4					
WESTERN HEMISPHERE Chile	517	8-35 days	No. of women	1,561	1,761		
			% followed up	15.6	19		
			Event Rates <sup>a</sup>	Expulsion rate	3.7	8	
				Removal (medical)	0.5	2.6	
				Continuation rate	94.3	82.9	
	519	1 year		No. of women	1,666	1,228	
			% followed up	70.4	85.5		
			Event Rates <sup>a</sup>	Expulsion rate	11	8	
				Removal (medical)	6.3 <sup>b</sup>	2.6	
				United States	57	1 year	No. of women
Pregnancy	3.7	2.9					
Expulsion rate	10.7	7.2					

<sup>a</sup>Expressed as number of cases per 100 women at time of follow-up.  
<sup>b</sup>Women involved had been admitted to hospital with septic abortions.

**Table 13. Complication Rates for Abortion and for Abortion Plus IUD Insertion, Selected Comparative Studies, 1972-1978**

Region & Country	Ref. No.	Group	Follow-up Interval	No. Cases	Percentage Followed-up	Event Rate (in %)				
						Bleeding <sup>a</sup>	Infection <sup>a</sup>	Reevacuation	Readmission	
<b>ASIA</b>		Control	7 days	185						
				IUD (TCu 200)	130		6.0	1.62		
<b>India</b>	374	Control	7 days							
				IUD (TCu 200)			7.6	.77		
<b>Korea</b>	199	Control	7 days	1,124	33	8.1	5.1			
				IUD (Lippes Loop)	1,104	56	9.4	3.3		
<b>EUROPE</b>		Control	0-8 weeks	144						
				IUD (TCu 200)	154		1.4	7.6		
<b>Finland</b>	487	Control	0-8 weeks							
				IUD (TCu 200)			0.6	4.5		
<b>Sweden</b>	249	Control	1 month	541	100	15				
				IUD (Cu-7)	551	100	8			
	336	Control	8 weeks	436	100	3.7	6.2		6	
				IUD (Cu-7)	1 year	196	100	3.6	3.6	
	454	Control	4 weeks	163					3.1	
				IUD (copper devices)	143					
<b>United Kingdom</b>	332	Control	1 year	718		.84		2.65	4.18	
				IUD (Cu-7)	121	85.94	0		2.48	1.7
				IUD (Dalkon Shield)	121	83.47	0		1.65	0.8
<b>WESTERN HEMISPHERE</b>		Control	25-35 days	292 <sup>b</sup>						
				IUD (Lippes Loop D)	292 <sup>b</sup>		28	4.4		
<b>Chile</b>	165	IUD (Lippes Loop D)	25-35 days	292 <sup>b</sup>		33	2.0			

<sup>a</sup>Definitions and criteria vary among studies.

<sup>b</sup>All women had been treated for abortion complications.

Lippes Loop D inserted before hospital discharge, and the other received no contraception. Both groups of women believed they had been fitted with IUDs even though one group had not, an aspect of the study that has been criticized.

No medically important differences between the two groups were detected when, approximately one month after discharge, 84 percent of the women returned for follow-up appointments. There were no significant differences in duration or amount of bleeding, abdominal pain, or gynecological abnormalities. No pregnancies were detected. There were two differences between the groups: the women with IUDs had a shorter interval between curettage and first menstruation and a heavier menstrual flow compared with previous menses than did women without IUDs. The researchers concluded that postabortion IUD insertion is a "necessary adjunct to more effective family planning services" (165).

Similar conclusions have been reached in research involving women obtaining legal abortions in Sweden (249, 336), Korea (199), Finland (487), India (374), Chile (517), and the US (67, 404). In two studies women whose IUDs were inserted immediately after abortion had fewer postoperative complications than women without IUD insertions after abortion (249, 487) (see Table 13).

The assumption that inserting an IUD into an infected or potentially infected uterus will aggravate infection has not been confirmed. A large international study by the Population Council reviewed data on 2,388 women hospitalized for incomplete abortions in five clinical centers in several developing coun-

tries. The researchers estimated that approximately 80 percent of the abortions had been illegally induced. Women randomly assigned to use IUDs were compared with those without IUDs with respect to hospitalization and extent of fever. There were no differences between the women with and those without IUDs (472).

While IUD insertion may not aggravate infection, IUD performance may be slightly impaired after septic abortion. Observing over 2,200 Chilean women for one year after IUD insertion, Benjamin Viel and Sonia Lucero noted higher rates of IUD expulsion and of removals for medical reasons in women hospitalized for illegal abortions than in women with IUDs inserted after menstruation — 6.3 versus 2.6 percent. The researchers concluded, however, that this difference was not great enough to warrant discontinuing IUD insertion after abortion (519).

A second study in Chile compared complication rates among women receiving IUDs after both septic and aseptic abortions. The women with septic abortions had a higher rate of reinfection in the month after insertion, but the infections were not serious enough to require removal of the IUD. The researchers concluded that IUD insertion after septic abortion is safe as long as it is combined with antibiotic therapy both prior to D&C and after insertion (69).

Immediate protection from pregnancy is the most important benefit of inserting an IUD immediately after abortion. In addition, there may be other medical advantages to IUD insertion at this time. The woman has usually received some form of



analgesia or anesthetic, her cervix is dilated, and, since the side effects of bleeding and cramping that sometimes occur with IUD insertion may also be present after abortion, women need not face these problems twice (164). The risk of perforation may also be decreased, since the physician is already familiar with the dimensions of the uterine cavity (249). Finally, women are often more motivated to accept contraception immediately after treatment for an induced abortion than at other times (57, 70, 164, 183, 336, 374).

Despite these advantages, many practitioners still hesitate to insert IUDs immediately after abortion. An international survey conducted in 1976 by the International Planned Parenthood Federation (IPPF) and the US Center for Disease Control (CDC) showed that about one-third of the 240 respondents — clinicians, program managers, researchers, and other recipients of the *IPPF Medical Bulletin* — limited IUD insertion to menstruation or five days thereafter. Moreover, respondents from areas where abortion is not available on request were the most likely to limit insertion to menstruation because they feared that women would conceal early pregnancies and request IUDs in the hope that they would cause abortions (528). Thus, many women are denied effective contraception at a time when they are most motivated to accept it.

### Sterilization

Female sterilization is a safe, effective, and permanent means of fertility control which has become an accepted and important part of many national family planning programs. While traditionally female sterilization was performed only after childbirth (postpartum) and only for medical reasons (440, 531), changing attitudes and new legislation have led to increased demand for sterilization by nonpregnant women (interval sterilization) and by women undergoing abortions.

The increased demand for postabortion sterilization has led to a debate over the safety of combining the two procedures. The basic question that remains unresolved is whether the complication rates for sterilization immediately after abortion are greater than the sum of the complication rates for the two procedures performed at different times (98, 135, 483). Some researchers have claimed that sterilization immediately after abortion leads to greater mortality and morbidity than two separate procedures (63, 192, 201, 352, 462). Other investigators argue that it does not (91, 97, 98, 108, 145, 250, 305, 328, 372, 453, 541).

A recent World Health Organization collaborative study conducted in Singapore was designed specifically to examine whether the risk of abortion plus immediate sterilization is greater than the sum of the risks of abortion and sterilization at separate times. The study concluded that the risk of the combined procedures was not greater (97).

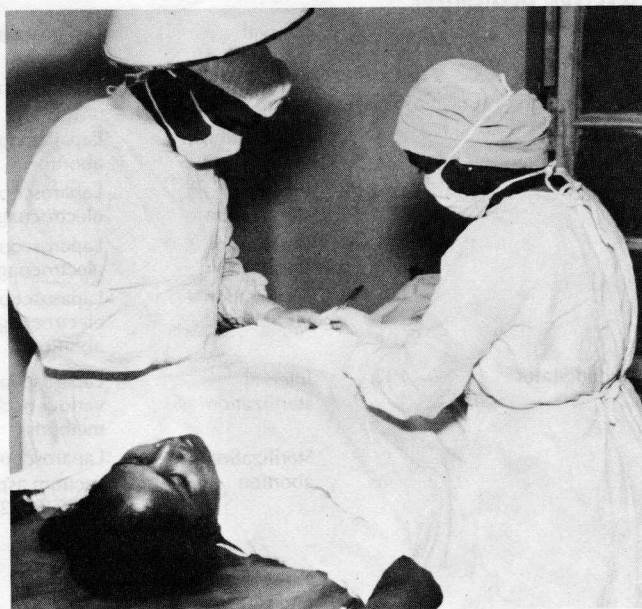
In this study, women who had requested abortion and sterilization and who were willing to participate in a prospective study were randomly assigned to one of two groups. Women in the first group had combined abortion and sterilization procedures; women in the second group (interval group) were sterilized six weeks after receiving abortions. Women in the two groups were comparable in age, parity, gestation, ethnicity, and health status. Vacuum aspiration, minilaparotomy, and lumbar epidural anesthesia were used for all women in both groups. Complications were reported separately for the abortion and sterilization procedures (see Table 14). With abortion plus sterilization, women had slightly lower complication rates for both the abortion and the sterilization — 3.8 percent and

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5.3 percent, respectively — than women who had sterilization six weeks after their abortion — 6.7 and 6.9 percent, respectively. The differences in rates were not statistically significant for either procedure (97).

Other research on the safety of combining abortion and sterilization has not been as carefully controlled as the World Health Organization study, nor has it specifically addressed the issue of whether the complications of abortion and sterilization combined are greater than the sum of the complications of two separate procedures. Generally, two kinds of studies have been undertaken: (1) those comparing abortion plus immediate sterilization with interval or postpartum sterilization alone (see Table 14) and (2) those comparing abortion alone with abortion plus immediate sterilization (see Table 15).

Unfortunately, the comparability of many of these studies is limited. Definitions of morbidity vary (134, 164, 531), different types of sterilization procedures and anesthesia were used, and the groups compared were not always matched for factors that affect morbidity, such as age, health status, parity, gestation, and type of abortion procedure (98, 134). In addition, differences in practitioners' experience and ability and in the facilities available can bias study results (531).

Studies comparing complication rates for interval sterilization and for sterilization plus abortion generally find little difference (see Table 14). In two studies, in fact, complications were slightly less common for women undergoing combined procedures than for those undergoing sterilization only (91, 97). Only one study involving legal abortion found significantly higher risks with sterilization after abortion than with interval sterilization (192). Most of these studies involve abortions performed by medical personnel and so are not directly applicable to women being treated for complications of illegal abortion. They suggest, however, that a sterilization procedure would not add substantially to the risks already faced by a woman who has had an illegal abortion.



**A recent World Health Organization study concluded that sterilization immediately after legal abortion is no more dangerous than sterilization and legal abortion performed separately, but little research has been done on the safety of sterilization after treatment for complications of abortion, whether illegally induced or spontaneous.** (Chernush/World Bank)

Table 14. Complication Rates for Sterilization after Abortion and for Sterilization Only,  
Selected Comparative Studies, 1974-1979

Region & Country	Ref. No.	Procedure	Type of Procedure	No. of Women	% of Women with Complications Due to:			
					Abortion	Sterilization		
ASIA India	180	Interval sterilization	Colpotomy	196		6.0		
		Sterilization + abortion	Colpotomy + vacuum aspiration	422	3.0	9.4		
Singapore	97	Interval sterilization	Minilaparotomy	131	6.7 <sup>a</sup>	6.9		
		Sterilization + abortion	Minilaparotomy + vacuum aspiration	211	3.8	5.2		
	250	Interval sterilization	Laparoscopic clip or ring	68		1.5		
		Sterilization + abortion	Laparoscopic clip or ring + D&C or vacuum aspiration or hysterotomy	363 96	————— 3.0 ————— ————— 6.2 —————			
EUROPE United Kingdom	91	Interval sterilization	Laparoscopic electrocoagulation	11,459		2.7		
			Laparoscopic electrocoagulation & division of tubes	8,053		3.2		
		Sterilization + abortion	Laparoscopic electrocoagulation + "vaginal termination"	1,672	————— 2.3 —————			
			Laparoscopic electrocoagulation & division of tubes + "vaginal termination"	1,051	————— 2.6 —————			
WESTERN HEMISPHERE Latin America (6 countries)	106	Interval sterilization	Laparoscopic ring	1,281		2.0 <sup>b</sup>		
		Postpartum sterilization	Laparoscopic ring	120		4.1 <sup>b</sup>		
		Sterilization + abortion	Laparoscopic ring + abortion	517	<sup>c</sup>	2.3 <sup>b</sup>		
		Interval sterilization	Laparoscopic electrocoagulation	5,323		2.5 <sup>b,d</sup>		
		Postpartum sterilization	Laparoscopic electrocoagulation	391		4.9 <sup>b,d</sup>		
		Sterilization + abortion	Laparoscopic electrocoagulation + abortion	163	<sup>c</sup>	6.7 <sup>b,d</sup>		
		United States	192	Interval sterilization	Laparoscopy & various occlusion methods	283		7.7 <sup>e</sup>
				Sterilization + abortion	Laparoscopy + vacuum aspiration	82	————— 23 <sup>e</sup> —————	
or PGF <sub>2α</sub> (2nd trimester)	38				————— 23 <sup>e</sup> —————			

<sup>a</sup>Women had vacuum aspiration abortions followed by interval minilaparotomy sterilization six weeks later.

<sup>b</sup>Surgical complications only

<sup>c</sup>All women were being treated for complications of incomplete abortion.

<sup>d</sup>Differences among complications rates for electrocoagulation are statistically significant.

<sup>e</sup>Difference between complication rates for interval sterilization and sterilization + abortion (both methods combined) is statistically significant.

Studies comparing complication rates for abortion only with complication rates for abortion plus sterilization, which are less relevant to countries where abortion is illegal, report a wide range of results. As Table 15 shows, four studies comparing complication rates from abortion only with complication rates from abortion plus sterilization found only slight differences (97, 108, 145, 177), while four studies found that at least twice as many women had complications from abortion plus sterilization as had complications from abortion alone (311, 460, 462, 486). These eight studies involved four different abortion procedures and four types of sterilization, including both abdominal and vaginal routes. Consequently, differences in rates of complications are difficult to assess.

Recent research suggests that, apart from these medical complications, there may occasionally be psychological contraindications to performing sterilization immediately after abortion. The stress of an unwanted pregnancy may bias a woman's decision to be sterilized. A small percentage of women express regret after postabortion sterilization (440, 531). In a review of 22 studies published between 1949 and 1969, Winston Schwyhart and S. Jerome Kutner found that 8.4 percent of a total of 1,625 women sterilized immediately after abortion regretted the sterilization, compared with 5 percent of women receiving interval or puerperal sterilization (431). This difference, although slight, indicates that health care providers serving women who have had abortions need to inform women clearly and carefully that sterilization is a permanent form of fertility control. After abortion, as at all other times, women should be given accurate information without coercion before they make a decision on sterilization (201, 481).

#### Illegal Abortion and Concurrent Sterilization

Little research has been conducted on the risks of sterilization immediately after treatment for complications of illegally induced or septic abortion, a question of great importance where abortion is legally restricted. Angel Quan and colleagues observed 189 women admitted to the Maternity Hospital of El Salvador for treatment of inevitable or incomplete abortion who underwent laparoscopic sterilization before hospital dis-

charge. They speculated that most of the abortions were illegally induced. Type 1 septic abortion (infection confined to the uterus) was diagnosed in 10 percent of the women. In these cases antibiotics were administered and laparoscopic sterilization was delayed until their temperatures returned to normal. In all cases, laparoscopic sterilization was performed within 48 hours of curettage. The rate of complications was low — 3.2 percent. The most frequent problem was tears of the fallopian tubes. The researchers concluded that laparoscopic sterilization after inevitable or incomplete abortion was as safe as interval sterilization (373).

A second study, conducted in six hospitals in Latin American countries where abortion is illegal, compared complication rates in 680 women sterilized after treatment for incomplete abortion with complication rates in 6,604 women undergoing interval sterilizations. Among those sterilized after treatment for abortion were 46 cases of septic abortion. These women had approximately the same rate of complications as women whose abortions were not infected (106).

In the same study, women sterilized by laparoscopy with tubal rings after treatment for abortion complications had no higher rate of subsequent complications than women receiving interval sterilization, but, when electrocoagulation was used, complications were higher after abortion (106) (see Table 14). The difference, while statistically significant ( $p < .05$ ), was slight (106).

A precise determination of the comparative risks of abortion and sterilization performed together or separately has yet to be made. For countries where abortion is illegal, even more important would be determining whether sterilization at the time of treatment for abortion complications causes more complications than does sterilization at other times. While the comparative risks of combining procedures may vary in different countries and under different circumstances, there are advantages to combining sterilization either with legal abortion or with treatment for complications of illegal abortion that may outweigh any slight additional risks:

- The woman faces only one exposure to anesthesia (97, 98).



Women receive family planning counseling and supplies at a hospital in Kenya. Hospitals could help prevent abortions by offering contraceptives to women treated for abortion complications. There is little evidence, however, that most do. (Chernush/World Bank)

**Table 15. Complication Rates for Legal Abortion and for Legal Abortion with Sterilization, Selected Comparative Studies, 1971-1975**

Region & Country	Ref. No.	Procedure	Type of Procedure	Number	% of Women with Complications
<b>ASIA</b>					
India	311	Abortion	Vacuum aspiration	68	7.3
		Abortion + sterilization	Vacuum aspiration + colpotomy	340	14.1
Singapore	98	Abortion	Vacuum aspiration	1,805	4.3 <sup>a</sup>
		Abortion + sterilization	Vacuum aspiration + various sterilization techniques	616	5.2 <sup>a</sup>
<b>EUROPE</b>					
United Kingdom	460	Abortion	Vacuum aspiration	63	0
		Abortion + sterilization	Vacuum aspiration + electrocoagulation	72	8.3
	177	Abortion	NA	40	7.5
		Abortion + sterilization	NA + laparoscopy	19	10.5
		Sterilization only	Laparoscopy	20	5.0
<b>WESTERN HEMISPHERE</b>					
Canada	108	Abortion	D&C	947	.63
		Abortion + sterilization	D&C + colpotomy	394	1.3
United States	145	Abortion	Vacuum aspiration	195	7.2
		Abortion + sterilization	Vacuum aspiration + laparoscopic electrocoagulation or clips	108	9.2
	462	Abortion	Vacuum aspiration	3,482	4.9 <sup>b</sup> 2 <sup>c</sup>
		Abortion + sterilization	Vacuum aspiration + NA	112	26 <sup>b</sup> 18 <sup>c</sup>
	486	Abortion	Vacuum aspiration	50,352	4.2
		Abortion + sterilization	Vacuum aspiration + abdominal tubal ligation + colpotomy + laparoscopy	380	20.3
				131	13.7
				266	5.3
		Abortion	D&C	3,077	6.0
		Abortion + sterilization	D&C + NA	48	16.7
Abortion		Saline (2nd trimester)	13,946	23.4	
Abortion + sterilization		NA	108	25.0	
Abortion	Hysterotomy (2nd trimester)	96	33.3		
Abortion + sterilization	Hysterotomy + NA	683	33.4		

NA = Not available

<sup>a</sup>Difference in complication rates between abortion-only group and abortion + sterilization group was not statistically significant

<sup>b</sup>Percentage with hemorrhage, defined as "blood loss greater than 500 ml"

<sup>c</sup>Percentage with febrile response, defined as "temperature greater than 38°C for more than 12 hours"

- Only one hospital admission or trip to a medical facility is required (97, 98, 145).
- There is no risk of pregnancy occurring in an interval between abortion or treatment for complications and sterilization (541).

#### Oral Contraceptives

Oral contraceptives are among the most effective methods of contraception and one of the most popular as well. More

couples around the world rely on oral contraceptives than on any other effective contraceptive method except sterilization (229, 582). The popularity of "the pill" favors its inclusion in contraceptive programs for women treated for abortion complications.

Taking OCs after abortion appears to be just as safe as taking them at any other time. Research has shown that oral contraceptives do not affect the duration of bleeding after abortion (359) or the process by which endometrial tissue regenerates after abortion. Comparison of postabortion endometrial biop-

sies from OC users and nonusers did show that retained decidua (mucous lining of uterus) and inflammation were slightly more frequent among the users. Also, an unusual glandular reaction was noted in a few users, but the importance of these findings is unknown (389).

The main question to be considered in using oral contraceptives after abortion is when to start (359). Some practitioners have delayed prescribing the pill after abortion on the grounds that blood clots are more common during the postpartum period and oral contraceptive use may aggravate this potential (164). This fear is based on hypothesis rather than evidence, however; no research has demonstrated that pill use after an abortion increases the incidence of blood clots (348).

In the absence of specific medical contraindications, practical considerations and the convenience of the user should prevail. The common practice of delaying oral contraceptives until the fifth day of the woman's first postabortion menstrual cycle creates several difficulties. Some women do not resume a normal menstrual cycle for several months, and others may bleed intermittently or continuously (164, 334), making menstruation difficult to identify. Also, delaying contraception increases the likelihood of pregnancy. It is most convenient for the woman to start using oral contraceptives on the day of the abortion. This allows her to begin effective contraception when her motivation to avoid pregnancy is greatest (359, 494).

## ABORTION IN ASIA

Planning to meet the medical and contraceptive needs of women who have had illegal abortions requires at least an approximate estimate of the extent of illegal abortion and a knowledge of the women who obtain abortions as well as of the complications of illegal abortion. Such information can be obtained by a variety of methods, but its accuracy is always in doubt (see box, p. F-137). Most studies underestimate the actual frequency of illegal abortion due to the reluctance of women to report their experience. Furthermore, this reluctance may change over time, complicating the analysis of trends. Nonetheless, the many surveys and analyses conducted throughout the world do suggest some broad patterns and trends:

- Induced abortion is more common in Asia and Latin America than in the Middle East and Africa.
- Abortion is as common in some countries where it is illegal, particularly those in Southeast Asia, as in some countries where it is legal.
- Rates of illegal abortion are increasing in some developing countries.
- For the most part, the women in developing countries who have illegal abortions are older, married women with children who wish to end childbearing. The clearest exception may be Africa, where many women who have abortions are young and unmarried and rely on abortion to postpone childbearing.

Throughout Asia the legal status of abortion varies considerably. In three countries—the People's Republic of China, Singapore, and Viet Nam—abortion is legal on request. In a number of others abortion for a broad range of social and/or medical reasons is legal, although the actual availability of

legal abortion may depend more on judicial interpretation and public perception of the law than on statutory language. In India women may obtain abortions legally for social as well as medical reasons, but the abortion must be performed by a certified physician in a specially licensed facility. In several countries—Hong Kong, the Republic of Korea (South Korea), Japan, Nepal, and Thailand—abortion is permitted if the woman's health is threatened by continuation of the pregnancy. South Korea permits abortion in cases of rape, incest, and possible fetal abnormality as well, as does Japan, which also recognizes socioeconomic reasons for abortion (501, 589).

Abortion laws are more restrictive in other Asian countries. In Bangladesh, Burma, Laos, Pakistan, and Sri Lanka, abortion is illegal except to save the woman's life. In Malaysia, abortion is legal to save a woman's life or for reasons of rape, incest, or fetal abnormality. In Taiwan, Indonesia, and the Philippines, abortion is illegal under any circumstances (501, 589).

The incidence of abortion in Asia is very high regardless of legal status (see Table 16). In South Korea, Thailand, and Taiwan—where abortion is illegal—and in Singapore and Japan—where abortion is legal—the abortion rates and ratios estimated from surveys of women and abortion providers and from government records are equivalent to or higher than those in the United States and in other developed countries where abortion is legal. They are exceeded only by those of Eastern European nations. For example, in 1976 Singapore reported an abortion rate of 27.5 abortions per 1,000 women age 15-44 and a ratio of 371 abortions per 1,000 live births (483). In South Korea, based on surveys of currently married women age 15-44, the abortion rate for 1975 was estimated at 64.4 abortions per 1,000 married women, and the abortion ratio, at 667 abortions per 1,000 live births (356). The corresponding figures for the United States in 1977, based on government statistics, were an abortion rate of 22.2 per 1,000 women age 15-44 and a ratio of 329 abortions per 1,000 live births annually (502).

Country & Date	Ref. No.	Legal Status	Annual Abortion Rate	Annual Abortion Ratio
Singapore 1976	483	Legal	27.5	371
South Korea 1975	356	Illegal	64.4	667
Thailand (rural) 1978	478	Illegal	37	245
United States 1977	502	Legal	22.2	329
Hungary 1976	483	Legal	41.5	520

The incidence of illegal abortion is determined not only by legal status but also by the accessibility of abortion services and the public awareness of the law. In South Korea and Taiwan, for example, the grounds for legal abortion are restricted, but abortion is widely practiced because services are readily available. In India, on the other hand, abortion is legal for sociomedical reasons but not readily available.

### India

Since India liberalized its abortion laws in 1972, the number of legal abortions has increased yearly, but substantial numbers of illegal abortions still take place. In 1972, 24,000 legal abortions were recorded; by 1977 the number had risen to 278,073 (171). No national statistics are available, but illegal abortions are estimated still to total 4 to 6 million yearly (120, 171, 238, 274, 315).

Indian women continue to resort to illegal abortion for several reasons:

- lack of information about abortion services (92, 223, 238, 351, 446)
- limited publicity about the law and the widely held misperception that abortion is illegal (92, 171)
- lack of adequate facilities and certified medical practitioners who meet the requirements of the law, particularly in rural areas (49, 351, 446)
- drawbacks in abortion services provided at approved centers — long waiting periods, lack of privacy, impersonal atmosphere, inadequate follow-up (120, 238)
- reluctance of unmarried women to go to hospitals and clinics for abortions (49).

Since access to legal abortion is limited, illegal abortion remains a major health problem. Septic abortions and subsequent complications cause between 15 and 25 percent of maternal deaths in a number of Indian hospitals (223, 238, 269, 351, 360, 446) (see Table 1). The majority of women hospitalized for abortion complications have turned to *dais* (traditional midwives) for their abortions or induced their own abortions (51, 94, 328). Among these women, the most com-

mon method for inducing abortion is introducing a stick, sometimes coated with arsenic or phosphorus, into the uterine cavity (50, 223). As might be expected, the women who develop the most serious complications of abortion are those least able or willing to seek professional medical care. M. Kochhar reports that at Kasturba Hospital, Delhi, "Septic abortion was mostly seen in unmarried, young girls who had interference done in the 2nd trimester by untrained personnel and were admitted in serious condition" (233).

#### South Korea

The situation in South Korea contrasts with that in India. Although abortion is legally restricted in South Korea, it is so common that many Koreans believe it is legal on request (198, 297). The Maternal and Child Health law, enacted in 1973, which permits abortion in cases of risk to maternal health, rape, incest, and possible fetal deformity, is relatively restrictive in its wording but has been seen as a legalization of abortion (181). Both before and since the 1973 law, however, physicians have routinely performed abortions in their private offices and clinics, and whether the 1973 legal change had any effect on actual practice is unknown (197, 198).

Table 16. Incidence Rates and Ratios of Legal and Illegal Abortion in Asia, Selected Studies, 1970-1979

Country	Ref. No.	Legal Status of Abortion	Period & Source of Data	Abortion Rate: Abortions per 1,000 Women 15-44	Abortion Ratio: Abortions per 1,000 Live Births	
<b>LEGAL ABORTIONS</b>						
India	483	Legal	1977, official statistics	2.2 <sup>a</sup>	11 <sup>a,b</sup>	
Japan	483	Legal	1976, official statistics	24.9	372 <sup>b</sup>	
Singapore	483	Legal	1976, official statistics	27.5	371 <sup>b</sup>	
Hong Kong	483	Illegal except when women's health is threatened	1976, official statistics	2.3 <sup>a</sup>	27 <sup>a,b</sup>	
<b>ILLEGAL ABORTIONS</b>						
Korea, Republic of	198	Illegal except when woman's life or health is threatened	1970, survey of 4,216 ever-married women, 20-44	80 <sup>c</sup>	400 <sup>c</sup>	
	356	Illegal except when woman's health is threatened or in case of rape, incest, fetal damage	1976, survey of 5,008 currently married women, 15-44	64.4	667	
Seoul	198	Illegal except when woman's life or health is threatened	1970, survey of 925 ever-married women, 20-44	104 <sup>c</sup>	520 <sup>c</sup>	
	197	Illegal except when woman's health is threatened or in case of rape, incest, fetal damage	1978-79, survey of 726 abortion providers	235	2,750	
Malaysia	449	Illegal except when woman's life is threatened	1973, survey of 9,506 ever-married women, 15-44	NA	190	
Taiwan	464	Illegal	1973, survey of 331 abortion providers	NA	594-736	
Thailand	111	Illegal except when woman's health is threatened and in cases of rape, incest	1972-1973, records from all provincial hospitals	28 <sup>d</sup>	NA	
	Chiang Mai	441	Same as above	1977, survey of 1,921 ever-married women, 15-44	24	NA
	Chiang Rai	441	Same as above	Same as above	7	NA
Rural areas	478	Same as above	1978, survey of 81 abortion providers	37	245.1	

NA = not available

<sup>a</sup>Legal abortion only

<sup>b</sup>Live births: six months later

<sup>c</sup>Ever-married women age 20-44

<sup>d</sup>Per 1,000 women age 15-45

## PROBLEMS OF DATA SOURCES FOR ILLEGAL ABORTION

Where abortion is illegal, most information on the extent of abortion and subsequent mortality and morbidity comes from four sources: (1) hospital admissions records, (2) surveys of women (3) surveys of abortion providers, and (4) death certificates. The extent of illegal abortion, nationally or regionally, has also been estimated using theoretical fertility models (143), hospital abortion mortality data (54, 202), and fertility rates, subtracting actual births from expected births (247, 514).

**Hospital admissions records** generally report the number of women admitted for treatment of abortion complications and the number of subsequent deaths in a given period. The principal advantages of hospital records are:

- Fluctuations may suggest trends in abortion incidence.
- If the proportion of abortions which require hospital care is known, abortion incidence can be estimated.
- They suggest minimum incidence and mortality.
- They indicate the direct public costs of illegal abortion.

The principal disadvantages of hospital records are:

- Hospitalized women represent only a proportion of all women obtaining abortions, and that proportion is difficult to estimate.
- Hospital records rarely differentiate between induced and spontaneous abortions. When they do, illegal abortions are undercounted since some women and attending physicians conceal induced abortions, calling them spontaneous (535).
- Hospital data can be inaccurate. In Bogotá, Colombia, for example, six hospitals, on three separate occasions and in response to three separate inquiries, reported the number of abortion-related admissions in 1976. The total number reported ranged from 7,782 to 12,182 (264).

**Surveys of women** inquire about reproductive histories and abortion experience. The main advantages are:

- If a nationally representative sample of women is selected and interviewed, the results can be extrapolated to the entire country and national prevalence rates determined.
- If a series of surveys is conducted over several years, trends in abortion prevalence may be detected.
- Regional or ethnic differences in abortion practice and the characteristics of women using abortion can be identified.
- An estimate can be made of the number and type of complications and the proportion requiring hospitalization.

The main disadvantages are:

- Surveys often underestimate the extent of abortion due to underreporting. Underreporting may be caused by fear of legal prosecution, forgetting past events, or a difference between the questioners' and respondents' definitions of abortion. For example, to many women in developing countries using medication to bring on a late period is not considered an induced abortion (331).
- Surveys are not always comparable due to differences in age and marital status of women surveyed, methods of gathering data, and ways of reporting results (160).
- Some surveys ask specifically about induced abortions; others ask about all abortions, spontaneous and induced. Where the two are distinguished, women may overreport spontaneous abortions to conceal induced abortions (523). Where they are not distinguished, data cannot be corrected to eliminate spontaneous abortions because the incidence of spontaneous abortion, while estimated at 15 to 25 per-

cent of all pregnancies in the absence of induced abortion (225), is not certain.

Underreporting of past abortions is the most serious limitation of survey research. One way around this problem may be the randomized response technique (RRT), developed in 1965. The RRT enables respondents to answer sensitive questions without disclosing their answer to the interviewer. The RRT device is often a small plastic box containing a fixed number of beads of two different colors. The front of the box is imprinted with two questions, one concerning abortion, the other non-controversial, both of which can be answered either yes or no. In a study done in North Carolina, for example, the noncontroversial question asked about the woman's month of birth (6). The woman shakes the box to allow a bead to roll into a window on the top of the box which only she sees. The color of the bead determines which question the woman answers. Her response is recorded by the interviewer, who does not know which question she is answering. Since the number of beads of each color is fixed, the probability that the abortion question will be answered is known. Thus the reported prevalence of abortion can be statistically determined (6, 522). The RRT has been adapted for use in different cultures and among illiterate women. In studies in Turkey and Taiwan almost twice as many women reported at least one induced abortion when they answered RRT questions as when they answered direct questions (100, 474). In Ethiopia the difference was even greater (104). RRT is still experimental, however, and not widely used.

**Surveying abortion providers** is a recent and, so far, rare form of abortion research, but it may prove to be the least biased method of estimating incidence and prevalence. Only four major surveys have been conducted — in South Korea (197), Thailand (478), Taiwan (464), and the Philippines (155). Provider surveys report higher rates of abortion than other research methods in the same countries. The advantages are:

- If providers' anonymity is guaranteed, they may be less likely to conceal information than their clients.
- Providers give information on both married and single women, not just married women, who are often the only ones questioned in surveys of women (197, 478).
- Cases of spontaneous abortion are excluded (478)

The main disadvantages are:

- In areas where most abortions are performed by nonmedical personnel identifying all providers is difficult.
- Women inducing their own abortions are not counted.
- Providers are not always aware of or may not admit the complications from the abortions they perform (478).

**Death certificates** indicate the number of deaths officially attributed to abortion in a country. Advantages are:

- They suggest a minimum figure for abortion mortality.
- Used carefully, the number of deaths attributed to abortion can sometimes serve as an indirect measure of the extent of abortion (367).

The major disadvantages of death certificates are:

- In developing countries, many deaths are not registered at all.
- The completeness and validity of death registration varies in different countries, making comparisons unreliable.
- Falsification of records and incorrect certification are very common, particularly for deaths due to abortion.

The prevalence of abortion in Korea has increased substantially in the last two decades. National surveys of married women of reproductive age document a sixfold increase in the percentage of women reporting ever having had an induced abortion, from 7 percent in 1964 to 39 percent in 1976 (181, 198, 236, 356). Even so, abortion prevalence estimated from national surveys of women may be far below the actual figure. A 1977-78 survey of 726 providers of abortion services in Seoul — one-third of all providers of medical services in the city — found that Seoul residents obtained approximately 480,000 abortions in that time period, five times the number estimated for 1970 from a national survey of women (197, 198). The 1977-78 researchers, Sung-Bong Hong and Christopher Tietze, attribute the increase in the number of abortions chiefly to a much higher rate of abortions rather than to the increase in Seoul's population.

The abortion rate and ratio derived from the survey of providers are far higher than previous estimates based on surveys of women. According to the survey of providers, the abortion rate in Seoul in 1977-78 was 235 abortions per 1,000 women age 15-44 and the abortion ratio was 2,750 abortions per 1,000 live births. By comparison, according to the 1971 survey of women, the rate in Seoul in 1970 was 75 abortions per 1,000 women and the ratio was 750 per 1,000 live births, or only about one-quarter as high as in 1977-78 (197, 198). (The 1970 data were adjusted for underreporting based on results of a subsequent resurvey of a subsample of the group originally interviewed.)



Vendors of abortifacients and other folk medicines hawk their wares outside the Quiapo in Manila. Most of the abortifacients are herbs intended to bring on delayed menses. A bottle costs about \$.25 (US).

### Taiwan

In Taiwan, as in Korea, surveys of women show a marked increase in abortion prevalence in the last two decades. Between 1965 and 1976 the percentage of surveyed women acknowledging at least one induced abortion increased from 9 to 21 percent (469). Even these figures probably understate the extent of illegal abortion in Taiwan. A 1971 study in a Taiwanese county compared two methods of eliciting information on abortion experience: direct questioning and the randomized response technique (RRT) (see box, page F-137). Of the women answering through the RRT, 28.2 percent admitted having had an abortion, compared with 12.9 percent of the women answering a direct question (100).

A provider survey in Taiwan in 1973, covering almost half of the nation's clinics and maternal health care providers, indicated a ratio of 594-736 abortions per 1,000 live births (464). This is higher than the ratios in most of Asia, except Korea.

### Malaysia

While in Malaysia abortion is legally permitted only when the woman's life is endangered by the pregnancy, both hospital admission records and surveys of women indicate that illegal abortion is increasing. The number of women with abortion complications admitted to University Hospital in Kuala Lumpur doubled between 1969 and 1974, while admissions for deliveries increased by 24 percent. Almost one-third of the maternal deaths occurring during this period were due to induced abortion (333).

In a 1973-74 national survey of 9,506 ever-married women age 15-44, almost 11 percent reported having had one or more induced abortions (449). Between 1970 and 1973 the reported abortion ratios increased markedly, from 63 to 190 abortions per 1,000 live births. While abortion is more common in urban than rural areas, the abortion ratio tripled between 1970 and 1973 in both rural and urban areas (449).

### Philippines

Despite legal and religious prohibitions against abortion in the Philippines, surveys reveal that many women are terminating unwanted pregnancies. In a 1967-69 survey in the province of Laguna, 13 percent of 4,787 ever-married women reported having had an abortion or stillbirth in the previous five years. Further questioning of a subgroup of the women found that 28.5 percent admitted having had at least one abortion in her lifetime (509). In 1976, 676 married women in five barrios in Cavite Province, a predominantly rural area, were surveyed; 17 percent admitted having had at least one induced abortion; 4 percent, more than one induced abortion. Despite the cost and inconvenience of hospitalization for people in the barrios, women were hospitalized after 12 percent of the induced abortions (146).

In 1979 surveys of 106 abortion providers and 286 women from four areas of the Philippines — Northern Luzon, Central and Southern Luzon, the Visaijas, and Mindanao — found that the providers treated about 1,300 clients per month. The average monthly caseload per provider ranged from a high of 37 women in metropolitan Manila to a low of 3.8 women in Northern Luzon province (155). The providers included physicians, midwives and nurses, traditional midwives and healers, and nonliterate housewives with no training in either modern or traditional medicine. The majority of the surveyed women first tried to induce menses with medications, and when these



methods failed went to abortion providers. More women obtained their abortions from traditional midwives or persons with no health care background than from trained medical personnel (155).

### Thailand

A 1978 survey of abortion providers in rural Thailand (478) reported higher rates of illegal abortion — 37 abortions per 1,000 women — than had been previously estimated from surveys of rural women in northern provinces (441) and from national hospital admissions records (111) (see Table 16, p. F-136). This abortion rate, while lower than the rate reported in South Korea in 1975, is higher than the 1976 rate in Singapore, where abortion is legal. Some 81 practitioners from 51 rural Thai districts were interviewed. The practitioners — many of them young, educated women and wives of government civil servants, others traditional midwives — reported several different methods of varying effectiveness for inducing abortion: massage, injecting solutions into the uterus through a catheter, curettage, and inserting shrub roots and grass stems into the vagina. Based on the reports of these practitioners, the researchers estimated that 298,945 illegal abortions take place annually in the rural areas of Thailand. This figure represents a rate of 37 abortions per 1,000 women age 15-44 and a ratio of 245 abortions per 1,000 live births (318, 478).

### Bangladesh

Although induced abortion is illegal in Bangladesh except to save the life of the pregnant woman, hospital admission records and surveys of rural health workers indicate that abortion is common and is responsible for a substantial number of maternal deaths. In 1977 and 1978 three hospitals recorded abortion-related admissions ranging from 640 cases in 12 months to 479 cases in 5 months. The proportion of these women acknowledging having had induced abortions varied from 6 percent to 62.5 percent (44, 52, 214).

A survey of clinicians and health workers in rural Bangladesh during a 6-month period in 1978 and 1979 found that abortion complications account for a high proportion of all maternal deaths (395, 397, 403). Interviews were conducted with at least 1100 health workers in about 795 health care centers. The health workers reported a total of 1,590 cases of abortion complications, including 498 deaths, and 1,092 other pregnancy-related deaths. Based on these interviews from rural areas, it has been estimated that approximately 6,000 maternal deaths occur annually in Bangladesh, approximately one-fourth of which may be due to abortion. Most abortions in Bangladesh are induced by *dais*, and the most common method is inserting a stick or tree root into the uterus (395, 397, 529).

### Characteristics of Women Having Abortions

In many Asian countries information from surveys of women and from hospital records indicates that most women who seek abortions are married, over age 25, and have several living children (12, 44, 47, 52, 53, 94, 103, 146, 198, 214, 225, 235, 236, 356, 360, 403, 467, 469, 483). Asian women who obtain abortions generally do so after they have achieved their desired family size.

Surveys of abortion providers in Thailand and Korea offer indirect evidence that many unmarried women are seeking abortions as well. In the Thailand survey, for example, 45 percent of the rural practitioners reported that they serve mostly single women (478). In Korea the abortion rates estimated from the

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1977-78 provider survey in Seoul are extremely high compared with rates reported in earlier surveys of women in part because of the inclusion of unmarried women in the total count of women having abortions (197).

In the countries where national surveys have been conducted — Malaysia, Korea, and Taiwan — induced abortion is more prevalent in urban than in rural areas (103, 198, 356, 449). According to the 1970 survey in Korea, for example, the abortion rate among married urban women age 20-44 was 55 abortions per 1,000 women, compared with a rate of 46 among rural women (198). In Malaysia in 1974 the lifetime induced abortion ratio among urban women — 76 abortions per 1,000 live births — was four times as high as the ratio among rural women — 18 abortions per 1,000 live births (449).

The apparently greater prevalence of abortion in urban areas may be due both to better access to abortion providers and facilities and to greater willingness among urban women to report abortions as well as to greater demand (449). The surveys of providers and family health workers in Thailand (478) and Bangladesh (397, 403) indicate that a wide network of abortion services exists in rural areas.

In Korea, Malaysia, and Taiwan, high prevalence of abortion is associated not only with residence in urban areas but also with education. In both urban and rural areas in all three countries, abortion is less common among women with no education (148, 198, 356, 449). The Korean World Fertility Survey showed that socioeconomic status, measured by husband's occupation, also is related to abortion. The percentage of women reporting abortions, the mean number of abortions per woman, and the total number of abortions per 1,000 live births all tend to increase with the wife's education and with the husband's occupational status (236, 483).

## ABORTION IN THE MIDDLE EAST

With the exception of Tunisia, where abortion is available on request, abortion laws in the Middle East are highly restrictive. Influenced by Islamic law and colonial tradition, most countries permit abortion only if the woman's life or health is threatened by continuation of the pregnancy (483). Cyprus, Egypt, and Turkey permit abortion in cases of possible damage to the fetus; Cyprus, Turkey and Jordan authorize abortion in cases of rape (589).

The laws, while restrictive, are rarely enforced. As a result, physicians perform illegal abortions in private clinics and hospitals (161, 246, 310, 323). In Egypt physicians in large medical centers are inducing abortions for women who have become pregnant with IUDs in place even though, if prosecuted and convicted, they could receive sentences of life imprisonment at hard labor (325, 466). In a 1975 Turkish survey 211 women reported a total of 462 induced abortions; 64 percent of the abortions had been performed by physicians in their offices and 14 percent by physicians in hospitals (477). Performing illegal abortions is a major source of income for some physicians and midwives in the Middle East. Thus, some may have been opposed to the dissemination of effective contraceptives and the easing of legal restrictions on abortion (277, 323).



In Pakistan as in most Islamic countries, abortion is permitted only to preserve a woman's life. (USAID)

Most information on the extent of illegal abortion in the Middle East dates back to the 1960s and early 1970s and is of poor quality. Hospital records and survey research were often limited to a few institutions or to selected groups of women in urban areas. Nevertheless, these data do suggest that in at least 10 countries abortion was widespread — Cyprus (470), Egypt (136, 137, 147, 222, 488), Iran (18, 247, 280, 321), Iraq (161), Jordan (116, 310), Kuwait (188), Lebanon (54, 105, 162, 184, 540), Morocco (246), Sudan (410), and Turkey (350, 468, 474, 477, 537). For example, a study in three major hospitals in Cairo and Alexandria, Egypt, from 1965 to 1969 found that between 496 and 575 women were admitted with abortion complications for every 1,000 women admitted in labor (222). A 1967 survey of over 3,800 teachers in Alexandria reported that 34.3 percent of the women who had ever been pregnant had had at least one spontaneous or induced abortion. Over 23 percent of all pregnancies ended in abortion (224). A study in Iran analyzed rural and urban age-specific fertility rates and contraceptive use and concluded that 25,000 to 33,000 abortions were induced in Teheran in 1966, or one abortion for every three to five live births (247).

More recent information on the extent of abortion in the Middle East is available for only two countries, Tunisia and Turkey. This information indicates that in the last decade increasing numbers of women have relied on abortion to prevent unwanted births.

#### Tunisia

In 1973 Tunisia legalized abortion in the first trimester of pregnancy as part of a program to control population growth (219, 546). Before 1973 illegal abortion was common. In 1968, for example, Tunisian hospital services reported 10,344 admis-

sions for complications of illegal abortion (46). After legalization, the number of legal abortions increased from 6,500 in 1973 to 20,000 in 1976 and has since remained at approximately that level while contraceptive use has gained (322, 483, 521). Isam Nazer concludes:

These changes reflect the increasing use of contraceptive methods in preference to and despite the easy availability of abortion. Abortion now appears to be used basically as a back-up in cases of contraceptive failure (322).

#### Turkey

Eleven nationwide or community surveys of married women document the high prevalence of illegal abortion in Turkey. Like all survey research on abortion, the Turkish studies must be interpreted cautiously, but they do suggest that the number of women having illegal abortions is increasing. Between 1963 and 1975 a series of four surveys of nationally representative samples of women found that the percentage of women admitting induced abortions increased from 7.5 to 13.9 (350, 474, 475). The actual prevalence of abortion is probably much higher. In 1975 Sabahat Tezcan asked two nationally representative samples of women, either by direct questioning or by the randomized response technique (RRT) (see page F-137), whether they had ever had induced abortions. Some 33 percent of the women interviewed by the RRT reported at least one induced abortion compared with only 14 percent of the women interviewed by direct questioning (474). Turkish women are believed to have the highest prevalence of illegal abortion in the Middle East because the desired family size is small and effective contraceptives are not widely available (476).

The nationwide surveys showed marked regional differences. In all surveys the proportion of women having induced abortion was highest in the metropolitan areas and lowest in the rural villages. In 1975, for example, one in every four women in the metropolitan areas reported an induced abortion, compared with one in 20 in the villages (477).

#### Characteristics of Women Having Abortions

Most Middle Eastern women who obtain abortions do so to limit family size. The women most likely to abort their pregnancies are married, over age 25, with three or more living children. The prevalence of abortion increases with age (224, 477). In a survey of 1,459 Lebanese women, those age 20-24 reported that 14.4 percent of their pregnancies had ended in abortion, while women age 40-44 reported 59.5 percent (105).

Pregnancy and illegal abortion among unmarried women seem to be relatively rare. In a hospital in Cairo, for example, only 11 of 147 women hospitalized after induced abortions reported that they were single, although it is possible that some single women misrepresented their marital status. None of the women hospitalized following spontaneous abortions was unmarried (136).

Female chastity before marriage is highly valued in Muslim cultures, and customs such as segregation of the sexes and female seclusion have evolved to maintain female virginity. A girl who becomes pregnant before marriage may be murdered by her male relatives (77). Under these circumstances, the likelihood is great that any premarital pregnancies that do occur will be aborted. In fact, the laws in several Muslim countries — Iraq, Egypt, Lebanon, Syria, and Jordan — include provisions to reduce penalties in cases where illegitimate pregnancies are aborted (324). The Jordanian law, for example, considers a woman who aborts herself to protect her reputation

and family honor to have acted under mitigating circumstances (310). The attitude toward premarital pregnancies also means that abortions of premarital pregnancies are not likely to be reported in surveys.

In the Middle East, as in Asia, abortion is more common in urban areas and among the better educated (310, 468, 477). In Lebanon whether a woman is Muslim or Christian may be less important in determining abortion practice than education and residence. In a 1961 study, among Muslims over 30 percent of educated urban women reported having had induced abortions compared with 13 percent of uneducated urban women and 2 percent of uneducated rural women. Similar differences were seen among Christian women (540).

According to survey data from three countries (105, 321, 468, 477) and the opinions of practicing physicians (54, 161, 184, 310, 470), abortion is more common among women in upper and middle classes than in the lower classes (54, 161, 222, 310, 323). In 1970 and 1971 women in Lebanon, Iran, and Turkey were surveyed as part of a World Health Organization Collaborative Study on family formation patterns and health. In each country, middle class women reported a greater percentage of pregnancies ending in abortion than did lower class women (105, 321, 468).

## ABORTION IN AFRICA

Abortion laws in most African countries south of the Sahara are a legacy of the region's colonial past (16, 341). With the exception of Zambia, most countries forbid abortion entirely or permit it only if the pregnant woman's life or health is threatened (341, 483, 501). In Zambia, the 1972 Termination of Pregnancy Act permits abortion when the pregnant woman's physical or mental health is threatened, in case of potential fetal deformity, and if additional childbearing poses a threat to the physical or mental health of her children (285, 483, 501).

Restrictive legislation and strong pronatalist traditions, especially in francophone Africa (346), have limited both the amount and reliability of research on illegal abortion. While it is difficult to obtain national statistics, illegal abortion is generally regarded as an increasing problem, particularly in urban areas (14, 20, 40, 72, 76, 266, 275, 414). African gynecologists agree that complications from spontaneous and illegal abortions are one of the most frequent causes of hospitalization among women of reproductive age (284). Relying on hospital records and the impressions of practicing physicians, a 1978 International Planned Parenthood Federation (IPPF) Africa Region workshop on abortion management agreed that:

- The increase in numbers of women hospitalized for abortion complications indicates a real increase in the incidence of abortion.
- Illegal abortions are a serious health problem in Africa.
- The problem will probably grow worse as more women try to control fertility.
- A comprehensive approach to prevention and management undertaken at the national level is needed (113).

### Hospital Records

Hospital admissions records are the major source of information about abortion in Africa. Data on abortion-related admissions for three or more years may suggest trends, and, as Table 17 shows, in most of these hospitals the number of admissions

**Table 17. Number of Admissions for Abortion Complications in African Hospitals Selected Studies, 1970-1979**

Country	Ref. No.	Hospital	Year	No. of Abortion-Related Admissions	
Ethiopia	16	Adeoyo Hospital, Ibadan	1965	453	
			1966	615	
			1967	754	
Ghana	22	Korle Bu Hospital, Accra	1967	2,886	
			1968	3,204	
	25	Effia-Nkwanta Hospital	1970	3,034	
			1971	3,148	
	296	Koforidua Hospital	1972	3,275	
			1976	3,772	
	25	Effia-Nkwanta Hospital	1970	835	
			1971	885	
			Koforidua Hospital	1972	824
				1970	345
		Koforidua Hospital	1971	408	
			1972	255	
Kenya	25	Kenyatta Maternity Hospital, Nairobi	1970	914	
			1971	1,312	
	275	Kenyatta National Hospital, Nairobi	1972	1,564	
			1971	1,838	
	296	Kenyatta National Hospital, Nairobi	1974	2,070	
			1975	3,048	
			Kenyatta National Hospital, Nairobi	1976	3,702
				1970	1,028
			Civil Hospital	1971	593
				1972	751
		Victoria Hospital	1970	891	
			1971	647	
		7 rural hospitals	1972	751	
			1970	350	
		All hospitals	1971	498	
			1972	668	
	511	All hospitals	1973	2,013	
			1974	2,285	
Nigeria	16	Lagos Island Maternity Hospital	1975	2,479	
			1976	2,515	
	16	Lagos Island Maternity Hospital	1962	1,700	
			1963	1,800	
	15	Lagos University Teaching Hospital	1964	1,600	
			1965	2,100	
	25	Lagos University Teaching Hospital	1966	2,200	
			1967	1,900	
			Lagos University Teaching Hospital	1964	171
				1965	194
		Lagos University Teaching Hospital	1966	122	
			1967	157	
		Lagos University Teaching Hospital	1970	177	
			1971	196	
		Lagos University Teaching Hospital	1972	229	
			1970	206	
Sierra Leone	597	Maternity and Connaught Hospitals, Freetown	1971	220	
			1972	244	
Uganda	266	Mulago Hospital, Kampala	1967	1,518	
			1968	1,830	
			1969	2,120	
Zambia	285	University Teaching Hospital, Lusaka	1972	1,448*	
			1973	1,592*	
			1974	2,130*	
			1975	3,075*	
			1976	2,991*	

Note: This table includes only those hospitals with records for 3 or more years. For other records see Ampofo (25), Akinla (16), Ojo (339).

\*Includes legal abortions: 1972, 48; 1973, 88; 1974, 133; 1975, 165; 1976, 173.

for abortion complications has increased. For example, in Kenyatta National Hospital, Nairobi, Kenya, the number of abortion-related admissions doubled between 1971 and 1976, rising from 1,838 to 3,702. The number of septic abortions also doubled from 306 in 1971 to 611 in 1975 (275). In Korle Bu Hospital, Accra, Ghana, the number of abortion-related admissions increased by 31 percent between 1967 and 1976, from 2,886 to 3,772 (22, 296).

The greatest increase in admissions is found in Zambia, the only country in sub-Saharan Africa where abortion is legal. Between 1972 and 1976 the number of admissions for abortion complications at University Teaching Hospital, Lusaka, jumped 106 percent, from 1,448 to 2,991. An estimated one-third of the 2,991 women treated at University Teaching Hospital in 1976 had had illegal abortions (296). The number of legal abortions also rose but remained low; only 173 were performed in 1976 (285). These figures indicate that illegal abortion is continuing in Lusaka despite liberalization of the law in 1972. The increase in admissions for incomplete abortion, however, may also be due to the fact that legalization removes the stigma from abortion, making women more willing to seek medical treatment for abortion complications (284).

The requirements of Zambian law as well as the limited number of physicians and hospitals keep legal abortion inaccessible to many women. Under the 1972 law every abortion must be approved by three medical practitioners, including one specialist, and must be performed in a hospital except when an immediate procedure is necessary to save the woman's life or to prevent permanent physical or mental injury (285). Not all requests for abortion are granted. In Lusaka approximately 20 percent of requests are denied, and this proportion may be higher elsewhere (285). An acute shortage of

physicians in Zambia—only one per 10,000 people in 1975—also prevents widespread implementation of the 1972 abortion law (535).

Using 1976 hospital records, Tegualda Monreal and colleagues estimated the annual incidence of induced abortion in seven African capital cities. The incidence rates, determined by a formula developed by the researchers, ranged from a low of 2.3 illegal abortions per 1,000 women in Kampala, Uganda, and Nairobi, Kenya, to a high of 15.3 in Yaounde, Cameroun (296). These figures are not reliable because it is difficult to determine the number of births in the cities, as needed for this method of estimation, and it is possible, as suggested both by the researchers and by participants in the 1978 IPPF Africa Region workshop, that women with spontaneous abortions are more likely to go to hospitals than women who have had illegal abortions (296, 413).

### Surveys of Women and Men

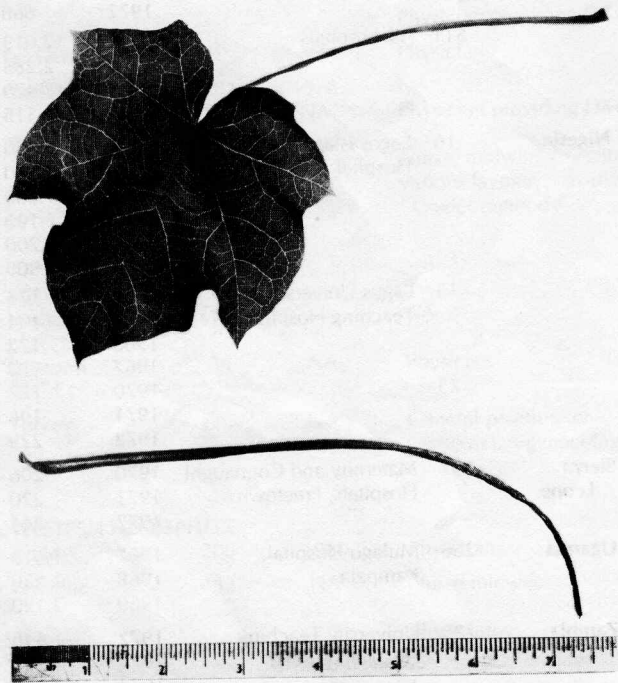
Surveys have been conducted in the last two decades to determine knowledge, attitudes, and practice of contraception among African men and women in four countries — Togo (240), Nigeria (8, 74, 75), Sierra Leone (129, 185), and Ghana (56). In all four, fewer than 5 percent of the women admitted having had induced abortions. A considerably higher percentage of the respondents in most studies acknowledged knowing about traditional and modern methods of inducing abortions. For example, in 1969, 8,400 rural and urban men and women in Nigeria were surveyed. Only 2 percent of the men reported that their partners had undergone induced abortions, and only 1.3 percent of the women admitted having induced abortions. By contrast, 24 percent of the women and 38 percent of the men said they knew about modern and traditional abortion methods (75). Knowledge of abortion, of course, does not imply practice, but the large differential suggests that a considerable degree of underreporting occurs in African survey research.

Strong tribal sanctions as well as legal restrictions may prevent most individuals from acknowledging their abortions. A 1973 study in rural Ethiopia demonstrated the substantial underreporting that can occur in standard survey research. The women were divided into two groups and asked, either by direct questioning or by the randomized response technique (RRT), if they had ever had induced abortions. Fewer than one percent of the women questioned directly admitted to having had abortions compared with an estimated 34.5 percent of the women interviewed by the RRT (104).

### Characteristics of Women Having Abortions

African women tend to turn to abortion early in their reproductive lives. The majority of women hospitalized for abortion complications are under 25 years of age, and, with the exception of those in one study in Ghana (28), unmarried. Their parity is low. In almost every study close to one-third of the women have no children, and very few have more than three. Between 50 and 75 percent of the abortions take place in the first trimester of pregnancy (16, 296, 339, 342, 358, 414). After analyzing 3,182 admissions for abortion complications at Mama Yemo Hospital in Kinshasa, Zaire, Ferdinand Pauls described the typical patient: she is 15 or 16 years old, unmarried, with no previous pregnancies. She is generally a student in her first or second year of secondary school, and her family is economically well off (358).

In many developing countries abortion is most common among older women with several living children, for whom



Fresh stalks of the jatropha plant contain a mildly corrosive sap. When stalks are inserted into the uterus, chemical reaction may start uterine bleeding. Also, the amniotic sac may be pierced. The combined effect may induce abortion. Asked to help choose plantings for the school grounds, girls at a secondary school in Ghana reportedly selected the jatropha plant (523). (Ghana Medical School, courtesy of D.A. Ampofo)

abortion serves as a means of ending childbearing. By contrast, in Africa married and particularly unmarried women rely on abortion to terminate first pregnancies. Moreover, young married women intending to bear more children at a later time use abortion to space their pregnancies (20, 414). This pattern is probably related to socioeconomic changes now underway in most countries in the region — rapid urbanization and increasing education for women — and to the absence of extensive national family planning programs and commercially available contraceptives.

### Urbanization, Education, and Fertility Control

Urbanization and the rising costs of living in a money economy have created strong pressures to reduce childbearing (74, 241, 346, 353). The influx of young men and women into the urban areas has resulted in high unemployment and acute overcrowding (267, 495). The average household in urban Africa supports at least two or three relatives from rural areas who are either looking for employment or attending school (267).

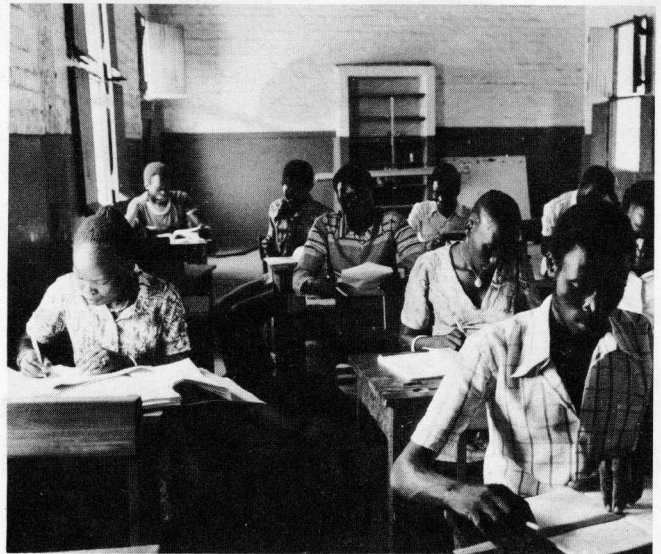
Use of modern contraceptives, while higher in urban than in rural areas, is nonetheless slight, largely because of the lack of organized family planning services (72, 353). Moreover, urban life has led to a breakdown in a major traditional form of fertility control, postpartum abstinence (61, 241, 302). In rural Africa the taboo against sexual intercourse during lactation promotes adequate child spacing. Crowded city living (which prevents physical separation of marriage partners), education, and the lack of social support for abstinence have eroded the practice. As a result, women have to find a substitute method of spacing births, and that substitute has often been abortion.

Education as well as urbanization is associated with a desire for smaller families (56, 185). In the past decade the proportion of African women attending school has increased markedly. In Kenya, for example, the percent of females age 5-17 attending primary and secondary schools increased from 20 in 1970 to 64 in 1976. Similar increases are reported in other African countries (500). As more young women are continuing their educations, early marriage and family life are delayed. Educated women marry later and have fewer children in their early reproductive years than women without education (73, 114, 186, 190, 191, 309, 489).

Delaying marriage increases the likelihood of unwanted pregnancies. Since pregnancy is grounds for expulsion from most African schools, many young women resort to abortion so that their educations will not be cut short (14, 16, 20, 55, 451, 492). A 1968 survey found that, among 45 Nigerian schools in operation for five years or more, only 12 had witnessed no student expulsions or withdrawals as a result of unwanted pregnancies or deaths from abortion. One school had recorded three deaths in eight years (14).

School girls have little access to effective contraception and often cannot afford safe abortions. In Ghana, for example, the family planning program is directed solely to married women (55, 493); in Tanzania physicians are not permitted to prescribe contraceptives for the unmarried (434). The cost of a safe abortion is high. In Dar es Salaam, Tanzania, for example, the price of a medical abortion in a private hospital is \$150 or \$200 (US) (434).

Unable to obtain safe abortions, students resort to nonmedical personnel and traditional abortifacients, and the complication



**Pregnancy is grounds for dismissal from most African schools. Because contraception is seldom available to unmarried women, many girls will resort to abortion in order to stay in school. (USAID)**

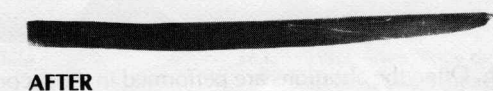
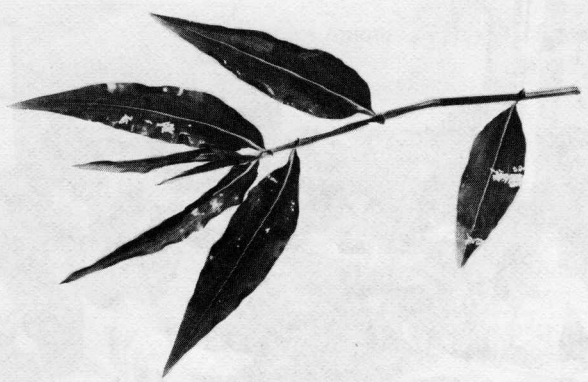
rates are high. Often the abortions are performed in the second trimester of pregnancy, leading to more frequent and more serious complications. The delay occurs partly because it is difficult to find a willing provider and partly because traditional methods are less successful at earlier stages of pregnancy (284). In Kampala Hospital, Uganda, in 1973-74 over one-third of the students admitted for abortion complications had had their abortions induced by untrained abortionists (266). In Lagos University Teaching Hospital, Nigeria, there were 22 cases of postabortion tetanus admitted between 1964 and 1966; 15 of the women were young and unmarried (17). Tetanus often results from the use of nonsterile instruments to induce abortion.

### Abortion in Rural Areas

While changes in African life and the associated increases in abortion have been most obvious in urban areas, abortion is not strictly an urban phenomenon. Induced abortion is a traditional form of birth control in many parts of Africa (326). Abortion was most often used when a woman broke the lactation taboo and became pregnant while nursing. Closely spaced pregnancies led to strong social condemnation of both partners, but especially of the women. In some areas in Zaire, for example, special songs of contempt accompanied by descriptive gestures and laughter were sung at the woman (520). Women in Benin (423), Nigeria (8), Tanzania (382), Zaire (520), and Zambia (457) are reported to have relied on abortion to avoid the social consequences of unwanted pregnancies.

In some African tribes abortion also was practiced to terminate premarital or extramarital pregnancies (61, 382). For example, among the Meru in Central Kenya, illegitimate children were not accepted in the society, and uncircumcised women were expected to refrain from sexual activity. If a mother discovered that her uncircumcised daughter was pregnant, she called the *aruti ba mau*, who applied pressure to the abdomen until the fetus was expelled (312).

A survey conducted in the southeastern region of Ghana in the early 1970s provides persuasive evidence that abortion is not



*However,*

The dried stems of the commelina plant are used as cervical dilators in Ghana. The twig, shown before and after insertion into the cervix, absorbs fluid and swells, dilating the cervix and inducing abortion. (Ghana Medical School, courtesy of D.A. Ampofo)

uncommon outside major urban centers (56). In interviews of over 300 women and men living in a town of 4,000 inhabitants, 150 respondents described 53 different abortifacients and abortion techniques. While most methods described would be for self-induced abortion, at least seven abortion providers in the community were mentioned. In autobiographical essays written by middle and secondary school students, pregnancy and abortion were commonly reported. The incidence of induced abortion in one family lineage studied was believed to be as high as 53 abortions per 100 ever-pregnant women (56).

### ABORTION IN LATIN AMERICA

Abortion legislation in Latin America is very restrictive. In 10 countries—Chile, Colombia, the Dominican Republic, Guatemala, Haiti, Nicaragua, Panama, Paraguay, Peru, and Venezuela—abortion is prohibited under any circumstances or allowed only if the woman's life is endangered by pregnancy. Four countries—Brazil, Ecuador, Mexico, and Uruguay—permit abortion to save a woman's life and in cases of incest. El Salvador recognizes possible fetal deformity as legal grounds for abortion as well (212, 589).

Less restrictive legislation, which permits abortion when the woman's physical health is threatened by pregnancy, is in force in six countries, including Bolivia and Costa Rica (589).

In Uruguay, legal penalties may be waived because of economic hardship if a woman has an abortion in the first three months of pregnancy (212). Despite the severe restrictions in most countries, criminal prosecutions are few. Generally, investigations are begun only when a woman has died from an illegal abortion (212, 514).

In Cuba the Penal Code of November 1979 legalized abortion on request. In practice, however, since 1965 abortion has been available for all women in the first 10 weeks of pregnancy, and the new law reflects this practice. Harsh penalties are established for illegal abortion—defined as abortion performed for profit, outside hospitals, or without permission of the woman (196).

The incidence of illegal abortion is believed to be very high in Latin America. The International Planned Parenthood Federation estimated in 1974 that approximately 5 million abortions were performed annually in Latin America, corresponding to an abortion rate of 65 per 1,000 women of reproductive age and an abortion ratio of 500 per 1,000 live births (211, 483). These figures on illegal abortion are comparable to the abortion rates and ratios in Cuba, the only country in the region where abortion, although technically illegal until 1979, has been openly provided in hospitals and where official statistics record the annual incidence. In 1977 Cuba reported an abortion rate of 55.9 per 1,000 women and a ratio of 724 abortions per 1,000 live births (482).

Survey research in Latin American countries since the early 1960s documents a high prevalence of illegal abortion (see Table 18) despite the restrictive laws and the opposition of the Roman Catholic Church to abortion. The proportion of survey respondents acknowledging one or more induced abortions in their lifetimes ranges from 9.2 percent in Brazil to 30.7 percent in Mexico (204, 393). The proportion of pregnancies ending in induced abortion may be as low as 5 percent, reported in a 1966 Brazilian study (287), or as high as 33.6 percent, reported in a 1967-1970 prospective survey of women in Santiago, Chile (422).

In addition, a series of epidemiological studies on fertility and abortion conducted by the Latin American Demographic Center (CELADE), showed that the incidence of abortion increased in the 1960s in major Latin American cities (157, 158, 159). In at least one country—Chile—illegal abortion and its complications apparently are decreasing as the national family planning program grows (345).

#### Chile

When Chile's family planning program was established in 1963, reducing maternal mortality and morbidity from illegal abortion was one of the major objectives (151, 167, 545). Survey research around that time indicated that as many as one of every four women in Chile had had an illegal abortion. Since 1968, however, decreasing numbers of women have been hospitalized for abortion complications, while rates of contraceptive use have increased and birthrates have declined. These statistics reflect the success of the family planning program in Chile (345).

Survey research in Chile in the 1960s showed a high prevalence of abortion (see Table 18). Between 1962 and 1964 Rolando Armijo and Tegualda Monreal interviewed 3,776 women age 20-45 who lived in Santiago, the Province of Concepción, or the city of Antofagasta. Over 20 percent of the women reported having had one or more induced abortions,

**Table 18. Lifetime Prevalence of Abortion and Pregnancy Outcome in Latin America, Selected Surveys, 1965-1980**

Country	Ref. No.	Date & Place	Respondents	% Reporting Abortion		Total No. of Induced Abortions	% Pregnancies Ending in Abortion	
				Spontaneous & Induced	Induced Only		Spontaneous & Induced	Induced Only
Brazil	29	1978, São Paulo State	2,803 women, 15-49	14.7 <sup>a</sup>	NA	NA	10.9	NA
	316							
	354	Jan.-Feb. 1968, Pôrto Alegre	197 families	NA	NA	147	22.5	13.6
	287	1967, São Paulo	1,157 married women, 15-49	NA	NA	9 <sup>b</sup>	26.1	6.7
		1966, São Paulo	1,391 married women, 15-49	NA	NA	13 <sup>c</sup>	15.3	5.0
	150	1967-1970, San José	1,211 sexually active women	NA	25.1	776	27.6	15.0
	48	Aug. 1965-Feb. 1966, São Paulo	2,857 married women, 15-49 <sup>d</sup>	NA	10.7	594 <sup>e</sup>	17.8	6.1
204	July-Dec. 1963, Rio de Janeiro	1,734 married women, 20-50	NA	9.2	NA	NA	NA	
Chile	420	Oct. 1969-Dec. 1970, Santiago	804 married women, 25-39	56 <sup>b</sup>	NA	NA	48.2	33.6
	422		675 married women, 25-29	52.3 <sup>c</sup>	NA	NA	34.3	20.7
	36	1962-1964, Santiago, Antofagasta & Province of Concepción	3,776 women, 20-45, most married	41.3	22.6	2,415	NA	NA
		1962-1964, Santiago	1,890 women, 20-45	46.3	26.2	1,394	NA	NA
	387	Oct. 1962-Sept. 1963, Santiago	580 women of reproductive age, most married	NA	NA	608	34.5	23.2
518	June 1964-NA, Western Santiago	15,467 women in family planning program	NA	NA	18,554	NA	NA	
Colombia	400	1976, national	5,378 ever-married women, 15-49	NA	NA	NA	7.5	NA
	282	1966-1968, 4 areas:	Women of reproductive age:					
		Cali	1,905	NA	NA	181	NA	14.5
		Candelaria	142	NA	NA	7	NA	14.0
		Manizales	1,397	NA	NA	93	NA	16.0
138	1969, rural areas	2,736 women, 15-49, one-third unmarried	16.5	NA	NA	7.6	NA	
El Salvador	29,	1978, national	2,322 women, 15-49	13.3 <sup>a</sup>	NA	NA	6.1	NA
	124	1975, national	2,125 women, 15-44	14.8	NA	NA	NA	NA
Mexico	347	1967-1968, Mexico City	1,753 women, 16-49	26.7	NA	NA	NA	NA
	393	early 1960s, Mexico City	1,000 clients of family planning clinic	NA	30.7	797	NA	13.0
Guatemala	361	1978, national	2,684 women, 15-49	10.6 <sup>a</sup>	NA	NA	5.4	NA
Paraguay	29,	Mar.-Apr. 1977, national	2,048 women, 15-44	15.3	NA	NA	7.4	NA
Panama	29,	1976, national	3,701 married women, 20-44	NA	NA	97	7.1	NA
30								

<sup>a</sup>Percentage of women age 15-44

<sup>b</sup>Prospective study design

<sup>c</sup>Retrospective study design

<sup>d</sup>Once married or having one union only

<sup>e</sup>Includes 40 abortions induced "under medical advice"

and over 10 percent had each had four or more abortions. A similar study conducted by Mariano Requena in Santiago in 1962 and 1963 found that a random sample of 580 women had had a total of 608 induced abortions, or an average of 1.05 abortions per woman (387). A prospective study of 804 women age 25-39 in Santiago showed that about one-third of their 164 pregnancies in 1969 and 1970 ended in induced abortion (422).

The high prevalence of abortion reported in survey research is substantiated by the large number of hospital admissions for abortion complications. Between 1931, when records were first kept, and the 1960s, increasing numbers of women were hospitalized for abortion complications, reaching a high of 62,800 in 1966 (516). After 1966 the number of admissions declined. Data from national health service hospitals, which serve about 95 percent of the population, show that this trend has continued. The number of women with abortion complications admitted to national health service hospitals fell by about 45 percent between 1965 and 1978 (345). Rates of hospitalization, based on the national female population age 15-49, fell at a similar pace (see Figure 4 and also Figure 3, p. F-127).

Rates of hospitalization for abortion complications are higher in urban than in rural areas. In the city of Santiago in 1965, 41.6 women were hospitalized for abortion complications per 1,000 women of fertile age, while in Chile as a whole the rate was 29.8 (516).

In Chile, hospital admissions may represent roughly one-third of all acknowledged illegal abortions. In their 1962 survey, Armijo and Monreal found that 31 percent of the women who admitted having had illegal abortions required subsequent hospitalization (36). In a 1970 survey in northern Santiago, 36 percent of all women admitting abortions required subsequent hospitalization (294).

The rapid increase between 1946 and 1960 in hospital admissions for abortion complications (see Figure 4) may have been related to changes in Chilean socioeconomic conditions: decreased agricultural and mining exports, high unemployment, and increased rural-to-urban migration, creating strong pressure to limit family size (294). The decrease in admissions in the 1960s and 1970s has been attributed to the intensive family planning programs begun in the mid-1960s (141, 208, 294, 345, 421, 517, 519). Tegualda Monreal theorizes that, in addition to increased use of contraception, abortions were increasingly performed by physicians and paramedical personnel, rather than by untrained personnel, leading to fewer and less severe complications and thus fewer hospitalizations (294).

The combination of increased contraceptive use and, possibly, more use of skilled abortion providers caused a dramatic decline in abortion morbidity and mortality. Between 1964 and 1979 mortality from abortion fell from 11.8 to 2.4 deaths per 10,000 live births, a decline made even more impressive by the fact that birthrates declined sharply in that period (345, 556). (see Figure 3, p. F-127). In 1964 abortion cases constituted over 20 percent of all obstetrical admissions. by 1978 the proportion had dropped to 13 percent (345). This reduction in abortion admissions eased pressure on obstetrical and gynecological service staff and facilities.

### Brazil

Estimates of the annual number of illegal abortions in Brazil in the early 1970s range from 600,000 (300) to 3,000,000 (398). Most research has been confined to urban areas, and, as the range of the estimates suggests, the information from the

studies is not always comparable (419). Results of seven surveys of Brazilian women are summarized in Table 18; between 9 and 25 percent of respondents acknowledged one or more induced abortions. Between 5 and 15 percent of all pregnancies ended in induced abortion.

A 1978 survey of 2,800 women from São Paulo State showed that almost 15 percent of all respondents had had a spontaneous or induced abortion (see Table 18). The reported level of induced abortions was twice as high among women in urban areas as among women in the rural areas. In the municipality of São Paulo, 16 percent of the abortions were reported as induced compared with 13.5 percent in other urban areas and 7 percent in rural areas (316).

Admissions records from Brazilian hospitals indicate that women with complications of spontaneous or illegal abortion constitute a substantial proportion of all patients. Of 1,697 women admitted to a maternity hospital in Salvador, Bahia, during 3 months in 1970, 21 percent were treated for abortion complications (84). In 46 Brazilian hospitals in 1964, 233 women were treated for abortion complications for every 1,000 deliveries (399). A São Paulo hospital that admitted 5,500 women for complications of pregnancy and childbirth between 1944 and 1962 treated one-third of them for abortion complications (327).

### Colombia

Three national and regional surveys conducted since 1965 report a wide range of abortion rates and ratios in Colombia. The surveys show that between 7 and 16 percent of reported pregnancies ended in spontaneous or induced abortions (138, 282, 400). (see Table 18). It has been estimated, however, that between 200,000 and 250,000 illegal abortions occur annually in Colombia, or about 286 abortions per 1,000 live births (209, 490).

The highest abortion rates were reported in a 1964 survey of three cities and one rural area — between 570 and 960 abortions per 1,000 women interviewed. By contrast, the Colombian rural fertility survey of 1969 reported a lifetime incidence of only 288 abortions per 1,000 women interviewed and the World Fertility Survey in 1976 found 221 abortions per 1,000 women interviewed (138, 400). This difference may represent a decline in abortion or simply a variation in survey responses.

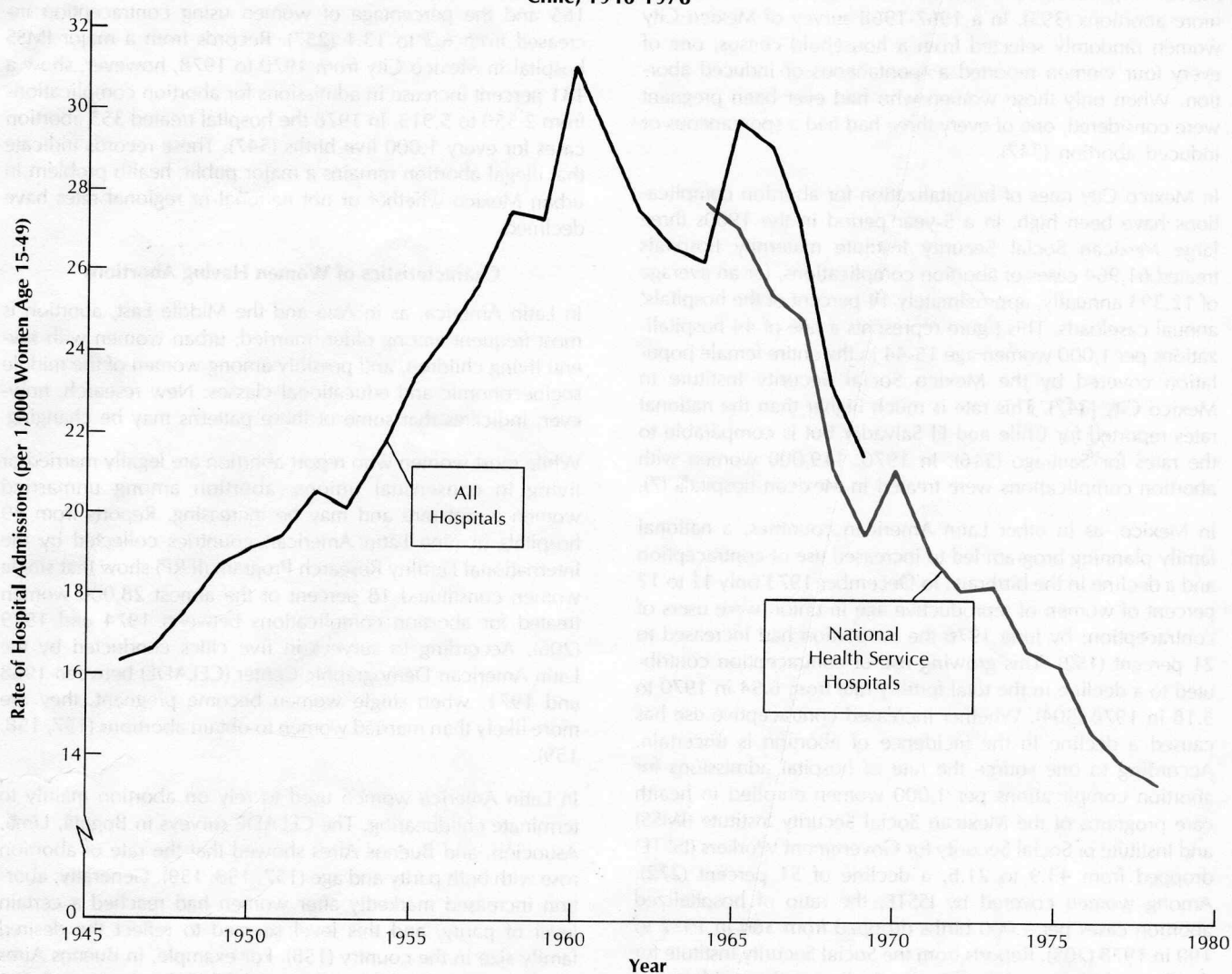
Hospital admissions records dating back to the 1960s indicate that women with abortion complications occupied many hospital beds in Colombian cities. From 1965 through the first eight months of 1969, the Maternal and Child Institute in Bogotá recorded 25,569 admissions for abortion complications. Between 77 and 87 percent of the abortions were believed to have been induced (417). From 1970 through 1978 the same hospital reported 54,705 admissions for abortion complications — 18 percent of all hospital admissions. Deaths from septic abortion alone during this period accounted for 40 percent of the maternal mortality occurring in this hospital (572). The University Hospital in Caldas treated 1,229 abortion complication cases between 1966 and 1968 — 186 abortions per 1,000 births, or about one abortion case for every five births (512). A similar ratio, 215 abortions per 1,000 births, was recorded at University Hospital of Barranquilla. Between 1969 and 1971, 4,106 abortion complication cases were admitted; 33 percent of the abortions were induced (130).

### El Salvador

Illegal abortion is a significant cause of maternal mortality in El Salvador. In 1973 and 1974, at least 11 percent of maternal



**Figure 4. Rates of Hospital Admissions for Abortion Complications, Chile, 1946-1978**



Note: Rates for national health service hospitals based on national population of women age 15-49; thus rates shown underestimate actual rate. Population data from United Nations (497-499, 592-595), United States (503).

Source: Onetto (345), Viel (516)

deaths were due to complications of abortion (307). The actual prevalence of abortion and of induced abortion specifically are still unknown, but contraceptive prevalence surveys conducted in 1975 and 1978 indicate that one of every seven women age 15-44 has had a spontaneous or induced abortion at some time in her life. Among currently married women age 15-44, as many as one of every five has had one or more abortions (124, 307) (see Table 19).

Compared with Chile, the rate of hospitalization for abortion complications in El Salvador in the last two decades is low. Between 1964 and 1973, rates ranged from 9.9 to 12 per 1,000 women age 15-49, less than half the Chilean rates for the same period. The El Salvador rates remained fairly stable between 1964 and 1973. The proportion of abortions classified as septic has increased, however. In Maternity Hospital in San Salvador in 1968 one of every five hospitalized abortions was septic; in 1972, one of every four (308).

**Panama**

As in Colombia, the Panama World Fertility Survey, conducted in 1976, found relatively few women reporting abortions. Only 7.1 percent of all pregnancies were said to terminate in spontaneous or induced abortion (30) (see Table 18). Hospital re-

ports and death certificates, however, suggest that abortion is actually more frequent and is an important cause of maternal mortality and morbidity. In the years 1968 to 1973, abortion complications caused between 6 and 13 percent of the reported maternal deaths in Panama (306). In 1973 Ministry of Health institutions treated 3,207 spontaneous and illegal abortion cases, comprising 9.6 percent of the maternal discharges for that year (306).

**Mexico**

An estimated 500,000 to 600,000 illegal abortions are performed annually in Mexico, for a national rate of about 48 abortions per 1,000 women age 15-44 (7, 152, 498). As many as one of every four or five pregnancies ends in illegal abortion. Since 1973, when the national family planning program began, contraceptive usage has increased and the birthrate has declined. While some evidence is conflicting, records from the Mexican Social Security Institute suggest that the increasing use of contraception may have led to lower rates of abortion.

Hospital admissions records and surveys of women (see Table 18) from the 1960s and early 1970s document a high prevalence of illegal abortions. In the early 1960s interviews with

1,000 randomly selected clients at a family planning clinic in Mexico City revealed that almost one-third had had one or more abortions (393). In a 1967-1968 survey of Mexico City women randomly selected from a household census, one of every four women reported a spontaneous or induced abortion. When only those women who had ever been pregnant were considered, one of every three had had a spontaneous or induced abortion (347).

In Mexico City rates of hospitalization for abortion complications have been high. In a 5-year period in the 1960s three large Mexican Social Security Institute maternity hospitals treated 61,964 cases of abortion complications, for an average of 12,393 annually, approximately 14 percent of the hospitals' annual caseloads. This figure represents a rate of 44 hospitalizations per 1,000 women age 15-44 in the entire female population covered by the Mexico Social Security Institute in Mexico City (347). This rate is much higher than the national rates reported for Chile and El Salvador but is comparable to the rates for Santiago (516). In 1970, 119,000 women with abortion complications were treated in Mexican hospitals (7).

In Mexico, as in other Latin American countries, a national family planning program led to increased use of contraception and a decline in the birthrate. In December 1973 only 11 to 12 percent of women of reproductive age in union were users of contraception; by June 1976 the proportion had increased to 21 percent (152). This growing use of contraception contributed to a decline in the total fertility rate from 6.54 in 1970 to 5.18 in 1978 (504). Whether increased contraceptive use has caused a decline in the incidence of abortion is uncertain. According to one source the rate of hospital admissions for abortion complications per 1,000 women enrolled in health care programs of the Mexican Social Security Institute (IMSS) and Institute of Social Security for Government Workers (ISSTE) dropped from 43.9 to 21.6, a decline of 51 percent (272). Among women covered by ISSTE, the ratio of hospitalized abortion cases per 1,000 births dropped from 380 in 1972 to 190 in 1978 (205). Reports from the Social Security Institute for the State of Mexico also suggest a decline in the incidence of abortion. Between 1972 and 1979 the hospitalized abortion rate per 1,000 women of fertile age registered with a family

physician fell from about 45 to 15. At the same time, the number of births per 1,000 women also declined from 228 to 165 and the percentage of women using contraception increased from 6.3 to 13.1 (257). Records from a major IMSS hospital in Mexico City from 1970 to 1978, however, show a 131 percent increase in admissions for abortion complications from 2,559 to 5,915. In 1978 the hospital treated 355 abortion cases for every 1,000 live births (547). These records indicate that illegal abortion remains a major public health problem in urban Mexico whether or not national or regional rates have declined.

**Characteristics of Women Having Abortions**

In Latin America, as in Asia and the Middle East, abortion is most frequent among older, married, urban women with several living children, and possibly among women of the middle socioeconomic and educational classes. New research, however, indicates that some of these patterns may be changing.

While most women who report abortion are legally married or living in consensual unions, abortion among unmarried women is not rare and may be increasing. Reports from 39 hospitals in nine Latin American countries collected by the International Fertility Research Program (IFRP) show that single women constituted 18 percent of the almost 28,000 women treated for abortion complications between 1974 and 1979 (206). According to surveys in five cities conducted by the Latin American Demographic Center (CELADE) between 1968 and 1971, when single women become pregnant, they are more likely than married women to obtain abortions (157, 158, 159).

In Latin America women used to rely on abortion mainly to terminate childbearing. The CELADE surveys in Bogotá, Lima, Asunción, and Buenos Aires showed that the rate of abortion rose with both parity and age (157, 158, 159). Generally, abortion increased markedly after women had reached a certain level of parity, and this level seemed to reflect the desired family size in the country (158). For example, in Buenos Aires women with two children reported 39.6 abortions per 1,000 women in their lifetimes, while women with three children reported 93.5 per 1,000. In Panama City and Lima large increases in abortion rates occur after the fourth child (157, 158, 159).

The IFRP hospital study presents evidence that growing proportions of women are now using abortion to space births or postpone childbearing. The majority of the women hospitalized for abortion complications were between 25 and 29 years of age and almost 25 percent had no living children. Thus, the women in this study were younger and of lower parity than women in studies conducted in the 1960s (206).

Several Latin American studies indicate that women who have already had one induced abortion tend to have another when faced with additional unwanted pregnancies (515). In three Mexico City hospitals, for example, 3,714 women treated for abortion complications reported a total of 11,398 induced abortions, or 3 abortions per woman (347). In a survey of Chilean women in 1962-1964, 885 women admitted to 2,415 induced abortions, or 2.7 abortions per woman (34). Similar results from other studies indicate that repeat abortions are not uncommon (48, 376, 385, 386, 422).

Hospital admissions records suggest that abortion is more frequent among urban women than rural (308, 386, 516). This difference, however, may be partially due to greater availabil-

**Table 19. Percentage of Currently Married Women Age 15-44 Reporting History of Spontaneous or Induced Abortion, by Residence, Four Latin American Areas, 1975-1978**

Country & Date	Ref. No.	No. of Women	% Reporting History of Abortion			
			All Women	Metro-politan	Other Urban	Rural
El Salvador 1975	307	631	24.6	19.8	20.1	27.4
1978	124	1,476	19.9	18.8	16.2	21.6
Guatemala 1978	361	2,684	20.4			16 <sup>a</sup> 6.8 <sup>b</sup>
Brazil 1978 São Paulo State	316	1,880	21.9	24.3	20.1	22.4
Paraguay 1977	31	1,233	24	37.5	18.4	21.7

<sup>a</sup>Rural Latin population  
<sup>b</sup>Rural indigenous population

ity and use of health care facilities by women in urban areas. In recent fertility surveys of currently married women in El Salvador, São Paulo State in Brazil, Guatemala, and Paraguay, abortion rates are higher in the urban area of only one country, Paraguay. Except in Brazil, women in urban areas were more likely to be hospitalized after their last abortion than women in rural areas. In the 1978 El Salvador survey, for example, 68 percent of urban women reporting abortions were hospitalized after their last abortion compared with 27 percent of the rural women (124) (see Table 19).

Early research on the association between socioeconomic status and abortion suggested that abortion was most frequent at the middle socioeconomic levels of society and least frequent at the extreme upper and lower levels. More recent research, however, fails to reveal any consistent relationship. Using education as a measure of social class, Mariano Requena cites studies in the 1960s in Mexico City, Santiago, and Bogotá showing a greater prevalence of induced abortion among women with primary school education than among women with no education or women with secondary or university education (386).

Research conducted in the late 1960s and 1970s no longer shows this pattern. The CELADE survey, for example, found differing relationships between abortion and education among the cities surveyed. In Bogotá, Lima, Panama City, and Asunción, lifetime abortion rates decreased as education increased. In Buenos Aires, however, the highest rate of abortion was among university educated women (157, 158, 159). Other survey research documents wide differences in relationships be-

tween abortion and education among Latin American countries. In Santiago and El Salvador, abortion was most common among women with three years of education or less (124, 422), whereas in Paraguay abortion was most common among women with more than six years of education (31). Thus, in Latin America, other factors — such as the desire to control fertility and the availability of contraception — may have more impact on abortion prevalence than education.

Overall, throughout the developing world, abortion seems to be increasing except where family planning programs have been specifically designed, as in Chile, to substitute family planning for abortion. Mortality from abortion is markedly lower (1) where contraception is used instead of abortion; (2) where legal restrictions on abortion have been lifted and legal abortion procedures are readily available; (3) where physicians or other medically trained practitioners perform the procedure using sterile dilatation and curettage or vacuum aspiration techniques; and (4) where good clinical management of abortion complications is easily accessible. Nevertheless, in many parts of the world, these conditions do not prevail, and mortality from illegally induced abortion is high — as many as one out of every 3 or 4 maternal deaths may be due to illegal abortion. Other health problems among women of reproductive age — including infertility — can be attributed to complications of illegal abortion. As more women and couples decide to have fewer children and as more public and private agencies try to develop improved family health programs, the individual health hazards of illegal abortion and the public health costs of treating the ensuing complications will remain a serious problem in many countries.

Education  
Paraguay

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