

Chapter 13

Associated Complications

In general, the term *complication* is defined as a condition following an illness or surgery which may or may not be associated with it, but which usually requires further medical care. A complication indicates a deviation from the expected progression of events during the course of a disease or condition already present and/or the occurrence of a subsequent illness or event that would not have arisen in the absence of an earlier disease or condition. Complications may take various forms, as for instance: a new disease such as pulmonary thrombosis in the post-partum period; an exaggeration of an expected event such as blood loss associated with an abortion; a prolonged and severe depression after an otherwise normal pregnancy; or bowel obstruction due to adhesions years after an abdominal operation.

The complication may become apparent soon after the onset of the original disease or condition, or it may not be evident until much later when the original illness has been long past. Complications may be regarded as minor or unimportant when they do not alter the progression of the original disease significantly. Major complications will delay a person's rate of recovery or introduce new difficulties. Some complications such as infection are common to many diseases, while others are associated with particular organs or events.

How complications are defined by attending physicians and how these events are subsequently listed for statistical classification influence what is known about their prevalence. Complications which may arise from childbirth or induced abortion may not occur until sometime after these events have occurred. As a result they may be considered and classified separately, with no indication being given in official statistical reports as to what led to their occurrence. It is for these reasons that the findings about complications associated with pregnancy and induced abortion must be seen for what they are—available, but not fully conclusive sources of information.

One of the Terms of Reference set for the Committee was to examine: "the timeliness with which this procedure makes an abortion available in light of what is desirable for the safety of the applicant." A related Term of Reference was: "... to what extent has permitting the pregnancy to continue affected the woman or her family..." In its review of these Terms, the

Committee drew upon two sources of information. At the Committee's request Statistics Canada undertook a number of special tabulations dealing with complications associated with induced abortion. This information depends upon the assumption that there is a uniform interpretation of the term *complication*, an assumption which is not wholly valid. Counterbalancing this caution which applies equally to the reporting of all other health conditions listed in hospital and medical care insurance statistics as well as to all vital statistics collected for the nation, is that these sources of information are the best which are now available. In considering the experience of large numbers of women, they are relevant and necessary sources upon which to determine if consistent trends occur. It is from this perspective that they were considered by the Committee.

A second source of information which was used in the review of complications associated with childbirth and abortion relates to the experience of women in two provinces, Saskatchewan and Alberta. Because hospital and medical care insurance programs in Saskatchewan antedated the start of these measures elsewhere in Canada, they provide an unrivalled source of information over a period of time about morbidity and utilization of health services' trends. Both of these programs in Saskatchewan were in operation prior to the 1969 changes in the Abortion Law, thus providing a means of documenting some of the legislation's effects on the incidence of and complications associated with abortion. Obtained for other purposes, the research work involving these provincial statistical records resulted in a 10 percent sample of the Saskatchewan population which brought together for these individuals information on their hospitalization experience, their use of medical care services, and their income levels. This step was done by means of an individual identification number for each person in the 10 percent sample whose overall size, allowing for population mobility or death, was augmented annually over a period of several years. In the original analysis there was no personal identification of any individual involved.

Drawing upon this source of information involving the experience of a representative 10 percent sample of the Saskatchewan population, special tabulations were made of the women in this sample who had had deliveries, spontaneous abortions, and therapeutic abortions in 1970 and 1971. The health care experience of all women in these three categories was considered for a year before and a year after their pregnancy-related experience. This information included their experience in hospital, their before-and-after use of medical services, and the reported associated health complications which they experienced. While the number of the women in each of the three categories was small, their experience was representative of what was happening in these respects to other women in Saskatchewan.

Based on a request of the Committee, the Perinatal Committee of the Alberta Medical Association, a committee approved by the Alberta Hospital Association and the University of Alberta, took two samples of women from the 1970 computer service records of the Alberta Health Care Insurance Commission. These two groups of randomly selected women consisted of 101 women who had had induced abortions in 1970 who were matched by age with 100 women who had not had induced abortions that year. The health care

experience of these two groups of women was traced over a period of five years. A major difference between the groups of women whose health experience was considered in Saskatchewan and Alberta were the characteristics of the women in each instance with whom induced abortion patients were compared. In Saskatchewan, the comparison group consisted of women who had had deliveries or spontaneous abortions, that is, they had had pregnancy-related conditions. This was not the case for the group of women with whom induced abortion patients were compared in Alberta. The comparison group in this case involved a cross-section of women, only some of whom had had pregnancies.

Independent viability

The fertilization of a female egg cell or ovum is the result of a union with a male sperm. The engrafting of the fertilized ovum in the lining of the uterus is known as implantation. The length of an ordinary pregnancy lasts about 40 weeks of gestation. It ends with a full-term birth. This process may end anytime during the period of gestation, either spontaneously or by interruption. Independent viability is a relative term implying that the newborn is able to survive outside the womb. This viable state depends on life supports which may be available after the birth of an infant. At the present time in Canada the level of care which is needed for the optimum survival of the newborn infant varies by the level of foetal development. Warmth and nourishment in most instances are sufficient to ensure the survival of a foetus weighing 2,500 grams or more. Below this weight the premature infant requires special care, the complexity of which increases as the weight or maturity decreases. Five hundred grams is widely considered to indicate the minimum stage of maturity above which there is any possibility for the independent viability of the infant. Feasible techniques for the prediction of foetal weight, such as ultrasound, can predict within limits the defined abortion/prematurity point (500 grams) and the premature/mature infant (2,500 grams). A more easily determined measure of infant maturity is the length of gestation. Although the measure of time is not individually precise, the average stage of a pregnancy required to reach 500 grams is usually about 20 weeks and the length of the pregnancy which is needed to reach 2,500 grams is about 37 weeks. The actual determination of the time of conception is imprecise. It relies on the approximate date of the last menses and the judgment of the physician in determining the size of a pregnant woman's uterus.

Abortion, derived from the latin *abortio*, meaning a miscarriage, can be applied to the failure of inanimate as well as of animate beings to progress to maturity. Its most common usage is in connection with the outcome of pregnancy, where it means that a foetus has failed to achieve or has not been allowed to reach independent viability prior to separation from the uterus of a woman. By international agreement, the separation of the products of conception is called an abortion if the separation takes place some time up to 28 completed weeks of gestation—that is, the point at which an infant is considered to be viable. Beyond 28 completed weeks, infants may be referred to as

a premature or a full-term infant. Between 20 and 28 weeks the chances of survival depend upon the length of gestation.

The viability of the female germ cell after its release from the ovary is limited. If the ovum is not fertilized within a relatively short time (about 24 hours) after ovulation, it will degenerate and be re-absorbed or expelled from the uterus. The male sperm on the other hand can survive for several days within the female reproductive tract. The time of fertilization of the ovum primarily depends upon the timing of ovulation rather than on the actual time of coitus. The medical means which are available at present for the detection of ovulation are retrospective, e.g., basal body temperatures, hormone estimations.

The implantation of the fertilized ovum is delayed for up to eight days after fertilization during which time the endometrial lining of the uterus is being prepared to receive and nourish the dividing cells. The early detection of the presence of a fertilized ovum depends upon the changes it brings about on the maternal environment, or on the production of a unique hormone which is absorbed into a mother's circulation and excreted in her urine. Newer and more sensitive laboratory techniques for the assay of this hormone of pregnancy (chorionic gonadotrophin) have made it possible to detect a pregnancy as early as two weeks after fertilization, before there are any detectable physical changes in the uterus or in the other maternal organs. The usual pregnancy tests done in laboratories, however, are not reliable until at least four weeks after fertilization, or assuming a 28 to 30 day cycle, until two weeks after the first missed menstrual flow.

Although an assay will determine the presence of an early pregnancy, it does not provide a specific date upon which to base subsequent calculations of the duration of the pregnancy. This fact still depends upon the nature of each woman's menstrual cycle and upon the accuracy of her recall of the date of her last menstrual flow. A frequently used method to determine the expected time of delivery is to identify the first day of the last menstrual flow, add seven days, and count back three months (or forward nine months). This method, when applied to the 28 day cycle, over-estimates the duration of a pregnancy by about two weeks as compared to the more precise method of determining the date of ovulation and counting forward between 266 and 270 days. If the woman's cycle is shorter or longer than 28 days, the difference between the two methods becomes greater. The practical dividing line between an abortion and a premature birth depends upon the method which is used to calculate the duration of a pregnancy.

A similar issue relating to the difference between an abortion and contraception, and the role of treatments such as the "morning-after pill" and menstrual extraction revolves around the problem of determining when a pregnancy begins. The use of these techniques might involve several factors:

Prophylactic—e.g., the inhibition of ovulation, or the union of the sperm and the ovum.

Interruptive—e.g., the inhibition of the implantation or the promotion of sloughing-off of the fertilized ovum.

Unnecessary—e.g., their use in the absence of the ovum, sperm, or pregnancy.

Which of these outcomes is the case in any individual event is seldom, if ever, known with certainty. The means are unavailable to get precise answers to two basic questions: (1) When did the pregnancy begin?, and (2) When did the foetus reach independent viability? Until there are more conclusive answers to these questions, the query "What is an abortion?" can be answered in only a general way. Only the weight can be determined with finality. This fact is only known after the foetus has been delivered.

Methods of terminating pregnancy

Induced abortions may be done by an unqualified attendant, or by qualified attendants who are able to prevent, or cope safely and effectively with bleeding, infection, and tearing. Throughout a pregnancy and afterwards, there are a number of risks such as bleeding, infection, torn muscles and others which may be associated with child-bearing or which may occur at a later date. Statistics Canada lists the complications associated with therapeutic abortion as:

- Haemorrhage
- Infection
- Laceration of the cervix
- Perforation of the uterus
- Retained products of conception
- Death
- Other

These complications are not associated solely with an abortion, whether spontaneous or induced, but can occur more or less immediately with labour, delivery at term, or in connection with other diseases. The complications which are specific to pregnancy involve the breaking down of vascular connections between a mother and the foetus before, during, or after the removal of the products of conception from the womb. This relationship is usually not disturbed at term until after a baby is delivered. Then the uterine muscle contracts on the lessened volume, the placenta is sheared off and separated cleanly as a single mass, and the maternal vessels are tightly squeezed so that bleeding is held to a minimum. There is usually no need to introduce any instrument into the uterus to assist this mechanism and the risk of infection and trauma is small.

Spontaneous abortion occurs with a similar, but less efficient sequence. There is often some placental separation before or during the contractions which are needed to bring about the dilatation of the cervix and the expulsion of the products of conception. This bleeding may be prolonged and excessive so that it becomes necessary to dilate the cervix mechanically and remove the uterine contents thus allowing the muscle to constrict the maternal vessels and reduce the bleeding. This procedure carries with it the risks of the laceration of the cervix, the perforation of the uterus and the introduction of infection. The incomplete emptying of the uterus is not unusual for two reasons:

1. The maternal/foetal division of the placenta is not mature and the placenta is more intimately connected to the uterus than it is at term.

2. The procedure is done on a blind basis. The inner surface of the uterus is not easily inspected for the removal of placental fragments.

As a result of these factors the products of conception may be left behind or retained, adding further to the risks of haemorrhage and infection.

The problems associated with induced abortion are similar to those associated with spontaneous abortion. In the absence of spontaneous contractions which cause the cervical dilatation and the spontaneous separation of the products of conception, the risks become greater.

To understand the basis for the selection of the method which may be most appropriate for emptying the uterus at different stages of pregnancy, the procedure must be seen in the context of the changing relationships between the products of conception and the uterus. The uterus has muscular and fibrous walls the inner surface of which is covered by a membranous lining (the endometrium) which in the non-pregnant state is shed and regenerated periodically. When the fertilized and developing ovum enters the cavity by either one of the two tubal openings, it adheres to and then burrows into a small spot in the endometrium, enlarging rapidly. It soon involves a large area of the endometrium. While the invasive properties of the placental tissue permit it to establish a firm connection to the uterus, it generally does not penetrate the muscle layer to any significant depth.

As the pregnancy progresses and the uterus enlarges to accommodate the foetus floating in its fluid-filled sac, the placental tissue becomes circumscribed and occupies a relatively small proportion of the uterine wall. The muscle layer of the body of the uterus thins as the pregnancy approaches maturity and the cervix becomes softer and shorter. When normal labour begins, the time required is relatively short for the muscular contractions of the body of the uterus to dilate the cervix. Following the delivery of an infant, the muscular walls contract still further so that the inner surface area becomes smaller. The placenta which is of a fixed size is sheared off and pushed out by the force of the uterine contractions. Simultaneously, the muscle fibres close down on the maternal blood vessels which were supplying the placenta so that the blood loss is minimized. In the large majority of pregnancies, this sequence progresses efficiently and it does not require any assistance or interference.

The physical and mechanical relationships are not the only changes which occur with time. The chemical and the normal changes in the uterus keep the muscle layer quiet in the early stages, so that it is difficult to produce coordinated and effective contractions by the use of drugs or other means. Later, as the pregnancy approaches the mid-point, the uterus gradually becomes more responsive to drugs such as oxytocin and prostaglandins which are used for the slow dilatation of the cervix, and to changes in the fluid around the foetus brought about by instilling hypertonic solutions of saline, glucose or urea into the amniotic sac.

These physiological changes dictate the means by which the uterus can be emptied most easily according to the stage of gestation. The pregnancy can be

terminated by the use of mechanical techniques, drugs or a combination of these two means.

Mechanical

1. Dilatation
2. Dilatation and curettage (D & C)
 - (a) Menstrual extraction
 - (b) Suction
 - (c) Surgical
3. Hysterotomy
4. Hysterectomy

Medical (Drugs)

1. Prostaglandins
2. Oxytocin

Combination of Mechanical and Medical

1. Intra-amniotic injections
2. Curettage after intra-amniotic injection

The stimulation of labour by the slow dilatation of the cervix can be attempted by mechanical dilatation or through the use of a laminaria tent which is a tightly woven mesh of seaweed or cellulose which has recently regained its popularity. Upon being introduced into the cervical canal, it absorbs local fluids, swells and dilates the cervix over a period of several hours. Labour may or may not follow. The laminaria tent is usually used concurrently with other procedures to reduce the risk of tearing the cervix. Its use is associated with some risk of infection.

In the earlier weeks of pregnancy the products of conception can be removed through a small-diameter, flexible cannula or catheter. Suction from a 50 cc syringe is sufficient to remove the contents of the uterus. The technique of menstrual extraction for the removal of the endometrium from the uterus up to seven weeks may be performed before the presence of the pregnancy is confirmed. Little is known about the extent to which this procedure is used by physicians in their offices or by women themselves, although there are indications from the national population survey that both occur in Canada. This method carries with it the risk of infection and/or the risk of a perforation of the uterus which are common to all invasive techniques, particularly when they are carried out by unskilled persons under less than optimal conditions.

The very early diagnosis of pregnancy has been made possible through the use of a recently developed sensitive and specific hormonal assay which differentiates between the hormone of pregnancy (chorionic gonadotrophin) and the chemically similar gonadotrophin produced by the pituitary gland. This significant advance coupled with the use of the vacuum or suction curette may lead to a lessening of the prevalence of complications. Because both the

suction and surgical curettage techniques are done on a "blind" basis by a physician, it is not always possible to be certain when all of the products of conception have been removed. When the retained products of conception remain, they may result in prolonged bleeding and/or infection. Precautions are necessary if the complications of trauma, haemorrhage and infection are to be reduced. The dilatation of the cervical canal to a diameter which is adequate for the passage of an instrument capable of scraping out (curetting) or aspirating (sucking) the endometrium and the products of conception, is the usual method for the termination of pregnancies prior to 13 weeks in length of gestation. With the increasing mass of the pregnancy these methods become less effective and their use is associated with greater blood loss. Consequently, they are usually replaced by techniques designed to stimulate the uterus to contract.

The induction of labour during the second trimester, similar to that which occurs at term, has been attempted to avoid excessive damage to the uterus. This step has been done successfully by injecting hypertonic solutions into the amniotic fluid around the foetus or by the use of a relatively new family of drugs, the prostaglandins. These latter drugs can be given by mouth or intravenously. Although these methods are successful, they bring new problems and result in unpleasant side effects related to the drugs which are used (water intoxication secondary to hypertonic solutions; nausea, vomiting and diarrhoea associated with the prostaglandins) and to the techniques (intra-uterine infection and haemorrhage secondary to needle puncture of the uterus). There is an increased risk of having retained products of conception in these mid-trimester abortions, because the placenta is less easily separated from the wall of the uterus at this time than at term and because the process of labour is longer and less efficient. Thus it may be necessary to complete the abortion by surgical or suction curettage.

The attempts to stimulate the uterus with drugs may be prolonged and uncomfortable. Uterine and bowel cramps, nausea, vomiting and diarrhoea are minor complications which are not listed separately. Water intoxication is a rare occurrence associated with prolonged intravenous infusions and oxytocin. Infection can be associated with intra-amniotic injections. When the uterus will not respond to efforts to induce labour at this more advanced stage of pregnancy, there is only one recourse, a hysterotomy. This operation is similar to a caesarian section, but it often involves a greater blood loss. It leaves the uterus weakened by a scar so that future pregnancies are accompanied by a threat of uterine rupture which can only be circumvented by elective caesarian section. Hysterotomies are often performed electively when a concurrent surgical sterilization is to be performed. The removal of the entire uterus along with the products of conception is an uncommon method which is used only as a last resort, or when there is an accompanying condition which is an indication for the removal of the uterus. As a pregnancy progresses, the complexity of the methods required to empty the uterus becomes greater. The problems associated with the procedures which are used increase in number and severity. Conversely, the earlier the termination is carried out, the simpler are the methods which are required which in turn result in fewer immediate associated complications.

In more than three-quarters (78.4 percent) of the 209 hospitals with therapeutic abortion committees which were surveyed by the Committee, surgical dilatation and curettage was one of the procedures which was used for therapeutic abortions. Nearly two-thirds (63.5 percent) had a suction curettage available for induced abortions. In half (56.7 percent) of the hospitals hysterotomies were performed, while intra-amniotic injections were carried out in 34.1 percent of hospitals. Menstrual extractions were performed in 3.4 percent of these hospitals.

Complications of abortion

The complications which are recorded depend upon the prevailing attitudes and customs of patients and the medical profession as well as the definitions and regulations which are involved in the classification of diseases. A haemorrhage for instance is a reportable complication, but the dividing line between the amount of bleeding which is acceptable or may be expected, and what constitutes a reportable event is a matter of subjective professional evaluation. The techniques which are used to measure the actual amount of blood which may be lost are cumbersome and unreliable, while the individual estimates which are made by physicians may be contingent upon their experience and attitudes. A temperature elevation, an increased white blood cell count, a purulent discharge, a local pain and tenderness and a rapid pulse rate are all associated with an infection. However, an infection may or may not be related to an induced abortion and an infected abortion may or may not produce all of these signs and symptoms. A simple temperature elevation which is treated immediately with antibiotics may suppress the development of other symptoms or signs. In this event it is difficult to determine whether an abortion has become infected, or whether there was an unrelated cause of the fever. Subjective evaluations cloud the reliability of reports and mask the actual incidence of the complications which are listed even under the best circumstances, their observation in hospital. When an induced abortion does not occur in hospital, there is less opportunity for professional observation and the reliability of the information which is obtained decreases. If the complication occurs following the discharge of a patient from the hospital, her treatment may be carried out in a private physician's office, or if it is more serious it may involve her re-admission to hospital.

The complications listed by Statistics Canada (haemorrhage, infection, laceration of the cervix, perforation of the uterus, retained products of conception, death and other) include the immediate events associated with induced abortion. Later complications which may be related to early difficulties include:

Infertility and tubal pregnancies secondary to tubal adhesions or to partial or complete obstruction after infection.

Premature delivery in subsequent pregnancies which may be related to the laceration of the cervix and the later inability of the uterus to retain an increasing mass of a normally developing pregnancy.

The reported prevalence of immediate and later complications associated with induced abortion and the possibility of any of them occurring can be influenced by one of several factors, including: (1) classification; (2) method of abortion; (3) gestational age of the pregnancy; (4) the chronological age of the patient; (5) previous pregnancies; and (6) the characteristics of the hospitals where induced abortions are done.

Classification. **The incidence of complications associated with therapeutic abortion declined as the total number of these operations done in Canadian hospitals increased between 1969 and 1974.** This decrease occurred in all provinces, but not to the same extent in each region. The initial complication rates were based upon incomplete information for the country. The range for 1972 (7.3 per 100 abortions) was based on reports from six provinces representing 13.1 percent of the induced abortions done that year in Canada. The 1972 listing included three categories which were dropped from the 1973 lists. These categories accounted for 2.8 of a total of 7.3 complications per 100 abortions. The rate of all complications for 1972 that should be used for comparative purposes is closer to 4.5 per 100 abortions, if it is restricted to the list that now is in use. This rate of 4.5 was little different from the 4.2 per 100 reported in 1973 which again was based on incomplete national information, representing some 26 percent of the therapeutic abortions done in Canada during that year. A more significant change occurred in 1974 when there was a decline to 3.1 complications per 100 abortions, a rate which was based on almost complete national information, i.e., 85.8 percent of the therapeutic abortions done in 1974. After this date, information which was not yet available to this inquiry will be complete for the nation.

The terminology which is used in the classification of complications affects the rates which may be reported in official statistics. The difference between sepsis and infection for instance is one of degree. It is open to individual professional interpretation. The term *other* in the listing of complications is a "catch-all" category which may include many deviations from the expected course of events. The recording of the complications assigned to the *other* category is left up to the individual physician and the discretion of the particular records librarian who codes the disease morbidity for a hospital. **The decline in the *other* rate from 1.6 in 1972 to 0.1 in 1974 more than accounts for the total drop in the incidence of all of the rates combined for the recorded listing of complications during this period.** For this reason, while there was an overall decline in the reported number of complications associated with therapeutic abortions, a further examination of the trends in the rates of individual complications is not indicated. Subsequent reference to complications is based on 1974 information only.

Induction Procedures. The initial complications associated with therapeutic abortions in 1974 listed by Statistics Canada varied by the induction method which was used and the specific risks by types of complications which resulted. In terms of the proportion of complications *per 100 therapeutic abortions*, the rates for these procedures were: 0.6, menstrual extraction; 1.4, suction dilatation and curettage; 1.6, surgical dilatation and curettage; 4.2, hysterotomy; 7.4, hysterectomy; 11.2, urea; 18.4, saline; and 25.8, other and

unrelated combinations. Overall, there were 1,295 initial complications (or 3.1 per 100) associated with the therapeutic abortions done in Canadian hospitals in 1974. Another way of looking at the prevalence of complications is by making a comparison of the extent to which an induction method was used and the overall proportional *distribution of complications which were associated with a given procedure*.

Surgical Procedure 1974	Percent of Therapeutic Abortions	Percent of Complications
Surgical D & C	20.8	10.5
Suction D & C	62.6	28.3
Hysterotomy	3.1	4.1
Hysterectomy	0.4	1.0
Saline	8.6	50.7
Urea	0.7	2.6
Prostaglandin	0.2	0.9
Menstrual extraction	3.4	0.7
Other and unrelated Combinations	0.2	1.2
TOTAL	100.0	100.0

Three methods, surgical dilatation and curettage, suction dilatation and curettage, and menstrual extraction, accounted for 86.8 percent of procedures used in therapeutic abortion operations. They resulted in 39.5 percent of the initial complications associated with induced abortions. For all other methods the level of complications was higher than the extent to which the procedures were done in 1974, and in particular, **the saline procedure which was used for 8.6 percent of the therapeutic abortions accounted for over half (50.7 percent) of the associated complications. This method, used in connection with second-trimester abortions, indicates the risks associated with the increased length of gestation.** A total of 84.7 percent of the complications associated with the saline procedure involved the retained products of conception. Overall, all types of complications were: 13.4 percent, haemorrhage; 15.8 percent, infection; 10.5 percent, laceration of the uterus; 4.4 percent, perforation of the uterus; 51.8 percent, retained products of conception; 4.0 percent, other complications; and, 0.1 percent, death. The nature of these complications varied by the induction methods which were used, with 65.1 percent of the haemorrhages associated with surgical dilatation and curettage and suction dilatation and curettage, as well as these two procedures accounting for most of the lacerations of the cervix (93.3 percent) and the perforations of the uterus (87.7 percent). There was a higher rate of post-operative infections associated with hysterotomies (49.0 percent) and hysterectomies (61.5 percent) than other induction techniques.

TABLE 13.1

**COMPLICATIONS OF THERAPEUTIC ABORTION BY CHRONOLOGICAL AGE,
LENGTH OF GESTATION, AND SURGICAL PROCEDURE, 1974**

STATISTICS CANADA

Therapeutic Abortions and Complications			
Patient Attributes and Surgical Procedure	Number of Therapeutic Abortions	Abortions with Mention of Complications	Complication Rates per 100 Therapeutic Abortions
CHRONOLOGICAL AGE			
under 15 years	505	47	9.3
15-19 years	12,481	516	4.1
20-24 years	12,081	334	2.8
25-29 years	7,609	190	2.5
30-34 years	4,409	102	2.3
35-39 years	2,783	74	2.6
40-44 years	1,217	30	2.5
45-49 years	138	2	1.4
50 years & over	4	—	0.0
LENGTH OF GESTATION			
9 weeks & under	8,588	98	1.1
8-12 weeks	23,901	383	1.6
13-16 weeks	6,005	381	6.3
17-20 weeks	2,561	410	16.0
21 weeks & over	172	23	13.4
SURGICAL PROCEDURE			
Surgical D & C	8,554	136	1.6
Suction D & C	25,822	367	1.4
Hysterotomy	1,247	53	4.2
Hysterectomy	175	13	7.4
Saline	3,565	656	18.4
Urea	302	34	11.2
Prostaglandin	83	11	13.2
Menstrual Extraction	1,417	9	0.6
Other and unrelated combina- tions	62	16	25.8

Gestational Age. The majority (58.0 percent) of all reported therapeutic abortions which were done in Canada in 1974 were carried out between the ninth and twelfth weeks of gestation. One out of five (20.8 percent) were done prior to this time, 14.6 percent were done between 13 and 16 weeks, and 6.2 percent between 17 and 20 weeks. Of the 172 therapeutic abortions which were done beyond the twentieth week of gestation in 1974, 158 were done between 21 and 24 weeks, 13 were done between 25 and 28 weeks, and one was done after the twenty-eighth week. In a majority of the 10 provinces and two territories, over three-quarters of the induced abortions were obtained before 12 weeks of gestation. The proportion of abortions done beyond 12 weeks of gestation was higher in four provinces, namely, 44.6 percent for Newfoundland; 32.0 percent, Prince Edward Island; 34.8 percent, Nova Scotia; and 32.7

percent, Manitoba. These higher rates for women with longer periods of gestation were associated with a smaller proportion of eligible hospitals which had established therapeutic abortion committees.

The reported complications associated with induced abortion rose with the increasing mass of a pregnancy. The complication rates per 100 abortions by the length of gestation were: 1.1, under 9 weeks; 1.6, 9-12 weeks; 6.3, 13-16 weeks; 16.0, 17-20 weeks; and 13.4, 21 weeks and over. The retained products of conception was the major complication among all age groups. The rate for this problem as well as for lacerations of the cervix and for the perforation of the uterus was higher in the earlier stages of pregnancy among women who were 19 years or younger, most of whom were pregnant for the first time. This shift may be related to the technical difficulties associated with the gaining of access to the cavity of the uterus through a rigid cervix not previously dilated by an earlier delivery.

Chronological Age. Among women who had therapeutic abortions in 1974, the frequency of reported complications was the highest among the youngest group of females. These are women who were just about to enter into the most fertile years of their lives. The abortion rates expressed as a rate per 100,000 women in each age group were highest among females between 15 and 19 years and 20 to 24 years of age. These rates decreased steadily with increasing age. This trend is expected since the fertility rate follows much the same pattern. A more reliable picture of the trend toward the use of induced abortion to terminate unwanted pregnancies can be obtained from the abortion rate expressed as the number of abortions per 100 *live births* by age group. This rate was also high among females between 15 and 19 years, but it dropped rapidly to its lowest point among women between 25 and 29 years. It then rose steadily so that at age 40 to 44 years, the rate equalled that of women between 15 and 19 years. The pattern was similar in all provinces, but it was much less pronounced in some such as Prince Edward Island, while there was a wider disparity in others such as Ontario and British Columbia.

The complication rate, when expressed as its frequency per 100,000 women, followed the same pattern as the abortion rate expressed in the same way. A truer picture of the effects of age on the risks of abortion is obtained if the reported complications are related to the number of abortions which are done in the same age group. This comparison shows that **the risks of complications associated with induced abortion were higher in the younger age groups: 9.3 per 100 for women between 10 and 14 years, and 4.1 per 100 for women between 15 and 19 years. After this age, the ratio remained stable at between 2.3 to 2.8 per 100 until the 45 to 49 age group.** For this older group of women the number of abortions and complications were too small to attach much significance to the lower ratio of 1.4 complications per 100 abortions.

Previous Pregnancies. Based on information from Statistics Canada, over half of the women (57.2 percent) who had therapeutic abortions in 1974 had not had a previous delivery and 11.0 percent had had three or more deliveries. A total of 15.1 percent had had a previous abortion—7.2 percent had had spontaneous abortions, and 7.9 percent had had previous therapeutic procedures. The nulliparous women had the highest complication rates in two

of the three categories, suggesting possibly that a previous delivery or therapeutic abortion provided an element of protection, because it was easier to dilate the cervix during the therapeutic abortion procedure. On the other hand, previous spontaneous abortions appeared to increase the risk of complications associated with subsequent therapeutic abortions, particularly if there had been more than one earlier spontaneous abortion. This increase in the number of complications may be due to the more general or local causes of spontaneous abortion, such as endocrine disease, uterine tumor or malformation. In addition, there was a higher proportion of older women who had had previous spontaneous abortions (19.9 percent) compared to women who had had previous therapeutic abortions (6.7 percent). The complication rate in this age group was high—4.8 percent after two spontaneous abortions and 7.6 percent after three previous spontaneous abortions.

Hospitals Where Abortions Were Done. Statistics Canada classifies hospitals which perform therapeutic abortions into four groups according to the number of operations which are done annually: 0-50; 51-100; 101-400; 401 and over. The group of hospitals with the highest volume (401 or more operations) which accounted for 70.7 percent of therapeutic abortions done in Canada in 1974 consisted of the larger, well-equipped, and more extensively staffed institutions whose number included many university-affiliated teaching hospitals. This group of hospitals had the lowest rate of complications (2.9 per 100 abortions), while hospitals which did the fewest abortion procedures had a rate which was almost double (5.6 per 100 abortions). Hospitals which did between 51 and 100 procedures annually had the next highest rate (5.1 per 100), while the hospitals doing 101 to 400 abortions had a rate comparable to the larger institutions (3.1 per 100).

The hospitals performing the largest number of abortions had the lowest complication rate in spite of carrying a larger case load of patients who were in the later stages of gestation when the complication rates for the nation were known to be higher. The one out of five (21.7 percent) of the procedures done after the twelfth week of gestation in hospitals doing over 400 abortions contrasted to 14.9 percent among this group of patients who were treated at hospitals doing less than one abortion per week (the 0-50 category per year). The only patient who was aborted after 28 weeks of gestation was treated in one of these hospitals which did under 50 such procedures annually. However, the hospitals which did fewer induced abortions admitted more patients who were at a higher risk in terms of their chronological age, those women who were 19 years or younger, or who were over 34 years. These women accounted for 52.5 percent of the admissions to the smaller-volume hospitals compared to accounting for 38.8 percent of the abortion admissions to the larger-volume hospitals. The differences in the rates of complications between the hospitals with the largest and the smallest volume of abortions were in the three categories of haemorrhage, infection, and *other*.

Other Complications. Because the national and regional information from Statistics Canada was only available for the early physical complications associated with therapeutic abortions, it was only possible to consider them in detail from this source. Early and late psychiatric and social complications

were not noted in these records, but are dealt with in the analysis of the Saskatchewan and Alberta findings. Similarly, late physical sequelae associated with induced abortion in Canada have not been dealt with except by a few individual researchers who have based their findings on unrepresentative clinical groups of patients. Among the research studies which have been done, there are indications that the physical problems of infection, laceration, and repeated surgical procedures on the uterus can and do produce lasting effects on the health of some women. In addition to the consequences of hysterotomy which have been noted on the subsequent course of pregnancies, lacerations of the cervix can result in scarring and distortion. Research results which are still inconclusive suggest that these effects may lead to the inability of the uterus to retain subsequent pregnancies so that late foetal loss or prematurity may occur.

When illegal abortions were more extensively done, particularly by untrained persons, infertility and chronic pelvic pain were on occasion attributed to the infections which subsequently resulted. This complication does not occur so frequently in hospital-induced abortions, but the infection rate is still not insignificant, particularly among hospitals where the procedure was not frequently done. The obliteration of the cavity of the uterus which is secondary to infection and surgical trauma is a complication which is particularly difficult to correct. Information on a national basis about the psychiatric and social side effects of therapeutic abortions is scarce. Many abortions are done because it is considered that a continuation of the pregnancy would constitute a threat to the emotional health of a woman or affect her family. These patients are frequently not followed up by the psychiatrist who examined them before the abortion operation or by the social worker who was assigned to counsel them. Young single women make up the largest group having therapeutic abortions. It will require time and diligent research to determine what effects these events will have on their future attitudes toward marriage, the family, and child-rearing. Likewise, there is little information about the nature of the complications which may result involving Canadian women who have induced abortions in the United States.

Before-and-after use of health services in Saskatchewan

The use of health services and the reasons why these services were used by women who had deliveries, spontaneous abortions, therapeutic abortions, and sterilizations were reviewed based on a 10 percent random sample of the Saskatchewan population for 1970 and 1971. There is no other comparable information recording system covering a large and representative group of the population in Canada assembled on this basis for this period, or subsequently, which is known to the Committee. For each of these pregnancy-related events, an assessment was made of the hospital and medical care which was received and reported for a year prior to the operation and for a year following this procedure. The sample was initially taken to study the effects of the introduction of medical care insurance in Saskatchewan between 1963 and 1971. As some persons dropped out of the original 10 percent sample, either by moving

out of the province or by death, their number was replaced on a representative sampling basis. In this sense the women in the sample were not, in the language of survey research, a cohort, but a repeated-time sample by means of which it was possible to trace their health care activities over a period of time.

This information was assembled to include the health experience of persons in the 10 percent sample up to 1971, or two full calendar years after the abortion legislation was amended. By this means, then, it was possible to review in some detail the use of health services as it related to abortion for this two-year period. The population sample included approximately 44,000 families, or about 120,000 individuals out of the provincial population of 926,245 residents in 1971. While their numbers were small, the health care experiences of women who had deliveries, spontaneous abortions, therapeutic abortions, and sterilizations can be considered to be representative of all of the women who had these experiences at that time in Saskatchewan.

The information was assembled by means of an information linkage system, which while preserving the anonymity of each person in the 10 percent sample, brought together their experience from hospital and medical care insurance records.

Trends in Deliveries and Abortions. The total number of deliveries with and without associated complications decreased by 36.1 percent between 1959 and 1974. During this period the rate of hospital separations for all categories of abortion declined by 17.1 percent. The steady fall in births which began in 1962 subsequently continued, while the trends in abortions which had been running parallel at that time to the curve for births reversed sharply after 1969. Although there is a minor discrepancy in the numbers of all abortions supplied by the Saskatchewan Health Services Plan and by the Medical Care Insurance Commission, the resulting trends from both sources are the same, namely a continuation of the downward curve from 1969 onward for the overall annual total of abortions. The differences in the two sets of information reflect differences in the medical and hospital records for the population but do not alter the trends in any significant manner. The decline in abortions other than those which were induced in hospital based on these sources becomes either 47.8 percent or 52.7 percent and exceeds the fall in births. These numbers represent 10.4 percent and 9.1 percent respectively of the births and are little different from the relationship which existed in 1959 (12.2 percent) or in 1969 (10.6 percent). The total number of abortions when expressed as a percentage of the births for each year between 1970 and 1974 was: 12.5 percent; 15.8 percent; 16.6 percent; 16.8 percent; and 15.9 percent. These trends indicate that the continued decline in the birth rate of Saskatchewan may have been influenced in part by the increased number of induced abortions, a trend, however, which may be offset by a displacement effect, namely a redesignation of the labelling and coding of these various abortion procedures.

Family Size and Residence. Among single women the number of normal deliveries increased from 0.9 percent to 6.5 percent of the total number of deliveries between 1963 and 1968. After 1968 this proportion fell to 2.6 percent and subsequently remained at about this level. Prior to 1969, induced abortions

were more common among women who had families of four or more persons. In 1969 for instance, 3 out of 5 women who had the abortion procedure were from families with three members and the remainder of these women had larger families. There was a shift which started in the early 1970s toward more single women obtaining therapeutic abortions, with their number constituting 29.4 percent of the total group in 1970, a proportion which rose to 42.1 percent in 1971. Until 1967 the largest group of women who had normal deliveries came from families consisting of four or more members, while there was a shift of the largest group involving families of three persons in 1968. Approximately a third of deliveries and abortions in 1970 and 1971 involved women who had families of five or more members.

In recent decades in Saskatchewan there has been an extensive outflow of provincial residents to other parts of Canada and a gradual shift from a rural to a more urban way of life. In 1971 over half of the provincial population lived in cities, with the two largest centres, Regina and Saskatoon accounting for 28 percent of the total population. About a fifth of the people of Saskatchewan then lived in towns and villages and about 1 out of 4 lived in rural farming areas. While women who lived in cities in Saskatchewan in 1971 accounted for about the same proportion of births as their residential distribution, almost two-thirds of the therapeutic abortions (64.9 percent) were performed for women living in urban centres.

Use of Health Services. The frequency with which health services are used includes: the hospitalization of patients, their consultations with physicians and the laboratory services which are prescribed for their care. In particular, the number of laboratory services can have an inflating effect when these trends are considered as units of service combined with care received from physicians. The experience of women who had deliveries, spontaneous and other abortions, therapeutic abortions and sterilizations was reviewed from 1970 and 1971 concerning their use of these services. In its work the Committee was advised by a number of experienced gynaecologists that as the professional familiarity with a procedure increased, it could be expected to be done more effectively and efficiently. If this is the case, then the 1971 information on therapeutic abortions which were done in Saskatchewan may be considered to be more representative than the 1970 treatment patterns when 75.1 percent fewer therapeutic abortions were performed (131 in 1970 and 562 in 1971). In the sample of women having therapeutic abortions, they represented 16.0 percent of the provincial total in 1970 and 13.2 percent of the 1971 total.

Differences in the prior utilization of hospital and physicians' services for 1970 and 1971 occurred for women having deliveries; spontaneous and other abortions, therapeutic abortions and sterilizations. These differences were relatively small except for the use of physicians' services by patients having therapeutic abortions. These women made the most use of physicians in each year, but the rate dropped in 1971 and approximated that of women who had spontaneous and other abortions. Both groups of women who had different types of abortions used the physicians' services more extensively than did the women who delivered babies.

TABLE 13.2
BEFORE AND AFTER USE OF HOSPITAL SERVICES BY AGE OF WOMEN FOR
SELECTED PROCEDURES: TIMES HOSPITALIZED PER PATIENT

Saskatchewan, 1971*

SASKATCHEWAN HOSPITAL SERVICES COMMISSION

Age of Women	Use of Hospital Services							
	One Year Before (1970)				One Year After (1972)			
	De- livery	Thera- peutic Abor- tion	Other Abor- tions	Sterili- zation	De- livery	Thera- peutic Abor- tion	Other Abor- tions	Sterili- zation
17 years & younger	0.49	0.58	0.25	—	1.23	1.00	1.00	—
18-23 years	0.46	0.39	0.63	1.00	1.14	1.23	1.40	1.00
24-39 years	0.39	0.18	0.43	0.57	1.13	1.00	1.12	0.60
40 years & older	0.58	0.10	0.36	0.50	1.31	1.10	1.21	0.71
AVERAGE	0.43	0.32	0.48	0.58	1.14	1.12	1.20	0.63

* The number of women in each category was: 1,537, delivery; 74, therapeutic abortion; 152, other abortions; and 231, sterilization.

TABLE 13.3
BEFORE AND AFTER USE OF HOSPITAL SERVICES BY WOMEN:
SELECTED DIAGNOSTIC CATEGORIES PER PATIENT

Saskatchewan, 1971*

SASKATCHEWAN HOSPITAL SERVICES COMMISSION

Diagnostic Categories	Use of Hospital Services							
	One Year Before (1970)				One Year After (1972)			
	De- livery	Thera- peutic Abor- tion	Other Abor- tions	Sterili- zation	De- livery	Thera- peutic Abor- tion	Other Abor- tions	Sterili- zation
Complications of Pregnan- cy, Childbirth, & Puer- perium	0.28	0.12	0.24	0.33	1.03	1.05	1.07	0.33
Diseases of Genito-urinary System	0.04	0.04	0.07	0.07	0.03	0.03	0.03	0.08
Diseases of Digestive System	0.02	0.07	0.03	0.02	0.04	—	0.03	0.04
Mental Disorders	0.01	0.01	0.01	0.02	—	—	0.02	0.04
Accidents, Poisonings, & Violence	0.02	0.05	0.02	0.03	0.01	—	0.43	0.01

* Prior to their hospitalization, the five diagnostic categories constituted 86.2 percent of the diagnoses for women who had deliveries; 91.7 percent, therapeutic abortion; 83.1 percent, other abortions; and 79.7 percent, sterilization. In the same order, these five diagnostic categories during 1972 were: 96.5 percent, 96.4 percent, 97.8 percent, and 78.1 percent.

TABLE 13.4

BEFORE AND AFTER USE OF PHYSICIANS' SERVICES
BY AGE OF WOMEN FOR SELECTED PROCEDURES:
NUMBER OF MEDICAL CONSULTATIONS AND SERVICES PER PATIENT

Saskatchewan, 1971*

SASKATCHEWAN MEDICAL CARE INSURANCE COMMISSION

Age of Women	Use of Physicians' Services							
	One Year Before (1970)				One Year After (1972)			
	De- livery	Thera- peutic Abor- tion	Other Abor- tions	Sterili- zation	De- livery	Thera- peutic Abor- tion	Other Abor- tions	Sterili- zation
17 years & younger	8.00	13.67	11.75	—	3.87	2.92	3.63	—
18-23 years	9.10	15.57	14.02	20.38	3.95	4.77	5.84	5.25
24-39 years	7.84	16.00	22.25	14.16	3.78	1.64	4.65	3.51
40 years & older	9.09	13.80	10.71	13.82	5.64	2.80	4.50	3.58
AVERAGE	8.36	15.11	12.52	14.32	3.90	3.27	4.89	3.58

* The number of women in each category was: 1,525, delivery; 74, therapeutic abortion; 142, other abortions; 230, sterilization.

TABLE 13.5

BEFORE AND AFTER USE OF PHYSICIANS' SERVICES BY WOMEN:
SELECTED DIAGNOSTIC CATEGORIES PER PATIENT

Saskatchewan, 1971*

SASKATCHEWAN MEDICAL CARE INSURANCE COMMISSION

Diagnostic Categories	Use of Physician's Services							
	One Year Before (1970)				One Year After (1972)			
	De- livery	Thera- peutic Abor- tion	Other Abor- tions	Sterili- zation	De- livery	Thera- peutic Abor- tion	Other Abor- tions	Sterili- zation
Complications of Pregnan- cy, Childbirth, & Puer- perium	1.60	1.35	2.22	0.91	0.08	0.10	0.41	0.02
Diseases of Genito-urinary System	1.08	1.86	2.97	2.44	0.81	0.87	1.34	0.68
Diseases of Digestive System	0.20	0.23	0.20	0.67	0.23	0.01	0.17	0.17
Mental Disorders	0.25	0.21	0.67	0.61	0.16	0.27	0.30	0.25
Accidents, Poisonings, & Violence	0.21	0.49	0.29	0.25	0.12	0.16	0.15	0.20

* During the year before their operation, the five diagnostic categories constituted 39.9 percent of the diagnoses for deliveries; 47.4 percent, for therapeutic abortion; 50.7 percent, other abortions; and 34.1 percent, sterilization. In the same order these five diagnostic categories during the year after were: 35.8 percent, 40.5 percent, 35.1 percent, and 36.9 percent.

In the case of all of these women, the use of laboratory services is included in these rates. As well, for women obtaining therapeutic abortions two additional factors contributed to their greater use of physicians' services prior to the abortion operation. Based on the estimates of the national patient survey, in which 16.5 percent of abortion patients saw three physicians, 3.9 percent saw four physicians, and 1.1 percent saw five physicians in their seeking of a therapeutic abortion, 4.7 percent or more of the visits of Saskatchewan patients can be accounted for by visits to physicians who were not prepared to assist them. In addition, since the requirements of therapeutic abortion committees usually call for at least two medical consultations prior to the submission of an abortion application, 6.7 percent of their prior visits were involved in making these visits. If these additional steps had not been involved, then the one-year prior use of physicians' services by women who had therapeutic abortions in Saskatchewan in 1971 would be reduced by 11.4 percent or to a level (13.39 services) more comparable to women who had spontaneous and other abortions (12.52 services).

In contrast with women who had deliveries and spontaneous and other abortions, the one year prior use of hospital services by women who had therapeutic abortions was substantially lower, while the post-pregnancy use of hospital services of the groups of women was comparable. However, during the year following their pregnancy-related operations, women who had therapeutic abortions in 1971 used physicians' services 16.2 percent less than women who had childbirth and 33.1 percent less than women who had spontaneous and other abortions. What these trends indicate is that women who had therapeutic abortions had less medical follow-up care than other women who had deliveries and who had spontaneous and other abortions.

Reasons for the use of Health Services. Compared to the three other groups of women, the women who had induced abortions in 1971 had been hospitalized half as often prior to their operations for complications associated with their pregnancy, but they had had more digestive disorders and double the rate of accidents which had resulted in their hospitalization. Their prior hospitalization for mental disorders was comparable to the experience of women who subsequently had spontaneous and other abortions. During the year following their induced abortion, the hospitalization of these women was comparable in terms of complications associated with pregnancy, childbirth and the puerperium to the prevalence of these disorders among women who had deliveries and other types of abortions. Unlike the three other groups of women, none of the abortion patients were hospitalized during the year after their operation for digestive system problems, mental disorders, or as a result of accidents or violence.

In their use of *physicians' services* during the year prior to their operation, in 1970, women who had therapeutic abortions in comparison to women who had had deliveries had: fewer complications associated with their pregnancies; more genito-urinary problems; about the same number of digestive system problems; a comparable number of mental disorders; and double the number of conditions resulting from accidents or violence which required medical treatment. In contrast with women who had spontaneous and other types of

abortions, during the year prior to their operation, the reasons why abortion patients had consulted physicians were: about 40 percent less often for pregnancy-related conditions; two-thirds less often for the treatment of mental disorders; and about twice as often for visits resulting from accidents or violence.

During the year after their operation the women who had therapeutic abortions were treated about as often as women who had deliveries for pregnancy-related problems and disorders of the genito-urinary tract. But unlike the women who had deliveries, these women were diagnosed by their physicians 40.8 percent more often as having mental disorders and 25.0 percent more often for the treatment of accidents or conditions resulting from violence. In comparison to women who had spontaneous and other abortions, substantially fewer women who had induced abortions visited their physicians during the year after their operation for pregnancy-related conditions or diseases of the genito-urinary tract. During this period following the termination of their pregnancies, the experience of the two groups of women who had abortions was about comparable in terms of their use of physicians' services for mental disorders and requiring treatment for accidents.

While the number of women involved in each of the three pregnancy-related operations was small, their experience with the use of hospital and medical services and the complications which they experienced are considered to be representative of women in Saskatchewan who had similar operations. In considering these findings, it is known that they neither represent complications which may occur over a longer period of time nor the experience of Saskatchewan women who obtained induced abortions in the United States. Saskatchewan's long-established background in the public provision of hospital and medical care services may also affect the general health status of its people and how they use these services. As well there are differences among the women in the three groups in terms of their age, marital status and parity.

Within the context of these unknown factors, what the findings indicate is that **women who had therapeutic abortions appeared generally to be in good health after their operations. In a small before-and-after study in Saskatchewan during the year following their operation, these women made slightly less use of hospital services and had fewer consultations with physicians than women who had deliveries or spontaneous and other abortions. In terms of the health services which they obtained, their level of mental health was comparable to women who had spontaneous and other abortions, or who had been sterilized. These three groups on an average subsequently consulted physicians twice as often for reasons related to mental health than women who had term deliveries.**

Five year follow-up in Alberta

In a five year retrospective study (1970 to 1974) a review was made of the use of health services of a group of women who had had induced abortions in

1970 compared to the experience of women who had not had this operation. Involving 101 women who had had therapeutic abortions and 100 women who were matched by age who had not had an induced abortion, the samples were drawn from the records of the Alberta Health Care Insurance Commission; a tabulation was made of the total reported use of hospital and medical services of the two groups. Omitted from the analysis of each group were those women who may have left the province during this five year interval. Because on an average younger women, more of whom are single, obtain induced abortions, this comparison involves a review of their health experience with a broader range of women more of whom may have been married. Unlike the women whose before-and-after use of health services was reviewed in Saskatchewan, the findings for Alberta did not consider the prior use of services of both groups of women, nor was there a matching of the two groups involving pregnancy-related experiences (e.g., delivery, spontaneous abortion, therapeutic abortion). It is in the context of how these findings were obtained and to whom they relate that the trends which are observed must be interpreted.

In reviewing the *hospitalization* experience over five years of the two groups of women, some of the findings from this exploratory study were:

- abortion patients had more subsequent hospitalizations (64 percent versus 52 percent).
- abortion patients had more subsequent abortions (12 percent versus 3 percent).
- fewer abortion patients were subsequently sterilized (3 percent versus 10 percent in the control group).
- hospitalization for gynaecological problems—none of the abortion patients subsequently had spontaneous abortions, while there were two in the control group; seven abortion patients versus two control group patients had subsequent gynaecological bleeding problems; the incidence of inter-menstrual bleeding was more than twice as high among abortion patients than among other women, but the incidence of pelvic inflammatory disease was greater among other women than among women who had had induced abortions.
- complications associated with pregnancy occurred among five abortion patients one of whom had pre-eclampsia.
- subsequent deliveries—22 percent, abortion patients; 32 percent, control group of women. Eight patients in each group appear to have had difficult deliveries.
- perinatal deaths—none among the control group; one stillbirth by a woman who had a therapeutic abortion.
- newborns—no premature infants were born to women in the control group, while there were two premature infants born to women who had had induced abortions.
- psychological problems—13 percent of the women who had had therapeutic abortions were subsequently hospitalized with psychological problems, four of which involved an overdose of drugs. Four percent of the women in the control group were hospitalized with psychological problems one of whom was an alcoholic.
- other reasons for admission to hospital—38 percent, abortion patients; 25 percent, control group. The reasons for these admissions ranged from tonsils to varicose veins. Four of the women who had abortions subsequently had elective plastic surgery breast operations.

In addition to the hospitalization experience of the two groups of women, their use of the *services of physicians* was documented for the five-year period. The major trends in their use of *medical services* were:

- visits to physicians—overall, a greater use by women who had an abortion (29 percent) than among the other women (13 percent).
- gynaecological problems—72 follow-up visits to physicians for women who had had abortions compared to 47 visits for this purpose by other women.
- obstetrics—in 1975, nine women who had had induced abortions had deliveries as did almost an equal number of other women (10 deliveries).
- psychological problems—women who had therapeutic abortions subsequently made more visits to psychiatrists (25 percent) than other women (3 percent).

In considering the findings obtained in this small study of Alberta women, it is important to recall that the experience of women who had induced abortions was compared with the use of health services of a cross-section of other women. The women in the matching (or the control) group were not selected on a basis of having had a pregnancy-related experience, that is, a delivery or a spontaneous and other abortion. For this reason the Committee draws no conclusions from the findings of this study.

National trends

The studies of therapeutic abortion which were done in Saskatchewan and Alberta are a useful beginning, but just that. A fuller understanding of what might be involved will require a prospective analysis, one which in addition to reviewing the use of health services considers the experience over a period of time of women who had: (1) deliveries; (2) therapeutic abortions in Canada; (3) induced abortions in the United States; (4) spontaneous and other abortions; (5) unwanted pregnancies; and (6) single mothers. For each group of these women such a prospective study should consider in more detail than was possible in the Saskatchewan and Alberta studies their social circumstances and how they usually obtain health care. It is apparent for instance that women who obtain therapeutic abortions are predominantly young and single. Many of these women have difficulties in obtaining physician referrals for the procedure or experience delays once such consultations have been made. In addition to affecting their prior use of health services as well as influencing the diagnoses which may be made by physicians (e.g., the widespread use of the medical diagnosis of reactive depression), the stigma associated with induced abortion can be expected to influence the subsequent use of hospital and medical services of women who have therapeutic abortions and in turn, it may affect how physicians whom these women consult provide treatment and the types of diagnoses which may be used. Studies are needed which would provide information to some of these questions. Such studies are methodologically feasible. In terms of their costs such studies would constitute a fraction of the health costs now spent directly on the treatment services for these problems.

Based on the information collected by Statistics Canada certain trends emerge involving the early physical complications of therapeutic abortion. These trends are:

1. The risk of early physical complications increased:
 - with the gestational age of pregnancy;
 - if the woman was pregnant for the first time;
 - if the woman had previous spontaneous abortions;
 - among the youngest and oldest age groups;
 - when the procedure was carried out in a hospital doing fewer than two abortions per week.
2. There was no national information available to determine the nature and frequency of the long-term physical complications and of the emotional and social problems associated with therapeutic abortion. Such information is not readily accessible by means of the current national reporting system.

What these trends mean is that the number and types of complications associated with therapeutic abortions might be reduced by: a decrease in the number of unwanted conceptions; the development and the broader use of safer induction techniques; the performing of all therapeutic abortions at an earlier stage of gestation; and concentrating the performance of the abortion procedure into specialized units with a full range of required equipment and facilities and staffed by experienced and specially trained nurses and medical personnel. The information which is available about therapeutic abortions and the complications associated with this procedure represent a minimal reporting system, but it is a largely unused resource for the surveillance of complications, their regional distribution, their extent by the types of procedures used and by the size of the hospitals doing these procedures. If these complex issues and their resolution are to be more fully understood, more extensive, long-term and interdisciplinary investigation is required. Obtaining such information and the raising of the standards of health care do not come about easily or by themselves. Their development requires firm and continuous public support. Until this stage is reached, the knowledge about these issues will be partial and it is likely that the problems posed will not be reduced or even contained.

The findings on complications associated with therapeutic abortions indicate that their frequency was lower in the hospitals which did a higher annual number of these procedures. **The implications of these findings are that the performance of therapeutic abortions, like the treatment of other conditions requiring specialized facilities and staffing, could be effectively handled through the principle of regional centres which would bring together the required resources and incorporate into their functions interdisciplinary research efforts. These means might focus on several problems which emerge from the trends on abortion complications. More comprehensive and complete information is required about the as yet unknown long-term physical effects of the induction methods which are now being used and about the emotional and social problems which may precede and follow unwanted pregnancy and**

abortion. Minimal attention is now paid to finding ways to improve the use of the techniques which are available for contraception and early induction, or to finding more acceptable methods for these purposes.