Hysterectomies in the United States, 1965–84

This report presents statistics on women with hysterectomies from 1965 through 1984 based on data collected from the National Hospital Discharge Survey. Trends are examined by using frequency estimates, rates, and/or average length of stay for the following variables: age, region, race, diagnosis, surgical approach, and by whether or not a bilateral oophorectomy was performed. In addition, the proportion of women with intact uteri is presented for the years 1960 through 1984, and hysterectomies in military facilities are presented.

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Symbols

- - - Data not available

. . .   Category not applicable

-       Quantity zero

0.0   Quantity more than zero but less
        than 0.05

Z   Quantity more than zero but less
        than 500 where numbers are
        rounded to thousands

*   Figure does not meet standards of
        reliability or precision (see
        Technical notes)

Hysterectomies in the United States

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Introduction

Hysterectomy is one of the most frequently performed major surgical procedures in the United States even though only one-half of the population is at risk for the procedure. There is extensive medical literature on hysterectomy, and a number of studies address the medical pros and cons of this procedure (Sandberg et. al., 1985, is a recent example). This report is statistical in nature; its purpose is to provide a historical perspective as well as an updated picture of hysterectomies in the United States. This will be done primarily using data from the National Hospital Discharge Survey (NHDS) for the years 1965-84; data from the Department of Defense (presented separately) are used in conjunction with NHDS data to estimate the total number of hysterectomies during the study period.

Some of the information in this report has been published elsewhere. Notably, the Centers for Disease Control and others have made extensive use of NHDS data to examine hysterectomies (Nolan, et al., 1982; Dicker, et al., 1982; Centers for Disease Control, 1983; Easterday, Grimes, and Riggs, 1983; Sattin, Rubin, and Hughes, 1983; Irvin, et al., 1986). Annual reports from the National Center for Health Statistics have presented estimates of the number of hysterectomies performed each year (NCHS, 1986). Lyon and Gardner (1977) used NHDS data and data from the National Health Examination Survey to estimate the proportion of females who had a hysterectomy. In addition, independent estimates of hysterectomies have been produced from data collected by the Commission on Professional and Hospital Activities (Perry, 1976). This report will expand on previous studies and will present historical as well as current estimates of hysterectomies.

Data in this report, as estimated by NHDS, are primarily of women who had a hysterectomy in short-stay non-Federal hospitals. The NHDS has been conducted continuously since 1965 in the 50 States and the District of Columbia. Short-stay hospitals are defined as those with an average length of stay of 29 days or less. Individual patient information was collected from the face sheets of a subsample of medical records within the sampled hospitals. A brief description of the sample design is given in appendix I; a more detailed report on the design of the NHDS has been published (NCHS, 1970). In 1969 diagnostic and surgical data were not coded in NHDS; therefore, where necessary, the number of hysterectomies in 1969 were imputed as the average of the 1968 and 1970 estimates.

Diagnoses and surgeries listed on the face sheets of sampled medical records were coded using one of three versions of the International Classification of Diseases (ICD) depending on the year in which the data were collected. From 1965 through 1968, the *International Classification of Diseases, Adapted for Indexing Hospital Records by Diseases and Operations* (ICDA-7) (NCHS, 1962) was used; from 1970 through 1978, the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States* (ICDA-8) (NCHS, 1967) was used; and from 1979 through 1984, the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) (NCHS, 1980) was used. Using these coding systems, hysterectomy in this report is defined as follows: From 1965 through 1968, ICDA-7 codes 72.3-72.7 were used; from 1970 through 1978, ICDA-8 codes 69.1-69.7; and from 1979 through 1984, ICD-9-CM codes 68.3-68.8. From 1965 through 1984, 63,361 medical records indicating a hysterectomy were sampled in the NHDS. Pelvic evisceration was indicated on 89, or one tenth of one percent, of the sampled records, and they are included.

The NHDS samples only non-Federal short-stay hospitals. In order to provide a more complete picture of the extent of hysterectomies in the United States, summary statistics are presented from Army, Navy, and Air Force data systems. These data are presented in a single table and are not included in the estimates or calculations in other tables in this report.

Highlights

- Approximately 12.5 million hysterectomies were performed on women in the United States during the 20-year period 1965-84. Of the 97 million females 15 years of age and older alive in the United States in 1985, about 18.5 million had had a hysterectomy. This translates to 19.1 percent of all females 15 years of age and over.
- The number of hysterectomies peaked in 1975 at 725,000, declined slightly into the 1980's, and has remained at about 650,000-675,000 procedures per year.
- The average length of hospitalization for a hysterectomy has decreased markedly, from over 11 days in the 1960's to 9.4 days in 1975 and 7.2 days in 1984.
- Women were most likely to have a hysterectomy in their 30's and 40's. The highest rate of hysterectomies was in the South, and in the South younger females had higher hysterectomy rates than in other regions.
- Although cancer accounted for about 10.7 percent of all hysterectomies, fibroids was the most common diagnosis—indicated for about 27 percent of all hysterectomies. The only condition showing a marked increase in rates for hysterectomy was endometriosis, which increased by 121 percent from 1965-67 to 1982-84.
- In 1985 about 2 percent of all females under 30 years of age had had a hysterectomy, 22 percent of women ages 40-44 years had had a hysterectomy, and 37 percent of women ages 55-59 years had undergone this procedure. The median age of women having a hysterectomy was 40.9 years.

Overview

Table 1 presents an overview of the number of hysterectomies performed in short-stay non-Federal hospitals by age from 1965 through 1984. The number performed each year increased from 427,000 in 1965 to 725,000 in 1975. There has been a slight decrease since 1975, but the estimated frequency has remained at 639,000 or more each year since 1977.

Using an imputed value of 507,000 hysterectomies in 1969 (the average of 1968 and 1970), approximately 12.2 million women had a hysterectomy in non-Federal hospitals during this 20-year span. A more complete estimate of the number of hysterectomies in the United States is obtained by combining data from NHDS (table 1) with data from the armed services hospitals (Schlaeppi, 1985; Pasternick, 1985; and Pickey, 1985) (table 2). The number of hysterectomies performed in these facilities from 1971 through 1984 was at least 160,000. (Data from Air Force facilities was not provided for 1970-74 or from the Navy for 1971.) Based on these data, it appears that hysterectomies in military hospitals accounted for about 1.6 to 2.2 percent of all hysterectomies annually. Assuming the lower figure 1.6 percent and applying it to NHDS estimates for the years 1965-74 (the years of incomplete data from military facilities), there would have been about 249,000 hysterectomies in military hospitals during these 20 years. This gives a total of approximately 12.5 million women having a hysterectomy in the United States from 1965 through 1984.

Table 10, presented in a later section, aggregates data for the period 1970-84 and shows an estimated 18,000 hysterectomies for females under 15 years of age. Because of small numbers, data for females in the age group under 15 years are not presented separately in other tables; however, hysterectomies for females under 15 year of age are included in the totals in table 1.

From 1965 (the earliest year data were available from NHDS) through 1980, hysterectomy was the most frequently performed major surgical procedure. In 1981 Cesarean section was performed for an estimated 702,000 women, surpassing hysterectomy in frequency. Cesarean section and hysterectomy have been, respectively, the first and second most common major surgical procedures from 1981 through 1984.

A perspective of the frequency of hysterectomy for the last 10 to 20 years can be obtained by comparing it with the frequency of some other common and well-known procedures. The frequencies that follow can be compared with

data on hysterectomy in table 1. For example, tonsillectomy, which was done more routinely in the past, was performed on 685,000 people in 1975 (NCHS, 1977) but on only 348,000 people in 1984 (NCHS, 1986). Lens extractions are quite common now because of improvements in technology and the advent of Medicare reimbursement; but only recently have they surpassed the frequency of hysterectomies. In 1965 only 142,000 lens extractions were performed; this increased to 333,000 in 1975. In recent years, lens extraction has become more common than hysterectomy, but the frequency of these procedures is underestimated by NHDS because most of them are done now in outpatient settings. Among frequently performed procedures for inpatients in 1984, there were an estimated 485,000 cholecystectomies, 469,000 repairs of inguinal hernia, and 202,000 coronary bypass procedures. Although the estimates above included both sexes, the most common male-specific surgery was prostatectomy. This procedure was performed on 361,000 men in 1984, 76 percent of these were for men 65 years of age and over.

Age, race, geographic region, and average length of stay

The majority of hysterectomies were performed on women in their 30's and 40's (table 1). From 1965 through 1984, about 65 percent of all hysterectomies were for women of these ages, with the most (2.2 million or 18.1 percent) for women aged 40-44 years. About 19 percent of hysterectomies were for women aged 50-69 years, another 12 percent for women under 30 years; and 4 percent for women 70 years and over. The frequency of hysterectomy rose as women approached the age of 30 years, peaked for women in their 30's and 40's; and from 50 years of age and over, the frequency dropped markedly. This pattern is illustrated in figure 1 for frequencies and in figure 2 by percent distribution.

The average age for women having a hysterectomy during the period 1965-84 was 42.7 years, and the median age was 40.9 years. There was relatively minor variation in average age of females having a hysterectomy during this period. The median age, or 50th percentile, is the age at which one-half of all women having a hysterectomy were younger than this age and one-half were older. The average, or arithmetic mean, is larger than the median because
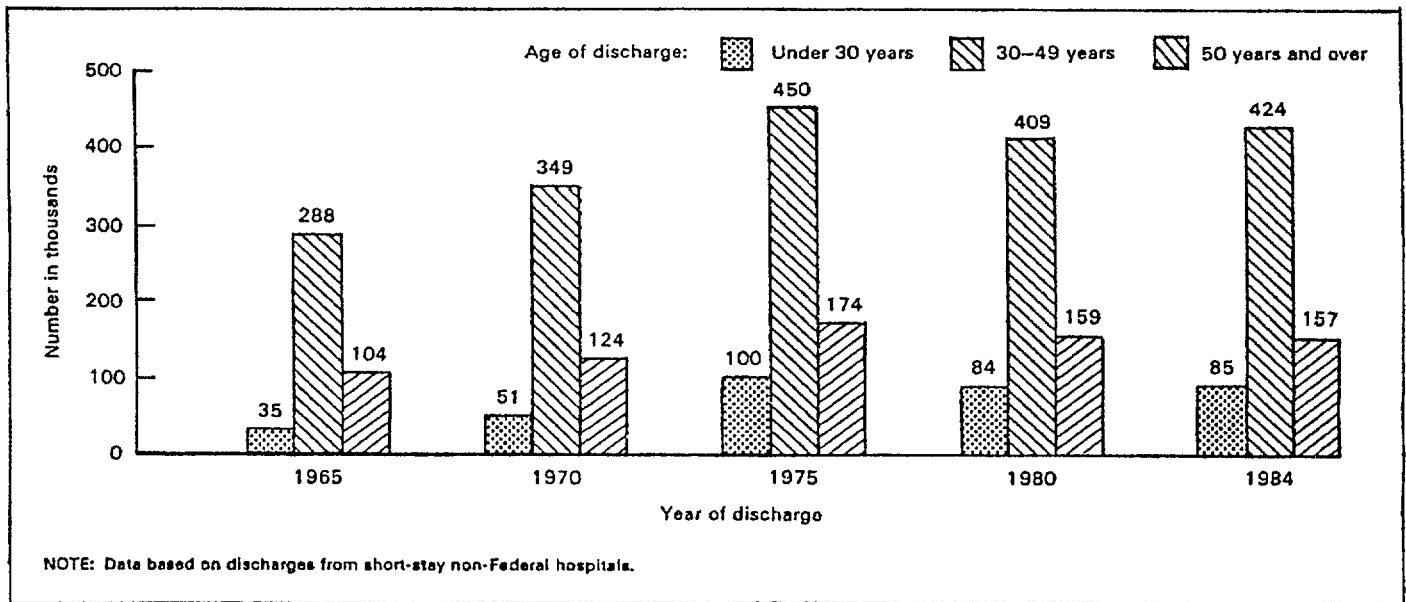
Figure 1. Number of hysterectomies by age of patient and year of discharge: United States, 1965, 1970, 1975, 1980, and 1984
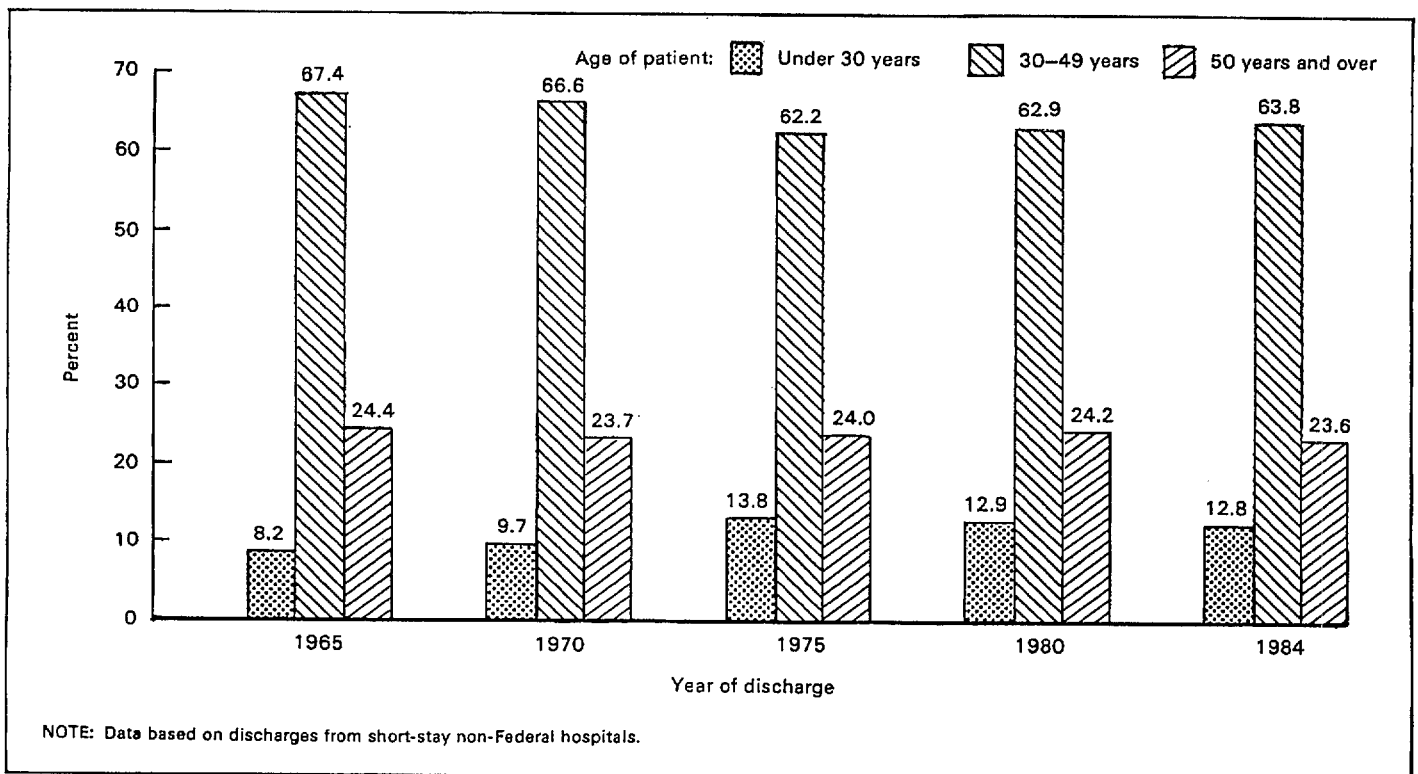
Figure 2. Percent of hysterectomies by age of patient and year of discharge: United States, 1965, 1970, 1975, 1980, and 1984

the age distribution of hysterectomies is slightly skewed toward older women.

Hysterectomies by race, region, and average length of stay are presented in table 3. The number of hysterectomies for white women ranged from 339,000 in 1965 to 546,000 in 1975. For black women the number ranged from 40,000 in 1965 to 77,000 in 1984. However, these estimates are low because of the relatively large number of sampled discharges with race unknown.

Most hysterectomies are for white persons because of their large proportion in the population; thus, rates are needed to properly compare hysterectomies by race. A direct conversion of estimates by race in table 3 to rates is inappropriate because race was unknown in 11.3 percent of the cases; and in most years, the number of hysterectomies for women with race unknown was larger than the number for black women. Without knowledge that unknown cases reflect the known distribution by race, proportional adjust-

ment was not used. However, others (Easterday, Grimes, and Riggs, 1983) have made this assumption and have shown that from 1970-78 black women had a higher rate of hysterectomy than white women. More recently, rates of hysterectomy by race indicate this difference may no longer exist (Irwin, Peterson, Hughes, Gills, 1986).

Each year the number of hysterectomies in the South has been greater than in each of the other three regions (table 3). From 1965 through the 1971, the fewest were performed in the West; between 1972 and 1980, the West and the Northeast had a fairly comparable number; and from 1981 to 1984, the Northeast had the fewest women undergoing a hysterectomy. Regional rates of hysterectomies are discussed later.

The average length of stay for a hysterectomy has decreased considerably in the last 20 years, from a high of 12.2 days in 1965 to a low of 7.2 days in 1984. This is a larger reduction in average length of stay than that experienced by all inpatients who stayed 7.8 days in 1965 (NCHS, 1971) and 6.6 days in 1984 (NCHS, 1986). Average length of stay was shorter for younger women who had a hysterectomy than for older women, which is expected and consistent with a general direct correlation of length of stay and age. The average length of stay for women with a hysterectomy was 3 to 5 days shorter for those 35 years of age and younger than for those 65 years of age and older.

The reduction in length of stay for hysterectomies is probably attributable to reductions in complications from improved surgical techniques, use of prophylactic antibiot-ics in high-risk patients, and earlier postoperative ambulation.

Hysterectomy with bilateral oophorectomy

Hysterectomy and bilateral oophorectomy (removal of both ovaries) are often performed together with either the ovaries or the uterus as the primary objective of the surgery. That is, the ovaries are removed during a hysterectomy, or the physician removes the uterus even though the surgery was undertaken because of a problem with the ovaries. From 1965 through 1984, both ovaries and the uterus were removed during the same hospital stay for about 36 percent of all women having a hysterectomy. Even though it is relatively common for women to have their ovaries removed during a hysterectomy, a bilateral oophorectomy is relatively uncommon by itself. In 1984 there were 305,000 bilateral oophorectomies (NCHS, 1986). Of these, 270,000 (or 88.5 percent) were performed in conjunction with a hysterectomy.

Women under 45 years of age were less likely to have a bilateral oophorectomy with a hysterectomy than older women (figure 3), presumably to maintain proper hormone balance while the ovaries are still functional. Women over 65 years of age were also less likely than women aged 45-64 years to have these procedures simultaneously. This may be because older women are less likely to have both ovaries,
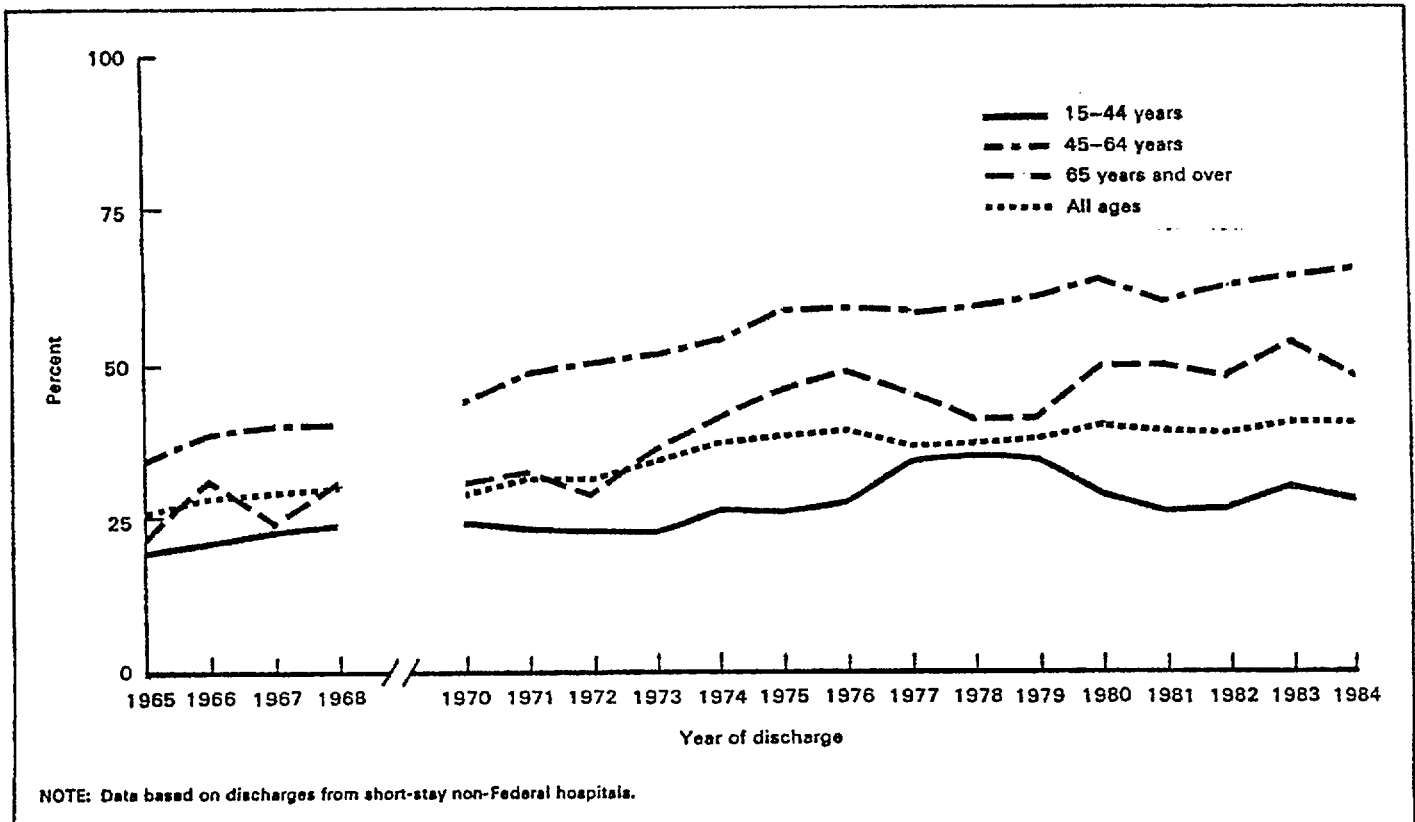
Figure 3. Percent of females having a hysterectomy and a bilateral oophorectomy of all females having a hysterectomy, by year of discharge and age: United States, 1965-84

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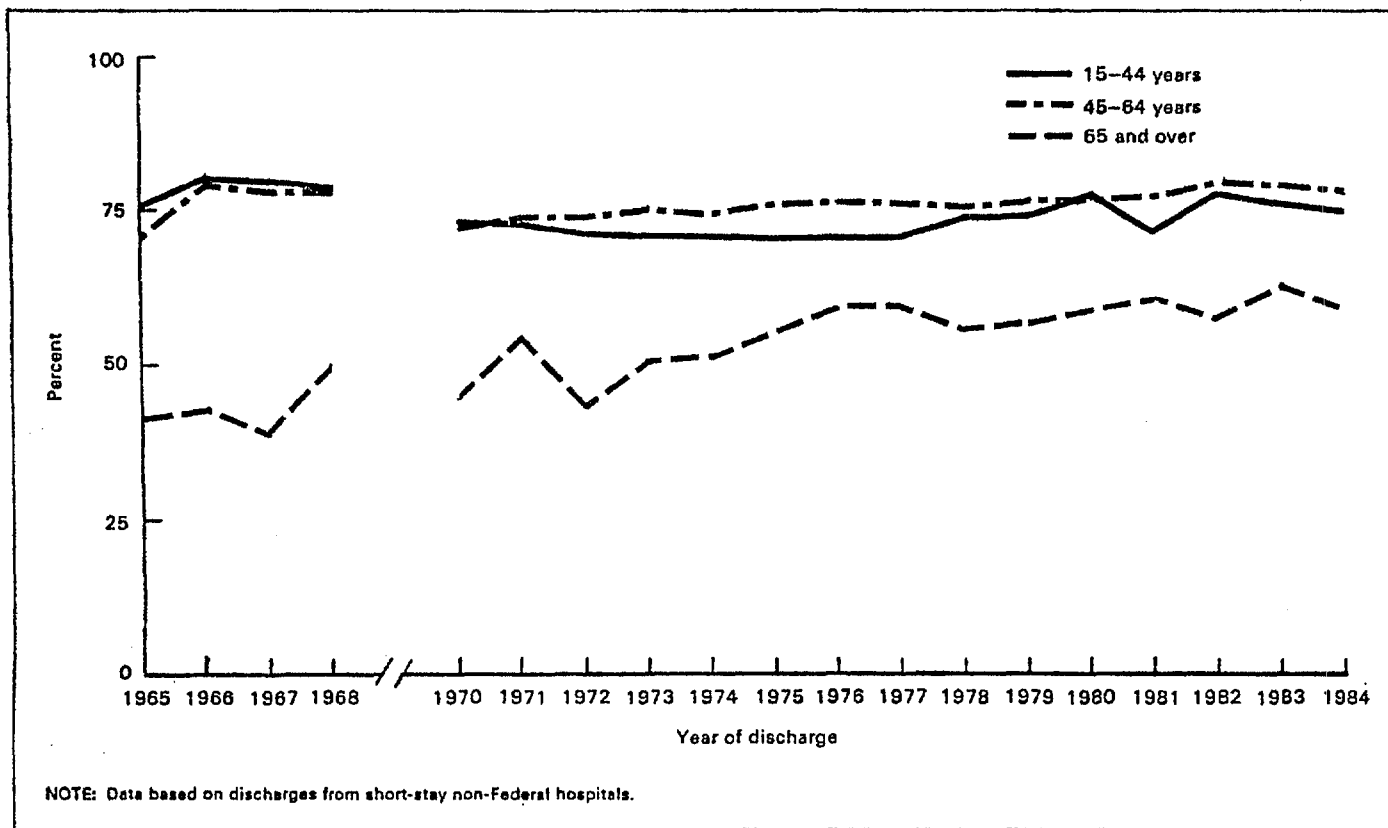
Figure 4. Percent of hysterectomies performed abdominally, by year of discharge and age of patient: United States, 1965–84

NOTE: Data based on discharges from short-stay non-Federal hospitals.

and only bilateral oophorectomies were counted. The trend in this combination of procedures for women 45-64 years of age has increased dramatically: from 35 percent of all women having a hysterectomy in 1965 to 66 percent in 1984.

Surgical approach

Hysterectomies can be performed abdominally or vaginally, with the abdominal approach being more common (figure 4). Before 1974 women aged 65 years and over had hysterectomies by either route in similar proportions. After 1974 hysterectomies for women of all ages were more likely to have been performed abdominally.

Almost no change has occurred in the proportion of hysterectomies done abdominally (or vaginally) for women under 65 years of age. About 75 percent of all hysterectomies for these women have been by the abdominal route. The abdominal approach has increased slightly in proportion for women 65 years of age and over; but for the past 4 to 5 years, it has been relatively stable: about 60 percent abdominal.

Women with intact uteri

Lyon and Gardner (1977) have examined a problem inherent in studying uterine cancer rates. Specifically, women who have had their uterus removed are not at risk of uterine cancer, and they should not be included in the population used to compute these rates. The proportion of the female population at risk of uterine cancer decreases with age as the proportion of women having had a hysterectomy increases (assuming similar life expectancy for women with and without hysterectomy, a tenable assumption (Sandberg et. al., 1985)). To address this Lyon and Gardner calculated the proportion of women with intact uteri using prevalence data for 1960 from the National Health Examination Survey and data on hysterectomy rates from the NHDS.

Marrett (1980), in a critique of the Lyon and Gardner paper, pointed out that their interpretation of data from the National Health Examination Survey could be improved for women after menopause (assumed to occur, on the average, at 50 years of age). Marrett's reworking of the Lyon and Gardner data results in slightly smaller proportions of women with intact uteri after age 50 years.

The general approach of Lyon and Gardner and the revision suggested by Marrett are used here to estimate the proportion of women with intact uteri through 1984. The actual methods are described in appendix I. These estimates are important for several reasons: As originally intended they allow better estimation of uterine cancer rates; they provide an examination of the dynamics of hysterectomy on the female population; and they allow an estimate of hysterectomy rates based on the population at risk.

Estimates in the diagonal cells of table 4 can be used to study the dynamics of hysterectomy for a particular cohort of women over time. As an example, females aged 30-34 years of age in 1960 will be followed to 1985. The proportions in table 4 are easily converted to percents by moving the decimal two places to the right. In 1960, 94.2 percent of women aged 30-34 years had not had a hysterectomy; by 1970 these women were 40-44 years of age, and 82.6 percent of them still had intact uteri. This indicates that 12.3 percent of women aged 30-34 in 1960 with uteri had a hysterectomy during this period ((($94.2 - 82.6$)/ 94.2) $\times$ 100 $= 12.3$ percent). By 1985 this hypothetical cohort was 55-59 years of age, and 62.6 percent still had their uteri. Using the same calculation as above, it is seen that 33.5 percent of the women aged 30-34 years with intact uteri in 1960 had a hysterectomy sometime during this 25-year period.

Women in their 40's run the greatest risk of hysterectomy. This is evident by comparing the proportion of women aged 40-44 years in table 4 with their cohort 5 years later. For example, 11.6 percent of women ages 40-44 years in 1970 had a hysterectomy by 1975 ((($.826 - .730$) /.826) $\times$ 100). This same calculation for women 40-44 years of age in 1975 and in 1980 produces estimates of 11.5 percent and 11.2 percent, respectively. These are the largest percent changes over 5 years within any cohort in table 4.

Table 4 also provides data which allow the estimation of an interesting statistic—the number of women alive at a particular time who have had a hysterectomy. For example, the proportions in table 4 for 1985 when applied to the civilian resident population estimates of the United States for 1985, show that of the 97 million females 15 years of age or over about 18.5 million had had a hysterectomy. This represents about 19.1 percent of all women 15 years of age or over.

Hysterectomy rates

Hysterectomy rates by region and age for 1972 through 1984 are given in table 5. This period is presented because population data for sex, age, and region categories were available. Population estimates for the years 1972-79 are slightly different from those for 1980-84. Previous to 1980, NHDS used civilian noninstitutionalized population estimates to calculate rates, but beginning in 1980, civilian resident estimates were used. This change and its effect on estimates of hospital utilization rates has been published (NCHS, 1984). The effect is negligible for persons under 65 years of age, for whom most hysterectomies are done. Rates for the elderly based on the civilian resident population are in the range of 2 to 4 percent lower than rates based on the civilian noninstitutionalized population.

The last column in table 5 is a combined annual rate for the period 1972-84 calculated from the sum of hysterectomies and population values. Examining these estimates, the South has had the highest overall rate for hysterectomies, 9.0 per 1,000 women age 15 years and over. Rates in the North Central and West were the same, 7.8 per 1,000, and that for the Northeast was the lowest, 5.7 per 1,000.

The pattern of rates by region varies with age. In the South, women in the age group 15-44 years had higher rates than those in the age group 45-64 years: 10.9 per 1,000 versus 8.7 per 1,000, respectively. In the other regions, women aged 15-44 years had lower rates than women aged 45-64 years: 5.2 versus 8.4 per 1,000 in the Northeast; 8.0 versus 10.3 in the North Central; and 7.9 versus 9.6 in the West. This general pattern holds for each year from 1972 through 1984, and it indicates that women in the South who had a hysterectomy were more likely to have had the procedure at an earlier age.

The most dramatic regional differences in hysterectomy rates were for women aged 15-44 years in the Northeast versus those in the South. The South had consistently higher rates than the Northeast for each year from 1972 through 1984. It is interesting to note that although hyster-

ectomy rates were generally decreasing during this period, the rates decreased more in the Northeast than in the South even though they were higher in the South. This is seen by examining the relative decrease in hysterectomy rates in the Northeast (a 40.6-percent drop, from 6.4 per 1,000 population to 3.8 per 1,000), and that of rates in the South (a 14.5-percent drop, from 11.7 per 1,000 to 10.0 per 1,000).

Rates of hysterectomies for all women (unadjusted) and for women at risk (adjusted from the calculations in table 4) are shown in table 6. The unadjusted rates are consistent with estimates published annually by the National Center for Health Statistics. Adjusted rates are greater than the unadjusted rates because the method used to calculate them removed women from the population who had had a hysterectomy. This results in proportional differences between the two rates that increase with age. For example, in 1984 the unadjusted rate of hysterectomies for women ages 30-34 was 9.3 per 1,000 women versus an adjusted rate of 9.9 per 1,000 women at risk, a difference of 6.5 percent in the adjusted rate over the unadjusted rate. In the same year, adjusted rates for women ages 50-54 years and 70-74 years were 51.3 and 56.8 percent higher, respectively, than unadjusted rates.

Rates of hysterectomies increased from 1965 to 1975 and decreased into the 1980's. Although the differences in rates from the 1960's to the 1970's and the 1970's to the 1980's may appear small, the percent changes are relatively large. From 1965 to 1975 the rate of unadjusted hysterectomies for all women increased from 6.1 per 1,000 to 8.6 per 1,000 a rise of 29 percent. The following decrease to 6.9 percent in 1984 represents a 20 percent drop. Likewise, the adjusted rate increased by 42.5 percent from 1965 to 1975 and then decreased by 17.3 percent from 1975 to 1984.

Women in their 30's and 40's had the highest rate of hysterectomies; and, in particular, women ages 40-44 consistently had the highest estimated rates, ranging from 16.2 per 1,000 population in 1965 to 21.9 per 1,000 in 1975.

Hysterectomy by diagnosis

Hysterectomies by diagnosis and age are presented in table 7 for 1965-84. For proper interpretation of these data, it is important to understand how information from NHDS was used to assign a diagnosis. The source document for NHDS was the medical record face sheet. Diagnoses listed on the face sheet were transcribed onto an NHDS abstract form (see appendix II) and later coded according to the International Classification of Diseases (ICDA-7, ICDA-8, or ICD-9-CM), depending on the year. On some face sheets, a specific box or location is available for the physician to indicate the principal diagnosis. In such instances, this diagnosis was listed first on the NHDS abstract form and subsequently listed first in the NHDS data base. If the medical record face sheet did not specifically identify a principal diagnosis, the diagnoses on the face sheet were transcribed in the order listed by the physician, and this order was maintained throughout the coding process.

In this report, a woman with a hysterectomy was assigned to one of five diagnostic conditions even though more than one diagnosis may have been indicated. The diagnoses used are: cancer, endometrial hyperplasia, fibroids, endometriosis, and prolapse. If none of these diagnoses were present, the category "other diagnoses" was assigned.

Cases with a single diagnosis were self-defined; for women with multiple diagnoses, the process leading to the selection of a diagnosis was as follows. Cancer was given precedence over any other condition. If there was a diagnosis of cancer, even though it was not the first-listed diagnosis, the case was assigned to this diagnostic group. If cancer was not present, endometrial hyperplasia was given precedence in the same manner. The ICD codes do not distinguish the various types of endometrial hyperplasia; the majority of these cellular changes are benign, but some are precancerous. However, because the latter forms of the disease could not be isolated using the ICD, the broader category was used. If cancer or endometrial hyperplasia was not present, diagnoses were examined in order from first-listed to last-listed for an indication of endometriosis, fibroids, or prolapse; and the first of these conditions encountered was designated as the diagnosis. If none of these diagnoses were found, the woman was assigned to the "other diagnoses" category. This process gives priority to nonelective reasons for hysterectomy and a lesser status to other indications. Where one of these five diagnoses was found, it was the first-listed diagnosis in 80 percent of the cases.

Although the diagnoses assigned in this manner are based on the discharge diagnoses as listed on the medical record face sheet, a clinical examination of the medical record (including laboratory and pathology reports) may have determined a different diagnosis or a coexisting and equally important diagnosis. An alternative grouping of diagnoses and/or a different rationale for selecting the diagnosis may have resulted in different estimates in tables 7-11. In addition, sterilization and disorders of menstruation may play a larger role in the decision to have a hysterectomy than can be measured from medical record information (Sandberg, 1986).

There was no way to assure that the codes used to define these diagnoses from the three versions of the ICD are strictly comparable even though in most cases the disease names are quite similar. Codes for fibroids and prolapse were the most straightforward to identify across coding systems. Endometriosis and adenomyosis were found in four distinct codes of the ICDA-7, but they were defined in a single code from 1970- 84. The cancer category includes malignant neoplasms of the uterus, cervix, placenta, ovaries, bladder, kidneys, and other or unspecified female genitourinary organs; carcinoma in situ of the cervix, uterus, or unspecified female genital organs; and neoplasms of uncertain behavior of the uterus. Codes from the three versions of the ICD for each diagnostic category are listed in appendix II.

Overall, about 21 percent of women with a hysterectomy were not assignable to one of these diagnostic groups. Using the first-listed diagnosis, data from 1978 were examined to see what diagnoses were in the "other" category. They included disorders of menstruation and abnormal bleeding; diseases of the parametrium or pelvic peritoneum; infectious and other diseases of the cervix, ovaries, or fallopian tubes; benign neoplasms (other than fibroids); obstetrical catastrophes; and hysterectomies performed during a hospitalization for childbirth. Individually the frequency of occurrence for these conditions as sampled in NHDS was too small to produce reliable age-by-diagnosis estimates.

Data on frequencies, proportions (by diagnosis and by age), and rates of hysterectomies by diagnosis are provided in tables 7-11. Rates in table 11 are based on the population
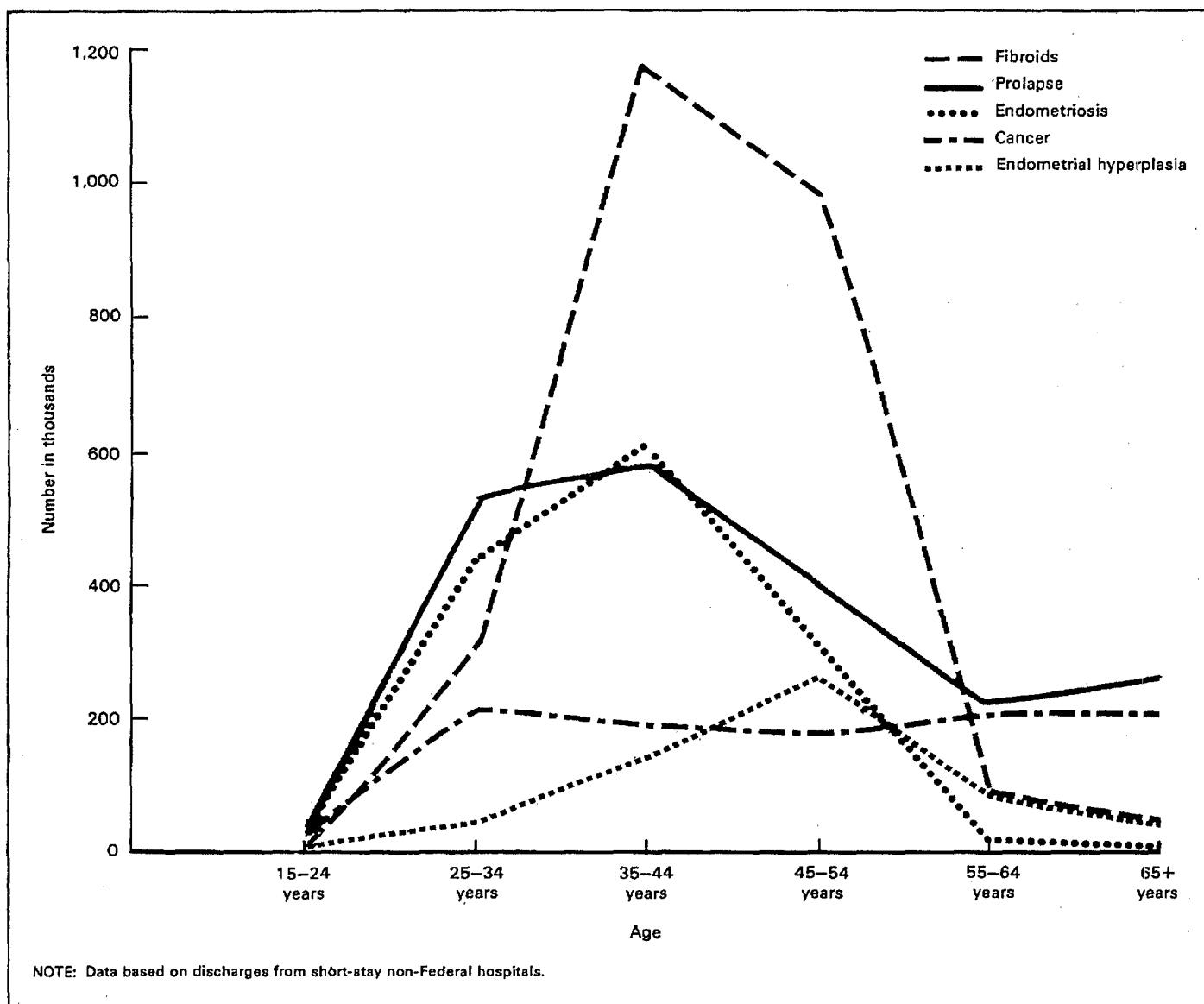
Figure 5. Number of hysterectomies by age of patient and diagnosis: United States, 1970—84

at risk, that is, the population of women with intact uteri. Three-year periods were used in order to produce reliable estimates for most of the age-by-diagnosis categories. Medical data was not coded in 1969, so of the 4 years 1965-68, the 3-year period 1965-67 was used in these tables.

Data are aggregated in table 10 for the 15-year period 1970-84. This table shows that there were about 9.8 million hysterectomies in civilian hospitals from 1970 through 1984. Of these, fibroids accounted for 26.8 percent; prolapse, for 20.8 percent; endometriosis, for 14.7 percent; cancer, for 10.7 percent; endometrial hyperplasia, for 6.2 percent; and other conditions, for 20.7 percent.

The most frequent diagnosis for hysterectomy was uterine fibroids (also called myoma or leiomyoma). These are benign fibromuscular growths that occur in more than 25 percent of women over 35 years of age (The Merck Manual, 1982). The proportion of women having a hysterectomy for fibroids decreased from 34.1 percent in 1965-67

to 26.8 percent in 1973-75 (table 8), but the proportion remained relatively constant from 1973-75 to 1982-84, ranging from 25.6 percent to 27.5 percent. Fibroids accounted for about 2.6 million hysterectomies in 1970-84; and during these 15 years, women aged 35-54 years with fibroids accounted for 22 percent of all hysterectomies (table 10). The predominance of fibroids as a condition for hysterectomy for women in this age group is seen graphically in figure 5.

The majority of hysterectomies for fibroids, 82 percent, were for women 35-54 years of age (table 10). This may result from two factors: (1) Women under 35 years of age with fibroids may be less likely to have a hysterectomy if they have not started or completed their family. Fibroids can be removed by means of a myomectomy, thereby preserving the uterus. In 1984 there were 18,000 myomectomies performed for women in the age group 15-44 years. (2) After menopause in the nonhormonally replaced fe-

male, new fibroids are less likely to develop; and existing fibroids may decrease in size, thereby reducing this as a condition for hysterectomy.

The rate of hysterectomies for fibroids was stable during the period 1965-84. The rate of hysterectomies for fibroids during this period ranged from 2.23 per 1,000 women at risk in 1979-81 to 2.75 per 1,000 in 1973-75. The highest rates of hysterectomy for fibroids were for women 35-54 years of age. During the period 1982-84, about 7.5 per 1,000 women at risk in this age group had a hysterectomy for fibroids.

Prolapse accounted for about 21 percent of hysterectomies from 1970 through 1984. This condition results when ligaments and supportive structural tissues weaken and stretch, allowing organs attached to these structures to change their relative position within the female pelvis. Prolapse as coded in the ICD includes uterine prolapse, vaginal prolapse, cystocele, rectocele, and enterocele. These conditions can present singularly or in combination, and they do not reflect uterine pathology. Another term included in this category is pelvic relaxation, a condition cited as a common diagnosis for hysterectomy (Easterday, Grimes, and Riggs, 1983).

Unlike fibroids, prolapse was a common indication for hysterectomy in women of all ages over 25 years. Although second in frequency overall, prolapse was the most common indication for hysterectomy in older women, accounting for 30.1 percent of all hysterectomies for women 55-64 and for 41.2 percent for women 65 years of age or over (table 10). Although the overall frequency of hysterectomy for prolapse has declined in recent years, the number of elderly females (65 years of age and over) having a hysterectomy for this condition has increased from 47,000- 49,000 for 3-year periods in the 1970's to 56,000 in 1979-81, and to 65,000 in 1982-84. However, the rate of hysterectomy for prolapse for these women has remained relatively stable over time.

From 1973-75 to 1982-84, the overall rate of hysterectomy for prolapse decreased from 2.41 to 1.54 per 1,000. This decrease is most heavily weighted in the age group 25-54 years.

Endometriosis was the most difficult condition to track across coding systems. In the 1960's it was found in four different codes of the ICDA-7 under benign neoplasms, but in the 1970's and 1980's it had a single code (which included adenomyosis) and was located under diseases of the genitourinary system (appendix I). Endometriosis and adenomyosis are benign gynecological diseases with a variety of clinical presentations. The etiology of this disease is not fully understood, but it is characterized by endometrial tissue found outside the endometrium. This ectopic tissue creates menstrual bleeding and other functions of endometrium at its ectopic sites. The clustering of hysterectomies for endometriosis at ages 15-54 years (97 percent) reflects the fact that the symptoms produced by endometriosis occur almost exclusively during the reproductive years in which women have an active menstrual cycle.

The number and rate of hysterectomies for endometriosis has increased steadily from 1965 through 1984. During this period, it showed the largest increase for hysterectomy of any diagnosis—an overall increase in frequency of 176 percent, with a corresponding increase in rate of 121 percent. For the same period, the rate of hysterectomy for cancer, fibroids, and prolapse changed by 2.1 percent, -7.2 percent, and -14.0 percent, respectively. Endometrial hyperplasia and other diagnoses showed larger relative increases in rate (31.6 percent and 47.9 percent), but they were still smaller than the increase for endometriosis. These trends in hysterectomy by diagnosis are graphed in figure 6, and the steady rise in frequency of hysterectomy for endometriosis compared to other diagnosis is well illustrated.

This increase in the number and rate of hysterectomies for endometriosis could theoretically arise for several reasons. First, the disease may have become more common and/or more severe in patients with the disease. Evidence for this explanation is that endometriosis appears to be more prevalent among women who delay childbearing (Houston, 1984), a trend that has increased during the past 20 years (NCHS, 1982), and oral contraception, which helps protect a woman from endometriosis, has declined since the 1960's (Pratt and Bachrach, 1985). Second, the prevalence of endometriosis may not have actually increased, but rather the disease has become better diagnosed with improved and more widely used technology, such as laparoscopy. Third, these data may not reflect an increase or a decrease in prevalence but rather a change in medical practice. That is, through the period 1965-84 physicians may have become more likely to perform a hysterectomy for endometriosis.

Malignant neoplasms, certainly the most serious condition leading to a hysterectomy, accounted for just over a million hysterectomies from 1970 through 1984, about 10.7 percent of all hysterectomies. Data in NHDS are limited to information collected from the face sheet of the medical record; and although presumably a patient's discharge diagnosis is indicated on this document, pathology reports were not examined. However, the findings here are consistent with a clinical examination of over 6,000 records by Amirikia and Evans (1979), in which 9 percent of all hysterectomies were performed for cancer.

Cancer was a less common diagnosis for hysterectomy in women under 25 years of age, but it was the only diagnosis for hysterectomy that increased in frequency after midlife (35-54 years). This is seen in table 10 by comparing women in the age groups 35-54 years with those 55 years and over: the number of hysterectomies for cancer in these two age groups increased from 372,000 to 423,000 (table 10). On the other hand, the frequency of hysterectomy for prolapse decreased from 986,000 to 484,000; that of endometrial hyperplasia decreased from 410,000 to 137,000, and that of other diagnoses decline from 880,000 to 143,000. The decrease in hysterectomies for younger versus older women with fibroids or endometriosis was even more
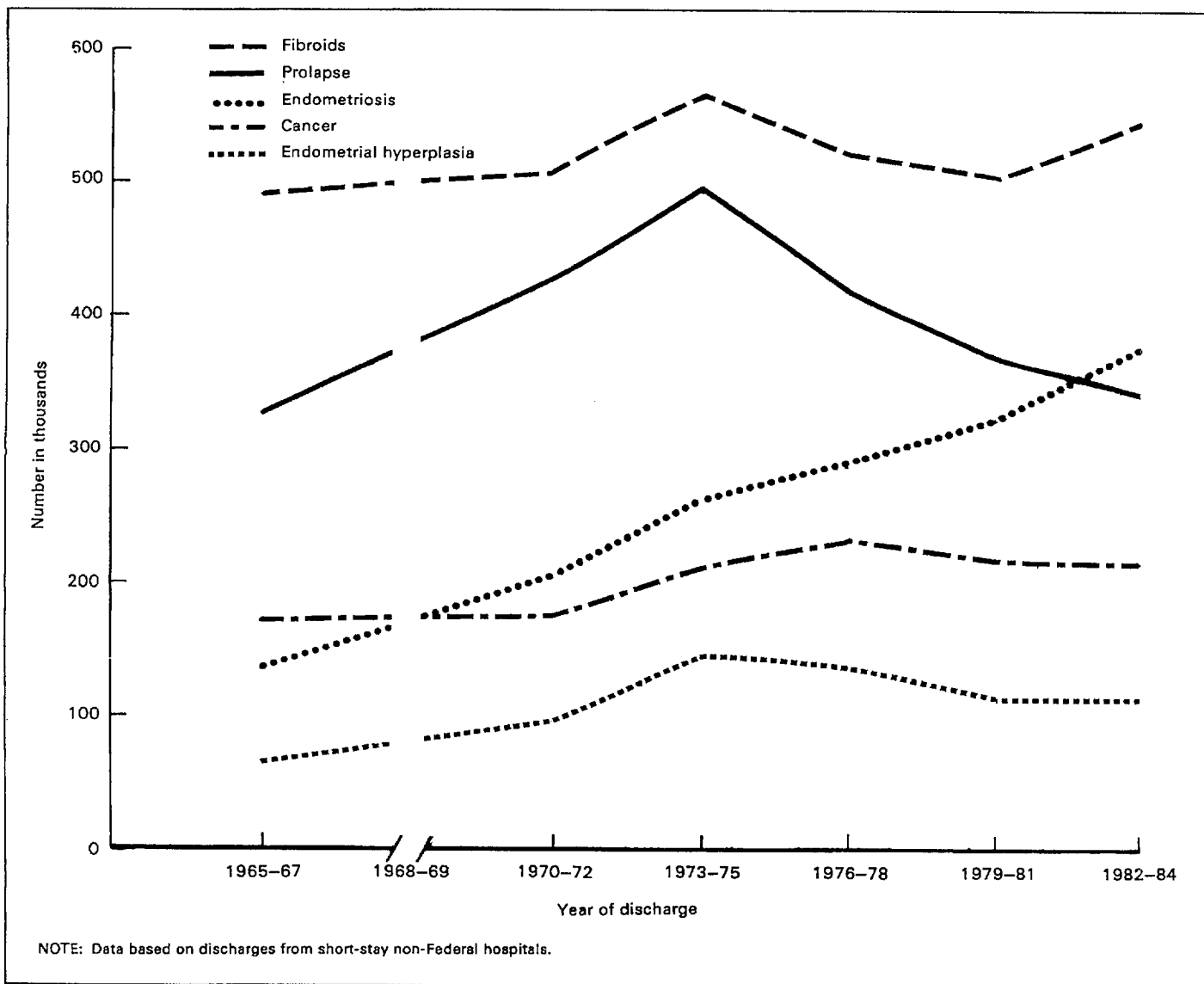
Figure 6. Number of hysterectomies by diagnosis and year of discharge: United States, 1965–84

dramatic, for reasons discussed earlier: from 2.2 million to 146,000 hysterectomies for fibroids and from 926,000 to 40,000 hysterectomies for endometriosis.

The frequency and rate of hysterectomy for cancer in the elderly has increased from 1965-67 through 1982-84. In 1965-67, 19,000 women aged 65 years or over (0.91 per 1,000) had a hysterectomy for cancer; this frequency increased to 64,000 (2.07 per 1,000) in 1982-84 (tables 7 and 11). Cancer and prolapse were the major reasons for hysterectomy in elderly women, accounting for 74 percent of all hysterectomies during the period 1970-84.

Summary

The most frequently performed major surgical procedure in the United States over the 20-year period 1965-84 was hysterectomy. It was done on 12.5 million women in the United States during this time; and by 1985, about 18.5 million women age 15 years and over in the United States had undergone the procedure.

Within the United States, there are regional variations in hysterectomy rates. Women in the South were more likely than women in other regions to have had a hysterectomy, and hysterectomy was more likely to be performed on these women at an earlier age.

The average length of stay for all hospital inpatients has decreased from 1965 through 1984; but for women who had a hysterectomy, the reduction in average length of stay has been dramatic—from 12.2 days in 1965 to 7.2 in 1984.

Women were most likely to have had a hysterectomy during their 30's and 40's; with the median at 40.9 years. By 1985, 37.4 percent of women 55-59 years of age had had their uterus removed. Fibroids, prolapse, and endometriosis were the most common reasons for these women to have had a hysterectomy, accounting for about 62 percent of all hysterectomies from 1970 through 1984. Cancer, the greatest life threatening condition leading to hysterectomy, accounted for an additional 10.7 percent.

Even though the most common diagnosis for hysterectomy was fibriods, the rate of hysterectomy for endometriosis showed the largest overall increase. From 1965 through 1984, the number and rate of hysterectomies for endometriosis have increased. Prolapse was the only condition for hysterectomy that declined in frequency. Fibroids, endometriosis, and prolapse accounted for most hysterectomies for women under 65 years of age, 63 percent, but cancer and prolapse accounted for a majority in older women, about 74 percent. Most recent estimates from 1982 through 1984 show an increase in the rate of hysterectomies for cancer in women 65 years of age and over.

As this report was being completed, data from the 1985 NHDS became available: The estimated number of hysterectomies in 1985 was 670,000 (NCHS, 1986).

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List of detailed tables

Table 1. Number of hysterectomies by age of patient and year of discharge: United States, 1965-84

[Data based on discharges from short-stay non-Federal hospitals.]

Year of discharge	All ages[1]	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70-74 years	75-79 years	80 years and over
							Number of hysterectomies in thousands								
1965	427	*Z	6	28	44	64	103	77	40	19	15	15	10	*4	*1
1966	482	*2	8	30	55	83	106	91	48	20	14	14	6	5	*1
1967	478	*1	9	34	49	89	104	86	44	20	13	15	7	5	*2
1968	490	*1	11	35	53	83	100	89	48	20	15	14	10	8	*3
1969	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1970	526	*1	12	38	70	85	100	94	51	25	17	13	11	*4	*3
1971	570	*2	14	46	75	90	108	102	61	26	18	15	8	5	*2
1972	649	*2	18	58	95	104	117	114	60	31	17	15	9	5	*2
1973	691	*2	16	68	98	109	122	120	65	34	23	16	8	5	*2
1974	695	*3	20	62	91	108	134	117	62	33	24	17	11	7	*5
1975	725	*2	19	79	100	110	125	115	73	36	25	18	11	7	*4
1976	679	*2	19	71	98	102	115	103	68	33	25	17	13	9	*3
1977	706	*3	24	77	112	115	113	101	64	29	21	21	12	6	*3
1978	644	*2	19	61	101	115	109	93	58	25	21	19	11	6	*3
1979	639	*1	16	60	114	117	99	90	50	28	20	17	12	9	6
1980	650	*2	20	62	102	109	107	91	57	31	26	16	15	9	*4
1981	674	*1	18	70	113	112	109	88	51	27	26	22	17	11	7
1982	651	*1	14	63	109	123	101	85	51	23	23	24	20	10	5
1983	673	*1	13	58	111	132	124	86	46	25	23	22	15	8	7
1984	665	*1	18	66	92	126	113	93	45	26	26	25	19	10	6

[1]Includes hysterectomies for those under 15 years of age.

Table 2. Number of hysterectomies performed in hospitals of the Army, Navy, and Air Force in selected years, and percent of total for all hysterectomies and year of discharge: United States, 1971-84

Year of discharge	Total	Army	Navy	Air Force	Total as percent of all hysterectomies
	Number of hysterectomies in thousands				
1971	...	6,280	---	---	...
1972	...	6,951	---	---	...
1973	...	6,738	3,838	---	...
1974	...	5,828	3,788	---	...
1975	15,599	5,883	3,827	5,889	2.1
1976	15,015	5,747	3,413	5,855	2.2
1977	13,949	5,522	3,110	5,317	1.9
1978	11,874	4,673	2,796	4,405	1.8
1979	12,021	4,635	2,857	4,529	1.8
1980	11,543	4,661	2,565	4,317	1.7
1981	11,468	4,492	2,456	4,520	1.7
1982	11,203	4,348	2,235	4,620	1.7
1983	11,592	4,307	2,301	4,984	1.7
1984	10,763	4,068	2,247	4,448	1.6

Table 3. Number of hysterectomies by race of patient, geographic region, and year of discharge, and average length of stay by age of patient and year of discharge: United States, 1965-84

[Data based on discharges from short-stay non-Federal hospitals]

Race, region, and age	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
									Number of hysterectomies in thousands											
Total	427	482	478	490	---	526	570	649	691	695	725	679	706	644	639	650	674	651	673	665
Race																				
White	339	377	381	369	---	388	439	498	525	530	546	507	528	479	478	495	[1]568	520	526	512
Black	40	55	50	58	---	59	56	62	66	65	72	73	71	72	73	72	[1]84	61	72	77
Other	5	5	*3	*4	---	5	7	5	*4	5	6	7	6	7		10	[1]22	12	14	13
Not stated	43	46	44	59	---	72	68	82	93	95	100	89	97	85	88	73	-	58	61	63
Region																				
Northeast	93	99	93	106	---	122	128	128	135	126	130	117	115	99	105	107	99	98	113	102
North Central	114	129	133	135	---	154	162	169	189	192	198	190	190	182	168	175	170	169	162	159
South	137	168	162	162	---	160	181	233	238	245	258	255	271	256	252	260	268	269	274	272
West	83	86	90	87	---	89	98	118	126	132	138	114	127	106	114	108	137	116	125	133
Age										Average length of stay in days										
Total	12.2	11.4	11.9	11.1	---	10.6	10.2	9.8	9.7	9.3	9.4	9.4	8.7	8.7	8.5	8.2	8.0	7.9	7.6	7.2
15-34 years	10.5	9.9	10.7	10.6	---	9.5	9.3	9.2	8.9	8.2	8.7	8.5	7.7	7.7	7.5	7.4	7.2	7.1	6.8	6.3
35-44 years	11.1	11.1	11.7	10.7	---	10.0	9.8	9.3	9.5	8.9	9.0	8.8	8.2	8.2	7.9	7.8	7.5	7.4	7.1	6.7
45-64 years	14.0	11.8	11.9	11.1	---	11.2	10.8	10.3	10.0	9.9	9.7	9.9	9.5	9.4	9.3	8.7	8.4	8.1	8.1	8.0
65 years and over	13.6	15.1	16.5	15.4	---	14.6	13.5	12.4	13.4	12.8	12.4	13.4	12.8	11.9	12.6	11.2	11.1	11.4	10.8	9.2

[1]One-time imputation of race.

Table 4. Proportion of females with intact uteri by age: United States, 1960, 1965, 1970, 1975, 1980, and 1985

[Data based on discharges from short-stay non-Federal hospitals]

Age	Year					
	1960[1]	1965[1]	1970	1975	1980	1985
Under 15 years	1.0	1.0	0.999	0.999	0.999	0.999
15-19 years	0.998	0.999	0.999	0.999	0.999	0.999
20-24 years	0.995	0.996	0.997	0.997	0.996	0.998
25-29 years	0.995	0.981	0.983	0.978	0.978	0.980
30-34 years	0.942	0.970	0.945	0.934	0.927	0.939
35-39 years	0.907	0.900	0.915	0.866	0.859	0.860
40-44 years	0.858	0.849	0.826	0.823	0.774	0.779
45-49 years	0.765	0.813	0.769	0.730	0.728	0.687
50-54 years	0.721	0.732	0.751	0.697	0.657	0.665
55-59 years	0.687	0.688	0.701	0.712	0.658	0.626
60-64 years	0.644	0.654	0.670	0.677	0.689	0.636
65-69 years	0.673	0.619	0.636	0.651	0.655	0.666
70-74 years	0.733	0.656	0.602	0.620	0.632	0.635
75-79 years	0.741	0.716	0.642	0.588	0.604	0.614
80-84 years	0.741	0.724	0.705	0.634	0.577	0.590
85 years and over	0.741	0.724	0.713	0.692	0.621	0.568

[1]Estimates for 1960 and 1965 were obtained from Lyon and Gardner (1977) and Marrett (1980) and reproduced with permission from the *American Journal of Epidemiology* and the authors.

Table 5. Rate of hysterectomies by age of patient, geographic region, and year of discharge: United States, 1972-84

[Data based on discharges from short-stay non-Federal hospitals]

Age and region	Year													
	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1972-84
15 years and over						Rate per 1,000 women								
United States	8.3	8.7	8.6	8.8	8.1	8.3	7.5	7.3	7.1	7.3	6.9	7.1	6.9	7.7
Northeast	6.7	7.0	6.5	6.6	5.9	5.8	5.0	5.3	5.3	4.7	4.7	5.4	4.8	5.7
North Central	7.9	8.8	8.8	9.0	8.6	8.5	8.0	7.3	7.5	7.2	7.1	6.8	6.6	7.8
South	9.6	9.6	9.5	9.9	9.6	9.9	9.2	8.9	8.7	8.7	8.5	8.5	8.3	9.0
West	8.9	9.3	9.4	9.6	7.7	8.4	6.8	7.1	6.4	7.9	6.6	6.9	7.2	7.8
15-44 years														
United States	8.9	9.2	9.1	9.3	8.5	9.1	8.2	8.0	7.6	7.9	7.5	8.0	7.4	8.2
Northeast	6.4	6.7	5.8	5.8	5.2	5.3	4.5	4.4	4.9	4.3	4.2	5.0	3.8	5.2
North Central	7.8	8.6	9.3	9.1	8.5	8.7	8.3	7.7	7.7	7.2	7.1	7.5	6.7	8.0
South	11.7	11.5	11.2	12.0	11.3	12.0	11.1	11.0	10.3	10.7	10.5	10.8	10.0	10.9
West	9.0	9.4	9.3	9.0	7.6	9.3	7.1	7.6	5.9	7.9	6.7	6.9	7.9	7.9
45-64 years														
United States	10.0	10.9	10.1	11.0	10.1	9.5	8.7	8.3	8.8	8.3	7.8	7.7	8.1	9.2
Northeast	9.3	10.1	9.5	10.2	8.8	8.3	7.2	8.0	7.6	6.9	6.6	7.9	8.4	8.4
North Central	10.8	12.4	10.9	12.4	11.7	10.8	10.1	8.9	9.2	9.5	9.1	8.3	8.7	10.3
South	9.0	9.5	10.2	9.1	10.1	9.6	9.2	8.1	8.8	7.5	7.8	7.0	8.0	8.7
West	11.5	12.3	12.1	13.7	9.7	9.2	8.1	7.9	9.6	9.7	7.6	8.0	7.0	9.6
65 years and over														
United States	2.7	2.6	3.3	3.2	3.2	3.2	2.9	3.3	3.1	3.7	3.7	3.2	3.6	3.2
Northeast	2.7	1.9	3.3	3.0	3.4	3.1	2.9	3.7	2.9	2.9	3.4	3.0	2.9	3.0
North Central	2.8	3.2	3.4	2.5	3.6	3.6	3.4	3.5	4.5	3.6	4.2	2.6	3.8	3.4
South	2.5	2.5	2.4	3.4	2.2	3.1	2.4	2.7	2.2	3.5	3.1	3.0	3.2	2.8
West	2.9	3.0	4.7	4.3	4.2	3.2	3.3	3.4	2.9	5.2	4.4	5.1	4.9	4.0

NOTE: Rates for 1972-79 are based on the civilian noninstitutionalized population; rates for 1980-84 are based on the civilian resident population, see text.

Table 6. Rate of hysterectomies for all females and for females with intact uteri by age and year of discharge: United States, 1965, 1970, 1975, 1980, and 1984

[Data based on discharges from short-stay non-Federal hospitals]

Age	Year					Year				
	1965	1970	1975	1980	1984	1965	1970	1975	1980	1984
	Rate per 1,000 females					Rate per 1,000 females with intact uteri				
15 years and over	6.1	6.9	8.6	7.1	6.9	7.3	8.2	10.4	8.7	8.6
15-19 years	*0.0	*0.2	*0.2	*0.2	*0.1	*0.0	*0.2	*0.2	*0.2	*0.1
20-24 years	0.8	1.4	2.0	1.9	1.7	0.8	1.4	2.0	1.9	1.7
25-29 years	4.8	5.5	9.1	6.3	6.1	4.9	5.6	9.3	6.5	6.3
30-34 years	7.8	11.9	14.0	11.4	9.3	8.0	12.6	15.0	12.3	9.9
35-39 years	10.5	14.9	18.6	15.3	14.7	11.7	16.3	21.4	17.8	17.1
40-44 years	16.2	16.3	21.9	17.8	16.2	19.1	19.8	26.6	23.0	20.3
45-49 years	13.3	15.0	18.9	16.0	15.8	16.3	19.5	25.8	21.9	23.0
50-54 years	7.6	8.9	11.8	9.4	7.8	10.3	11.8	16.9	14.3	11.8
55-59 years	3.8	4.7	6.4	5.0	4.3	5.5	6.7	8.9	7.6	6.8
60-64 years	3.8	3.7	5.0	4.7	4.4	5.7	5.6	7.4	6.8	7.0
65-69 years	4.1	3.3	4.0	3.2	4.8	6.6	5.2	6.1	4.9	7.2
70-74 years	3.4	3.4	3.3	3.8	4.4	5.1	5.6	5.4	6.0	6.9
75-79 years	*2.2	*1.9	2.8	3.0	3.1	*3.1	*2.9	4.8	5.0	5.0
80-84 years	*0.6	*1.6	*1.6	*1.4	2.5	*0.8	*2.3	*2.5	*2.5	4.3
85 years and over	*1.7	*0.8	*0.7	*1.0	*0.5	*2.4	*1.1	*1.1	*1.6	*1.0

Table 7. Number of hysterectomies by age of patient, year of discharge, and diagnosis: United States, 1965-84

[Data based on discharges from short-stay non-Federal hospitals]

Year and age	Total	Cancer	Endometrial hyperplasia	Fibroids	Endometriosis	Prolapse	Other
1965-67			Number of hysterectomies in thousands				
Total	1,387	171	68	473	136	322	217
15-24 years	25	*4	*Z	*2	*2	*2	16
25-34 years	239	38	7	37	27	57	73
35-44 years	549	48	26	219	68	107	81
45-54 years	387	37	25	191	35	67	34
55-64 years	101	26	6	17	*3	42	6
65 years and over	86	19	*3	8	*1	47	7
1970-72							
Total	1,746	174	98	506	202	427	339
15-24 years	49	8	*Z	*1	*3	9	28
25-34 years	382	40	12	44	53	110	123
35-44 years	602	35	26	217	86	123	115
45-54 years	481	35	39	213	51	92	51
55-64 years	134	35	14	18	8	45	14
65 years and over . . . . \	92	21	5	11	*1	47	7
1973-75							
Total	2,114	211	147	566	263	496	431
15-24 years	61	8	*Z	*2	*4	10	37
25-34 years	499	51	11	58	72	134	173
35-44 years	709	40	33	239	115	147	135
45-54 years	553	32	66	232	61	106	56
55-64 years	176	47	29	25	9	49	17
65 years and over . . . . . :	111	33	8	8	*2	49	11
1976-78							
Total	2,030	231	138	520	289	419	433
15-24 years	68	7	*Z	*4	7	9	41
25-34 years	520	55	11	72	90	111	181
35-44 years	668	41	31	228	119	121	128
45-54 years	488	42	62	187	63	85	49
55-64 years	154	46	22	20	6	44	16
65 years and over	124	40	10	8	*3	47	16
1979-81							
Total	1,961	217	114	502	321	369	438
15-24 years	59	6	*1	*2	9	9	32
25-34 years	523	41	10	74	105	103	190
35-44 years	653	39	33	223	137	90	131
45-54 years	445	35	51	173	64	70	52
55-64 years	137	45	13	17	*3	42	17
65 years and over	146	52	7	13	*3	56	15
1982-84							
Total	1,988	216	111	545	375	342	399
15-24 years	47	6	*1	*1	8	5	26
25-34 years	500	33	12	67	130	80	178
35-44 years	719	36	24	268	168	100	123
45-54 years	420	36	45	183	62	52	42
55-64 years	132	41	15	15	*4	40	17
65 years and over	170	64	15	11	*2	65	13

Table 8. Percent distribution of hysterectomies by diagnosis, according to year of discharge and age of patient: United States, 1965-84

[Data based on discharges from short-stay non-Federal hospitals]

Year and age	Total	Cancer	Endometrial hyperplasia	Fibroids	Endometriosis	Prolapse	Other
1965-67				Percent distribution			
Total	100.0	12.3	4.9	34.1	9.8	23.2	15.7
15-24 years.	100.0	15.1	*0.8	*6.2	*8.0	*7.7	64.1
25-34 years.	100.0	15.7	3.0	15.5	11.1	24.0	30.6
35-44 years.	100.0	8.8	4.7	40.0	12.4	19.4	14.8
45-54 years.	100.0	9.5	6.4	49.2	9.0	17.2	8.7
55-64 years.	100.0	25.5	6.1	16.8	*3.2	42.0	6.3
65 years and over.	100.0	22.5	3.9	9.0	*1.2	54.7	8.6
1970-72							
Total	100.0	10.0	5.6	29.0	11.6	24.4	19.4
15-24 years.	100.0	15.4	*1.3	*2.3	*6.5	17.9	56.7
25-34 years.	100.0	10.6	3.3	11.5	13.8	28.7	32.1
35-44 years.	100.0	5.8	4.4	36.0	14.2	20.5	19.1
45-54 years.	100.0	7.4	8.2	44.2	10.6	19.1	10.5
55-64 years.	100.0	26.0	10.8	13.7	5.6	33.6	10.3
65 years and over.	100.0	22.7	5.5	11.7	*1.2	51.6	7.2
1973-75							
Total	100.0	10.0	7.0	26.8	12.4	23.5	20.4
15-24 years.	100.0	12.6	*0.1	*4.1	*6.1	16.2	60.9
25-34 years.	100.0	10.2	2.3	11.7	14.4	26.8	34.6
35-44 years.	100.0	5.7	4.6	33.7	16.2	20.8	19.0
45-54 years.	100.0	5.8	12.0	42.0	11.1	19.1	10.1
55-64 years.	100.0	26.6	16.3	14.3	5.2	27.8	9.7
65 years and over.	100.0	29.7	7.1	7.1	*1.4	44.4	10.3
1976-78							
Total	100.0	11.4	6.8	25.6	14.2	20.7	21.3
15-24 years.	100.0	10.6	*1.0	*5.4	9.6	13.7	59.8
25-34 years.	100.0	10.6	2.0	13.8	17.4	21.4	34.8
35-44 years.	100.0	6.2	4.7	34.1	17.8	18.1	19.1
45-54 years.	100.0	8.5	12.8	38.4	12.9	17.5	10.0
55-64 years.	100.0	29.6	14.4	12.9	3.9	28.7	10.6
65 years and over.	100.0	32.4	8.1	6.6	*2.1	37.9	12.9
1979-81							
Total	100.0	11.1	5.8	25.6	16.4	18.8	22.3
15-24 years.	100.0	9.5	*1.7	*3.9	15.4	15.2	54.5
25-34 years.	100.0	7.8	1.8	14.1	20.1	19.6	36.4
35-44 years.	100.0	6.0	5.0	34.2	21.0	13.8	20.1
45-54 years.	100.0	7.9	11.4	38.9	14.4	15.7	11.7
55-64 years.	100.0	32.8	9.5	12.1	*2.5	30.4	12.7
65 years and over.	100.0	35.7	4.5	8.6	*1.7	39.0	10.4
1982-84							
Total	100.0	10.8	5.6	27.5	18.9	17.2	20.1
15-24 years.	100.0	12.9	*2.0	*2.5	17.6	10.4	54.6
25-34 years.	100.0	6.6	2.3	13.4	26.1	16.0	35.6
35-44 years.	100.0	5.0	3.3	37.3	23.4	13.9	17.1
45-54 years.	100.0	8.5	10.7	43.7	14.7	12.5	10.0
55-64 years.	100.0	31.1	11.4	11.1	*3.0	30.7	12.6
65 years and over.	100.0	37.7	8.6	6.7	*1.4	37.9	7.7

Table 9. Percent distribution of hysterectomies by year of discharge and age of patient, according to diagnosis: United States, 1965-84

[Data based on discharges from short-stay non-Federal hospitals]

Year and age	Total	Cancer	Endometrial hyperplasia	Fibroids	Endometriosis	Prolapse	Other
1965-67				Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15-24 years.	1.8	2.2	*0.3	*0.3	*1.5	*0.6	7.3
25-34 years.	17.2	21.9	10.8	7.8	19.6	17.8	33.7
35-44 years.	39.6	28.1	38.2	46.3	50.0	33.1	37.2
45-54 years.	28.0	21.5	36.4	40.3	25.7	20.7	15.5
55-64 years.	7.3	15.0	9.1	3.6	*2.4	13.1	2.9
65 years and over.	6.1	11.3	4.9	1.6	*0.8	14.6	3.4
1970-72							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15-24 years.	2.8	4.3	*0.6	*0.2	*1.6	2.0	8.2
25-34 years.	22.0	23.2	12.7	8.7	26.2	25.7	36.4
35-44 years.	34.6	20.2	26.8	43.1	42.6	29.0	34.2
45-54 years.	27.5	20.3	40.0	42.2	25.3	21.6	15.1
55-64 years.	7.7	20.0	14.7	3.6	3.7	10.6	4.1
65 years and over.	5.3	11.9	5.2	2.1	*0.6	11.1	2.0
1973-75							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15-24 years.	2.9	3.7	*0.1	*0.4	*1.4	2.0	8.7
25-34 years.	23.6	24.1	7.7	10.3	27.4	27.0	40.3
35-44 years.	33.5	19.2	22.4	42.3	43.8	29.8	31.4
45-54 years.	26.2	15.3	45.0	41.1	23.3	21.3	13.0
55-64 years.	8.3	22.2	19.4	4.4	3.5	9.8	4.0
65 years and over.	5.3	15.7	5.4	1.4	*0.6	10.0	2.7
1976-78							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15-24 years.	3.5	3.2	*0.5	*0.7	2.3	2.3	9.6
25-34 years.	25.6	23.8	7.7	13.8	31.4	26.6	42.0
35-44 years.	32.9	17.9	22.9	44.0	41.4	29.0	29.6
45-54 years.	24.0	18.0	45.4	36.1	21.8	20.4	11.3
55-64 years.	7.7	19.8	16.2	3.8	2.1	10.6	3.8
65 years and over.	6.1	17.3	7.2	1.6	*0.9	11.2	3.7
1979-81							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15-24 years.	3.0	2.6	*0.8	*0.5	2.8	2.4	7.3
25-34 years.	26.7	18.7	8.4	14.8	32.6	27.7	43.3
35-44 years.	33.3	18.0	28.8	44.5	42.7	24.4	30.0
45-54 years.	22.7	16.1	44.7	34.4	20.0	18.9	12.0
55-64 years.	7.0	20.7	11.4	3.3	*1.1	11.3	4.0
65 years and over.	7.4	23.8	5.8	2.5	*0.8	15.3	3.4
1982-84							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15-24 years.	2.4	2.9	*0.9	*0.2	2.3	1.5	6.6
25-34 years.	25.2	15.2	10.4	12.3	34.7	23.3	44.6
35-44 years.	36.2	16.6	21.7	49.2	44.9	29.2	30.9
45-54 years.	21.1	16.5	40.4	33.6	16.4	15.3	10.5
55-64 years.	6.6	18.9	13.5	2.7	*1.1	11.8	4.2
65 years and over.	8.6	29.9	13.2	2.1	*0.7	18.9	3.3

Table 10. Number and percent of hysterectomies by age of patient and diagnosis; percent distribution by age of patient, according to diagnosis; and percent distribution by diagnosis, according to age of patient: United States, 1970-84

[Data based on discharges from short-stay non-Federal hospitals]

Age	Total	Cancer	Endometrial hyperplasia	Fibroids	Endometriosis	Prolapse	Other
			Number of hysterectomies in thousands				
All ages	9,835	1,051	607	2,639	1,449	2,053	2,037
Under 15 years	18	*1	*1	*4	*2	*3	7
15-24 years.	286	35	*3	11	31	42	164
25-34 years.	2,421	220	56	316	450	537	843
35-44 years.	3,352	192	147	1,175	625	581	631
45-54 years.	2,386	180	263	987	301	405	249
55-64 years.	732	213	93	95	30	220	81
65 years and over.	640	210	44	51	10	264	62
			Percent				
All ages	100.0	10.7	6.2	26.8	14.7	20.8	20.7
15-24 years. . . . . :	2.9	0.4	*0.0	0.1	0.3	0.4	1.7
25-34 years.	24.6	2.2	0.6	3.2	4.6	5.5	8.6
35-44 years.	34.1	2.0	1.5	12.0	6.4	5.9	6.4
45-54 years.	24.3	1.8	2.7	10.0	3.1	4.1	2.5
55-64 years.	7.4	2.2	0.9	1.0	0.3	2.2	0.8
65 years and over.	6.5	2.1	0.4	0.5	0.1	2.7	0.6
			Percent distribution by age				
All ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15-24 years.	2.9	3.3	*0.5	0.4	2.1	2.0	8.1
25-34 years.	24.6	20.9	9.2	12.0	31.0	26.1	41.4
35-44 years.	34.1	18.3	24.3	44.5	43.1	28.3	31.0
45-54 years.	24.3	17.1	43.4	37.4	20.8	19.7	12.2
55-64 years.	7.4	20.3	15.4	3.6	2.1	10.7	4.0
65 years and over.	6.5	20.0	7.2	1.9	0.7	12.9	3.0
			Percent distribution by diagnosis				
All ages	100.0	10.7	6.2	26.8	14.7	20.8	20.7
15-24 years.	100.0	12.1	*1.1	3.8	10.9	14.6	57.5
25-34 years.	100.0	9.1	2.3	13.0	18.6	22.2	34.8
35-44 years.	100.0	5.7	4.4	35.1	18.6	17.3	18.8
45-54 years.	100.0	7.5	11.0	41.4	12.6	17.0	10.4
55-64 years.	100.0	29.1	12.7	12.9	4.1	30.1	11.1
65 years and over.	100.0	32.8	6.8	7.9	1.6	41.2	9.7

NOTE: Figure may not add to 100.0 because of rounding.

Table 11. Rate of hysterectomies for females with intact uteri by year of discharge, age of patient, and diagnosis: United States, 1965-84

[Data based on discharges from short-stay non-Federal hospitals]

Year and age	Cancer	Endometrial hyperplasia	Fibroids	Endometriosis	Prolapse	Other
1965-67			Rate per 1,000 females with intact uteri			
Total.	0.95	0.38	2.64	0.76	1.79	1.21
15-24 years	*0.08	*Z	*0.03	*0.04	*0.04	0.33
25-34 years	1.12	0.22	1.11	0.79	1.71	2.18
35-44 years	1.48	0.80	6.76	2.10	3.29	2.50
45-54 years	1.39	0.93	7.23	1.32	2.53	1.28
55-64 years	1.39	0.33	0.92	0.17	2.28	0.34
65 years and over	0.91	*0.16	0.37	*-	2.21	0.35
1970-72						
Total.	0.89	0.50	2.58	1.03	2.18	1.73
15-24 years	0.14	*Z	*0.02	*0.06	0.16	0.50
25-34 years	1.05	0.32	1.15	1.38	2.86	3.19
35-44 years	1.16	0.86	7.14	2.82	4.05	3.77
45-54 years	1.29	1.43	7.75	1.86	3.35	1.85
55-64 years	1.68	0.70	0.88	0.36	2.17	0.66
65 years and over	0.90	0.22	0.47	*0.05	2.04	0.28
1973-75						
Total.	1.02	0.71	2.75	1.28	2.41	2.09
15-24 years	0.13	*Z	*0.04	*0.06	0.17	0.63
25-34 years	1.16	0.26	1.34	1.64	3.06	3.95
35-44 years	1.37	1.11	8.05	3.86	4.96	4.54
45-54 years	1.20	2.47	8.66	2.28	3.95	2.07
55-64 years	2.13	1.31	1.15	0.42	2.23	0.78
65 years and over	1.33	0.32	0.32	*0.06	1.98	0.46
1976-78						
Total.	1.08	0.64	2.41	1.34	1.94	2.01
15-24 years	0.12	*Z	*0.06	0.11	0.15	0.67
25-34 years	1.13	0.22	1.47	1.85	2.28	3.71
35-44 years	1.38	1.05	7.58	3.97	4.03	4.24
45-54 years	1.64	2.45	7.33	2.46	3.35	1.91
55-64 years	2.01	0.98	0.87	0.27	1.95	0.71
65 years and over	1.50	0.36	0.30	*0.10	1.74	0.59
1979-81						
Total.	0.97	0.51	2.23	1.43	1.64	1.94
15-24 years	0.09	*0.01	*0.04	0.15	0.14	0.51
25-34 years	0.76	0.18	1.38	1.95	1.90	3.52
35-44 years	1.21	1.01	6.90	4.23	2.78	4.05
45-54 years	1.44	2.09	7.09	2.64	2.87	2.15
55-64 years	1.93	0.56	0.72	*0.15	1.79	0.75
65 years and over	1.79	0.23	0.43	*0.09	1.96	0.52
1982-84						
Total.	0.97	0.50	2.45	1.68	1.54	1.79
15-24 years	0.10	*0.02	*0.02	0.14	0.08	0.44
25-34 years	0.57	0.20	1.16	2.26	1.38	3.08
35-44 years	0.97	0.65	7.29	4.57	2.71	3.34
45-54 years	1.51	1.90	7.77	2.61	2.22	1.77
55-64 years	1.77	0.65	0.63	*0.17	1.75	0.72
65 years and over	2.07	0.49	0.36	*0.06	2.10	0.42

Appendixes

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Appendix I
Technical notes on methods

Statistical design of the National Hospital Discharge Survey

Scope of the survey

The National Hospital Discharge Survey (NHDS) encompasses patients discharged from noninstitutional hospitals, exclusive of military and Veterans Administration hospitals, located in the 50 States and the District of Columbia. Only hospitals with six beds or more for patient use and those in which the average length of stay for all patients is less than 30 days are included in the survey. Discharges of patients from Federal hospitals are not included.

Sample size

The Master Facility Inventory of Hospitals and Institutions is the universe from which the NHDS sample is drawn. A detailed description of the development, contents, maintenance plans, and assessment of coverage was published in 1965 (NCHS, 1965).

The original universe for the survey was made up of 6,965 hospitals contained in the 1963 Master Facility Inventory of Hospitals and Institutions. The sample for the survey, which was composed of 315 hospitals in 1965, has been increased six times and contained 553 hospitals in 1984. Each year some of the sampled hospitals refused to participate in the survey or were found to be out of scope either because they had gone out of business or failed to meet the definition of short-stay hospital. Thus, the number of hospitals participating in the survey varied from year to year, as did the number of abstracts of medical records provided by participating hospitals. These values are provided in table I.

Sample design

A two-stage sampling design is used in the survey. The first stage is the selection of the sample of hospitals. All hospitals with 1,000 beds or more in the universe of short-stay hospitals are included in the survey; those with fewer than 1,000 beds are stratified, the primary strata being 24 size-by-region classes. A controlled selection technique is used to allocate hospitals within each primary stratum so that the hospitals in the sample are properly distributed with regard to ownership and geographic division. Sample hospitals are drawn with probabilities ranging

from certainty for the largest hospitals to 1 in 40 for the smallest hospitals.

The second stage is the selection of a sample of discharges within sampled hospitals. Discharges are selected with an inverse relationship to the probability of hospital selection. In hospitals with 1,000 beds or more, the sampling probability is 1 in 100; for those with less than 50 beds, it is 4 in 10. This sampling is done to compensate for hospitals that were selected with probabilities proportionate to their size class and to insure that the overall probability of selecting a discharge is approximately the same in each size hospital.

In nearly all hospitals, the samples of discharges are selected from the daily listing sheet of discharges. The sample of discharges is selected by a random technique, usually on the basis of the terminal digit(s) of the patient's medical record number, which is assigned when the patient is admitted to the hospital. If the hospital's daily listing does not show the medical record numbers, the sample is selected by starting with a randomly selected discharge and taking every kth discharge thereafter.

Table I. Number of hospitals in the NHDS sample, number of hospitals participating in NHDS, number of abstracts of medical records collected, and number of records indicating a hysterectomy: United States, 1965-84

Year	Hospital		Number of abstracts collected	Number of abstracts indicating hysterectomy
	In sample	Partici- pating		
1965...............	315	296	100,000	1,447
1966...............	315	300	137,000	2,285
1967...............	315	289	145,000	2,188
1968...............	465	413	210,000	3,248
1969...............	465	402	208,000	- - -
1970...............	465	395	205,000	3,298
1971...............	465	379	200,000	3,400
1972...............	497	424	225,000	4,289
1973...............	497	424	225,000	4,356
1974...............	497	426	227,000	4,276
1975...............	511	432	232,000	4,418
1976...............	511	419	223,000	3,914
1977...............	535	423	224,000	3,914
1978...............	535	413	219,000	3,538
1979...............	544	416	215,000	3,276
1980...............	544	420	224,000	3,349
1981...............	550	428	227,000	3,400
1982...............	550	426	214,000	3,049
1983...............	553	418	206,000	2,960
1984...............	553	407	192,000	2,756

[1]National Hospital Discharge Survey.

Data collection and processing

The sample selection and transcription of information from the hospital records to abstract forms are performed by either the medical records department of the hospital or by personnel of the U.S. Bureau of the Census, acting for the National Center for Health Statistics, or by both. A facsimile of the abstract form currently used in sample hospitals is shown as figure I. The content of the form has been the same since 1977 when the following items, which were not on the abstract forms used from 1965 through 1976, were added: residence of patient (zip code), expected source(s) of payment, disposition of patient, and dates of procedures. Completed abstract forms for each sample hospital are shipped, along with sample selection control sheets, to a regional office of the U.S. Bureau of the Census. Every shipment is reviewed, and each abstract form is checked for completeness. Abstracts are then sent to the National Center for Health Statistics (NCHS) for processing.

Processing at the NCHS involves assigning an alfanumeric value for each variable collected in the NHDS. Much of this is staightforward, for example, in figure I under item number 9, sex, the value "1" would be entered if the box for "male" had been marked. Items C and D, diagnoses and procedures, are transcribed onto the abstract form at the hospital exactly as they appear on the medical record face sheet. Coding is done by NCHS staff using the International Classification of Diseases. Although a greater number may be listed, the first five diagnoses and the first three procedures were coded from 1965 through 1978; beginning in 1979, seven diagnoses and five procedures were coded.

Imputations are made for some missing items. The age and sex of the patient are not stated on the face sheet of the patient's medical record for less than one-fourth of 1 percent of the discharges. If these items are missing, imputations are made by assigning the patient an age or sex consistent with the age or sex of other patients with the same diagnostic code.

Reliability of estimates

Estimation

Statistics produced by NHDS are derived by a complex estimating procedure. The basic unit of estimation is the sample inpatient discharge abstract. The estimating procedure used to produce essentially unbiased national estimates in the NHDS has three principal components: inflation by reciprocals of the probabilities of sample selection, adjustment for nonresponse, and ration adjustment to fixed totals. These components of estimation are described in appendix I of two earlier publications (NCHS, 1967; NCHS, 1967).

Measurement errors

As in any survey, results are subject to nonsampling or measurement errors, which include errors because of hos-

pital nonresponse, missing abstracts, information incompletely or inaccurately recorded on abstract forms, and processing errors. Some of these errors concerning patient age and sex were just discussed, and nonresponse of race was discussed in the text.

The Institute of Medicine (IOM) has conducted three studies on the reliability of hospital abstract data collection; the most recent study was on the NHDS. The IOM NHDS study was performed by using data coded according to the ICDA-8; however, some of the findings are relevant to NHDS data coded according to the ICDA-7 and the ICD-9-CM. Of special interest to this report is the finding that, in a number of cases, the first-listed diagnosis in the NHDS was not the principal diagnosis as determined by IOM after a study of the entire medical record. For example, when diagnoses at the ICDA-8 class level were examined, the principal diagnosis from IOM matched the first-listed diagnosis from the NHDS in approximately 86 percent of the cases. This finding supports the approach used in this report to assign a diagnosis. Detailed accounts of this and other IOM findings have been published (Institute of Medicine, 1980; 1977a; 1977b).

Sampling errors

The standard error is primarily a measure of the variability attributed to a value obtained from the sample as an estimate of a population value. In this report it also reflects part of the measurement error. The value that would have been obtained if a complete enumeration of the population had been made will be contained in an interval represented by the sample estimate plus or minus 1 standard error about 68 out of 100 times and plus or minus 2 standard errors about 95 out of 100 times.

The relative standard error is obtained by dividing the standard error by the estimate. The resulting value is multiplied by 100, which expressed the standard error at the percent of the estimate.

For this report a subsample of records from the NHDS were used to estimate relative standard errors. A curve fit to these estimates is presented in figure II. The standard error of one statistic generally is different from another, even when both are from the same survey. Figure II provides general relative standard errors applicable to the various statistics in this report.

Tests of significance

In this report, the determination of statistical inference is based on the t-test using a 0.05 level of significance. Terms relating to differences, such as "higher" and "less," indicate that the differences are statically significant. Terms such as "similar" or "no difference" mean that no statistically significant difference exists between the estimates being compared. A lack of comment on the difference between two estimates does not mean that the difference was tested and found to be not significant.

CONFIDENTIAL — All information which would permit identification of an individual or of an establishment will be held confidential, will be used only by persons engaged in and for the purposes of the survey, and will not be disclosed or released to other persons or used for any other purpose.

FORM **HDS-1**
(8-5-82)

DEPARTMENT OF HEALTH AND HUMAN SERVICES
U.S. PUBLIC HEALTH SERVICE
NATIONAL CENTER FOR HEALTH STATISTICS

MEDICAL ABSTRACT — NATIONAL HOSPITAL DISCHARGE SURVEY

A. PATIENT IDENTIFICATION

1. Hospital number . . . . □□□

2. HDS number . . . . □□□□

3. Medical record number _____

	Month	Day	Year
4. Date of admission . .	□□ –	□□ –	□□
5. Date of discharge . .	□□ –	□□ –	□□

6. Residence ZIP code □□□□□

B. PATIENT CHARACTERISTICS

7. Date of birth Month □□ – Day □□ – Year □□□□

8. Age *(Complete only if date of birth not given)* . . . . Units □□
1□ Years
2□ Months
3□ Days

9. Sex *(Mark (X) one)*   1□ Male   2□ Female   3□ Not stated

10. Race   1□ White   3□ American Indian/Alaskan Native   5□ Other *(Specify)* _____
2□ Black   4□ Asian/Pacific Islander   6□ Not stated

11. Ethnicity *(Mark (X) one)*   1□ Hispanic origin   2□ Non-Hispanic   3□ Not stated

12. Marital status *(Mark (X) one)*   1□ Married   3□ Widowed   5□ Separated
2□ Single   4□ Divorced   6□ Not stated

13. Expected source(s) of payment

	Principal *(Mark one only)*	Other additional sources *(Mark accordingly)*
Government sources 1. Workmen's Compensation	□	□
2. Medicare	□	□
3. Medicaid	□	□
4. Title V	□	□
5. Other government payments	□	□
Private sources 6. Blue Cross	□	□
7. Other private or commercial insurance	□	□
Other sources 8. Self pay	□	□
9. No charge	□	□
10. Other *(Specify)* _____ . . .	□	□

□ No source of payment indicated

14. Status/Disposition of patient *(Mark (X) appropriate box(es))*

Status   **Disposition**

1□ Alive ➡ a.□ Routine discharge/ discharged home

b.□ Left against medical advice

c.□ Discharged, transferred to another short-term hospital

d.□ Discharged, transferred to long-term care institution

e.□ Disposition not stated

2□ Died

3□ Status not stated

C. FINAL DIAGNOSES

Principal: _____

Other/additional: _____

_____

_____

_____

_____

_____

_____

_____

□ See reverse side

D. SURGICAL AND DIAGNOSTIC PROCEDURES

Date: Month Day Year

Principal: _____ □□ – □□ – □□

Other/additional: _____ □□ – □□ – □□

_____ □□ – □□ – □□

_____ □□ – □□ – □□

□ NONE   □ See reverse side

Completed by   Date

Figure I. Medical abstract for the National Hospital Discharge Survey

EXAMPLE: As shown in table A, there were an estimated 98,000 hysterectomies for females aged 30-34 in 1976. The relative standard error of this estimate is approximately 6.7 percent. Thus, the standard error is approximately 6,550 (6.7 percent of 98,000).
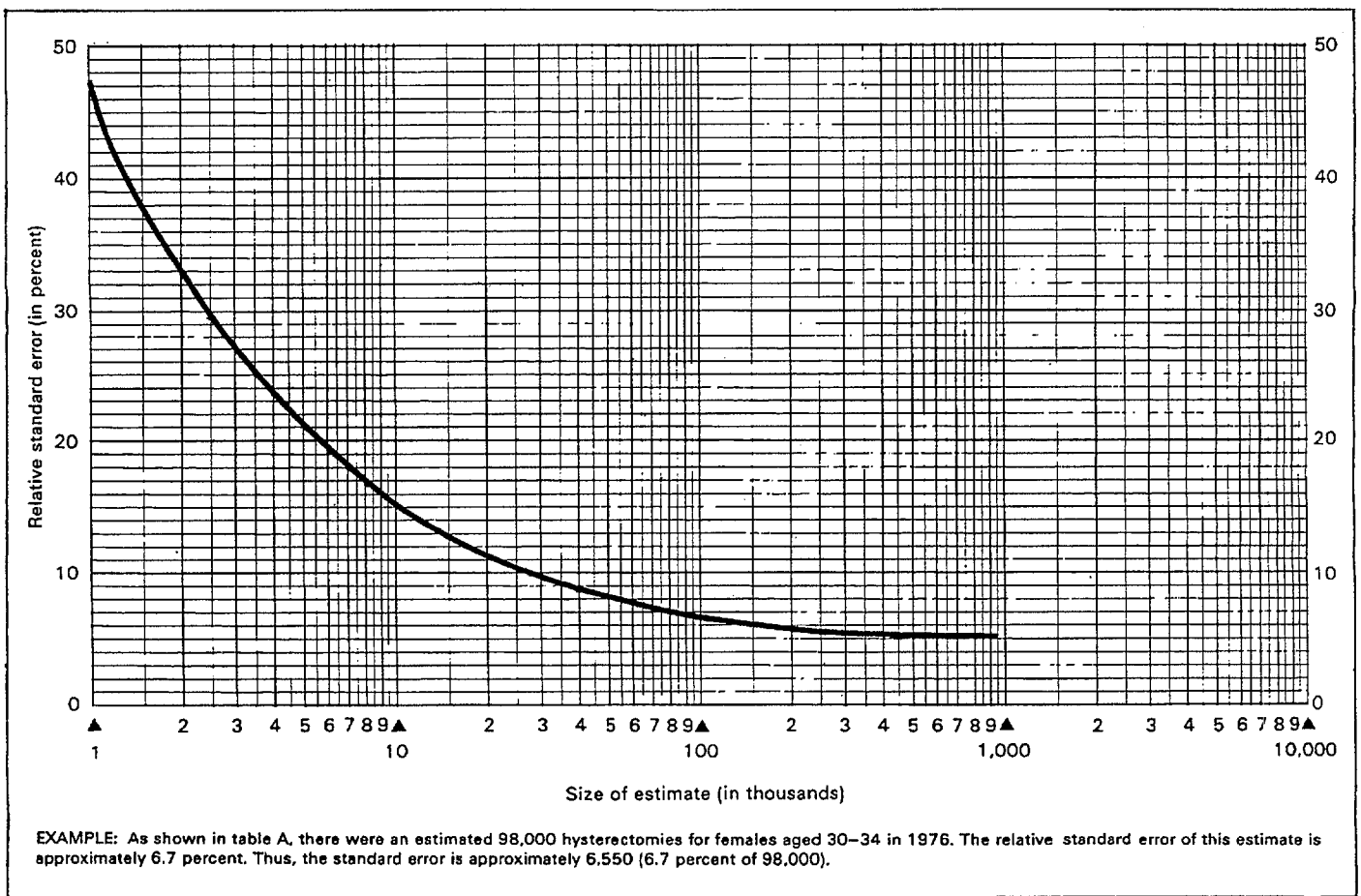
Figure II. Approximate relative standard errors of estimated numbers of females with hysterectomies

Women with intact uteri

Calculations used to produce estimates of the proportion of women with intact uteri (table 4) are presented here. The method is similar to that of Lyon and Gardner (1977) with a major difference. Lyon and Gardner used estimates of the number of hysterectomies from the NHDS for 1965, 1968, and 1973 to estimate the number of hysterectomies for each year from 1960 through 1975 by fitting an exponential curve to these points. In this report, data for each year of the NHDS from 1965 through 1984 are used avoiding the need to estimate intervening values.

The notation below is, where possible, consistant with that of Lyon and Gardner. The 1965 estimates of the proportion of women with intact uteri from Lyon and Gardner, with the modification suggested by Marrett (1980), were used as starting points; and calculation proceeded as follows:

$$f_{i,j} \times P_{i,(j+.5)} = P'_{i,j} \qquad (1)$$

where i = 5-year age cohorts (1 = 0-4 years of age; 2 = 5-9 years of age; etc.)

  j = year (1 = 1965; 2 = 1970; 3 = 1975; 4 = 1980; 5 = 1985)

  j + .5 = midpoint of (j, j + 1); i.e., $j_{1.5}$ = July 1, 1967

f = the proportion of women with intact uteri
P = cohort population at the midpoint of (j, j + 1)
P' = the number of women in the ith cohort with intact uteri at time j

then,

$$(P'_{i,j} - N_{i,j}) / (P_{i,(j+.5)}) = f_{i+1,j+1} \qquad (2)$$

where N = the number hysterectomies from j to j + 1(i.e., 1965-69,..., 1980-84) for cohort i

Population estimates used were those at the midpoint between the years in which estimates are given (July 1 of 1967, 1972, 1977, and 1982). This value was chosen in order to account for some of the population dynamics (for example, mortality) occurring during each 5-year period in which hysterectomies were being summed.

An example is presented to illustrate this process. The period chosen is 1970-74, with the cohort of women aged 30-34 years in 1970. At the start of 1970, 0.944 of these women had intact uteri (table 4). Women 30-34 years of age in 1970 were 31-35 in 1971 and 34-38 in 1974. This cohort of women had an estimated 464,885 hysterectomies from 1970-74. As an estimate of the number of these women alive during this period, the population

30

value at the midpoint was used: There were approximately 5,897,000 women 32-37 years of age on July 1, 1972.

These data can now be inserted into the formulae:

$$(0.944) \times (5,897,000) = 5,566,768 \qquad (1)$$

$$(5,566,768 - 464,885) / 5,897,000 = 0.865 \qquad (2)$$

Estimates of the population at risk used to calculate rates of hysterectomy by diagnosis and age in table 11 were calculated using one-year age cohorts for each year from 1965 through 1984. These data were not presented in this report.

Appendix II
Definition of terms

Hysterectomy— Surgical removal of the uterus. A surgical procedure listed on the face sheet of a woman's medical record assignable to one of the following ICD codes:

Years	Coding System	Code Numbers
1965-68	ICDA-7	72.3-72.7
1970-78	ICDA-8	69.1-69.5, 69.7
1979-84	ICD-9-CM	68.3-68.8

Diagnosis—Each sampled record was assigned a diagnosis as described in the text, the five diagnostic groups used in this report are represented by the following ICD codes:

	Coding System	Code Numbers
Cancer	ICDA-7	171-176, 180-181, 199, 233
	ICDA-8	180-184, 188-189, 199, 234
	ICD-9-CM	179-184, 188-189, 199, 233.1-233.3, 236.0
Endometrial hyperplasia	ICDA-7	633.0
	ICDA-8	625.2
	ICD-9-CM	621.3
Fibroids	ICDA-7	214
	ICDA-8	218
	ICD-9-CM	218
Endometriosis	ICDA-7	215.0, 215.2, 216.0, 217.0
	ICDA-8	625.3
	ICD-9-CM	617
Prolapse	ICDA-7	631
	ICDA-8	623
	ICD-9-CM	618

Hospitals—Short-stay special and general hospitals have six beds or more for inpatient use and an average length of stay of less than 30 days. Federal hospitals and hospital units of institutions are not included.

Patient—A person who is formally admitted to the inpatient service of a short-stay hospital for observation, care, diagnosis, or treatment is considered a patient. In this report the number of patients refers to the number of discharges during the year. The terms "patient" and "inpatient" are used synonymously.

Discharge—Discharge is the formal release of a patient by a hospital; that is, the termination of a period of hospitalization by death or by disposition to place of residence, nursing home, or another hospital. The terms "discharges" and "patients discharged" are used synonymously.

Discharge rate—The ratio of the number of hospital discharges during a year to the number of persons in the civilian population on July 1 of that year determines the discharge rate.

Average length of stay—The average length of stay is the total number of patient days accumulated at time of discharge by patients discharged during the year divided by the number of patients discharged.

Geographic region—Hospitals are classified by location in one of the four geographic regions of the United States that correspond to those used by the U.S. Bureau of the Census.

Region	States included
Northeast	Maine, Vermont, New Hampshire, Massachsuetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania
North Central	Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Kansas, and Nebraska
South	Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Louisiana, Oklahoma, Arkansas, and Texas
West	Washington, Oregon, California, Nevada, New Mexico, Arizona, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii

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