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Discharge for diabetes mellitus: IHS and tribal direct and contact general hospitals, fiscal year 1995 and U.S. non-federal short-stay hospitals, calendar year 1995

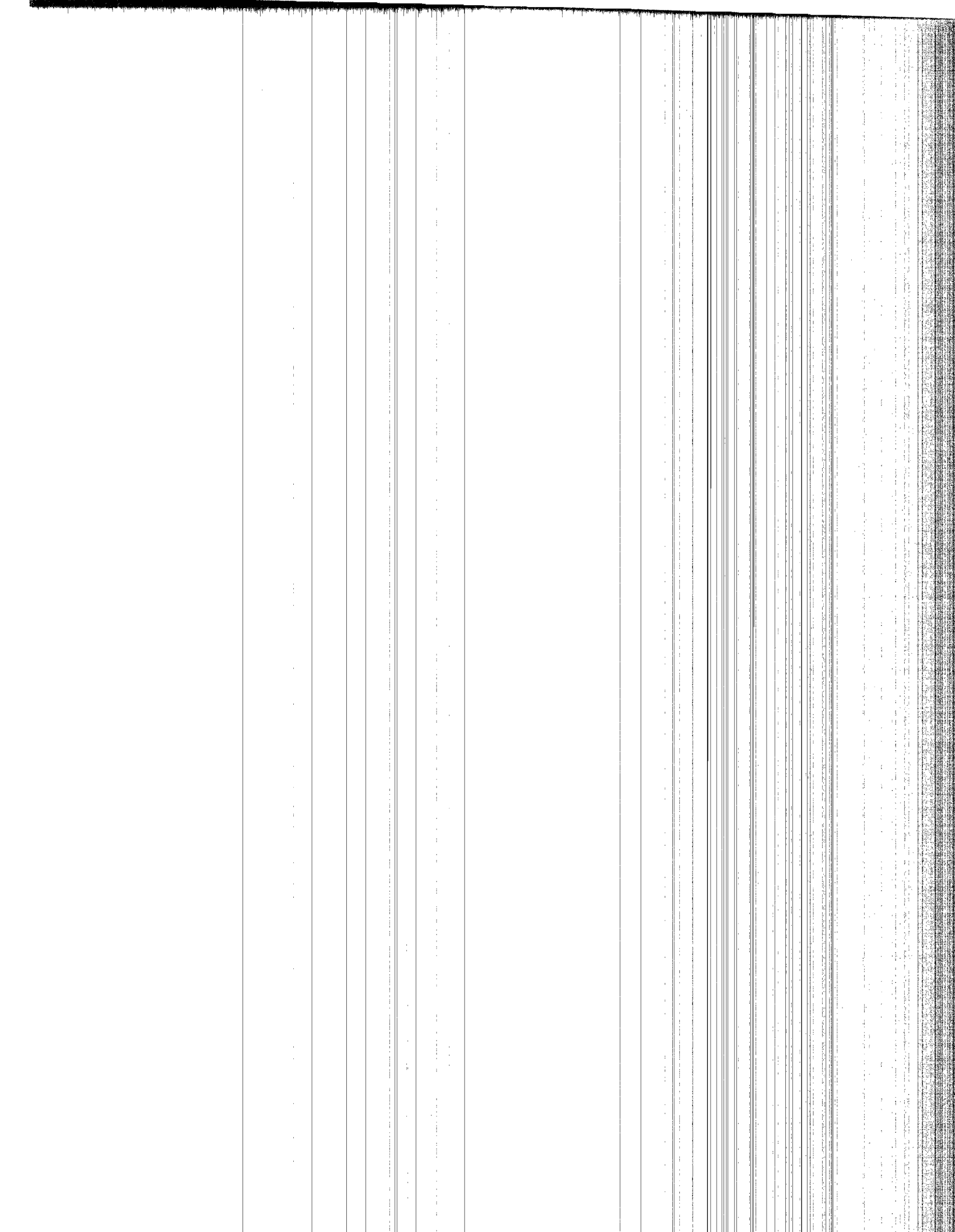
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DISCHARGES FOR DIABETES MELLITUS
IHS AND TRIBAL DIRECT AND CONTRACT
GENERAL HOSPITALS, FISCAL YEAR 1995
AND
U. S. NON-FEDERAL SHORT-STAY
HOSPITALS,
CALENDAR YEAR 1995

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INTRODUCTION

This report discusses the distribution of discharges for diabetes mellitus at Indian Health Service (IHS) and tribally operated direct and contract hospitals in fiscal year (FY) 1995. Diabetes is one of the leading causes of hospitalization for patients 45 years of age and over.

Information is tabulated by the age, sex, and principal (first-listed) diagnosis¹ of the patients. Up to six diagnoses may be recorded for each hospital discharge. The discharge records used in this analysis were those that listed diabetes as any one of the six diagnoses.

Inpatient care was available at 38 general hospitals operated by the IHS, 11 tribally-operated hospitals, and hundreds of community hospitals with which the IHS and tribes negotiate contracts or informal agreements on a reimbursable basis. Inpatient care is generally available to persons of Indian descent who reside on or near the reservation of their federally-recognized tribe, or on or near a reservation where social and economic ties are closely maintained.

The data in this report were collected from IHS-operated hospitals, tribally-operated hospitals, and community hospitals that are contracted by IHS or the tribes². IHS is organized into 12 administrative regions or Areas. This report covers 11 of the 12 Areas, because the California Area does not have any IHS or tribally-operated hospitals and did not report any IHS or tribal contract hospital workload into the IHS statistical computer data system.

Included in this report is a comparison of the IHS and tribal hospital experience to the use of non-Federal short-stay hospitals by the U.S. civilian all races population in calendar year (CY) 1995, for diabetes mellitus. Comparisons are made by the use of discharge rates (the number of discharges per 10,000 population). The FY 1995 IHS user population estimates were used to determine the IHS rates. When applicable, age-adjusted IHS hospital discharge rates are used. This allows for a more meaningful comparison of the IHS discharge rates to the U.S. rates, due to different age compositions in the two populations.

To correspond to the usual practice of presenting hospital discharge data, discharges from the newborn section of the hospital have been excluded from this report.

¹ The principal diagnosis is the condition established after study to be chiefly responsible for occasioning the admission of the patient to the hospital care.

² The data on tribal direct and contract hospitals may not be complete because not all facilities are currently required to report through the IHS statistical data system.

Thus, since the IHS hospitals had a lower percentage “without mention of complication,” they had a higher percentage of diabetes discharges with a complication than those at non-federal hospitals. This suggests that the diabetes cases at IHS hospitals were generally more serious.

The next largest specific diabetes diagnoses at non-federal hospitals were diabetes with ketoacidosis (18.1 percent), with “other specified manifestations” (16.6), and with peripheral circulatory disorders (12.0). These results were reasonably similar to those at IHS hospitals.

The 2,077 IHS hospital discharges were also well distributed among the different types³ of diabetes (Figure 4). There were

829 discharges (39.9 percent) for type 2 or unspecified type, not stated as uncontrolled,
440 discharges (21.2) for type 1, not stated as uncontrolled,
418 discharges (20.1) for type 2 or unspecified type, uncontrolled, and
390 discharges (18.8) for type 1, uncontrolled.

The percentages were 25.2, 31.4, 14.7, and 28.7, respectively, at non-federal hospitals. Thus, percentagewise the IHS hospitals see considerably more type 2 or unspecified type cases (60.0 vs. 39.7) and somewhat fewer “uncontrolled” cases (38.9 vs. 43.4).

Secondary Diagnoses of Diabetes

As noted previously, there were 11,511 IHS hospital discharges with diabetes as one of the diagnoses, and of these, 2,077 had a principal diagnosis of diabetes and 9,434 showed diabetes as a secondary diagnosis.

Of the 9,434 discharges with diabetes as a secondary diagnosis, 2,032 (21.5 percent) had a principal diagnosis relating to circulatory system diseases (Figure 5). The most prevalent were congestive heart failure (486 discharges), coronary atherosclerosis (230), and intermediate coronary syndrome (163).

Circulatory system diseases were also the leading principal diagnosis at non-federal hospitals, accounting for 38.9 percent of the discharges where diabetes was a secondary diagnosis; this percentage was nearly twice the percentage at IHS hospitals. As at IHS hospitals, the leading specific circulatory system diseases were congestive heart failure and coronary atherosclerosis; and as at IHS hospitals, these two causes accounted for over one-third (36.3 percent) of the discharges with circulatory system diseases as the principal diagnosis.

³Type 1 is insulin dependent. Type 2 is non-insulin dependent.

At IHS hospitals, 1,178 discharges (12.5 percent of the discharges with diabetes as a secondary diagnosis) had a digestive system disease and 1,028 (10.9) had a respiratory system disease as the principal diagnosis. These were the second and third leading categories after circulatory system diseases. Digestive system diseases included cholelithiasis (218 discharges) and noninfectious enteritis and colitis (127). Pneumonia (574) was the primary respiratory system disease; most of those (420) were “pneumonia, organism unspecified.”

At non-federal hospitals, digestive system diseases and respiratory system diseases were also the second and third leading principal diagnoses, but in the reverse order. Respiratory system diseases accounted for 10.6 percent and digestive system diseases accounted for 9.6 percent of the principal diagnoses where diabetes was a secondary diagnosis.

There were 9,976 secondary diabetes diagnoses (some discharge records contained more than one specific diabetes diagnosis) (Table 1). Of these, 6,503 (65.2 percent) were coded as “diabetes without mention of complication.” This was somewhat less than the percentage (73.1) at non-federal hospitals. Thus, as with the principal diagnosis, the IHS hospitals had a lower percentage of diabetes diagnoses “without mention of complication” and therefore a higher percentage of diagnoses with a complication.

The next largest specific diabetes diagnoses at IHS hospitals were “diabetes with renal manifestations” (1007, 10.1) and “diabetes with unspecified complication” (995, 10.0). No other specific diabetes diagnosis accounted for more than 5 percent of the total.

At non-federal hospitals, the next largest specific diagnoses were diabetes “with renal manifestations” (7.8 percent), and “with neurological manifestations” (6.2).

By type of diabetes, the distribution of the 9,976 secondary diabetes diagnoses differed considerably from the distribution of the 2,077 principal diabetes diagnoses. A much higher percentage of the “secondaries” (63.3) than the “principals” (39.9) were for “type 2 or unspecified type, not stated as uncontrolled.” The 9,976 were distributed as follows:

6,318 discharges (63.3 percent) for type 2 or unspecified type, not stated as uncontrolled,
2,070 discharges (20.7) for type 1, not stated as uncontrolled,
924 discharges (9.3) for type 2 or unspecified type, uncontrolled, and
664 discharges (6.7) for type 1, uncontrolled.

The percentages were 52.1, 29.8, 9.4, and 8.7, respectively, at non-federal hospitals. Thus, percentagewise the IHS hospitals see somewhat more type 2 or unspecified type cases (72.6 vs. 61.5) and somewhat fewer “uncontrolled” cases (16.0 vs. 18.1).

HOSPITALIZATIONS FOR DIABETES FOR PATIENTS 45 YEARS AND OLDER

First-Listed (Principal) Diagnosis of Diabetes

Of the total of 2,077 discharges at IHS hospitals with a principal diagnosis of diabetes, 1,376 (66.2 percent) were for patients 45 years old and older (Table 2). This age group accounted for only 18.7 percent of the IHS population.

The discharge rate at IHS hospitals for persons 45 years old and older with a principal diagnosis of diabetes was 62.4 discharges per 10,000 population. This was more than 50 percent higher than the non-federal hospital rate of 40.0 for this age group.

The difference in diabetes discharge rates between IHS and non-federal hospitals was particularly large in the 45-64 year old age group. The IHS rate (60.2) was nearly double the non-federal hospital rate (33.0). In the 65 years old and older age group, the IHS rate was 19 percent higher than the non-federal rate (66.9 vs. 56.1).

The largest specific diabetes principal diagnosis for both the 45-64 and 65 years and older age groups at IHS hospitals was diabetes "with other specified manifestations" (Tables 3 and 4 and Figure 6). In the 45-64 year old age group, this diagnosis accounted for 25.1 percent (232 discharges) of the total diabetes discharges, while it represented 30.7 percent (138) in the 65 years old and older age group.

Since diabetes "with other specified manifestations" is not very descriptive, the second diagnosis related to these discharges was reviewed to better understand what were the "specified manifestations." Approximately 40 percent had a second diagnosis of "ulcer of lower limbs, except decubitus." The remainder were widely distributed; the next largest second diagnosis was "osteomyelitis, periostitis, and other infections involving bone," which accounted for about 8 percent.

In the 45-64 year old age group, the next largest specific diagnoses were diabetes "without mention of complication" (20.8 percent), "with peripheral circulatory disorders" (13.8), and "with renal manifestations" (13.7).

These diagnoses were also the next three leading diagnoses for those 65 years and older, but in a different order: "with peripheral circulatory disorders" (23.3), "without mention of complication" (19.8), and "with renal manifestations" (10.2). Thus, diabetes with peripheral circulatory disorders was a considerably larger problem among those patients who were 65 years and older.

There was a considerable difference between IHS and non-federal hospitals in the percentage of total for diabetes without mention of complication. As noted above, 20.8 and 19.8 percent of the 45-64 and 65 years and older totals, respectively, were for this specific diabetes diagnoses. At non-federal hospitals, the relevant percentages were 37.8 and 33.0. Thus, at non-federal hospitals, a much higher percentage of the diabetes discharges mentioned no complications.

Secondary Diagnoses of Diabetes

The 45 years old and older age group accounted for 8,093 (81.1 percent) of the total secondary diagnoses of diabetes at IHS hospitals (Table 2). This was considerably higher than the percentage (66.2) for the principal diagnosis of diabetes. Thus, diabetes was a contributing factor in many more hospitalizations proportionately for persons 45 years and older than for those younger than 45 years old. Similar results were noted at non-federal hospitals.

Of the 8,093 secondary diagnoses of diabetes for patients 45 years and older, 3,326 (41.1 percent) were for patients who were 65 years old and older. This represented a higher percentage than for the principal diagnosis of diabetes (patients 65 and over accounted for 32.7 percent).

Diabetes without mention of complication was the leading specific diabetes secondary diagnosis at IHS hospitals among the 45-64 year old (62.7 percent) and 65 years and older (67.1) age groups (Tables 3 and 4). This was followed by diabetes with renal manifestations (45-64: 12.3; 65 and older: 10.1) and with unspecified complication (9.0; 9.5).

The results were similar at non-federal hospitals. Diabetes without mention of complication (69.6; 76.6), with renal manifestations (9.2; 6.7), and with neurological manifestations (7.4; 5.0) were the three leading specific diabetes secondary diagnoses.

HOSPITALIZATIONS FOR DIABETES BY GENDER

First-Listed (Principal) Diagnosis of Diabetes

Discharges with a principal diagnosis of diabetes at IHS hospitals were evenly split between males and females. Males accounted for 1,047 (50.4 percent) of the 2,077 principal diagnoses for diabetes. At non-federal hospitals, males accounted for only 47.1 percent of the total.

The diabetes discharge rates at IHS hospitals were similar for males and females. There were 18.5 male discharges with a principal diagnosis of diabetes per 10,000 male population. For females, the rate was 16.7. Age adjusted to the U.S. population, the IHS male rate was 27.0 and the female rate was 25.6.

The age-adjusted IHS male and female rates were considerably higher than the non-federal hospital rates. The IHS male rate was 48 percent higher (27.0 vs. 18.2), while IHS female rate (25.6) was 31 percent higher (non-federal hospitals: 19.5).

At IHS hospitals, the age-adjusted male rate (27.0) was slightly higher than the female rate (25.6). At non-federal hospitals, the male rate (18.2) was slightly lower than the female rate (19.5).

The leading specific diabetes diagnosis was the same for males and females at IHS hospitals (Figure 7). Diabetes without mention of complication accounted for 22.9 percent of the male and 25.0 of the female discharges with a principal diagnosis of diabetes (Tables 5 and 6).

This was also the leading specific diagnosis for both males (29.7 percent) and females (36.0) at non-federal hospitals. These percentages were much higher than those at IHS hospitals, indicating that the cases at non-federal hospitals had less complications.

Diabetes “with other specified manifestations” was the second largest specific principal diabetes diagnosis for both males (21.5) and females (22.8) at IHS hospitals. Within this group of discharges, the specific diagnosis most often listed as the second diagnosis was “ulcer of lower limbs, except decubitus.” This diagnosis was listed as the second diagnosis on 45 percent of the male discharges and 37 percent of the female discharges where “diabetes with other specified manifestations” was the first-listed diagnosis.

For males, there were two other specific diabetes diagnoses with at least 10 percent of the discharges: diabetes with ketoacidosis (18.3) and with peripheral circulatory disorders (15.1).

There were four additional specific diagnoses with at least 10 percent of the total for females. They were diabetes with renal manifestations (12.1), with ketoacidosis (10.9), with unspecified complication (10.9), and with peripheral circulatory disorders (10.0).

Males had proportionately more discharges than females for diabetes with ketoacidosis and with peripheral circulatory disorders. Females had more for diabetes with renal manifestations and with unspecified complications.

The distribution of specific diabetes diagnoses for males at IHS hospitals was very similar to the distribution at non-federal hospitals. However, the distributions for females at the two types of hospitals differed somewhat. The second leading specific diagnosis at non-federal hospitals was diabetes with ketoacidosis (18.0 percent of the total) and third was diabetes with other specific manifestations (14.6). Diabetes with renal manifestations (5.4) was much less significant at non-federal hospitals.

Secondary Diagnoses of Diabetes

Although the principal diagnoses for diabetes at IHS hospitals were split nearly evenly between males and females, females accounted for nearly three-fifths (5,885 discharges, 59.0 percent) of the 9,976 secondary diabetes diagnoses.

By far the largest specific diabetes diagnosis for both males and females was diabetes without mention of complication (Tables 5 and 6). This diagnosis accounted for 63.7 of the male and 66.2 percent of female secondary diabetes diagnoses. At non-federal hospitals, the comparative percentages were 71.9 and 74.0.

Of those secondary diagnoses of diabetes without mention of complication, the vast majority were "type 2 or unspecified type, not stated as uncontrolled." At IHS hospitals, this accounted for 72.5 percent of the male and 69.2 percent of the female secondary diagnoses of diabetes without mention of complication. The percentages were 63.3 for males and 57.4 for females at non-federal hospitals.

Other leading specific secondary diagnoses for males were diabetes with renal manifestations (9.8 percent) and with other unspecified complication (9.7 percent). These were also the next leading specific diabetes secondary diagnoses for females, with 10.3 and 10.2 percent of the total, respectively.

FIGURE 1.
Discharge Rates for Principal Diagnosis of Diabetes by Age
Indian Health Service and Tribal Direct and Contract Hospitals, Fiscal Year 1995
U.S. Non-Federal Short-Stay Hospitals, Calendar Year 1995

Discharge Rate per 10,000 Population

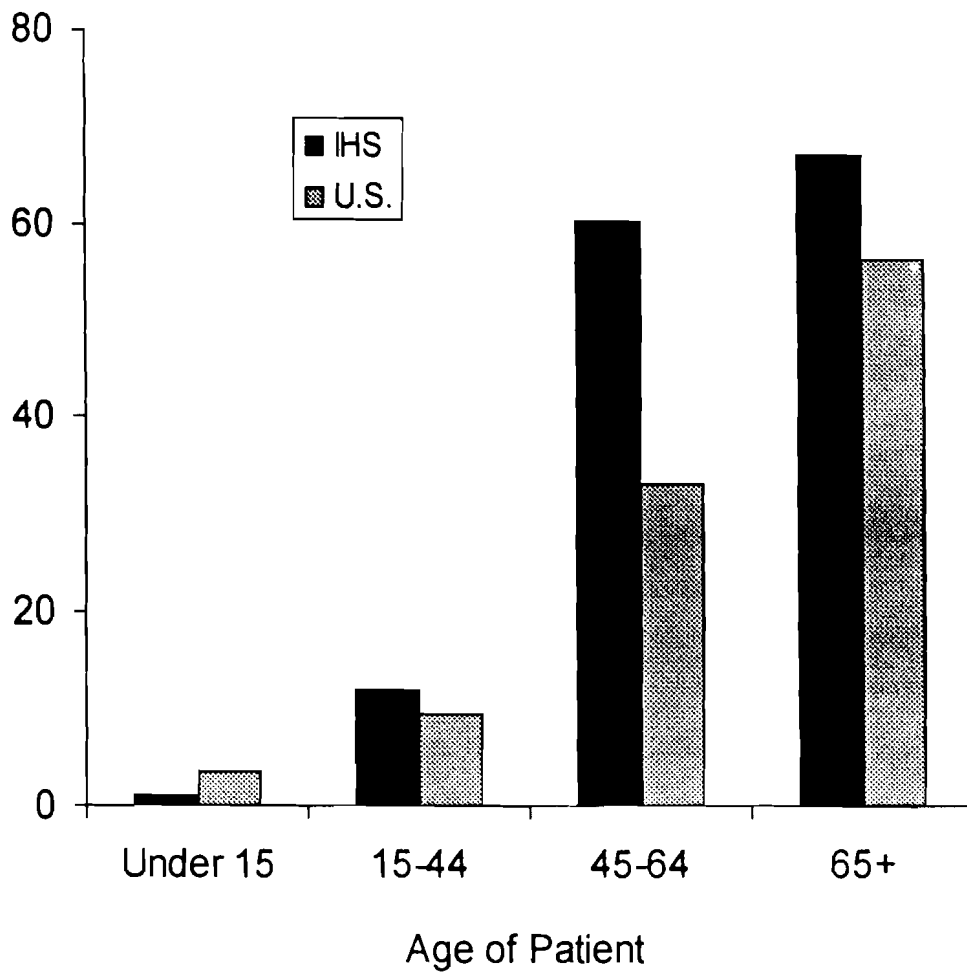


FIGURE 2.
Age-Adjusted Discharge Rates for Principal Diagnosis of Diabetes by Gender
Indian Health Service and Tribal Direct and Contract Hospitals, Fiscal Year 1995
U.S. Non-Federal Short-Stay Hospitals, Calendar Year 1995

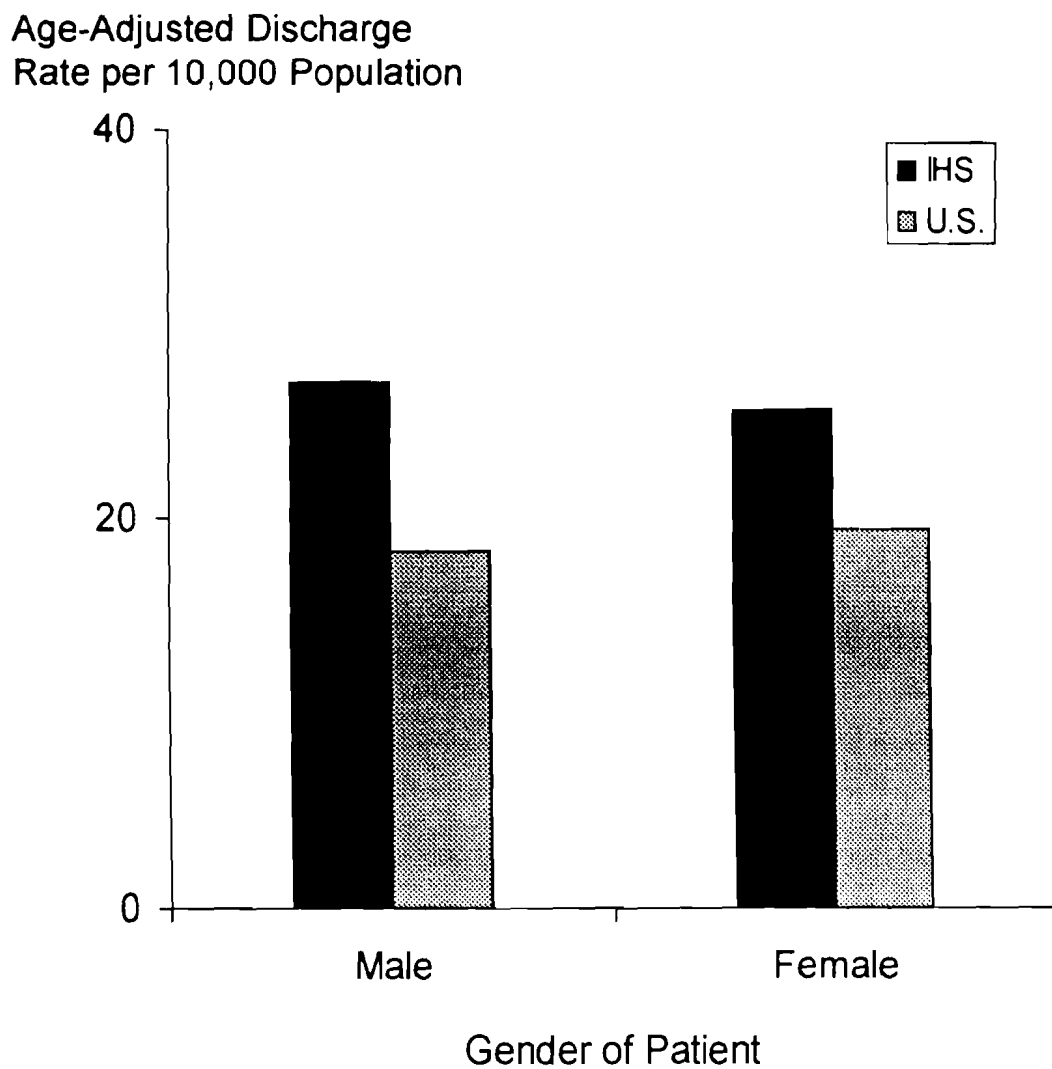
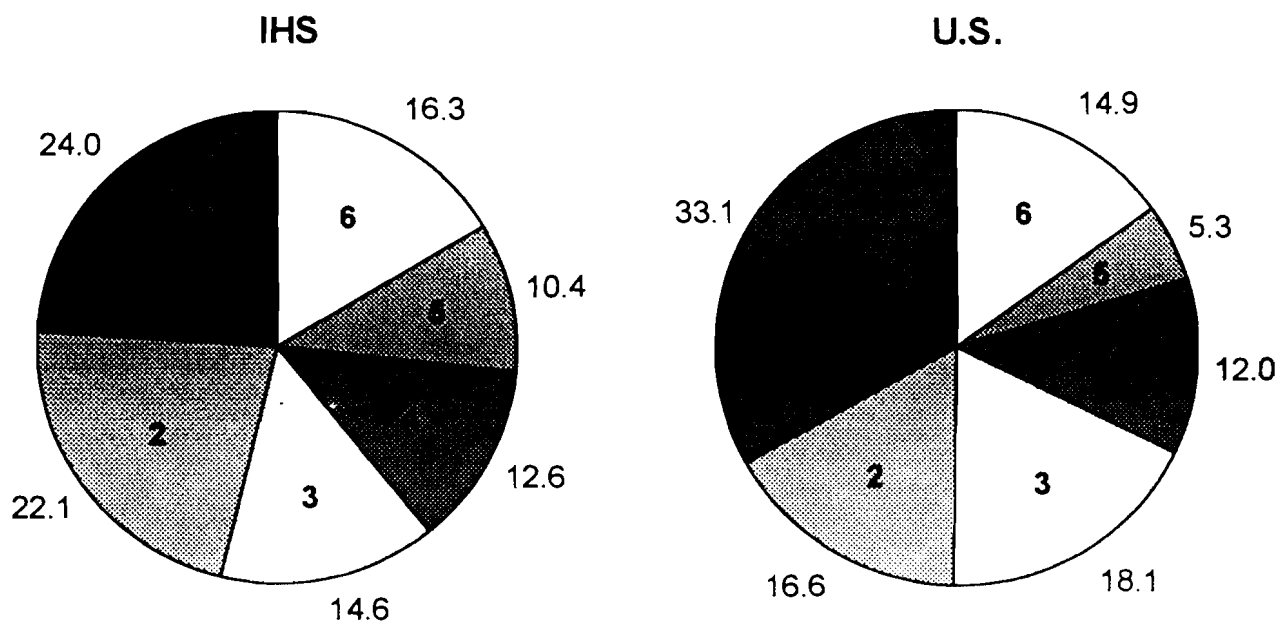
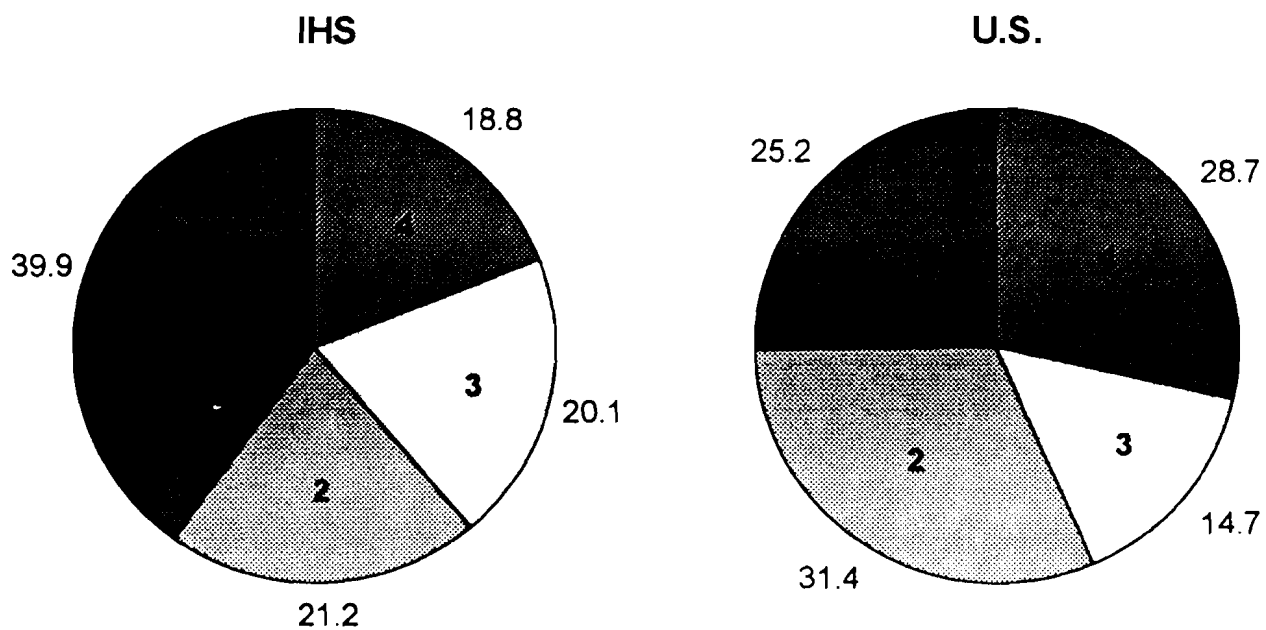


FIGURE 3.
Percentage Distribution of Discharges with Principal Diagnosis of Diabetes
by Specific Cause
Indian Health Service and Tribal Direct and Contract Hospitals, Fiscal Year 1995
U.S. Non-Federal Short-Stay Hospitals, Calendar Year 1995



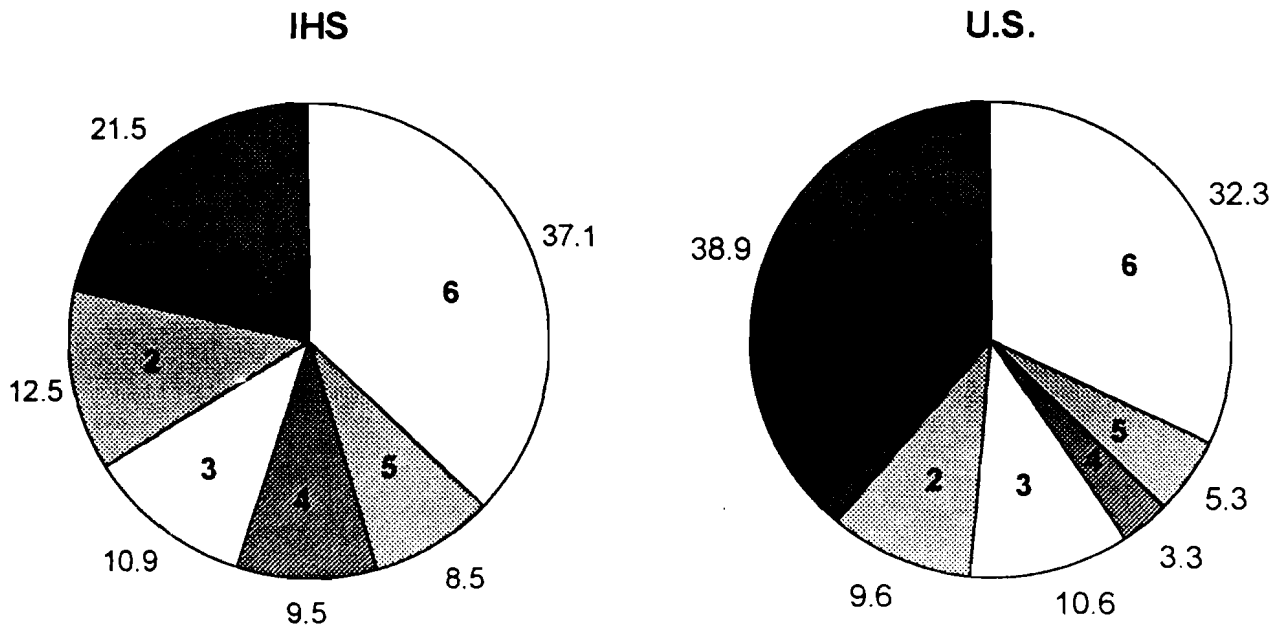
- Diabetes without Mention of Complication
- Diabetes with Other Specified Manifestations
- Diabetes with Ketoacidosis
- Diabetes with Peripheral Circulatory Disorders
- Diabetes with Renal Manifestations
- Diabetes with Other Complications

FIGURE 4.
Percentage Distribution of Discharges with Principal Diagnosis of Diabetes
by Type of Diabetes
Indian Health Service and Tribal Direct and Contract Hospitals, Fiscal Year 1995
U.S. Non-Federal Short-Stay Hospitals, Calendar Year 1995



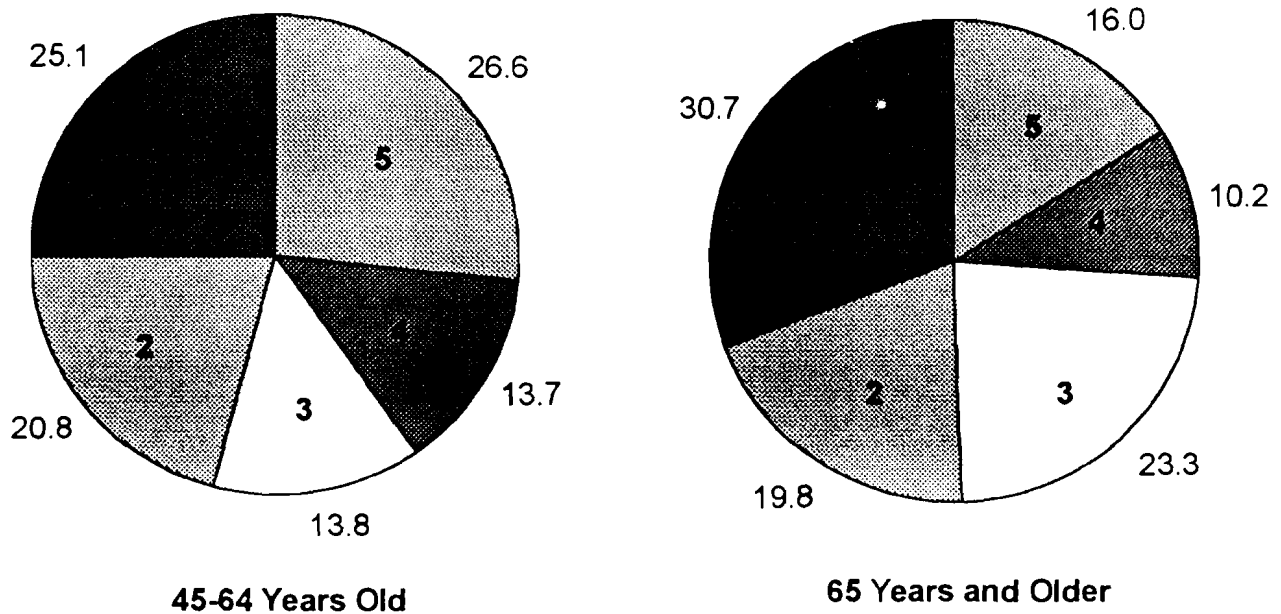
- Type 2 or Unspecified Type, Not Stated as Uncontrolled
- Type 1, Not Stated as Uncontrolled
- Type 2 or Unspecified Type, Uncontrolled
- Type 1, Uncontrolled

FIGURE 5.
Percentage Distribution of Principal Diagnoses Where Diabetes
Was a Secondary Diagnosis
Indian Health Service and Tribal Direct and Contract Hospitals, Fiscal Year 1995
U.S. Non-Federal Short-Stay Hospitals, Calendar Year 1995



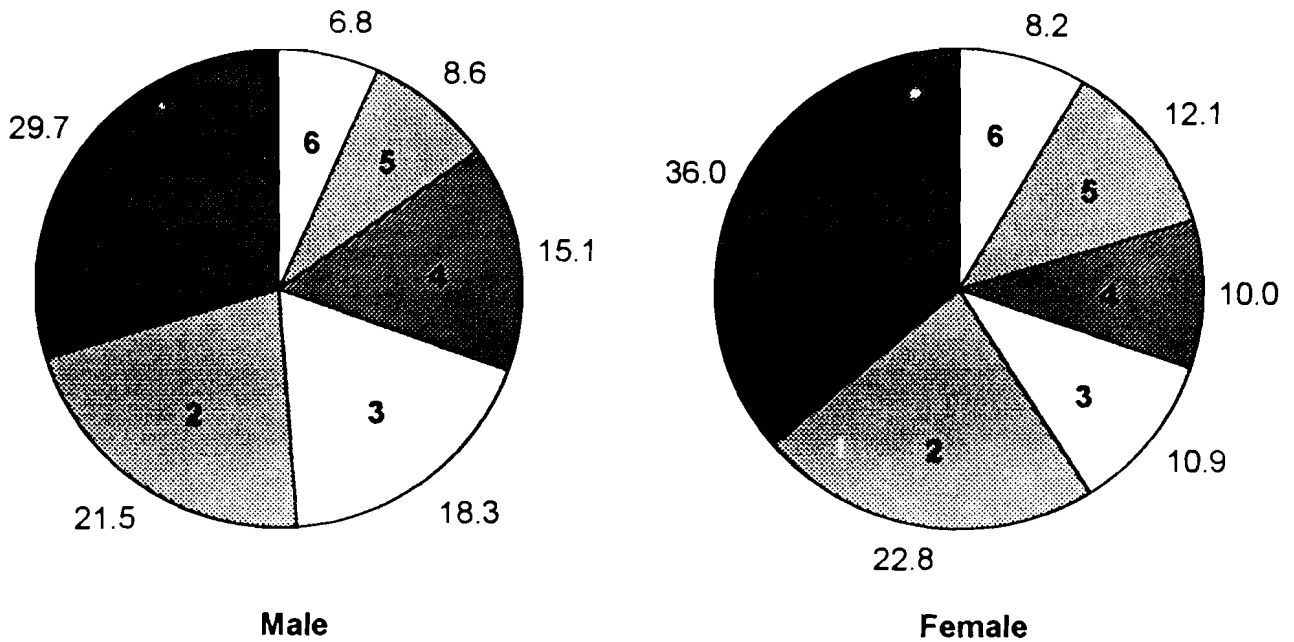
- Circulatory System Diseases
- Digestive System Diseases
- Respiratory System Diseases
- Skin and Subcutaneous Tissue Diseases
- Genitourinary System Diseases
- All Other

FIGURE 6.
Percentage Distribution of Discharges with Principal Diagnosis of Diabetes
by Specific Cause, Ages 45 Years and Older
Indian Health Service and Tribal Direct and Contract Hospitals, Fiscal Year 1995



- Diabetes with Other Specified Manifestations
- Diabetes without Mention of Complication
- Diabetes with Peripheral Circulatory Disorders
- Diabetes with Renal Manifestations
- Diabetes with Other Complications

FIGURE 7.
Percentage Distribution of Discharges with Principal Diagnosis of Diabetes
by Specific Cause and Gender
Indian Health Service and Tribal Direct and Contract Hospitals, Fiscal Year 1995



- Diabetes without Mention of Complication
- Diabetes with Other Specified Manifestations
- Diabetes with Ketoacidosis
- Diabetes with Peripheral Circulatory Disorders
- Diabetes with Renal Manifestations
- Diabetes with Other Complications

**Table 1. Distribution of Total Discharges for Diabetes
Indian Health Service and Tribal Direct and Contract General Hospitals, FY 1995**

DIAGNOSIS	TOTAL	PRINCIPAL DIAGNOSIS		SECONDARY DIAGNOSES	
		NUMBER	PERCENT	NUMBER	PERCENT
Diabetes Mellitus - Total	12,053	2,077	100.0	9,976	100.0
Diabetes mellitus without mention of complication	7,001	498	24.0	6,503	65.2
Diabetes with ketoacidosis	389	304	14.6	85	0.9
Diabetes with hyperosmolarity	34	24	1.2	10	0.1
Diabetes with other coma	37	26	1.3	11	0.1
Diabetes with renal manifestations	1,222	215	10.4	1,007	10.1
Diabetes with ophthalmic manifestations	291	17	0.8	274	2.7
Diabetes with neurological manifestations	447	83	4.0	364	3.6
Diabetes with peripheral circulatory disorders	538	261	12.6	277	2.8
Diabetes with other specified manifestations	910	460	22.1	450	4.5
Diabetes with unspecified complication	1,184	189	9.1	995	10.0

**Table 2. Distribution of Diabetes Discharges for Patients 45 Years Old and Over
Indian Health Service and Tribal Direct and Contract General Hospitals, FY 1995**

DIAGNOSIS	TOTAL	PRINCIPAL DIAGNOSIS		SECONDARY DIAGNOSES	
		NUMBER	PERCENT	NUMBER	PERCENT
Diabetes Mellitus - Total	9,469	1,376	100.0	8,093	100.0
Diabetes mellitus without mention of complication	5,504	282	20.5	5,222	64.5
Diabetes with ketoacidosis	127	89	6.5	38	0.5
Diabetes with hyperosmolarity	24	16	1.2	8	0.1
Diabetes with other coma	28	20	1.5	8	0.1
Diabetes with renal manifestations	1,096	173	12.6	923	11.4
Diabetes with ophthalmic manifestations	268	17	1.2	251	3.1
Diabetes with neurological manifestations	381	67	4.9	314	3.9
Diabetes with peripheral circulatory disorders	481	233	16.9	248	3.1
Diabetes with other specified manifestations	707	370	26.9	337	4.2
Diabetes with unspecified complication	853	109	7.9	744	9.2

**Table 3. Distribution of Diabetes Discharges for Patients 45 - 64 Years Old
Indian Health Service and Tribal Direct and Contract General Hospitals, FY 1995**

DIAGNOSIS	TOTAL	PRINCIPAL DIAGNOSIS		SECONDARY DIAGNOSES	
		NUMBER	PERCENT	NUMBER	PERCENT
Diabetes Mellitus - Total	5,693	926	100.0	4,767	100.0
Diabetes mellitus without mention of complication	3,182	193	20.8	2,989	62.7
Diabetes with ketoacidosis	97	72	7.8	25	0.5
Diabetes with hyperosmolarity	19	16	1.7	3	0.1
Diabetes with other coma	16	10	1.1	6	0.1
Diabetes with renal manifestations	714	127	13.7	587	12.3
Diabetes with ophthalmic manifestations	179	16	1.7	163	3.4
Diabetes with neurological manifestations	273	56	6.0	217	4.6
Diabetes with peripheral circulatory disorders	262	128	13.8	134	2.8
Diabetes with other specified manifestations	448	232	25.1	216	4.5
Diabetes with unspecified complication	503	76	8.2	427	9.0

**Table 4. Distribution of Diabetes Discharges for Patients 65 Years Old and Over
Indian Health Service and Tribal Direct and Contract General Hospitals, FY 1995**

DIAGNOSIS	TOTAL	PRINCIPAL DIAGNOSIS		SECONDARY DIAGNOSES	
		NUMBER	PERCENT	NUMBER	PERCENT
Diabetes Mellitus - Total	3,776	450	100.0	3,326	100.0
Diabetes mellitus without mention of complication	2,322	89	19.8	2,233	67.1
Diabetes with ketoacidosis	30	17	3.8	13	0.4
Diabetes with hyperosmolarity	5	0	0.0	5	0.2
Diabetes with other coma	12	10	2.2	2	0.1
Diabetes with renal manifestations	382	46	10.2	336	10.1
Diabetes with ophthalmic manifestations	89	1	0.2	88	2.6
Diabetes with neurological manifestations	108	11	2.4	97	2.9
Diabetes with peripheral circulatory disorders	219	105	23.3	114	3.4
Diabetes with other specified manifestations	259	138	30.7	121	3.6
Diabetes with unspecified complication	350	33	7.3	317	9.5

**Table 5. Distribution of Diabetes Discharges for Males
Indian Health Service and Tribal Direct and Contract General Hospitals, FY 1995**

DIAGNOSIS	TOTAL	PRINCIPAL DIAGNOSIS		SECONDARY DIAGNOSES	
		NUMBER	PERCENT	NUMBER	PERCENT
Diabetes Mellitus - Total	5,138	1,047	100.0	4,091	100.0
Diabetes mellitus without mention of complication	2,848	240	22.9	2,608	63.7
Diabetes with ketoacidosis	235	192	18.3	43	1.1
Diabetes with hyperosmolarity	18	14	1.3	4	0.1
Diabetes with other coma	13	9	0.9	4	0.1
Diabetes with renal manifestations	490	90	8.6	400	9.8
Diabetes with ophthalmic manifestations	129	10	1.0	119	2.9
Diabetes with neurological manifestations	193	32	3.1	161	3.9
Diabetes with peripheral circulatory disorders	303	158	15.1	145	3.5
Diabetes with other specified manifestations	435	225	21.5	210	5.1
Diabetes with unspecified complication	474	77	7.4	397	9.7

**Table 6. Distribution of Diabetes Discharges for Females
Indian Health Service and Tribal Direct and Contract General Hospitals, FY 1995**

DIAGNOSIS	TOTAL	PRINCIPAL DIAGNOSIS		SECONDARY DIAGNOSES	
		NUMBER	PERCENT	NUMBER	PERCENT
Diabetes Mellitus - Total	6,915	1,030	100.0	5,885	100.0
Diabetes mellitus without mention of complication	4,153	258	25.0	3,895	66.2
Diabetes with ketoacidosis	154	112	10.9	42	0.7
Diabetes with hyperosmolarity	16	10	1.0	6	0.1
Diabetes with other coma	24	17	1.7	7	0.1
Diabetes with renal manifestations	732	125	12.1	607	10.3
Diabetes with ophthalmic manifestations	162	7	0.7	155	2.6
Diabetes with neurological manifestations	254	51	5.0	203	3.4
Diabetes with peripheral circulatory disorders	235	103	10.0	132	2.2
Diabetes with other specified manifestations	475	235	22.8	240	4.1
Diabetes with unspecified complication	710	112	10.9	598	10.2

