



The Burden of Diabetes in Ohio

Ohio Hospital Discharge Data: 2003-2007



OHIO DEPARTMENT *of* HEALTH

**Ohio Diabetes Prevention
and Control Program**
Office of Healthy Ohio

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October 2010

ACKNOWLEDGEMENT:

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SUGGESTED CITATION:

Oza-Frank, R. (October 2010).
The Burden of Diabetes in Ohio:
Ohio Hospital Discharge Data 2003-2007;
Columbus, Ohio: Ohio Department of Health.

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This publication was supported by the Ohio Diabetes Prevention and Control Program's Cooperative Agreement/Grant Number IU58DP001983 with The Centers for Disease Control and Prevention.

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Diabetes prevalence in Ohio has increased by 64 percent over the past decade

INTRODUCTION

Diabetes prevalence has continued to increase over the past several years. In the United States in 2007, an estimated 24 million people, or 8 percent of the population, had diabetes, an increase of approximately 3 million people since 2005 (1).

In 2007, there were more than one million Ohio adults who were estimated to have diabetes, approximately 20 percent of which were undiagnosed (2, 3, 4). Diabetes prevalence in Ohio has increased by 64 percent over the past decade, from 6 percent in 1998 to 10 percent in 2007 (3).

Diabetes can affect many parts of the body and can lead to serious complications such as blindness, kidney damage and lower-limb amputations. Together, people with diabetes, their support network and their health care providers can reduce the occurrence of these and other diabetes complications by controlling the levels of blood glucose, blood pressure and blood lipids by receiving other preventive care practices in a timely manner (2).

Diabetes is also an economically costly disease. The total U.S. estimated cost of diabetes in 2007 was \$174 billion, including \$116 billion in medical expenditures and \$58 billion in reduced national productivity (5). The direct (medical care) and indirect (lost productivity) costs of diabetes in Ohio total an estimated \$5.9 billion. Approximately \$3.9 billion are direct medical expenditures for adults; \$2 billion are from indirect cost. The estimate includes only persons diagnosed with diabetes (6).

This report describes data from the Ohio Hospital Association (OHA) specific to diabetes related hospital discharges from 2003-2007. There are four sections: the first describes the number of hospital discharges specific to the broad category of diabetes. The second section describes diabetes related discharges associated with complications and specific conditions. The third section describes hospital discharges by diabetes type. The fourth section provides descriptions of diabetes related hospital inpatient charges. Finally, county specific hospital discharges are presented.

The Ohio Diabetes Prevention and Control Program is working toward more centralized and coordinated statewide data gathering, analysis and sharing. This report is intended to help describe the burden of diabetes in Ohio for state and local agency policy/decision makers and other interested local constituents. It is hoped the analyses from OHA data will help provide assistance in making policy changes and determining allocation of funding resources.

KEY FINDINGS

- The number of hospital discharges related to diabetes increased between 2003-2007 (Table 1, Figure 1).
- The number of discharges related to diabetes increased within age groups between 2003 and 2007, with the largest increases observed among those aged 65 and older (Table 3, Figure 2).
- Among hospital discharges with any mention of diabetes, the top three conditions associated with hospitalization were diseases of the digestive system, cerebrovascular disease, and nephritis/nephrotic syndrome/nephrosis, respectively (Table 4).
- Regarding complications associated with diabetes related hospital discharges, major cardiovascular diseases were noted more often in the medical record than any other condition (Table 5). Kidney disease, neurological manifestations and end stage kidney disease were some of the other frequently listed conditions.
- Among hospital discharges with any mention of diabetes, hypertension and ischemic heart disease were the most frequently associated cardiovascular diseases, both among men and women (Table 6).
- Between 2003-2007, there were 141,019 hospital discharges with a diagnosis of diabetes and pneumonia or influenza. The average length of stay in the hospital for treatment of these illnesses was more than one week (Table 7).
- Among discharges with diabetes listed as the primary diagnosis for persons under the age of 65, more than 9 percent had an ambulatory sensitive condition (Table 8). Ketoacidosis accounted for the majority of the ambulatory sensitive conditions.
- The number of discharges and the hospital discharge rate for any mention of type 1 diabetes decreased between 2003 and 2007. In contrast, the number of discharges and discharge rate for any mention of type 2 diabetes both increased (Table 4.9 and Figure 3).
- Between 2003 and 2007, total charges among hospital discharges with any mention of diabetes increased from \$6 billion to just over \$8 billion (Figure 5). Mean charges also increased, however, mean length of stay decreased from 5.3 to 5.0 days (Table 11, Figure 6).
- The number of hospital discharges with diabetes and CVD listed as any diagnosis increased from 2003 to 2007, as did the associated mean and total charges (Table 13, Figure 9); however, mean length of stay decreased during this same time period (Table 13, Figure 10).
- Medicare was the primary payer among hospital discharges with diabetes as any diagnosis, responsible for 62 percent of all discharged charges, followed by private insurance, and Medicaid (Figure 13).

NUMBER OF HOSPITAL DISCHARGES

Sex

The number of hospital discharges where diabetes was mentioned as any diagnosis increased steadily between 2003-2007 (Table 1). In 2003, there were 231 hospital discharges with a mention of diabetes per 10,000 Ohio residents. This increased to 262 in 2007 (Table 1, Figure 1). The mean length of stay in hospitals decreased slightly for both men and women between 2003 and 2007 (Table 1). Similar patterns were observed among hospital discharges where diabetes was mentioned as primary diagnosis (Table 2).

Table 1

Hospital Discharges with Any Mention of Diabetes¹ as a Listed Diagnosis by Year, Sex, Number of Discharges, Number of Days, Mean Length of Stay², Discharges per 10,000 Residents and Discharges per 10,000 Persons with Diabetes, Ohio 2003-2007.

Year	Sex	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ²	Crude Discharges per 10,000 Ohio Residents ³	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Discharges per 10,000 Ohio Persons with Diabetes ⁴
2003	Male	125,854	658,422	5.2	226	238	3,431
	Female	154,076	820,600	5.3	262	228	3,824
	Total	279,930	1,479,022	5.3	245	231	3,637
2004	Male	131,708	683,209	5.2	236	246	3,773
	Female	159,649	835,049	5.2	272	235	4,814
	Total	291,357	1,518,258	5.2	254	238	4,280
2005	Males	139,266	703,977	5.1	249	257	4,129
	Female	166,721	856,702	5.1	284	243	5,009
	Total	305,987	1,560,679	5.1	267	248	4,566
2006	Male	147,280	731,591	5.0	264	269	5,065
	Female	175,888	887,865	5.0	299	255	5,799
	Total	323,168	1,619,456	5.0	282	259	5,440
2007	Male	150,559	737,501	4.9	269	271	3,665
	Female	178,645	883,145	4.9	304	257	4,241
	Total	329,204	1,620,646	4.9	287	262	3,956

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

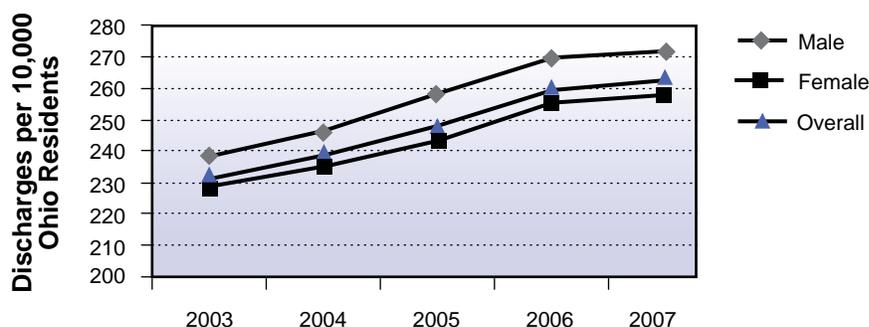
² Number of days divided by number of hospital discharges.

³ Based on Census data.

⁴ Based on number of persons with diagnosed diabetes from the Ohio Behavioral Risk Factor Surveillance System 2003-2007.

Figure 1

Hospital Discharges with Any Mention of Diabetes¹ as a Listed Diagnosis per 10,000 Residents², by Sex and Year, Ohio 2003-2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Based on Census data.

Table 2

Hospital Discharges with Diabetes Listed as Primary Diagnosis¹ by Year, Sex, Number of Discharges, Number of Days, Mean Length of Stay², Discharges per 10,000 Residents and Discharges per 10,000 Persons with Diabetes, Ohio 2003-2007.

Year	Sex	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ²	Crude Discharges per 10,000 Ohio Residents ³	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Discharges per 10,000 Persons with Diabetes ⁴
2003	Male	9,704	45,783	4.7	17	18	265
	Female	9,965	46,786	4.7	17	16	247
	Total	19,669	92,569	4.7	17	17	256
2004	Male	10,104	48,069	4.8	18	18	289
	Female	10,224	47,150	4.6	17	16	308
	Total	20,328	95,219	4.7	18	17	299
2005	Males	10,641	48,756	4.6	19	19	316
	Female	10,178	46,959	4.6	17	16	306
	Total	20,819	95,715	4.6	18	17	311
2006	Male	11,063	50,862	4.6	20	20	380
	Female	10,882	48,316	4.4	19	17	359
	Total	21,945	99,178	4.5	19	18	369
2007	Male	11,450	51,542	4.5	20	20	279
	Female	11,309	49,500	4.4	19	18	268
	Total	22,759	101,042	4.4	20	19	274

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Number of days divided by number of hospital discharges.

³ Based on Census data.

⁴ Based on number of persons with diagnosed diabetes from the Ohio Behavioral Risk Factor Surveillance System 2003-2007.

Age Group

The number of hospital discharges related to diabetes increased with increasing patient age (Table 3, Figure 2). In general, the number of discharges related to diabetes increased within age groups between 2003 and 2007, with the largest increases observed among those aged 65 years and older (Table 3, Figure 2).

Table 3

Hospital Discharges with Any Mention of Diabetes¹ as a Listed Diagnosis by Year, Age, Sex, Number of Discharges and Discharges per 10,000 Residents, Ohio 2003-2007.

Year	Age Group	Males		Females		Total	
		Number of Hospital Discharges	Age-Adjusted Hospital Discharges per 10,000 Ohio Residents ²	Number of Hospital Discharges	Age-Adjusted Hospital Discharges per 10,000 Ohio Residents ²	Number of Hospital Discharges	Age-Adjusted Hospital Discharges per 10,000 Ohio Residents ²
2003	15-24	1,043	13	2,120	27	3,163	20
	25-34	2,474	34	4,008	55	6,482	44
	35-44	7,689	91	8,997	104	16,686	98
	45-54	18,336	224	19,235	226	37,571	225
	55-64	26,320	488	28,739	491	55,059	490
	65-74	32,762	947	37,889	896	70,651	919
	75-84	29,365	1,351	38,602	1,140	67,967	1,222
	85+	7,303	1,294	13,802	989	21,105	1,077
2004	15-24	1,088	13	2,163	27	3,251	20
	25-34	2,755	38	4,448	61	7,203	49
	35-44	8,109	98	9,550	113	17,659	105
	45-54	19,086	230	20,077	232	39,163	231
	55-64	28,501	508	29,962	493	58,463	500
	65-74	33,549	970	38,315	909	71,864	936
	75-84	30,286	1,388	39,710	1,176	69,996	1,259
	85+	7,734	1,321	14,664	1,033	22,398	1,117
2005	15-24	1,287	16	2,243	29	3,530	22
	25-34	3,090	42	4,399	60	7,489	51
	35-44	8,426	103	9,914	119	18,340	111
	45-54	20,957	249	21,060	241	42,017	245
	55-64	30,286	519	32,265	513	62,551	516
	65-74	34,699	1,004	39,498	940	74,197	969
	75-84	31,333	1,434	41,163	1,225	72,496	1,307
	85+	8,583	1,403	15,527	1,065	24,110	1,165
2006	15-24	1,303	16	2,385	31	3,688	23
	25-34	3,113	43	4,709	64	7,822	54
	35-44	9,173	114	10,233	125	19,406	120
	45-54	22,505	264	22,705	257	45,210	260
	55-64	32,325	534	34,212	525	66,537	530
	65-74	35,894	1,033	41,063	973	76,957	1,000
	75-84	32,848	1,509	42,871	1,292	75,719	1,378
	85+	9,516	1,487	17,008	1,128	26,524	1,235
2007	15-24	1,299	16	2,534	33	3,833	24
	25-34	3,131	43	4,999	68	8,130	56
	35-44	8,990	114	10,328	129	19,318	121
	45-54	23,123	270	22,923	258	46,046	264
	55-64	33,484	535	34,633	516	68,117	525
	65-74	37,264	1,053	42,032	984	79,296	1,015
	75-84	33,117	1,536	42,664	1,307	75,781	1,398
	85+	9,600	1,436	17,921	1,156	27,521	1,241

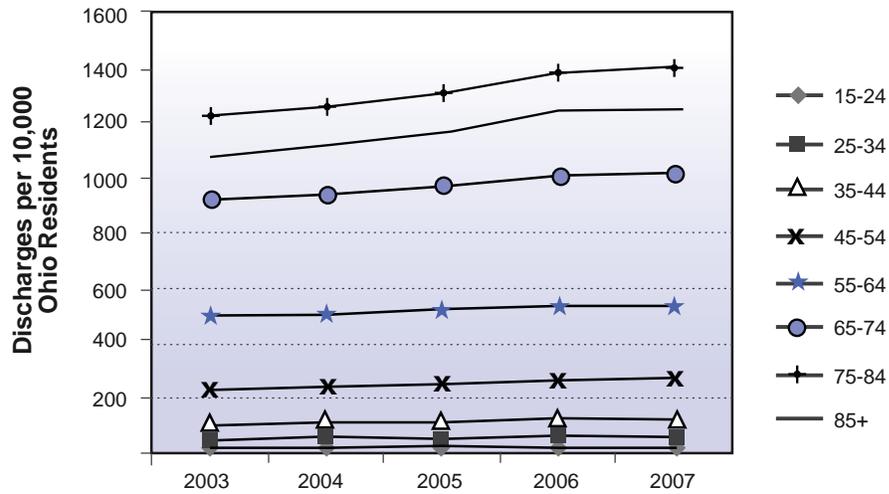
Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Based on Census data.

Figure 2

Hospital Discharges with Any Mention of Diabetes¹ as a Listed Diagnosis per 10,000 Residents², by Age Group and Year, Ohio 2003-2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Based on Census data.



Complications and Conditions

Among hospital discharges with any mention of diabetes, the top three conditions associated with hospitalization were diseases of the digestive system, cerebrovascular disease, and nephritis/nephrotic syndrome/nephrosis, respectively (Table 4). Regarding complications associated with diabetes related hospital discharges, major cardiovascular diseases were noted more often in the medical record than any other condition (Table 5). End stage renal disease, kidney disease, and neurological manifestations were some of the other frequently listed conditions.

Table 4

Primary Diagnosis of Hospital Discharges with Any Mention of Diabetes¹ as a Listed Diagnosis, by Total Discharges Number of Days, Mean Length of Stay², and Percent of Discharges, Ohio 2003-2007.

Primary Diagnosis	Total Discharges	Total Number of Days	Mean Length of Stay in Days ²	Percent of Discharges
Infectious & parasitic diseases (001-139)	188	979	5.2	0.0%
Malignant neoplasms (140-208)	47,427	321,237	6.8	3.2%
Other neoplasms (210-239)	44,146	302,201	6.8	2.9%
Disorders of thyroid glands (240-246)	9,456	44,439	4.7	0.6%
Other endocrine, nutritional and metabolic disorders(251-279) ³	106,964	488,950	3.9	7.1%
Disease of the blood and blood forming organs (280-289)	43,466	169,647	5.1	2.9%
Mental disorders (290-319)	12,938	66,083	5.1	0.9%
Diseases of the nervous system & sense organs (320-389) ³	66,773	442,442	6.6	4.5%
Acute rheumatic heart disease (390-392)	3,462	10,826	3.1	0.2%
Chronic rheumatic heart disease (393-398)	36	316	8.8	0.0%
Hypertensive disease (401-405)	8,412	38,214	4.5	0.6%
Ischemic heart disease (410-414)	64,242	352,376	5.5	4.3%
Disease of pulmonary circulation (415-417)	102,130	382,685	3.7	6.8%
Other forms of heart disease (420-429)	1,937	11,167	5.8	0.1%
Cerebrovascular disease (430-438)	156,267	771,453	4.9	10.4%
Arteries, arterioles and capillaries disease (440-448)	73,171	354,787	4.8	4.9%
Veins, lymphatic and other circulatory disease (451-459)	10,418	58,017	5.6	0.7%
Diseases of the respiratory system (460-519)	19,604	88,063	4.5	1.3%
Diseases of the digestive system (520-579)	175,914	1,007,033	5.7	11.8%
Nephritis, nephrotic syndrome, and nephrosis (580-589)	131,511	664,869	5.1	8.8%
Other diseases of the genitourinary system (590-629)	37,702	213,665	5.7	2.5%
Complications in pregnancy, childbirth and puerperium (630-677) ³	47,624	185,266	3.9	3.2%
Diseases of the skin and subcutaneous tissue (680-709)	5,607	23,119	4.1	0.4%
Musculoskeletal and connective tissue diseases (710-739)	3,272	13,417	4.1	0.2%
Congenital anomalies (740-759)	39,592	198,452	5.0	2.6%
Conditions of the perinatal period (760-779)	81,269	33,274	0.4	5.4%
Symptoms, signs and ill-defined conditions (780-799)	1,356	6,928	5.1	0.1%
Injury and poisoning (800-999)	26,064	88,432	3.4	1.7%
Factors influencing health status/contact with health services V01-V82)	66,391	187,274	2.8	4.4%
Other /unknown	109,385	596,899	5.5	7.3%
Total	1,496,724	7,122,510	4.8	100.0%

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Number of days divided by number of hospital discharges.

³ Excludes diabetes-related ICD-9CM codes (362.01-362.02, 366.41, or 648.00-648.04) falling within the designated range.

Table 5

Hospital Discharges with Any Mention of Diabetes¹ and Selected Complications as a Listed Diagnoses by Sex, Number of Discharges, Mean Length of Stay², Discharges per 10,000 Residents and Discharges per 10,000 Persons with Diabetes, Ohio 2003-2007.

Complications	Sex	Number of Discharges	Mean Length of Stay ²	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Discharges per 10,000 Ohio Persons with Diabetes ⁴
Diabetes with Ketoacidosis ICD-9-CM Codes: Diabetes with Ketoacidosis (250.1)	Males	17,206	4.0	6.1	98
	Females	19,793	4.2	6.8	110
	Total	36,999	4.1	6.5	104
Diabetes with Neurological manifestations ICD-9-CM Codes: Diabetes with Neurological manifestations (250.6)	Males	71,911	6.0	25.9	410
	Females	82,524	6.0	24.7	461
	Total	154,435	6.0	25.1	435
Diabetes with Hyperosmolarity ICD-9-CM Codes: Diabetes with Hyperosmolarity (250.2)	Males	2,476	5.1	0.9	14
	Females	2,337	5.6	0.7	13
	Total	4,813	5.3	0.8	14
Diabetes with other Coma ICD-9-CM Codes: Diabetes with other Coma (250.3)	Males	609	7.3	0.2	3
	Females	739	7.4	0.2	4
	Total	1,348	7.4	0.2	4
Diabetes with Peripheral Circulatory Disorders ICD-9-CM Codes: Diabetes with peripheral circulatory disorders (250.7)	Males	12,766	8.1	4.6	73
	Females	8,250	7.5	2.4	46
	Total	21,016	7.8	3.4	59
End Stage Renal Disease ICD-9-CM Procedure Codes: Chronic Dialysis(39.95) or Renal Transplantation (55.60-55.69), or Disease Codes: Chronic Renal Failure (585) or Kidney Transplant (V42.0) or Renal Dialysis Status (V45.1)	Males	236,027	4.8	88.0	1,345
	Females	213,107	5.1	61.1	1,189
	Total	449,134	5.0	72.3	1,266
Kidney Disease ICD-9-CM Codes: Diabetes with renal manifestations (250.4), Nephrotic syndrome (581.81), Nephritis and nephropathy (583.81), Acute renal failure (584), Renal failure (586), Renal sclerosis (587), Disorders resulting from impaired renal function (588), and Infections of kidney (590)	Males	105,955	7.0	39.2	604
	Females	112,353	7.1	32.6	627
	Total	218,308	7.1	35.3	616
Major Cardiovascular Diseases ICD-9-CM Codes: Major Cardiovascular Diseases (390-448)	Males	616,510	5.1	228.3	3,513
	Females	724,712	5.2	208.1	4,044
	Total	1,341,222	5.2	216.0	3,782
Vision Disorders ICD-9-CM Codes: Diabetes with ophthalmic manifestation (250.5) or Disorders of the eye and adnexa (360-379)	Males	47,257	5.6	17.5	269
	Females	61,449	5.6	17.7	343
	Total	108,706	5.6	17.6	306

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Number of days divided by the number of hospital discharges.

³ Based on Census data.

⁴ Based on number of persons with diagnosed diabetes from the Ohio Behavioral Risk Factor Surveillance System 2003-2007.

Cardiovascular Diseases

Among hospital discharges with any mention of diabetes, hypertension and ischemic heart disease were the most frequently associated cardiovascular diseases, both among men and women.

Table 6

Hospital Discharges with Any Mention of Diabetes¹ and Selected Cardiovascular Diseases as Listed Diagnoses by Sex, Mean Length of Stay², and Discharges per 10,000 Residents and Discharges per 10,000 Persons with Diabetes, Ohio 2003-2007.

Selected Cardiovascular Diseases								
Sex	Hypertensive Disease (ICD-9-CM codes:401-405)				Ischemic Heart Disease (ICD-9-CM codes:410-414)			
	Number of Discharges	Mean Length of Stay in Days ²	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Discharges per 10,000 Ohio Persons with Diabetes ⁴	Number of Discharges	Mean Length of Stay in Days ²	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Discharges per 10,000 Ohio Persons with Diabetes ⁴
Male	486,612	5.0	179	2,773	335,139	4.8	125	1,910
Female	600,691	5.1	173	3,352	307,840	5.0	87	1,718
Total	1,087,303	5.0	175	3,066	642,979	4.9	103	1,813

Selected Cardiovascular Diseases								
Sex	Cerebrovascular Disease (Stroke) (ICD-9-CM codes:430-438)				Heart Failure (ICD-9-CM code: 428)			
	Number of Discharges	Mean Length of Stay in Days ²	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Discharges per 10,000 Ohio Persons with Diabetes ⁴	Number of Discharges	Mean Length of Stay in Days ²	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Discharges per 10,000 Ohio Persons with Diabetes ⁴
Male	68,410	5.9	26.0	389.8	190,971	5.9	73	1,088
Female	75,679	5.8	21.2	422.3	235,773	6.0	66	1,316
Total	144,089	5.9	23.1	406.3	426,744	5.9	68	1,203

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Number of days divided by number of hospital discharges.

³ Based on Census data.

⁴ Based on number of persons with diagnosed diabetes from the Ohio Behavioral Risk Factor Surveillance System 2003-2007.

Pneumonia and Influenza

Pneumonia and influenza can be prevented or decreased in severity with the administration of a vaccine. However, between 2003-2007, there were 141,019 hospital discharges with a diagnosis of diabetes and pneumonia or influenza. The average length of stay in the hospital for treatment of these illnesses was more than one week (Table 7).

Table 7

Hospital Discharges with Any Mention of Diabetes and Pneumonia or Influenza as Listed Diagnoses by Sex, Number of Days, Mean Length of Stay, Discharges per 10,000 Residents and Discharges per 10,000 Persons with Diabetes, Ohio 2003-2007.

Sex	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Age-Adjusted Discharges per 10,000 Ohio Residents ⁴	Discharges Per 10,000 Ohio Persons with Diabetes ⁵
Male	66,964	479,942	7.2	26	382
Female	74,055	536,691	7.2	21	413
Total	141,019	1,016,633	7.2	23	398

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Number of days divided by number of hospital discharges.

³ Based on Census data.

⁴ Based on number of persons with diagnosed diabetes from the Ohio Behavioral Risk Factor Surveillance System 2003-2007.

Ambulatory Care Sensitive Conditions

Ketoacidosis, hyperosmolarity and coma are considered ambulatory care sensitive conditions (ACS)—conditions in which timely and effective care would have prevented a hospitalization. Of the 105,520 discharges with diabetes listed as the primary diagnosis for persons under the age of 65, more than 9 percent had an ambulatory sensitive condition (Table 8). Ketoacidosis accounted for the majority of the ambulatory sensitive conditions.

Table 8

Hospital Discharges for Persons Under 65 Years of Age with Diabetes Listed as a Primary Diagnosis by Selected Ambulatory Care Sensitive (ACS) Diabetes Conditions and Sex, Ohio 2003-2007.

Sex	Discharges with Diabetes Listed as Primary Diagnosis (ICD-9-CM codes 250.0-250.9)	Number of Hospital Discharges with Selected Diabetes Conditions			% Selected (ACS) Conditions ¹
		Diabetes with ketoacidosis (ICD-9-CM code 250.1)	Diabetes with hyperosmolarity (ICD-9-CM code 250.2)	Diabetes with other coma (ICD-9-CM code 250.3)	
Male	52,962	4,080	508	138	8.9
Female	52,558	4,711	431	130	10.0
Total	105,520	8,791	939	268	9.5

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Percentage of selected ACS conditions of the total discharges with diabetes listed as any diagnosis (ICD-9-CM 250.0-250.9).

Number of Hospital Discharges by Type of Diabetes

The number of discharges and the hospital discharge rate for any mention of type 1 diabetes decreased between 2003 and 2007. In contrast, the number of discharges and discharge rate for any mention of type 2 diabetes both increased (Table 9, Figure 3). Mean age was lower among those discharges associated with type 1 diabetes compared to type 2 diabetes.

Those patients with a primary diagnosis of type 1 had a decrease and those with a primary diagnosis of type 2 diabetes had an increase in both the number of discharges and hospital discharge rates (Table 10, Figure 4). Again, mean age was lower among those with type 1 than for persons with type 2 diabetes (Table 10).

Table 9

The Number of Hospital Discharges with Any Mention of Diabetes as a Listed Diagnosis by Type, Year, Discharges per 10,000 Residents and Mean Age, Ohio 2003-2007.

Year	Type 1 ¹			Type 2 ²		
	Number of Discharges	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Mean Age	Number of Discharges	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Mean Age
2003	34,698	29	55	245,229	202	67
2004	29,817	25	53	261,528	213	67
2005	19,505	17	47	286,479	231	66
2006	18,111	16	44	305,060	244	66
2007	17,110	15	43	312,099	247	66

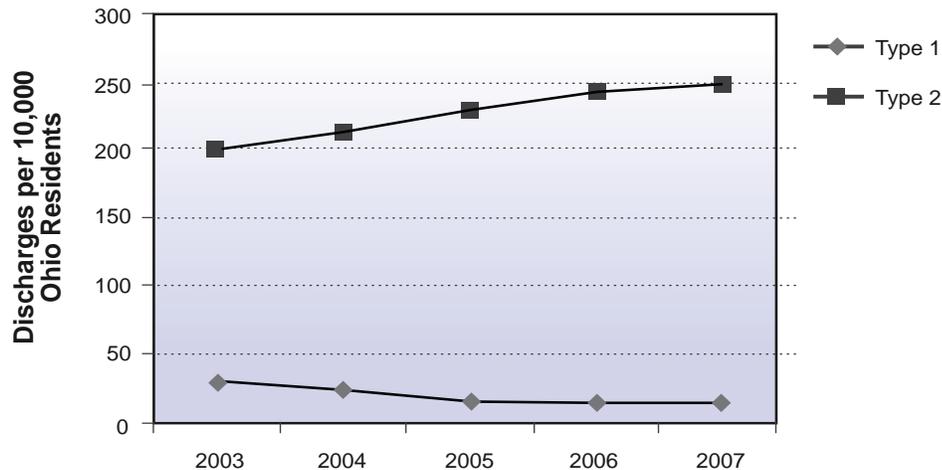
¹ ICD-9-CM Codes Type 1 Diabetes: The fifth digit sub classification of 250.x1 and 250.x3.

² ICD-9-CM Codes Type 2 Diabetes: The fifth digit sub classification of 250.x0 and 250.x2.

³ Based on Census data.

Figure 3

The Number of Hospital Discharges with Any Mention of Diabetes¹ as a Listed Diagnosis by Type, Year, Discharges per 10,000 Residents² and Mean Age, Ohio 2003-2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Type 1 Diabetes, fifth digit sub classification of 250.x1 and 250.x3; Type 2 Diabetes, fifth digit sub classification of 250.x0 and 250.x2.

² Based on Census data.

Table 10

The Number of Hospital Discharges with a Primary Diagnosis of Diabetes by Type, Year, Discharges per 10,000 Residents and Mean Age, Ohio 2003-2007.

Year	Type 1 ¹			Type 2 ²		
	Number of Discharges	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Mean Age	Number of Discharges	Age-Adjusted Discharges per 10,000 Ohio Residents ³	Mean Age
2003	7,577	6.6	38	12,092	10.0	61
2004	7,514	6.6	36	12,812	10.6	61
2005	6,469	5.8	33	14,353	11.7	60
2006	6,775	6.1	33	15,171	12.3	60
2007	6,896	6.2	32	15,865	12.8	60

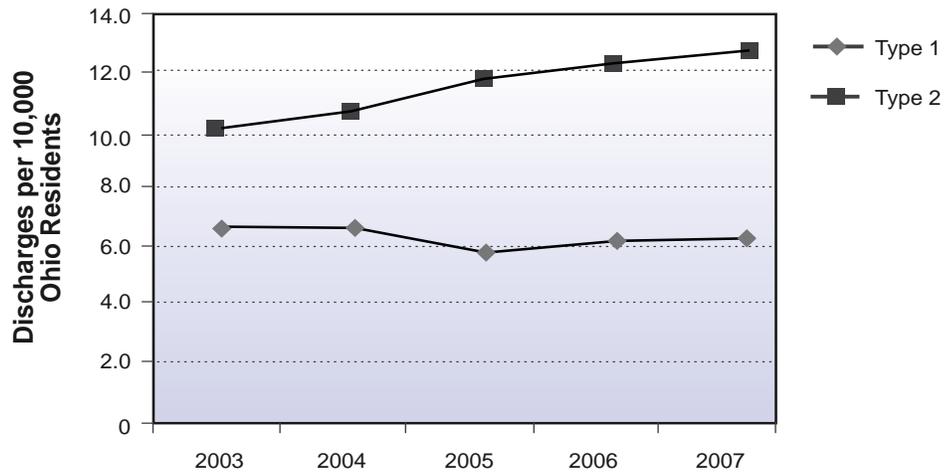
¹ ICD-9-CM Codes Type 1 Diabetes: The fifth digit sub classification of 250.x1 and 250.x3.

² ICD-9-CM Codes Type 2 Diabetes: The fifth digit sub classification of 250.x0 and 250.x2.

³ Based on Census data.

Figure 4

The Number of Hospital Discharges with Diabetes¹ Listed as a Primary Diagnosis per 10,000 Residents², by Type and Year, Ohio 2003-2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Type 1 Diabetes, fifth digit sub classification of 250.x1 and 250.x3; Type 2 Diabetes, fifth digit sub classification of 250.x0 and 250.x2.

² Based on Census data.



Hospital Inpatient Charges - *Diabetes Only*

Between 2003 and 2007, total charges among hospital discharges with any mention of diabetes increased from \$6 billion to just over \$8 billion (Figure 5). Mean charges also increased, however, mean length of stay decreased from 5.3 to 5.0 days (Table 11, Figure 6). This pattern was consistent among both men and women (Table 11). Overall, similar patterns were seen among hospital discharges with diabetes listed as primary diagnosis (Table 12; Figures 7, 8).

Table 11

Mean Charges¹, Total Charges, Mean Length of Stay², and Mean Age among Hospital Discharges with Any Diagnosis of Diabetes³ by Sex and Year, Ohio 2003-2007.

		Mean Charges ¹	Total charges ¹	Mean Length of Stay ²	Mean Age
2003	Males	\$ 23,593	\$ 2,885,326,865	5.3	64.7
	Females	\$ 20,762	\$ 3,135,030,769	5.4	65.7
	Total	\$ 22,024	\$ 6,020,357,635	5.3	65.2
2004	Males	\$ 25,285	\$ 3,255,370,039	5.2	64.5
	Females	\$ 21,926	\$ 3,443,718,520	5.3	65.6
	Total	\$ 23,432	\$ 6,699,088,558	5.3	65.1
2005	Males	\$ 25,983	\$ 3,531,710,436	5.1	64.4
	Females	\$ 22,877	\$ 3,752,527,621	5.2	65.7
	Overall	\$ 24,277	\$ 7,284,238,056	5.1	65.1
2006	Males	\$ 26,799	\$ 3,861,823,608	5.0	64.4
	Females	\$ 23,736	\$ 4,102,927,380	5.1	65.6
	Total	\$ 25,121	\$ 7,964,750,989	5.0	65.1
2007	Males	\$ 27,758	\$ 4,093,595,999	4.9	64.4
	Females	\$ 24,476	\$ 4,296,818,011	5.0	65.7
	Total	\$ 25,966	\$ 8,390,414,010	5.0	65.1

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

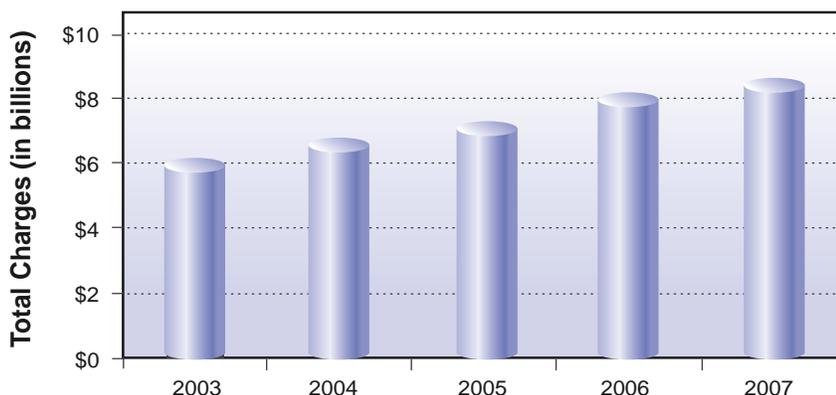
¹ Adjusted for Medical Care Inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

² Number of days divided by number of hospital discharges.

³ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Figure 5

Total Charges¹ among Hospital Discharges with Diabetes² as Any Diagnosis, Ohio, 2003–2007



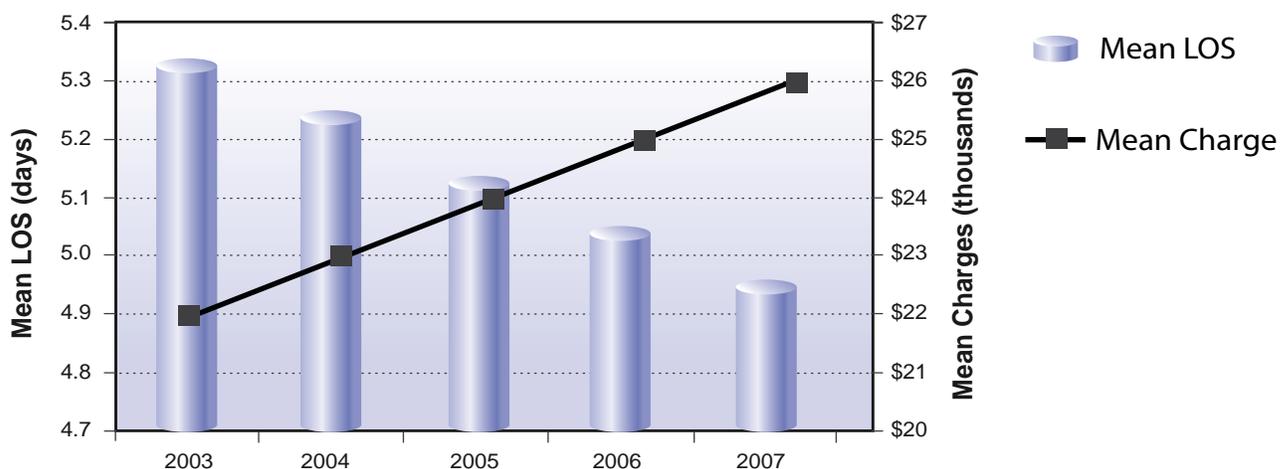
Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected

² ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Figure 6

Mean Charges¹ and Length of Stay(LOS)² among Hospital Discharges with Diabetes³ as Any Diagnosis, Ohio 2003–2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected

² Number of days divided by number of hospital discharges.

³ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Table 12

Mean Charges¹, Total Charges, Mean Length of Stay², and Mean Age among Hospital Discharges with a Primary Diagnosis of Diabetes³ by Sex and Year, Ohio 2003-2007.

		Mean Charges ¹	Total charges ¹	Mean Length of Stay ²	Mean Age
2003	Males	\$16,304	\$157,688,924	4.7	51.7
	Females	\$15,430	\$152,773,438	4.7	52.6
	Total	\$15,861	\$310,462,362	4.7	52.2
2004	Males	\$18,304	\$185,065,070	4.7	51.3
	Females	\$16,582	\$169,374,238	4.6	52.1
	Total	\$17,437	\$354,439,307	4.7	51.7
2005	Males	\$18,390	\$194,742,227	4.6	51.0
	Females	\$17,147	\$174,526,788	4.6	52.2
	Overall	\$17,782	\$369,269,017	4.6	51.6
2006	Males	\$19,703	\$217,695,156	4.6	50.9
	Females	\$17,444	\$189,965,576	4.4	51.8
	Total	\$18,584	\$407,660,731	4.5	51.4
2007	Males	\$20,721	\$237,218,007	4.5	51.5
	Females	\$18,156	\$205,022,717	4.4	51.6
	Total	\$19,446	\$442,240,724	4.4	51.6

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

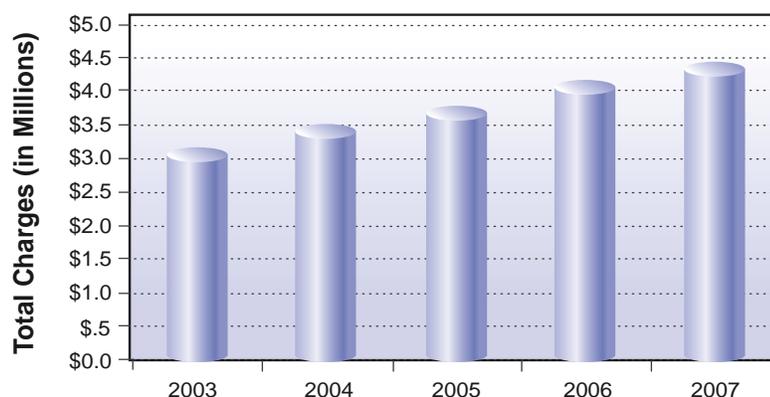
¹ Adjusted for Medical Care Inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

² Number of days divided by number of hospital discharges.

³ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Figure 7

Total Charges¹ among Hospital Discharges with Diabetes² as Primary Diagnosis, Ohio 2003–2007



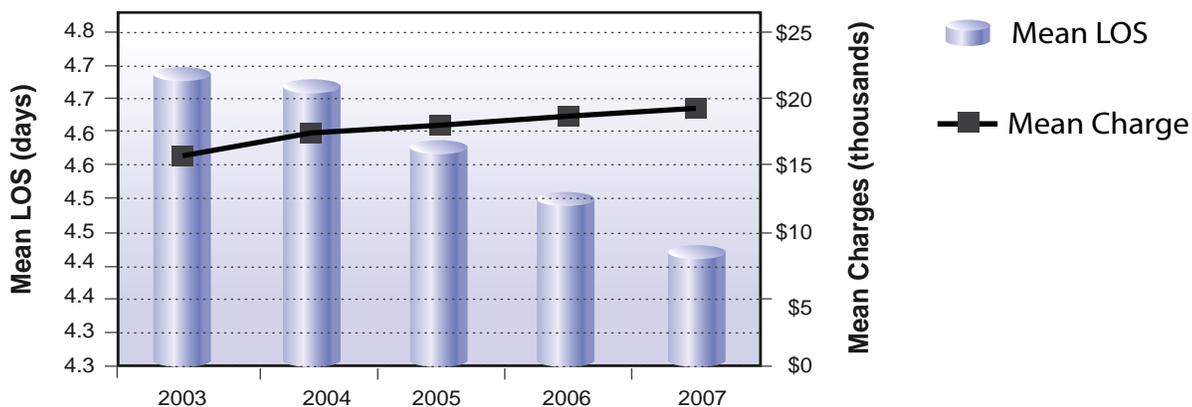
Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected

² ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Figure 8

Mean Charges¹ and Length of Stay (LOS)² among Hospital Discharges with Diabetes³ as Primary Diagnosis, Ohio 2003–2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected

² Number of days divided by number of hospital discharges.

³ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Diabetes and Cardiovascular Disease

The number of hospital discharges with diabetes and cardiovascular disease (CVD) listed as any diagnosis increased from 2003 to 2007, as did the associated mean and total charges (Table 13, Figure 9); however, mean length of stay decreased during this same time period (Table 13, Figure 10). Overall, similar patterns were seen among hospital discharges with diabetes listed as primary diagnosis and CVD listed as any diagnosis (Table 14, Figures 11 and 12).

Table 13

Mean Charges¹, Total Charges, Mean Length of Stay², and Mean Age among Hospital Discharges with Any Diagnosis of Diabetes³ and Any Diagnosis of CVD⁴ by Sex and Year, Ohio 2003-2007.

		Mean Charges ¹	Total charges ¹	Mean Length of Stay ²	Mean Age
2003	Males	\$ 23,889	\$ 2,625,311,296	5.3	66.4
	Females	\$ 21,247	\$ 2,803,748,976	5.4	68.2
	Total	\$ 22,447	\$ 5,429,060,271	5.4	67.4
2004	Males	\$ 25,616	\$ 2,978,773,450	5.3	66.2
	Females	\$ 22,393	\$ 3,081,752,874	5.3	68.1
	Total	\$ 23,869	\$ 6,060,526,327	5.3	67.2
2005	Males	\$ 26,232	\$ 3,230,107,037	5.1	66.1
	Females	\$ 23,318	\$ 3,368,991,799	5.2	68.0
	Overall	\$ 24,658	\$ 6,599,098,838	5.2	67.1
2006	Males	\$ 26,992	\$ 3,546,007,777	5.0	66.0
	Females	\$ 24,057	\$ 3,691,823,007	5.1	68.0
	Total	\$ 25,411	\$ 7,237,830,785	5.1	67.1
2007	Males	\$ 27,871	\$3,755,749,117	4.9	66.0
	Females	\$ 24,739	\$3,866,810,257	5.0	68.0
	Total	\$ 26,189	\$7,622,559,374	5.0	67.0

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for Medical Care Inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

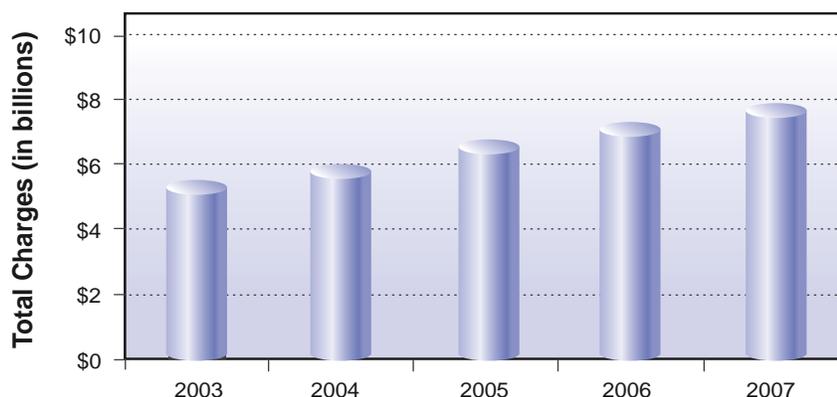
² Number of days divided by number of hospital discharges.

³ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

⁴ ICD-9-CM Codes: CVD (390-448).

Figure 9

Total Charges¹ among Hospital Discharges with Any Diagnosis of Diabetes² and Any Diagnosis of CVD³ by Year, Ohio 2003–2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

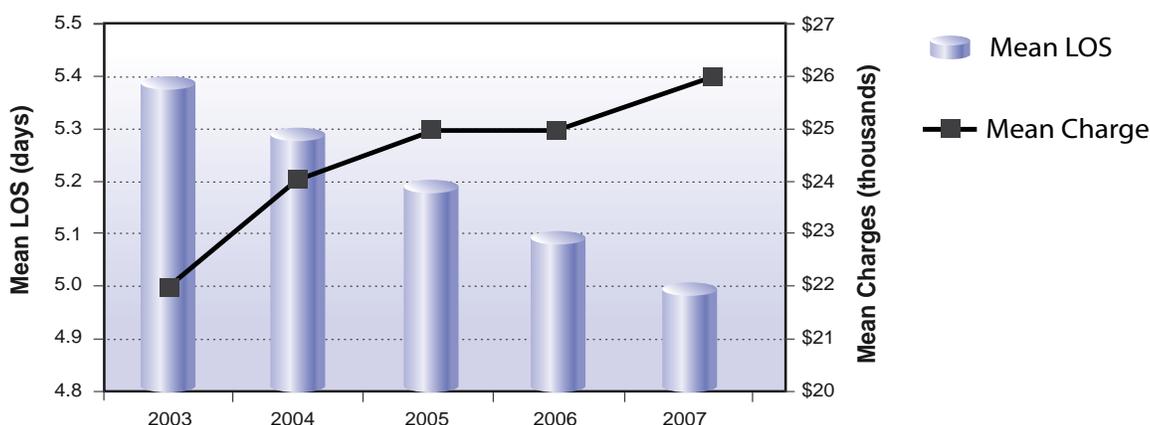
¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

² ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

³ ICD-9-CM Codes: CVD (390-448).

Figure 10

Mean Charges¹ and Length of Stay² (LOS) among Hospital Discharges with Any Diagnosis of Diabetes³ and Any Diagnosis of CVD⁴ by Year, Ohio 2003–2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected

² Number of days divided by number of hospital discharges.

³ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

⁴ ICD-9-CM Codes: CVD (390-448).

Table 14

Mean Charges¹, Total Charges, Mean Length of Stay², and Mean Age among Hospital Discharges with a Primary Diagnosis of Diabetes³ and Any Diagnosis of CVD⁴ by Sex and Year, Ohio 2003-2007.

		Number of Discharges	Mean Charges ¹	Total charges ¹ (after inflation)	Mean Length of Stay ²	Mean Age
2003	Males	6,418	\$ 19,218	\$ 22,840,476	5.4	59.6
	Females	6,506	\$ 18,021	\$ 116,887,402	5.4	61.8
	Total	12,924	\$ 18,615	\$ 239,727,878	5.4	60.7
2004	Males	6,846	\$ 21,714	\$ 148,397,856	5.5	58.8
	Females	6,721	\$ 19,216	\$ 128,921,752	5.2	61.6
	Total	13,567	\$ 20,477	\$ 277,319,610	5.4	60.2
2005	Males	7,203	\$ 21,423	\$ 153,732,719	5.2	58.3
	Females	6,739	\$ 19,834	\$ 133,480,189	5.2	61.3
	Overall	13,942	\$ 20,654	\$ 287,212,907	5.2	59.8
2006	Males	7,741	\$ 23,018	\$ 177,818,061	5.2	58.0
	Females	7,418	\$ 19,853	\$ 147,107,618	5.0	60.6
	Total	15,159	\$ 21,469	\$ 324,925,679	5.1	59.3
2007	Males	8,164	\$ 23,958	\$195,428,617	5.1	58.0
	Females	7,695	\$ 20,615	\$158,404,034	4.9	60.4
	Total	15,859	\$ 22,337	\$353,832,652	5.0	59.2

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for Medical Care Inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

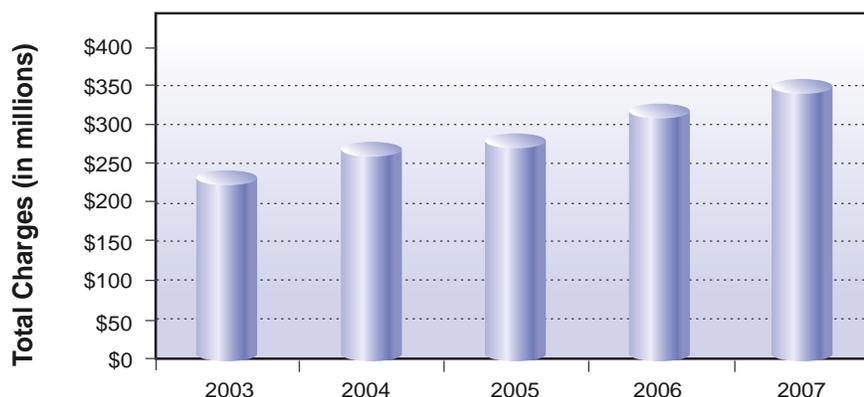
² Number of days divided by number of hospital discharges.

³ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

⁴ ICD-9-CM Codes: CVD (390-448).

Figure 11

Total Charges¹ among Hospital Discharges with Primary Diagnosis of Diabetes² and Any Diagnosis of CVD³ by Year, Ohio 2003–2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

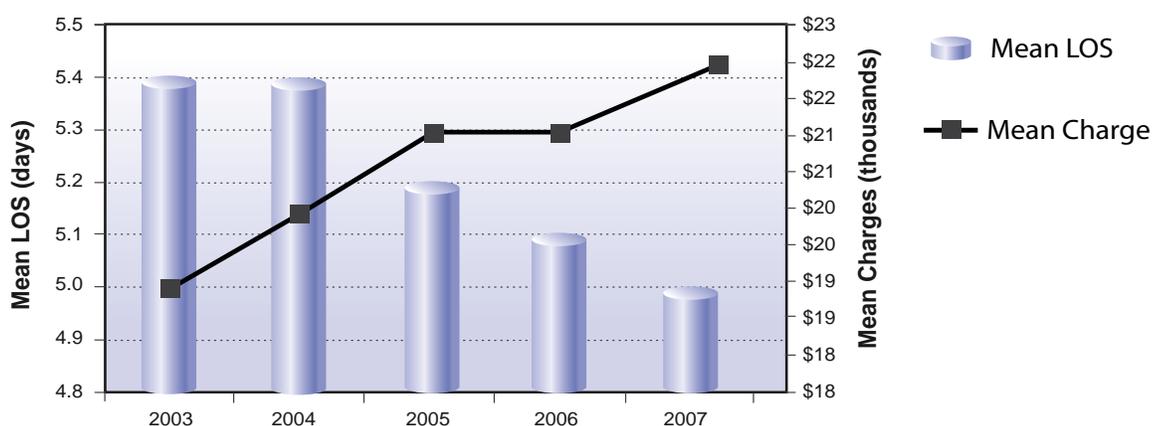
¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

² ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

³ ICD-9-CM Codes: CVD (390-448).

Figure 12

Mean Charges¹ and Length of Stay² (LOS) among Hospital Discharges with Primary Diagnosis of Diabetes³ and Any Diagnosis of CVD⁴ by Year, Ohio 2003–2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected

² Number of days divided by number of hospital discharges.

³ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

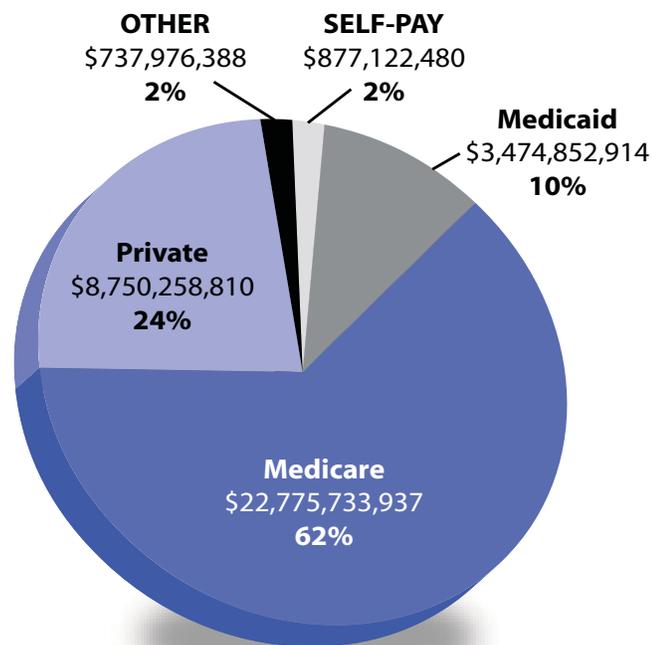
⁴ ICD-9-CM Codes: CVD (390-448).

Primary Payer

Medicare was the primary payer among hospital discharges with diabetes as any diagnosis, responsible for 62 percent of all discharged charges, followed by private insurance, and Medicaid (Figure 13). By age group (Figure 14), Medicaid was the primary payer for those aged 24 years and younger, while Medicare was responsible for over 90 percent of discharged charges among those aged 65 years and older. Similar patterns were observed among hospital discharges with diabetes as primary diagnosis, type 1 and type 2 diabetes (Figures 15, 16, 17).

Figure 13

Total Charges¹ for Hospital Discharges with Diabetes² as Any Diagnosis by Primary Payer, Ohio 2003–2007.



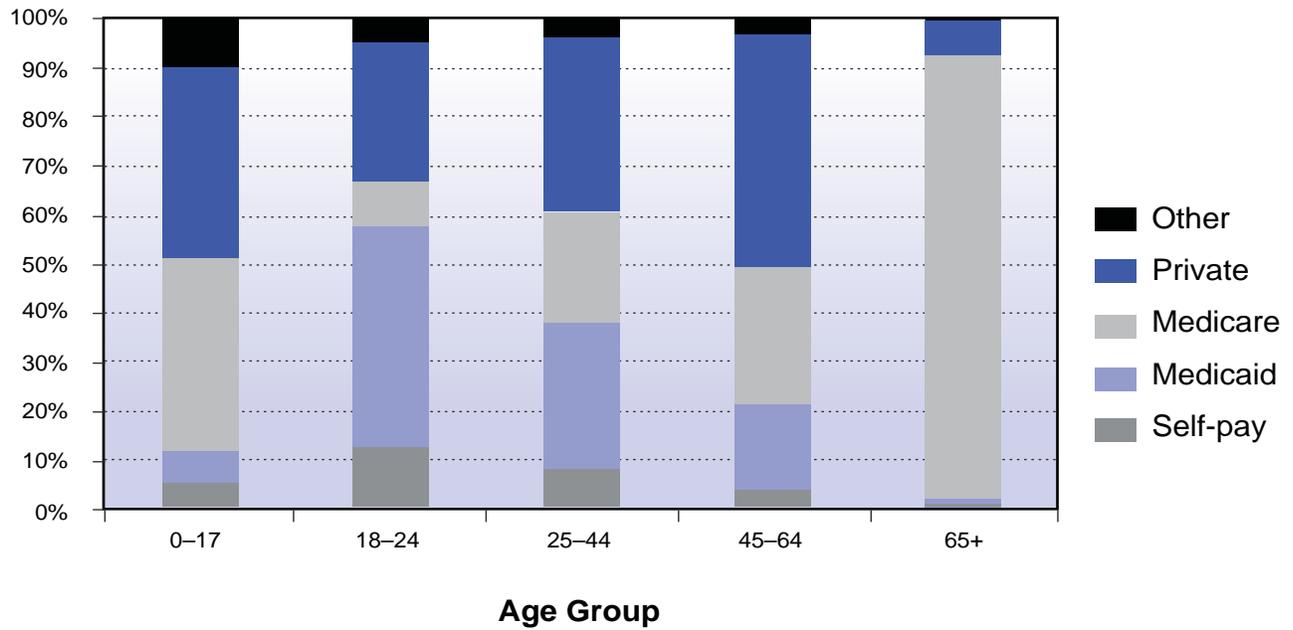
Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

² ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Figure 14

Percent of Total Charges¹ for Discharges with Diabetes² as Any Diagnosis by Primary Payer and Age Group, Ohio 2003–2007.



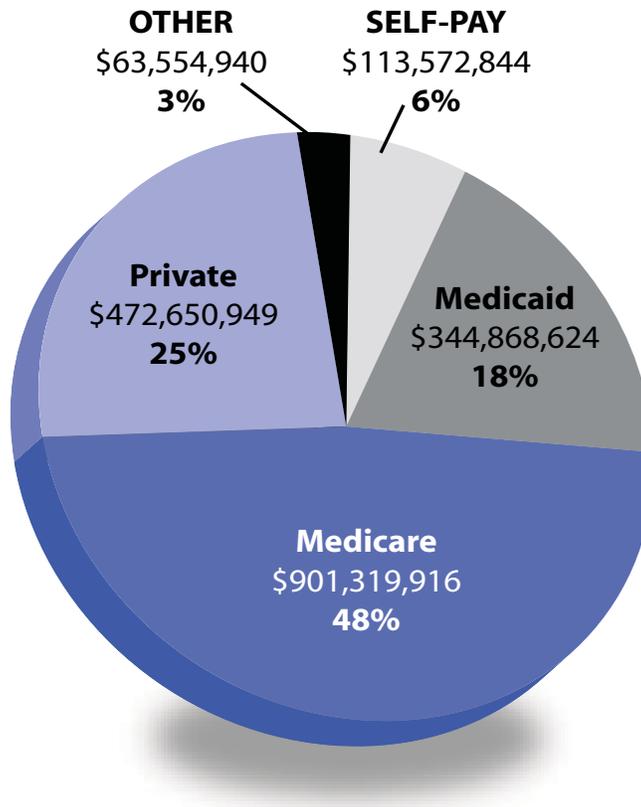
Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

² ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Figure 15

Total Charges^{1,2} for Hospital Discharges with Diabetes² as Primary Diagnosis by Primary Payer, Ohio 2003–2007.



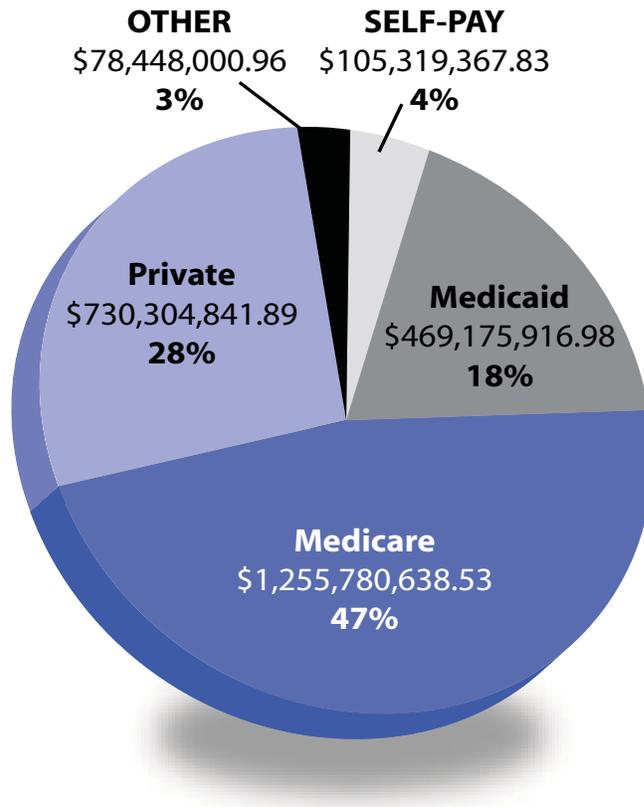
Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

² ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Figure 16

Total Charges¹ for Hospital Discharges with Type 1 Diabetes² as Any Diagnosis by Primary Payer, Ohio 2003–2007.



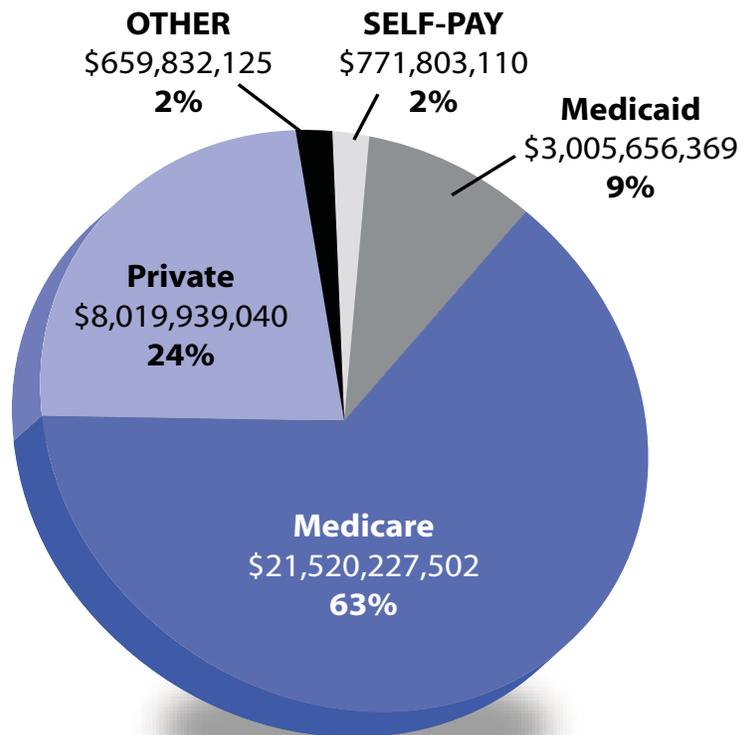
Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

² ICD-9-CM Codes Type 1 Diabetes: The fifth digit sub classification of 250.x1 and 250.x3.

Figure 17

Total Charges¹ for Hospital Discharges with Type 2 Diabetes² as Any Diagnosis by Primary Payer, Ohio 2003–2007.



Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ Adjusted for medical cost inflation comparing each year to 2007; charges represent total amount billed, not actual amount collected.

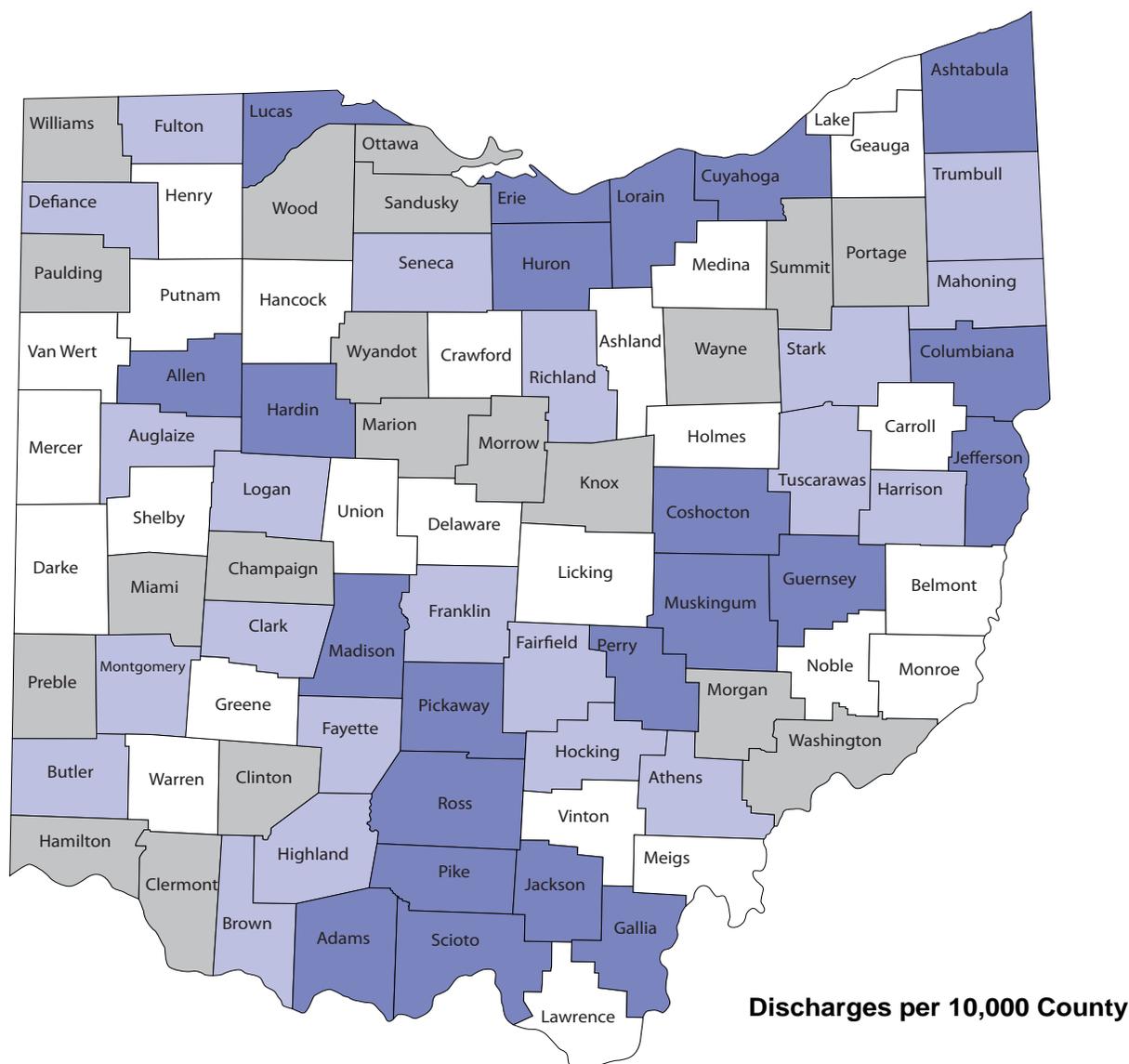
² ICD-9-CM Codes Type 2 Diabetes: The fifth digit sub classification of 250.x0 and 250.x2.

County Hospital Discharges

The southern part of Ohio (in a portion of the Appalachian region) had some of the highest number of discharges per 10,000 county residents.

Figure 18

Hospital Discharges with Any Mention of Diabetes¹ as a Listed Diagnosis per 10,000 Residents by County, Ohio 2003-2007



* Ohio rate - 345 per 10,000 Ohio residents

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41) Diabetes in pregnancy but not gestational (648.00-648.04).

Appendix A: Description of Data

The hospital discharge data was collected by the Ohio Hospital Association and provided to the Ohio Department of Health for analysis. Data collected between 2003-2007 were analyzed for this report.

Diabetes was defined by the following range of ICD-9-CM Codes:

- Diabetes (250.0–250.9)
- Polyneuropathy in diabetes (357.2)
- Diabetic retinopathy (362.01–362.02)
- Diabetic cataract (366.41)
- Diabetes mellitus complicating pregnancy, childbirth, or the puerium, but not gestational diabetes (648.00-648.04).

ICD-9-CM codes were also used to differentiate between Type 1 and Type 2 diabetes. The fifth digit of the ICD-9-CM code (i.e., y in 250.xy) classifies the type of diabetes. The following specifies the definition of the fifth-digit categorization. Note that this classification is based on the definition of “insulin dependent”.

- Fifth-digit 0 sub-classifies the diagnosis as Type 2 [non-insulin dependent type] [adult-onset type] or unspecified type, not stated as uncontrolled.
- Fifth-digit 1 sub-classifies the diagnosis as Type 1 [insulin dependent type] [juvenile type], not stated as uncontrolled.
- Fifth-digit 2 sub-classifies the diagnosis as Type 2 [non-insulin dependent type] [adult-onset type] or unspecified type, uncontrolled. The fifth-digit 2 is for type II, adult-onset, diabetic patients, even if the patient requires insulin.
- Fifth-digit 3 sub-classifies the diagnosis as Type 1 [insulin dependent type] [juvenile type], uncontrolled.

The variables analyzed included the number of diabetes-related discharges, average length of stay in the hospital in days, rates per 10,000 of the resident population, and crude and age-adjusted rates per 10,000 of the estimated diabetic population by age, gender, select comorbid conditions (listed below), diabetes type, primary payer, and county of residence. “Any mention of diabetes” referred to a diagnosis of diabetes being present in one of the 15 available diagnosis fields in the hospital record. Hospital discharges with invalid dates of birth, age, unknown sex, and lengths of stay greater than 365 days were excluded from the analysis. All analyses were performed using SAS version 9.1 (SAS Institute, Cary, NC).

Co-morbid conditions were defined by the listed ICD-9-CM codes.

- 1) Diabetes with other coma: Diabetes with other coma (250.3)
- 2) Diabetes with hyperosmolarity: Diabetes with hyperosmolarity (250.2)
- 3) Diabetes with ketoacidosis: Diabetes with ketoacidosis (250.1)

- 4) Diabetes with neurological manifestations: Diabetes with neurological manifestations (250.6)
- 5) Diabetes with Peripheral Circulatory Disorders: Diabetes with Peripheral Circulatory Disorders (250.7)
- 6) End-stage renal disease (ESRD): Procedure codes for chronic dialysis (39.95) or renal transplantation (55.60–55.69), or disease codes kidney transplant (V42.0), renal dialysis status (V45.1), chronic renal failure (585).
- 7) Kidney disease: Diabetes with renal manifestations (250.4), nephrotic syndrome (581.81), nephritis and nephropathy (583.81), acute renal failure (584), renal failure (586), renal sclerosis (587), disorders resulting for impaired renal function (588), infections of kidney (590).
- 8) Vision disorders: Diabetes with ophthalmic manifestations (250.5), or disorders of the eye and adnexa (360–379).
- 8) Non-traumatic amputation of the lower limb: Lower limb amputation procedure code (84.1) in the absence of lower limb amputation disease codes (895–897).
- 9) Ischemic heart disease: Ischemic heart disease (410–414)
- 10) Heart failure: Heart failure (428)
- 11) Hypertensive disease: Hypertensive disease (401–405)
- 12) Major cardiovascular disease: Major cardiovascular disease (390–448)
- 13) Cerebrovascular disease: Stroke (430–438)
- 14) Pneumonia or influenza: Pneumonia or influenza (480.0–487.8)

Two methods were used to calculate hospital discharge rates. Crude rates were calculated by using the estimate for Ohio's resident population as the denominator. Age-adjusted rates were calculated using the direct method to the U.S. 2000 standard population. Both rates were calculated as the number of hospital discharges per 10,000 persons. The Ohio resident population was obtained from the U.S. Census Bureau using the censal 2000 population estimates and the 2003-2007 intercensal population estimates.

The estimated diabetic population was determined by applying the estimated prevalence of persons diagnosed with diabetes from the Ohio Behavioral Risk Factor Surveillance System (2003-2007) to the census estimates of each Ohio County for the corresponding years. Two different methods were used to calculate hospital discharge rates. In the first method, rates were calculated by using the estimate for Ohio's resident population as the denominator. In the second method, rates were calculated using the synthetic estimates of the number of persons diagnosed with diabetes in Ohio as the denominator. Both rates were calculated as the number of hospital discharges per 10,000 persons. The two rates provide different outlooks on the impact of diabetes hospitalizations in Ohio. Rates with the Ohio population as the denominator are useful to describe hospitalization discharges for diabetes and co-morbid conditions in the entire Ohio population. Rates using the estimated number of persons with diabetes as the denominator describes diabetes-related hospitalization rates for the Ohio diabetic population rather than for all Ohioans.

Appendix B: County Tables

Table B.1.

Hospital Discharges with Any Mention of Diabetes¹ as a Listed Diagnosis by County, Number of Discharges, Discharge per 10,000 Residents, Number of Days and Mean Length of Stay², Ohio 2003-2007.

County	Number of Hospital Discharges	Age-Adjusted Discharges per 10,000 County Residents	Length of Stay	
			Number of Days	Mean Length of Stay in Days ²
Adams	5,018	331	21,434	4.3
Allen	16,978	290	88,348	5.2
Ashland	5,524	184	25,557	4.6
Ashtabula	16,220	277	79,442	4.9
Athens	6,059	241	30,451	5.0
Auglaize	7,187	270	35,680	5.0
Belmont	8,686	192	42,707	4.9
Brown	5,563	247	23,564	4.2
Butler	42,662	259	214,210	5.0
Carroll	2,761	160	15,448	5.6
Champaign	4,690	219	20,905	4.5
Clark	21,884	265	107,351	4.9
Clermont	19,450	221	92,920	4.8
Clinton	5,056	235	21,804	4.3
Columbiana	18,777	287	95,382	5.1
Coshocton	5,842	277	26,880	4.6
Crawford	5,383	197	26,624	4.9
Cuyahoga	213,912	277	1,103,393	5.2
Darke	5,485	175	24,819	4.5
Defiance	5,306	242	22,733	4.3
Delaware	9,241	163	42,820	4.6
Erie	14,085	285	75,752	5.4
Fairfield	16,723	253	89,402	5.3
Fayette	3,776	240	17,829	4.7
Franklin	127,872	263	679,424	5.3
Fulton	5,523	244	25,008	4.5
Gallia	4,875	279	27,224	5.6
Geauga	7,553	143	35,926	4.8
Greene	15,011	193	78,333	5.2
Guernsey	6,632	285	28,145	4.2
Hamilton	107,428	237	554,899	5.2
Hancock	7,023	179	31,746	4.5
Hardin	5,266	325	24,462	4.6
Harrison	2,737	262	14,197	5.2
Henry	3,212	197	14,495	4.5
Highland	5,546	246	24,273	4.4
Hocking	4,014	251	18,751	4.7
Holmes	2,996	171	14,326	4.8
Huron	9,622	310	44,952	4.7
Jackson	5,387	298	25,132	4.7
Jefferson	15,310	325	82,439	5.4
Knox	6,995	224	33,649	4.8
Lake	26,640	195	137,828	5.2
Lawrence	6,824	194	32,656	4.8
Licking	14,133	177	63,738	4.5
Logan	6,397	249	29,817	4.7
Lorain	44,894	284	217,733	4.8
Lucas	66,268	286	350,964	5.3
Madison	5,997	295	29,041	4.8
Mahoning	40,023	254	221,081	5.5
Marion	8,431	233	37,466	4.4
Medina	14,258	179	69,267	4.9
Meigs	2,486	185	12,632	5.1
Mercer	4,175	182	20,415	4.9
Miami	12,883	228	66,915	5.2
Monroe	1,731	177	7,644	4.4
Montgomery	74,846	247	404,018	5.4
Morgan	1,890	209	9,383	5.0
Morrow	3,333	199	14,833	4.5
Muskingum	14,902	309	75,727	5.1
Noble	1,433	194	6,420	4.5
Ottawa	6,238	234	30,236	4.8
Paulding	2,349	219	10,845	4.6
Perry	5,141	289	26,643	5.2
Pickaway	7,625	284	37,536	4.9
Pike	5,472	367	23,037	4.2
Portage	17,429	232	81,562	4.7
Preble	5,527	234	27,757	5.0
Putnam	3,575	192	18,666	5.2
Richland	17,550	238	95,093	5.4
Ross	12,786	324	55,168	4.3
Sandusky	7,354	210	34,365	4.7
Scioto	18,193	415	94,003	5.2
Seneca	8,325	259	35,886	4.3
Shelby	5,038	206	24,374	4.8
Stark	57,692	254	327,171	5.7
Summit	72,192	237	377,990	5.2
Trumbull	37,023	275	202,710	5.5
Tuscarawas	13,446	247	71,083	5.3
Union	3,828	197	16,196	4.2
Van Wert	2,806	167	12,992	4.6
Vinton	2,170	315	9,504	4.4
Warren	15,072	183	73,334	4.9
Washington	8,607	226	41,062	4.8
Wayne	13,683	230	64,921	4.7
Williams	4,461	201	24,357	5.5
Wood	12,554	211	59,278	4.7
Wyandot	2,696	199	12,030	4.5
Total	1,529,646	248	7,798,213	5.1

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.2.

Hospital Discharges with Diabetes¹ Listed as Primary Diagnosis by County, Number of Discharges, Discharge per 10,000 Residents, Number of Days and Mean Length of Stay², Ohio 2003-2007.

County	Number of Hospital Discharges	Age-Adjusted Discharges per 10,000 County Residents	Length of Stay		County	Number of Hospital Discharges	Age-Adjusted Discharges per 10,000 County Residents	Length of Stay	
			Number of Days	Mean Length of Stay in Days ²				Number of Days	Mean Length of Stay in Days ²
Adams	298	20	1,202	4.0	Logan	351	15	1,434	4.1
Allen	858	16	3,577	4.2	Lorain	2,803	18	12,659	4.5
Ashland	319	11	1,499	4.7	Lucas	5,235	23	23,837	4.6
Ashtabula	988	18	4,583	4.6	Madison	419	20	1,941	4.6
Athens	481	18	2,045	4.3	Mahoning	2,746	20	13,329	4.9
Auglaize	330	13	1,256	3.8	Marion	685	20	3,894	5.7
Belmont	427	10	2,119	5.0	Medina	891	11	4,205	4.7
Brown	379	17	1,547	4.1	Meigs	168	14	602	3.6
Butler	2,545	15	11,263	4.4	Mercer	190	9	740	3.9
Carroll	120	7	688	5.7	Miami	797	15	3,600	4.5
Champaign	239	12	925	3.9	Monroe	85	9	351	4.1
Clark	1,494	20	6,515	4.4	Montgomery	5,299	19	24,618	4.6
Clermont	1,117	12	5,001	4.5	Morgan	79	10	285	3.6
Clinton	385	18	1,392	3.6	Morrow	197	11	888	4.5
Columbiana	1,310	22	5,664	4.3	Muskingum	870	20	4,016	4.6
Coshocton	352	18	1,638	4.7	Noble	96	13	442	4.6
Crawford	356	14	1,768	5.0	Ottawa	299	13	1,279	4.3
Cuyahoga	17,375	24	80,302	4.6	Paulding	116	11	529	4.6
Darke	317	11	1,127	3.6	Perry	335	19	1,560	4.7
Defiance	322	17	1,297	4.0	Pickaway	482	18	2,016	4.2
Delaware	601	9	2,738	4.6	Pike	271	19	1,164	4.3
Erie	741	17	3,277	4.4	Portage	1,166	15	5,148	4.4
Fairfield	1,142	17	5,504	4.8	Preble	427	19	2,059	4.8
Fayette	310	21	1,333	4.3	Putnam	138	8	556	4.0
Franklin	11,173	21	51,816	4.6	Richland	1,226	18	5,794	4.7
Fulton	332	15	1,776	5.3	Ross	879	23	3,961	4.5
Gallia	305	19	1,332	4.4	Sandusky	424	13	1,833	4.3
Geauga	384	8	1,802	4.7	Scioto	1,033	25	4,632	4.5
Greene	958	12	4,111	4.3	Seneca	475	15	1,961	4.1
Guernsey	508	23	2,271	4.5	Shelby	288	12	1,310	4.5
Hamilton	8,391	19	40,503	4.8	Stark	3,172	15	15,490	4.9
Hancock	395	11	1,673	4.2	Summit	5,132	18	23,673	4.6
Hardin	194	12	751	3.9	Trumbull	2,600	22	13,128	5.0
Harrison	137	15	571	4.2	Tuscarawas	727	15	3,480	4.8
Henry	207	13	870	4.2	Union	237	11	828	3.5
Highland	328	15	1,327	4.0	Van Wert	148	10	538	3.6
Hocking	228	15	1,047	4.6	Vinton	126	19	477	3.8
Holmes	124	7	530	4.3	Warren	918	10	3,896	4.2
Huron	537	18	2,312	4.3	Washington	460	14	1,821	4.0
Jackson	345	20	1,285	3.7	Wayne	663	11	2,707	4.1
Jefferson	805	20	3,929	4.9	Williams	208	10	1,012	4.9
Knox	459	15	2,344	5.1	Wood	764	13	3,103	4.1
Lake	1,525	12	7,210	4.7	Wyandot	156	12	590	3.8
Lawrence	442		1,974	4.5					
Licking	1,157	15	4,674	4.0					
					Total	105,521	18	483,754	4.6

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.3.

Hospital Discharges per 10,000 Residents with Any Mention of Diabetes¹ as a Listed Diagnosis by County and Age, Ohio 2003-2007.

County	Age Group (Years)							
	15-24		25-34		35-44		45-54	
	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents
Adams	90	49	101	49	320	166	700	355
Allen	122	16	444	68	1009	145	2248	291
Ashland	38	9	87	26	269	76	609	158
Ashtabula	92	14	333	52	882	123	1947	250
Athens	59	5	240	60	324	99	810	240
Auglaize	52	17	120	45	315	94	911	256
Belmont	61	14	121	29	375	80	1006	183
Brown	86	30	147	49	333	100	814	256
Butler	538	19	1139	50	2906	114	6625	261
Carrroll	17	10	34	19	95	48	300	132
Champaign	49	19	92	38	213	74	675	235
Clark	296	31	592	70	1234	131	2805	272
Clermont	196	16	469	36	1208	82	3052	211
Clinton	89	30	142	48	284	94	750	244
Columbiana	200	29	377	54	783	102	2335	267
Coshocton	81	34	137	60	238	94	791	288
Crawford	42	16	99	35	301	99	657	196
Cuyahoga	2156	26	5306	69	13425	138	30993	303
Darke	62	19	145	46	238	65	611	159
Defiance	59	23	98	41	227	90	822	273
Delaware	80	8	231	20	526	44	1275	120
Erie	81	17	248	60	622	119	1466	237
Fairfield	203	22	333	34	865	84	2171	214
Fayette	49	29	146	78	350	177	515	247
Franklin	2242	28	4519	52	10237	119	21375	278
Fulton	34	12	158	63	257	84	642	192
Gallia	75	35	95	49	227	110	621	264
Geauga	32	5	75	17	225	36	644	81
Greene	253	17	395	44	920	92	1965	174
Guernsey	106	42	182	71	402	142	982	329
Hamilton	1634	27	3024	59	7844	127	17081	267
Hancock	69	13	190	39	423	84	856	160
Hardin	39	12	59	29	309	158	757	365
Harrison	17	19	31	34	75	72	301	240
Henry	46	23	66	37	154	77	389	178
Highland	67	25	132	44	359	125	697	240
Hocking	30	17	73	38	200	100	543	249
Holmes	27	9	38	12	114	46	312	138
Huron	104	27	211	52	448	107	1026	239
Jackson	81	37	76	32	279	118	748	312
Jefferson	120	26	290	80	768	171	2093	371
Knox	81	17	161	45	403	104	888	214
Lake	216	15	355	26	1078	62	2605	139
Lawrence	87	22	193	46	603	136	1134	255
Licking	187	18	369	39	817	72	2090	181
Logan	57	19	108	36	264	82	778	225
Lorain	399	20	855	46	2852	131	6008	265

Table B.3. Continued

Hospital Discharges per 10,000 Residents with Any Mention of Diabetes¹ as a Listed Diagnosis by County and Age, Ohio 2003-2007.

County	Age Group (Years)							
	15-24		25-34		35-44		45-54	
	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents
Lucas	922	28	2075	70	4538	147	10692	328
Madison	60	21	170	58	368	110	744	245
Mahoning	423	26	847	63	1845	116	4656	238
Marion	99	23	207	46	524	106	1324	268
Medina	175	17	214	21	614	48	1466	111
Meigs	23	16	55	37	118	73	316	180
Mercer	44	16	53	22	149	55	474	156
Miami	158	25	281	46	700	97	1487	195
Monroe	7	8	14	18	62	65	172	151
Montgomery	1053	28	2061	61	5423	141	11220	282
Morgan	10	11	38	45	111	109	193	185
Morrow	28	12	72	31	237	95	429	162
Muskingum	132	23	335	62	846	144	1848	303
Noble	6	5	29	26	79	73	160	165
Ottawa	26	10	63	28	217	78	681	202
Paulding	20	15	65	56	97	71	263	177
Perry	58	25	106	46	285	111	677	271
Pickaway	92	25	157	42	435	105	1102	286
Pike	40	22	124	60	303	152	702	368
Portage	307	21	411	41	910	84	2153	190
Preble	106	39	89	35	305	100	735	224
Putnam	12	5	36	19	183	76	379	146
Richland	193	24	455	57	1016	115	2377	247
Ross	160	34	390	72	715	121	1747	307
Sandusky	59	15	148	40	359	86	932	196
Scioto	178	33	461	88	939	182	2347	441
Seneca	37	8	144	41	286	76	921	209
Shelby	34	11	112	36	357	100	674	192
Stark	393	16	988	45	2883	111	6505	221
Summit	684	19	1666	50	4100	102	9604	227
Trumbull	294	22	820	66	1810	123	4289	255
Tuscarawas	102	18	207	35	660	107	1363	195
Union	50	18	116	34	239	62	453	136
Van Wert	29	15	62	34	160	83	347	159
Vinton	8	10	74	75	105	113	334	342
Warren	166	14	342	24	945	58	1901	134
Washington	122	29	205	58	333	79	1085	220
Wayne	145	17	220	31	687	89	1491	180
Williams	38	15	71	28	173	64	471	159
Wood	155	11	247	33	612	78	1645	187
Wyandot	16	11	62	43	81	53	230	135
Total	17,465	22	37,128	51	91,409	111	210,012	245

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Appendix B: County Tables

Table B.3. Continued

Hospital Discharges per 10,000 Residents with Any Mention of Diabetes¹ as a Listed Diagnosis by County and Age, Ohio 2003-2007.

County	Age Group (Years)							
	55-64		65-74		75-84		85+	
	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents
Adams	1231	824	1387	1309	908	1453	265	1161
Allen	3556	637	4194	1161	4033	1439	1285	1122
Ashland	1086	377	1521	781	1299	989	597	1009
Ashtabula	3333	589	4081	1102	4059	1510	1436	1371
Athens	1303	515	1509	949	1306	1245	475	1183
Auglaize	1214	516	1853	1177	1912	1479	773	1350
Belmont	1675	422	2045	728	2377	1024	1004	1072
Brown	1311	586	1478	969	1000	1106	371	1263
Butler	8933	527	10314	1000	9450	1437	2566	1177
Carroll	632	351	711	625	755	1018	214	851
Champaign	1080	453	1230	892	1028	1221	302	826
Clark	4842	575	5576	1032	4889	1274	1516	1003
Clermont	4511	472	4656	852	4072	1251	1182	1124
Clinton	1140	546	1367	1002	936	1047	329	926
Columbiana	3651	585	5023	1192	4814	1534	1518	1466
Coshocton	1127	548	1567	1111	1460	1517	429	1272
Crawford	1213	459	1588	856	1113	869	350	690
Cuyahoga	40097	566	49091	1044	52291	1367	19903	1281
Darke	1076	364	1345	683	1357	935	619	873
Defiance	1037	472	1359	981	1223	1247	464	1211
Delaware	2060	315	2367	695	2101	1081	544	875
Erie	2919	589	3590	1122	3837	1632	1281	1510
Fairfield	3605	500	4462	1068	3877	1526	1142	1236
Fayette	759	482	960	916	731	987	256	1000
Franklin	27999	567	29123	1037	24172	1294	7551	1147
Fulton	1197	535	1387	1007	1358	1393	454	1112
Gallia	930	531	1302	1036	1193	1622	420	1643
Geauga	1424	232	2075	590	2147	1011	890	1120
Greene	3022	357	3874	761	3427	1067	1048	1008
Guernsey	1454	635	1709	1043	1345	1318	412	1062
Hamilton	21524	501	24209	881	23597	1141	8042	935
Hancock	1438	375	1638	682	1706	999	660	818
Hardin	1124	713	1323	1240	1132	1583	499	1748
Harrison	565	581	663	1009	809	1626	271	1241
Henry	730	479	799	780	689	944	312	961
Highland	1135	512	1387	892	1290	1344	454	1200
Hocking	980	571	1177	1064	813	1308	192	930
Holmes	697	434	836	729	709	963	252	820
Huron	2091	684	2532	1277	2457	1824	723	1496
Jackson	1304	760	1422	1216	1146	1408	303	1017
Jefferson	2832	653	3844	1181	4021	1643	1314	1495
Knox	1456	489	1825	878	1685	1198	461	890
Lake	4654	335	6694	781	7933	1271	3015	1428
Lawrence	1519	422	1674	681	1272	809	321	617
Licking	3179	369	3638	689	3003	966	753	721
Logan	1223	488	1888	1125	1520	1351	534	1255

Appendix B: County Tables

Table B.3. Continued

Hospital Discharges per 10,000 Residents with Any Mention of Diabetes¹ as a Listed Diagnosis by County and Age, Ohio 2003-2007.

County	Age Group (Years)							
	55-64		65-74		75-84		85+	
	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents	Number of Discharges	Discharges per 10,000 County Residents
Lorain	8602	536	11386	1144	11415	1659	3224	1332
Lucas	14375	635	14667	1075	14241	1346	4528	1077
Madison	1270	618	1639	1247	1344	1680	352	1207
Mahoning	7137	508	9282	971	11462	1355	4181	1304
Marion	1974	549	2109	923	1704	1058	467	828
Medina	2765	300	3760	744	3803	1207	1369	1300
Meigs	486	360	566	622	661	1123	226	982
Mercer	947	473	1067	757	1054	925	371	879
Miami	2655	445	3344	895	3106	1295	1100	1229
Monroe	343	353	535	771	449	1032	143	899
Montgomery	14857	499	17363	880	16961	1197	5577	1101
Morgan	335	378	579	861	485	1234	135	847
Morrow	724	388	761	674	801	1299	267	1180
Muskingum	3164	700	3971	1262	3475	1569	1087	1153
Noble	327	513	403	785	337	1066	90	733
Ottawa	1124	419	1926	1069	1631	1360	547	1238
Paulding	425	374	565	809	654	1473	255	1375
Perry	1182	649	1374	1206	1116	1514	318	1224
Pickaway	1901	674	1972	1095	1588	1573	347	1051
Pike	1081	796	1388	1416	1443	2178	385	1341
Portage	3400	420	4502	928	4213	1398	1454	1461
Preble	1158	482	1443	910	1238	1209	411	1181
Putnam	622	379	1073	932	950	1087	298	786
Richland	3570	497	4570	918	4017	1204	1300	1058
Ross	2729	689	3306	1266	2902	1813	784	1402
Sandusky	1732	523	1839	829	1708	1073	539	786
Scioto	3945	969	5015	1681	4035	1942	1231	1612
Seneca	1575	524	2126	1064	2388	1562	825	1629
Shelby	1033	421	1243	823	1163	1159	404	869
Stark	11482	524	14124	1007	15804	1445	5361	1297
Summit	14532	491	16529	896	18359	1277	6380	1253
Trumbull	7240	543	9693	1115	9384	1427	3311	1373
Tuscarawas	2519	496	3458	998	3855	1485	1242	1218
Union	902	424	1019	885	803	1168	231	862
Van Wert	582	365	759	718	651	780	201	623
Vinton	537	762	541	1144	452	1727	112	1203
Warren	3163	360	3980	767	3259	1080	1214	1223
Washington	1723	469	2287	880	2076	1193	747	1167
Wayne	2802	474	3600	933	3569	1404	1116	1152
Williams	900	439	1122	815	1206	1210	465	1056
Wood	8519	414	2971	832	3231	1289	1127	1139
Wyandot	524	440	817	942	718	1118	235	851
Total	316,731	513	372,967	968	361,963	1312	121,659	1170

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

Appendix B: County Tables

Table B.4.

Hospital Discharges with Any Mention of Diabetes¹ and Ketoacidosis² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	108	456	4.2	7.6	8
Allen	294	1,182	4.0	5.7	6
Ashland	114	378	3.3	4.3	4
Ashtabula	271	1,256	4.6	5.3	5
Athens	203	693	3.4	6.9	6
Auglaize	116	414	3.6	5.1	5
Belmont	85	468	5.5	2.6	2
Brown	158	551	3.5	7.2	7
Butler	1,102	4,075	3.7	6.2	6
Carroll	35	134	3.8	2.4	2
Champaign	129	466	3.6	6.7	7
Clark	667	2,886	4.3	9.8	9
Clermont	418	1,644	3.9	4.4	4
Clinton	131	405	3.1	6.1	6
Columbiana	462	1,721	3.7	8.4	8
Coshocton	122	562	4.6	6.8	7
Crawford	109	486	4.5	4.7	5
Cuyahoga	5,220	23,053	4.4	7.9	8
Darke	134	490	3.7	5.2	5
Defiance	140	412	2.9	7.1	7
Delaware	213	879	4.1	2.9	3
Erie	195	836	4.3	5.3	5
Fairfield	421	1,697	4.0	6.0	6
Fayette	117	451	3.9	8.7	8
Franklin	4,280	17,650	4.1	7.6	8
Fulton	86	316	3.7	4.0	4
Gallia	84	290	3.5	5.6	5
Geauga	94	438	4.7	2.0	2
Greene	460	1,743	3.8	6.0	6
Guernsey	151	572	3.8	7.6	7
Hamilton	3,220	13,730	4.3	7.6	8
Hancock	120	367	3.1	3.3	3
Hardin	83	365	4.4	5.3	5
Harrison	35	162	4.6	4.0	4
Henry	56	226	4.0	3.8	4
Highland	130	466	3.6	6.3	6
Hocking	60	283	4.7	4.2	4
Holmes	29	90	3.1	1.5	1
Huron	170	523	3.1	5.8	6
Jackson	157	511	3.3	9.3	9
Jefferson	177	786	4.4	5.2	5
Knox	142	533	3.8	4.9	5
Lake	473	1,919	4.1	4.1	4
Lawrence	151	581	3.8	5.0	5
Licking	415	1,432	3.5	5.5	5
Logan	114	473	4.1	5.2	5
Lorain	796	3,143	3.9	5.4	5
Lucas	1,871	7,119	3.8	8.4	8
Madison	163	759	4.7	7.8	8
Mahoning	983	5,067	5.2	8.2	8
Marion	214	621	2.9	6.5	7
Medina	283	1,055	3.7	3.5	3
Meigs	62	191	3.1	5.7	5
Mercer	78	250	3.2	3.8	4
Miami	285	1,091	3.8	5.8	6
Monroe	14	67	4.8	1.8	2
Montgomery	2,108	8,802	4.2	7.9	8
Morgan	35	178	5.1	4.7	5
Morrow	68	293	4.3	3.9	4
Muskingum	316	1,469	4.6	7.5	7
Noble	24	87	3.6	3.3	3
Ottawa	95	487	5.1	4.7	5
Paulding	41	182	4.4	4.4	4
Perry	115	441	3.8	6.7	7
Pickaway	206	705	3.4	7.8	8
Pike	76	285	3.8	5.5	5
Portage	511	2,104	4.1	6.1	7
Prebble	186	704	3.8	9.4	9
Putnam	45	199	4.4	2.5	3
Richland	456	1,909	4.2	7.3	7
Ross	353	1,304	3.7	9.4	9
Sandusky	120	516	4.3	4.0	4
Scioto	392	1,460	3.7	10.3	10
Seneca	108	409	3.8	3.8	4
Shelby	73	319	4.4	3.1	3
Stark	988	3,835	3.9	5.3	5
Summit	1,925	8,280	4.3	7.1	7
Trumbull	809	3,757	4.6	7.6	7
Tuscarawas	218	744	3.4	5.0	5
Union	78	336	4.3	3.4	3
Van Wert	58	170	2.9	4.3	4
Vinton	34	121	3.6	5.1	5
Warren	397	1,467	3.7	4.1	4
Washington	178	708	4.0	5.8	6
Wayne	238	780	3.3	4.2	4
Williams	54	171	3.2	2.8	3
Wood	247	902	3.7	3.9	4
Wyandot	47	166	3.5	4.3	4
Total				6	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes for Ketoacidosis: Diabetes with Ketoacidosis (250.1).

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.5.

Hospital Discharges with Any Mention of Diabetes¹ and End Stage Renal Disease² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³ and Discharges per 10,000 Residents, Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	1,055	4,590	4.4	69	75
Allen	5,825	31,208	5.4	98	110
Ashland	1,830	8,139	4.4	60	68
Ashtabula	4,844	22,880	4.7	82	95
Athens	1,852	9,412	5.1	74	59
Auglaize	2,550	12,679	5.0	94	110
Belmont	2,455	11,566	4.7	53	71
Brown	1,529	6,656	4.4	68	70
Butler	12,526	60,350	4.8	77	72
Carroll	934	4,789	5.1	54	65
Champaign	1,255	5,621	4.5	58	64
Clark	6,250	29,640	4.7	74	88
Clermont	5,108	23,427	4.6	59	54
Clinton	1,415	6,426	4.5	66	67
Columbiana	5,469	26,661	4.9	82	100
Coshocton	1,581	7,582	4.8	74	86
Crawford	1,578	7,770	4.9	57	70
Cuyahoga	58,806	295,512	5.0	75	89
Darke	1,610	6,889	4.3	50	61
Defiance	1,482	6,145	4.1	67	77
Delaware	2,551	11,671	4.6	47	34
Erie	4,889	25,247	5.2	97	126
Fairfield	4,659	24,945	5.4	71	68
Fayette	1,015	4,744	4.7	63	72
Franklin	38,889	206,286	5.3	82	71
Fulton	1,502	6,777	4.5	66	71
Gallia	1,207	6,428	5.3	68	78
Geauga	2,243	9,841	4.4	42	48
Greene	4,603	23,325	5.1	59	59
Guernsey	1,639	6,905	4.2	69	81
Hamilton	30,645	153,004	5.0	67	72
Hancock	1,767	7,806	4.4	45	48
Hardin	1,508	7,242	4.8	93	95
Harrison	853	4,336	5.1	80	109
Henry	808	3,376	4.2	49	55
Highland	1,414	6,024	4.3	62	67
Hocking	1,011	4,834	4.8	63	70
Holmes	844	3,999	4.7	48	41
Huron	3,503	15,561	4.4	113	117
Jackson	1,380	6,144	4.5	75	83
Jefferson	4,751	24,311	5.1	97	136
Knox	2,289	9,942	4.3	72	79
Lake	8,275	41,013	5.0	60	71
Lawrence	1,452	6,789	4.7	40	47
Licking	3,652	17,043	4.7	46	48
Logan	2,024	9,115	4.5	78	87
Lorain	16,401	75,953	4.6	104	110
Lucas	19,069	95,120	5.0	82	85
Madison	1,979	9,171	4.6	99	97
Mahoning	12,181	63,938	5.2	75	99
Marion	2,905	12,679	4.4	80	88
Medina	3,775	17,037	4.5	48	46
Meigs	670	3,451	5.2	49	58
Mercer	1,278	6,333	5.0	55	63
Miami	4,053	20,267	5.0	71	81
Monroe	571	2,289	4.0	57	78
Montgomery	21,495	116,420	5.4	70	79
Morgan	689	3,374	4.9	75	94
Morrow	941	4,217	4.5	56	55
Muskingum	6,193	30,382	4.9	127	145
Noble	442	1,994	4.5	60	62
Ottawa	2,172	9,994	4.6	80	105
Paulding	648	3,104	4.8	61	67
Perry	1,857	9,317	5.0	104	107
Pickaway	2,262	11,062	4.9	85	86
Pike	1,631	6,754	4.1	109	117
Portage	4,291	18,748	4.4	57	55
Preble	1,631	7,963	4.9	68	78
Putnam	1,196	6,311	5.3	64	69
Richland	5,606	29,440	5.3	75	88
Ross	3,974	16,869	4.2	101	106
Sandusky	1,903	8,899	4.7	54	62
Scioto	4,532	24,221	5.3	101	119
Seneca	2,458	10,335	4.2	76	86
Shelby	1,189	5,722	4.8	49	49
Stark	18,772	99,163	5.3	81	99
Summit	19,134	93,796	4.9	62	70
Trumbull	11,216	58,281	5.2	81	103
Tuscarawas	3,891	19,423	5.0	71	85
Union	1,193	5,079	4.3	63	52
Van Wert	659	3,017	4.6	38	45
Vinton	628	2,867	4.6	90	95
Warren	4,480	22,067	4.9	56	46
Washington	2,458	11,762	4.8	63	79
Wayne	4,054	18,580	4.6	68	72
Williams	1,125	6,342	5.6	50	59
Wood	3,465	16,140	4.7	58	56
Wyandot	750	3,374	4.5	55	66
Total				72	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes for ESRD: Chronic Dialysis (39.95) or Renal Transplantation (55.60-55.69), or Disease Codes: Chronic Renal Failure (585) or Kidney Transplant (V42.0) or Renal Dialysis Status (V45.1).

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.6.

Hospital Discharges with Any Mention of Diabetes¹ and Kidney Disease Disorders² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	466	3,130	6.7	30	33
Allen	1,427	10,352	7.3	24	27
Ashland	781	4,978	6.4	26	29
Ashtabula	1,901	12,610	6.6	32	37
Athens	718	5,476	7.6	29	23
Auglaize	619	4,175	6.7	23	27
Belmont	687	4,325	6.3	15	20
Brown	733	4,500	6.1	33	34
Butler	5,682	40,050	7.0	35	33
Carroll	385	3,022	7.8	22	27
Champaign	539	3,288	6.1	25	27
Clark	2,549	17,932	7.0	31	36
Clermont	2,491	17,957	7.2	29	26
Clinton	589	3,954	6.7	27	28
Columbiana	2,481	17,274	7.0	38	45
Coshocton	703	4,539	6.5	33	38
Crawford	748	5,166	6.9	27	33
Cuyahoga	32,825	222,358	6.8	42	50
Darke	651	4,175	6.4	20	25
Defiance	541	3,308	6.1	25	28
Delaware	1,295	9,166	7.1	23	17
Erie	1,717	13,215	7.7	35	44
Fairfield	2,451	19,052	7.8	37	36
Fayette	608	4,278	7.0	38	43
Franklin	23,421	174,630	7.5	49	43
Fulton	765	4,901	6.4	34	36
Gallia	548	4,099	7.5	31	35
Geauga	1,007	6,196	6.2	19	21
Greene	2,411	16,940	7.0	31	31
Guernsey	607	3,908	6.4	26	30
Hamilton	17,740	123,978	7.0	39	42
Hancock	759	4,566	6.0	19	21
Hardin	466	3,018	6.5	29	29
Harrison	329	2,217	6.7	31	42
Henry	399	2,257	5.7	24	27
Highland	553	3,715	6.7	24	26
Hocking	457	3,199	7.0	29	32
Holmes	406	2,665	6.6	23	20
Huron	1,337	8,866	6.6	43	45
Jackson	656	4,389	6.7	36	40
Jefferson	958	7,409	7.7	20	27
Knox	881	6,048	6.9	28	30
Lake	3,467	23,795	6.9	25	30
Lawrence	769	5,206	6.8	22	25
Licking	1,970	13,685	6.9	25	26
Logan	691	4,436	6.4	27	30
Lorain	6,874	48,300	7.0	43	46
Lucas	10,462	73,879	7.1	45	47
Madison	897	6,397	7.1	44	44
Mahoning	6,438	49,109	7.6	41	52
Marion	888	5,784	6.5	24	27
Medina	1,693	11,629	6.9	21	20
Meigs	322	2,177	6.8	24	28
Mercer	385	2,540	6.6	17	19
Miami	1,435	10,559	7.4	25	29
Monroe	244	1,273	5.2	25	34
Montgomery	13,111	94,960	7.2	43	48
Morgan	262	1,864	7.1	29	36
Morrow	445	2,898	6.5	26	26
Muskingum	2,055	14,135	6.9	43	48
Noble	170	1,010	5.9	23	24
Ottawa	877	6,407	7.3	33	43
Paulding	238	1,341	5.6	22	25
Perry	732	5,504	7.5	41	42
Pickaway	1,168	8,342	7.1	43	44
Pike	872	5,236	6.0	58	62
Portage	1,483	9,848	6.6	20	19
Preble	815	5,815	7.1	34	39
Putnam	282	1,858	6.6	15	16
Richland	2,626	18,388	7.0	36	41
Ross	1,835	11,691	6.4	46	49
Sandusky	909	6,024	6.6	26	30
Scioto	2,600	19,283	7.4	58	68
Seneca	1,135	6,184	5.4	35	40
Shelby	423	3,016	7.1	17	17
Stark	8,364	63,271	7.6	37	44
Summit	8,579	63,292	7.4	28	31
Trumbull	4,820	36,915	7.7	36	44
Tuscarawas	2,435	16,852	6.9	44	53
Union	486	2,883	5.9	25	21
Van Wert	222	1,797	8.1	13	15
Vinton	296	1,940	6.6	43	45
Warren	2,202	15,663	7.1	27	23
Washington	1,139	7,521	6.6	30	37
Wayne	1,661	11,246	6.8	28	29
Williams	364	2,493	6.8	16	19
Wood	1,599	11,004	6.9	27	26
Wyandot	282	1,900	6.7	21	25
Unknown					
Total				35	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes for Kidney Disease: Diabetes with renal manifestations (250.4), Nephrotic syndrome (581.81), Nephritis and nephropathy (583.81), Acute renal failure (584), Renal failure (586), Renal sclerosis (587), Disorders resulting from impaired renal function (588), and Infections of kidney (590).

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.7.

Hospital Discharges with Any Mention of Diabetes¹ and Major Cardiovascular Diseases² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	4,121	17,787	4.3	269	293
Allen	15,094	79,896	5.3	255	286
Ashland	4,967	23,091	4.6	164	184
Ashtabula	14,311	70,222	4.9	242	281
Athens	5,161	26,721	5.2	207	164
Auglaize	6,366	31,933	5.0	236	274
Belmont	7,451	36,903	5.0	162	217
Brown	4,811	20,769	4.3	213	220
Butler	36,892	186,987	5.1	225	211
Carroll	2,464	13,776	5.6	142	171
Champaign	4,022	18,056	4.5	186	205
Clark	18,880	93,376	4.9	224	267
Clermont	16,761	80,873	4.8	192	177
Clinton	4,100	18,097	4.4	190	194
Columbiana	16,559	85,438	5.2	250	302
Coshocton	5,084	23,647	4.7	238	278
Crawford	4,598	22,923	5.0	166	204
Cuyahoga	189,710	988,515	5.2	242	286
Darke	4,681	21,463	4.6	146	178
Defiance	4,678	20,161	4.3	211	242
Delaware	8,008	37,633	4.7	145	108
Erie	12,731	68,943	5.4	253	327
Fairfield	14,595	79,887	5.5	222	213
Fayette	3,199	15,426	4.8	200	227
Franklin	111,339	605,851	5.4	232	202
Fulton	4,777	21,777	4.6	210	225
Gallia	4,372	24,800	5.7	248	283
Geauga	6,743	32,420	4.8	127	143
Greene	13,102	68,838	5.3	168	168
Guernsey	5,452	23,163	4.2	231	268
Hamilton	93,357	485,583	5.2	205	220
Hancock	6,107	27,818	4.6	154	166
Hardin	4,726	22,272	4.7	290	298
Harrison	2,442	12,855	5.3	230	313
Henry	2,730	12,323	4.5	166	188
Highland	4,662	20,797	4.5	205	221
Hocking	3,531	16,819	4.8	220	246
Holmes	2,627	12,574	4.8	151	128
Huron	8,576	40,394	4.7	276	287
Jackson	4,796	22,681	4.7	264	290
Jefferson	13,265	71,520	5.4	275	379
Knox	6,100	29,545	4.8	194	211
Lake	23,676	123,987	5.2	172	204
Lawrence	5,799	27,812	4.8	163	186
Licking	11,845	54,577	4.6	148	154
Logan	5,744	27,018	4.7	222	248
Lorain	40,178	196,217	4.9	253	269
Lucas	57,879	309,661	5.4	249	259
Madison	5,212	25,476	4.9	257	254
Mahoning	35,527	198,365	5.6	220	289
Marion	7,003	31,317	4.5	192	213
Medina	12,521	61,225	4.9	158	151
Meigs	2,266	11,708	5.2	166	197
Mercer	3,634	18,017	5.0	157	178
Miami	11,364	59,816	5.3	199	226
Monroe	1,531	6,746	4.4	155	210
Montgomery	65,250	356,111	5.5	213	240
Morgan	1,666	8,452	5.1	181	227
Morrow	2,951	13,293	4.5	177	174
Muskingum	13,088	67,627	5.2	269	307
Noble	1,228	5,502	4.5	167	173
Ottawa	5,645	27,588	4.9	209	274
Paulding	2,068	9,562	4.6	191	213
Perry	4,486	23,859	5.3	252	258
Pickaway	6,776	33,852	5.0	253	257
Pike	4,708	20,115	4.3	315	337
Portage	15,193	71,850	4.7	203	196
Preble	4,790	24,209	5.1	200	229
Putnam	3,214	17,040	5.3	171	186
Richland	15,251	83,046	5.4	204	240
Ross	11,223	48,388	4.3	284	300
Sandusky	6,353	30,117	4.7	179	208
Scioto	16,294	85,659	5.3	368	426
Seneca	7,508	32,435	4.3	232	262
Shelby	4,367	21,542	4.9	178	180
Stark	51,620	296,828	5.8	224	272
Summit	63,414	335,621	5.3	206	233
Trumbull	32,861	181,767	5.5	239	303
Tuscarawas	11,928	64,104	5.4	216	261
Union	3,395	14,457	4.3	178	149
Van Wert	2,296	10,998	4.8	134	158
Vinton	1,947	8,745	4.5	282	293
Warren	12,876	63,456	4.9	159	133
Washington	7,632	36,790	4.8	197	246
Wayne	12,156	58,565	4.8	204	215
Williams	3,888	21,572	5.5	174	202
Wood	10,741	51,600	4.8	181	174
Wyandot	2,314	10,587	4.6	169	205
Unknown					
Total				216	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes: Major Cardiovascular Diseases (390-448).

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.8.

Hospital Discharges with Any Mention of Diabetes¹ and Vision Disorders² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	193	1,191	6.2	13	14
Allen	682	4,155	6.1	12	13
Ashland	401	2,034	5.1	13	15
Ashtabula	1,200	6,230	5.2	20	24
Athens	307	1,905	6.2	12	10
Auglaize	240	1,394	5.8	9	10
Belmont	342	1,859	5.4	7	10
Brown	315	1,620	5.1	14	14
Butler	2,371	13,680	5.8	14	14
Carroll	220	1,411	6.4	13	15
Champaign	241	1,152	4.8	11	12
Clark	933	5,133	5.5	11	13
Clermont	1,073	6,135	5.7	12	11
Clinton	236	1,248	5.3	11	11
Columbiana	1,299	7,176	5.5	20	24
Coshocton	322	1,653	5.1	15	18
Crawford	273	1,485	5.4	10	12
Cuyahoga	19,135	102,012	5.3	24	29
Darke	353	1,952	5.5	11	13
Defiance	519	2,304	4.4	24	27
Delaware	630	3,553	5.6	11	8
Erie	925	5,105	5.5	19	24
Fairfield	1,113	6,752	6.1	17	16
Fayette	253	1,311	5.2	16	18
Franklin	8,823	50,902	5.8	18	16
Fulton	460	2,503	5.4	20	22
Gallia	351	2,167	6.2	20	23
Geauga	826	3,909	4.7	15	18
Greene	1,080	6,232	5.8	14	14
Guernsey	323	1,600	5.0	14	16
Hamilton	8,079	45,766	5.7	18	19
Hancock	583	2,832	4.9	15	16
Hardin	226	1,186	5.2	14	14
Harrison	114	682	6.0	11	15
Henry	265	1,275	4.8	16	18
Highland	252	1,138	4.5	11	12
Hocking	229	1,218	5.3	14	16
Holmes	200	1,195	6.0	11	10
Huron	601	3,110	5.2	19	20
Jackson	244	1,305	5.3	14	15
Jefferson	580	3,061	5.3	12	17
Knox	424	2,152	5.1	14	15
Lake	2,359	12,773	5.4	17	20
Lawrence	266	1,524	5.7	8	9
Licking	797	4,463	5.6	10	10
Logan	486	2,379	4.9	19	21
Lorain	3,603	20,458	5.7	23	24
Lucas	5,572	31,254	5.6	24	25
Madison	359	1,831	5.1	17	18
Mahoning	2,797	17,650	6.3	18	23
Marion	359	1,922	5.4	10	11
Medina	1,137	6,256	5.5	14	14
Meigs	184	1,020	5.5	14	16
Mercer	158	875	5.5	7	8
Miami	1,092	5,990	5.5	19	22
Monroe	65	435	6.7	7	9
Montgomery	5,582	34,333	6.2	18	21
Morgan	122	642	5.3	14	17
Morrow	193	1,059	5.5	11	11
Muskingum	1,014	5,456	5.4	21	24
Noble	78	404	5.2	11	11
Ottawa	467	2,253	4.8	17	23
Paulding	180	870	4.8	17	19
Perry	347	2,093	6.0	19	20
Pickaway	394	2,133	5.4	14	15
Pike	390	2,052	5.3	26	28
Portage	939	4,700	5.0	13	12
Preble	342	1,988	5.8	14	16
Putnam	156	802	5.1	8	9
Richland	1,002	6,332	6.3	14	16
Ross	887	4,472	5.0	22	24
Sandusky	504	2,457	4.9	14	16
Scioto	656	4,112	6.3	15	17
Seneca	613	2,881	4.7	19	21
Shelby	174	916	5.3	7	7
Stark	4,916	30,994	6.3	22	26
Summit	5,324	28,981	5.4	17	20
Trumbull	3,089	18,860	6.1	23	28
Tuscarawas	914	5,430	5.9	17	20
Union	232	1,118	4.8	12	10
Van Wert	79	500	6.3	5	5
Vinton	130	663	5.1	19	20
Warren	882	5,279	6.0	11	9
Washington	537	2,886	5.4	14	17
Wayne	933	4,877	5.2	16	16
Williams	179	1,203	6.7	8	9
Wood	855	4,241	5.0	14	14
Wyandot	129	729	5.7	9	11
Unknown					
Total				18	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes for Vision Disorders: Diabetes with ophthalmic manifestation (250.5) or Disorders of the eye and adnexa (360-379)

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.9.

Hospital Discharges with Any Mention of Diabetes¹ and Hypertensive Disease² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	3,070	13,091	4.3	200	219
Allen	12,113	63,093	5.2	205	229
Ashland	3,918	17,770	4.5	130	145
Ashtabula	11,239	53,136	4.7	190	221
Athens	3,906	19,665	5.0	156	124
Auglaize	4,890	24,180	4.9	182	211
Belmont	5,118	24,231	4.7	112	149
Brown	3,652	15,402	4.2	162	167
Butler	30,175	149,186	4.9	184	173
Carroll	1,997	10,914	5.5	115	138
Champaign	3,123	13,483	4.3	144	159
Clark	14,015	66,255	4.7	167	198
Clermont	12,794	59,547	4.7	146	135
Clinton	2,979	12,903	4.3	138	141
Columbiana	13,135	65,233	5.0	199	239
Coshocton	3,791	17,025	4.5	178	207
Crawford	3,480	16,861	4.8	126	155
Cuyahoga	159,213	807,725	5.1	204	240
Darke	3,688	16,595	4.5	115	140
Defiance	3,797	15,788	4.2	171	196
Delaware	6,350	29,928	4.7	117	86
Erie	10,429	55,064	5.3	208	268
Fairfield	11,549	61,657	5.3	175	169
Fayette	2,522	12,012	4.8	158	179
Franklin	94,068	498,815	5.3	196	171
Fulton	3,700	16,695	4.5	163	174
Gallia	3,554	19,734	5.6	201	230
Geauga	5,379	25,203	4.7	101	114
Greene	10,560	53,769	5.1	136	135
Guernsey	3,663	15,264	4.2	156	180
Hamilton	76,214	383,007	5.0	167	180
Hancock	4,915	21,543	4.4	124	134
Hardin	3,687	17,249	4.7	226	232
Harrison	1,817	9,557	5.3	172	233
Henry	2,117	9,313	4.4	129	145
Highland	3,383	14,676	4.3	148	160
Hocking	2,679	12,772	4.8	166	187
Holmes	2,102	9,766	4.6	121	102
Huron	6,670	30,339	4.5	214	223
Jackson	3,861	18,074	4.7	212	233
Jefferson	9,483	48,772	5.1	197	271
Knox	4,828	22,457	4.7	153	167
Lake	18,941	96,721	5.1	138	163
Lawrence	4,407	19,996	4.5	124	141
Licking	9,351	42,698	4.6	117	122
Logan	4,733	21,534	4.5	183	204
Lorain	33,178	157,917	4.8	209	223
Lucas	48,292	252,805	5.2	208	216
Madison	4,171	20,030	4.8	205	203
Mahoning	29,138	157,681	5.4	182	237
Marion	5,616	24,993	4.5	154	171
Medina	9,976	47,686	4.8	125	121
Meigs	1,879	9,613	5.1	138	163
Mercer	2,601	12,954	5.0	114	128
Miami	9,145	46,391	5.1	160	182
Monroe	1,144	4,905	4.3	116	157
Montgomery	54,774	288,754	5.3	179	201
Morgan	1,369	6,760	4.9	150	187
Morrow	2,412	10,653	4.4	145	142
Muskingum	10,500	52,634	5.0	216	246
Noble	922	4,149	4.5	125	130
Ottawa	4,476	21,091	4.7	166	217
Paulding	1,593	7,168	4.5	147	164
Perry	3,535	18,423	5.2	198	203
Pickaway	5,430	26,669	4.9	202	206
Pike	3,627	15,231	4.2	243	260
Portage	12,124	55,065	4.5	162	157
Preble	3,698	18,229	4.9	154	176
Putnam	2,623	13,516	5.2	140	151
Richland	12,572	65,381	5.2	169	198
Ross	9,032	38,065	4.2	228	241
Sandusky	4,868	22,885	4.7	138	159
Scioto	13,135	67,980	5.2	297	344
Seneca	5,880	24,695	4.2	182	206
Shelby	3,357	16,177	4.8	137	139
Stark	42,360	238,676	5.6	184	224
Summit	52,354	267,730	5.1	170	192
Trumbull	25,549	132,937	5.2	186	235
Tuscarawas	9,411	48,602	5.2	171	206
Union	2,774	11,578	4.2	145	122
Van Wert	1,688	7,803	4.6	99	116
Vinton	1,512	6,604	4.4	219	228
Warren	10,112	48,472	4.8	124	105
Washington	6,347	30,141	4.7	164	205
Wayne	9,849	46,517	4.7	165	174
Williams	3,076	16,752	5.4	138	160
Wood	8,228	38,950	4.7	139	133
Wyandot	1,764	8,042	4.6	130	156
Unknown					
Total				175	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes: Hypertensive Disease (401-405).

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.10.

Hospital Discharges with Any Mention of Diabetes¹ and Ischemic Heart Disease² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	1,936	8,025	4.1	125	138
Allen	8,531	44,502	5.2	143	162
Ashland	2,467	11,147	4.5	81	91
Ashtabula	7,114	33,197	4.7	119	140
Athens	2,658	13,599	5.1	106	84
Auglaize	3,750	18,346	4.9	138	162
Belmont	4,134	19,079	4.6	89	120
Brown	2,441	9,677	4.0	108	112
Butler	16,928	80,725	4.8	104	97
Carroll	1,299	7,015	5.4	75	90
Champaign	1,883	8,162	4.3	87	96
Clark	9,215	41,179	4.5	108	130
Clermont	7,523	33,685	4.5	87	79
Clinton	1,817	7,722	4.2	85	86
Columbiana	8,192	39,942	4.9	122	149
Coshocton	2,602	11,686	4.5	121	142
Crawford	2,323	11,235	4.8	83	103
Cuyahoga	81,919	406,373	5.0	103	124
Darke	2,363	10,160	4.3	72	90
Defiance	2,335	9,424	4.0	105	121
Delaware	3,958	18,058	4.6	74	53
Erie	6,767	34,619	5.1	132	174
Fairfield	7,587	41,608	5.5	116	111
Fayette	1,549	7,200	4.6	96	110
Franklin	53,155	281,041	5.3	113	96
Fulton	2,460	11,015	4.5	108	116
Gallia	2,181	11,393	5.2	123	141
Geauga	3,223	14,935	4.6	60	68
Greene	6,116	30,662	5.0	78	78
Guernsey	2,937	11,920	4.1	123	144
Hamilton	37,534	178,286	4.7	82	88
Hancock	3,095	13,602	4.4	78	84
Hardin	2,733	12,469	4.6	167	172
Harrison	1,298	6,457	5.0	120	166
Henry	1,355	5,959	4.4	81	93
Highland	2,106	9,109	4.3	92	100
Hocking	1,801	8,346	4.6	111	125
Holmes	1,291	6,035	4.7	74	63
Huron	4,754	20,702	4.4	153	159
Jackson	2,476	11,172	4.5	135	149
Jefferson	6,784	33,945	5.0	138	194
Knox	3,445	15,310	4.4	108	119
Lake	11,660	58,654	5.0	85	100
Lawrence	2,743	12,210	4.5	76	88
Licking	5,289	25,155	4.8	66	69
Logan	3,213	14,872	4.6	124	139
Lorain	22,975	104,864	4.6	145	154
Lucas	28,115	144,877	5.2	120	126
Madison	2,738	12,740	4.7	136	134
Mahoning	17,430	93,449	5.4	105	142
Marion	4,007	17,039	4.3	110	122
Medina	6,022	27,954	4.6	76	73
Meigs	1,184	5,876	5.0	86	103
Mercer	1,973	9,579	4.9	85	97
Miami	5,613	28,379	5.1	98	112
Monroe	849	3,569	4.2	85	117
Montgomery	26,979	139,240	5.2	87	99
Morgan	847	1,461	1.7	91	115
Morrow	1,610	6,825	4.2	97	95
Muskingum	6,874	34,728	5.1	140	161
Noble	683	2,942	4.3	93	96
Ottawa	3,251	15,059	4.6	119	158
Paulding	1,084	4,779	4.4	100	112
Perry	2,456	12,097	4.9	138	141
Pickaway	3,700	18,077	4.9	139	141
Pike	2,390	10,050	4.2	160	171
Portage	7,056	31,936	4.5	95	91
Preble	2,459	11,775	4.8	102	117
Putnam	1,799	9,517	5.3	96	104
Richland	7,220	38,479	5.3	95	114
Ross	6,233	26,232	4.2	158	166
Sandusky	3,183	14,050	4.4	89	104
Scioto	9,410	48,432	5.1	209	246
Seneca	3,880	16,289	4.2	119	136
Shelby	1,973	9,252	4.7	81	81
Stark	25,494	142,146	5.6	110	135
Summit	29,214	148,192	5.1	94	107
Trumbull	16,168	83,461	5.2	116	149
Tuscarawas	6,456	33,066	5.1	116	141
Union	1,824	7,768	4.3	97	80
Van Wert	1,177	5,500	4.7	68	81
Vinton	1,087	4,865	4.5	158	164
Warren	5,898	27,551	4.7	74	61
Washington	3,693	16,840	4.6	94	119
Wayne	6,399	29,748	4.6	107	113
Williams	2,071	11,010	5.3	92	108
Wood	5,399	24,820	4.6	91	87
Wyandot	1,182	5,371	4.5	86	104
Unknown					
Total				103	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes: Ischemic Heart Disease (410-414)

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.11.

Hospital Discharges with Any Mention of Diabetes¹ and Cerebrovascular Disease² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	413	1,925	4.7	27	29
Allen	1,348	8,348	6.2	23	26
Ashland	480	2,357	4.9	16	18
Ashtabula	1,464	7,671	5.2	24	29
Athens	474	2,749	5.8	19	15
Auglaize	664	4,268	6.4	24	29
Belmont	660	3,939	6.0	14	19
Brown	486	2,348	4.8	22	22
Butler	4,082	23,733	5.8	26	23
Carroll	285	1,831	6.4	16	20
Champaign	405	1,956	4.8	19	21
Clark	1,942	11,049	5.7	23	27
Clermont	1,726	9,528	5.5	20	18
Clinton	328	1,863	5.7	15	16
Columbiana	2,209	12,108	5.5	33	40
Coshocton	492	2,482	5.0	23	27
Crawford	390	2,363	6.1	14	17
Cuyahoga	21,356	123,935	5.8	27	32
Darke	477	2,595	5.4	14	18
Defiance	492	2,217	4.5	22	25
Delaware	731	3,805	5.2	14	10
Erie	1,551	9,722	6.3	30	40
Fairfield	1,433	8,543	6.0	22	21
Fayette	284	1,500	5.3	18	20
Franklin	11,356	72,092	6.3	25	21
Fulton	514	2,489	4.8	23	24
Gallia	422	3,403	8.1	24	27
Geauga	902	4,442	4.9	17	19
Greene	1,672	9,871	5.9	22	21
Guernsey	513	2,780	5.4	21	25
Hamilton	10,565	63,333	6.0	23	25
Hancock	638	3,182	5.0	16	17
Hardin	361	2,190	6.1	22	23
Harrison	258	1,392	5.4	24	33
Henry	216	991	4.6	13	15
Highland	492	2,483	5.0	21	23
Hocking	269	1,439	5.3	17	19
Holmes	250	1,229	4.9	14	12
Huron	946	4,789	5.1	30	32
Jackson	462	2,969	6.4	25	28
Jefferson	1,342	8,065	6.0	26	38
Knox	570	3,029	5.3	18	20
Lake	3,223	17,956	5.6	23	28
Lawrence	392	2,364	6.0	11	13
Licking	1,166	6,333	5.4	15	15
Logan	654	3,366	5.1	25	28
Lorain	4,741	26,467	5.6	30	32
Lucas	6162	37316	6.1	26	28
Madison	454	2,598	5.7	23	22
Mahoning	4,526	27,664	6.1	27	37
Marion	516	2,587	5.0	14	16
Medina	1,214	6,620	5.5	16	15
Meigs	212	1,538	7.3	15	18
Mercer	383	2,470	6.4	16	19
Miami	1,343	7,838	5.8	24	27
Monroe	160	801	5.0	16	22
Montgomery	7,442	47,393	6.4	24	27
Morgan	192	1,108	5.8	20	26
Morrow	245	1,073	4.4	15	14
Muskingum	1,330	7,852	5.9	27	31
Noble	138	746	5.4	19	19
Ottawa	575	3,128	5.4	21	28
Paulding	203	1,021	5.0	19	21
Perry	473	2,595	5.5	27	27
Pickaway	619	3,406	5.5	24	24
Pike	432	2,065	4.8	29	31
Portage	1,425	7,159	5.0	19	18
Preble	539	2,894	5.4	22	26
Putnam	290	2,183	7.5	15	17
Richland	1,442	8,639	6.0	19	23
Ross	1,143	5,362	4.7	29	31
Sandusky	617	3,010	4.9	17	20
Scioto	1,473	9,120	6.2	32	39
Seneca	820	3,958	4.8	25	29
Shelby	484	2,590	5.4	20	20
Stark	5,761	38,685	6.7	25	30
Summit	6,603	37,641	5.7	21	24
Trumbull	3,868	25,646	6.6	27	36
Tuscarawas	1,226	7,305	6.0	22	27
Union	287	1,345	4.7	16	13
Van Wert	198	1,017	5.1	11	14
Vinton	175	912	5.2	26	26
Warren	1,265	7,019	5.5	16	13
Washington	857	4,865	5.7	22	28
Wayne	1,149	5,993	5.2	19	20
Williams	394	3,020	7.7	18	20
Wood	1,121	5,616	5.0	19	18
Wyandot	239	1,120	4.7	17	21
Unknown					
Total				23	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes: Cerebrovascular Disease(430-438)

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.12.

Hospital Discharges with Any Mention of Diabetes¹ and Heart Failure² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	1,344	6,568	4.9	88	96
Allen	4,665	27,736	5.9	77	88
Ashland	1,432	7,195	5.0	46	53
Ashtabula	4,853	26,891	5.5	81	95
Athens	1,656	10,165	6.1	67	53
Auglaize	2,071	11,501	5.6	74	89
Belmont	2,305	13,551	5.9	48	67
Brown	1,762	8,217	4.7	79	81
Butler	10,650	63,688	6.0	67	61
Carroll	790	5,290	6.7	46	55
Champaign	1,253	6,358	5.1	58	64
Clark	6,130	35,443	5.8	71	87
Clermont	5,301	30,448	5.7	63	56
Clinton	1,303	6,275	4.8	61	62
Columbiana	5,012	30,566	6.1	75	91
Coshocton	1,660	8,942	5.4	77	91
Crawford	1,024	5,469	5.3	36	46
Cuyahoga	63,755	375,729	5.9	79	96
Darke	1,503	7,742	5.2	45	57
Defiance	1,395	6,407	4.6	63	72
Delaware	2,223	12,377	5.6	43	30
Erie	3,603	23,012	6.4	70	93
Fairfield	4,654	30,846	6.6	73	68
Fayette	1,059	5,829	5.5	65	75
Franklin	34,492	217,890	6.3	74	63
Fulton	1,422	7,457	5.2	62	67
Gallia	1,659	10,236	6.2	93	107
Geauga	2,121	11,297	5.3	40	45
Greene	4,433	27,091	6.1	58	57
Guernsey	1,589	8,134	5.1	66	78
Hamilton	29,082	172,048	5.9	63	69
Hancock	1,695	9,046	5.3	42	46
Hardin	1,572	8,152	5.2	95	99
Harrison	826	4,726	5.7	76	106
Henry	847	4,320	5.1	50	58
Highland	1,331	7,087	5.3	58	63
Hocking	1,106	6,041	5.5	69	77
Holmes	949	5,193	5.5	54	46
Huron	2,496	14,006	5.6	80	83
Jackson	1,568	8,151	5.2	86	95
Jefferson	4,093	26,346	6.4	82	117
Knox	1,670	9,146	5.5	52	58
Lake	7,718	46,238	6.0	56	67
Lawrence	2,018	10,920	5.4	56	65
Licking	3,259	17,448	5.4	42	42
Logan	1,482	8,624	5.8	57	64
Lorain	11,311	67,116	5.9	72	76
Lucas	17,927	107,705	6.0	77	80
Madison	1,626	8,854	5.4	82	79
Mahoning	11,634	74,746	6.4	70	95
Marion	2,197	11,019	5.0	60	67
Medina	3,938	21,998	5.6	51	48
Meigs	871	5,111	5.9	63	76
Mercer	1,268	6,600	5.2	54	62
Miami	4,159	25,013	6.0	73	83
Monroe	550	2,690	4.9	55	76
Montgomery	20,400	128,318	6.3	66	75
Morgan	426	2,505	5.9	46	58
Morrow	876	4,350	5.0	54	52
Muskingum	3,575	21,801	6.1	72	84
Noble	352	1,907	5.4	48	50
Ottawa	1,947	11,074	5.7	71	95
Paulding	622	3,053	4.9	58	64
Perry	1,295	8,375	6.5	73	74
Pickaway	2,447	13,784	5.6	93	93
Pike	1,490	7,361	4.9	98	107
Portage	4,770	26,542	5.6	65	62
Preble	1,632	9,420	5.8	68	78
Putnam	880	5,243	6.0	46	51
Richland	4,079	23,979	5.9	54	64
Ross	2,939	15,105	5.1	76	78
Sandusky	1,654	9,026	5.5	46	54
Scioto	6,128	37,423	6.1	135	160
Seneca	2,675	12,627	4.7	82	94
Shelby	1,322	7,631	5.8	54	55
Stark	16,763	109,678	6.5	71	88
Summit	22,707	137,346	6.0	73	83
Trumbull	11,660	72,683	6.2	83	107
Tuscarawas	4,031	24,580	6.1	71	88
Union	1,019	5,117	5.0	55	45
Van Wert	520	2,984	5.7	29	36
Vinton	625	3,320	5.3	92	94
Warren	4,046	24,284	6.0	53	42
Washington	2,377	12,567	5.3	60	77
Wayne	3,879	21,223	5.5	65	69
Williams	1,191	7,044	5.9	52	62
Wood	3,307	18,105	5.5	56	53
Wyandot	811	4,106	5.1	57	72
Unknown					
Total				68	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes: Heart Failure (428).

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.13.

Hospital Discharges with Any Mention of Diabetes¹ and Pneumonia or Influenza² as Listed Diagnoses by County, Number of Discharges, Mean Length of Stay³, Discharges per 10,000 Residents and Discharges per 10,000 Diabetics, Ohio 2003-2007.

County	Number of Hospital Discharges	Total Number of Days	Mean Length of Stay in Days ³	Discharges per 10,000 County Residents	Discharges per 10,000 County Diabetics
Adams	625	3,687	5.9	41	44
Allen	1,232	8,569	7.0	21	23
Ashland	485	2,900	6.0	16	18
Ashtabula	1,738	11,336	6.5	29	34
Athens	557	4,178	7.5	22	18
Auglaize	636	4,445	7.0	23	27
Belmont	801	5,660	7.1	17	23
Brown	859	4,665	5.4	39	39
Butler	4,841	36,587	7.6	30	28
Carroll	270	2,219	8.2	16	19
Champaign	504	2,878	5.7	24	26
Clark	2,274	15,305	6.7	27	32
Clermont	2,371	16,678	7.0	28	25
Clinton	570	3,252	5.7	26	27
Columbiana	2,098	15,588	7.4	31	38
Coshocton	486	3,529	7.3	23	27
Crawford	439	2,912	6.6	16	20
Cuyahoga	16,548	115,476	7.0	21	25
Darke	519	3,135	6.0	16	20
Defiance	469	2,533	5.4	21	24
Delaware	815	5,453	6.7	15	11
Erie	1,198	9,684	8.1	24	31
Fairfield	1,706	13,297	7.8	27	25
Fayette	355	2,393	6.7	22	25
Franklin	10,567	86,435	8.2	22	19
Fulton	392	2,389	6.1	17	18
Gallia	659	4,830	7.3	38	43
Geauga	651	3,972	6.1	12	14
Greene	1,735	12,644	7.3	23	22
Guernsey	678	4,298	6.3	28	33
Hamilton	10,651	81,062	7.6	23	25
Hancock	578	3,742	6.5	15	16
Hardin	548	3,262	6.0	33	35
Harrison	306	2,086	6.8	28	39
Henry	258	1,705	6.6	15	18
Highland	603	4,283	7.1	26	29
Hocking	379	2,574	6.8	24	26
Holmes	325	1,945	6.0	19	16
Huron	883	6,038	6.8	29	30
Jackson	628	3,989	6.4	34	38
Jefferson	1,147	9,053	7.9	23	33
Knox	580	4,053	7.0	18	20
Lake	2,287	16,959	7.4	17	20
Lawrence	713	4,765	6.7	20	23
Licking	980	6,315	6.4	12	13
Logan	590	3,980	6.7	23	25
Lorain	4,189	30,200	7.2	27	28
Lucas	4,778	35,071	7.3	20	21
Madison	523	3,902	7.5	26	26
Mahoning	2,955	22,701	7.7	18	24
Marion	550	3,497	6.4	15	17
Medina	1,373	8,754	6.4	18	17
Meigs	273	2,076	7.6	20	24
Mercer	468	2,863	6.1	20	23
Miami	1,460	10,643	7.3	26	29
Monroe	160	990	6.2	16	22
Montgomery	6,266	48,882	7.8	20	23
Morgan	244	1,685	6.9	26	33
Morrow	373	2,276	6.1	23	22
Muskingum	1,518	11,443	7.5	31	36
Noble	147	821	5.6	20	21
Ottawa	526	3,622	6.9	20	26
Paulding	266	1,452	5.5	25	27
Perry	552	4,176	7.6	31	32
Pickaway	754	5,284	7.0	29	29
Pike	565	3,653	6.5	37	40
Portage	1,765	10,870	6.2	24	23
Preble	555	3,931	7.1	23	26
Putnam	272	1,924	7.1	14	16
Richland	1,706	11,932	7.0	23	27
Ross	1,125	7,572	6.7	29	30
Sandusky	582	3,630	6.2	16	19
Scioto	2,087	16,024	7.7	47	55
Seneca	747	4,224	5.7	23	26
Shelby	577	3,706	6.4	24	24
Stark	5,517	41,737	7.6	24	29
Summit	7,766	58,842	7.6	25	28
Trumbull	3,465	24,445	7.1	25	32
Tuscarawas	1,717	13,145	7.7	30	38
Union	364	2,101	5.8	19	16
Van Wert	209	1,300	6.2	12	14
Vinton	197	1,129	5.7	29	30
Warren	1,491	10,314	6.9	19	15
Washington	1,051	7,026	6.7	27	34
Wayne	1,683	10,838	6.4	28	30
Williams	425	2,934	6.9	18	22
Wood	984	6,505	6.6	17	16
Wyandot	266	1,781	6.7	19	24
Unknown					
Total				23	

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ ICD-9-CM Codes: Diabetes (250.0-250.9), Polyneuropathy in diabetes (357.2), Diabetic retinopathy (362.01-362.02), Diabetic cataract (366.41), Diabetes in pregnancy but not gestational (648.00-648.04).

² ICD-9-CM Codes: Pneumonia and Influenza (480.0-487.8).

³ Number of days divided by the number of hospital discharges.

Appendix B: County Tables

Table B.14.

Hospital Discharges Under 65 Years of Age with Selected Ambulatory Care Sensitive (ACS) Diabetes Conditions Listed as the Primary Diagnosis by County and Percentage, Ohio 2003-2007.

County	Discharges with Diabetes Listed as Primary Diagnosis ¹	Number of Hospital Discharges with Selected Diabetes Conditions			% Selected (ACS) Conditions ⁵
		DM (250.1) ²	DM (250.2) ³	DM (250.3) ⁴	
Adams	298	53	1	0	18.1
Allen	858	48	2	0	5.8
Ashland	319	10	0	0	3.1
Ashtabula	988	47	5	2	5.5
Athens	481	54	2	1	11.9
Auglaize	330	17	3	0	6.1
Belmont	427	33	4	1	8.9
Brown	379	26	2	3	8.2
Butler	2,545	181	14	3	7.8
Carroll	120	8	2	0	8.3
Champaign	239	24	1	1	10.9
Clark	1,494	127	15	3	9.7
Clermont	1,117	79	10	2	8.1
Clinton	385	19	4	2	6.5
Columbiana	1,310	48	6	1	4.2
Coshocton	352	83	4	0	24.7
Crawford	356	37	3	0	11.2
Cuyahoga	17,375	1035	152	56	7.2
Darke	317	36	2	0	12.0
Defiance	322	15	0	2	5.3
Delaware	601	89	1	1	15.1
Erie	741	105	10	2	15.8
Fairfield	1,142	63	6	0	6.0
Fayette	310	28	1	1	9.7
Franklin	11,173	732	66	19	7.3
Fulton	332	17	3	0	6.0
Gallia	305	7	1	0	2.6
Geauga	384	12	3	2	4.4
Greene	958	202	9	3	22.3
Guernsey	508	109	6	2	23.0
Hamilton	8,391	576	94	28	8.3
Hancock	395	9	0	0	2.3
Hardin	194	44	1	1	23.7
Harrison	137	12	2	0	10.2
Henry	207	6	5	0	5.3
Highland	328	38	5	1	13.4
Hocking	228	15	1	0	7.0
Holmes	124	7	2	0	7.3
Huron	537	65	2	1	12.7
Jackson	345	24	2	2	8.1
Jefferson	805	109	17	2	15.9
Knox	459	33	2	2	8.1
Lake	1,525	57	4	1	4.1
Lawrence	442	10	1	1	2.7
Licking	1,157	82	4	1	7.5
Logan	351	31	2	0	9.4
Lorain	2,803	232	41	11	10.1
Lucas	5,235	166	45	8	4.2
Madison	419	33	1	4	9.1
Mahoning	2,746	330	44	16	14.2
Marion	685	55	1	0	8.2
Medina	891	128	12	2	15.9
Meigs	168	12	0	3	8.9
Mercer	190	23	0	1	12.6
Miami	797	44	2	1	5.9
Monroe	85	4	0	1	5.9
Montgomery	5,299	535	64	19	11.7
Morgan	79	6	2	0	10.1
Morrow	197	20	2	1	11.7
Muskingum	870	53	1	1	6.3
Noble	96	18	1	0	19.8
Ottawa	299	10	1	0	3.7
Paulding	116	5	0	0	4.3
Perry	335	14	1	0	4.5
Pickaway	482	106	7	3	24.1
Pike	271	24	1	3	10.3
Portage	1,166	283	17	4	26.1
Preble	427	39	2	0	9.6
Putnam	138	3	0	0	2.2
Richland	1,226	60	4	0	5.2
Ross	879	208	9	4	25.1
Sandusky	424	17	3	1	5.0
Scioto	1,033	58	4	2	6.2
Seneca	475	10	3	0	2.7
Shelby	288	36	2	0	13.2
Stark	3,172	342	40	9	12.3
Summit	5,132	800	101	11	17.8
Trumbull	2,600	263	17	4	10.9
Tuscarawas	727	83	3	2	12.1
Union	237	16	1	2	8.0
Van Wert	148	6	0	0	4.1
Vinton	126	13	3	0	12.7
Warren	918	104	8	1	12.3
Washington	460	53	3	1	12.4
Wayne	663	56	4	4	9.7
Williams	208	25	4	0	13.9
Wood	764	22	8	2	4.2
Wyandot	156	14	0	0	9.0
Total					

Source: Ohio Hospital Association Discharge Data, years 2003-2007. Analysis by Reena Oza-Frank, CDC/CSTE Fellow, State Epidemiology Office, Ohio Department of Health.

¹ICD-9-CM Codes: Diabetes (250.0-250.9).

²Diabetes with ketoacidosis (250.1).

³Diabetes with hyperosmolarity (250.2).

⁴Diabetes with other coma (250.3).

⁵Percentage of selected ACS conditions of the total discharges with diabetes listed as primary diagnosis (ICD-9-CM 250.0-250.9).

Appendix C: Glossary of Terms

age-adjusted rates: age-adjustment is a statistical process applied to rates of disease, death, injuries or other health outcomes that allows communities with different age structures to be compared.

ambulatory care sensitive conditions (ACS): certain diabetes diagnoses (i.e. diabetes with ketoacidosis, diabetes with hyperosmolarity and diabetes with other coma) that with timely and effective ambulatory care, a hospital admission may have been prevented.

any mention of diabetes: a diagnosis of diabetes listed in one of the available diagnosis fields in a hospital record.

atherosclerosis: clogging, narrowing and hardening of the body's large arteries and medium-sized blood vessels. Atherosclerosis can lead to stroke, heart attack, eye problems and kidney problems.

Behavioral Risk Factor Surveillance System (BRFSS): an ongoing, state-based, random-digit-dialed telephone survey for adults 18 years and older for the U.S. non-institutionalized civilian population. The survey is coordinated by the Centers for Disease Control and Prevention and is conducted annually by all states. The BRFSS is the primary source of information on health-related behaviors of Americans.

blood glucose: The main sugar the body makes from the three elements of food - proteins, fats and carbohydrates - but mostly from carbohydrates. Glucose is the major source of energy for living cells and is carried to each cell through the bloodstream. However, the cells cannot use glucose without the help of insulin.

body mass index (BMI): a measure used to evaluate body weight relative to a person's height. BMI is used to find out if a person is underweight, normal weight, overweight or obese.

cholesterol: a type of fat produced by the liver and found in the blood; it is also found in some foods. Cholesterol is used by the body to make hormones and build cell walls.

complications: harmful effects of diabetes such as damage to the eyes, heart, blood vessels, nervous system, teeth and gums, feet and skin or kidneys.

coronary heart disease: heart disease caused by narrowing of the arteries that supply blood to the heart. If the blood supply is cut off, the result is a heart attack.

crude rates: the actual rate for the disease incidence and mortality unadjusted for other factors. They should be used for planning purposes.

diabetic ketoacidosis (DKA): an emergency condition in which extremely high blood glucose levels, along with a severe lack of insulin, result in the breakdown of body fat for energy and an accumulation of ketones in the blood and urine. Signs of DKA are nausea and vomiting, stomach pain, fruity breath odor and rapid breathing. Untreated DKA can lead to coma and death.

diabetes kidney failure: a chronic condition in which the body retains fluid and harmful wastes build up because the kidneys no longer work properly. A person with kidney failure needs dialysis or a kidney transplant. Also called end-stage renal disease or ESRD.

diabetes mellitus: a condition characterized by hyperglycemia resulting from the body's inability to use blood glucose for energy. In type 1 diabetes, the pancreas no longer makes insulin and therefore blood glucose cannot enter the cells to be used for energy. In type 2 diabetes, either the pancreas does not make enough insulin or the body is unable to use insulin correctly.

diabetes-related hospital discharges: hospital discharges of Ohio residents with diabetes as a primary or secondary diagnosis.

diabetic retinopathy: diabetic eye disease; damage to the small blood vessels in the retina. Loss of vision may result.

gestational diabetes mellitus (GDM): a type of diabetes mellitus that develops only during pregnancy and usually disappears upon delivery, but increases the risk that the mother will develop diabetes later. GDM is managed with meal planning, activity and, in some cases, insulin.

hospital discharge data: information collected on patients discharged from the hospital.

hypertension: a condition present when blood flows through the blood vessels with a force greater than normal. Also called high blood pressure. Hypertension can strain the heart, damage blood vessels and increase the risk of heart attack, stroke, kidney problems and death.

ICD-9: International Classification of Diseases, Ninth Revision; this is a system of classifying diseases using specific diagnosis code numbers to describe a patient's health care condition.

ischemic heart disease: a group of heart diseases related to circulatory disturbances caused by coronary atherosclerosis and inadequate oxygen supply to the myocardium.

kidneys: the two bean-shaped organs that filter wastes from the blood and form urine. The kidneys are located near the middle of the back. They send urine to the bladder.

Medicaid: program that provides medical assistance for certain individuals and families with low incomes and resources. Medicaid eligibility is limited to individuals who fall into specific categories. Although the federal government establishes general guidelines for the program, Medicaid program requirements are actually established by each state. Whether a person can be eligible for Medicaid will depend on the state where he or she lives.

Medicare: the federal health program that provides medical coverage for people 65 or older, for certain disabled people and for some people with end-stage renal disease.

nephropathy: disease of the kidneys. Hyperglycemia and hypertension can damage the kidneys' glomeruli. When the kidneys are damaged, protein leaks out of the kidneys into the urine. Damaged kidneys can no longer remove waste and extra fluids from the blood-stream.

neuropathy: disease of the nervous system. The three major forms in people with diabetes are peripheral neuropathy, autonomic neuropathy and mononeuropathy. The most common form is peripheral neuropathy, which affects mainly the legs and feet.

non-insulin-dependent diabetes mellitus (NIDDM): former term for type 2 diabetes.

primary diagnosis: the principal diagnosis (also referred to as principal diagnosis) is submitted as the first of several possible diagnoses coded on the discharge record. The condition established after study to be chiefly responsible for admitting the patient to the hospital for care.

prevalence: the number of people in a given group or population who are reported to have a disease.

risk factor: anything that raises the chances of a person developing a disease.

secondary diagnosis: a diagnosis listed as a condition or disease in the medical record but is not the cause of admittance to the hospital.

stroke: condition caused by damage to blood vessels in the brain; may cause loss of ability to speak or to move parts of the body.

type 1 diabetes: a condition characterized by high blood glucose levels caused by a total lack of insulin. Occurs when the body's immune system attacks the insulin-producing beta cells in the pancreas and destroys them. The pancreas then produces little or no insulin. Type 1 diabetes develops most often in young people but can appear in adults.

type 2 diabetes: a condition characterized by high blood glucose levels caused by either a lack of insulin or the body's inability to use insulin efficiently. Type 2 diabetes develops most often in middle-aged and older adults but can appear in young people.



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