

## CHAPTER 42

# HEALTH INSURANCE AND DIABETES

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## SUMMARY

National data from 2009 indicate that among adults age  $\geq 18$  years with diabetes, 90.1% had some type of health insurance coverage, including 84.7% of those age 18–64 years and 99.7% of those age  $\geq 65$  years. An estimated 2.02 million adults with diabetes had no health insurance coverage, including 2.0 million adults age 18–64 years and 25,700 adults age  $\geq 65$  years. For adults without diabetes, 81.4% had health insurance coverage, including 78.3% at age 18–64 years and 99.2% at age  $\geq 65$  years.

For adults with diabetes age 18–64 years, Hispanics had a significantly lower prevalence of health insurance coverage (72.0%) compared to non-Hispanic whites (87.6%), non-Hispanic blacks (85.4%), and non-Hispanic Asians (91.3%). The majority of adults age 18–64 years with diabetes had private insurance coverage (58.3%), 19.4% had Medicaid, 13.6% had Medicare, and 4.0% had military benefits; types of insurance coverage are not mutually exclusive. Compared to those without diabetes, significantly more adults age 18–64 years with diabetes had Medicare coverage, and fewer adults with diabetes had private insurance coverage. For adults age  $\geq 65$  years with diabetes, the majority had Medicare (95.2%), 50.6% had private insurance, 11.2% had Medicaid, and 11.0% had military benefits; results are again not mutually exclusive. For individuals age  $\geq 65$  years without diabetes, 94.6% had Medicare coverage, 58.6% had private insurance, 6.4% had Medicaid, and 7.0% had military benefits. For all adults, the prevalence of types of private health insurance plans was similar by diabetes status and age, with preferred provider organization plans being the most common followed by health maintenance organization/individual practice association plans. The majority of uninsured adults age 18–64 years with diabetes had been without health insurance for  $\geq 3$  years; these individuals were more often low-income earners, and high cost was the most common reason for not having insurance (51.5%).

Persons with diabetes who had health insurance had greater health care utilization, better diabetes control, and less morbidity. Adults with diabetes age  $< 65$  years who had health insurance more often reported seeing a doctor in the past year (87.9%), including eye (58.5%) and foot (19.4%) specialists, compared to their counterparts without insurance (69.6%, 24.4%, 6.9%, respectively). In addition, those with insurance more often visited a regular doctor's office and less frequently went to a clinic or health center for care compared to those without insurance. For adults age  $< 65$  years with diabetes, control of hemoglobin A1c, blood pressure, and cholesterol was better among those with insurance compared to those without insurance. Furthermore, adults age 18–64 years with diabetes who have health insurance were more likely to report having hypertension (65.2%) or heart disease (23.2%) compared to those without insurance (55.3% and 13.5%, respectively). Finally, the proportion of income spent on private insurance premiums and family medical care was inversely associated with family income, regardless of age or diabetes status.

## SOURCES AND LIMITATIONS OF DATA ON HEALTH INSURANCE

Information on health insurance is available in several national probability samples in the United States. The majority of this chapter utilizes data from the National Health Interview Survey (NHIS) 2009 (1,2). The NHIS is a cross-sectional household interview survey that uses a multistage area probability design and has been conducted continuously since 1957. Participants are asked detailed questions about diabetes and health insurance coverage. Diabetes is determined if participants answer "yes" to the following question: "(If female, other than during

pregnancy) Have you ever been told by a doctor or health professional that you have diabetes or sugar diabetes?" Health insurance questions include items on type and source of coverage, reasons for no health insurance, and health care costs. Although the health insurance questions in NHIS are comprehensive, a limitation is that the data are self-reported; however, participants were encouraged to bring their health insurance cards to the interview. In addition, a considerable proportion of participants were unaware of private insurance premiums costs;

estimates for the proportion of income spent on premiums or family medical care should be interpreted with caution.

The National Health and Nutrition Examination Survey (NHANES) is another cross-sectional national probability sample that has been conducted continuously since 1999 (3) and in certain years prior to 1999. Participants self-report diabetes status, health insurance coverage, and information on health care utilization. An advantage of the NHANES is that the survey includes a physical exam where

laboratory measures are collected. Thus, the NHANES has diabetes-related clinical information, such as glycosylated hemoglobin (A1c) levels, cholesterol, and blood pressure.

The Medical Expenditure Panel Survey (MEPS) 2008 contains national data on the specific health services that the U.S. population uses, the frequency of use, the cost of services, and the expected sources of payment for services (4).

The household component collects data from a sample of families and individuals who participated in the prior year's NHIS, including demographic information, health conditions, use of medical services, access to care, health insurance coverage, income, and employment. Data from the household component are supplemented

with information from the participants' medical provider, including information on charges and expected sources of payment. For the data presented in this chapter, expected sources of payment were determined for medical services used by persons with diabetes.

The National Ambulatory Medical Care Survey (NAMCS) 2008 is a national survey designed to collect information about the provision and use of ambulatory medical care services in the United States (5).

The data are based on a sample of visits to nonfederal-employed, office-based physicians who are primarily engaged in direct patient care. Similarly, the National Hospital Ambulatory Medical Care Survey (NHAMCS) 2008 is designed to collect data on the utilization and provision of

ambulatory care services in emergency and outpatient departments. Data are collected from a national sample of noninstitutional general and short-stay hospitals. Both surveys are based on visits to health care providers and include information on costs and sources of payment for care. For data presented in this chapter, expected sources of payment were determined for persons with a diagnosis of diabetes.

The majority of NHIS 2009 data presented in this chapter are from a previously published paper (2) or are expanded analyses from this paper that were completed specifically for *Diabetes in America, 3rd edition*. All completely new analyses for this chapter are noted in the text.

## HEALTH INSURANCE COVERAGE AND TYPES OF COVERAGE

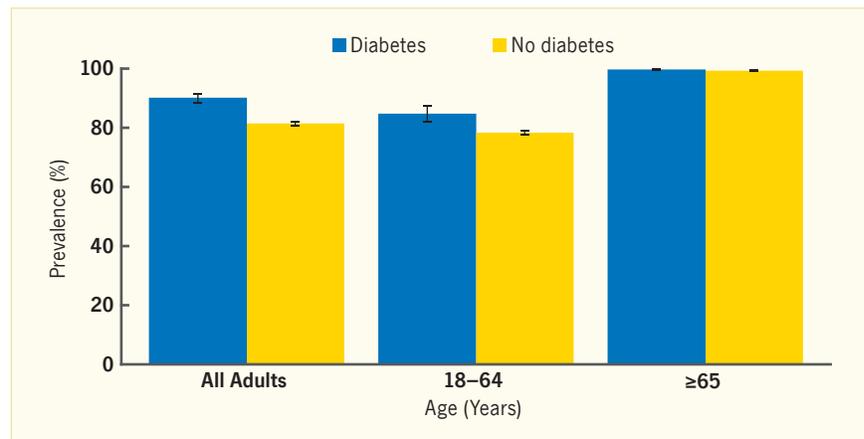
### PREVALENCE OF HEALTH INSURANCE COVERAGE BY AGE

Data from the NHIS 2009 indicate that 90.1% of all adults with diabetes had some type of health insurance coverage compared to 81.4% of adults without diabetes ( $p < 0.001$ ) (Figure 42.1). For adults with diabetes age 18–64 years, 84.7% had health insurance coverage compared to 78.3% without diabetes ( $p < 0.001$ ). The prevalence of health insurance coverage for adults age  $\geq 65$  years (and eligible for Medicare) was similar regardless of diabetes status (99.7% for those with diabetes and 99.2% for those without diabetes).

For adults age 18–64 years with diabetes, the prevalence of health insurance coverage was 79.7% for those age 18–34 years, 82.9% for those age 35–49 years, and 86.3% for those age 50–64 years (Figure 42.2). For persons with diabetes age  $\geq 65$  years, 99.7% had some type of health insurance coverage.

For adults age 18–64 years without diabetes, the prevalence of health insurance coverage was 71.7% for those age 18–34 years, 78.7% for those age 35–39 years, and 87.1% for those age 50–64 years (Figure 42.2). Similar to persons

**FIGURE 42.1.** Prevalence of Health Insurance Coverage, by Diabetes Status and Age, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.  
SOURCE: National Health Interview Survey 2009

with diabetes, almost all persons age  $\geq 65$  years without diabetes had health insurance coverage (99.2%).

### PREVALENCE OF HEALTH INSURANCE COVERAGE BY RACE/ETHNICITY

For adults age 18–64 years, significantly more non-Hispanic blacks (85.4%), Hispanics (72.0%), and Mexican Americans (71.6%) with diabetes had health insurance coverage compared to their counterparts without diabetes (74.5%, 56.1%, 52.5%, respectively,  $p < 0.01$

for all) (Figure 42.3, Table 42.1). There were no significant differences by diabetes status among racial/ethnic groups age  $\geq 65$  years (Table 42.2).

For adults age 18–64 years with diabetes, the prevalence of health insurance for non-Hispanic whites, non-Hispanic blacks, and non-Hispanic Asians was similar, with 87.6%, 85.4%, and 91.3% having health coverage, respectively (Figure 42.3, Table 42.1). Fewer Hispanics with diabetes had insurance coverage (72.0%,  $p < 0.005$  compared to all other racial/ethnic

groups). Among adults age  $\geq 65$  years with diabetes, health insurance coverage was similar by race/ethnicity, including 100.0% for non-Hispanic whites, 99.9% for non-Hispanic blacks, 98.3% for Hispanics, and 96.5% for non-Hispanic Asians.

For adults age 18–64 years without diabetes, 83.9% of non-Hispanic whites, 74.5% of non-Hispanic blacks, 82.6% of non-Hispanic Asians, and 56.1% of Hispanics had health insurance coverage ( $p < 0.001$  for Hispanics vs. all other racial/ethnic groups) (Figure 42.3, Table 42.1). Similar to persons with diabetes, for those age  $\geq 65$  years without diabetes,

coverage was similar by race/ethnicity and ranged from 94.4% for non-Hispanic Asians to 99.7% for non-Hispanic whites.

### PREVALENCE OF HEALTH INSURANCE COVERAGE BY SEX AND SOCIOECONOMIC CHARACTERISTICS

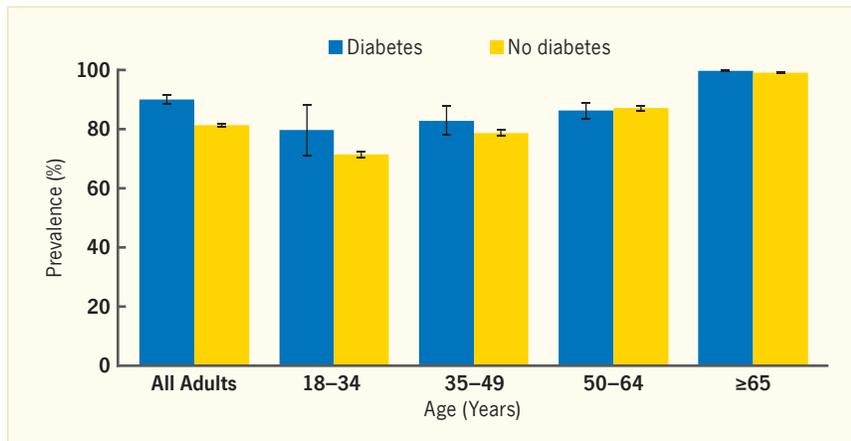
Among adults age 18–64 years, significantly more men with diabetes had health insurance coverage (84.8%) compared to their counterparts without diabetes (75.1%,  $p < 0.01$ ); the prevalence of health insurance was similar for women by diabetes status (Table 42.1). Those with diabetes who had a high school education or less were more likely to have health insurance than their counterparts

without diabetes ( $p < 0.01$  for all). Adults age 18–64 with diabetes who had family income  $< \$35,000$  more often had health insurance compared to those without diabetes (75.7% vs. 60.4%,  $p < 0.001$ ).

Among adults age 18–64 years with diabetes, 85% of men and women had health insurance coverage (Table 42.1). The prevalence of health insurance coverage steadily increased with increasing education, ranging from 71.4% for those with less than a high school education to 97.6% for those with a master's or professional degree ( $p < 0.001$ ). Similarly, the prevalence of health insurance coverage increased with increasing family income, ranging from 75.7% for those with an income of  $< \$35,000$  to 96.0% for those with a family income  $\geq \$100,000$  ( $p < 0.001$ ). Health insurance coverage was similar by marital status.

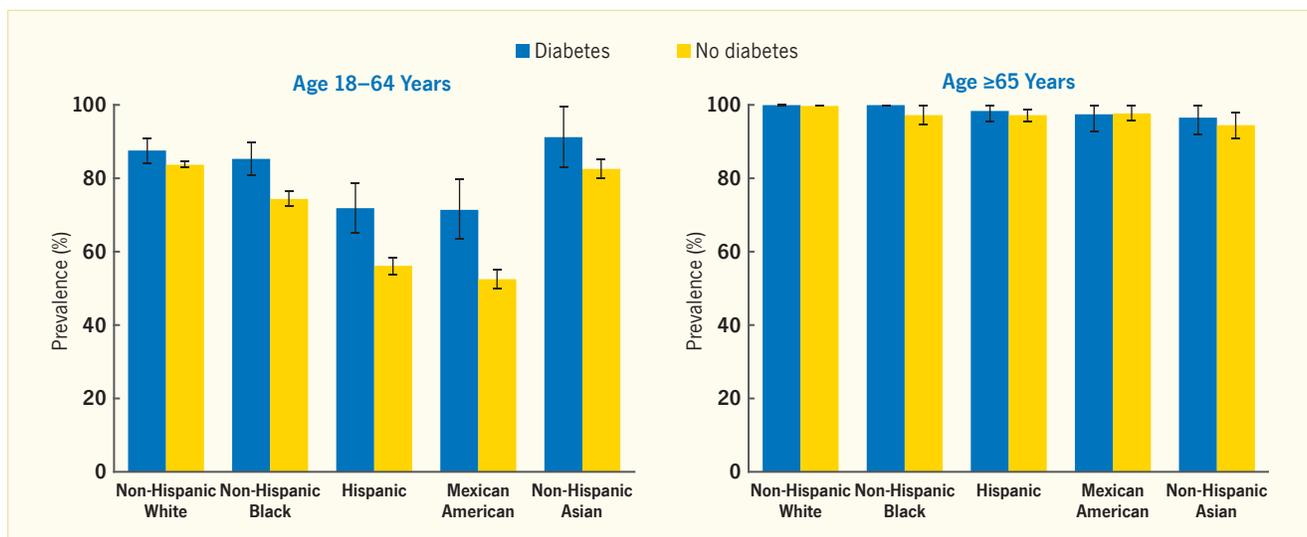
For adults age 18–64 years without diabetes, the prevalence of health insurance was higher for women compared to men (81.4% vs. 75.1%,  $p < 0.001$ ) and for persons who were married or living with a partner (82.0%) compared to those who had never been married (71.2%,  $p < 0.001$ ). Similar to those with diabetes, the prevalence of health insurance coverage increased with more education and income.

**FIGURE 42.2.** Prevalence of Health Insurance Coverage, by Diabetes Status and Age, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.  
SOURCE: National Health Interview Survey 2009

**FIGURE 42.3.** Prevalence of Health Insurance Coverage Among Adults, by Diabetes Status, Age, and Race/Ethnicity, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.  
SOURCE: National Health Interview Survey 2009

**TABLE 42.1.** Prevalence of Health Insurance Coverage Among Adults Age 18–64 Years, by Diabetes Status and Demographic Characteristics, U.S., 2009

CHARACTERISTICS	PERCENT (STANDARD ERROR)	
	Diabetes	No Diabetes
<b>Age (years)</b>		
18–29	74.7 (7.35)	69.5 (0.90)
30–39	80.0 (4.33)	77.0 (0.73)
40–49	84.4 (2.74)	79.6 (0.72)
50–64	86.3 (1.49)	87.1 (0.56)
<b>Sex</b>		
Male	84.8 (1.80)	75.1 (0.62)
Female	84.7 (1.71)	81.4 (0.53)
<b>Race/ethnicity</b>		
Non-Hispanic white	87.6 (1.83)	83.9 (0.47)
Non-Hispanic black	85.4 (2.27)	74.5 (1.10)
Hispanic	72.0 (3.63)	56.1 (1.15)
Mexican American	71.6 (4.22)	52.5 (1.35)
Non-Hispanic Asian	91.3 (4.28)	82.6 (1.43)
<b>Education</b>		
Less than high school	71.4 (3.78)	56.0 (1.37)
High school graduate	86.2 (2.02)	71.6 (0.87)
Associate degree/some college	86.4 (1.94)	80.9 (0.64)
Bachelor’s degree	94.0 (2.04)	90.5 (0.60)
Master’s or professional degree	97.6 (1.49)	94.5 (0.78)
<b>Family income</b>		
<\$35,000	75.7 (2.34)	60.4 (0.79)
\$35,000–\$49,999	76.7 (4.44)	72.2 (1.14)
\$50,000–\$74,999	90.6 (2.15)	82.0 (0.85)
\$75,000–\$99,999	95.0 (2.07)	90.6 (0.88)
≥\$100,000	96.0 (1.53)	94.3 (0.55)
<b>Marital status</b>		
Married or living with a partner	86.2 (1.81)	82.0 (0.50)
Divorced or separated	82.7 (3.11)	74.0 (0.97)
Widowed	85.0 (5.34)	79.6 (2.58)
Never married	80.2 (3.53)	71.2 (0.87)

Data are self-reported.

SOURCE: National Health Interview Survey 2009; and Reference 2, copyright © 2012 American Diabetes Association, reprinted with permission

**TABLE 42.2.** Prevalence of Health Insurance Coverage Among Adults Age ≥65 Years, by Diabetes Status and Race/Ethnicity, U.S., 2009

RACE/ETHNICITY	PERCENT (STANDARD ERROR)	
	Diabetes	No Diabetes
Non-Hispanic white	100.0	99.7 (0.13)
Non-Hispanic black	99.9 (0.15)	97.1 (1.44)
Hispanic	98.3 (1.51)	97.1 (0.90)
Mexican American	97.5 (2.53)	97.7 (1.12)
Non-Hispanic Asian	96.5 (2.43)	94.4 (1.92)

Data are self-reported.

SOURCE: National Health Interview Survey 2009

**PREVALENCE OF HEALTH INSURANCE COVERAGE BY DURATION OF DIABETES**

Among adults age 18–64 years with diabetes, the prevalence of health insurance coverage ranged from 83.1% for adults with newly diagnosed diabetes (<1 year) to 88.6% for adults who had been diagnosed ≥20 years ago (Table 42.3).

**TYPES OF HEALTH INSURANCE COVERAGE**

More adults age 18–64 years with diabetes had Medicare coverage compared to those without diabetes (13.6% vs. 2.7%, respectively,  $p<0.001$ ) (Figure 42.4). Fewer persons with diabetes had private insurance coverage (58.3%) compared to those without diabetes (65.9%,  $p<0.001$ ), but more persons with diabetes were insured by Medicaid/other public coverage compared to persons without diabetes (19.4% vs. 9.2%,  $p<0.001$ ). A similar proportion of persons with and without diabetes had coverage through military benefits (4.0% and 2.6%, respectively). Among persons age ≥65 years, 95% had Medicare regardless of diabetes status. Fewer adults age ≥65 years with diabetes had private insurance (50.6% vs. 58.6%,  $p<0.001$ ), and Medicaid and military benefits were higher for persons with diabetes compared to those without diabetes ( $p<0.01$  for all).

For adults age 18–64 years with diabetes, the prevalence of Medicare coverage was 13.6%; 58.3% had private insurance, 19.4% had Medicaid/other public insurance, and 4.0% had military benefits (Figure 42.4). Types of health insurance

**TABLE 42.3.** Prevalence of Health Insurance Coverage Among Adults With Diabetes Age 18–64 Years, by Duration of Diabetes, U.S., 2009

DIABETES DURATION (YEARS)	PERCENT (STANDARD ERROR)
<1	83.1 (6.02)
1–4	80.2 (2.57)
5–9	87.7 (1.92)
10–19	86.3 (2.45)
≥20	88.6 (3.12)

Data are self-reported.

SOURCE: National Health Interview Survey 2009; and Reference 2, copyright © 2012 American Diabetes Association, reprinted with permission

coverage were not mutually exclusive. Among adults  $\geq 65$  years with diabetes, 99.7% had some type of health insurance coverage. The vast majority had Medicare (95.2%), 50.6% had private insurance, 11.2% had Medicaid/other public coverage, and 11.0% had military benefits.

Among adults age 18–64 years without diabetes, the prevalence of Medicare coverage was 2.7%; 65.9% had private insurance, 9.2% had Medicaid/other public insurance, and 2.6% had military benefits. For adults age  $\geq 65$  years without diabetes,

94.6% had Medicare coverage, 58.6% had private insurance, and 6%–7% had Medicaid or military benefits.

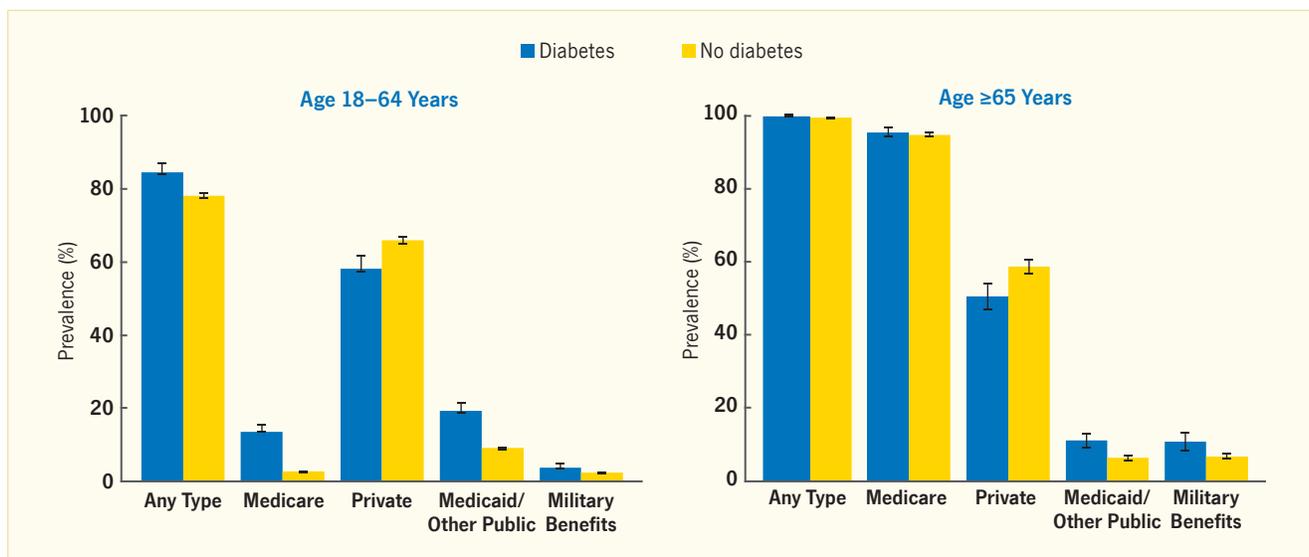
**TYPES OF HEALTH INSURANCE COVERAGE BY GLYCEMIC MEDICATION USE FOR PERSONS WITH DIABETES**

The prevalence of health insurance coverage among diabetic adults age 18–64 years was highest for persons taking insulin and oral medication (90.7%) and lowest for those not taking any medication (80.5%,  $p=0.007$ ) (Figure 42.5). The prevalence

of Medicare coverage was highest for those taking insulin and oral medication (24.9%) and lowest for those taking oral medication only (10.3%,  $p<0.001$ ). There was little difference in private, Medicaid/other public health insurance coverage, or military benefits by medication use.

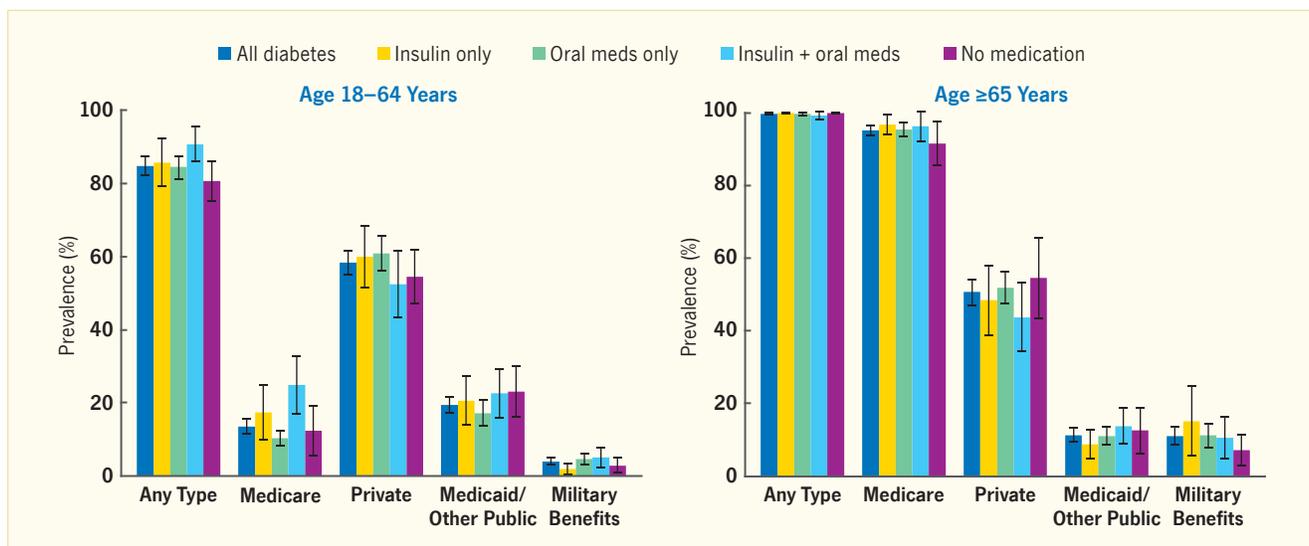
For adults age  $\geq 65$  years with diabetes, there was no significant difference in health insurance coverage by medication use, with nearly 100% of persons having coverage across all medication types (Figure 42.5). As mentioned previously,

**FIGURE 42.4.** Types of Health Insurance Coverage Among Adults, by Diabetes Status and Age, U.S., 2009



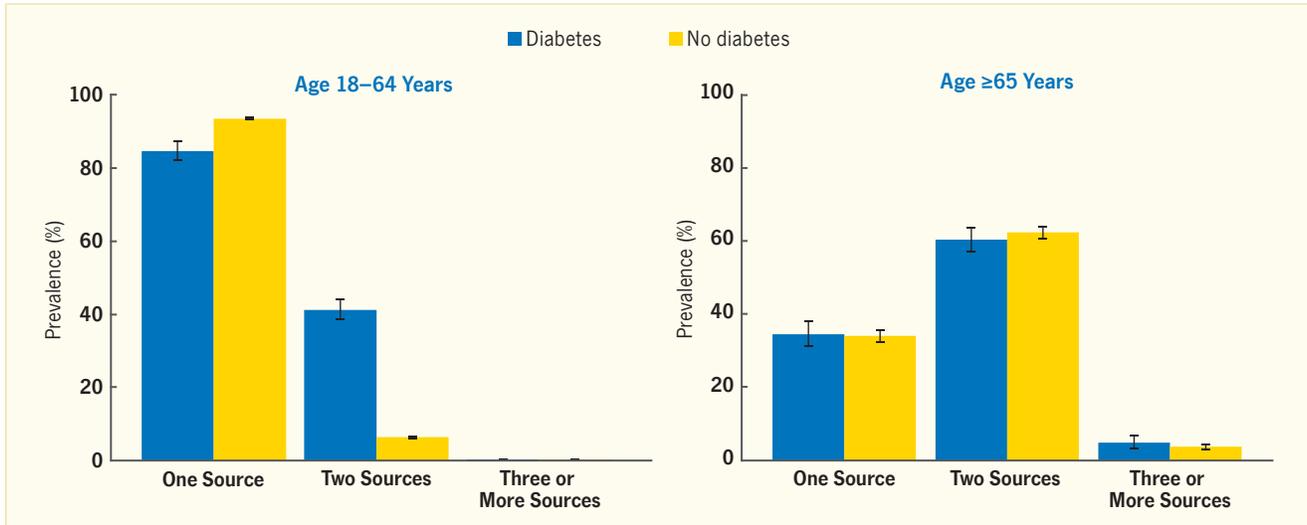
Types of health insurance are not mutually exclusive. Data are self-reported. Error bars represent 95% confidence intervals. SOURCE: National Health Interview Survey 2009; and Reference 2, copyright © 2012 American Diabetes Association, reprinted with permission

**FIGURE 42.5.** Types of Health Insurance Coverage Among Adults With Diabetes, by Glycemic Medication Use and Age, U.S., 2009



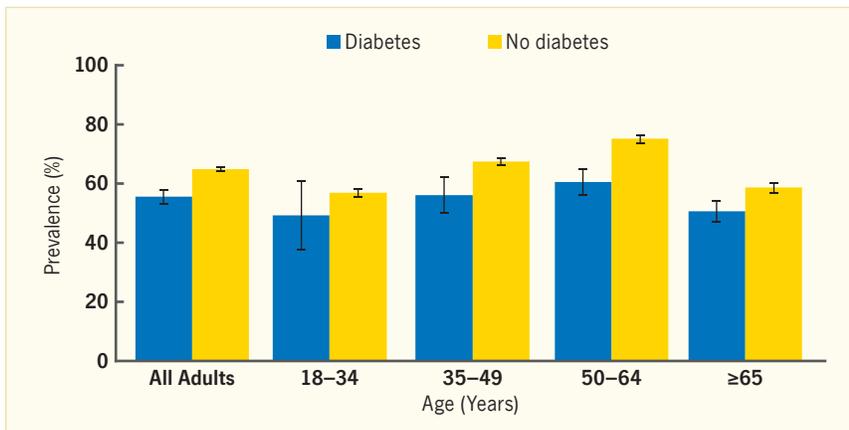
Types of health insurance are not mutually exclusive. Data are self-reported. Error bars represent 95% confidence intervals. SOURCE: National Health Interview Survey 2009

**FIGURE 42.6.** Number of Health Insurance Sources Among Adults, by Diabetes Status and Age, U.S., 2009



Data are self-reported; among adults with health insurance. Error bars represent 95% confidence intervals. SOURCE: National Health Interview Survey 2009

**FIGURE 42.7.** Prevalence of Private Health Insurance Coverage, by Diabetes Status and Age, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals. SOURCE: National Health Interview Survey 2009

the high prevalence of coverage for persons age ≥65 years was mainly attributable to Medicare (95.2%).

**NUMBER OF SOURCES OF HEALTH INSURANCE COVERAGE**

For adults with diabetes age 18–64 years with insurance, the majority had one source of health insurance (84.5%) (Figure 42.6). Fourteen percent had two health insurance sources, with few having three or more sources (0.2%). Among adults age ≥65 years with insurance, the majority had two health insurance sources (60.4%). About one-third had one health insurance source (34.6%), and 5.0% had three or more sources.

Compared to persons with diabetes, fewer insured adults age 18–64 years without diabetes had two sources of insurance (6.3%,  $p < 0.001$ ); the prevalence of three or more sources of insurance was low (0.3%). For adults age ≥65 years, the prevalence of the number of health insurance sources was similar by diabetes status.

**PREVALENCE OF PRIVATE HEALTH INSURANCE**

Among persons with diabetes, the prevalence of private health insurance was 55.5% for all adults age ≥18 years (Figure 42.7). Prevalence gradually rose with age, from 49.4% at age 18–34 years to 56.4% at age 35–49 years and 60.5% at

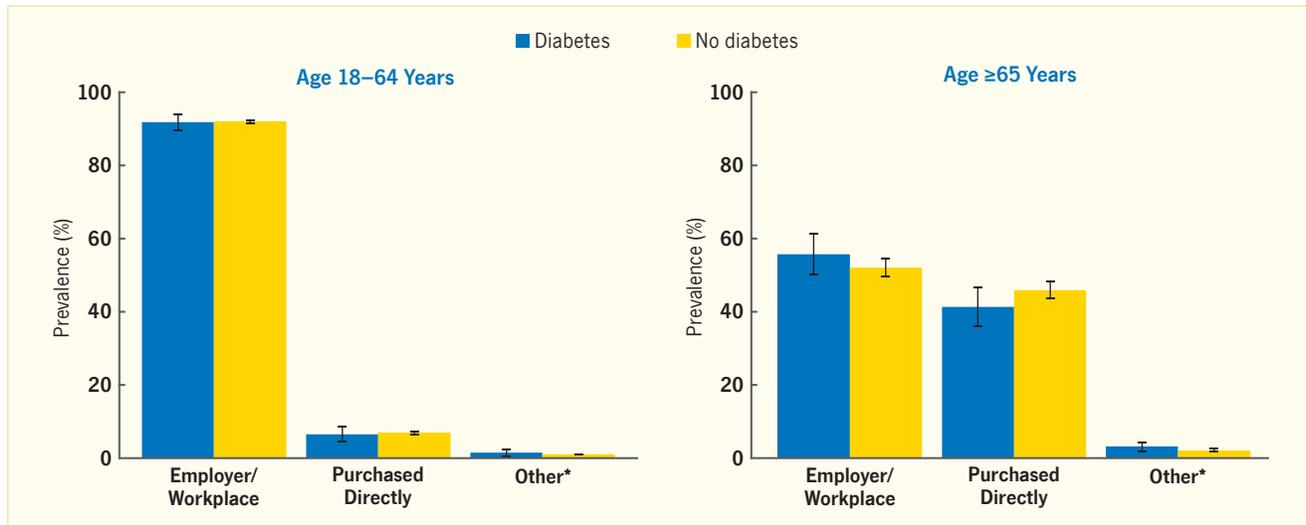
age 50–64 years, but decreased to 50.6% at age ≥65 years.

Compared to persons with diabetes, private health insurance coverage for persons without diabetes was significantly higher among all adults (64.9%,  $p < 0.01$ ) and higher across all age groups, being 57.0% at age 18–34 years, 67.7% at age 35–49 years, 75.1% at age 50–64 years, and 58.6% at age ≥65 years.

**SOURCES OF PRIVATE HEALTH INSURANCE**

For adults age 18–64 years, the vast majority of private health insurance plans were obtained through the employer or workplace, regardless of diabetes status (92%) (Figure 42.8). The prevalence of purchasing a private plan directly was 6.6% for persons with diabetes and 6.9% for persons without diabetes.

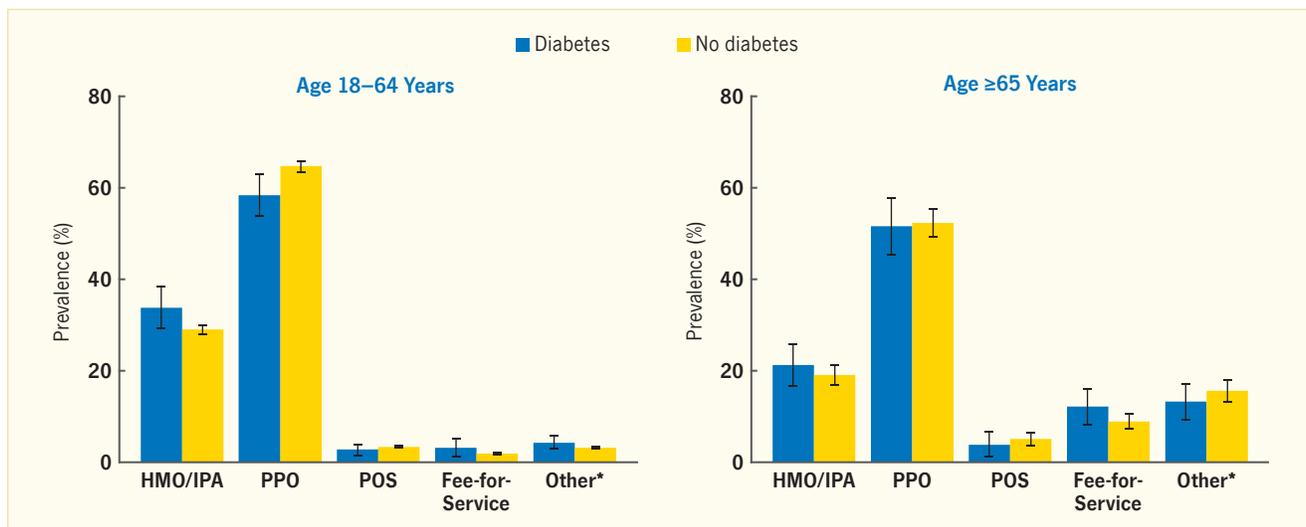
Similarly, the source of private insurance was comparable by diabetes status for adults age ≥65 years. Private health insurance plans were most often obtained through an employer (55.6% for persons with diabetes, 52.1% without diabetes). Purchasing a private plan directly was more common for adults age ≥65 years (41.3% for persons with diabetes, 45.8% without diabetes) compared to adults age 18–64 years (7%).

**FIGURE 42.8.** Sources of Private Health Insurance, by Diabetes Status and Age, U.S., 2009

Data are self-reported. Error bars represent 95% confidence intervals.

\* Other sources include state or local governments and schools.

SOURCE: National Health Interview Survey 2009

**FIGURE 42.9.** Types of Private Health Insurance, by Diabetes Status and Age, U.S., 2009

Data are self-reported. Error bars represent 95% confidence intervals. HMO/IPA, health maintenance organization/individual practice association; POS, point of service; PPO, preferred provider organization.

\* Other includes Medigap, Medicare Advantage, COBRA (Consolidated Omnibus Budget Reconciliation Act), or TCC (Temporary Continuation of Coverage).

SOURCE: National Health Interview Survey 2009; and Reference 2, copyright © 2012 American Diabetes Association, reprinted with permission

### TYPES OF PRIVATE HEALTH INSURANCE

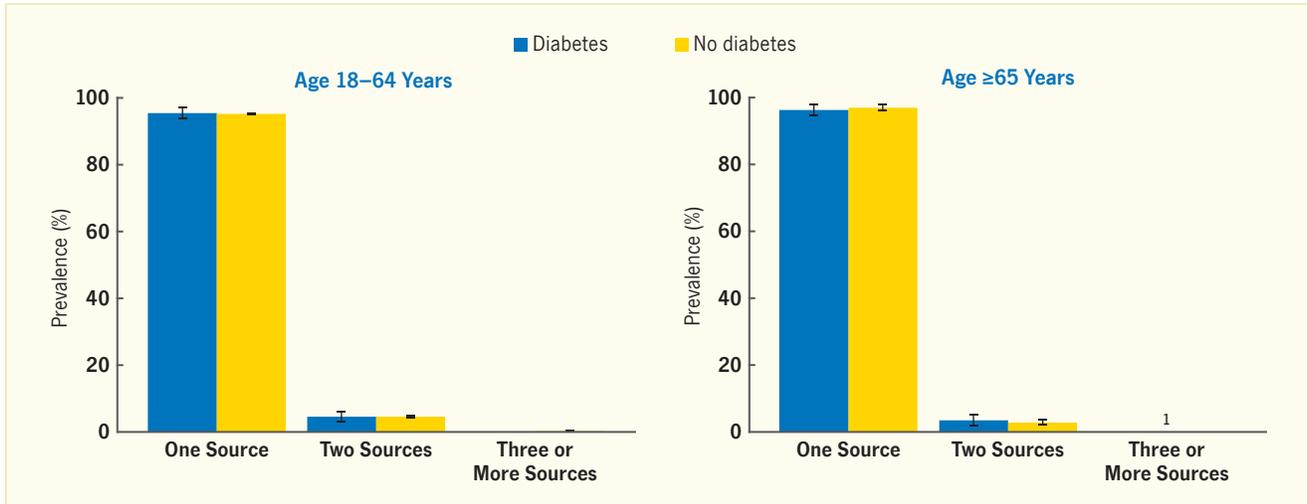
For adults age 18–64 years who had private insurance, the prevalence of type of private insurance was similar by diabetes status (Figure 42.9). Preferred provider organization (PPO) plans were the most prevalent (58.3% for persons with diabetes, 64.6% without diabetes,  $p=0.018$ ) followed by health maintenance organization (HMO)/individual practice association (IPA) plans (33.7% for those with diabetes, 28.9% without diabetes,

$p=0.049$ ). The prevalences of point-of-service (POS), fee-for-service, and other private plans were low, ranging from 1.8% to 4.2%.

Similar to younger adults, PPO plans were most prevalent for adults age  $\geq 65$  years, regardless of diabetes status (51.6% for persons with diabetes, 52.3% without diabetes). HMO/IPA plans were the second most common plan type (21.3% for those with diabetes, 19.1% without diabetes) followed by fee-for-service plans (12.1%

for those with diabetes, 8.9% without diabetes). The prevalences of other private insurance plans were higher in this older age group, ranging from 13.2% to 15.6%, including Medigap (plans that cover gaps in Part A or Part B Medicare), Medicare Advantage, COBRA (Consolidated Omnibus Budget Reconciliation Act), or TCC (Temporary Continuation of Coverage, federal government).

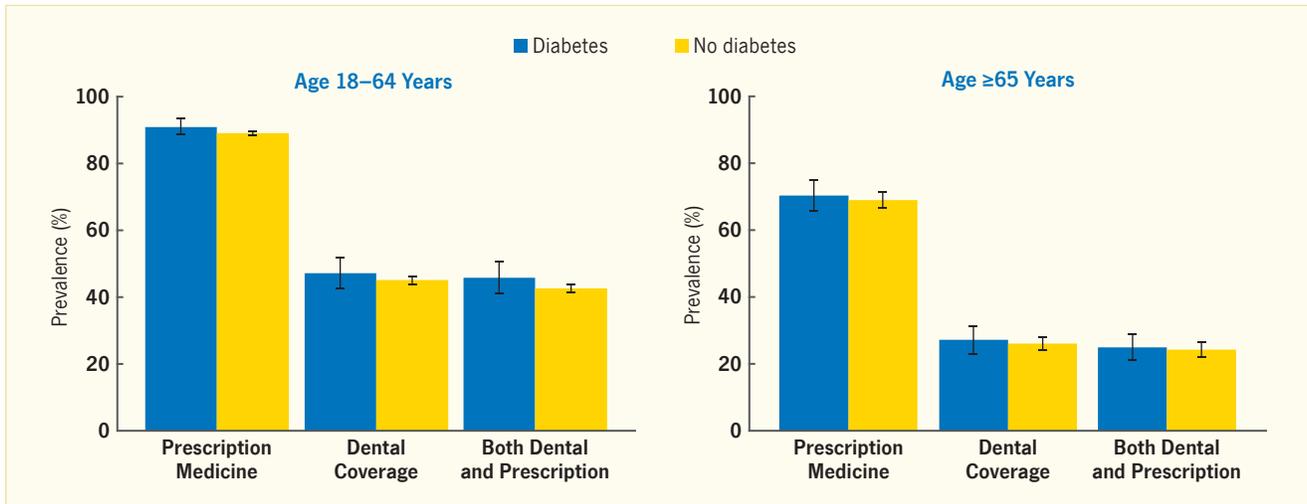
**FIGURE 42.10.** Number of Private Health Insurance Sources Among Adults, by Diabetes Status and Age, U.S., 2009



Data are self-reported; among adults with private insurance. Error bars represent 95% confidence intervals.  
<sup>1</sup> Estimate is too unreliable to present; ≤1 case or relative standard error >50%.

SOURCE: National Health Interview Survey 2009

**FIGURE 42.11.** Prevalence of Prescription and Dental Coverage Through a Private Health Insurance Plan Among Adults, by Diabetes Status and Age, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.

SOURCE: National Health Interview Survey 2009

**NUMBER OF SOURCES OF PRIVATE HEALTH INSURANCE**

For persons age 18–64 years with diabetes who had private health insurance, 95.4% had one source of private insurance, 4.6% had two sources, and none had three or more sources (Figure 42.10). Among adults age ≥65 years, 96.5% had one private health insurance source, and 3.4% had two sources; estimates were low and unreliable for the percentage who had three or more sources.

The prevalence of the number of sources of private health insurance was similar

by diabetes status, with 95.2% of adults age 18–64 without diabetes having one source, and 4.5% having two sources. Similarly, there were no significant differences by diabetes status for those age ≥65 years; about 97% had one private insurance source and 3% had two sources, regardless of diabetes status.

**COVERAGE FOR SPECIFIC ASPECTS OF HEALTH INSURANCE  
 Prescription and Dental Coverage**

For adults age 18–64 years who had private health insurance, the prevalence of prescription and dental coverage through

the private plan was similar by diabetes status (Figure 42.11). The prevalence of prescription coverage was 91.1% for persons with diabetes and 89.1% for persons without diabetes; dental coverage prevalence was 47.3% for those with diabetes and 45.2% for those without diabetes. Forty-six percent of persons with diabetes and 42.7% of those without diabetes had both prescription and dental coverage.

Prescription and dental coverage was nearly identical for adults age ≥65 years, regardless of diabetes status. About 70%

had prescription coverage, 26%–27% had dental coverage, and 24%–25% had both.

**Medicare Parts**

Among adults age ≥65 years with diabetes who had Medicare insurance, the majority (52.6%) had both Part A (hospital insurance) and Part B (medical insurance) (Figure 42.12). An additional 41.9% had Parts A, B, and D (prescription plan). Few had Part A only (4.2%) or Part B only (1.3%).

The prevalence of Medicare parts was similar among adults age ≥65 years without diabetes, including 56.1% who had both Part A and Part B, and an additional 38.2% who had Parts A, B, and D.

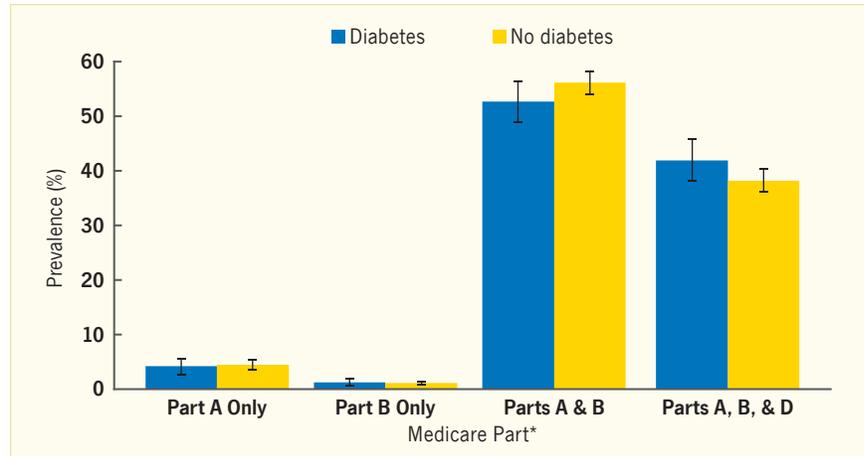
**ADDITIONAL HEALTH INSURANCE COVERAGE**  
**Combinations of Health Insurance Plans Among Persons With Medicare Coverage**

For persons with diabetes age 18–64 years with Medicare coverage, 36.0% had Medicare as their only source of insurance, and 27.0% had additional private insurance coverage (Figure 42.13). About one-third had additional Medicaid coverage (32.0%), and few had additional military benefits (4.1%). For adults with diabetes age ≥65 years with Medicare, 31.8% had only Medicare coverage, and 47.5% had additional private health insurance. Fewer persons had additional Medicaid (9.0%) or military benefits (8.3%).

**Combinations of Health Insurance Plans Among Persons With Private Insurance**

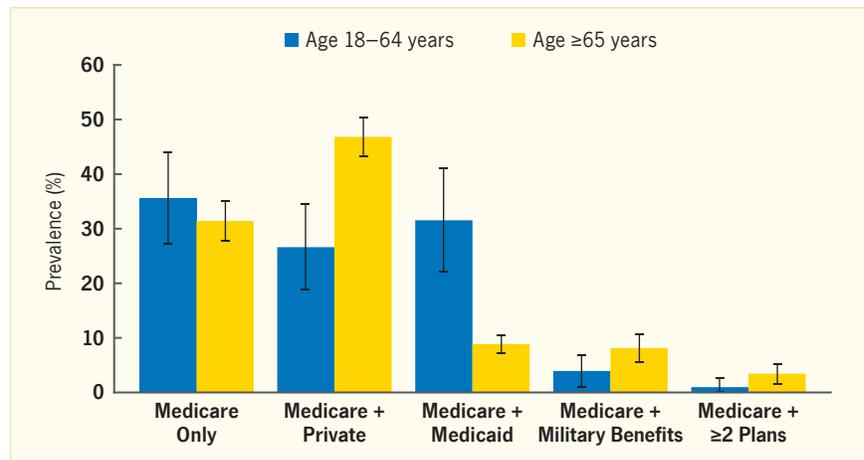
Among adults with diabetes age 18–64 years who reported having private insurance, the vast majority had only private coverage (90.7%); 6.3% had additional Medicare coverage, 2.0% had additional military benefits, 0.9% had additional Medicaid/other public coverage, and 0.2% had a combination of three plans (Figure 42.14). For adults with diabetes age ≥65 years with private insurance, few had private insurance as their only source of coverage (4.2%). The majority of older adults with private insurance additionally had Medicare coverage (89.4%); 6.1% had private insurance and an additional two plans.

**FIGURE 42.12.** Prevalence of Medicare Parts Among Adults Age ≥65 Years, by Diabetes Status, U.S., 2009



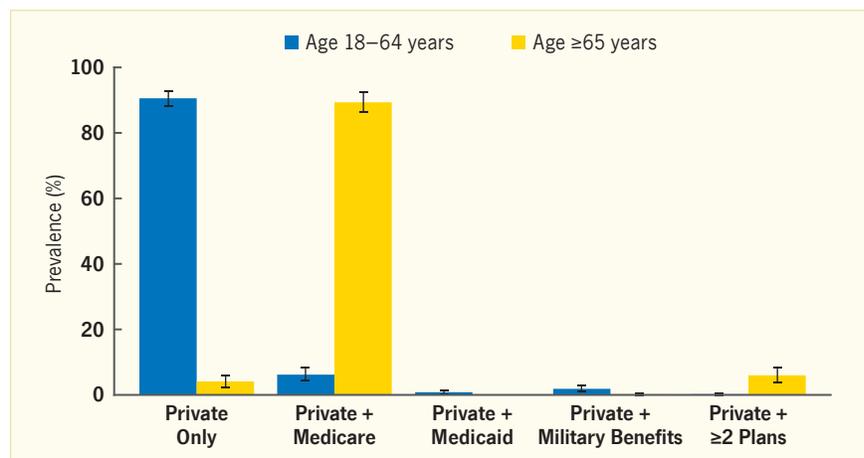
Data are self-reported. Error bars represent 95% confidence intervals.  
 \* Part A: hospital insurance; Part B: medical insurance; Part D: prescription drug coverage.  
 SOURCE: National Health Interview Survey 2009

**FIGURE 42.13.** Prevalence of Combinations of Health Insurance Plan(s) Among Adults With Diabetes and Medicare, by Age, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.  
 SOURCE: National Health Interview Survey 2009

**FIGURE 42.14.** Prevalence of Combinations of Health Insurance Plan(s) Among Adults With Diabetes and Private Insurance, by Age, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.  
 SOURCE: National Health Interview Survey 2009

## HEALTH INSURANCE AND DIABETES CARE

### IMPORTANCE OF HEALTH INSURANCE FOR QUALITY OF DIABETES CARE

Successful control of diabetes and its associated complications is affected by several different facets of health care, including health care utilization, availability of medical supplies, access to prescription medication, and education on how to manage diabetes; all of these factors are tightly related to health insurance coverage.

Diabetes usually requires that patients take some form of medication. Patients may use insulin, oral glucose medication, insulin and oral agents, and/or lipid-lowering and antihypertensive medications, as described in Chapter 39 *Medication Use and Self-Care Practices in Persons With Diabetes*. Data from the NHIS 2009 indicate that more adults age 18–64 years with diabetes who had health insurance were taking insulin (27.1%) or diabetes pills (70.1%) compared to their counterparts without health insurance (19.7% and 64.8%, respectively); these differences could be attributed to medication costs or frequency of seeing a physician (6). The dosages of these medications should be monitored regularly by a physician for optimum treatment and to avoid medication side-effects; thus, patients need to have regular doctor's visits.

In addition, persons with diabetes often need glucose monitors and glucose test strips, which are costly materials, especially when uninsured. Finally, diabetes patients need proper instruction and education from providers in order to successfully control their diabetes. In a new analysis conducted for *Diabetes in America*, data from the NHANES 2007–2010 show that more adults with health insurance regularly checked their blood sugar (56.4%) compared to those without insurance (33.1%), which suggests that those with insurance are more likely to learn and practice daily management skills (Table 42.4). Thus, diabetes management requires a multifaceted approach that is extremely challenging and potentially cost-prohibitive without health insurance coverage.

**TABLE 42.4.** Prevalence of Health Care Utilization Among Adults Age 20–64 Years With Diabetes, by Health Insurance Status, U.S., 2007–2010

MEDICAL CARE	PERCENT (STANDARD ERROR)	
	Health Insurance	No Health Insurance
Routine place to go for health care		
Clinic or health center	20.0 (2.71)	37.5 (3.97)
Doctor's office or HMO	76.9 (2.85)	55.0 (4.38)
Hospital emergency room	1.1 (0.47) <sup>1</sup>	3.2 (1.40) <sup>1</sup>
Hospital outpatient department	1.9 (0.53)	4.3 (1.92) <sup>1</sup>
Have a usual doctor for diabetes care	83.5 (1.67)	64.9 (3.90)
Saw diabetes specialist in past year	42.5 (3.02)	38.6 (5.27)
Overnight hospital stay in past year	22.7 (2.66)	21.3 (3.55)
Check blood glucose $\geq 1$ time per day	56.4 (2.72)	33.1 (4.58)
<b>Frequency of A1c test in past year*</b>		
0	7.1 (1.71)	19.0 (3.85)
1	19.4 (2.50)	11.1 (3.14)
2	16.3 (2.71)	7.9 (2.31)
3–4	24.9 (2.34)	13.8 (3.86)
$\geq 5$	4.5 (1.07)	<sup>2</sup>
Never heard of A1c test	16.0 (2.05)	30.3 (4.33)
Do not know	11.8 (1.65)	13.7 (2.89)
<b>Number of times doctor checked for foot sores in past year</b>		
0	32.6 (2.84)	45.6 (3.69)
1–2	30.2 (2.65)	33.2 (4.52)
$\geq 3$	37.3 (3.06)	21.2 (3.41)
<b>Last time pupils dilated for eye exam</b>		
Within the last year	64.2 (2.72)	31.1 (4.39)
1–2 years	13.3 (2.33)	17.5 (4.63)
>2 years	14.8 (2.48)	27.2 (4.73)
Never	7.7 (1.45)	24.2 (3.93)

A1c, glycosylated hemoglobin; HMO, health maintenance organization.  
\* Frequency of A1c testing includes data from the NHANES 2005–2008.

<sup>1</sup> Relative standard error >40%–50%

<sup>2</sup> Estimate is too unreliable to present;  $\leq 1$  case or relative standard error >50%.

SOURCE: National Health and Nutrition Examination Surveys 2007–2010

**TABLE 42.5.** Prevalence of Health Care Utilization Among Adults Age 18–64 Years With Diabetes, by Health Insurance Status, U.S., 2009

MEDICAL CARE	PERCENT (STANDARD ERROR)	
	Health Insurance	No Health Insurance
Saw doctor in past year	87.9 (1.16)	69.6 (3.59)
Saw eye doctor in past year	58.5 (1.87)	24.4 (3.18)
Saw foot doctor in past year	19.4 (1.65)	6.9 (3.07)

Data are self-reported.

SOURCE: National Health Interview Survey 2009

Health insurance is not only important for those with diagnosed diabetes for managing their disease but also for the significant proportion of persons with undiagnosed diabetes (approximately one-quarter to one-third of diabetes cases are undiagnosed) (7). Among adults age 18–64 years, an estimated 36.6% with undiagnosed diabetes are uninsured (8). These patients are at increased risk of serious complications and health care costs since a diagnosis will likely be delayed due to infrequent health care visits.

### HEALTH INSURANCE AND HEALTH CARE UTILIZATION

In a new analysis for *Diabetes in America*, data from the NHIS 2009 indicate that among adults age 18–64 years with diabetes, 87.9% of those with health insurance saw a doctor in the past year compared to 69.6% of diabetic adults without health insurance ( $p<0.05$ ) (Table 42.5). Similarly, among adults age 18–64 years with diabetes, 58.5% with health insurance and 24.4% without health insurance saw an eye doctor in the past year; 19.4% with health insurance and 6.9% without health insurance saw a foot doctor in the past year ( $p<0.05$  for both).

In analyses for *Diabetes in America*, data from the NHANES 2007–2010 show that among adults age 20–64 years with diabetes, 76.9% with health insurance went to a doctor's office or HMO for routine care compared to 55.0% of adults without insurance ( $p<0.01$ ); fewer with health insurance went to a clinic or health center compared to those without insurance (20.0% vs. 37.5%,  $p<0.05$ ) (Table 42.4). Significantly more adults with diabetes who had health insurance reported having a usual doctor for diabetes care (83.5%) compared to those without insurance (64.9%) ( $p<0.001$ ). Adults with diabetes who had health insurance more often checked their blood glucose  $\geq 1$  time per day, had their A1c tested more frequently, and more often had a dilated eye exam in the past year compared to their counterparts without insurance ( $p<0.05$  for all). There was little difference in the prevalence of overnight

**TABLE 42.6.** Prevalence of Diabetes Control Among Adults Age 20–64 Years With Diabetes, by Health Insurance Status, U.S., 2007–2010

DIABETES CONTROL MEASURE	PERCENT (STANDARD ERROR)	
	Health Insurance	No Health Insurance
<b>A1c (%)</b>		
<7.0	50.0 (3.80)	42.5 (4.41)
<8.0	75.1 (3.01)	65.4 (3.65)
<9.0	85.7 (1.48)	72.3 (3.83)
<b>Blood pressure (mmHg)</b>		
<130/80	56.7 (2.98)	55.0 (3.93)
<140/80	66.4 (3.16)	61.5 (4.08)
<140/90	79.4 (2.65)	71.6 (4.19)
<b>Cholesterol</b>		
LDL <100 mg/dL	55.4 (4.33)	38.3 (7.32)
On statin	45.7 (2.44)	30.9 (4.05)

Diabetes data are self-reported. Conversions for A1c and LDL values are provided in *Diabetes in America Appendix I Conversions*. A1c, glycosylated hemoglobin; LDL, low-density lipoprotein.

SOURCE: National Health and Nutrition Examination Surveys 2007–2010

hospital stays or seeing a diabetes specialist in the past year by health insurance status.

Previous studies corroborate these new findings from the NHIS and NHANES showing that lack of health insurance coverage is a major barrier to health care access. Data from the Behavioral Risk Factor Surveillance System 2000 found that adults age 18–64 years with diabetes who were uninsured were less likely to report having an annual dilated eye exam, foot examination, or A1c test and less likely to perform daily blood glucose monitoring compared to persons with private health insurance ( $p<0.05$  for all) (9). A study using data from the NHIS 2009–2010 found that adults age 18–64 years with no insurance during the preceding year were six times as likely to forgo needed medical care compared to those who were continuously insured (10). In another cross-sectional study using data from the NHANES 1999–2004, adults with diabetes age 18–64 years who were uninsured were less likely to have a standard site for care when sick and were less likely to visit a health professional in the past year compared to their diabetic counterparts with health insurance (11). Finally, data from the NHANES 1999–2008 showed that the number of health care

visits in the past 12 months was significantly higher for adults with diabetes who had health insurance compared to those with no coverage ( $\geq 4$  visits in past year, 70.9% vs. 49.3%, respectively,  $p<0.001$ ). Persons with diabetes who did not have health insurance coverage were less likely to have a routine place for care and more often utilized a hospital emergency room or outpatient department ( $p<0.001$ ) (12).

### HEALTH INSURANCE AND DIABETES CONTROL

In new analyses conducted for *Diabetes in America*, data from the NHANES 2007–2010 show that A1c control and cholesterol control were better for adults age 20–64 years with diabetes who had health insurance compared to those without health insurance (Table 42.6). A significantly greater proportion of adults with diabetes who had health insurance achieved an A1c  $<9.0\%$  ( $<75$  mmol/mol; 85.7% vs. 72.3% for uninsured,  $p=0.006$ ); achieving A1c  $<7.0\%$  ( $<53$  mmol/mol) or  $<8.0\%$  ( $<64$  mmol/mol) was greater for those with health insurance but was not statistically different from those without insurance. Among adults age 20–64 years with diabetes, 55.4% with health insurance achieved low-density lipoprotein (LDL) cholesterol  $<100$  mg/dL ( $<2.59$  mmol/L; vs. 38.3% for uninsured,  $p=0.049$ ), and

45.7% were taking statin medication (vs. 30.9% for uninsured,  $p=0.001$ ). There was no statistically significant difference in blood pressure control by health insurance status for adults with diabetes.

Previous literature from the NHANES 1999–2008 found diabetes control was significantly worse among uninsured adults compared to those with health insurance (12). A1c control was worse among adults without health insurance coverage compared to those with coverage (A1c >9.0%, 34.1% vs. 16.9%, respectively). Similarly, blood pressure control was worse among those without health insurance (blood pressure  $\geq 140/90$  mmHg, 31.8% vs. 22.8%, respectively). Health insurance coverage was not associated with worse cholesterol levels.

### HEALTH INSURANCE, MORBIDITY, AND MORTALITY

In new analyses conducted for *Diabetes in America*, data from the NHANES 2007–2010 show that more adults age 20–64 years with diabetes who had health insurance reported a history of cardiovascular disease or stroke compared to those without health insurance, although the differences were not statistically significant (Table 42.7). These results may reflect greater health care utilization and opportunity for diagnosis among those with insurance. The prevalence of renal disease was similar by health insurance status, while the prevalence of retinopathy was slightly lower among those with health insurance. In a similar new analysis for

**TABLE 42.7.** Prevalence of Morbidity Among Adults Age 20–64 Years With Diabetes, by Health Insurance Status, U.S., 2007–2010

DIABETES-RELATED COMORBIDITY	PERCENT (STANDARD ERROR)	
	Health Insurance	No Health Insurance
History of CVD*	16.4 (1.78)	11.5 (2.61)
History of stroke*	6.8 (1.45)	4.9 (1.50)
Renal disease†	7.3 (1.26)	8.2 (3.02)
Retinopathy*	18.4 (2.32)	23.1 (3.72)
Neuropathy‡	20.1 (2.21)	17.9 (5.11)

CVD, cardiovascular disease.

\* Data are self-reported; diabetes data are self-reported.

† Renal disease: estimated glomerular filtration rate (eGFR) <60 mL/min/1.73 m<sup>2</sup> determined using the CKD-EPI equation and serum creatinine.

‡ Neuropathy is defined as having  $\geq 1$  insensate area on either foot by monofilament testing; includes only adults age 40–64 years from the NHANES 1999–2004.

SOURCE: National Health and Nutrition Examination Surveys 2007–2010

**TABLE 42.8.** Prevalence of Comorbidity Among Adults Age 18–64 Years With Diabetes, by Health Insurance Status, U.S., 2009

COMORBIDITY	PERCENT (STANDARD ERROR)	
	Health Insurance	No Health Insurance
Hypertension	65.2 (1.94)	55.3 (4.16)
Heart disease	23.2 (1.72)	13.5 (2.61)
Failing kidneys	6.7 (0.88)	5.8 (2.05)
Vision problems	16.6 (1.56)	20.6 (3.19)

Data are self-reported.

SOURCE: National Health Interview Survey 2009

*Diabetes in America*, data from the NHIS 2009 indicated that adults age 18–64 years with health insurance more often reported having hypertension or heart disease compared to those without health insurance ( $p<0.05$ ) (Table 42.8). The prevalence of failing kidneys or vision problems was similar by health insurance status.

Prospective data from the Health and Retirement Study that was conducted during 1992 and 2000 showed that uninsured individuals who were near elderly (mean age 55 years) were at a significantly increased risk of dying from diabetes, hypertension, or heart disease compared to their insured counterparts (13).

## ECONOMIC ASPECTS OF HEALTH INSURANCE COVERAGE

### PERCENT DISTRIBUTION OF PAYMENT FOR MEDICAL CARE EXPENSES

In new analyses conducted for *Diabetes in America*, data from the MEPS 2008 indicate that among adults age 18–64 years with diabetes, the predominant source of payment for medical care expenses for all services was private insurance (46.8%); 17.5% of services were paid by Medicare, 15.4% were paid out-of-pocket, 11.6% were paid by Medicaid, and the remaining 8.7% were paid by other

sources (Table 42.9). A similar distribution was seen for all office-based visits. For emergency room visits, 54.9% were paid by private health insurance, with 10%–12% of emergency room visits paid out-of-pocket, by Medicare, by Medicaid, or by other sources. The majority of dental visits were paid by private insurance (50.6%) or out-of-pocket (39.1%).

For adults age  $\geq 65$  years with diabetes, the majority of services were paid by Medicare (62.6%), with 12.5% paid

out-of-pocket and 13.5% paid by private insurance. Payment sources were distributed similarly for all office-based visits. A large majority of emergency room visits were paid by Medicare (87.1%), and most dental visits were paid out-of-pocket (77.4%).

### EXPECTED SOURCES OF PAYMENT FOR VISITS INVOLVING DIABETES

In new analyses conducted for *Diabetes in America*, data from the NAMCS/NHAMCS 2008 show that for adults age

**TABLE 42.9.** Percent Distribution of Payment for Medical Care Expenses for Adults With Diabetes, by Source of Payment, U.S., 2008

MEDICAL CARE EXPENSE	PERCENT (STANDARD ERROR)				
	Out-of-Pocket	Private Health Insurance	Medicare	Medicaid	Other*
<b>Total services</b>					
All Adults	14.1 (0.79)	31.9 (2.18)	37.6 (2.04)	8.1 (1.14)	8.3 (0.80)
Age 18–64 years	15.4 (1.23)	46.8 (3.09)	17.5 (2.48)	11.6 (1.89)	8.7 (1.24)
Age ≥65 years	12.5 (0.82)	13.5 (1.59)	62.6 (1.98)	3.8 (0.63)	7.7 (1.07)
<b>Total office-based visits</b>					
All Adults	11.8 (1.17)	31.9 (2.32)	38.3 (2.23)	7.1 (1.22)	10.9 (1.16)
Age 18–64 years	14.6 (1.61)	46.4 (3.59)	16.8 (3.20)	10.4 (2.11)	11.8 (1.78)
Age ≥65 years	8.5 (1.16)	15.4 (2.06)	62.8 (2.12)	3.4 (0.77)	9.9 (1.48)
<b>Emergency room visits</b>					
All Adults	6.1 (2.31)	26.3 (9.45) <sup>1</sup>	55.9 (15.29)	4.8 (1.87) <sup>1</sup>	6.9 (2.82) <sup>2</sup>
Age 18–64 years	11.4 (2.02)	54.9 (5.01)	11.4 (3.00)	10.2 (2.27)	12.1 (3.37)
Age ≥65 years	<sup>3</sup>	<sup>3</sup>	87.1 (7.75)	<sup>3</sup>	<sup>3</sup>
<b>Dental visits</b>					
All Adults	51.6 (3.69)	38.3 (3.62)	1.6 (0.59)	4.5 (1.96) <sup>2</sup>	4.0 (1.37) <sup>1</sup>
Age 18–64 years	39.1 (2.99)	50.6 (3.26)	<sup>3</sup>	<sup>3</sup>	4.2 (1.63) <sup>1</sup>
Age ≥65 years	77.4 (4.95)	12.9 (3.36)	3.8 (1.67) <sup>2</sup>	<sup>3</sup>	<sup>3</sup>

Diabetes is self-reported.

\* Other sources: Federal (Indian Health Service, Military Treatment Facilities), State/local, Workers' Compensation, other unclassified sources (e.g., automobile, homeowner's, liability, other miscellaneous).

<sup>1</sup> Relative standard error >30%–40%

<sup>2</sup> Relative standard error >40%–50%

<sup>3</sup> Estimate is too unreliable to present; ≤1 case or relative standard error >50%.

SOURCE: Medical Expenditure Panel Survey 2008

**TABLE 42.10.** Prevalence of Expected Sources of Payment for Visits Involving Diabetes, by Age, U.S., 2008

SOURCE OF PAYMENT	PERCENT (STANDARD ERROR)*	
	Age 18–64 Years	Age ≥65 Years
Private	70.2 (2.61)	51.4 (3.23)
Medicare	13.0 (1.84)	77.2 (2.87)
Medicaid/SCHIP	13.9 (2.17)	5.8 (1.55)
Workers' compensation	<sup>3</sup>	<sup>3</sup>
Self-pay	5.2 (1.05)	<sup>3</sup>
No charge	<sup>3</sup>	<sup>3</sup>
Other†	4.4 (1.37) <sup>1</sup>	3.5 (1.30) <sup>1</sup>
Unknown	1.6 (0.58) <sup>1</sup>	2.5 (1.24) <sup>2</sup>

Diabetes includes the following ICD-9 codes: 250, 357.2, 362.0, 366.41, 648.0, and 775.1. ICD-9, International Classification of Diseases, Ninth Revision; SCHIP, State Children's Health Insurance Program.

\* Columns may not add to 100% since there may be multiple sources of payment.

† Other sources may include CHAMPUS (now TRICARE from Department of Defense), state and local governments, private charitable organizations, and other liability insurance (e.g., automobile collision policy coverage).

<sup>1</sup> Relative standard error >30%–40%

<sup>2</sup> Relative standard error >40%–50%

<sup>3</sup> Estimate is too unreliable to present; ≤1 case or relative standard error >50%.

SOURCE: National Ambulatory Medical Care Survey 2008 and National Hospital Ambulatory Medical Care Survey 2008

18–64 years having ambulatory office or hospital visits with diabetes as a diagnosis, 70.2% of visits were expected to be paid by private insurance, 13.0% by Medicare, 13.9% by Medicaid or State Children's Health Insurance Program (SCHIP), and 5.2% by self-pay (Table 42.10). Multiple sources of payment for a visit could occur; thus, expected sources of payment were not mutually exclusive.

For adults age ≥65 years, 51.4% of visits were expected to be paid by private insurance, 77.2% by Medicare, 5.8% by Medicaid/SCHIP, and 2.4% by self-pay.

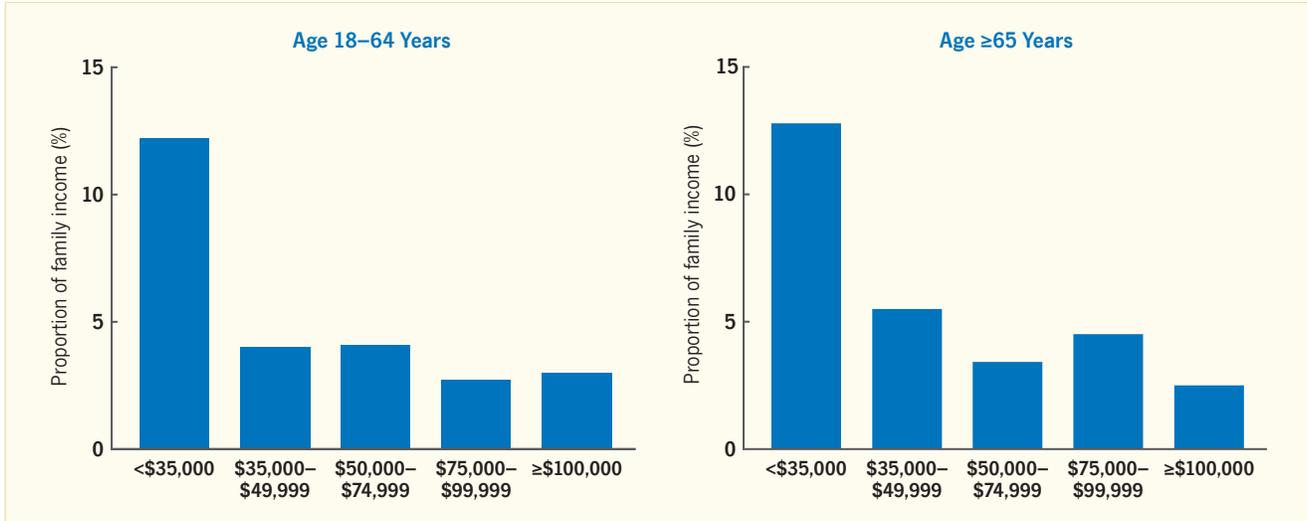
### PROPORTION OF INCOME SPENT ON PRIVATE INSURANCE PREMIUMS

In the NHIS 2009, the proportion of family income that adults with diabetes spent on out-of-pocket private insurance premiums was higher for persons with lower income (Figure 42.15). Using median premium costs, adults age 18–64 years with diabetes who had an annual family income <\$35,000 spent 12.2% of their income on private premiums, while counterparts with an annual income ≥\$100,000 spent 3.0% of their income on private premiums. When using mean health insurance premium costs, a less conservative approach, a greater discrepancy was observed between low and high income earners (22% for income <\$35,000 vs. 4% for income ≥\$100,000).

Similar inverse relationships were seen for adults ≥65 years of age with diabetes. Using median costs, the proportion of income spent on out-of-pocket insurance premiums ranged from 12.8% for those earning <\$35,000 per year to 2.5% for those earning ≥\$100,000. Using mean costs, out-of-pocket costs ranged from 13.8% for those earning <\$35,000 per year to 3.4% for those earning ≥\$100,000.

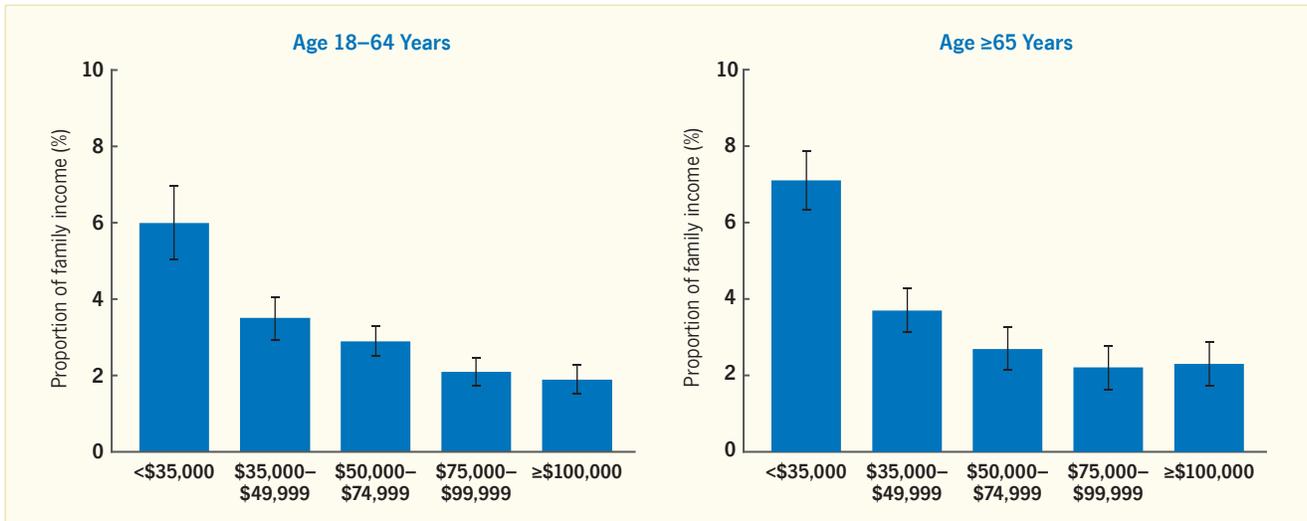
All relationships persisted for adults without diabetes, regardless of age, although the absolute differences between low and high income levels were less. For adults age 18–64 years, the proportion of income spent on median private

**FIGURE 42.15.** Proportion of Family Income Spent on Out-Of-Pocket Private Premiums in the Past Year Among Adults With Diabetes, by Family Income and Age, U.S., 2009



Data are self-reported using median costs for private insurance premiums.  
SOURCE: National Health Interview Survey 2009

**FIGURE 42.16.** Proportion of Income Spent on Family Medical Costs in the Past Year Among Adults With Diabetes, by Family Income and Age, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.  
SOURCE: National Health Interview Survey 2009

premiums ranged from 8.5% for persons with an annual income of <\$35,000 to 3.0% for those with income ≥\$100,000; for adults age ≥65 years, the proportion ranged from 10.1% to 2.1%, respectively (2).

**PROPORTION OF INCOME SPENT ON FAMILY MEDICAL CARE**

In the NHIS 2009, adults with diabetes age 18-64 years who had an annual family income <\$35,000 spent 6.0% of their income on medical care, excluding

premium costs, while those with a family income ≥\$100,000 spent 1.9% of their income on medical care (Figure 42.16).

For adults with diabetes age ≥65 years, the proportion of income spent on medical care ranged from 7.1% for families with an income <\$35,000 to 2.3% for families with an income ≥\$100,000.

Similar relationships persisted for adults without diabetes, regardless of age. The proportion of family income spent on

family medical care was 4.4% for adults age 18-64 years and 5.7% for adults age ≥65 years who had an income <\$35,000 compared to 1.7% and 1.8%, respectively, for those earning a family income of ≥\$100,000.

## NO HEALTH INSURANCE COVERAGE

### NUMBER OF PERSONS WITHOUT INSURANCE

Data from the NHIS 2009 indicate that 20.5 million adults had diabetes. Applying the rates of health insurance coverage estimated in Figure 42.1, 2.02 million adults with diabetes had no health insurance coverage, including 2.0 million adults age 18–64 years and 25,700 adults age ≥65 years (Figure 42.17).

For adults without diabetes, 38.4 million had no health insurance, including 38.1 million adults age 18–64 years and 251,550 adults age ≥65 years (S. S. Casagrande and C. C. Cowie, unpublished data).

### PERCENT OF PERSONS WITHOUT INSURANCE

The prevalence of having no health insurance was 9.9% for all adults with diabetes and 18.6% for adults without diabetes (Figure 42.18). Among adults with diabetes, 20.3% of adults age 18–34 years, 17.1% of adults age 35–49 years, and 13.7% of adults age 50–64 years had no health insurance; for persons without diabetes, 28.3%, 21.3%, and 12.9% had no health insurance, respectively. Very few adults age ≥65 years had no health insurance, including 0.3% of persons with diabetes and 0.8% of persons without diabetes.

### LENGTH OF TIME WITHOUT INSURANCE

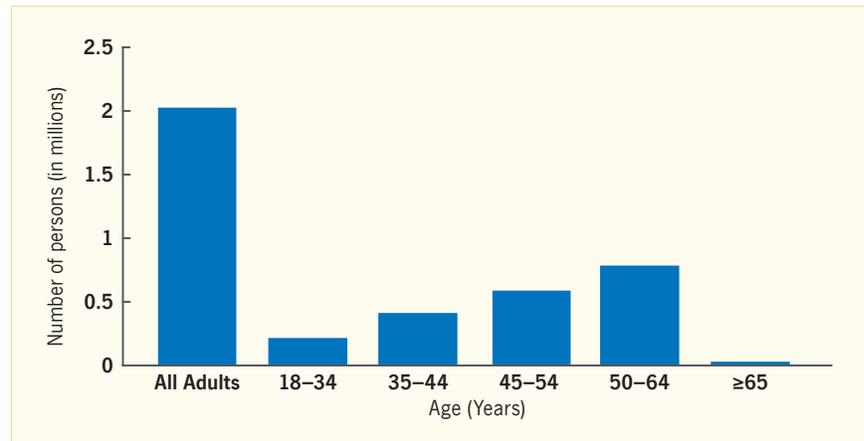
Among uninsured adults with diabetes age 18–64 years, the majority had been uninsured for ≥3 years (48.1%); 15.5% had been uninsured for ≤6 months, 19.0% for >6 months to <1 year, and 17.4% for 1 to <3 years (Figure 42.19).

Adults age 18–64 years without diabetes had been uninsured for similar lengths of time, with 40.2% having no health insurance coverage for ≥3 years, and 28.0% having been uninsured for 1 to <3 years.

### REASONS FOR NOT HAVING HEALTH INSURANCE

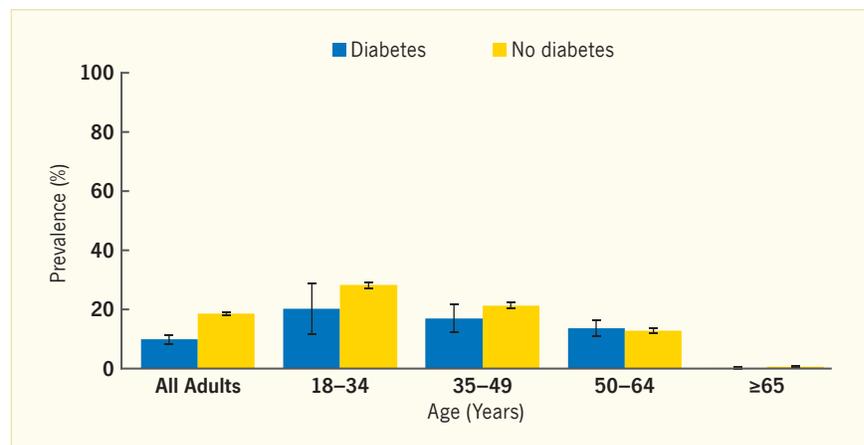
For persons with diabetes age 18–64 years, high health insurance cost was the most prevalent reason for not having

**FIGURE 42.17.** Number of Adults With Diabetes Who Do Not Have Health Insurance Coverage, by Age, U.S., 2009



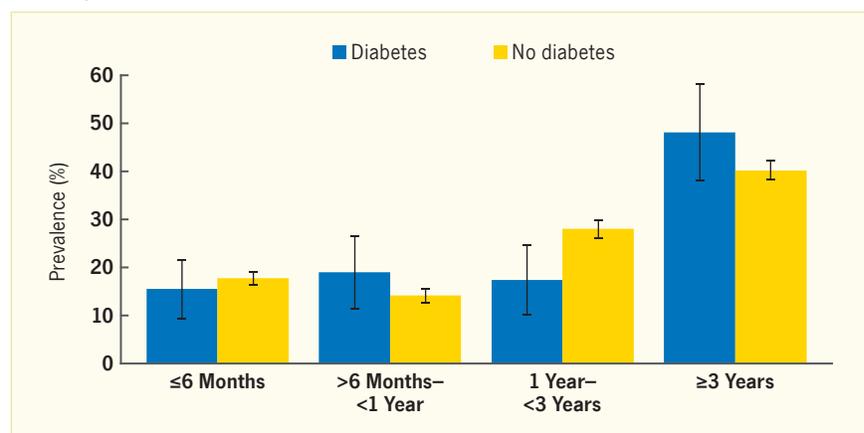
Data are self-reported.  
SOURCE: National Health Interview Survey 2009

**FIGURE 42.18.** Prevalence of Having No Health Insurance Coverage, by Diabetes Status and Age, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.  
SOURCE: National Health Interview Survey 2009

**FIGURE 42.19.** Length of Time Since Last Had Health Insurance Among Adults Age 18–64 Years, by Diabetes Status, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.  
SOURCE: National Health Interview Survey 2009

coverage (51.5%) (Table 42.11). Thirty-five percent of persons with diabetes reported job loss or a change in employer as a reason for no coverage. Fewer persons reported that their employer did not offer or they were not eligible for health insurance (8.2%).

Reasons for lack of health insurance coverage were similar for persons without diabetes. Forty-seven percent reported that high health insurance cost was a reason for not having coverage, and 29.9% reported job loss or a change in employer as a reason for no coverage.

### FAMILY INCOME OF PERSONS WITHOUT INSURANCE

Among adults age 18–64 years with diabetes who were uninsured, the majority had a family income <\$35,000 (59.9%); 21.7% had a family income \$35,000–\$49,999, 10.8% had a family income \$50,000–\$74,999, 3.5% had a family income \$75,000–\$99,999, and 4.1% had a family income ≥\$100,000 (Figure 42.20).

The distribution of family income was similar for uninsured adults age 18–64 years without diabetes. Fifty-four percent had a family income <\$35,000; 17.6% had a family income \$35,000–\$49,999, 16.3% had a family income \$50,000–\$74,999, 5.7% had a family income \$75,000–\$99,999, and 6.2% had a family income ≥\$100,000.

**TABLE 42.11.** Reasons for No Health Insurance Among Adults Age 18–64 Years, by Diabetes Status, U.S., 2009

REASON	PERCENT (STANDARD ERROR)	
	Diabetes	No Diabetes
Cost is too high	51.5 (4.48)	46.5 (1.08)
Lost job/changed employers	34.7 (3.79)	29.9 (0.86)
Lost Medicaid	11.4 (2.98)	5.0 (0.39)
Employer does not offer/not eligible for coverage	8.2 (1.86)	13.8 (0.72)
Divorce/death of spouse or parent	3.7 (1.50) <sup>1</sup>	2.6 (0.28)
Insurance company refused coverage	3.0 (1.42) <sup>1</sup>	1.1 (0.21)
Medicaid/medi-plan stopped after pregnancy	<sup>2</sup>	3.7 (0.35)
Ineligible because of age or left school	<sup>2</sup>	12.0 (0.77)

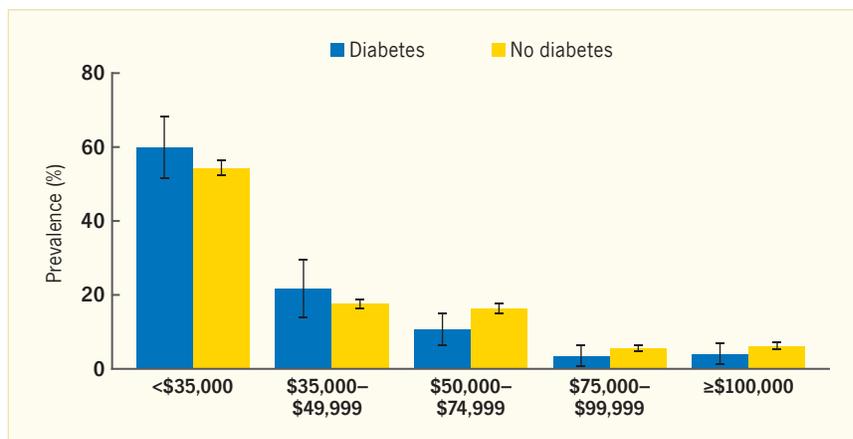
Respondents could report multiple reasons for no health insurance.

<sup>1</sup> Relative standard error >40%–50%

<sup>2</sup> Estimate is too unreliable to present; ≤1 case or relative standard error >50%.

SOURCE: National Health Interview Survey 2009

**FIGURE 42.20.** Distribution of Adults Age 18–64 Years Without Health Insurance, by Diabetes Status and Family Income, U.S., 2009



Data are self-reported. Error bars represent 95% confidence intervals.

SOURCE: National Health Interview Survey 2009

## TIME TRENDS IN HEALTH INSURANCE COVERAGE

### PREVALENCE OF HEALTH INSURANCE COVERAGE AND TYPES OF COVERAGE, NHIS 1989–2009

For adults age 18–64 years with diabetes, the prevalence of any type of health insurance coverage was similar in 1989 compared to that in 2009 (86.5% and 84.7%, respectively) (Figure 42.21) (14). The prevalence of Medicare coverage was 10.3% in 1989 and 13.6% in 2009, and the prevalence of private insurance coverage was 69.3% and 58.3% in 1989 and 2009, respectively. Medicaid and other public insurance coverage was 14.1% in 1989 and 19.4% in 2009. The prevalence of

military benefits remained similar in both study years.

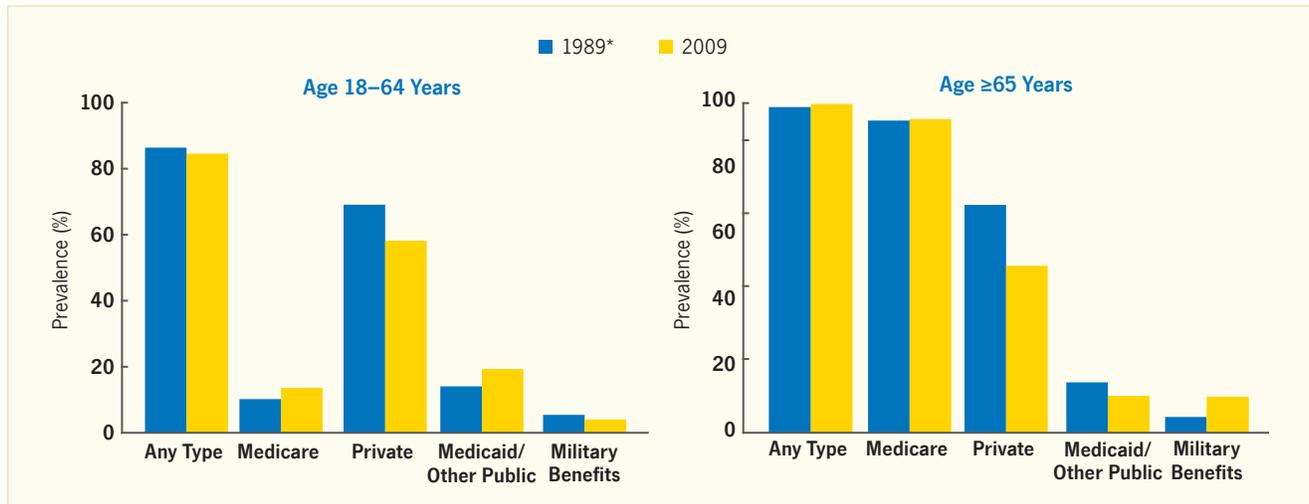
For adults age ≥65 years with diabetes, the prevalence of any type of health insurance remained virtually the same, with 98.8% and 99.7% of adults having health insurance in 1989 and 2009, respectively. Health insurance coverage in older adults was primarily driven by Medicare, with 95% having Medicare coverage in 1989 and 2009. Similar to younger adults, private health insurance was higher in 1989 (69.2%) than in 2009 (50.6%) for adults age ≥65 years. Medicaid and other

public health insurance coverage was 15.4% in 1989 and 11.2% in 2009, and the prevalence of military benefits was 4.9% and 11.0% in 1989 and 2009, respectively.

### PREVALENCE OF TYPE OF PRIVATE HEALTH INSURANCE COVERAGE, NHIS 1989–2009

The most common type of private health insurance coverage shifted from fee-for-service plans in 1989 to PPO plans in 2009 (S. S. Casagrande and C. C. Cowie, unpublished data). In 1989, 57.8% of adults with diabetes age 18–64 years with private coverage

**FIGURE 42.21.** Prevalence of Types of Health Insurance Coverage Among Adults With Diabetes, by Age, U.S., 1989 and 2009



Data are self-reported.  
 \* 1989 estimates are from Reference 14.  
 SOURCE: National Health Interview Surveys 1989 and 2009

had a fee-for-service plan, 9.3% had a HMO, and 5.2% had an IPA (14). In 2009, 58.3% of adults age 18–64 years had a PPO plan, 33.7% had an HMO/IPA, and 3.1% had a fee-for-service plan. The prevalences of these plan types were not mutually exclusive. This shift was a result of increasing health insurance costs in the 1980s and 1990s when the majority

of employee-sponsored fee-for-service plans were replaced with less expensive managed care plans.

Adults age ≥65 years with diabetes had similar private plan types as their younger counterparts. In 1989, 62.5% were covered by fee-for-service plans, 5.8% by a HMO, and 1.3% by an IPA. In 2009,

51.6% were covered by a PPO, 21.3% by a HMO/IPA, and 12.1% by a fee-for-service plan.

### LIST OF ABBREVIATIONS AND DEFINITIONS

- A1c . . . . . glycosylated hemoglobin
- Fee-for-service plan . . . . . The patient agrees to pay premiums in exchange for freedom to choose a doctor. Patients are able to see service providers where, when, and as often as they want and may see specialists without a referral. The premiums are generally high.
- HMO/IPA . . . . . Health Maintenance Organization/Independent Practice Association. The patient needs to choose a primary care physician within a network. A primary care referral is needed to see a specialist.
- LDL . . . . . low-density lipoprotein cholesterol
- Medicaid . . . . . Health insurance program for certain individuals and families with low incomes. It is jointly funded by the state and federal governments and is managed by the state.
- Medicare . . . . . National health insurance program administered by the U.S. federal government since 1965 that guarantees access to health insurance for Americans age ≥65 years and for younger people with disabilities, including those with end-stage renal disease.
- MEPS . . . . . Medical Expenditure Panel Survey
- Military benefits . . . . . Includes non-enlisted civilian population who have benefits from the Veterans Health Administration, TRICARE (a Department of Defense health care program), or CHAMP-VA (coverage for a spouse or widow(er) and to the children of a veteran who is not eligible for TRICARE).
- NAMCS . . . . . National Ambulatory Medical Care Survey
- NHAMCS . . . . . National Hospital Ambulatory Medical Care Survey
- NHANES . . . . . National Health and Nutrition Examination Survey
- NHIS . . . . . National Health Interview Survey
- Other public insurance . . . . . Includes state-sponsored health plan, other government plan, and SCHIP.

## LIST OF ABBREVIATIONS AND DEFINITIONS (continued)

POS . . . . .	Point of Service. Combines the lower cost of an HMO with the freedom of choice of a PPO. The plan requires that the patient choose a primary care provider but allows you to choose where you get care. Costs are lower if the patient stays in-network.
PPO . . . . .	Preferred Provider Organization. Patients have the option to choose from a number of doctors/specialists who are in the network of the insurer without a primary care physician “gatekeeper.” The patient is heavily penalized if an “out of network doctor” is chosen. This plan is considered a combination of a fee-for-service and HMO plan.
SCHIP . . . . .	State Children’s Health Insurance Program

### CONVERSIONS

Conversions for A1c and LDL values are provided in *Diabetes in America Appendix 1 Conversions*.

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### DUALITY OF INTEREST

Drs. Casagrande and Cowie reported no conflicts of interest.

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