Preventive-Care Practices Among Persons With Diabetes—United States, 1995 and 2001

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Effective interventions are available to persons with diabetes that can prevent or delay the development of serious health complications such as lower limb amputation, blindness, kidney failure, and cardiovascular disease. However, the use of preventive-care practices is lower than recommended, and the national health objectives for 2010 aim to improve care for all persons with diabetes. To assess progress toward meeting these goals, CDC analyzed data on selected diabetes-related preventive-care practices, including influenza and pneumococcal vaccination coverage, from the Behavioral Risk Factor Surveillance System (BRFSS) from 1995 and 2001. This report presents the findings of these analyses, which indicate that levels of preventive-care practices among persons with diabetes in the United States increased from 1995 to 2001. Further efforts are needed to improve care among persons with diabetes, reduce the burden of diabetes-related complications, and achieve the national health objectives, including continued surveillance of diabetes-related preventive-care practices and collaboration with community-based organizations, health-care providers, public health officials, and persons with diabetes.

BRFSS is a state-based, random-digit-dialed telephone survey of the noninstitutionalized U.S. population aged ≥18 years. The surveys are conducted in all 50 states, the District of Columbia, and three U.S. territories. Persons with diabetes were defined as respondents who answered “yes” to the question, “Has a doctor ever told you that you have diabetes?” Women who were told that they had diabetes only during pregnancy were not included. Persons who reported that they had diabetes were asked questions from the diabetes module on preventive-care practices, including: “When was the last time you had an eye exam in which the pupils were dilated?” (eye examination); “About how many times in the last year has a health professional checked your feet for any sores or irritations?” (foot examination); and “About how often do you check your blood for glucose or sugar?” (self-monitoring of blood glucose at least once daily [SMBG]). All BRFSS respondents were asked two additional questions: “During the past 12 months, have you had a flu shot?” (influenza vaccination) and “Have you ever had a pneumonia shot?” (pneumococcal vaccination).

A total of 35 states had information from the diabetes module for both 1995 and 2001 and were included in these analyses. The median response rate was 68.7% for 1995 (range: 48.6%-84.5%) and 52.1% for 2001 (range: 33.3%-70.8%). Data were weighted to reflect the age, sex, and racial/ethnic distribution in each of the 35 states. The percentage of persons with diabetes who received each of the preventive-care services and vaccinations was assessed by year, selected sociodemographic characteristics, and health insurance status. Age-specific rates are presented, and rates for selected characteristics are age-adjusted to the 2000 U.S. standard population. All analyses were conducted by using SAS v8 software with SUDAAN to estimate standard errors and test for significant differences in rates between 1995 and 2001.

The age-adjusted rates of all preventive-care practices increased from 1995 to 2001. The increases for rates of eye examinations and SMBG were statistically significant.

Rates of eye examinations increased with age for both 1995 and 2001, and in each age group rates increased from 1995 to 2001. Among persons aged 65-74 years, the increase was statistically significant. In addition, men, non-Hispanic whites, and persons without health insurance had statistically significant increases in the age-adjusted rate of eye examinations.

Rates of annual foot examinations increased significantly from 1995 to 2001 among those aged 45-64 and 65-74 years. Statistically significant increases also were shown among men, non-Hispanic whites, non-Hispanic blacks, and persons with health insurance.

The overall rate of SMBG was lower in the older age groups in both 1995 and 2001. However, the rate of SMBG increased significantly in all age groups. In addition, the age-adjusted rate of SMBG increased significantly among both sexes, non-Hispanic whites, Hispanics, persons with an education level of high school or greater, and persons with and without health insurance.

From 1995 to 2001, the age-adjusted rate increased significantly for both influenza and pneumococcal vaccinations. However, in 2001, the age-adjusted rate of influenza vaccination among persons with diabetes was higher than that for pneumococcal vaccination (43.5% versus 33.0%).

The rates of influenza vaccination increased with age for both 1995 and 2001, and rates in each age group increased from 1995 to 2001; however, the increase was statistically significant only among those aged 65-74 years. In addition, the age-adjusted rate of influenza vaccination increased significantly among men, non-Hispanic blacks, and those with a high school education.

The age-specific rate of pneumococcal vaccination increased with age in both 1995 and 2001. The rate of
pneumococcal vaccination increased significantly in each age group. In addition, the age-adjusted rate increased significantly among men and women, non-Hispanic whites and non-Hispanic blacks, Hispanics, persons at each level of education, and those with and without health insurance.

In 2001, the age-adjusted rates of the three preventive-care practices and the two vaccinations were below levels recommended by the national health objectives. Rates of pneumococcal vaccination among younger persons with diabetes showed the largest difference compared with the 2010 objectives.

CDC Editorial Note: Effective interventions are available that can prevent or delay the development of diabetes complications. The findings in this report indicate that the percentage of persons with diabetes who received preventive-care services increased from 1995 to 2001.

Consistent with previous reports, the rate of the use of preventive-care practices and vaccination coverage among persons with diabetes in 2001 was less than recommended, and improvement is needed in all areas of diabetes care to achieve the national health objectives. Differences observed in the reported use of diabetes-related preventive-care practices among racial/ethnic populations might reflect differences in socioeconomic status, access to care, cultural or language barriers, or other factors. In addition, these analyses identified target groups who are in need of interventions to improve their preventive care, such as younger persons with diabetes who need to receive eye examinations and vaccinations, and older persons who need to practice SMBG.

The findings in this report are subject to at least five limitations. First, these analyses included only the noninstitutionalized population and cannot be generalized to persons residing in nursing homes and other institutions. Second, self-reported data are subject to recall bias, and preventive-care practices or vaccination levels might be underreported or overreported. The extent to which reporting bias might affect these results is unknown. Third, BRFSS is a telephone survey, and rates of diabetes-related preventive-care practices presented in this report might be overestimated slightly because persons of low socioeconomic status are less likely to have telephones and less likely to receive preventive care. Fourth, the median response rate was 68.7% for 1995 and 52.1% for 2001; however, compared with census data, BRFSS data have minimal bias (BRFSS data quality report; available at http://www.cdc.gov/brfss). Finally, the analysis included only 35 states and might not be representative of the entire country. However, the rates of both influenza and pneumococcal vaccinations were assessed for all states in 2001 and showed little difference from the results in this report (CDC, unpublished data, 2001).

Public and private efforts to improve the level of diabetes care are ongoing. CDC collaborates with many partners to ensure good care and education for persons with diabetes. CDC and the National Institutes of Health cosponsor the National Diabetes Education Program (available at http://www.ndep.nih.gov), which develops educational tools and community-based interventions and establishes public and private partnerships to address the gap between current and desired levels of diabetes care and practices. CDC also is working with the Bureau of Primary Health Care of the Health Resources and Service Administration on the National Diabetes Collaborative, a partnership of public and private agencies to increase access to and improve the quality of diabetes care within federally funded health centers. As part of its national strategy, CDC provides resources and technical assistance to state diabetes-control programs to improve access to quality diabetes care. CDC also is working with managed-care partners on Project TRIAD (Translating Research into Action for Diabetes), a 5-year prospective study of the quality of diabetes care, costs, and outcomes in managed-care settings.

Continued surveillance of diabetes-related preventive-care practices using the BRFSS will be an important tool in monitoring the effectiveness of strategies designed to improve the quality of care among persons with diabetes, identify racial/ethnic health disparities, and focus interventions to eliminate such disparities.

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Influenza and Pneumococcal Vaccination Levels Among Persons Aged ≥65 Years—United States, 2001

TWO VACCINE-PREVENTABLE DISEASES, influenza and pneumococcal disease, contribute to the mortality of older persons in the United States. Influenza caused an average of 20,000 deaths per year during influenza epidemics in the United States from 1969 to 1996; persons aged ≥65 years accounted for approximately 90% of these deaths. Pneumococcal disease caused approximately 3,400 deaths among persons aged ≥65 years in the United States in 1998. National health objectives for 2010 include increasing influenza and pneumococcal vaccination levels to ≥90% among persons aged ≥65 years (objective nos. 14.29a and 14.29b, respectively). To assess progress toward achieving these objectives, CDC analyzed data from the 2001 Behavioral Risk Factor Surveillance System (BRFSS). This report summarizes the results, which indicate that the estimated point prevalences of influenza and pneumococcal vaccination were...
<80% among persons aged ≥65 years in all reporting areas. Influenza vaccination levels during 2000–2001 decreased from 1998–1999 levels in 27 of 52 reporting areas; pneumococcal vaccination prevalence increased a median of 7 percentage points from 1999 to 2001. Continued efforts are needed to increase the proportion of older adults who receive influenza and pneumococcal vaccines; health-care providers should offer pneumococcal vaccine all year and should continue to offer influenza vaccine during December and throughout the influenza season, even after influenza activity has been documented in the community.

BRFSS is a state-based, random-digit-dialed telephone survey of the noninstitutionalized civilian U.S. population aged ≥18 years. The survey is conducted in all 50 states, the District of Columbia, and three U.S. territories. Questions about influenza vaccination (“During the past 12 months, have you had a flu shot?”) and pneumococcal vaccination (“Have you ever had a pneumonia vaccination?”) were asked in all reporting areas in odd-numbered years starting in 1993. The response rate (CASRO method) was >60% in 10 of the 54 reporting areas (median: 51.1%; range: 33.3%-81.5%). Response rates for persons aged ≥65 years were not available. In 2001, the sample included 39,910 respondents aged ≥65 years. Respondents who reported an unknown influenza (0.3%) or pneumococcal (2.6%) vaccination status were excluded from the analysis. Overall vaccination levels were estimated for the 50 states and the District of Columbia; data for Guam, Puerto Rico, and the Virgin Islands were reported in area-specific results only. Data were weighted by age, sex, and, in some areas, by race/ethnicity to reflect each area’s estimated adult population. SUDAAN was used to calculate point estimates and 95% confidence intervals (CIs) and to conduct multivariable logistic regression to calculate odds ratios and test associations of vaccination status with age, race/ethnicity, sex, education level, geographic region, self-reported health, diabetes status, smoking status, and asthma history.

During 2001, a total of 64.9% (95% CI=64.0%-65.8%) of respondents aged ≥65 years reported having received an influenza vaccination during the preceding year, compared with 66.9% (95% CI=66.0%-67.8%) in 1999. Previous analyses have indicated percentage point increases of 7.7%, 7.4%, and 1.5% from 1993 to 1995, 1995 to 1997, and 1997 to 1999, respectively. Estimated influenza vaccination levels exceeded 60% in 48 of 54 reporting areas; in 34 of these areas, 95% CIs exceeded 60%. Vaccination prevalence ranged from 36.8% (Puerto Rico) to 79.0% (Hawaii). Of the 52 areas for which data were available for both 1999 and 2001, the median percentage point difference from 1999 to 2001 was −0.9 (range: −9.6 to 6.5).

The proportion of respondents reporting having ever received pneumococcal vaccination increased 5.9 percentage points, from 54.1% (95% CI=53.2%-55.1%) in 1999 to 60.0% (95% CI=59.2%-60.8%) in 2001. Previous analyses indicated percentage point increases of 6.9%, 9.8%, and 8.7% from 1993 to 1995, 1995 to 1997, and 1997 to 1999, respectively. Of the 52 reporting areas for which data were available for both 1999 and 2001, the proportion of respondents reporting having ever received pneumococcal vaccination increased in 51 areas. Estimated pneumococcal vaccination levels exceeded 60% in 32 reporting areas, and 95% CIs exceeded 60% in 18 of these areas. Vaccination prevalence ranged from 24.1% (Puerto Rico) to 70.9% (Oregon).

Receipt of one vaccine was associated with receipt of the other vaccine. A total of 10.5% of respondents reported pneumococcal vaccination only, and 15.4% reported recent influenza vaccination only; 49.3% reported both, and 24.7% reported having received neither.

The estimated percentages of non-Hispanic blacks and Hispanics having received influenza (non-Hispanic black = 48.1% and Hispanic = 55.2%) and pneumococcal vaccination (non-Hispanic black = 39.4% and Hispanic = 41.6%) were less than those for non-Hispanic whites having received influenza (67.1%) and pneumococcal vaccination (63.5%). After accounting for variations in age, sex, education level, self-reported health, diabetes status, geographic region, smoking status, and asthma history by logistic regression, the disparity in vaccination coverage between non-Hispanic whites and non-Hispanic blacks and Hispanics remained statistically significant.

The association between vaccination status and additional variables was examined by multivariable logistic regression. Persons aged ≥75 years were more likely to report influenza or pneumococcal vaccination than persons aged 65–74 years. Men were more likely than women to report influenza vaccination and less likely to report pneumococcal vaccination. Persons with diabetes or asthma were significantly more likely to report influenza and pneumococcal vaccination, compared with those who did not have diabetes or asthma. Coverage with both vaccines increased as education level increased and as self-reported health declined. Pneumococcal vaccination coverage was higher among smokers than among nonsmokers.
increased linearly during 1993-2001 and was significantly above 60% in 18 states in 2001. The number of states with point prevalence estimates of ≥60% increased from eight in 1999 to 32 in 2001. However, coverage in all 54 reporting areas remained <90% and must increase substantially to meet the national health objective for 2010.

Previous reports have noted racial/ethnic disparities in adult vaccine coverage. In the 2001 BRFSS, non-Hispanic blacks and Hispanics had substantially lower coverage than non-Hispanic whites. After adjusting for known potential confounding factors measured by BRFSS (e.g., education level but not direct measures of access to care, which were not available), the odds of members of these populations receiving influenza or pneumococcal vaccine remained substantially lower. These gaps were greatest for pneumococcal vaccine. In comparison with influenza vaccine, which is recommended annually, a single dose of pneumococcal vaccine is needed for persons aged ≥65 years. Strategies for addressing these disparities will be investigated by CDC’s Racial and Ethnic Adult Disparities Immunization Initiative (READII) through 2-year demonstration projects in Chicago, Illinois; Milwaukee, Wisconsin; a rural area of Mississippi; Rochester, New York; and San Antonio, Texas. Local and state health departments in these areas will work with community partners, CDC, and other federal agencies to identify and implement effective ways to improve influenza and pneumococcal vaccination levels among older non-Hispanic blacks and Hispanics.

Health-care providers should assess the vaccination status of their patients and offer indicated vaccines. Annual influenza vaccination provides such an opportunity; persons reporting recent influenza vaccination were 2.5 times more likely to report having received pneumococcal vaccine than were persons who did not report recent influenza vaccination. Administration of influenza and pneumococcal vaccine simultaneously does not increase the incidence or severity of adverse reactions.

Nevertheless, approximately one fourth of persons reporting recent influenza vaccination did not report having ever received pneumococcal vaccine.

The findings in this report are subject to at least three limitations. First, receipt of influenza or pneumococcal vaccination was based on self-report and not validated. The validity of self-reported pneumococcal vaccination is lower than that of influenza vaccination. Second, the BRFSS excludes persons without telephones or those with only cellular telephones. Third, the BRFSS response rate was >60% in 10 of the 54 reporting areas.

To assess possible selection bias resulting from the two latter limitations, comparisons were made between national estimates of vaccination coverage from BRFSS and the National Health Interview Survey (NHIS). NHIS data are collected through household, face-to-face interviews and usually have higher response rates (e.g., 72.1% in 2000). Estimated influenza vaccination levels for persons aged ≥65 years in 1997, 1999, and 2001 were 63.2%, 65.7%, and 63.0%, respectively, from NHIS and 65.5%, 66.9%, and 64.9%, respectively, from BRFSS. For the same years, estimated pneumococcal vaccination levels were 42.4%, 49.7%, and 53.8%, respectively, from NHIS and 45.4%, 54.1%, and 60.0%, respectively, from BRFSS. National BRFSS vaccination estimates show similar trends and subgroup differences as NHIS estimates but are consistently slightly higher than NHIS estimates. Previous analysis has documented that NHIS respondents living in households without telephones were less likely to report being vaccinated than those living in households with telephones, but this accounts for only a small portion of the differences observed between NHIS and BRFSS estimates.

The optimal time to administer influenza vaccination is during October-November. However, influenza vaccination should continue into December and later because many persons at high risk for influenza-related complications, household members of these persons, health-care workers, and other persons who want to decrease their risk for influenza remain unvaccinated by the end of November. Current projections indicate that 93 million doses of influenza vaccine will be available during the 2002-03 influenza season, and several million doses remain available for purchase. To maximize coverage among target groups and overall use, physicians should offer influenza vaccine throughout the influenza season. Influenza activity peaked in January or later in 21 of the preceding 25 influenza seasons. During influenza season and all year, pneumococcal vaccination also should be offered to persons aged ≥65 years and others at high risk who have not been vaccinated or whose vaccination status is unknown. Physicians can improve coverage by using strategies such as improved record keeping, standing orders, reminder/recall systems, and offering vaccinations to hospitalized patients before discharge. Additional information about influenza and pneumococcal vaccination is available at http://www.cdc.gov/nip.

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Progress Toward Global Dracunculiasis Eradication, June 2002

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In 1986, when the World Health Assembly first adopted a resolution calling for the eradication of dracunculiasis (Guinea worm disease), an estimated 3.5 million persons in 20 countries had the disease, and approximately 120 million persons were at risk for infec-

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tion. By December 2001, annual incidence of dracunculiasis had decreased approximately 98%, and seven countries (Cameroon, Chad, India, Kenya, Pakistan, Senegal, and Yemen) in which dracunculiasis had been endemic previously had eliminated the disease. This report describes the status of the global Dracunculiasis Eradication Program (DEP) as of June 2002. The findings indicate that DEP has succeeded in reducing incidence of dracunculiasis substantially; the disease can be eradicated if the remaining 13 countries in which it is endemic detect and contain transmission from the final cases.

For surveillance purposes, village-based health-care workers search for infected persons in each village in which disease is endemic and complete a register that provides a basis for monthly zonal, district, and national surveillance reports. During 2001, dracunculiasis was endemic in 13 African countries (Benin, Burkina Faso, Central African Republic, Côte d’Ivoire, Ethiopia, Ghana, Mali, Mauritania, Niger, Nigeria, Sudan, Togo, and Uganda) (2002 population: 353.5 million). These countries reported 63,717 cases from 6,122 villages; 3,921 (64%) of these villages were in Sudan, which reported 49,471 (78%) cases.

During January-June 2002, a total of 21,164 cases were reported, including 14,986 (71%) from Sudan. In countries other than Sudan, 6,158 indigenous cases were reported during January-June 2002, a decrease of 26% from the 8,349 cases those countries reported during the same period in 2001 and 53% from the 13,142 cases reported during the same period in 2000. During January-June 2002, Ghana (3,076 cases) and Nigeria (1,993 cases) accounted for 82% of the cases reported outside of Sudan; 2,005 (33%) cases were reported from five districts in Ghana’s northern region. A total of 27 cases were exported from one country to another, including 16 from Sudan, five from Togo, four from Ghana, one from Nigeria, and one from Burkina Faso. Mauritania has reported two indigenous cases of dracunculiasis, Uganda has reported four cases, Benin and Ethiopia appear close to interrupting transmission, and dracunculiasis is now confined to relatively restricted areas in Côte d’Ivoire and Mali. In addition, the World Health Organization (WHO) is verifying the occurrence of endemic transmission of dracunculiasis and the extent of the disease in the Central African Republic. During January-June 2002, the incidence of dracunculiasis in southeastern Nigeria, the country’s most highly endemic zone, declined 80% compared with the same period in 2001.

Interventions in all 13 countries, including those parts of Sudan not affected by the civil war, have been intensified since mid-2000. For example, cloth filters were distributed in 13 countries to all households in 63% of villages in which the disease is endemic and in 85% of such villages excluding Sudan. During January-June 2002, external advisors provided programs with 176 person-months of in-country supervisory assistance compared with 88 person-months during 2000. To prevent further transmission of the infection, some national eradication programs (e.g., in Togo and Ghana) are emphasizing the voluntary physical isolation of patients in health facilities or temporary structures when worms are emerging.

Reported by: The Carter Center, Atlanta, Georgia. World Health Organization Collaborating Center for Research, Training and Eradication of Dracunculiasis; Div of Parasitic Diseases, National Center for Infectious Diseases, CDC.

CDC Editorial Note: Dracunculiasis is a parasitic infection caused by Dracunculus medinensis. Persons become infected by drinking water from ponds contaminated by copepods (water fleas) that contain immature forms of the parasite. A year after entering the infected person, adult worms 1-meter (approximately 40 inches) long emerge through skin lesions, usually on the lower limbs, which frequently develop severe secondary bacterial infections. No effective treatment or vaccine for the disease exists, and infected persons do not become immune to future infections by the parasite. However, dracunculiasis can be prevented by filtering drinking water through a finely woven cloth, by treating contaminated water with the larvicide Abate® (temephos), by educating persons to avoid entering water sources when worms are emerging from their bodies, and by providing clean water from bore-hole wells or from protected hand-dug wells.

During January-June 2002, dracunculiasis continued to decline; the two major remaining endemic foci of the disease are in southern Sudan and northern Ghana. Increased efforts to stop transmission of dracunculiasis in northern Ghana are being carried out by the government and its partners (i.e., The Carter Center, United Nations Children’s Fund [UNICEF], WHO, U.S. Peace Corps, Ghana Red Cross Society, and various bilateral donors and nongovernment organizations involved with providing safe sources of drinking water). These efforts are expected to result in reductions similar to those recorded in southeast Nigeria. In southern Sudan, the 19-year-old civil war is the main reason for the high rate of disease. If the intensified political negotiations now under way between the two sides in Sudan succeed in ending hostilities, full access to the final areas of endemic dracunculiasis in southern Sudan might be possible soon. After the war ends and health-care workers gain access to this area, at least 4-5 years will be required to eliminate dracunculiasis, given the extent to which the disease is endemic and southern Sudan’s enormous size, geographic barriers, and poor infrastructure and communications networks. With the devotion of sufficient resources and the resolution of civil conflict, Sudan and the other countries in which dracunculiasis is endemic can eradicate this disease.

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*Major program partners include the ministries of health in 20 countries in which dracunculiasis is or was endemic, The Carter Center, United Nations Children’s Fund (UNICEF), World Health Organization, Bill and Melinda Gates Foundation, other bilateral and private donors, U.S. Peace Corps, and CDC.