

# Influenza Vaccination Coverage Among People With High-Risk Conditions in the U.S.



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**Introduction:** During annual influenza epidemics, rates of serious illness and death are higher among those who have medical conditions, such as pulmonary disease, diabetes, or heart disease, which place them at increased risk of influenza complications. Annual influenza vaccination was recommended for people with high-risk conditions as early as 1960.

**Methods:** Data from the 2012–2013 Behavioral Risk Factor Surveillance System were analyzed in 2014 to estimate national and state-specific influenza vaccination coverage among people aged 18–64 years with high-risk conditions. Prevalence ratios adjusted for demographic and access-to-care characteristics were calculated using logistic regression and predictive marginal models.

**Results:** Unadjusted influenza vaccination coverage was 45.4% among adults aged 18–64 years with at least one high-risk condition, compared with 32.9% among those with no high-risk conditions ( $p < 0.05$ ). Among adults aged 18–64 years with multiple conditions (at least two high-risk conditions), vaccination coverage was 53.2%. Coverage was 43.9% for those with pulmonary diseases, 52.7% for those with diabetes, 48.1% for those with heart disease, and 45.0% for those with cancer. Individuals with high-risk conditions were more likely to receive an influenza vaccine than those with no high-risk conditions, even after controlling for demographic and access-to-care characteristics.

**Conclusions:** Despite ongoing influenza vaccination recommendations for adults with high-risk conditions, coverage was below the *Healthy People 2020* target; only about half were vaccinated. Primary care providers and subspecialists should ensure routine assessment of vaccination status every fall and winter and recommend vaccination to people with high-risk conditions.

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## Introduction

Almost half of U.S. adults have at least one chronic condition, and more than a quarter have multiple conditions.<sup>1</sup> The number of Americans with chronic conditions is expected to increase by more than 1% each year through 2030.<sup>1</sup> During annual influenza epidemics, rates of serious illness and death are higher among those with medical conditions, such as pulmonary disease, diabetes, or heart disease, placing them at

increased risk of influenza complications.<sup>2–5</sup> Annual vaccination is the most effective way to prevent influenza infection and its complications.<sup>2</sup>

Annual influenza vaccination was recommended for individuals with high-risk conditions by the U.S. Public Health Service as early as 1960 and by the Advisory Committee on Immunization Practices (ACIP) prior to 2010.<sup>6,7</sup> The ACIP has since recommended annual vaccination for all adults.<sup>2,8</sup> However, vaccination coverage for adults with high-risk conditions was recently reported at 47%, well below a previous 90% *Healthy People 2020* target for high-risk adults and the current 70% target for all adults.<sup>9,10</sup>

Data from the 2012–2013 Behavioral Risk Factor Surveillance System (BRFSS) were used to examine national and state-specific influenza vaccination coverage among adults with select high-risk conditions.

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**Table 1.** Sample Characteristics Among Adults 18–64 Years by High-Risk Condition, BRFSS 2012–2013

	No high-risk conditions	≥ 1 high-risk condition <sup>a</sup>	≥ 2 high-risk conditions <sup>a</sup>	Pulmonary disease <sup>b</sup>	Diabetes	Heart disease <sup>c</sup>	Cancer <sup>d</sup>
Characteristic	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
<b>Total (N=245,480)</b>	180,839 (77.0)	64,641 (23.0)	14,258 (4.4)	33,611 (12.6)	22,213 (7.6)	12,321 (4.0)	13,697 (4.1)
Age							
18–49 years	104,637 (73.0)	<b>23,261 (50.5)*</b>	<b>3,156 (31.7)*</b>	<b>15,294 (60.7)*</b>	<b>5,490 (37.1)*</b>	<b>2,402 (29.5)*</b>	<b>3,695 (38.5)*</b>
50–64 years	76,202 (27.0)	41,380 (49.5)	11,102 (68.3)	18,317 (39.3)	16,723 (62.9)	9,919 (70.5)	10,002 (61.5)
Sex							
Male	80,368 (51.4)	<b>24,705 (43.7)*</b>	<b>5,255 (42.4)*</b>	<b>10,871 (38.1)*</b>	9,701 (50.4)	<b>6,648 (60.2)*</b>	<b>3,714 (29.0)*</b>
Female	100,471 (48.6)	39,936 (56.3)	9,003 (57.6)	22,740 (61.9)	12,512 (49.6)	5,673 (39.8)	9,983 (71.0)
Race/ethnicity							
White, non-Hispanic	134,923 (61.7)	<b>46,837 (63.2)*</b>	<b>10,136 (64.7)*</b>	<b>24,490 (64.8)*</b>	<b>14,667 (55.8)*</b>	<b>8,921 (63.9)*</b>	<b>10,934 (73.7)*</b>
Black, non-Hispanic	15,517 (11.7)	7,489 (14.5)	1,816 (15.6)	3,733 (15.1)	3,435 (16.6)	1,449 (14.7)	1,087 (9.7)
Hispanic	14,898 (17.9)	4,528 (14.3)	914 (11.8)	2,225 (11.7)	1,983 (19.5)	763 (12.7)	642 (10.3)
Asian, non-Hispanic	4,743 (4.5)	800 (2.3)	105 (1.1)	338 (1.9)	353 (2.6)	114 (2.2)	108 (1.4)
American Indian/Alaska Native, non-Hispanic	2,713 (1.2)	1,489 (1.8)	405 (2.2)	772 (2.0)	639 (1.9)	338 (1.8)	268 (1.8)
Other <sup>e</sup>	5,129 (3.0)	2,300 (3.9)	627 (4.5)	1,441 (4.4)	739 (3.6)	486 (4.7)	409 (3.1)
Marital status							
Married or unmarried couple	109,953 (59.4)	<b>33,983 (56.1)*</b>	<b>6,596 (52.6)*</b>	<b>16,228 (50.6)*</b>	<b>11,610 (58.5)*</b>	<b>6,273 (57.2)*</b>	<b>7,678 (62.6)*</b>
Divorced, widowed, or separated	32,082 (12.6)	19,135 (23.0)	5,640 (32.9)	10,257 (22.8)	7,037 (25.7)	4,553 (30.4)	4,318 (25.3)
Never married	37,794 (28.0)	11,204 (20.8)	1,968 (14.5)	6,949 (26.6)	3,476 (15.9)	1,449 (12.4)	1,635 (12.2)
Education level							
Less than high school	10,924 (10.4)	<b>6,943 (14.9)*</b>	<b>2,169 (18.5)*</b>	<b>4,041 (14.7)*</b>	<b>2,821 (18.0)*</b>	<b>1,708 (18.9)*</b>	<b>1,091 (11.6)*</b>
High school graduate/GED	47,113 (33.9)	19,831 (36.6)	4,806 (39.4)	10,342 (36.4)	7,352 (38.8)	4,238 (39.2)	3,684 (34.1)
Some college or technical school	50,225 (28.7)	19,300 (29.1)	4,356 (28.2)	10,203 (30.1)	6,481 (27.2)	3,664 (27.1)	4,238 (30.2)
College graduate	72,005 (27.0)	18,383 (19.4)	2,891 (13.9)	8,924 (18.8)	5,493 (16.0)	2,682 (14.8)	4,653 (24.2)

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