The Affordable Care Act and Health Insurance Coverage Among People With Diagnosed and Undiagnosed Diabetes: Data From the National Health and Nutrition Examination Survey

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Despite recent improvements, many people with diabetes remain undiagnosed, and those who are diagnosed often fail to reach their targets (1,2). Insurance coverage can change the health trajectory of people with diabetes by facilitating timely diabetes diagnosis and management (3,4). It is therefore important to understand how public policies can increase coverage among people with diabetes.

Increasing access to health insurance was a key goal of the Patient Protection and Affordable Care Act (ACA), but gaps remain in our knowledge about coverage gains among people with diabetes. An analysis of data from 2009 to 2016 found that insurance coverage for adults with diagnosed diabetes increased after key ACA provisions were implemented (5). However, the study did not include people whose diabetes is undiagnosed—a group comprising approximately one-third of all adults with diabetes prior to the ACA, including many people who are underserved minorities (1). To address this gap, we used the National Health and Nutrition Examination Survey (NHANES) to estimate the full changes in insurance coverage under the ACA for adults with diabetes, including undiagnosed diabetes.

We analyzed data from the 2005–2016 waves of NHANES, a repeated cross-sectional survey with biomarkers that is nationally representative of the noninstitutionalized civilian population on a biennial basis. Our sample included 2,401 nonpregnant U.S. citizens aged 26–64 years with diabetes, defined as $HbA_{1c} \geq 6.5\%$ or prior diagnosis by a health care professional.

Insurance coverage was modeled via linear regression as a function of indicator variables for 2013–2014 (transition period) and 2015–2016 (period with implementation of key ACA provisions to expand coverage), a linear time trend, and respondent age, race/ethnicity (non-Hispanic black, non-Hispanic white, Hispanic, other), sex, education (less than high school vs. more), married/living with partner versus not, language preference (English vs. other), diabetes diagnosis status, and household income (<$15,000, $15,000–45,000, and $45,000+), with heteroscedasticity robust SEs. We also examined changes in coverage rates among adults with low income (<138% federal poverty level) with diabetes, who became eligible for Medicaid under the ACA in many states, and adults age 65+ years, a group less affected by ACA coverage expansions. In secondary analyses, we used interaction terms to assess changes in coverage by diagnosis status. To calculate adjusted coverage rates before and after the ACA, we predicted coverage for all included respondents with the post-ACA variable set to 0 or set to 1, respectively. All analyses incorporated weights to account for the NHANES sampling design. Analyses were conducted using Stata 14.1.

In 2009–2010, 17% of nonelderly adults with diabetes, including 33% of those with low income, were uninsured (95% CI 16–18 and 32–35, respectively). After ACA implementation, adjusted uninsured rates among nonelderly adults with diabetes declined by 12 percentage points and among those with low income by 27 percentage points (95% CI 3–20 and 9–45) (Table 1). Applied to the population of nonelderly adults with diabetes in 2015–2016, these estimates suggest that an additional 1.9 million people, 1.2 million of whom had low income, gained health insurance after ACA implementation (bootstrapped 95% CI 0.5–3.3 million and 0.4–2.0 million, respectively). There were no significant changes in coverage among adults aged 65+ years.

Approximately one-quarter of nonelderly adults with undiagnosed diabetes in 2009–2010 lacked insurance

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Table 1—Uninsurance rates in nonelderly adults with diabetes before and after the ACA

Group	Before the ACA	After the ACA	Change after the ACA
All	17 (16–18)	5 (5–6)	−12 (−3 to −20)***
Low income (income <138% FPL)	33 (32–35)	6 (5–8)	−27 (−9 to −45)***
Diagnosed diabetes	15 (14–16)	5 (4–5)	−11 (−2 to −19)***
Undiagnosed diabetes	25 (23–27)	8 (7–10)	−17 (−5 to −29)***
Age 65+ years (placebo check)	2 (2–3)	1 (1–1)	−1 (−4 to 2)

Data are % (95% CI). Before and after the ACA refer to 2009–2010 and 2015–2016, respectively. Data were adjusted for a linear time trend, as well as respondents' age, race and ethnicity, sex, education, income, partner status, English language preference, and diagnosis status of diabetes. The three columns may not sum perfectly due to rounding. All quantities were calculated taking into account the complex sampling scheme of NHANES. FPL, federal poverty level. ***Significance of the additional change (***$P < 0.01$).

(25% [95% CI 23–27]). After ACA implementation, adjusted uninsured rates among people with undiagnosed diabetes declined by 17 percentage points compared with 11 percentage points among people with diagnosed diabetes (95% CI 5–29 and 2–19, respectively).

In summary, an additional 1.9 million people with diabetes—more than half of whom had low income—gained insurance coverage under the ACA, after adjustment for respondent characteristics and secular trends. Given that insurance reduces the financial strain of health care utilization, the coverage gains among people with low income may be particularly impactful (3).

To our knowledge, this study is the first to demonstrate gains in insurance coverage among both patients with diabetes that is diagnosed and patients with diabetes that is undiagnosed under the ACA. Gains in coverage for undiagnosed patients could improve both health outcomes and health equity going forward. Randomized trials have found that insurance coverage increases diabetes diagnosis and treatment, which are two key inputs to long-term health (3,4). Due to these diagnosis effects, including people with undiagnosed diabetes is crucial to correctly measuring coverage trends before and after insurance expansions. Additionally, insurance coverage for people with undiagnosed diabetes could improve health equity because people with undiagnosed diabetes disproportionately hail from underserved groups (1). Our estimates of the total coverage gains among people with diabetes after ACA implementation are informative of the potential losses in coverage that might occur under reversal of policy.

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