Introduction

Chronic hepatitis C virus (HCV) infection is the most common blood-borne pathogen and a leading cause of morbidity and mortality related to liver disease in the U.S.\(^1\) There are an estimated 2.7–3.2 million people chronically infected in the U.S., 81% of whom are accounted for by people born between 1945 and 1965 ("baby boomers").\(^2,3\) The majority of infected individuals are unaware of their infections despite the availability of effective treatment.\(^1\) In 2012, CDC recommended one-time HCV testing for baby boomers,\(^4\) which was endorsed by the U.S. Preventive Services Task Force (USPSTF) and approved by the Centers for Medicare and Medicaid Services (CMS) for eligible Medicare beneficiaries.\(^5,6\) In this letter, we provide the first nationwide estimates of HCV testing prevalence among this population, which could be used as the baseline for measuring the effects of the CDC and USPSTF recommendations of one-time HCV testing.

Methods

Data from the 2013 National Health Interview Survey (NHIS), an in-home national cross-sectional survey among non-institutionalized adults including community-dwelling veterans, was used in this study.\(^7\) Analyses were restricted to baby boomer respondents with non-missing data (N=10,945/12,018) for the question Have you ever had a blood test for HCV? This self-reported HCV testing was the primary outcome of the study. Weighted prevalence of HCV testing was calculated by sociodemographic and behavioral factors (e.g., race/ethnicity, sex, insurance, education, marital status, immigration status, and alcohol use) to assess the associations of these factors with receipt of HCV testing. Multivariable prevalence ratios (PR) and 95% CIs of HCV testing, adjusted for the aforementioned sociodemographic and behavioral factors, were estimated using predicted margins. All statistical analyses accounted for complex sampling design and were conducted with SAS, version 9.4, and SAS-callable SUDAAN, version 9.0.3, in 2014.

Results

Overall, 12.27% of the baby boomers reported HCV testing, with the prevalence varying from 8.86% in high school graduates or General Educational Development (GED) recipients to 22.12% in military insureds (Table 1). In a multivariate analysis, the prevalence of HCV testing was greater in men compared to women (PR=1.24, 95% CI=1.08, 1.42) and in Medicaid (PR=1.63, 95% CI=1.25, 2.12), Medicare and Medicaid (PR=2.15, 95% CI=1.59, 2.92), and military (PR=1.72, 95% CI=1.32, 2.24) insured people compared to privately insured individuals. People with a high school level of education (PR=0.59, 95% CI=0.46, 0.76) or high school graduates or GED recipients (PR=0.62, 95% CI=0.50, 0.76) had a lower prevalence of testing compared to college graduates. Adjusted prevalence also varied by marital status.

Discussion

This is the first study to provide nationwide estimates on the prevalence of HCV testing among those born between 1945 and 1965 for which screening is recommended. Although the prevalence of testing is low in all subgroups (<23%), the higher prevalence in Medicaid and dually insured Medicaid and Medicare recipients compared to privately insured individuals may reflect increased testing associated with higher prevalence of liver disease and its risk factors (e.g., injection drug use especially in the Medicaid population). The elevated prevalence among military insureds may reflect efforts to control HCV infection by the Veterans Health Administration.\(^8\)

This study has a number of limitations. First, the findings apply to non-institutionalized U.S. population because the NHIS sampling frame excludes incarcerated and homeless persons, who have higher HCV infections\(^9\) and may be more likely to receive HCV testing under risk-based screening. Second, HCV-testing was self-reported and subject to recall bias. Third, insurance status, alcohol consumption, and marital status were ascertained at the time of the interview and not prior to testing. Fourth, 9% of participants had missing HCV information; however, there were no significant differences between people with missing and non-missing HCV data by race/ethnicity (p=0.506); health insurance (p=0.152); and immigration status (p=0.113). Despite these limitations, this study provides the first national estimate of HCV testing in the 1945–1965 birth cohort and could be used as baseline for measuring the uptake following the CDC and USPSTF one-time screening recommendation. The low prevalence of testing underscores the need for concerted effort by primary healthcare providers and other concerned parties to enhance the uptake of testing.
Table 1. Prevalence of HCV Testing Among Adults Born Between 1945-1965, National Health Interview Survey 2013 ($n=10,945$)

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted Prevalence (95% CI)</th>
<th>Adjusted* PR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>12.3 (11.5, 13.1)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11.1 (10.1, 12.3)</td>
<td>1.00</td>
</tr>
<tr>
<td>Male</td>
<td>13.5 (12.3, 14.8)</td>
<td>1.24 (1.08, 1.42)</td>
</tr>
<tr>
<td><strong>Race/ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>12.4 (11.5, 13.4)</td>
<td>1.00</td>
</tr>
<tr>
<td>Hispanic</td>
<td>11.5 (9.3, 14.0)</td>
<td>0.94 (0.71, 1.23)</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>12.6 (10.7, 14.7)</td>
<td>0.97 (0.81, 1.17)</td>
</tr>
<tr>
<td>Non-Hispanic Asian</td>
<td>10.1 (7.4, 13.7)</td>
<td>0.69 (0.47, 1.02)</td>
</tr>
<tr>
<td>Non-Hispanic other</td>
<td>19.5 (12.0, 29.9)</td>
<td>1.07 (0.61, 1.85)</td>
</tr>
<tr>
<td><strong>Insurance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>11.7 (19.6, 12.9)</td>
<td>1.00</td>
</tr>
<tr>
<td>Medicaid</td>
<td>16.5 (13.0, 20.8)</td>
<td>1.63 (1.25, 2.12)</td>
</tr>
<tr>
<td>Medicaid+Medicare</td>
<td>21.3 (16.0, 27.7)</td>
<td>2.15 (1.59, 2.92)</td>
</tr>
<tr>
<td>Medicare</td>
<td>9.5 (7.9, 11.4)</td>
<td>0.83 (0.67, 1.03)</td>
</tr>
<tr>
<td>Military</td>
<td>22.1 (17.6, 27.5)</td>
<td>1.72 (1.32, 2.24)</td>
</tr>
<tr>
<td>Uninsured</td>
<td>11.2 (9.2, 13.4)</td>
<td>1.01 (0.81, 1.27)</td>
</tr>
<tr>
<td>Other</td>
<td>17.1 (13.4, 21.5)</td>
<td>1.43 (1.07, 1.89)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College graduate</td>
<td>13.7 (12.2, 15.3)</td>
<td>1.00</td>
</tr>
<tr>
<td>Some college</td>
<td>15.2 (13.7, 16.8)</td>
<td>1.06 (0.90, 1.24)</td>
</tr>
<tr>
<td>HS graduate or GED</td>
<td>8.9 (7.4, 10.6)</td>
<td>0.62 (0.50, 0.76)</td>
</tr>
<tr>
<td>&lt; HS</td>
<td>12.5 (11.7, 13.3)</td>
<td>0.59 (0.46, 0.76)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
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<tr>
<td>Married</td>
<td>11.3 (10.6, 13.1)</td>
<td>1.00</td>
</tr>
<tr>
<td>Not currently married*</td>
<td>13.9 (12.7, 15.3)</td>
<td>1.22 (1.05, 1.41)</td>
</tr>
<tr>
<td>Never married</td>
<td>14.2 (12.1, 16.6)</td>
<td>1.25 (1.04, 1.49)</td>
</tr>
<tr>
<td><strong>Immigration Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Born in U.S.</td>
<td>12.5 (11.6, 13.4)</td>
<td>1.00</td>
</tr>
<tr>
<td>Not born in U.S.</td>
<td>11.3 (9.5, 13.3)</td>
<td>1.10 (0.87, 1.39)</td>
</tr>
<tr>
<td><strong>Alcohol use</strong></td>
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<tr>
<td>0 or 1 drink/day</td>
<td>12.2 (11.4, 13.1)</td>
<td>1.00</td>
</tr>
<tr>
<td>≥2 drinks/day</td>
<td>12.9 (10.7, 15.4)</td>
<td>0.96 (0.79, 1.18)</td>
</tr>
</tbody>
</table>

*Only respondents with complete information on all covariates were included in analyses. A total of 1,274 respondents were excluded because of missing independent variables. Adjusted for race/ethnicity, sex, insurance, education, marital status, immigration status, and alcohol use.

*bIncludes divorced, separated, and widowed.

HCV, hepatitis C virus; HS, high school; GED, General Educational Development; PR, prevalence ratio.
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References


7. CDC. About the National Health Interview Survey. 2014 www.cdc.gov/nchs/nhis/about_nhis.htm#procedures.
