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The impact of Medicare eligibility on cancer screening behaviors☆

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ABSTRACT

Introduction. Lack of health insurance limits access to preventive services, including cancer screening. We examined the effects of Medicare eligibility on the appropriate use of cancer screening services in the United States.

Methods. We performed a cross-sectional analysis of the 2012 Behavioral Risk Factor and Surveillance System (analyzed in 2014). Univariable and logistic regression analyses were performed for participants aged 60–64 and 66–70 to examine the effects of Medicare eligibility on prevalence of self-reported screening for colorectal, breast, and prostate cancers. Sub-analyses were performed among low-income (<$25,000 annual/household) individuals.

Results. Medicare-eligible individuals were significantly more likely to undergo all examined preventive services (colorectal cancer OR: 1.90; 95% CI 1.79–2.04; prostate cancer OR: 1.29; 95% CI 1.17–1.43; breast cancer OR: 1.23; 95% CI 1.10–1.37) and the effect was most pronounced among low-income individuals (colorectal cancer OR: 2.04; 95% CI 1.8–2.32; prostate cancer OR: 1.39; 95% CI 1.12–1.72; breast cancer OR: 1.42, 95% CI 1.20–1.67). Access to a healthcare provider was the strongest independent predictor of undergoing appropriate screening, ranging from OR 2.73 (95% CI 2.20–3.39) for colorectal cancer screening in the low-income population to OR 4.79 (95% CI 3.95–5.81) for breast cancer screening in the overall cohort. The difference in screening prevalence was most pronounced when comparing Medicare-eligible participants to uninsured Medicare-ineligible participants (+33.2%).

Conclusions. Medicare eligibility impacts the prevalence of cancer screening, likely as a result of increased access to primary care. Low-income individuals benefit most from Medicare eligibility. Expanded public insurance coverage to these individuals may improve access to preventive services.

Introduction

Increasing emphasis is being made on reducing costs in the US healthcare system while minimizing barriers to care. There exists an urgent need for improved efficiency in the delivery of healthcare; in its current iteration, ever-increasing expenditures are unsustainable (Moses et al., 2013; Woolhandler et al., 2003). Treatment costs for cancer have more than doubled to an average of $10,000/month over the past decade ("The state of cancer care in america, 2015: a report by the american society of clinical oncology.," 2015). In addition, the demand for cancer care is rapidly increasing, with an estimated 1.6 million new diagnoses in 2014. Moreover, the use of preventive services such as cancer screening results in improved health, better quality of life and decreased overall costs (Calonge et al., 2009; Cohen et al., 2008; Curry et al., 1998; Maciosek et al., 2006; Moyer, 2012; U.S. Department of Health and Human Services, 2007; Whitlock et al., 2008).

Any successful strategy to optimize preventive services will include minimization of well-recognized barriers to existing services. Limited access to primary care has been associated with a myriad of factors including patient income, race, geographic location, and insurance status (Anderson et al., 2012; McWilliams et al., 2009; Ross et al., 2006; Sabik et al., 2015; Tangka et al., 2006). Prior to Medicare eligibility – beginning at age 65 – many Americans have lacked health coverage or have had limited coverage requiring significant out-of-pocket expenses for preventive services. Uninsured individuals are less likely to access a

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healthcare provider, resulting in increased utilization of emergency departments and decreased office-based care, including preventive services (Decker et al., 2012; Ross et al., 2006). Fifty years after its inception, the Medicare program is facing its greatest challenge yet. An estimated 81 million individuals will be covered under the Medicare umbrella by 2030, and program expenditures are projected to surpass the growth of the US economy (Davis et al., n.d.). To govern such tasks, health policies must distinguish promising initiatives from wasteful use of taxpayer funds (Berwick and Hackbarth, 2012). Such considerations are of particular significance at this pivotal time in American healthcare; while the ACA calls for improving preventive services in Medicare-insured individuals by eliminating copayments for qualifying preventive services, some prominent legislators have argued for increasing the age of Medicare eligibility as a means of cost-savings.

Based on these considerations, we sought to examine the effects of Medicare eligibility on the use of cancer screening services. We hypothesized that universal access to health insurance through Medicare enrollment significantly increases the appropriate use of cancer screening, with the greatest impact among low-income individuals.

Methods

Data source

The Behavioral Risk Factor Surveillance System (BRFSS) is the nation's largest continuously conducted health survey. This joint initiative of the Centers for Disease Control (CDC) and US states/territories is designed to measure behavioral risk factors for the adult population living in households and is administered to a stratified random sample of the U.S. population aged 18 and older. The BRFSS is conducted by landline and cellular telephones in 53 states and territories, providing nationally representative estimates via iterative proportional fitting as a means of weighting. The current methodology minimizes non-response bias and error within estimates. Patients are weighted by age, gender, race/ethnicity, education, marital status, property ownership, and telephone ownership. The median combined response rate was 45.2% in 2012. The 2012 survey was conducted in 2011 and includes the most recent complete data pertaining to cancer screening behaviors and was therefore selected for this analysis ("http://www.cdc.gov/brfss/").

Outcome measures

We assessed the self-reported use of several cancer preventive services in the years prior to (ages 60–64) and following (ages 66–70) Medicare eligibility. We excluded persons aged 65 as a washout period. We included screening utilization for three common malignancies for which screening recommendations were made by the United States Preventive Services Task Force (USPSTF) at the time the survey was administered (2011): breast, colorectal and prostate cancers (Calonge et al., 2008, 2009; Whitlock et al., 2008). The recommended screening protocols for each of these cancers did not differ among individuals in either age group included in the analysis, facilitating comparison of compliance with screening recommendations before and after Medicare eligibility. Conversely, cervical cancer screening was not included in our analyses given that the USPSTF only recommends screening until age 65 (Moyer, 2012). All cases with a previous history of the respective cancers (prostate [$n = 502$], breast [$n = 955$], and colorectal [$n = 287$]) were excluded from analyses to ensure the analysis pertained to screening and not surveillance.

Independent variables

Independent variables included annual household income (<$25,000 and ≥$25,000), health insurance status (Yes vs. No) and access to a regular healthcare provider (HCP) (Yes vs. No). Socio-demographic covariates included age at the time of the survey; education level (did not graduate high school, graduated high school, some college or technical school and graduated from college or technical school); residence location (city center, urban/sub-urban, rural); and marital status (married vs. never married or member of unmarried couple vs. divorced, widowed, separated).

Statistical analysis

Descriptive statistics were calculated for patient demographics. For all point estimates, we calculated 95% confidence intervals (CIs) and *p*-values using the complex sample package for statistical package for social sciences (SPSS) software. We used the BRFSS variables _STSTR, _PSU, and _LLCPWT to define strata, cluster, and sample weights respectively, accounting for landline and cell phone surveys. Complex sample methodology using Taylor series ensured unbiased estimates corresponding to the general national population. To assess for the independent effect of primary predictors on self-reported use of cancer preventive services, complex sample multivariable logistic regression was performed. Separate models were employed for each of the three cancers. Sensitivity analyses were performed within the lowest annual income strata <$25,000 — reflecting the poverty line for four-person households established by the US Census Bureau ("www.census.gov/hhes/www/poverty/data/threshld"). Additionally, the different appropriate tests for colorectal cancer screening (fecal occult blood test [FOBT], sigmoidoscopy, and colonoscopy) were examined separately (see Table 2 in the corresponding Data in Brief) (Meyer et al., submitted for publication). Finally, to determine whether the increased prevalence of screening among Medicare-eligible participants reflects acquisition of insurance coverage, we compared the prevalence of screening among Medicare-eligible vs. ineligible participants, stratified by insurance status among the latter.

All statistical analyses were performed using the complex sample package for SPSS 20 (IBM, Armonk, NY, USA), with a two-sided significance level set at $p < 0.05$. Bonferroni corrections were applied given the multiple comparisons performed and we found our results to be consistent. An institutional review board waiver was obtained in accordance with the use of de-identified administrative data.

Results

Study cohort

An overall weighted sample of 237.0 million adults was identified within the 2012 BRFSS, which translated into an estimated 18.8 million (unweighted $n = 51{,}976$) and 13.1 million ($n = 43{,}634$) participants meeting the inclusion criteria in age groups 60–64 and 66–70, respectively. Of those, an estimated 7.8 million fell under the low-income category.

The demographic characteristics of the entire cohort stratified by Medicare eligibility are shown in Table 1 and for the low-income bracket in Table 1 in the complementary Data in Brief (Meyer et al., submitted for publication). The mean age (± standard error [SE]) among the non-Medicare-eligible was 62 ± 0.013 years and 68 ± 0.014 in the Medicare-eligible. In the overall cohort, the statistical differences between groups were recorded for all characteristics except residential status; Medicare-eligible had significantly higher proportions of females (53.9% vs. 51.9%), insured persons (97.9% vs. 86.3%) and regular access to healthcare providers (93.8% vs. 90.0%). Overall, Medicare-eligible participants had lower incomes, were more often widowed and of White race, and of lower education. These differences were accounted for in adjusted analyses.

Fig. 1 presents the prevalence of unadjusted cancer screening by Medicare eligibility for the overall and low-income cohorts. Medicare eligibility was associated with increased prevalence of screening for all examined cancers. The association was more pronounced in the low-income cohort and for colorectal cancer screening. The unadjusted prevalence of colorectal cancer screening increased by 13.8% and 18.3%-points ($p < 0.001$) in the overall and low-income cohorts, respectively, while prostate cancer screening increased by 8.2% and 9.6%-points ($p < 0.001$) and breast cancer screening increased by 3.8% and 8.3%-points ($p < 0.001$), respectively. Sensitivity analyses according to insurance status among Medicare-ineligible participants revealed that the prevalence of screening increased by 4.9%-points compared to the previously insured vs. 33.2%-points when compared to the previously uninsured. Among low-income participants, increases of 5.6% and 27.3%-points were observed, respectively (Fig. 2). Compared to uninsured Medicare-ineligible subjects, Medicare-eligibility was associated