Use of preventive care by the working poor in the United States

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Abstract

Objective—Examine the association between poverty and preventive care use among older working adults.

Method—Cross-sectional analysis of the pooled 1996, 1998 and 2000 waves of the Health and Retirement Study, a nationally representative sample of older community-dwelling adults, studying self-reported use of cervical, breast, and prostate cancer screening, as well as serum cholesterol screening and influenza vaccination. Adults with incomes within 200% of the federal poverty level were defined as poor.

Results—Among 10,088 older working adults, overall preventive care use ranged from 38% (influenza vaccination) to 76% (breast cancer screening). In unadjusted analyses, the working poor were significantly less likely to receive preventive care. After adjustment for insurance coverage, education, and other socio-demographic characteristics, the working poor remained significantly less likely to receive breast cancer (RR 0.92, 95% CI, 0.86–0.96), prostate cancer (RR 0.89, 95% CI, 0.81–0.97), and cholesterol screening (RR 0.91, 95% CI, 0.86–0.96) than the working non-poor, but were not significantly less likely to receive cervical cancer screening (RR 0.96, 95% CI, 0.90–1.01) or influenza vaccination (RR 0.92, 95% CI, 0.84–1.01).

Conclusion—The older working poor are at modestly increased risk for not receiving preventive care.

Keywords

Poverty; Socioeconomic factors; Prevention and control; Health promotion; Mass screening/ utilization; Health services/utilization; United States

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Background

In 2003, 35.9 million people – one-eighth of the population – were living at or below the federal poverty threshold; 7.4 million of those in poverty are working adults and this number increased by over 1 million adults between 2000 and 2003 (U.S. Department of Labor, 2005). Working adults living in poverty, or the working poor, have recently been well described in the popular press (Shipler, 2004; Ehrenreich, 2001) and are more likely to be women maintaining families, racial and ethnic minorities, less educated, and employed in either the service, sales and office, or production, transportation, and material moving sectors than are the working non-poor (U.S. Department of Labor, 2005). In addition, they are significantly less likely to receive insurance from their employers than are the non-poor (Seccombe and Amey, 1995) and have been targeted for insurance coverage expansions (Sillow-Carroll and Meyer, 2001; Kinney et al., 1999).

No studies have examined the use of preventive care by the working poor, who are at risk for not receiving recommended preventive care by virtue of their poverty. Previous research has shown that lower income adults are less likely than higher income adults to receive recommended preventive care, such as cervical, breast, and colorectal cancer screening, blood pressure screening, and cholesterol screening (Ross et al., 2006; Collins et al., 2004). However, little is known about whether working mitigates the effects of poverty on preventive care; hence the risk among the working poorly is largely unknown. This is particularly a concern for the older working poor, who may be at even greater risk given their greater burden of chronic disease in combination with their need for preventive care. Understanding their patterns of preventive care use is important for targeting private or public sector policies to ensure that recommended preventive care is available and used in this growing population. Our hypothesis was that the working poor would be less likely to receive preventive care when compared with the working non-poor.

To examine the association between poverty and use of preventive care among older working adults, we used data from the Health and Retirement Study (HRS), a nationally representative, longitudinal survey of individuals 50 years of age and older. We also specifically examined the mediating effects of insurance and education, an approach that has been suggested when studying social disparities in health care use (Braveman et al., 2005; Braveman et al., 2004). The HRS is ideally suited for this investigation, as it provides detailed measures of income and wealth, socio-demographic characteristics, past medical history, health behaviors, and preventive health care use for 9824 community-dwelling older adults.

Methods

Data source and study design

We performed a cross-sectional study using pooled data from the 1996, 1998, and 2000 waves of the HRS. The HRS is a nationally representative, longitudinal study of individuals 50 years of age and older sponsored by the National Institute on Aging and conducted by the Institute for Social Research at the University of Michigan (Servais, 2005), designed to investigate the experience of older individuals as they advance from work to retirement, with particular emphasis on health insurance, savings, and trajectories of economic and physical well-being. In 1992, the initial wave of the HRS included data from 12,652 community-dwelling adults between the ages of 51 and 61 or their spouses, regardless of age, collected via in-home interviews, comprising the core sub-sample of the HRS. Follow-up data are collected at 2-year intervals. Vital status is ascertained using the National Death Index and household contacts.

We supplemented the 1998 and 2000 waves of the HRS with data on age-eligible participants from the 1998 and 2000 waves of three additional sub-samples now collected as part of the

HRS: Asset and Health Dynamics among the Oldest Old (AHEAD), War Baby (WB), and Children of the Depression Age (CODA). In brief, the AHEAD sub-sample consisted of community-dwelling adults aged 70 or older in 1993 (or their spouses), the WB sub-sample consisted of community-dwelling adults between the ages 51 and 56 in 1998 (or their spouses), and the CODA sub-sample consisted of community-dwelling adults between the ages 68 and 74 in 1998 (or their spouses). Additional information about HRS survey instruments and procedures is available from the University of Michigan (Institute for Social Research, 2006).

Study sample

Our cohort included 10,088 community-dwelling adults between 50 and 64 years of age who (1) reported working either part-time or full-time 27 or more weeks per year and (2) answered questions about preventive health behaviors. Our cohort predominantly consisted of participants from the HRS (72%) and WB (27%) sub-samples. We excluded adults older than age 64 years because almost all are eligible for Medicare insurance. In addition, we excluded 156 participants who had missing data for one or more study variables: physician visits (99), educational attainment (37), marital status (19) or self-rated health status (1).

Study variables

Our dependent variables were 5 self-reported measures of use of recommended preventive health care services. These were chosen because they are available in the HRS and recommended for preventive care by either the U.S. Preventive Services Task Force (USPSTF) or the Centers for Disease Control and Prevention (CDC). All dependent variables were categorized dichotomously as use or non-use of the service within the 2 years prior to the relevant survey using the question "In the past two years, have you had any of the following medical tests or procedures?" The HRS does not ask for exact time intervals since preventive service use. We examined self-reported rates of (1) Papanicolaou smears among women for cervical cancer screening (U.S. Preventive Services Task Force, January 2003), (2) mammography among women for breast cancer screening (U.S. Preventive Services Task Force, February 2002), (3) digital rectal examination among men for prostate cancer screening (U.S. Preventive Services Task Force, December 2002), (4) serum cholesterol screening among all adults for cardiovascular risk reduction (U.S. Preventive Services Task Force, 2001), and (5) influenza vaccination among all adults (Bridges et al., 2000).

Our primary independent variable was whether participants were among the working poor. Because our sample included only working adults, working poor status was determined by comparing the sum of household income items, excluding capital gains and losses, to poverty threshold values established by the U.S. Census Bureau in the relevant survey year (U.S. Census Bureau, 2006). Total household income includes the following items for the respondent and spouse: earned income, pension/annuity income, Social Security/disability income, retirement income, unemployment compensation, other Government income, and other sources of income (alimony, insurance, pension, and inheritance income, and other income). For one-person households, we compared HRS household income amounts to age-specific, weighted-average poverty thresholds for single individuals; for households of two or more individuals, we compared the HRS income amounts to the corresponding two-person household thresholds, as the HRS summarized household income exclusively for the respondent and spouse dyad. Participants were categorized as working poor if their total household income was less than or equal to 200% of the Census Bureau threshold, a broadly inclusive definition that has been employed in previous research of the working poor (Guendelman et al., 2005; Guendelman and Pearl, 2001).

We categorized the sample by the following socio-demographic characteristics, all of which were included in our analyses after evaluating for multicollinearity: age, sex, race/ethnicity,

marital status, education, family size, and household net worth, as well as self-reported health status, health insurance status, and annual physician visits. The HRS defined response categories for the self-report of all socio-demographic variables in addition to self-reported health status and health insurance status.

Statistical analysis

We described participant characteristics using standard means and frequency analyses. We then used Chi-squared tests to examine the unadjusted effect of poverty on use of each preventive service. To understand potential mediators in this relationship, we fit sequential, multivariable regression models using generalized estimating equations, employing separate models for each outcome. Generalized estimating equations allowed us to correct for within-subject correlation arising from repeated measures taken from the same individuals (Liang and Zeger, 1993; Ware, 1985; Wolfinger and O'Connell, 1993; Zeger and Liang, 1986). Our first model included poverty as an independent variable along with survey wave year (Model 1). In the subsequent model, we added the following patient-level independent variables: age, sex, race/ethnicity, marital status, family size, household net worth, self-reported health status, and annual physician visits (Model 2). We then added education to the model (Model 3). Finally, we added insurance coverage to the model (Model 4), resulting in our fully adjusted model. Patient education and health insurance coverage were added last, as we were specifically interested in their potential mediating effects on the otherwise fully adjusted model, an approach that has been suggested when studying social disparities in health care use (Braveman et al., 2005; Braveman et al., 2004). Moreover, their effects were of particular interest given the known associations between use of preventive care and both education (Sambamoorthi and Mcalpine, 2003; Selvin and Brett, 2003) and health insurance coverage (Ayanian et al., 2000; Devoe et al., 2003; Powell-Griner et al., 1999; Ross et al., 2006). In addition, we tested the interaction between working poverty and both health insurance coverage and self-reported fair or poor health status in our multivariable analyses based on bivariate associations. Neither variable significantly interacted with working poverty in more than one of the five separate analyses for each preventive service and so interaction terms were not included in our fully adjusted model. We also tested the interaction between working poverty and wave of data collection as a potential source of confounding and found no significant differences in the effect of working poverty on use of any preventive service by wave and so the interaction term was not included in our fully adjusted model. As a sensitivity analysis, we also created a sequence of models where health insurance coverage was added before patient education and where both were added before self-reported health status. The results from this sequence of analyses were no different and so we will present only the results from the analyses described in detail above.

To facilitate interpretation of our results given our analysis of non-rare events, odd ratios from adjusted analyses were converted to risk ratios using standard techniques (Zhang and Yu, 1998). All analyses were performed using SAS software, version 9.1 (SAS Institute, Inc., Cary, NC). All statistical tests were two-tailed. Because the HRS is a publicly available anonymous data source, the Yale Human Investigation Committee was not asked to review the study.

Results

Participant characteristics

Among the 10,088 working adults included in our cohort, 1196 (12%) were poor and 8892 (88%) were non-poor. The mean age was 57 years, 50% were female, and 82% were white. The working poor were significantly less likely to be male, white, college-educated, married and insured when compared with the working non-poor, and were significantly more likely to report fair or poor health status (Table 1).

The working poor and use of preventive care

Overall preventive care use ranged from 38% for influenza vaccination to 76% for breast cancer screening. For each preventive service examined, the working poor were significantly less likely to receive care than the working non-poor (P values<0.01). Among older working poor adults: 63% received cervical cancer screening, 62% received breast cancer screening, 45% received prostate cancer screening, 58% received serum cholesterol screening, and 31% received influenza vaccination, whereas among older working non-poor adults, 76%, 79%, 67%, 72%, and 39% received care respectively (Table 1).

In our unadjusted analyses (Model 1), older working poor adults were between 14% and 26% less likely than older working non-poor adults to receive cervical, breast, and prostate cancer screening, serum cholesterol screening, and influenza vaccination (P-values<0.01) (Table 2). The effect of poverty persisted, although it was slightly attenuated, after adjusting for age, sex, race/ethnicity, marital status, family size, household net worth, self-reported health status, and annual physician visits in our analyses (Model 2) (P-values<0.01).

In our subsequent analyses, which additionally adjusted for education (Model 3), older working poor adults remained between 9% and 20% less likely to receive cervical, breast, and prostate cancer screening, serum cholesterol screening, and influenza vaccination (P-values<0.01). As a sensitivity analysis, if we had instead next added insurance to our analyses, rather than education, our results would be grossly the same, demonstrating older working poor adults to be between 6% and 14% less likely to receive cervical, breast, and prostate cancer screening, serum cholesterol screening, and influenza vaccination (P-values $\leq$ 0.03).

In our final analyses (Model 4), which adjusted for all described covariates including education and insurance status, we found that older working poor adults remained significantly less likely to receive breast cancer screening (RR 0.92, 95% CI, 0.86–0.96, P<0.01), prostate cancer screening (RR 0.89, 95% CI, 0.81–0.97, P<0.01), and serum cholesterol screening (RR 0.91, 95% CI, 0.86–0.96, P<0.01) when compared with older working non-poor adults. However, the effect of poverty was further attenuated, as the working poor were now 8% to 11% less likely to use these preventive services. Moreover, the effect of poverty became non-significant for cervical cancer screening (RR 0.96, 95% CI, 0.90–1.01, P = 0.10) and influenza vaccination (RR 0.92, 95% CI, 0.84–1.01, P=0.09), as older working poor adults were not significantly less likely than older working non-poor adults to receive these services.

Discussion

We found that, among older adults, the working poor are at increased risk for not receiving important preventive care services: breast and prostate cancer screening and serum cholesterol screening. However, we did not find the older working poor to be significantly less likely to receive either cervical cancer screening or influenza vaccination. We had hypothesized that the working poor would be less likely to receive preventive care when compared with the working non-poor based on prior work on the relationship between poverty and preventive care use (Ross et al., 2006; Collins et al., 2004), an effect that has been suggested to be due to unemployment, limited or no health insurance coverage, or low education and health literacy. We found that the effect of poverty persisted among a population of older working adults, such that the working poor were at increased risk for not receiving preventive care. Furthermore, for several preventive services, this increased risk remained significant even after adjustment for insurance and education, suggesting that the effect of poverty is not fully explained by either of these socioeconomic factors.

Nonetheless, although the working poor are a vulnerable population and at increased risk for not receiving preventive care, the significant associations between poverty and decreased use

of care that we found were not as strong as we had expected, such that poor working adults were only between 4% and 11% less likely to receive preventive care when compared with non-poor working adults. This more modest effect likely reflects important advantages among the working poor. For instance, adults insured through employer-sponsored health insurance plans are typically provided access to a regular source of care, which is associated with increased preventive care use (Bindman et al., 1996; Devoe et al., 2003; Sambamoorthi and Mcalpine, 2003). In addition, 90% of large employers sponsor wellness programs (Association for Worksite Health Promotion, 2000) which are known to increase health care use (Yen et al., 2006, 2001). Moreover, the working poor may benefit from employer-sponsored health promotion activities or from exposure to an environment that facilitates interaction between individuals of diverse educational and economic backgrounds, perhaps increasing use of preventive care by improving health literacy or encouraging healthy behaviors. In addition, our findings may also be attributable to unmeasurable skills or characteristics of adults who maintain employment, such as time management, organizational skills, or expectations for the future, which may be similarly associated with increased use of preventive care. Further research is necessary to better understand how employment affects the use of preventive health care services independent of education and insurance.

Our study focused on the older working poor, who may be at even greater risk for not receiving preventive care, given that their greater burden of chronic disease in combination with their need for preventive services may conflict during their potentially limited opportunities to visit physicians. Research among Medicare beneficiaries has shown that patients of primary care physicians who had greater practice revenue from Medicaid, who did not graduate from medical schools in either the United States or Canada, and who were not board certified –all likely characteristics of the primary care physicians taking care of the older working poor – were less likely to receive recommended preventive care (Pham et al., 2005). In addition, illustrative of the consequences of barriers to health care access not unlike working poverty, intermittent periods without health insurance coverage have been associated with decreased use of preventive care (Sudano and Baker, 2003) and increased likelihood of adverse health outcomes among older adults (Baker et al., 2001). However, we are unable to determine whether differences in preventive care use between the older working poor and non-poor are a consequence of system-related (e.g., access), physician-related (e.g., practice patterns), or even patient-related factors (e.g., preferences).

It is not clear why adjustment for education and insurance, along with other covariates, substantially weakened the association between poverty and reduced use of cervical cancer screening and influenza vaccination among working adults, but not for the other services examined. Our research may indicate that the effect of poverty is weaker for less costly services, such as vaccinations or Papanicolaou smears, wherein even the poor may use out-of-pocket funds to purchase care that they consider important and beneficial. In contrast, the substantial campaigns by patient advocacy organizations to promote breast and prostate cancer screening and by the pharmaceutical industry to promote cholesterol screening may have improved the adults' understanding that these preventive health care services are of sufficient value. In turn, adults with greater incomes may be more likely to ensure that they receive these services by using out-of-pocket funds to purchase care.

Our research has important implications for health policy makers. First, in order to meet broad population goals for preventive care, all working adults, both poor and non-poor, need to be targeted for outreach. Both the working poor and non-poor use preventive care at rates below goals set by Healthy People 2010, with the exception of breast cancer screening (and prostate cancer screening, for which goals were not set). Second, because adjustment for the independent effects of education and insurance decreases the magnitude of association between poverty and reduced use of preventive care for all of the services examined, it is important to

recognize the importance of each in ensuring that older working adults receive care. Until national health insurance is available, employers are best-positioned to preserve the health and well-being of working adults. To do so, there are many potential employer strategies, including enrolling them in health insurance plans that provide coverage for recommended preventive care, offering health promotion activities in the work-place, such as blood pressure and serum cholesterol screenings, influenza and pneumococcal vaccinations, and educational programs that encourage preventive care, and maintaining flexible workday scheduling to support the weekday access to health care providers and services.

Our study is one of the first to examine preventive health behaviors among the older working poor, adults whose incomes are not substantial enough to lift them out of poverty. We took advantage of a large, nationally representative survey that includes information on preventive health behaviors in addition to detail of participant's income and wealth, allowing for a more comprehensive analysis of the working poor than has been previously accomplished. However, there are several considerations in interpreting its results. First, our study focused on adults 50 years of age or older and should not be used to make inferences about the younger working poor. Second, our study is based on self-reported data. Although the tendency of respondents to over-report health promotion and disease prevention activities is widely recognized (Brown and Adams, 1992; Johnson et al., 2005; Newell et al., 1999), there is little reason to think that over-reporting would be more prevalent among working poor adults than among working non-poor adults, and therefore, we do not believe that this biased our results substantially. Third, the HRS does not ask for exact time intervals since preventive service use and so our measurement of use of preventive care cannot be based on the specific time intervals recommended by either the USPSTF for cholesterol and cervical, breast, and prostate screening or the CDC's Advisory Committee on Immunization Practices (ACIP) for influenza vaccination. Finally, we studied the use of prostate cancer screening despite the current debate about its clinical benefit. In 1996, the USPSTF recommended against routine rectal examination to screen for prostate cancer (U.S. Preventive Services Task Force, 1996), whereas in 2002, the USPSTF determined that the evidence is insufficient to recommend for or against routine screening for prostate cancer (U.S. Preventive Services Task Force, December 2002). Similarly, we studied the use of influenza vaccination despite recommendation changes from the CDC's ACIP during our study period. Prior to 2000, the ACIP only recommended universal vaccination of adults aged 65 and older (Advisory Committee on Immunization Practices, 1999). In 2000, the ACIP lowered the recommended age to 50 years and older (Bridges et al., 2000). Nevertheless, although the clinical significance of decreased use of prostate cancer screening and the differential effect of increased influenza vaccination are unknown, each illustrates the relationship between working poverty and preventive care use.

The number of working poor Americans is increasing dramatically (U.S. Department of Labor, 2005), possibly related to soaring housing costs, rising levels of family debt, or a decline in low-end wages and benefits (Rank, 2004). According to our study, the older poor, even if working, continue to face challenges in receiving effective and recommended preventive care, which may lead to long-term, severe health consequences in this population. More research is needed to understand the causal pathways by which poverty affects use of preventive care, even among a working population, and action is necessary to increase the use of preventive care by the older working poor in the United States.

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Table 1

Self-reported socio-demographic and other characteristics and use of preventive care from the Health and Retirement Study, 1996–2000, for working adults and stratified by poverty status

	Total (*N*=10,088)	Working poor (*n*=1196)	Working non-poor (*n*=8892)
Participant characteristics			
Mean age±SD [a] (years)	57.0±3.6	57.6±3.5	57.0±3.6
Female (%)[a]	50	65	48
White race (%)[a]	82	66	84
Some college education or higher[a] (%)	47	22	50
Married (%)[a]	78	50	82
Family size±SD (number)[a]	2.6±1.3	2.7±1.7	2.5±1.3
Net worth (/100,000)±SD[a] ($)	2.2±8.2	0.5±3.3	2.5±8.6
Fair or poor self-reported health status[a] (%)	12	24	10
Mean annual doctor visits±SD (number)	6.6±10.9	6.4±10.1	6.6±11.0
Health insurance coverage[a] (%)	91	67	95
Use of preventive care			
Cervical cancer screening[a] (%)	74	63	76
Breast cancer screening[a] (%)	76	62	79
Prostate cancer screening[a] (%)	65	45	67
Serum cholesterol screening[a] (%)	70	58	72
Influenza vaccination (%)[a]	38	31	39

[a] *P*<0.01 for difference between working poor and non-poor adults.

Table 2

Unadjusted and adjusted risk ratios with 95% confidence intervals between poverty and use of preventive care among older working adults from the health and retirement study, 1996–2000

	Cervical cancer screening (n=5036)	Breast cancer screening (n=5036)	Prostate cancer screening (n=5052)	Serum cholesterol screening (n=10,088)	Influenza vaccination (n=10,088)
Unadjusted (Model 1)	0.85 (0.80–0.90)[a]	0.82 (0.77–0.87)[a]	0.74 (0.67–0.82)[a]	0.84 (0.80–0.88)[a]	0.86 (0.79–0.94)[a]
Partially adjusted (Model 2) [b]	0.89 (0.84–0.94)[a]	0.85 (0.80–0.90)[a]	0.76 (0.68–0.84)[a]	0.82 (0.77–0.86)[a]	0.80 (0.72–0.88)[a]
Partially adjusted (Model 3) [c]	0.91 (0.86–0.96)[a]	0.87 (0.82–0.92)[a]	0.80 (0.72–0.88)[a]	0.84 (0.80–0.89)[a]	0.85 (0.77–0.94)[a]
Fully adjusted (Model 4) [d]	0.96 (0.90–1.01)	0.92 (0.86–0.96)[a]	0.89 (0.81–0.97)[a]	0.91 (0.86–0.96)[a]	0.92 (0.84–1.01)

[a] P<0.01 for difference in use of preventive care between poor and non-poor working adults.

[b] Model 2 adjusts for age, sex, race/ethnicity, marital status, family size, household net worth, self-reported health status, and annual physician visits.

[c] Model 3 adjusts for education in addition to the independent variables adjusted for in Model 2.

[d] Model 4 adjusts for insurance in addition to the independent variables adjusted for in Model 3.