Original Article

Unemployment and Cancer Screening: Baseline Estimates to Inform Health Care Delivery in the Context of COVID-19 Economic Distress

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BACKGROUND: During the coronavirus disease 2019 pandemic, US unemployment rates rose to historic highs, and they remain nearly double those of prepandemic levels. Employers are the most common source of health insurance among nonelderly adults. Thus, job loss may lead to a loss of health insurance and reduce access to cancer screening. This study examined associations between unemployment, health insurance, and cancer screening to inform the pandemic's potential impacts on early cancer detection. **METHODS:** Up-to-date and past-year breast, cervical, colorectal, and prostate cancer screening prevalences were computed for nonelderly respondents (aged <65 years) with 2000-2018 National Health Interview Survey data. Multivariable logistic regression models with marginal probabilities were used to estimate unemployed-versus-employed unadjusted and adjusted prevalence ratios. **RESULTS:** Unemployed adults (2000-2018) were 4 times more likely to lack insurance than employed adults (41.4% vs 10.0%; $P < .001$). Unemployed adults had a significantly lower up-to-date prevalence of screening for cervical cancer (78.5% vs 86.2%; $P < .001$), breast cancer (67.8% vs 77.5%; $P < .001$), colorectal cancer (41.9 vs 48.5%; $P < .001$), and prostate cancer (25.4% vs 36.4%; $P < .001$). These differences were eliminated after accounting for health insurance coverage. **CONCLUSIONS:** Unemployment was adversely associated with up-to-date cancer screening, and this was fully explained by a lack of health insurance. Ensuring the continuation of health insurance coverage after job loss may mitigate the pandemic's economic distress and future economic downturns' impact on cancer screening. ***Cancer* 2022;128:737-745**. © *2021 American Cancer Society*.

KEYWORDS: cancer detection, cancer screening, coronavirus disease 2019 (COVID-19), disparities, economy, health insurance, neoplasms, race/ethnicity, unemployment.

INTRODUCTION

During the coronavirus disease 2019 (COVID-19) pandemic, the US unemployment rates have risen to levels not seen since the Great Depression. In April 2020, the unemployment rate peaked at 14.7%, and despite declining to 6.3% in early 2021, rates remain nearly twice as high as prepandemic levels.[1] Job loss may lead to reductions in income and access to employer-based health insurance coverage, which is the main source of coverage for most (61%) nonelderly adults (aged <65 years) in the United States.[2] People without insurance experience barriers to the receipt of preventive care, including cancer screening, and uninsured individuals are half as likely to be up to date (UTD) with recommended breast cancer, cervical cancer, and colorectal cancer (CRC) screening.[3]

A limited number of studies have examined the relationship between individual or area-level unemployment and breast cancer, cervical cancer, and CRC screening.[4-6] For example, a population-based study found that <50% of unemployed adults were UTD with CRC screening, whereas >60% of currently employed adults were.[5] However, no previous study has evaluated the extent to which health insurance coverage explains the relationship between unemployment and cancer screening. In this study, we examined associations between individual-level unemployment, health insurance coverage, and cancer screening with prepandemic nationally representative survey data to inform the economic impacts of the COVID-19 pandemic as well as future adverse events on cancer screening.

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MATERIALS AND METHODS

Data from multiple years (2000-2018) of the National Health Interview Survey (NHIS), a nationally representative, in-person, annual survey of the noninstitutionalized civilian population, were used in this study.[7] Self-reported past-week employment data are captured annually, and screening data are collected periodically, as outlined in Supporting Table 1. NHIS response rates ranged from 53.0% to 74.3%.

Our primary outcomes were recent (past-year) and UTD breast, cervical, colorectal, and prostate cancer screening prevalences. Recent screening prevalence was used to assess proximal associations between screening practices and unemployment. UTD cancer screening prevalence was defined according to US Preventive Services Task Force recommendations (Supporting Table 2) and was analyzed because it has been shown to affect cancer mortality.[8,9] We hypothesized that current unemployment may be more strongly associated with recent screening prevalence than UTD screening prevalence because some tests recommended by the US Preventive Services Task Force have longer intervals (eg, colonoscopy every 10 years for CRC screening), and UTD screening may have been accomplished before job loss. Analyses were restricted to nonelderly adults because people aged ≥65 years are commonly partially or fully retired and nearly all have Medicare insurance coverage.[10] The following age ranges were used for screening because these were most consistently recommended during the study period: 21 to 64 years for cervical cancer, 50 to 64 years for breast cancer, 50 to 64 years for CRC, and 50 to 64 years for prostate cancer.[11]

We examined screening prevalence according to employment status, which was categorized as currently working or unemployed (Supporting Table 2). NHIS respondents who were "not working and not looking for work" were coded as not participating in the labor force and were excluded from primary analyses.

Covariates were selected on the basis of previously reported associations with cancer screening.[12-14] Insurance coverage was classified as private, Medicaid/state plan, uninsured, other government (which included TRICARE), or Medicare. Race/ethnicity was grouped as Hispanic, non-Hispanic White (White), non-Hispanic Black (Black), Asian/Pacific Islander, American Indian/Alaskan Native, and other. Additional variables included age, sex (for CRC only), survey year, marital status, annual income with respect to the federal poverty level, and educational attainment.

Statistical Analysis

The screening prevalence was examined by employment status (unemployed vs employed) with prevalence ratios (PRs) and 95% confidence intervals (CIs), which were computed with marginal probabilities predicted from logistic regression models.[15] People whose employment status was missing (0.1%-0.2%) were excluded (Supporting Table 1). Respondents who were diagnosed with breast, cervical, colorectal, or prostate cancer or had missing data for these cancer screening tests were excluded from respective analyses. The following respondents were included in the analyses of recent screening: 33,040 women aged 50 to 64 years for breast cancer screening, 97,759 women aged 21 to 64 years for cervical cancer screening, 65,463 men and women aged 50 to 64 years for CRC screening, and 16,203 men aged 50 to 64 years for prostate cancer screening. Fewer respondents were included in the analyses of UTD screening because the NHIS collected longer term screening histories less frequently.

To determine which sociodemographic and health care factors might account for associations between unemployment and screening, a series of adjusted models was performed. Model 1 was unadjusted. Model 2 estimated adjusted prevalence ratios (aPRs) and accounted for age, year, sex (for CRC only), marital status, and race/ethnicity. Model 3 accounted for the model 2 factors plus income as a percentage of federal poverty level and education. Model 4 accounted for factors in model 3 plus insurance coverage. An additional model accounting for insurance coverage only was also constructed to determine whether this factor alone accounted for potential differences in screening prevalence among employed and unemployed persons. Several sensitivity analyses were also conducted. Models were stratified by insurance status and the following 3 time periods: 1) 2000-2007, a period with relatively low unemployment and before the Affordable Care Act (ACA); 2) 2008-2013, a period with relatively high unemployment and at the onset of the ACA when provisions were not widespread; and 3) 2014-2018, a period with relatively low unemployment and when several ACA provisions that improved health insurance coverage were implemented.[16] For example, by 2014, 26 states and Washington, DC, had expanded Medicaid eligibility to people with incomes up to 138% of the federal poverty level, and some individuals with lower incomes were eligible to receive subsidies to purchase health insurance from the federal marketplace.[17] Analyses were stratified according to race/ethnicity (White, Black, and

Hispanic) to determine whether associations between unemployment and cancer screening varied across the groups. All models were restricted to respondents with nonmissing covariates. The Hosmer-Lemeshow test was used to test the model fit.[18] All survey estimates were weighted to be nationally representative and to account for nonresponse. The proportion and number of unemployed adults were estimated with 2018 and 2020 age- and sex-specific Bureau of Labor Statistics (BLS) unemployment data.[1] SAS version 9.4 was used for all data analyses.

RESULTS

Employment Among Adults Eligible for Screening

During the study period (2000-2018), 3.2% of adults aged 50 to 64 years were unemployed, 67.4% were employed, 29.3% were not in the labor force, and a small proportion (0.1%) were missing employment status. The proportion unemployed was slightly greater among males aged 50 to 64 years (3.6%) and women aged 21 to 64 years (4.2%) and was significantly higher among Black, Hispanic, Asian, and American Indian/Alaskan Native individuals than White individuals (Supporting Table 3). Between 2000 and 2018, the annual proportions of unemployed adults aged 50 to 64 years in the NHIS were similar to BLS estimates and ranged from 2% in 2000 to 8% in 2010 before declining to approximately 3% in 2018 (Supporting Fig. 1). In 2020, unemployment rates according to BLS data peaked at approximately 12% in April and declined to approximately 6% in December, a rate double the prepandemic level, and on the basis of BLS annual averages, the number of unemployed adults increased 2-fold between 2018 and 2020 (Supporting Fig. 2). For example, there were approximately 1.26 million adults aged 50 to 64 years who were unemployed in 2018; this number more than doubled to 2.86 million in 2020.

Unemployed and Employed Characteristics

Our main analyses were restricted to unemployed and employed adults. Unemployed adults were more likely to be male and unmarried and to have higher poverty levels and lower educational attainment (Table 1). Nearly 30% of unemployed adults were either Black (16.4%) or Hispanic (13.1%), whereas 20% of employed adults were (Black, 9.9%; Hispanic, 9.4%). Comparable patterns were observed when populations eligible for sex-specific cancer screening tests were examined (Supporting Table 4).

TABLE 1. Characteristics of Screening Eligible Adults Aged 50 to 64 Years According to Employment Status, National Health Interview Survey, 2000-2018

Characteristic	Unemployed	Employed
No. of respondents	3428	62,314
Male, %	53.9	51.9
Age, %		
50-54 y	44.7	43.3
55-59 y	33.8	33.9
60-64 y	21.5	22.8
Married, %	52.2	68.9
Race/ethnicity, %		
Hispanic	13.1	9.4
NH White	64.2	75.5
NH Black	16.4	9.9
Asian/Pacific Islander	4.9	4.3
American Indian/Alaska Native	1.3	0.7
Other	0.1	0.2
Education, %		
<HS	15.0	9.4
HS/GED	28.4	26.2
Some college	31.9	29.2
College graduate	24.7	35.2
FPL, %		
Poor: <100%	20.4	4.0
Nearly poor: 100%-199%	21.1	9.3
Not poor: ≥200%	58.5	86.7
Insurance coverage, %		
Private	40.2	83.5
Medicare	2.9	1.1
Other government/military	4.7	3.0
Medicaid/state plan	10.9	2.5
Uninsured	41.4	10.0

Abbreviations: FPL, federal poverty level; GED, General Educational Development; HS, high school; NH, non-Hispanic.
The years included 2000, 2003, 2005, 2008, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, and 2018. The number of respondents varies by outcome and data availability, as noted in Supporting Tables 1 and 5.

The proportions of unemployed and employed respondents who were uninsured declined throughout the study period, although unemployed respondents were persistently 4 times as likely to be uninsured because of parallel declines in uninsured rates in the 2 groups (Fig. 1). Unemployed adults were 5 times as likely to have Medicaid insurance in the most recent time period (2014-2018) and 3 times as likely to have Medicaid insurance in earlier time periods because of steeper inclines among unemployed adults versus employed adults.

Unemployed and Employed Cancer Screening Prevalence

Unemployed adults were less likely to report having a recent breast (49.0%), cervical (50.9%), colorectal (16.7%), or prostate cancer screening test (25.4%) than employed adults (61.4%, 60.2%, 20.0%, and 36.4%, respectively; Fig. 2A), with PRs that were 20%,

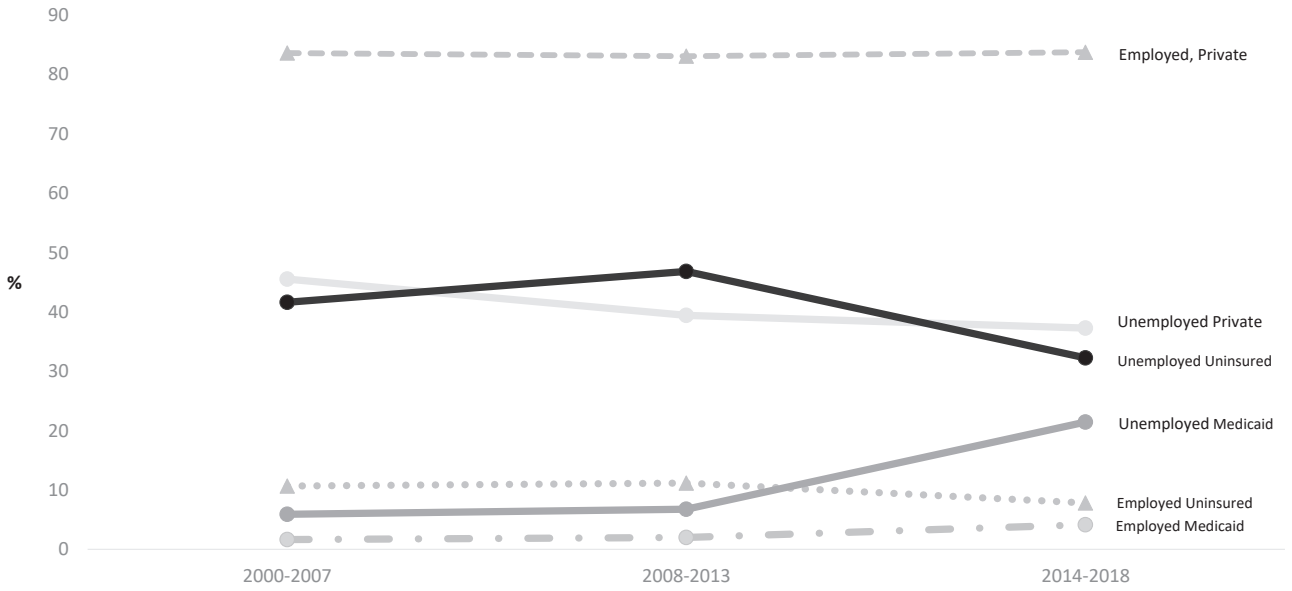

Figure 1. Insurance status among unemployed and employed adults aged 50 to 64 years (National Health Interview Survey, 2000-2018). Other forms of insurance (TRICARE) are not displayed.

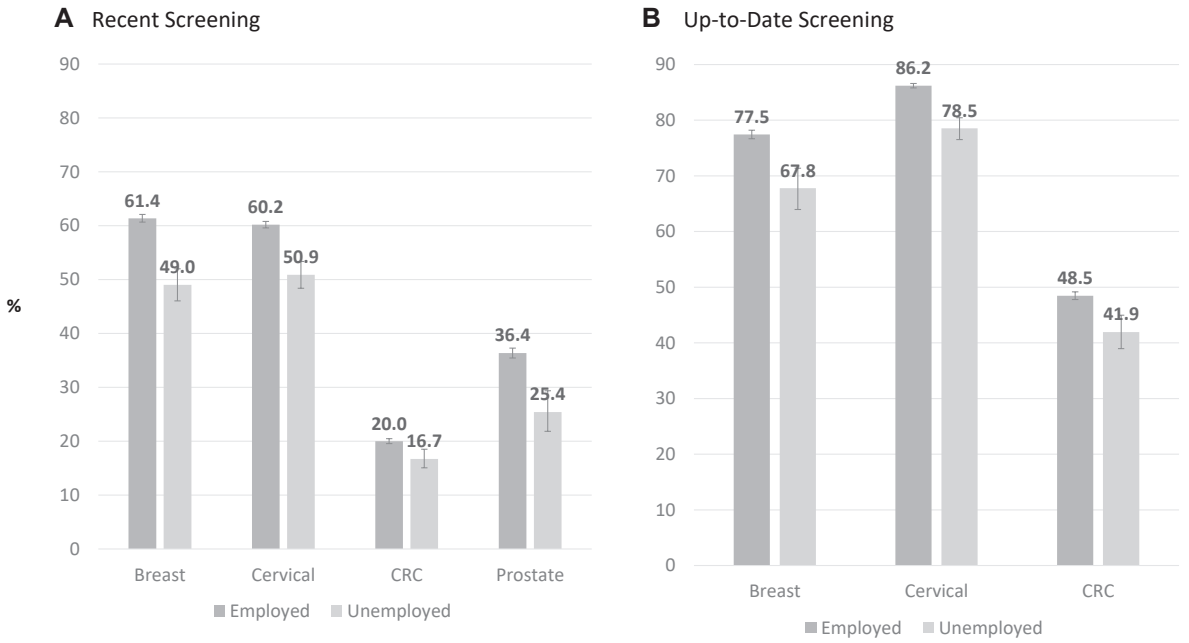

Figure 2. Recent and up-to-date breast, cervical, colorectal, and prostate cancer screening according to employment status among nonelderly adults (National Health Interview Survey, 2000-2018). Recent screening is defined as self-reported screening in the past year. Up-to-date screening is a mammogram in the past 2 years among women aged 50 to 64 years for breast cancer. For cervical cancer screening the definition of up to date is: Pap test in the past 3 years among women aged 21 to 64 years and beginning in 2015, women aged 30 to 64 years with a HPV plus Pap-testing (co-testing) in the past 5 years were also considered to be up to date with cervical cancer screening. The up-to-date CRC screening definition was a stool test, sigmoidoscopy, and/or colonoscopy in the past 1, 5, and 10 years, respectively, among adults aged 50 to 64 years. CRC indicates colorectal cancer.

TABLE 2. Unadjusted and Adjusted PRs of Recent and Up-to-Date Breast, Cervical, Colorectal, and Prostate Cancer Screening Among Nonelderly Unemployed and Employed Adults, National Health Interview Survey, 2000-2018

	Recent (Past-Year) Screening											
	Breast[a]			Cervical[b]			Colorectal[c]			Prostate Cancer[d]		
	PR	95% CI		PR	95% CI		PR	95% CI		PR	95% CI	
Model 1: unadjusted	0.80	0.75	0.85	0.85	0.80	0.89	0.86	0.78	0.95	0.70	0.60	0.81
Model 2: adjusted for nonmodifiable factors[e]	0.82	0.77	0.87	0.91	0.82	1.02	0.85	0.76	0.94	0.80	0.69	0.92
Model 3: adjusted for SES + model 2 factors[f]	0.90	0.85	0.96	0.91	0.81	1.01	0.95	0.86	1.05	0.81	0.70	0.93
Model 4: adjusted for insurance + model 3 factors[g]	1.01	0.96	1.07	0.99	0.89	1.09	1.11	1.00	1.23	0.90	0.78	1.04
Model 5: adjusted for insurance only	0.99	0.94	1.05	0.96	0.92	1.01	1.13	1.02	1.25	1.00	0.88	1.15
	Up-to-Date Screening											
	Breast[a]			Cervical[b]			Colorectal[c]			—		
	PR	95% CI		PR	95% CI		PR	95% CI				
Model 1: unadjusted	0.88	0.83	0.93	0.90	0.85	0.96	0.86	0.80	0.93			
Model 2: adjusted for nonmodifiable factors[e]	0.90	0.85	0.95	0.93	0.88	0.98	0.86	0.80	0.92			
Model 3: adjusted for SES + model 2 factors[f]	0.95	0.91	1.00	0.98	0.93	1.02	0.95	0.89	1.02			
Model 4: adjusted for insurance + model 3 factors[g]	1.04	1.00	1.08	1.03	0.99	1.06	1.08	1.02	1.15			
Model 5: adjusted for insurance only	1.03	0.99	1.07	1.02	0.98	1.06	1.11	1.05	1.18			

Abbreviations: CI, confidence interval; PR, prevalence ratio; SES, socioeconomic status.
Recent screening was performed within the past year.
[a]Women aged 50 to 64 years. Up-to-date screening was a mammogram in the past 2 years.
[b]Women aged 21 to 64 years who reported no hysterectomy. Up-to-date screening was a Papanicolaou test in the past 3 years and human papillomavirus/Papanicolaou cotesting every 5 years (beginning in 2015). Model 4 for recent cervical cancer screening failed the Hosmer-Lemeshow goodness-of-fit test.
[c]Men and women aged 50 to 64 years. Up-to-date screening was stool testing, sigmoidoscopy, or colonoscopy in the past 1, 5, and 10 years, respectively.
[d]Men aged 50 to 64 years.
[e]Adjusted for employment status, race/ethnicity, age, marital status, and sex (colorectal cancer).
[f]Adjusted for employment status, race/ethnicity, age, marital status, sex (colorectal cancer), poverty level, and education.
[g]Adjusted for employment status, race/ethnicity, age, marital status, sex (colorectal cancer), poverty level, education, and insurance.

15%, 14%, and 30% significantly lower, respectively (Table 2). After we accounted for nonmodifiable risk factors, aPRs were similar to unadjusted PRs for breast cancer and CRC, but differences diminished for cervical cancer screening, and the aPR for prostate cancer screening was modestly reduced (aPR, 0.80; 95% CI, 0.69-0.92; Table 2). After we accounted for socioeconomic status, unemployed adults' breast and prostate cancer prevalence remained significantly lower in comparison with employed adults, but relative differences were narrowed to 10% and 19%, and the aPR for CRC screening was no longer statistically significant (Table 2). When insurance was sequentially added to multivariable models and when it was the only factor accounted for in bivariable models, there were no longer significant employment differences in breast, cervical, or prostate cancer screening aPRs. However, after we accounted for insurance, recent CRC screening was higher among unemployed adults versus employed adults (aPR, 1.13; 95% CI, 1.02-1.25), and in test-specific analyses, a higher aPR was observed for recent colonoscopy but not for stool testing (Supporting Table 5). In analyses stratified by health insurance coverage, recent CRC screening prevalence was higher among unemployed adults than employed adults who were uninsured, whereas the prevalence was similar among insured adults (Fig. 3 and Supporting Table 6).

Unemployed adults were 12%, 10%, and 14% less likely to be UTD with breast cancer, cervical cancer, and CRC screenings, respectively (P values < .001; Fig. 2B).

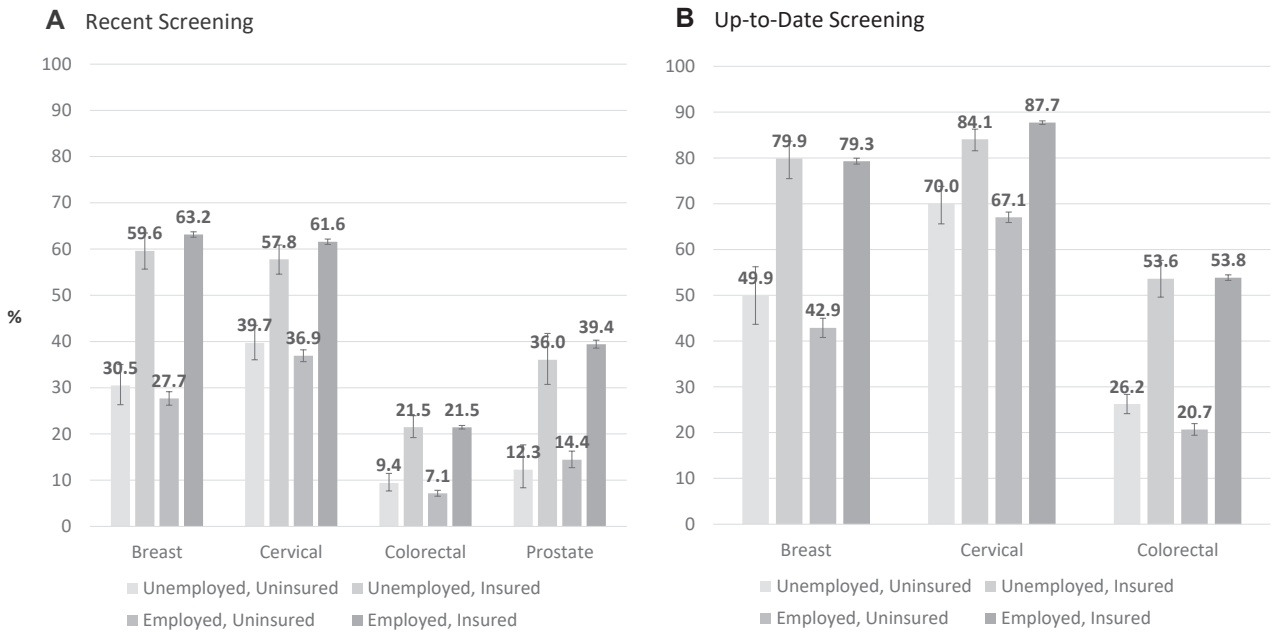

Figure 3. Recent and up-to-date cancer screening according to employment and insurance status among nonelderly adults (2000-2018). Recent screening is defined as self-reported screening in the past year. Up-to-date screening is a mammogram in the past 2 years among women aged 50 to 64 years for breast cancer; a Papanicolaou smear in the past 3 years among women aged 21 to 64 years for cervical cancer; and a stool test, sigmoidoscopy, and/or colonoscopy in the past 1, 5, and 10 years, respectively, among adults aged 50 to 64 years for colorectal cancer.

The differences in aPRs remained unaltered after we accounted for nonmodifiable factors (Table 2). When we adjusted for only health insurance, there were no differences in UTD breast and cervical cancer screening aPRs, although unemployed adults' UTD CRC screening prevalence became 11% higher (aPR, 1.11; 95% CI, 1.05-1.18). In CRC screening test–specific analyses, unemployed adults were approximately 20% less likely to undergo colonoscopy in the past 10 years and stool testing in the past year, but after we accounted for health insurance, there were no differences in colonoscopy or stool testing utilization (Supporting Table 5).

Association Between Employment Status and Screening Within Subgroups

Other subgroup analyses revealed that unemployed adults were generally less likely to receive recent screening or to be UTD with breast, cervical, colorectal, or prostate cancer screening across the 3 time periods, including 2014-2018, a period with relatively low unemployment and when ACA provisions to improve health insurance coverage were implemented (Supporting Table 7). The exception was for recent breast cancer and CRC screening during 2000-2007: prevalence estimates were lower among unemployed adults than employed adults, but PRs were not statistically significant.

In analyses stratified according to race/ethnicity, the prevalence of recent and UTD breast, cervical, colorectal, and prostate cancer screening was generally lower among unemployed adults than employed adults across the racial/ethnic groups analyzed (White, Black, and Hispanic; Supporting Table 8 and Supporting Fig. 3).

DISCUSSION

In this nationally representative study, unemployed nonelderly adults were 10% to 30% less likely to have recent screening or be UTD with recommended screening for breast, cervical, colorectal, and prostate cancer in comparison with employed adults. Unemployed adults were 4 times as likely to be uninsured as employed adults, and these differences in insurance coverage completely accounted for lower screening utilization among unemployed adults.

Our finding of both lower recent and UTD screening prevalence among those currently unemployed suggests that unemployment at a single point in time may

hinder both recent and potentially longer term screening practices. The latter is especially concerning because not being UTD with screening increases a person's risk of being diagnosed with late-stage breast cancer, cervical cancer, or CRC,[19-21] and this sets off a trajectory of less effective treatment options, the potential for more treatment side effects, and cancer death. For example, within large health systems, more than half of late-stage breast cancers have been attributed to not being screened with mammography, and three-quarters of CRC deaths have been attributed to not being UTD with CRC screening.[20,22] A global study of 79 countries found that even a 1% rise in the unemployment rate was associated with increases in mortality rates for cancers with screening tests (breast cancer and CRC), and these associations remained for up to 5 years after unemployment began to climb.[23] This public health concern overlays with the immediate impacts that the COVID-19 pandemic may have had on missed or delayed cancer screenings. Early in the pandemic (early spring 2020), professional societies recommended postponing screening tests, and cervical cancer, breast cancer, and CRC screening volumes declined by 80% to 90% in March/April 2020 in comparison with expected volumes according to studies of health systems and electronic medical record company reports.[24-27] Shallower drops (29%-34% declines) in weekly screening volumes were reported during the summer of 2020 after guidelines were issued and return-to-screening initiatives began, and in 1 large health system, screening volumes reached prepandemic levels.[24,25] These studies were confined to adults who had private insurance and/or had primary care encounters and may not have included the growing number of people who were uninsured and/or experienced coverage disruptions during the recent economic downturn. With BLS data, we estimate that the number of adults eligible for screening who were unemployed doubled between 2018 and 2020.

Our finding that insurance coverage fully accounted for unemployed adults' lower cancer screening utilization is noteworthy because it is potentially modifiable. In the aforementioned 79-country study, unemployment rates were positively associated with mortality rates for cancers that are amenable to screening and early detection in countries without universal health care coverage but not in those countries with universal health care.[23] These findings highlight the importance of and need for comprehensive policies that ensure health insurance coverage and access to care while people are unemployed. In the United States, the ACA has improved health insurance coverage through multiple provisions, including the expansion of eligibility for Medicaid insurance coverage to low-income adults.[28] We observed a decline in the proportions of employed and unemployed adults who were uninsured during the study period, but the 4-fold gap in uninsured rates between the 2 groups remained during the post-ACA period, as did the unemployed-versus-employed screening disparities. During the post-ACA period (2014-2018), a third of unemployed adults in our study were uninsured. As of April 2021, 11 states have not yet expanded Medicaid eligibility.[28] Previous studies note that unemployed adults residing in nonexpansion states are twice as likely (35.8%) to be uninsured in comparison with unemployed adults residing in states that expanded Medicaid (16.4%).[29] We were not able to precisely examine the intersection of unemployment, Medicaid expansion/nonexpansion, and receipt of cancer screening because we did not have access to state-level data, although this will be important future research.

We observed that household income mitigated some of the association between unemployment and cancer screening but did not eliminate it except for cervical cancer and CRC screening, whereas health insurance more consistently accounted for lower cancer screening use among unemployed persons. We were not able to examine state-level unemployment benefits in relation to cancer screening, but previous research on unemployment benefits has shown better self-reported health among unemployed males in states with more generous unemployment benefits; this suggests that social programs may moderate the association between unemployment and health.[30] In terms of health care utilization, during the COVID-19 pandemic, people in households that received unemployment insurance benefits were less likely to have delayed medical care.[31] Further research on cancer care in relation to state-level unemployment benefit generosity, Medicaid expansion, and their nexus is needed.

Similarly to recent (December 2020) BLS data, we found that Hispanic and Black adults faced a greater burden of unemployment and were 50% and 70% more likely to be unemployed, respectively.[1] Thus, Hispanic and Black adults will likely be disproportionately represented in populations that are unemployed and potentially unscreened. Race/ethnicity did not account for the association between unemployment and cancer screening, and being unemployed appeared to be similarly deleterious to cancer screening across racial/ethnic groups. There is mixed evidence on how different racial/ethnic groups access safety-net programs. Black and Hispanic women may be more likely to use the National Breast

and Cervical Cancer Detection Program, which provides free screening services to uninsured or underinsured women.[32] However, another study shows that Black or Hispanic adults are less likely to apply for safety-net benefits, including unemployment insurance, in comparison with White adults.[33]

Our finding of higher recent and UTD CRC screening among unemployed adults versus employed adults after we accounted for insurance was a result of an interaction between these 2 factors. Those who were uninsured and employed had the lowest CRC screening utilization of any employment/insurance combination, including those who were uninsured and unemployed.[34] The impact of insurance and its interaction with unemployment is particularly important for colonoscopy, which is the most common CRC screening test in the United States.[3] In addition to insurance, people who are working and are uninsured may face additional access barriers to cancer screening, including a lack of paid sick leave, which may be more prominent for colonoscopy because this test requires time off work (eg, a full day vs a partial day) and requires a chaperone after the procedure.[34] Additionally, low-income adults who are working may not have insurance offered through their employer, may have precarious employment, and may experience insurance coverage churn, which can hinder access to health care.[35]

Limitations

There are several limitations to the current study. All data were based on self-reports. However, a meta-analysis of the accuracy of self-reported screening with respect to medical records showed relatively high sensitivity.[36] We were not able to measure the causal association between job loss and insurance loss as well as specific dynamics of job loss, insurance, and screening because of the NHIS's cross-sectional design. Additionally, we did not have information on longer term employment status and the employment status of all household members. Despite these limitations, our study is one of the first to examine unemployment and cancer screening within the context of insurance.

In conclusion, unemployment was adversely associated with guideline-recommended cancer screenings, and this was explained by a lack of health insurance. Expanding and ensuring health insurance coverage after job loss may mitigate the COVID-19 pandemic's economic impact as well as the impact of future adverse economic events on cancer screening.

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CONFLICT OF INTEREST DISCLOSURES

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AUTHOR CONTRIBUTIONS

Stacey A. Fedewa: Full access to all of the data in the study and responsibility for the integrity of the data and the accuracy of the data analysis; administrative, technical, or material support; statistical analysis; supervision; concept and design; acquisition, analysis, or interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content. **K. Robin Yabroff:** Supervision; concept and design; acquisition, analysis, or interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content. **Priti Bandi:** Concept and design; acquisition, analysis, or interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content. **Robert A. Smith:** Concept and design; acquisition, analysis, or interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content. **Nigar Nargis:** Concept and design; acquisition, analysis, or interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content. **Zhiyuan Zheng:** Concept and design; acquisition, analysis, or interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content. **Jeffrey Drope:** Concept and design; acquisition, analysis, or interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content. **Ahmedin Jemal:** Supervision; concept and design; acquisition, analysis, or interpretation of data; drafting of the manuscript; and critical revision of the manuscript for important intellectual content.

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