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Employment Status, Unemployment Duration, and Health-Related Metrics among U.S. Adults of Prime Working Age: Behavioral Risk Factor Surveillance System, 2018–2019

Sharon R. Silver, MS, MA¹, Jia Li, MS¹, Brian Quay, MS²

¹National Institute for Occupational Safety and Health, Division of Field Studies and Engineering, Health Informatics Branch

²National Institute for Occupational Safety and Health, Office of the Director, Economic Research and Support Office

Abstract

Background: While unemployment has been associated with poor health, few recent studies in the United States (U.S.) have comprehensively assessed associations among employment status (including duration unemployed) and healthcare access, health-related behaviors, and specific health outcomes. The purpose of this study was to better understand relations between employment and health in the U.S. by examining prevalences of healthcare access, behaviors, and outcomes by employment status.

Methods: We assessed health-related metrics by employment status among 2018–2019 Behavioral Risk Factor Surveillance System respondents ages 25–54. We calculated unadjusted prevalences and adjusted prevalence ratios to compare metrics among employed workers to those of respondents who were self-employed, short-term (<12 months) unemployed, long-term unemployed, and unable to work.

Results: Prevalences of adverse health outcomes increased with unemployment duration and were highest for those unable to work. Non-Hispanic Blacks were most likely to be unemployed or unable to work. Short-term unemployment and self-employment were associated with poor healthcare access. Health behaviors and outcomes declined with duration unemployed and were worst for those unable to work.

Conclusions: Employment is a health equity issue. In the U.S., access to affordable healthcare is problematic for both the self-employed and the short-term unemployed. Short-term unemployment is a particularly important locus for intervention and resource provision to prevent health declines that hinder re-employment.

Keywords

employment status; health equity; healthcare access; occupational health; unemployment

Sharon Silver, ssilver@cdc.gov, National Institute for Occupational Safety and Health, Division of Field Studies and Engineering, MS R-17, 1150 Tusculum Ave., Cincinnati, OH 45226, (513) 841-4313.

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Introduction

While unemployment has been associated with poor health, comprehensive assessments of associations among employment status, including duration unemployed, and healthcare access, health-related behaviors, and specific health outcomes in the United States (U.S.) are sparse.

Along with race, ethnicity, and gender, work has been described as a fundamental cause of health status.^{1,2} Demographic determinants influence work options and, therefore, occupational exposures. Work affects health not only via adverse and positive workplace physical and psychosocial exposures, but also through employment compensation and benefits, including healthcare access.

Relations between work and health are likely mediated by the strength of linkages between work and healthcare access and costs. Such linkages are particularly strong in the U.S., where employment status is closely linked to healthcare access and costs. In 2019, the majority of U.S. adults ages 19–64 had employer-sponsored health insurance.³ A study using 2009–2010 National Health Interview Survey data found that unemployed U.S. adults were more likely than their employed counterparts to report being unable to afford to fill needed prescriptions and to pay for medical care, with healthcare access worst among the uninsured, followed by the publicly insured, and best among those privately insured.⁴ The inability to afford care adversely affects health outcomes,^{5–7} further linking work to health in the U.S.

While the literature on employment status and health in Europe is extensive and has been reviewed elsewhere,^{8,9} most peer-reviewed U.S. studies on this topic were conducted in the 1990s or earlier. Differences in the social context and repercussions of employment status by country may limit the generalizability of findings from (primarily European) studies that have more recently assessed relations of unemployment with health-related behaviors, self-reported health status, and specific health outcomes. An international review of associations between long-term unemployment and a number of health outcomes noted differences by sex and by country studied and suggested that effects of unemployment on health are modified by the social supports in place.¹⁰

Briefly, previous studies of associations between unemployment or being out of the labor market due to permanent illness and 1) health behaviors and 2) mental health have noted differing results by outcome. Recent unemployment has a stronger association with uptake of smoking (cigarettes and/or marijuana) than with new heavy alcohol use.^{11,12} Unemployment also has been associated with adverse mental health outcomes, with results modified by age at unemployment, employment stability, and numerous health and socioeconomic attributes.^{13–16} A meta-analysis of international studies found that risk of attempted or completed suicide increased with unemployment duration up to five years.¹⁷

Other research has examined self-rated health and specific health outcomes by employment status. European studies have found worse self-rated health among the unemployed, particularly those on disability pensions.^{12,18} Declines in self-rated health were observed to be steeper among unemployed than employed respondents, increasing with unemployment

duration.¹⁹ Studies assessing relations among unemployment and multiple health outcomes have found increasing prevalences of poor mental and general health, obesity, and smoking with unemployment duration up to 5 years.²⁰ Associations of musculoskeletal injuries, mental job strain, job dissatisfaction, and mental health with health-related job loss and disability retirement have also been observed.^{21,22}

Evaluating the temporal aspect of associations among employment status and health outcomes is problematic. Research from panel studies suggests that baseline mental distress has been associated with later receipt of disability payments for either psychiatric or somatic illnesses,²³ and that the baseline self-rated health status of workers who later become unemployed is worse than that of their counterparts who remain employed.²⁴ However, the effects of health on employment may be temporally complex and vary by type of impairment, as with a study reporting that mental health worsened before and after job loss, while declines in physical health accelerated later after job loss.¹⁶

The associations of shorter-term unemployment (less than one year) with health status in the U.S. have had little attention. An exception is an analysis of the 2009 Nevada Behavioral Risk Factor Surveillance Study (BRFSS) that examined healthcare access, health behaviors, general health, and mental health, comparing employed respondents to the shorter-term unemployed, the longer-term unemployed, and those voluntarily out of the labor force. The researchers reported elevated adverse prevalences of all outcomes except binge drinking among the shorter and longer-term unemployed, with results slightly worse among the latter.²⁵

The current work expands the research on associations between employment status and health by using recent (2018–2019), national BRFSS data and including an array of specific health outcomes. BRFSS is an annual, cross-sectional study and cannot be used to make causal or temporal inferences about employment status and health. However, the survey's large sample size facilitates examination of differences in the prevalence of multiple health-related metrics by employment status. This study assessed prevalences of healthcare access and utilization, health behaviors, and health outcomes among BRFSS respondents of prime working age (ages 25–54) by employment status: organizationally employed, self-employed, short-term unemployed, long-term unemployed, and unable to work.

Materials and Methods

BRFSS is an annual, state-based random-digit dialed landline and cellular telephone survey of the noninstitutionalized U.S. civilian population aged 18 years and older. All states, the District of Columbia, and territories conduct the study, designed to collect information about healthcare access, health-related risk behaviors, and health outcomes. The core survey includes a question about employment status: “Are you currently employed for wages, self-employed, out of work for 1 year or more, out of work for less than 1 year, a student, a homemaker, retired, or unable to work?”

We defined our study population as adults of prime working age (25–54); U.S. adults in this age range are most likely to be in the labor force full time or seeking work.²⁶ In a

secondary analysis, we expanded the age range to 18–64 (results shown in online Appendix). We included respondents who reported their employment status as employed for wages (henceforth “employed”), self-employed (“self-employed”), out of work less than 1 year (“short-term unemployed”), out of work for 1 year or more (“long-term unemployed”), and unable to work (“unable to work”). We excluded adults of prime working age who reported they were retired, homemakers, or students; we considered them more likely to have opted out of the workforce voluntarily (if temporarily).

We used data from two years of BRFSS (2018–2019) because some questions (e.g., number of hours slept, hypertension) are not asked every year. BRFSS response rates for 2018 were 53.3% for landline and 43.4% for cellphone calls; for 2019, response rates were 53.5% for landline and 45.9% for cellphone. Response rates overall and by state are found at https://www.cdc.gov/brfss/data_documentation/index.htm

Demographic characteristics

To show the demographic composition of each employment status, we assessed weighted prevalences within multiple descriptors: sex (male/female); age (five-year intervals); race/ethnicity combined (white non-Hispanic, black non-Hispanic, other non-Hispanic, Hispanic); marital status (married, divorced, widowed, separated, never married, unmarried couple); educational attainment (less than high school, high school/GED, some college, college graduate), annual household income (<\$10,000, \$10,000–<\$15,000, \$15,000–<\$20,000, \$20,000–<\$25,000, \$25,000–<\$35,000, \$35,000–<\$50,000, \$50,000–<\$75,000, >=\$75,000), housing status (rental vs. ownership), and percent of Federal Poverty Level (<=100% vs. >100% of 2017 FPL for data from 2018, <=100% vs. >100% of 2018 FPL for data from 2019). We present these distributions as descriptive information and used only a subset of these characteristics for adjustment in subsequent modeling.

Health-related Metrics—Healthcare access and utilization questions included having healthcare coverage; having a personal healthcare provider; visiting the doctor in the past year for a routine checkup; visiting a dentist in the past year; and needing to see a doctor in the past year but being unable to do so due to cost; and having been immunized against influenza in the past year.

Health-related behaviors included smoking (current or former), binge drinking (during the past 30 days had 5 or more drinks for men or 4 or more drinks for women on an occasion), no exercise (did not participate in any physical activities or exercise (other than regular job) during past month and insufficient sleep (fewer than 7 hours per 24-hour period).

BRFSS respondents were asked to categorize their general health as excellent, very good, good, fair, or poor (“fair” and “poor” were combined to fair/poor). They were also asked the number of days during the past 30 that their 1) physical and 2) mental health was not good. For physical and mental health, answers >=14 were considered “poor physical health” or “poor mental health” for primary analyses. We conducted secondary analyses with responses to these questions dichotomized at >=7 days and >=21 days. Obesity (BMI >=30.0) was calculated by BRFSS staff from self-reported height and weight. History of chronic medical conditions was elicited by the question “Has a doctor, nurse, or other health

practitioner ever told you that you have” followed by a set of conditions: hypertension; high cholesterol; cancer (other than non-malignant skin cancer); diabetes; coronary heart disease (positive answer to questions about heart attack and/or coronary heart disease/angina); chronic obstructive pulmonary disease; stroke; ever asthma; and current asthma.

Statistical Analyses

We calculated distributions of self-reported responses to demographic, healthcare access and utilization, health-related behaviors, and health outcome questions for workers of each included employment status. We conducted all analyses using SAS version 9.4 (SAS Institute Inc., Cary, NC) and SAS-callable SUDAAN version 11.0.1 (RTI International, Research Triangle Park, NC) to account for the complex survey design and incorporate respondent sampling weight in BRFSS. We weighted data according to state demographics distributions and then aggregated the results. We used the SURVEYFREQ procedure to estimate population counts and weighted, but unadjusted, prevalences for all variables. To examine differences in healthcare access by employment status, we used the RLOGISTIC procedure to perform logistic regression and estimate adjusted prevalences (Korn et al. 1999), as well as adjusted prevalence ratios (aPRs) comparing each other employment status group to the reference group, employed workers. We calculated 95% confidence intervals (CIs) and considered CIs for aPRs not spanning the null statistically significant.

Employment status and income are not independent, and because income and other socioeconomic variables are on the pathway between employment status and health, we limited adjustment in our primary analysis to age, sex, race/ethnicity, and marital status (collapsed to married vs. non-married). As some readers will be interested in examining differences after adjustment for income, we conducted a secondary analysis that also adjusted for annual household income. We have included these results, as well as those of primary analyses, in the main tables and briefly note the impact on the results but consider them overadjusted.

Results

A. Demographics

Of the 840,759 respondents to the 2018 and 2019 BRFSS surveys, 562,335 were excluded from the main analyses for one or more reasons: missing employment status (refused to answer, not asked, response missing, n=11,318); younger than 25 or older than 54 (526,392); retired (256,223); homemakers (39,593); students (21,986). These exclusions left 278,424 eligible respondents: 205,211 employed (74%); 34,815 self-employed (12%); 9,276 short-term unemployed (3%); 7,471 long-term unemployed (3%); and 21,651 unable to work (8%).

Unadjusted, weighted prevalences of employment status differed by demographic characteristics (Table 1). Results are shown by row percentage to permit assessment of the distribution of employment status within a demographic category. Employment status differed by sex and race/ethnicity. Men and women were equally likely to be employed, but men were more likely to be self-employed (15.1% vs. 10.5%), and women were more

likely to report being unable to work (5.6% men, 8.6% women). Non-Hispanic Blacks were most likely of all racial/ethnic groups to report being short-term unemployed (5.3%), long-term unemployed (4.4%), and unable to work (11.0%). Hispanics were most likely to be self-employed (14.8%). Non-Hispanic Whites were most likely (75.1%) and non-Hispanic Blacks least likely (69.3%) to be employed or self-employed.

The youngest workers were most likely to report short-term unemployment, but there was no clear age pattern for long-term unemployment. The prevalence of being unable to work rose with age, from 3.4% in the youngest group to 12.6% in the oldest group. Employment declined from 79.4% to 66.2% with age, but the converse was true for self-employment, which rose from 9.0% to 14.7% from the youngest to oldest group. Married respondents and homeowners were the most likely to report employment/self-employment and the least likely to report any type of unemployment.

Educational attainment and household income categories were associated with the largest differences in employment status. Compared to those who completed college, respondents who did not finish high school were more than twice as likely to report short-term unemployment, more than three times as likely to report long-term unemployment, and nearly 10 times as likely to report being unable to work. In contrast, those with lower educational attainment were somewhat more likely to be self-employed. Employment ranged from 27.0% for respondents with incomes <\$10,000 to 84.5% for those with incomes >\$75,000. The trend was reversed for short-term unemployment (11.5% in the lowest income category vs. 1.2% in the highest), long-term unemployment (15.5% to 0.8%), and being unable to work (35.8% vs. 1.0%). There was no clear association between income and self-employed status. The short-term unemployed were more than three times as likely to be at or below the Federal Poverty Level (FPL) than to be above that level; the ratio was above five for the long-term unemployed and those unable to work.

Secondary analyses including respondents ages 18–64 had fewer employed respondents and more who reported being unable to work, but patterns by employment category were consistent with those observed among respondents of prime working age. Demographics and results for all other analyses for this expanded groups of respondents are found in online supplement tables S1–S4.

B. Healthcare Access and Utilization

The short-term unemployed had the highest prevalences of several adverse healthcare access and utilization metrics (Table 2): more than one third of this group reported lacking health insurance (34.8%); 41.4% did not have a personal provider; and 30.3% needed to see a doctor in the past year but could not because of cost. Self-employed respondents also had low access to care, with the highest prevalences of not visiting a doctor in the past year for a routine checkup (38.1%) and not having received an influenza vaccination during the past 12 months (81.4%). Employed respondents were the most likely to have healthcare coverage, visit a dentist, and were least likely to be unable to see a doctor due to cost. Respondents unable to work were as likely as the employed to have health insurance and were most likely to have a personal doctor and to have visited a doctor in the past year for a routine checkup but were, along with the long-term unemployed, least likely to have visited a dentist in the

past year. Employed respondents and those unable to work were most likely to have been vaccinated for influenza in the past year; the self-employed were least likely to have been vaccinated, followed by the unemployed (regardless of duration).

Many of these differences were reflected in statistically significant elevated aPRs for adverse healthcare access metrics comparing prevalences among workers of other employment statuses to prevalences for employed workers. These differences were attenuated (sometimes slightly), and some lost statistical significance, after additional adjustment for income.

C. Health Behaviors

Prevalences of current smoking and lack of physical exercise rose along the continuum from employment/self-employment to being unable to work; the converse was true for binge drinking. Self-employed workers were significantly less likely than employed respondents to report insufficient sleep. For most metrics, the confidence intervals for prevalence ratios for neighboring categories did not overlap. Some differences between neighboring categories were attenuated after adjustment for income.

D. Health Outcomes

Prevalences of every adverse health outcome (Table 4) were highest for those unable to work, followed by the long-term unemployed and then the short-term unemployed; prevalences were lowest for the employed or the self-employed. More than half of respondents who were unable to work reported having fair/poor general health, poor physical health, and/or diagnosed depression; nearly half had obesity and more than 40% reported poor mental health, hypertension, and high cholesterol. Before adjustment for income, aPRs comparing this group to the employed exceeded 5.0 for fair/poor general health, poor physical health, CVD, stroke, and COPD and were above 3.0 for poor mental health, depression, and diabetes. Among the long-term unemployed, 40.8% had obesity, and approximately one-third reported fair/poor general health and depression; aPRs before income adjustment were above 3.0 for poor physical health and stroke. Of the short-term unemployed, 35.3% had obesity and more than 25% reported diagnoses of depression or hypertension. Self-employed respondents had significantly elevated aPRs compared to the employed for poor physical and mental health before adjustment for income but had statistically significant deficits for obesity, hypertension, high cholesterol, and diabetes. Dichotomizing poor physical and mental health at 7 or 21 days yielded similar patterns between adjacent employment status groups (data not shown). After adjustment for household income, point estimates for most aPRs decreased, but statistical significance was unchanged for most outcomes.

Discussion

Results from the 2019 BRFSS survey suggest that in terms of health, employment status can be viewed as a continuum, with employment and self-employment relatively desirable states, and short-term unemployment, long-term unemployment, and the inability to work increasingly undesirable. Prevalences of adverse health outcomes among adults of prime working age increased sharply along this continuum.

Our results for healthcare access by employment status contrast markedly with those for health outcomes, with gaps particularly notable among the short-term unemployed. In the U.S. healthcare system, people with very low incomes, and a subset of those unable to work, are eligible for public benefits. The short-term unemployed may be more likely to fall into the gap between employer-sponsored and public benefits. For unemployed persons, the ability to maintain health adequate to allow reemployment is linked to both preexisting assets and government-provided benefits. In the U.S., the Consolidated Omnibus Budget Reconciliation Act (COBRA) is a bridge program, allowing former employees, who cover up to 102% of costs, to retain group health coverage for up to 18 months. Income loss makes this benefit unaffordable to many laid-off workers. The long-term unemployed and those unable to work might have greater likelihood of Medicaid eligibility. Medicaid expansion, not addressed in our study, is associated with greater healthcare access, and within two years after implementation, modest improvements in self-reported health and larger decreases in positive screening for depression.²⁷ However, loss of Medicaid coverage under work requirements can hinder healthcare access, particularly in states not expanding coverage,²⁸ creating a disincentive for reemployment into jobs that do not provide affordable, or any, healthcare coverage.

Healthcare coverage gaps were notable among self-employed respondents as well. In the current research, the self-employed were more likely than the short-term unemployed to report not seeing a doctor in the past year for a routine checkup. The prevalence of not visiting a doctor was high in both groups. However, the self-employed were much less likely to report being unable to see a doctor due to cost. Self-employed persons in the U.S. are more likely to be uninsured or underinsured, as the lack of access to a large insured pool greatly increases premiums. According to a study on the impacts of the Affordable Care Act (ACA) on insurance coverage rates, from 2010–2013, 31.4 percent of self-employed individuals were uninsured, compared to only 5.8 percent of wage earners with employer coverage offers.²⁹ However, following the expanded coverage provisions of the ACA implemented in 2014, the rate of uninsured self-employed individuals from 2014–2016 declined 6.7 percentage points (21 percent) to 24.7 percent. Finally, while most respondents who were unable to work had healthcare coverage and a primary care provider, many reported they could not afford to see a health practitioner.

The business cycle influences the unemployment rate and job-finding probability;³⁰ the availability of jobs is not static.³¹ However, certain resources have been shown to support reemployment. A review of employment interventions addressing mental health needs identified key resources for success, including a multidisciplinary team, comprehensive services, and individualized work with clients and prospective employers.³² The authors highlight the importance of increasing 1) understanding among primary care staff of employment as a social determinant of health and 2) linkages to social/community health workers and external employment services. Similar approaches have been recommended for unemployed persons with physical limitations.³³ In addition to addressing chronic conditions, healthcare access and having a regular provider may increase the opportunity to connect clients with resources to address health-related behaviors,³⁴ including those hindering employability. However, in our research, the short-term unemployed were most likely to lack a primary care provider; this coverage gap coverage must be addressed for

primary care to be part of a multidisciplinary approach to promoting reemployment for this group.

Our study has several limitations. Research on health and unemployment has identified differences in associations by demographic categories (age, sex, race/ethnicity, education); employment status is not independent of other social determinants of health. Our results echo findings from the 2009–2010 NHIS data: unemployed adults were more likely than the employed/self-employed to be non-Hispanic Black, have less than a high school education, and have household incomes below the poverty level.⁴ Other research has described the influence of systemic issues such as residential segregation, sex, educational opportunities, transportation, and employment discrimination on employment status and opportunities.^{35–37} Furthermore, employment status and all health metrics are self-reported in BRFSS, introducing the possibility of reporting bias. BRFSS respondents have been found to report poorer overall self-rated health than respondents from several other large, U.S. surveys but give highly accurate information about whether they have healthcare coverage.³⁸ Differences in reporting by socioeconomic status and race/ethnicity have been observed in other studies using self-rated health; interpretations of the differences range from heterogeneity in expectations of health status³⁹ to accurate reflections of lived experience,⁴⁰ depending on the metric and direction of difference. Although we adjusted our results for age, sex, race/ethnicity, and marital status for this assessment of 25 health-related endpoints, presentation of results stratified by demographic categories would be a key component of future, more focused research.

BRFSS does not differentiate between voluntary and involuntary nonemployment status or level of attachment to the labor market (e.g., looking for work, not looking for work), an important factor in other research.⁴¹ The survey does not capture whether involuntary unemployment led respondents to enter school, categorize themselves as homemakers, or retire early. No information is collected about other work arrangements (work contingency; work hours; shift) that may impact job security and desirability.

Disability status interacts with employment status, healthcare access, and health outcomes⁴² but was not explicitly assessed in this research due to methodologic limitations, including substantial differences in estimated prevalence of disability between BRFSS and 1) the American Community Survey⁴³ and 2) Social Security.⁴⁴ The employment statuses we examined included a category for respondents unable to work, but our results may have residual confounded by 1) disabilities that do not preclude employment or 2) differences in respondents' self-categorization as unemployed versus unable to work.

Finally, unemployment duration is bifurcated at 12 months in BRFSS, precluding detailed examination of employment duration within the shorter and longer-term unemployed groups. Many respondents in the short-term unemployed category were likely employed during some part of the previous year, and may have been insured at that time, complicating interpretation of the healthcare metrics with temporal components (and perhaps explaining in part why more self-employed than short-term unemployed respondents reported not visiting a doctor in the past year). While health-related job loss may not be permanent,⁴⁵ the cross-sectional design of BRFSS precludes assessment of respondents' employment

histories. Longitudinal studies can better capture the cumulative effects of repeated unemployment and to assess temporal changes in health symptoms and behaviors,³⁴ although unobserved changes between observations remain problematic.¹⁶

Employment is a social determinant of health and a health equity issue. Each non-employed status (short-term unemployment, long-term unemployment, and being unable to work) has unique needs in terms of health outcomes, and the short-term unemployed and self-employed have deficits in healthcare access. Additional resources are needed across this spectrum. We found strong associations between unemployment and prevalences of multiple adverse health-related metrics.

Decoupling these observed associations will require addressing 1) social and economic factors contributing to unemployment (for example, residential segregation affecting access to high-quality primary and secondary education, and thus higher education, which in turn influences employment options, and attendant wages and stability); 2) job and income insecurity; and 3) healthcare access, which in the U.S. is related to employment both directly (through employer-based coverage) and indirectly (through income). Insufficient healthcare access comprises a barrier to identifying and treating both chronic conditions and health behaviors that exacerbate these conditions, potentially leading to an inability to work (e.g., smoking and COPD).

Research has examined how unemployment benefits generosity affects health behaviors and self-reported health. U.S. studies have found that smoking cessation rose with increased benefits among those involuntarily unemployed, but not among the voluntarily unemployed and re-entrants⁴⁶ and that a 63% increase in state unemployment benefits fully offset the negative effect of unemployment on self-rated health.⁴⁷ Both an international review⁴⁸ and a study of 26 countries in Europe⁴⁹ noted that benefits were positively associated with self-rated health. The importance of considering benefits within the context of the labor market, related policies, and differing effects of unemployment by sex, socioeconomic status, and family composition has been noted.⁴⁸⁻⁵⁰

Economic insecurity, such as job and income insecurity, can lead to negative health outcomes.^{51,52} Enhanced unemployment benefits, such as those provided by the U.S. Congress from March 2020 until September 2021, can help to compensate for economic insecurity by adding some degree of income security for certain groups of workers.⁵³ Although preliminary work has shown no evidence that these enhanced unemployment benefits discouraged people from working⁵⁴⁻⁵⁶ more research is needed to understand the micro- and macroeconomic effects.

The health-related needs of short-term unemployed persons have received scant attention. Our research indicates this group may comprise a pivot point in terms of health status. Short-term unemployment may be a key locus for focusing interventions to support health and increase reemployment prospects. The effects of fully funded healthcare access, as well as accessible education and training, on short-term unemployment should be evaluated. Additional research using more granular, longitudinal data to assess the temporal course of

unemployment by previous occupation and work arrangement would facilitate understanding of the optimal content and timing for delivery of these resources.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Data availability:

Data used for these analyses are available in a public-use dataset from CDC at https://www.cdc.gov/brfss/annual_data/annual_2019.html

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Table 1 –

Demographics by Employment Status^a 2018–19 Behavior Risk Factor Surveillance System (BRFSS)^b

Characteristic	Category	Employed		Self-employed		Unemployed < 12 months		Unemployed ≥ 12 months		Unable to work	
		Sample Size	Weighted %	Sample Size	Weighted %	Sample Size	Weighted %	Sample Size	Weighted %	Sample Size	Weighted %
Total Respondents		205,211 (81,774)		34,815 (14,422)		9,276 (3,945)		7,471 (3,373)		21,651 (7,770)	
Sex	Male	103,581	73.46	20,798	15.11	4,494	3.30	3,296	2.51	8,745	5.62
	Female	101,393	73.50	13,973	10.45	4,772	3.83	4,162	3.64	12,866	8.57
Race	White, non-Hispanic	146,368	75.06	25,303	13.03	5,371	2.83	4,183	2.42	14,141	6.66
	Black, non-Hispanic	18,503	69.29	2,221	10.04	1,356	5.26	1,176	4.44	3,250	10.96
	Other, non-Hispanic	17,747	74.35	2,962	12.98	1,081	3.82	1,030	3.34	2,202	5.50
	Hispanic	22,593	71.21	4,329	14.81	1,468	4.37	1,082	3.75	2,058	5.86
Age	25–29	29,390	79.44	3,085	9.00	1,773	5.07	959	3.10	1,089	3.38
	30–34	31,716	76.92	4,332	11.45	1,653	4.16	1,100	3.11	1,742	4.35
	35–39	33,534	75.18	5,679	13.29	1,466	3.52	1,069	2.62	2,464	5.39
	40–44	32,921	73.12	5,958	14.30	1,329	3.07	1,070	2.85	3,211	6.66
	45–49	36,131	70.39	6,967	14.98	1,363	2.72	1,374	2.68	4,864	9.24
Marital status	50–54	41,519	66.19	8,794	14.73	1,692	2.73	1,899	3.71	8,281	12.64
	Married	118,107	77.84	20,959	14.07	3,005	2.18	2,241	1.81	6,452	4.10
	Divorced	23,358	66.39	4,138	12.84	1,468	4.27	1,291	3.90	5,168	12.60
	Widowed	2,117	54.10	455	12.60	163	4.97	206	5.58	875	22.75
	Separated	5,397	61.62	970	13.07	523	6.25	411	4.26	1,623	14.80
Housing status	Never married	43,532	69.77	6,119	10.58	3,383	5.57	2,780	4.99	6,318	9.10
	Unmarried couple	11,267	72.74	1,963	13.35	667	4.23	468	3.16	1,035	6.52
Education, highest level completed	Owns home	132,557	76.91	24,024	14.13	3,403	2.24	2,674	1.99	8,138	4.73
	Rents or other arrangement	71,661	67.66	10,633	10.91	5,819	5.80	4,742	4.80	13,361	10.83
Education, highest level completed	Less than high school graduate	10,124	56.80	2,739	16.14	1,064	5.39	1,074	5.26	4,086	16.41
	High school graduate or GED	42,724	67.66	8,540	13.40	3,065	4.66	2,715	4.26	8,352	10.02
	Some college or technical school	53,379	73.87	9,673	12.99	2,650	3.52	2,085	3.04	6,267	6.59

Characteristic	Category	Employed		Self-employed		Unemployed < 12 months		Unemployed >= 12 months		Unable to work	
		Sample Size	Weighted %	Sample Size	Weighted %	Sample Size	Weighted %	Sample Size	Weighted %	Sample Size	Weighted %
	College graduate or more	98,406	83.34	13,757	11.47	2,466	2.10	1,566	1.35	2,851	1.74
Household income from all sources	<\$10,000	2,094	26.96	944	10.16	1,258	11.52	1,688	15.52	4,419	35.84
	\$10- <15,000	2,792	41.02	892	12.87	669	8.24	670	8.24	3,087	29.62
	\$15- <20,000	6,623	52.95	1,759	14.15	1,065	8.57	850	6.17	3,027	18.16
	\$20- <25,000	10,579	62.14	2,397	14.53	1,079	6.28	743	4.75	2,368	12.29
	\$25- <35,000	14,621	71.31	2,773	15.01	808	4.46	542	2.95	1,496	6.27
	\$35- <50,000	23,003	78.15	3,841	13.23	858	2.81	465	1.80	1,210	4.01
	\$50- <75,000	32,679	82.64	4,616	11.46	793	2.26	402	1.44	926	2.19
Poverty level	\$75,000	90,802	84.49	13,126	12.51	1,161	1.25	581	0.76	979	0.99
	<=100% FPL	13,889	47.50	3,928	13.53	2,882	8.72	2,991	8.87	8,469	21.38
	>100% FPL	167,940	79.60	26,182	12.68	4,756	2.42	2,902	1.61	8,930	3.69

^aExcludes retired, students, and homemakers

^bState-by-state participation in BRFSS by year is charted in Online Appendix A. General BRFSS documentation can be found at <https://www.cdc.gov/brfss/datadocumentation/index.htm>

Healthcare access by employment status, prevalence estimates and adjusted prevalence ratios (aPRs), 2018–19 Behavioral Risk Factor Surveillance System (BRFSS)

Table 2 –

Item	Employed (reference group)		Self-employed		Unemployed <12 months		Unemployed ≥= 12 months		Unable to work	
	Prevalence ^a (%)	Adjusted Prevalence ^b (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)
Lacks health care coverage (health insurance, prepaid plan, or government plan)	12.7 12.9 (12.6–13.2) 13.6 (13.3–14.0)		27.8 2.12 (2.03–2.22) 1.90 (1.81–1.99)		34.8 2.33 (2.19–2.47) 1.68 (1.56–1.81)		27.6 1.89 (1.74–2.04) 1.20 (1.08–1.32)		12.9 0.99 (0.92–1.07) 0.53 (0.48–0.58)	
Does not have at least one personal doctor or health care provider	28.6 28.4 (28.1–28.8) 29.0 (28.6–29.4)		35.6 1.25 (1.21–1.29) 1.18 (1.15–1.22)		41.1 1.30 (1.23–1.36) 1.11 (1.05–1.18)		35.1 1.20 (1.13–1.27) 0.96 (0.89–1.04)		17.7 0.72 (0.68–0.76) 0.53 (0.49–0.57)	
Did not visit doctor in past year for routine checkup	29.8 29.7 (29.3–30.0) 30.3 (29.9–30.7)		38.1 1.27 (1.23–1.31) 1.23 (1.19–1.27)		34.2 1.12 (1.06–1.18) 1.02 (0.96–1.09)		31.8 1.10 (1.03–1.18) 0.99 (0.91–1.08)		15.6 0.60 (0.56–0.64) 0.49 (0.45–0.53)	
Needed to see doctor in last 12 months but could not because of cost	13.8 13.9 (13.6–14.2) 14.9 (14.4–15.2)		18.0 1.33 (1.27–1.40) 1.20 (1.14–1.27)		30.3 1.95 (1.83–2.07) 1.49 (1.39–1.61)		28.8 1.85 (1.71–2.00) 1.33 (1.21–1.47)		27.1 1.77 (1.68–1.86) 1.17 (1.09–1.25)	
Did not visit dentist in past year ^d	31.7 32.0 (31.4–32.5) 33.3 (32.6–33.8)		39.1 1.22 (1.17–1.27) 1.13 (1.08–1.18)		48.6 1.42 (1.34–1.51) 1.15 (1.06–1.24)		51.8 1.55 (1.45–1.65) 1.25 (1.14–1.36)		52.1 1.62 (1.56–1.68) 1.18 (1.12–1.25)	
No influenza vaccination past 12 months	68.0 68.1 (67.7–68.5) 68.5 (68.0–68.9)		81.4 1.19 (1.18, 1.21) 1.18 (1.16–1.19)		76.8 1.10 (1.07, 1.12) 1.06 (1.04–1.09)		77.3 1.12 (1.09, 1.15) 1.07 (1.03–1.11)		67.4 0.99 (0.97, 1.01) 0.92 (0.89–0.94)	

aPR = adjusted prevalence ratio, CI= confidence interval

^aWeighted, unadjusted prevalence

^bAdjusted prevalences (column 2) and aPRs (columns 3–6) adjusted for: age (25–29, 30–34, 35–39, 40–44, 45–49, 50–54); sex: race/ethnicity combined (classified as white non-Hispanic, black non-Hispanic, other non-Hispanic, Hispanic) and marital status (married vs. all other)

^cIncludes all adjustments from note b and also adjustment for household income (<\$10,000, \$10,000–\$15,000, \$15,000–\$20,000, \$20,000–\$25,000, \$25,000–\$35,000, \$35,000–\$50,000, \$50,000–<\$75,000, >=\$75,000)

^dIn 2018 survey only.

Health-related behaviors by employment status, prevalence estimates and adjusted prevalence ratios (aPRs), 2018–19 Behavioral Risk Factor Surveillance System (BRFSS)

Table 3 –

Item	Employed (reference group) Prevalence ^a (%)	Adjusted Prevalence ^b (95% CI)	Adjusted Prevalence ^c (95% CI)	Self-employed			Unemployed <12 months			Unemployed ≥12 months			Unable to work						
				Prevalence ^a (%)	aPR ^b (95% CI)	aPR ^c (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	aPR ^c (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	aPR ^c (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	aPR ^c (95% CI)				
Smoker – current	16.4	16.7 (16.4, 17.0)	20.5 (20.2, 20.9)	18.9	1.14 (1.09, 1.20)	1.04 (0.99, 1.09)	31.5	1.74 (1.64, 1.85)	1.36 (1.27, 1.45)	17.5	1.05 (1.00, 1.09)	1.06 (1.02, 1.11)	33.4	1.86 (1.74, 1.99)	1.41 (1.28, 1.54)	38.0	2.09 (2.01, 2.18)	1.49 (1.42, 1.58)	21.7
Smoker – former	20.6	17.8 (17.5, 18.2)	20.7 (20.3, 21.0)	22.7	1.04 (0.99, 1.09)	1.06 (1.02, 1.11)	17.5	0.95 (0.87, 1.03)	1.03 (0.94, 1.13)	21.7	0.92 (0.84, 1.00)	1.01 (0.91, 1.11)	17.0	0.92 (0.84, 1.00)	1.01 (0.91, 1.11)	10.0	1.09 (1.03, 1.14)	1.20 (1.13, 1.28)	
Binge drinking (during the past 30 days had 5 or more drinks for men or 4 or more drinks for women on an occasion)	23.9	23.8 (23.4, 24.1)	24.0 (23.6, 24.3)	22.9	0.96 (0.92, 1.00)	1.00 (0.95, 1.04)	21.7	0.87 (0.81, 0.94)	0.96 (0.88, 1.04)	27.3	0.64 (0.58, 0.71)	0.75 (0.67, 0.84)	33.2	0.64 (0.58, 0.71)	0.75 (0.67, 0.84)	47.8	0.46 (0.43, 0.50)	0.58 (0.53, 0.64)	
Did not participate in any physical activities or exercise during past month	20.3	20.7 (20.3, 21.0)	21.5 (21.1, 21.9)	21.2	1.02 (0.97, 1.07)	0.93 (0.88, 0.97)	27.3	1.25 (1.17, 1.33)	0.96 (0.89, 1.04)	41.2	1.05 (0.98, 1.13)	1.04 (0.96, 1.12)	48.1	1.48 (1.37, 1.59)	1.11 (1.01, 1.22)	53.9	2.31 (2.24, 2.39)	1.72 (1.65, 1.81)	
Insufficient sleep (less than 7 hours per 24 hour period) ^e	38.9	39.1 (38.6, 39.7)	39.3 (38.7, 39.9)	35.0	0.90 (0.86, 0.94)	0.90 (0.86, 0.95)	41.2	1.05 (0.98, 1.13)	1.04 (0.96, 1.12)	48.1	1.20 (1.11, 1.29)	1.21 (1.11, 1.32)	48.1	1.20 (1.11, 1.29)	1.21 (1.11, 1.32)	1.33 (1.28, 1.38)	1.33 (1.28, 1.40)		

aPR = adjusted prevalence ratio, CI= confidence interval

^aWeighted, unadjusted prevalence

^b Adjusted prevalences (column 2) and aPRs (columns 3–6) adjusted for: age (25–29, 30–34, 35–39, 40–44, 45–49, 50–54); sex; race/ethnicity combined (classified as white non-Hispanic, black non-Hispanic, other non-Hispanic, Hispanic) and marital status (married vs. all other)

^c Includes all adjustments from note b and also adjustment for household income (<\$10,000, \$10,000–\$15,000, \$15,000–\$20,000, \$20,000–\$25,000, \$25,000–\$35,000, \$35,000–\$50,000, >=\$75,000)

^d In 2018 survey only

Health outcomes by employment status, prevalence estimates and adjusted prevalence ratios (aPRs), 2018–19 Behavioral Risk Factor Surveillance System (BRFSS)

Table 4 –

Item	Employed (reference group) Prevalence ^a (%) Adjusted Prevalence ^b (95% CI) Adjusted Prevalence ^c (95% CI)	Self-employed		Unemployed <12 months		Unemployed ≥ 12 months		Unable to work	
		Prevalence ^a (%) aPR ^b (95% CI) aPR ^c (95% CI)	Prevalence ^a (%) aPR ^b (95% CI) aPR ^c (95% CI)	Prevalence ^a (%) aPR ^b (95% CI) aPR ^c (95% CI)	Prevalence ^a (%) aPR ^b (95% CI) aPR ^c (95% CI)	Prevalence ^a (%) aPR ^b (95% CI) aPR ^c (95% CI)	Prevalence ^a (%) aPR ^b (95% CI) aPR ^c (95% CI)		
General health fair or poor	10.7 11.0 (10.7, 11.3) 11.8 (11.5, 12.1)	11.9 1.05 (0.98, 1.12) 0.92 (0.86, 0.99)	22.5 1.90 (1.76, 2.05) 1.37 (1.26, 1.49)	32.7 2.67 (2.48, 2.87) 1.81 (1.64, 1.99)	61.6 5.17 (4.99, 5.35) 3.68 (3.51, 3.87)				
Poor physical health ^d	6.0 6.1 (5.9, 6.4) 6.4 (6.2, 6.7)	7.4 1.24 (1.13, 1.36) 1.14 (1.03, 1.26)	15.9 2.60 (2.37, 2.86) 2.07 (1.86, 2.30)	20.6 3.21 (2.92, 3.51) 2.46 (2.19, 2.76)	53.0 8.03 (7.69, 8.40) 6.34 (5.97, 6.73)				
Poor mental health ^e	10.8 10.8 (10.5, 11.0) 11.2 (11.0, 11.5)	11.2 1.12 (1.05, 1.19) 1.07 (1.00, 1.15)	23.9 2.03 (1.89, 2.17) 1.74 (1.60, 1.89)	26.1 2.25 (2.08, 2.43) 1.85 (1.68, 2.04)	43.5 3.83 (3.68, 3.99) 3.19 (3.03, 3.36)				
Obesity (body mass index >= 30) ^f	33.4 33.7 (33.3, 34.1) 34.5 (34.1, 35.0)	26.9 0.79 (0.76, 0.82) 0.78 (0.75, 0.81)	35.3 1.05 (0.99, 1.11) 0.98 (0.92, 1.05)	40.8 1.18 (1.11, 1.25) 1.13 (1.06, 1.22)	48.4 1.35 (1.31, 1.40) 1.27 (1.22, 1.32)				
Has a doctor, nurse, or other health practitioner ever told you that you have:									
Depression	15.3 15.4 (15.1, 15.7) 16.2 (15.9, 16.5)	14.0 1.00 (0.95, 1.05) 0.96 (0.91, 1.01)	28.1 1.74 (1.64, 1.84) 1.53 (1.44, 1.64)	33.8 2.07 (1.94, 2.21) 1.76 (1.62, 1.90)	55.1 3.37 (3.26, 3.47) 2.92 (2.80, 3.04)				
Hypertension ^g	20.3 21.0 (20.5, 21.4) 21.4 (20.9, 21.9)	19.6 0.87 (0.82, 0.92) 0.84 (0.78, 0.89)	26.4 1.33 (1.22, 1.45) 1.24 (1.12, 1.36)	28.7 1.34 (1.23, 1.46) 1.21 (1.09, 1.35)	48.9 2.03 (1.94, 2.12) 1.88 (1.77, 1.99)				
High cholesterol ^e	20.8 21.3 (20.8, 21.9) 21.6 (21.1, 22.1)	20.1 0.86 (0.81, 0.92) 0.85 (0.79, 0.91)	22.6 1.15 (1.03, 1.29) 1.12 (0.98, 1.27)	29.7 1.40 (1.28, 1.54) 1.33 (1.19, 1.49)	42.7 1.80 (1.71, 1.89) 1.72 (1.61, 1.84)				
Diabetes	4.9 4.8	4.8	7.5	10.2	21.7				

Item	Employed (reference group)		Self-employed		Unemployed <12 months		Unemployed ≥ 12 months		Unable to work	
	Prevalence ^a (%)	Adjusted Prevalence ^b (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)	Prevalence ^a (%)	aPR ^b (95% CI)
	5.1 (4.9, 5.3)		0.86 (0.78, 0.95)		1.57 (1.32, 1.88)		1.83 (1.59, 2.11)		3.30 (3.10, 3.51)	
	5.4 (5.2, 5.7)		0.78 (0.70, 0.86)		1.32 (1.08, 1.61)		1.51 (1.28, 1.79)		2.56 (2.37, 2.78)	
CVD	1.8		2.4		3.4		5.0		12.3	
	1.8 (1.7, 1.9)		1.16 (1.01, 1.34)		1.99 (1.56, 2.53)		2.59 (2.16, 3.09)		5.46 (4.97, 6.00)	
	2.0 (1.8, 2.1)		1.05 (0.90, 1.23)		1.46 (1.10, 1.93)		1.52 (1.24, 1.86)		3.45 (3.01, 3.95)	
Stroke	0.8		1.0		2.3		3.7		10.9	
	0.8 (0.8, 0.9)		1.11 (0.92, 1.35)		2.83 (2.23, 3.59)		3.99 (2.78, 5.71)		10.0 (8.90, 11.2)	
	0.9 (0.8, 1.0)		1.00 (0.81, 1.22)		2.11 (1.60, 2.77)		2.66 (1.63, 4.34)		6.57 (5.58, 7.73)	
Chronic Obstructive Pulmonary Disease	2.6		3.0		5.1		8.1		20.1	
	2.6 (2.5, 2.8)		1.14 (1.00, 1.30)		1.94 (1.66, 2.26)		2.77 (2.36, 3.26)		6.07 (5.64, 6.53)	
	2.9 (2.8, 3.1)		0.99 (0.86, 1.15)		1.32 (1.11, 1.58)		1.70 (1.39, 2.09)		3.66 (3.31, 4.05)	
Current Asthma	7.6		6.6		11.6		13.4		24.5	
	7.6 (7.4, 7.8)		0.94 (0.87, 1.02)		1.45 (1.30, 1.62)		1.62 (1.43, 1.84)		2.87 (2.72, 3.03)	
	7.8 (7.6, 8.1)		0.94 (0.87, 1.03)		1.29 (1.14, 1.46)		1.41 (1.21, 1.65)		2.61 (2.43, 2.79)	
Ever Asthma	12.9		11.8		18.2		18.7		29.8	
	12.0 (12.6, 13.2)		0.97 (0.92, 1.03)		1.34 (1.22, 1.48)		1.38 (1.25, 1.53)		2.20 (2.10, 2.30)	
	13.1 (12.8, 13.4)		0.98 (0.92, 1.04)		1.29 (1.16, 1.44)		1.25 (1.11, 1.41)		2.12 (2.01, 2.25)	
Cancer	2.6		2.5		3.0		5.1		10.4	
	2.7 (2.5, 2.8)		0.95 (0.84, 1.07)		1.21 (1.02, 1.43)		1.78 (1.43, 2.22)		2.95 (2.69, 3.24)	
	2.8 (2.6, 2.9)		0.93 (0.82, 1.07)		1.06 (0.89, 1.27)		1.55 (1.18, 2.04)		2.71 (2.39, 3.07)	

aPR = adjusted prevalence ratio, CI= confidence interval

^aWeighted, unadjusted prevalence

^b Adjusted prevalences (column 2) and aPRs (columns 3–6) adjusted for: age (25–29, 30–34, 35–39, 40–44, 45–49, 50–54); sex; race/ethnicity combined (classified as white non-Hispanic, black non-Hispanic, other non-Hispanic, Hispanic) and marital status (married vs. all other)

^c Includes all adjustments from note b and adjustment for household income (<\$10,000, \$10,000–<\$15,000, \$15,000–<\$20,000, \$20,000–<\$25,000, \$25,000–<\$35,000, \$35,000–<\$50,000, \$50,000–<\$75,000, >=\$75,000)

^dPhysical health not good ≥14 of past 30 days

ϵ Mental health not good ≥ 14 of past 30 days
 f Computed from self-reported height and weight.
 g In 2019 survey only.

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