

ENVIRONMENTAL DETERMINANTS

Correlates of Smoking During an Economic Recession Among Parents of Children with Asthma

TRACY L. JACKSON, MPH,^{1,*} ANNIE GJELSVIK, PH.D.,¹ ARIS GARRO, MD, MPH,²
AND DEBORAH N. PEARLMAN, PH.D.¹

¹Department of Epidemiology, Brown University Warren Alpert Medical School, 121 South Main Street S 121-2, 02912 Providence, RI, USA.

²Department of Pediatrics and Emergency Medicine, Brown University Warren Alpert Medical School, 125 Whipple Street, 3rd floor, UEMF Suite, 02908 Providence, RI, USA.

Objective. We describe the correlates of smoking among parents who have a child with asthma and examine whether the correlates changed from 2008 to 2010, when the United States experienced a severe recession and a sharp increase in unemployment, a stressor that could influence smoking behavior. **Methods.** Data are from the 2008 and 2010 Behavioral Risk Factor Surveillance System (BRFSS), a nationally representative survey of U.S. adults age 18 and older. Separate logistic regressions estimated the association between unemployment and smoking in 2008 and 2010, adjusting for sociodemographic and other characteristics of parents of a child with asthma. **Results.** Being unemployed was a significant predictor of smoking in 2010 (AOR = 1.80; 95% CI: 1.24–2.61), but was not a significant predictor in 2008 (AOR = 1.26, 95% CI: 0.82–1.95). One central component of well-being, as measured by being dissatisfied with one's life, was significantly associated with parental smoking in 2010 (AOR = 2.06, 95% CI: 1.00–4.27), but not in 2008 (AOR = 1.62, 95% CI: 0.85–3.11). Several covariates had similar associations with parental smoking in both survey years, including low education, not being currently married, not having health insurance, and binge drinking. **Conclusions.** Our results support the idea that during hard economic times unemployment and related stressors may be strong determinants of parental smoking when a child in the home has asthma. Given that the BRFSS is a cross-sectional survey, definitive conclusions cannot be drawn regarding the causal pathway connecting unemployment, global well-being, and parental smoking.

Keywords economic recession, education, employment, mental health, smoking, socioeconomic status, stressor

The adverse health effects of exposure to environmental tobacco smoke (ETS) for children with asthma are well known (1–9). Exposure to ETS in children with asthma has been associated with poorer quality of life, reduced lung function, increased asthma-related emergency room visits and hospitalizations, and prolonged recovery after an asthma attack (2, 4, 8, 9). Because children with asthma are adversely affected by ETS exposure, one might expect that parents of children with asthma would be less likely to smoke, yet this is not the case. Parents of children with asthma continue to smoke at levels comparable to the general population of smokers (2, 8). To date, no studies have focused on whether the factors associated with cigarette smoking are unique to parents of a child with asthma as compared to the general U.S. adult population.

Studies examining risk factors for smoking in the general adult U.S. population have found that smoking is associated with low socioeconomic status (SES), depressive symptoms, and parental and peer smoking (10–16). Low SES, either measured through educational attainment or income, is the strongest predictor (10–16). Another strong predictor of smoking is poor mental health, as

smoking has been found to occur at higher rates among individuals with anxiety and depression (17–24). Unemployment has also been associated with increased smoking rates in both cross-sectional (25) and longitudinal studies (26, 27). This is consistent with previous literature suggesting that unemployment itself can be a stressor and may serve as a proxy measure for otherwise unmeasured social and economic strain. However, unemployment also has been associated with decreased cigarette consumption as smokers seek to balance their budgets when faced with job loss (28).

In the present study, we examined mental health measures, employment status, and SES in relation to parental smoking. We also were interested in investigating whether these factors differed at two points in time—in 2008 as the U.S. economy entered a recession, and in 2010 after the U.S. went through one of its longest and most severe recessions since the Great Depression of the 1930s (29).

METHODS

Study Design

Data are from the 2008 and 2010 Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a state-based random-digit-dialed telephone survey of the noninstitutionalized U.S. civilian population aged ≥18 years (30). The

*Corresponding author: Tracy L. Jackson, MPH, Department of Epidemiology, Brown University Warren Alpert Medical School, 121 South Main Street S 121-2, 02912 Providence, RI, USA; Tel: (516) 557-3744; E-mail: Tracy_Jackson@brown.edu

sample obtained in 2010 was independent of the sample in 2008 as the BRFSS are serial cross-sectional surveys.

The BRFSS Childhood Asthma optional module was utilized by 37 states/territories in 2008 and 35 states/territories in 2010. Two asthma prevalence measures are asked about a randomly selected child in the household aged 17 years or younger. Current asthma is determined from the response, "Does the child still have [diagnosed] asthma?"

Eligibility study criteria for the study included the following: respondent was a parent/guardian of a child who lived in their home, the child in the home (one child was randomly selected if the parent reported having more than one) had current doctor-diagnosed asthma and was between 2 and 17 years of age, and the parent had valid information on smoking and employment status.

The total number of BRFSS respondents in 2008 was 414,509, of which 69,814 were parents/guardians of a child who lived in their home. Of this sample of parents/guardians, 5811 reported that their randomly selected child had current doctor-diagnosed asthma (8.3%), 5426 of which were children 2–17 years of age. After respondents with missing data on smoking status and employment status were excluded, the final analytic sample for 2008 was 4244.

The total number of BRFSS respondents in 2010 was 451,075, of which 78,619 were parents/guardians of a child who lived in their home. Of this sample of parents/guardians, 5155 reported that their randomly selected child had current doctor-diagnosed asthma (6.6%), 4818 of which were children 2–17 years of age. The final analytic sample for 2010 was 3601, after excluding respondents with missing data on smoking and employment status.

Measures

Current smoking was measured by whether the parent or guardian of a child in the home with asthma currently smoked (yes/no). SES was measured according to parents' educational level (<12th grade, high school graduate, some college or college graduate), rather than household income. Income may be problematic as an indicator of SES, since income can fluctuate over the life course, unlike education, which is more stable beyond early adulthood (31). Furthermore, BRFSS response rates tend to be higher for educational attainment (~99%), unlike household income, which typically has lower response rates (~93%) and consequently higher response bias. In addition to educational status, health insurance was included as a proxy for access to care and potential tobacco cessation counseling. Marital status was defined as either married or unmarried. We also included a measure of binge drinking, given that binge drinking is the most common pattern of excessive alcohol use in the United States (32), and alcohol and tobacco use often co-occur in the general adult U.S. population (33). Binge drinkers were defined as men who reported consuming five or more drinks or females who reported consuming four or more drinks in one sitting on one or more occasions in the past 30 days.

Psychosocial stress was assessed through self-reported global life satisfaction, receipt of emotional and social

support, and frequency of mental distress. The Centers for Disease Control and Prevention (CDC) assesses global well-being with two valid measures—life satisfaction and emotional support received. The CDC also supports frequency of mental distress as a measure of health-related quality of life with acceptable criterion validity and test–retest reliability (34–36). Questions measuring psychosocial stress in the 2008 and 2010 BRFSS included the following: "In general, how satisfied are you with your life?" (very satisfied, satisfied, dissatisfied/very dissatisfied), "How often do you get the social and emotional support you need?" (always/often, sometimes/rarely/never), and "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" (0 days, 1–13 days, 14 or more days). CDC measures the prevalence of poor mental health based on number of mentally unhealthy days. Respondents who report ≥ 14 mentally unhealthy days over the past month are defined as having frequent mental distress (34, 35, 37). The 14-day minimum period also was used because clinicians and researchers often use this period as a marker for clinical depression. Adopting this precedent ensured comparability with other studies looking at poor mental health based on frequent mental distress (≥ 14 days) in relation to health outcomes.

Unemployment can be a significant source of stress. Financial strain, stigma of job loss, and uncertainty about the future may be particularly prevalent during an economic recession. In the current study, employment status was defined as either employed or unemployed. Respondents who were homemakers, retired, students, or unable to work were excluded from both sample years.

Statistical Analysis

Sampling weights that correct for unequal probabilities of sample selection and adjust for nonresponse and telephone noncoverage were applied to the BRFSS adult samples to obtain a nationally representative sample of parents with a child in the home with asthma (38).

Separate logistic regressions estimated the associations between unemployment and smoking in 2008 and 2010, adjusting for the same covariates in each model. An interaction term between current smoking and survey year assessed statistically significant differences in unemployment by time period. Since the interaction term was not significant in the logistic regressions in either survey year, it was dropped from each model.

RESULTS

The rates of smoking among parents of children with asthma were similar across the two study years. In 2008, 20.0% of parents were smokers, compared to 17.8% in 2010 (Table 1). There were no significant differences between the two sample populations by socio-demographic and health characteristics or in rates of unemployment. The only significant difference between the two periods was the substantial increase in the proportion of

TABLE 1.—Survey respondent characteristics in 2008 and 2010.^a

Characteristic	2008 BRFSS (n = 4244)	2010 BRFSS (n = 3601)
Smoker		
Yes	808 (20.0%)	637 (17.8%)
No	3438 (80.0%)	2964 (82.2%)
Sex		
Male	1336 (40.7%)	1159 (41.3%)
Female	2908 (59.3%)	2442 (58.7%)
Mean age (standard error)	39.3 (0.22)	39.1 (0.23)
Currently married		
Yes	3033 (77.8%)	2549 (77.9%)
No	1206 (22.2%)	1046 (22.1%)
Race/ethnicity		
Non-Hispanic white	2984 (63.5%)	2446 (63.4%)
Non-Hispanic black	490 (14.1%)	504 (16.3%)
Hispanic	427 (15.3%)	349 (13.2%)
Other	324 (7.1%)	282 (7.1%)
Education level		
<12 years education	235 (7.1%)	206 (7.5%)
High school graduate/GED	1061 (25.4%)	865 (22.6%)
Some college/college graduate	2946 (67.5%)	2529 (69.9%)
Employed		
Yes	3886 (89.9%)	3186 (89.6%)
No	358 (10.1%)	415 (10.4%)
Health insurance**		
Yes	3744 (88.0%)	3077 (83.4%)
No	499 (12.0%)	521 (16.6%)
Binge drinker		
Yes	614 (16.4%)	532 (17.2%)
No	3609 (83.6%)	3051 (82.8%)
Life satisfaction		
Very satisfied	1762 (41.6%)	1474 (41.6%)
Satisfied	2220 (51.8%)	1896 (53.6%)
Dissatisfied/very dissatisfied	246 (6.5%)	216 (4.8%)
Social and emotional support		
Always/usually	3300 (77.4%)	2843 (80.8%)
Sometimes/rarely/never	926 (22.5%)	741 (19.2%)
Mental distress past 30 days		
0 days	2363 (55.8%)	2026 (57.5%)
1–13 days	1297 (31.0%)	1075 (30.3%)
14–30 days	559 (13.1%)	462 (12.2%)

Notes: ^aUnweighted numbers; weighted percents or means.***p* < .01.

parents without health insurance, from 12.0% in 2008 to 16.6% in 2010 (*p* < .01; Table 1). There was no significant difference in the proportion of children with current asthma by age, sex, or race/ethnicity across the two study periods (data not shown). The average age of children in 2008 was 10.3 years (95% confidence interval (CI): 10.1–10.5) and 10.2 years in 2010 (95% CI: 9.9–10.5).

In 2008, unemployment was not significantly associated with parental smoking [adjusted odds ratios (AOR) = 1.26, 95% CI: 0.82–1.95], but in 2010 this association was significant (AOR = 1.80, 95% CI: 1.24–2.61). Dissatisfaction with one's life was not a significant predictor of smoking in 2008. In 2010, parents who reported being either satisfied with life or dissatisfied with life were more likely to smoke compared to those who reported being very satisfied with life (Table 2).

Several covariates had similar associations with parental smoking in both survey years. The AOR for smoking among those with less than a high school level of education

TABLE 2.—Adjusted odds ratio in logistic regression model for predictors of current smoking among parents with a child in the home with diagnosed asthma.^a

	2008 BRFSS (n = 4133)		2010 BRFSS (n = 3492)	
	AOR	95% CI	AOR	95% CI
Sex				
Male	1.00	—	1.00	—
Female	0.97	0.71–1.31	1.27	0.92–1.76
Mean age (standard error)	0.98	0.96–1.00	0.99	0.97–1.00
Currently married				
Yes	1.00	—	1.00	—
No	1.76	1.27–2.44	1.58	1.11–2.27
Race/ethnicity				
Non-Hispanic white	1.00	—	1.00	—
Non-Hispanic black	0.75	0.49–1.15	0.70	0.45–1.09
Hispanic	0.46	0.27–0.80	0.26	0.14–0.50
Other	1.42	0.78–2.58	0.71	0.37–1.34
Education level				
<12 years education	4.10	2.46–6.84	4.81	2.82–8.22
High school graduate/GED	1.97	1.46–2.65	1.88	1.37–2.58
Some college/college graduate	1.00	—	1.00	—
Employed				
Yes	1.00	—	1.00	—
No	1.26	0.82–1.95	1.80	1.24–2.61
Health insurance				
Yes	1.00	—	1.00	—
No	1.76	1.20–2.59	1.51	1.03–2.21
Binge drinker				
Yes	2.64	1.88–3.70	2.72	1.92–3.85
No	1.00	—	1.00	—
Life satisfaction				
Very satisfied	1.00	—	1.00	—
Satisfied	1.25	0.90–1.74	1.43	1.02–1.99
Dissatisfied/very dissatisfied	1.62	0.85–3.11	2.06	1.00–4.27
Social and emotional support				
Always/usually	1.00	—	1.00	—
Sometimes/rarely/never	1.09	0.76–1.56	1.25	0.89–1.76
Mental distress past 30 days				
0 days	1.00	—	1.00	—
1–13 days	0.96	0.69–1.34	0.69	0.49–0.97
14–30 days	1.92	1.24–2.94	1.70	1.05–2.76

Note: ^aWeighted estimates.

were 4.10 (95% CI: 2.46–6.84) in 2008 and 4.81 (95% CI: 2.82–8.22) in 2010. Reporting frequent mental distress (14 or more days of poor mental health in the last month), not being currently married, and being a binge drinker also were positively associated with smoking in both study years. Hispanic ethnicity was negatively associated with parental smoking in both 2008 and 2010. There were no significant associations between smoking and not getting social and emotional support needed in either study year.

DISCUSSION

The results of this study confirm previous findings in the literature regarding the relationship between unemployment and smoking in cross-sectional and longitudinal studies where the unemployed were more likely to smoke than the employed or the general population of adults (25–27, 39–42). The study adds to the previous literature by showing that a

parent's employment status, while not a significant predictor of smoking in 2008 at the beginning of the downturn in the U.S. economy, was a significant predictor of smoking in 2010, two years into a severe and prolonged economic recession. Study findings provide new empirical evidence on the relation between parents' unemployment status and parental smoking when a child in the home has asthma, a topic that has not been previously studied.

Still, whether a parent of a child with asthma is more likely to smoke in response to being unemployed is complex. One explanation for the study's findings is that being unemployed in 2010 reflected an accumulation of stress during a prolonged recession—the longest and most severe recession in the United States in decades. It is not entirely clear if intermittent spells of being unemployed during a downturn in the economy impact the likelihood of smoking among parents of a child with asthma to a greater degree than does long-term unemployment. The statistical models in this study did not adjust for length of unemployment.

A previous study found no association between high unemployment and smoking in the general U.S. adult population based on cross-sectional data from the BRFSS survey comparing 2006–2007 a pre-recession period, with 2009–2010, the end of the “official U.S. recession” (43). A report on the national prevalence of smoking in the Italian population aged 15 years or over, based on two cross-sectional surveys, found a significant increase in smoking prevalence overall during the economic crisis of 2009 as compared to 2008 when the economic crisis was just beginning (44). In contrast, a prospective cohort study from Iceland found that increased unemployment rates between 2007 (pre-economic collapse) and 2009 (post-economic collapse) were associated with decreased cigarette consumption, although women were less likely to quit smoking during the recession compared to men (28). An earlier analysis conducted during the economic recession in the 1990s found that women responded to unemployment with increased psychological stress and greater likelihood of smoking, but this was not true of men (45). These findings highlight the need for more research on how the transition of persons in and out of the labor market (short term, long term, and intermittent) during periods of prolonged and severe economic recession influences smoking for the general adult population as well as for parents of a child with asthma.

Previous cross-sectional research studies have demonstrated that psychosocial factors are key predictors of smoking among adults, with smoking prevalence increasing as the level of life satisfaction decreases (46), or emotional isolation and psychological stress increase (25). In our study of parents, 59% of whom were mothers, dissatisfaction with life was associated with smoking in 2010 when the U.S. economy was coming out of its deepest economic crisis since World War II. A survey of 6025 unemployed U.S. workers between 2009 and 2010 found unemployed workers were struggling with prolonged feelings of anxiety, sadness, and dissatisfaction with one's life, but the study did not report whether more women were affected than men (47). A 2008 American Legacy Foundation survey found that

stress over the economy was causing some smokers to delay attempts to quit. Seven percent of stressed-out smokers who had quit began smoking again, and 9% of former smokers said the current economic crisis had led them to think about starting to smoke again (48). The stress and financial strains that come with the detrimental effects of an economic recession on employment, housing foreclosures, and food security may induce some former smokers to relapse and current smokers to continue smoking.

Our finding that smoking also was influenced by low SES, not having health insurance, and poor mental health in both 2008 and 2010 are noteworthy results of this study. Data from national U.S. surveys have consistently shown that smoking prevalence among adults generally decreases with increasing education (49, 50). Recent research has shown the importance of health care insurance in increasing access to effective clinical smoking cessation services with long-term uninsured smokers least likely to receive physician advice to quit smoking (51). The positive correlation between poor mental health and smoking is well documented (52).

The results of our study must be interpreted with caution. Inferences are limited by the cross-sectional data. Associations such as those involving dissatisfaction with one's life or poor mental health may be consequences of smoking as well as determinants of smoking. Additionally, some smokers in our study may have been misclassified as nonsmokers because smoking is considered a socially undesirable behavior. However, this misclassification is unlikely to be large enough to significantly alter our results. Furthermore, as with any study, there is the possibility of recruitment bias. It is possible that due to the known association between exposure to ETS and exacerbations of asthma symptoms in children, that parents who smoke may be less likely to admit that their child has asthma. However, due to the length of the BRFSS survey and the fact that items pertaining to parental smoking and those pertaining to the child's asthma status are not positioned close to each other on the survey, we feel that it is unlikely that responses to items on smoking status influenced those on child asthma status.

Despite these limitations, this is the first research study to identify the correlates of smoking for parents of a child with asthma during a severe economic recession. For some parents, smoking may be a way of coping with the emotional stress and financial strains of caring for a child with a chronic condition during hard economic times. It takes time, energy, and resources to reduce asthma triggers in the home and monitor a child's asthma medications. This may be exacerbated for parents who are unemployed and for those with low levels of education who may be balancing family life with more than one job. Therefore, in our population, it is plausible that the desire to smoke to alleviate symptoms of depression and stress outweighs the concerns parents have about the detrimental effects of secondhand smoke on their children with asthma. Research suggests that some of the chemicals in cigarette smoke may have antidepressant properties similar to monoamine oxidase inhibitors (53). Longitudinal data from epidemiologic studies show that smokers report

poorer overall quality of life, such as increased frequency of mental distress and life dissatisfaction than former smokers or never smokers (54,55).

Our results have important implications in terms of health promotion and tobacco control. We recommend that future studies address how barriers to smoking cessation in parents of children with asthma are affected during an economic recession. Factors such as educational attainment and employment status may not be modifiable; however, existing mental health problems and/or stress related to unemployment may be targets for interventions. Interventions to promote smoking cessation in parents of children with asthma should focus on assessing mental health. Additionally it is important to take into account the challenges faced by parents who lose their job during an economic recession, particularly those of low SES who are most likely to experience prolonged unemployment.

CONCLUSIONS/KEY FINDINGS

This research adds to the literature on the correlates of smoking in a nationally representative sample of parents with a child in the home with asthma. The results indicate that economic and psychological stressors may be major risk factors for starting and/or maintaining smoking in this subpopulation. Although there are many tobacco control policies in place at the federal and state levels to reduce adult's smoking rates, the effectiveness of these policies has not been evaluated for parents of a child with asthma or for this population during a severe and prolonged economic recession. By drawing attention to a specific group of smokers, we hope more careful thought is given to determine which interventions are most effective for decreasing parental smoking and improving health outcomes of children with asthma in these homes.

ACKNOWLEDGMENTS

Tracy L. Jackson and Deborah N. Pearlman conceived the idea for the study, conducted statistical data analyses, and cowrote the manuscript. Annie Gjelsvik and Aris Garro helped develop the conceptual ideas and contributed to writing the manuscript. All authors read and approved the final version of the manuscript.

DECLARATION OF INTEREST

The authors declare they have no conflict of interest.

REFERENCES

- Becklake M, Ernst P. Asthma: Environmental factors. *Lancet* 1997; 350 (suppl. II):10–13.
- Irvine L, Crombie IK, Clark RA, Slane PW, Feyerabend C, Goodman KE, Cater JJ. Advising parents of asthmatic children on passive smoking: Randomised controlled trial. *BMJ* 1999; 318(7196):1456–1459.
- Sporik R, Holgate ST, Cogswell JJ. Natural history of asthma in childhood: A birth cohort study. *Arch Dis Child* 2001; 66:1050–1053.
- Beeber SJ. Parental smoking and childhood asthma. *J Pediatr Health Care* 1996; 10(2):58–62.
- Martinez FD, Cline M, Burrows B. Increased incidence of asthma in children of smoking mothers. *Pediatrics* 1992; 89(1):21–26.
- Schober SE, Zhang C, Brody DJ, Marano C. Disparities in secondhand smoke exposure United States, 1988–1994 and 1999–2004 (Reprinted from *MMWR*, vol. 57, pp. 744–747, 2008). *JAMA-J Am Med Assoc* 2008; 300(9):1019–1020.
- Strachan DP, Cook DG. Health effects of passive smoking. 1. Parental smoking and lower respiratory illness in infancy and early childhood. *Thorax* 1997; 52(10):905–914.
- Liem JJ, Kozyskyj AL, Benoit CM, Becker AB. Asthma is not enough: Continuation of smoking among parents with an asthmatic child. *Can Respir J* 2007; 14(6):349–353.
- Thomson N. The role of environmental tobacco smoke in the origins and progression of asthma. *Curr Allergy Asthma Rep* 2007; 7:303–309.
- Gilman SE, Abrams DB, Buka SL. Socioeconomic status over the life course and stages of cigarette use: initiation, regular use, and cessation. *J Epidemiol Community Health* 2003; 57(10): 802–808.
- Finney Rutten LJ, Augustson EM, Moser RP, Beckjord EB, Hesse BW. Smoking knowledge and behavior in the United States: sociodemographic, smoking status, and geographic patterns. *Nicotine Tob Res* 2008; 10(10):1559–1570.
- Gilman SE, Martin LT, Abrams DB, Kawachi I, Kubzansky L, Loucks EB, Rende R, Rudd R, Buka SL. Educational attainment and cigarette smoking: A causal association? *Int J Epidemiol* 2008; 37:615–624.
- Hu MC, Davies M, Kandel DB. Epidemiology and correlates of daily smoking and nicotine dependence among young adults in the United States. *Am J Public Health* 2006; 96(2):299–308.
- Datta GD, Subramanian SV, Colditz GA, Kawachi I, Palmer JR, Rosenberg L. Individual, neighborhood, and state-level predictors of smoking among US Black women: A multilevel analysis. *Soc Sci Med* 2006; 63:1034–1044.
- Centers for Disease Control and Prevention. Vital signs: Current cigarette smoking among adults aged ≥18 years—United States, 2009. *MMWR Morb Mortal Wkly Rep* 2010; 59(35):1135–1140.
- Pratt LA, Brody DJ. Depression and smoking in the U.S. household population aged 20 and over, 2005–2008. *NCHS Data Brief* 2010; 34:1–8.
- Anda RF, Williamson DF, Escobedo LG, Mast EE, Giovino GA, Remington PL. Depression and the dynamics of smoking: A national perspective. *J Am Med Assoc* 1990; 264(12):1541–1545.
- Boden JM, Fergusson DM, Horwood LJ. Cigarette smoking and depression: Tests of causal linkages using a longitudinal birth cohort. *Br J Psychiatry* 2010; 196(6):440–446.
- Breslau N, Peterson EL, Schultz LR, Chilcoat HD, Andreski P. Major depression and stages of smoking: A longitudinal investigation. *Arch Gen Psychiatry* 1998; 55(2):161–166.
- Brook JS, Schuster E, Zhang C. Cigarette smoking and depressive symptoms: A longitudinal study of adolescents and young adults. *Psychol Rep* 2004; 95(1):159–166.
- Glassman AH, Helzer JE, Covey LS, Cottler LB, Stetner F, Tipp JE, Helzer JE, Covey LS, Cottler LB, Stetner F, Tipp JE, Johnson J. Smoking, smoking cessation, and major depression. *J Am Med Assoc* 1990; 264(12):1546–1549.
- Trosclair A, Dube SR. Smoking among adults reporting lifetime depression, anxiety, anxiety with depression, and major depressive episode, United States, 2005–2006. *Addict Behav* 2010; 35(5):438–443.
- Urban R, Kugler G, Olah A, Szilagyi Z. Smoking and education: Do psychosocial variables explain the relationship between education and smoking behavior? *Nicotine Tob Res* 2006; 8(4):565–573.
- Jamal M, Van der Does AJW, Penninx BWJH, Cuijpers P. Age at smoking onset and the onset of depression and anxiety disorders. *Nicotine Tob Res* 2011; 13(9):809–819.
- De Vogli R, Santinello M. Unemployment and smoking: Does psychosocial stress matter? *Tobacco Control* 2005; 14(6):389–395.
- Hammarstrom A, Janlert U. Unemployment—An important predictor for future smoking: A 14-year follow-up study of school leavers. *Scand J Public Health* 2003; 31(3):229–232.
- Montgomery SM, Cook DG, Bartley MJ, Wadsworth MEJ. Unemployment, cigarette smoking, alcohol consumption and body weight in young British men. *Eur J Public Health* 1998; 8(1):21–27.

28. McClure CB, Valdimarsdottir UA, Hauksdottir A, Kawachi I. Economic crisis and smoking behaviour: Prospective cohort study in Iceland. *BMJ Open* 2012; 2(5):1–7.
29. Center on Budget Policies and Priorities. Chart Book: The Legacy of the Great Recession. 2012. Available at: <http://www.cbpp.org/cms/index.cfm?fa=view&id=3252>. Accessed December 6, 2012.
30. Centers for Disease Control and Prevention. About the BRFSS: Turning Information into Public Health. 2008a. Available at: <http://www.cdc.gov/BRFSS/about.htm>. Accessed August 24, 2011.
31. Shavers VL. Measurement of socioeconomic status in health disparities research. *J Natl Med Assoc* 2007; 99(9):1013–1023.
32. Centers for Disease Control and Prevention. Fact Sheets: Binge Drinking. 2012. Available at: <http://www.cdc.gov/alcohol/fact-sheets/binge-drinking.htm>. Accessed December 6, 2012.
33. Falk DE, Yi HY, Hiller-Sturmhofel S. An epidemiologic analysis of co-occurring alcohol and tobacco use and disorders—Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Alcohol Res Health* 2006; 29(3):162–171.
34. Centers for Disease Control and Prevention. Health-Related Quality of Life (HRQOL): Frequently Asked Questions. 2011. Available at: <http://www.cdc.gov/hrqol/faqs.htm#11>. Accessed November 17, 2012.
35. Reeves WC, Strine TW, Pratt LA, Thompson W, Ahluwalia I, Dhingra SS, McKnight-Eily LR, Harrison L, D'Angelo DV, Williams L, Morrow B, Gould D, Safran MA. Mental illness surveillance among adults in the United States. *MMWR Morb Mortal Wkly Rep* 2011; 60(03):1–32.
36. Moriarty DG, Zack MM, Holt JB, Chapman DP, Safran MA. Geographic patterns of frequent mental distress: U.S. adults, 1993–2001 and 2003–2006. *Am J Prev Med* 2009; 46:497–505.
37. Centers for Disease Control and Prevention. Self-reported frequent mental distress among adults—United States, 1993–2001. *MMWR Morb Mortal Wkly Rep* 2004; 53(41):963–966.
38. Centers for Disease Control and Prevention. Improvements to BRFSS Methodology, Design, and Implementation. 2008b. Available at: <http://www.cdc.gov/brfss/pubs/methodology.htm>. Accessed September 25, 2011.
39. Waldron I, Lye D. Employment, unemployment, occupation, and smoking. *Am J Prev Med* 1989; 5(3):142–149.
40. Hammarstrom A. Health consequences of youth unemployment. *Publ Health* 1994; 108(6):403–412.
41. Osler M. Smoking habits in Denmark from 1953 to 1991: A comparative analysis of results from three nationwide health surveys among adult Danes in 1953–1954, 1986–1987 and 1990–1991. *Int J Epidemiol* 1992; 21(5):862–871.
42. Hammarstrom A, Janlert U. Early unemployment can contribute to adult health problems: Results from a longitudinal study of school leavers. *J Epidemiol Commun H* 2002; 56(8):624–630.
43. Mutarak R, Gallus S, Ghislandi S. Puffing in hard times does the financial crisis have a role on smoking prevalence in the US? Population Association of America; San Francisco, CA, 2012.
44. Gallus S, Tramacere I, Pacifici R, Zuccaro P, Colombo P, Ghislandi S, Tramacere I, Pacifici R, Zuccaro P, Colombo P, Ghislandi S, La Vecchia C. Smoking in Italy 2008–2009: A rise in prevalence related to the economic crisis? *Prev Med* 2011; 52(2):182–183.
45. Novo M, Hammarstrom A, Janlert U. Smoking habits—a question of trend or unemployment? A comparison of young men and women between boom and recession. *Publ Health* 2000; 114(6):460–463.
46. Strine TW, Chapman DP, Balluz LS, Moriarty DG, Mokdad AH. The associations between life satisfaction and health-related quality of life, chronic illness, and health behaviors among U.S. community-dwelling adults. *J Community Health* 2008; 33(1):40–50.
47. Krueger AB, Mueller A. Job Search, Emotional Well-Being, and Job Finding in a Period of Mass Unemployment: Evidence from High-Frequency Longitudinal Data. Brookings Papers on Economic Activity: The Brookings Institution; Spring 2011.
48. American Legacy Foundation. Current Economic Situation Prompts Increased Smoking, Delay in Quit Attempts Middle and Low-income Americans Hit Hardest. Washington, DC. 2008. Available at: <http://www.legacyforhealth.org/2753.aspx>. Accessed July 15, 2012.
49. Garrett BE, Dube SR, Trosclair A, Caraballo RS, Pechacek TF. Cigarette smoking—United States, 1965–2008. *MMWR Surveill Summ* 2011; 14 (60 Suppl.):109–113.
50. Centers for Disease Control and Prevention. Vital signs: Current cigarette smoking among adults aged ≥ 18 years—United States, 2005–2010. *MMWR Morb Mortal Wkly Rep* 2011; 60:1207–1212.
51. Bandi P, Cokkinides VE, Virgo KS, Ward EM. The receipt and utilization of effective clinical smoking cessation services in subgroups of the insured and uninsured populations in the USA. *J Behav Health Serv Res* 2012; 39(2):202–213.
52. Lasser K, Boyd JW, Woolhandler S, Himmelstein DU, McCormick D, Bor DH. Smoking and mental illness: A population-based prevalence study. *JAMA*. 2000 Nov 22–29;284(20):2606–10.
53. Lewis A, Miller JH, Lea RA. Monoamine oxidase and tobacco dependence. *Neuro Toxicology*. 2007; 28(1): 182–195.
54. Murphy JM, Horton NJ, Monson RR, Laird NM, Sobol AM, Leighton AH. Cigarette smoking in relation to depression: historical trends from the Stirling County Study. *Am J Psychiatry* 2003; 160 (9):1663–1669.
55. Piper ME, Kenford S, Fiore MC, Baker TB. Smoking cessation and quality of life: Changes in life satisfaction over 3 years following a quit attempt. *Ann Behav Med* 2012; 43(2):262–270.