

# Life Course Indicator: Adolescent Smoking

## The Life Course Metrics Project

As MCH programs begin to develop new programming guided by a life course framework, measures are needed to determine the success of their approaches. In response to the need for standardized metrics for the life course approach, AMCHP launched a project designed to identify and promote a set of indicators that can be used to measure progress using the life course approach to improve maternal and child health. This project was funded with support from the [W.K. Kellogg Foundation](#).

Using an RFA process, AMCHP selected seven state teams, Florida, Iowa, Louisiana, Massachusetts, Michigan, Nebraska and North Carolina, to propose, screen, select and develop potential life course indicators across four domains: Capacity, Outcomes, Services, and Risk. The first round of indicators, proposed both by the teams and members of the public included 413 indicators for consideration. The teams distilled the 413 proposed indicators down to 104 indicators that were written up according to three data and five life course criteria for final selection.

In June of 2013, state teams selected 59 indicators for the final set. The indicators were put out for public comment in July 2013, and the final set was released in the Fall of 2013.

### Basic Indicator Information

**Name of indicator:** Adolescent Smoking (LC-23)

**Brief description:** Percent of adolescents who smoked cigarettes in the past 30 days.

**Indicator category:** Family Well-being

**Indicator domain:** Risk/Outcome

**Numerator:** Total ninth through 12<sup>th</sup> graders who smoked cigarettes  $\geq$  one day during the past 30 days

**Denominator:** Total population of ninth through 12<sup>th</sup> graders

**Potential modifiers:** Race, ethnicity, age, education, socioeconomic status

**Data source:** Youth Risk Behavior Surveillance System (YRBSS)

**Notes on calculation:** Analysts who use the raw datasets should apply the appropriate survey weights to generate the final estimates.

**Similar measures in other indicator sets:** Preconception Health Indicator E1; HP 2020 Focus area TU-2 (TU-2.2 is a Leading Health Indicator); CDC Winnable Battle (Decrease the percentage of youth who smoke cigarettes by 11 percent); MIECHV Benchmark Area Improved Maternal and Newborn Health: Parental use of alcohol, tobacco, or illicit drugs; Chronic Disease Indicator

## Life Course Criteria

### **Introduction**

Cigarette smoking has long been recognized as having high mortality, morbidity, and economic costs (OSH, 2004; Thorne, 2007). Because of the addictive nature of nicotine (OSH 2001; Fiore, 2000), preventing cigarette smoking is an especially important societal goal (OSH, 2000; WHO, 2002), and has recently been identified by the Centers for Disease Control and Prevention (CDC) as a Winnable Battle that will have a significant impact on our nation's health (CDC, 2012).

Data on the long and short-term effects of cigarette smoking is vast and compelling. Since the publication of the Surgeon General's first report on smoking, an extensive amount of evidence has been identified to support the detrimental effect that smoking cigarettes has on those who engage in the behavior, particularly the lifelong health effects and price tag associated with the treatment of smoking-related diseases, such as lung cancer and chronic obstructive pulmonary disease (COPD).

Although there is some evidence that the age of initiation may be increasing, most regular smokers smoke their first cigarette by age 18 years. (Lantz, 2003; OAS, 2006). Because smoking initiation rarely occurs at later ages, the critical time for prevention occurs in adolescence and early adulthood (Musto, 1999; Giovino, 2002).

### **Implications for equity**

Smoking behaviors within a given geographic location are related to both compositional factors (socioeconomic and demographic characteristics of individuals/households) and contextual factors (area characteristics and policies). Compositional characteristics associated with smoking include poverty, education, occupation, race, nativity, gender, marital status and age (Acevedo-Garcia et al., 2005, Barbeau et al., 2004, Geronimus et al., 1993, Pampel, 2009, Siahpush et al., 2005 and Williams and Jackson, 2000). Contextual characteristics have shown to be associated with smoking after controlling for individual covariates; these include neighborhood poverty, proximity of cigarette advertisements, and rules of smoking in workplaces and homes (Diez Roux et al., 1997, Duncan et al., 1999, Kandula et al., 2009, Reijneveld, 1998, Ross, 2000 and Tseng et al., 2001).

Of note, racial/ethnic minorities in the United States experience a disproportionate burden of smoking-related diseases, including cancer and heart disease, despite having larger proportions of light and intermittent smokers and generally lower adult smoking prevalence rates than non-Hispanic Whites (Jemal, et al., 2008; Trinidad et al., 2009). Racial/ethnic minorities are also less likely to quit smoking successfully than are non-Hispanic Whites (Okuyemi et al., 2007; Cokkinider et al., 2008).

Despite the fact that Black smokers smoke fewer cigarettes per day than White smokers, there is ample evidence that Black smokers are more susceptible than White smokers to smoking-related health consequences such as lung-cancer, heart disease and stroke (Haiman et al., 2006; Hebert, 2005; U.S. Department of Health and Human Services, 1998). The adverse public health consequences of smoking among Latinos are severe, as three of the four leading causes of death among Latinos are smoking-related (i.e., cancer, heart disease, and stroke (CDC, 2009).

Moreover, evidence shows that cigarette smoking is a major contributor to mortality according to education level (Jemal et al., 2008; Lauderdale, 2001; Pappas et al., 1993; Warren and Hernandez, 2007): smoking, which has become increasingly concentrated in low education groups (e.g., Pampel, 2005), greatly increases the risk of premature adult mortality (e.g., Rogers et al., 2005).

Among addictive behaviors, cigarette smoking is the one most likely to become established during adolescence (DASH, NCCDPHP, CDC, 2008). Each day in the United States, approximately 3,800 young people under 18 years of age smoke their first cigarette, and an estimated 1,000 youth in that age group become daily cigarette smokers (USDHSS, 2011). More specifically, the percentage of middle school students who were current cigarette smokers in 2009 was 3.9 percent. Of these, 3.2 percent were female students and 4.6 percent were male students. Racial and ethnic differences are present among this population of middle school students who were current smokers: 4.7 percent were black, non-Hispanic students, 1.4 percent were Asian, non-Hispanic students, 6.2 percent were Hispanic students and 3.0 percent were white, non-Hispanic students (CDC, 2010).

### **Public health impact**

From 2000 to 2004, cigarette smoking and exposure to tobacco smoke resulted in at least 443,000 premature deaths, approximately 5.1 million years of potential life lost (YPLL), and \$96.8 billion in productivity losses annually in the United States (USDHHS, 2008). Lightwood and colleagues (2008) examined the economics of tobacco use and revealed that investments in tobacco control programs led to substantial savings in health care expenditures. The authors showed that the \$1.8 billion spent on California's tobacco control programs over 15 years (1989–2004) yielded a 50-fold return (\$86 billion) in reduced health care costs. In addition to effectively reducing smoking – a significant public health goal in itself – the benefits of the programs included “substantial, rapid, and growing reductions in per capita state health care expenditures” (Lightwood et al., 2008).

Policies to combat smoking have resulted in substantial progress with national smoking prevalence declining from 24.5 percent in 1992–1993 to 18.5 percent in 2006–2007 (Giovino, Chaloupka, and Hartman, 2009). However, tobacco remains a leading cause of preventable and premature death, killing more than 1,200 Americans every day. For every tobacco-related death, two new young people under the age of 26 become regular smokers. Nearly 90 percent of these replacement smokers try their first cigarette by age 18, and approximately three out of four high school smokers continue to smoke well into adulthood (USDHSS, 2012).

Smoking during adolescence and young adulthood can have immediate adverse health effects and lasting impacts throughout the life course. Additionally, exposure to tobacco can also impact future generations. This broadened concern reflects the emergence of a body of evidence linking risk exposures in early life, even in the antenatal period, to risk for chronic disease in adulthood (USDHSS, 2006).

### ***Leverage or realign resources***

There are a number of opportunities to use resources to improve the adolescent smoking indicator. These opportunities include:

- School administrators and counselors working with parents of adolescents to development awareness campaigns and also create a smoking cessation plan for adolescents who smoke
- Community and school programs, policies and interventions coordinated and implemented in conjunction with efforts to create tobacco-free social norms
- Prohibiting smoking on school grounds, and in worksites and public places
- Care managers/coordinators working with providers to target education and self-education
- Using home visiting as an opportunity to share education and smoking cessation information
- Engage stakeholders in the key actions from the CDC Winnable Battles for Tobacco, including: Monitor tobacco use and prevention policies; Protect people from secondhand smoke; Offer help to quit tobacco use; Warn about the dangers of tobacco; Enforce bans on tobacco advertising, promotion and sponsorship; and Raise taxes on tobacco

Schools and workplaces are both stakeholders in reducing adolescent smoking because complications from smoking are responsible for absenteeism from both school and work. The CDC Winnable Battles progress report indicates that school programs to prevent smoking among middle- and high-school students are a good investment: every dollar invested in school tobacco prevention programs saves almost \$20 in medical care costs (CDC 2013). While adolescents may not be part of the workforce yet, it is understood that their future involvement in the economy will have a significant effect on the cost for society at large. Therefore, given the changing environment of health care in the United States, private as well as public entities could benefit from a joint effort to curb smoking initiation in adolescents.

Lastly, adolescent smoking is a major risk factor for chronic diseases later in life. As such, chronic disease programs may invest in adolescent smoking prevention programs that may ultimately help to reduce the incidence of future adult chronic diseases.

### ***Predict an individual's health and wellness and/or that of their offspring***

Smoking is a leading risk factor for mortality, cardiovascular disease, respiratory disease, and a variety of other health outcomes, contributing to an estimated 443,000 deaths annually in the United States (CDC, 2007). Smoking also has a detrimental effect on reproductive health. For instance, smoking during pregnancy is associated with increased risk for premature rupture of membranes, abruptio placentae (placenta separation from the uterus), and placenta previa (abnormal location of the placenta, which can cause massive hemorrhaging during delivery. Additionally, smoking also is

associated with a modest increase in risk for preterm delivery (CDC, 2001). Moreover, infants born to women who smoke during pregnancy have a lower average birth weight and are more likely to be small for gestational age than infants born to women who do not smoke. Low birth weight is associated with increased risk for neonatal, perinatal, and infant morbidity and mortality. The longer the mother smokes during pregnancy, the greater the effect on the infant's birth weight. The risk for perinatal mortality, both stillbirths and neonatal deaths, and the risk for sudden infant death syndrome (SIDS) are higher for the offspring of women who smoke during pregnancy (CDC, 2001).

The adverse health effects of smoking can accumulate over the lifetime of the smoker. Moreover, those who quit smoking will, over time, see a significant reduction in the adverse effects with some disappearing entirely (Trannah et al, 2011, USDHHS, 2010). Therefore, it is clear that the opportunity to intervene when smoking behaviors are initiated, which is most often during adolescence, can potentially avoid the cost of treating future poor health outcomes.

## Data Criteria

### **Data availability**

Data on adolescent smoking prevalence in the United States is vast and readily available. The majority of the data is generated by the CDC, through its office on Smoking and Health. More specifically, The *Youth and Young Adult Data* Youth Risk Behavior Surveillance System (YRBSS) monitors priority health-risk behaviors and the prevalence of obesity and asthma among youth and young adults. The YRBSS includes a national school-based survey conducted by the CDC, state, territorial, and local education and health agencies and tribal governments. YRBSS monitors six categories of priority health-risk behaviors among youth and young adults, including behaviors that contribute to unintentional injuries and violence; sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including HIV infection; alcohol and other drug use; tobacco use; unhealthy dietary behaviors; and inadequate physical activity. In addition, YRBSS monitors the prevalence of obesity and asthma.

The YRBSS is administered every other year (odd years), generally in the spring semester in schools via a pencil and paper mode. The YRBSS survey contains no skip patterns. In the even-numbered years, CDC leads a process of examining and revising the questionnaire, using both expert opinion and votes from the YRBS coordinators in states. The final result is a standard questionnaire that can be modified by states to meet their needs, but modifications must be within certain parameters.: 1) the modified questionnaire must contain at least two-thirds of the original standard questionnaire, 2) questions that are added are limited to 8 mutually exclusive response options, 3) the questionnaire may not have skip patterns or fill in the blanks, and 4) the questionnaire may not exceed 99 questions, and the state must retain the height and weight questions. The 2011 YRBSS included a national school-based survey conducted by CDC and 47 state surveys, six territory surveys, two tribal government surveys, and 22 local surveys conducted among students in grades nine through 12 during October 2010-February 2012. Data collected by CDC represent both public and private schools with students in grades nine through 12; data collected by states, territories, tribes, and localities represents primarily public school students.

This measure does not require the linkage of datasets. MCH programs can readily gain immediate access to the data on an annual basis and possibly provisionally. The survey question of interest is "During the past 30 days, on how many days did you smoke cigarettes?"

### **Data quality**

From the available YRBSS documentation, the 2011 national YRBS school response rate was 81 percent; the student response rate was 87 percent; and the overall response rate was 71 percent. Comparisons between estimates for states and districts from the national data collection effort and the surveys collected by states, territories, tribes, and localities can be found on the CDC YRBSS website. Each jurisdiction reached a minimum site response rate of 60 percent and therefore had weighted data for that year. Weighted data allows a jurisdiction to make statements from the data that generalize to all high school students in that jurisdiction.

Studies by CDC and others indicate that data about risk behaviors can be gathered as credibly from adolescents as from adults. YRBSS performs internal reliability checks to help identify the small percentage of students who falsify their answers. To obtain truthful answers, students must perceive the survey as important and know procedures have been developed to protect their privacy and allow for anonymous participation.

A test-retest study of the 1999 version of the questionnaire (Brenner 2002) found that 47 percent of items had at least “substantial” reliability, with kappa statistics of agreement of 61 percent or greater, and 93 percent of items had at least “moderate” reliability, with kappas of 41 percent or greater. The study found no differences in reliability by gender, grade, or race/ethnicity. The study found that items related to tobacco use, alcohol and other drug use, and sexual behavior had the highest reliability. By comparison, items asking about dietary behaviors, physical activity, and other health-related topics were less reliable. A study of mode and setting using the YRBSS questions (Brenner 2006) determined that students were more likely to report risk behaviors when they took the survey at school compared with taking the survey at home.

Data availability and quality for the YRBS varies by year and it depends on the participation status for states, districts, territories, and tribal governments (CDC, 2013). Survey response rates can vary substantially by jurisdiction. In the Brenner (2002) study, the smoking indicator had “substantial” reliability (Brenner, et. al, 2002). The prevalence of “Smoked cigarettes  $\geq$  one day during the past 30 days,” which can be used as an indicator of current adolescent smoking, was 27.2 at Time 1 and 27.5 at Time 2. The kappa statistic was 81.9.

### **Simplicity of indicator**

The level of complexity in calculating and explaining this indicator is relatively low. YRBS results do require statistical weighting provided by CDC to approximate representativeness of the student population. Although somewhat controversial, adolescent smoking prevalence is calculated based on daily smoking. For instance, evidence suggests that adolescents have a varied perception of what constitutes different classifications of smokers and smoking. For example, Leatherdale and McDonald (2006) found that approximately 52 percent of students who were categorized by researchers as “regular smokers” and 98 percent categorized as “experimenters” did not actually consider themselves to be smokers. Evidence also suggests that less frequent smoking, being younger, and social smoking, are related to less likelihood of an individual identifying themselves as a smoker (Berg et al., 2009; Levinson et al., 2007; Moran, Wechsler, & Rigotti, 2004).

However, the standard manner in which YRBS assesses adolescent smoking may circumvent these issues. The survey asks respondents to state whether or not they “smoked cigarettes  $\geq$  1 day during the past 30 days.” This number is divided by the number of nine through 12 grade respondents. Also, to better capture frequency or intensity, YRBS also prompts students to state whether they “smoked  $\geq$  20 cigarettes per day on the days smoked during the past 30 days” (Brenner, et. al., 2002).

## **References**

- Acevedo-Garcia, D., Pan, J., Jun, H.-J., Osypuk, T. L., & Emmons, K. M. (2005). The effect of immigrant generation on smoking. *Social Science & Medicine*, 61, 1223-1242.
- Adler, N.E., Ostrove, J.M. (1999). Socioeconomic status and health: what we know and what we don't. *Academic Science*. 896:3–15.
- Berg, C. J., Lust, K. A., Sanem, J. R., Kirch, M. A., Rudie, M., Ehlinger, E., et al. (2009). Smoker self-identification versus recent smoking among college students. *American Journal of Preventive Medicine*, 36, 333–336.
- Brenner, N.D., Kann, L., McManus, T., Kinchen, S. A., Sundberg, E.C., Ross, J.G. (2002). Reliability of the 1999 youth risk behavior survey questionnaire. *Journal of Adolescent Health*. 31(4): 336-342.
- Brenner, N.D; Eaton, D.K., Kann, L., et al. (2006)The Association of Survey Setting and Mode with Self-Reported Health Risk Behaviors Among High School Students. *Public Opinion Quarterly* 70:354–374
- Centers for Disease Control and Prevention (2007). Cigarette smoking among adults—United States, 2006. *Morbidity and Mortality Weekly Report*, 56, (pp. 1157–1161), Retrieved January 2009 from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5745a>.
- Centers for Disease Control and Prevention, (2012, June 7). YRBSS in brief. Retrieved from <http://www.cdc.gov/healthyyouth/yrbs/brief.htm>
- Centers for Disease Control and Prevention, (2012, June 7). Requesting Youth Risk Behavior Surveillance System (YRBSS) Data Files. Retrieved from <http://www.cdc.gov/healthyyouth/yrbs/requestingdata.htm>
- Centers for Disease Control and Prevention, (2010, August 27). Tobacco use among middle and high school students --- United States, 2000--2009. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5933a2.htm>
- Centers for Disease Control and Prevention, (2001, March 27). Highlights: Tobacco use and reproductive outcomes. Retrieved from [http://www.cdc.gov/tobacco/data\\_statistics/sgr/2001/highlights/outcomes/index.htm](http://www.cdc.gov/tobacco/data_statistics/sgr/2001/highlights/outcomes/index.htm)
- Centers for Disease Control and Prevention, (2013, February 25). Participation History & Data Quality, 1991–2011 — High School. Retrieved from <http://www.cdc.gov/healthyyouth/yrbs/history-states.htm#1>
- Centers for Disease Control and Prevention, (2012, September 12). Winnable battles: Tobacco use. Retrieved from <http://www.cdc.gov/winnablebattles/Tobacco/>
- Centers for Disease Control and Prevention, (2013). Winnable Battles Progress Report: 2010-2015. Retrieved from <http://www.cdc.gov/winnablebattles/targets/pdf/winnablebattlesprogressreport.pdf>
- Christakis, N.A., Fowler, J.H. (2007). The spread of obesity in a large social network over 32 years. *New England Journal of Medicine*; 357(4):370–379.
- Cokkinides, V.E., Halpern, M.T., Barbeau, E.M., Ward, E., Thun, M.J. (2008). Racial and ethnic disparities in smoking- cessation interventions: analysis of the 2005 National Health Interview Survey. *American Journal of Preventive Medicine*;34(5)
- Crimmins, E., Preston, S., Cohen, B. (2011), for the Panel on Divergent Trends in Longevity, National Research Council. Explaining Divergent Levels of Longevity in High Income Countries. Washington, DC: National Academy Press.

Diez Roux, A. V., Nieto, F., Muntaner, C., Tyroler, H., Comstock, G., Shahar, E., et al. (1997). Neighborhood environments and coronary heart disease: a multilevel analysis. *American Journal of Epidemiology*, 146(1), 48-63.

Division of Adolescent and School Health (DASH), National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), Centers for Disease Control and Prevention (CDC) (June 2008). Tobacco Use and the Health of Young People. Retrieved from [http://www.cdc.gov/HealthyYouth/tobacco/pdf/tobacco\\_factsheet.pdf](http://www.cdc.gov/HealthyYouth/tobacco/pdf/tobacco_factsheet.pdf)

Duncan, C., Jones, K., & Moon, G. (1999). Smoking and deprivation: are there neighborhood effects? *Social Science & Medicine*, 28(4), 497-505.

Fiore, M.C., Bailey, W.C., Cohen, S.J., et al. Treating Tobacco Use and Dependence: Clinical Practice Guideline. Rockville, Md: Public Health Service, U.S. Dept of Health and Human Services; 2000

Franks, P., Fiscella, K. (2008). Reducing disparities down- stream: prospects and challenges. *Journal of General and Internal Medicine*. 23(5):672–677.

Geronimus, A. T., Neidert, L. J., & Bound, J. (1993). Age patterns of smoking in U.S. black and white women of childbearing age. *American Journal of Public Health*, 83, 1258-1264.

Giovino, G.A., Chaloupka, F.J., Hartman, A.M., et al. *Cigarette Smoking Prevalence and Policies in the 50 States: An Era of Change – The Robert Wood Johnson Foundation ImpacTeen Tobacco Chart Book*. Buffalo, NY: University at Buffalo, State University of New York, 2009.

Giovino, G.A. (2002). Epidemiology of tobacco use in the United States. *Oncogene*; 21:7326–7340.

Haiman, C.A., Stram, D.O., Wilkens, L.R., Pike, M.C., Kolonel, L.N., Henderson, B.E., et al. (2006). Ethnic and racial differences in the smoking-related risk of lung cancer. *New England Journal of Medicine*, 354, 333–342.

Hebert, R. (2005). What's new in nicotine and tobacco research? *Nicotine & Tobacco Research*, 7, 485–490.

Husten, C., Thorne, S. Tobacco: health effects and control. In: Wallace RB, ed. Maxey-Rosenau-Last Public Health and Preventive Medicine. 15th ed. New York, NY: McGraw-Hill. 2007

Jemal, A., Thun, M.J., Ward, E.E., Henley, S.J., Cokkinides, V.E., Murray, T.E., 2008. Mortality from leading causes by education and race in the United States, 2001. *American Journal of Preventative Medicine* 34, 1–8.

Jemal, A., Thun, M.J., Ries, L.A., et al. (2008). Annual report to the nation on the status of cancer, 1975–2005, featuring trends in lung cancer, tobacco use, and tobacco control. *Journal National Cancer Institute*; 100(23):1672–1694.

Jha, P., Peto, R., Zatonski, W., et al. (2006). Social inequalities in male mortality, and in male mortality from smoking: indirect estimation from national death rates in England and Wales, Poland, and North America. *Lancet*; 368:367–370.

Kandula, N. R., Wen, M., & Jacobs, E. A. (2009). Association between neighborhood context and smoking prevalence among Asian Americans. *American Journal of Public Health*, 99(5), 885-892.

Leatherdale, S. T., Ahmed, R., Lovato, C., Manske, S., & Jolin, M. A. (2007). Heterogeneity among adolescent non-daily smokers: Implications for research and practice. *Substance Use and Misuse*, 42, 837–851.

Lauderdale, D.S., (2001). Education and survival: birth cohort, period, and age effects. *Demography* 38, 551–561.

Lantz, P.M. (2003). Smoking on the rise among young adults: implications for research and policy. *Tobacco Control*;12(suppl 1):60–70

Levinson, A. H., Campo, S., Gascoigne, J., Jolly, O., Zakharyan, A., & Tran, Z. V. (2007). Smoking, but not smokers: Identity among college students who smoke cigarettes. *Nicotine & Tobacco Research*, 9, 845–852.

Lightwood, J. M., Dinno, A., Glantz, S. A. (2008). Tobacco industry youth smoking prevention programs: Protecting the industry and hurting tobacco control. *American Journal Of Public Health*. 92: 917-930.

Moran, S., Wechsler, H., & Rigotti, N. A. (2004). Social smoking among U.S. college students. *Pediatrics*, 114, 1028–1034.

Muennig, P., Fiscella, K., Tancredi, D., & Franks, P. (2010). The relative health burden of selected social and behavioral risk factors in the United States: Implications for policy. *American Journal of Public Health*; 100(9): 1758-1764.

Musto, D. *The American Disease: Origins of Narcotic Control*. 3rd ed. New York, NY: Oxford University Press, 1999

Office of Applied Studies. Results from the 2005 National Survey on Drug Use and Health: National Find- ings. Rockville, Md: Substance Abuse and Mental Health Services Administration; 2006. NSDUH Series H-30, DHHS publication SMA 06-4194. Available at: <http://oas.samhsa.gov/NSDUH/2k5NSDUH/2k5results.htm>. Accessed December 15, 2006

Office on Smoking and Health. *The Health Consequences of Smoking. A Report of the Surgeon General*. Atlanta, Ga; Centers for Disease Control and Prevention; 2004.

Office on Smoking and Health. *Women and Smoking. A Report of the Surgeon General*. Atlanta, Ga; Centers for Disease Control and Prevention; 2001.

Okuyemi, K.S., Faseru, B., Sanderson, C.L, Bronars, C.A., Ahluwalia, J.S. (2007). Relationship between menthol cigarettes and smoking cessation among African American light smokers. *Addiction*;102(12):1979– 1986.

Pampel, F.C. (2005). Diffusion, cohort change, and social patterns of smoking. *Social. Science Research* 34, 117–139.

Pampel, F. C. (2009). The persistence of educational disparities in smoking. *Social Problems*, 56, 526-542.

Pappas, G., Queen, S., Hadden, W., Fisher, G., 1993. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *New England Journal of Medicine* 329, 103–109.

Preston, S.H., Wang, H. (2006) Sex mortality differences in the United States: the role of cohort smoking patterns. *Demography*;43 (4):631–646.

Reijneveld, S. A. (1998). The impact of individual and area characteristics on urban socioeconomic differences in health and smoking. *International Journal of Epidemiology*, 27(1), 33-40.

Rogers, R.G., Hummer, R.A., Krueger, P.M., Pampel, F.C. (2005). Mortality attributable to cigarette smoking in the United States. *Population and Development Review* 31, 259–292.

Ross, C. (2000). Walking, exercising, and smoking: does neighborhood matter? *Social Science & Medicine*, 51, 265-274.

Sen A. *Development as Freedom*. New York, NY: Knopf; 1999.

Siahpush, M., Heller, G., & Singh, G. (2005). Lower levels of occupation, income and education are strongly associated with a longer smoking duration: multivariate results from the 2001 Australian national drug strategy survey. *Public Health*, 119, 1105-1110.

The World Health Report 2002: Reducing Risks, Promoting Healthy Life. Geneva, Switzerland: World Health Organization; 2002.

Tranah, G., Holly, E., Wang, F., & Bracci, P. (2011). Cigarette, cigar and pipe smoking, passive smoke exposure, and risk of pancreatic cancer: a population-based study in the San Francisco Bay Area. *BMC Cancer*, 11:138. doi:10.1186/1471-2407-11-138

Trinidad, D.R., Perez-Stable, E.J., Emery, S.L., White, M.M., Grana, R.A., Messer, K.S. (2009). Intermittent and light daily smoking across racial/ethnic groups in the United States. *Nicotine and Tobacco Research*;11(2):203–210.

Tseng, M., Yeatts, K., Millikan, R., & Newman, B. (2001). Area-level characteristics and smoking in women. *American Journal of Public Health*, 91(11), 1847-1850.

U.S. Department of Health and Human Services. *Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General*. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. DHHS Publication No. (CDC) 89

U.S. Department of Health and Human Services, (2012, March 8). Surgeon General releases new report on youth smoking. Retrieved from. <http://www.hhs.gov/news/press/2012pres/03/20120308a.html>

U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Young People. A Report of the Surgeon General*. Atlanta (GA): U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Pro- motion, Office of Smoking and Health, 1994.

U.S. Department of Health and Human Services. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon*

General. Atlanta (GA): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006.

U.S. Department of Health and Human Services, (2008, November, 14). Smoking-Attributable Mortality, Years of Potential Life Lost, and Productivity Losses --- United States, 2000—2004. Retrieve from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5745a3.htm>

U.S. Department of Health and Human Services. (1998). Tobacco use among U.S. racial/ethnic groups-African Americans, American Indian, and Alaska natives, Asian Americans and Pacific Islanders, and Hispanics: A report of the surgeon general. Atlanta, GA: U.S. Department of Health and Human services, Centers for Disease Control and Prevention.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, (2011, September). Results from the 2010 National Survey on Drug Use and Health: Summary of National Findings. Retrieved from <http://www.samhsa.gov/data/NSDUH/2k10NSDUH/2k10Results.pdf>

U.S. Department of Health and Human Services (2010). *A Report of the Surgeon General: How Tobacco Smoke Causes Disease: What It Means to You*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Warren, J.R., Hernandez, E.M., 2007. Did socioeconomic inequalities in morbidity and mortality change in the United States over the course of the twentieth Century? *Journal of Health and Social Behavior* 48, 335–351.

Williams, D., & Jackson, J. (2000). Race/ethnicity and the 2000 census: recommendations for African American and other black populations in the United States. *American Journal of Public Health*, 90(11), 1728-1730.

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