

HEALTH EFFECTS OF TOBACCO USE

Studies have shown that smoking tobacco and using tobacco-based products have a variety of adverse health ramifications. In the United States alone, smoking is responsible for 443,000 deaths, or one in every five, each year (CDC, 2010). Furthermore, the U.S. Surgeon General (2010) reported that for every tobacco-related death, an additional 20 Americans suffer from at least one severe or chronic tobacco-related illness.

carcinogens are cancer-causing agents or substances. Tobacco products contain a wide array of carcinogens that are damaging to the human body.

Cigarette smoke contains 7,000 chemicals and compounds, at least 200 of which are toxic, either alone or in combination with one another (Vardavas & Panagiotakos, 2009). Sixty-nine are known **carcinogens**, or cancer-causing agents, including carbon monoxide, which puts the smoker at a higher risk for diseases such as lung, larynx, and pancreatic cancer (USDHHS, 2010). In a 2010 report, the U.S. Surgeon General indicated that even brief, secondhand, or intermittent exposure to cigarette smoke can have immediate and long-term adverse health consequences. The smoke first impacts the lungs, where it can cause inflammation or impaired lung function, which can lead to chronic pulmonary diseases, chronic bronchitis, heart attack, or stroke. From the lungs, chemicals from the smoke pass into the bloodstream and are distributed to every organ and tissue system in the body, where

nitrosamines are among the most harmful carcinogens found in tobacco products.

Nicotine is the stimulant in tobacco that is responsible for its addictive nature.

passive smoking also known as secondhand smoking or environmental tobacco smoking, occurs when a person other than the individual smoking a tobacco product inhales tobacco smoke.

they may damage DNA, weaken the immune system, increase risk for cancers such as those of the pancreas (Tranah, Holly, Wang, & Bracci, 2011) and lungs, and aggravate existing conditions, such as diabetes or cancer (USDHHS, 2010).

Additionally, the tobacco fermentation process produces specific forms of nitrosamines, which are among the most harmful carcinogens (Richter et al., 2008). Thus, even smokeless tobacco, though free of tar and potentially lethal gases, can still increase the risk of oral cancer (as with chewable tobacco) or nasopharyngeal cancer (with the use of snuff). The CDC (2011b) reported that smokeless tobacco still contains 28 carcinogens and places users at increased risk of developing cancers of the oral cavity, as well as tooth, gum, and soft tissue disease. Both smoking and smokeless tobacco product use are also known to adversely affect both male and female reproductive systems. Research has shown that smoking during advanced prenatal stages can hinder cognitive development in fetuses and even infants (Stanton, Martin, & Henningfield, 2005). Nicotine, the stimulant in tobacco that causes addiction, and the other toxins found in tobacco products, are especially harmful to the ovaries, where they may interfere with estrogen production and regulation, and fallopian tubes, which may increase smokers' risk of ectopic pregnancies, miscarriages, premature births, and low birth weight babies (CDC, 2011a; Dechanet et al., 2011; USDHHS, 2010). Tobacco toxins, both smoke-based and smokeless varieties, may also damage sperm-borne DNA, which can contribute to problematic fetal development or birth defects as well as infertility (CDC, 2011b; USDHHS, 2010). Compared to cigarette smoke, the prevalence of smokeless tobacco products is relatively low in the general population. According to data reported in 2009, the CDC (2011b) estimated that 3.5% of all adults, 6.1% of all high school students, and 2.6% of all middle school students used some form of smokeless tobacco product.

Passive smoking, also known as secondhand smoking (SHS) or environmental tobacco smoking (ETS), is also a major cause of smoking-related health problems, including disease, disability, and even death (U.S. Surgeon General, 2006). In passive smoking, people other than the smoker inhale tobacco smoke and can receive its harmful health effects. Specifically, secondhand smoke can increase nonsmokers' risk of developing lung cancer by 20% to 30% and heart disease by 25% to 30% (USDHHS, 2006). Other studies have found that exposure to passive smoking may produce nearly the same 70% to 80% increased risk of coronary heart disease presented by light smoking (Vardavas & Panagiotakos, 2009). Significant exposure to passive smoking has also been shown to increase the risk of non-Hodgkin and follicular lymphoma in lifetime nonsmokers (Lu et al., 2011). CDC data show that as a result of exposure to secondhand smoke, 46,000 nonsmokers die from heart disease and 3,400 nonsmokers die from lung cancer annually in the United States (Tynan, Babb, MacNeil, & Griffin, 2011). Even thirdhand smoking, caused by residual contamination of smoke-borne toxins on surfaces, carpets, and clothing, among other things, long after the cigarette has been extinguished, may prove to be a possible health hazard (Sleiman et al., 2010).

In addition to health effects, the use of tobacco products also has an associated financial cost, both for the individual (cost of the products themselves and the costs of the attendant health problems) and for society. According to the U.S.

Department of Health and Human Services, cigarette smoking in the United States adds up to nearly \$133 billion a year in health care costs alone, not including a comparable \$156 billion in lost productivity (USDHHS, 2014). While secondhand smoking does not cost nearly as much, it does total nearly \$10 billion per year in health care expenditures (Behan, Eriksen, & Lin, 2005).

Measurement

There are various measurements for smoking exposure and health risks that can be used to gauge prevalence and problems. Subjectively, smokers can self-report smoking and its health effects or take self-administered surveys. Estimates of tobacco consumption in most population surveys are usually based on self-reported information, which is generated from standard questions such as: Are you a current or former smoker? Have you ever smoked? Do you now smoke every day, some days, or not at all? How many packets of cigarettes do you smoke per day? However, studies show that self-reported estimates may underestimate true smoking prevalence (Coultas, Howard, Peake, Skipper, & Samet, 1988; Lewis et al., 2003; Tyrpien, Bodzek, & Manka, 2001). Alternatively, scientists may choose to use biochemical tests to objectively measure tobacco use and exposure. Objective measures include measuring nicotine levels in blood, hair, and urine (Al-Delaimy, Crane, & Woodward, 2002; Benowitz, Hukkanen, & Jacob III, 2009). These measures have proven effective in controlling for the biases of self-reported tobacco use rates but may not be feasible for measurement in large-scale studies (Connor-Gorber, Schofield-Hurwitz, Hardt, Levasseur, & Tremblay, 2009).