The Childhood Obesity Epidemic: Lessons Learned from Tobacco

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Cigarette smoking was a relatively uncommon behavior in 1900, when the average annual per capita consumption among adults was 54 cigarettes.[1] Annual per capita consumption increased 80-fold, to 4345 cigarettes by 1963—just before the first landmark Surgeon General's Report.[1] In 2009, cigarette smoking was down to 1028 cigarettes per capita per year, a 76% reduction from 1963.[2] In 2010-2011, 19.3% of adults aged 18 years and older and 18.1% of high school students were regular smokers.[3,4] This is a substantial reduction in smoking from the peak prevalence of 70% of adult men in 1958, and 45% of adult women in 1963.[5] Thus, although the epidemic of smoking is not eliminated—per capita consumption globally continues to increase—there has been a notable decrease in the US since 1964.[1,2,6]

Between the late 1970s and early 1990s, adult obesity rates began to climb, with the prevalence of obese adults increasing from 14.5% to 22.5%, according to the National Health and Nutrition Evaluation Surveys.[7] The prevalence of obese children increased even more dramatically. Among 6-11 year old children, for example, the prevalence of obesity was 4.2% in the 1960s, and was 19.6% in 2007-2008, nearly a 5-fold increase in 40 years, according to National Health and Nutrition Evaluation Surveys data.[8]

Each of these behavioral epidemics has had serious health consequences. As smoking rates climbed, so did deaths from lung cancer, with the peak in smoking prevalence (in 1958 for men and 1963 for women), followed by the peak in lung cancer mortality in 1990 for men and 2004 for women.[9] Although the lung cancer rates have finally decreased for both men and women, the prevalence of another serious chronic disease, diabetes, has increased, from 2.8% of the population in 1980 to 6.4% in 2011, and it does not appear that this has yet peaked.[10] This increase in diabetes has been shown to be directly associated with the increase in obesity in the US population, only slightly confounded by an aging population.[11-14] Even though smoking is still responsible for the largest number of deaths in the US, about 1 in 5 deaths, overweight and obesity are now responsible for 1 in 10 deaths, and are the third highest risk factors for mortality in the US.[15]

The large increases in the prevalence of smoking and obesity in the 20th century are associated with changes in the products themselves (cigarettes and food), as well as the social and physical environments that support, encourage or discourage smoking, unhealthy dietary intake, and sedentary behaviors. In this paper, we focus on several of the primary factors that were responsible for the increase in cigarette smoking, and then examine whether those factors might also be involved in the increase in childhood obesity levels in the US. These factors include changes in manufacturing capabilities, expanded and targeted marketing, low prices and added convenience, and lack of adequate information to the public. From these analyses, additional strategies to reduce the childhood obesity epidemic can be considered.

CFBAI	Children's Food and Beverage Advertising Initiative

The Increase in Cigarette Smoking in the 20th Century

Manufacturing of Cigarettes

In the 19th century, the cigarette was hand-rolled, and sold for a penny apiece. An automated cigarette rolling machine was developed in 1881 and revolutionized cigarette production.[16] The machine could produce 200 cigarettes per minute, a production rate that would have previously taken 50 workers. The retail price was reduce by one-half, and production, which had never exceeded 500 million cigarettes per year, leaped to 10 billion by 1910.[16] This early technology clearly led to the tobacco industry's ability to produce large supplies of cigarettes in the 20th century.[17] The increase in production continued throughout the first one-half of the 20th century, and by 1944, cigarette production was up to 400 billion per year, with 75% of those cigarettes going to men in the armed services.[16] These men came back from World War II addicted to nicotine, with addiction made easier and normative because the US government provided cigarettes for free in servicemen's C-rations.[18,19] Cigarettes are currently made from reconstituted tobacco sheets that are sprayed with nicotine to optimize dosing of nicotine, as well as other additives, such as menthol, which make the nicotine less harsh, and ammonia that provides a bigger nicotine "kick."[20-22] Technology has been utilized by the tobacco companies to produce an inexpensive, consistent, addictive product, which regular users consume at the rate of over a pack (20 cigarettes) a day.[23] Young people become addicted to nicotine while they are still underage because cigarettes are now designed to be less harsh for beginning users.[24]

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Marketing of Cigarettes

There are volumes of published papers and books written about the successful marketing campaigns of the tobacco industry, particularly those aimed at youth.[24,25] Monies allocated for cigarette marketing, tracked by the Food and Drug Administration from 1963, show an exponential increase in dollars spent in the US on marketing, from $249 million in 1963 to over $15 billion in 2003, then "down" to about $10 billion in 2008.[24] Even adjusting for inflation, the dollars spent on cigarette marketing increased 10-fold over the 40-year period following the release of the first Surgeon General's Report on cigarette smoking in 1964.[24] The promotion of cigarettes to those under the legal age of 18 has been a key component of the tobacco industry's marketing strategy.[24, 26] Because nearly 90% of smokers begin to smoke by age 18 years, it has been imperative for cigarette companies to attract young people to their brand.[26] This was very evident in the tobacco company documents that were examined during and after litigation with the tobacco companies in the late 1990s. For example, Claude Teague, a researcher at RJ Reynolds Research Planning Department wrote in 1973: "Realistically, if our company is to survive and prosper over the long term, *we must get our share of the youth market*" ([emphasis added] p. 7358).[27] The 2012 Surgeon General's Report concluded that: "Advertising and promotional activities by tobacco companies have been shown to cause the onset and continuation of smoking among adolescents and young adults (p. 8)."[24] It was the first Surgeon General's Report to delineate a causal relationship between tobacco industry marketing and the onset of smoking among youth.

Cigarette marketing restrictions did not work through industry self-regulation,[25] and although the Fairness Doctrine era (1967-1971) did result in Congress restricting advertising on television and radio, the tobacco companies used billboards, magazines, and increased promotional activities such as entertainment sponsorships very effectively to reach young audiences. Smoking rates among youth continued to increase through the 1990s.[24] As a result, the Master Settlement Agreement in 1998, and the Family Smoking Prevention and Tobacco Control Act in 2009, established stronger federal regulations on marketing, including the banning of tobacco advertising on billboards and promotional activities that reach underage youth.[24,28] These strong regulatory restrictions on marketing continue to be needed, and even expanded, as other addictive tobacco products (eg, snus, hookah) and other forms of tobacco marketing (direct mail, websites) continue to reach adolescents.[24]

Cheap Cigarettes

Young people are more price-sensitive to the cost of cigarettes than are adults, and access to cheap cigarettes makes it more likely for adolescents to smoke.[24,29] Traditionally, cigarette prices were equivalent among the major tobacco companies because the number of major companies was limited, and there were disadvantages to pricing either below or above the other companies.[24,30] For example, a price increase by one of the leading companies might result in greater profits in the short-term, from addicted adult smokers who were brand loyal. But the profits would diminish in the long-term because youth would be less likely to begin to smoke a higher-price brand.

The importance of keeping prices low to attract youth was noted by the tobacco companies after the doubling of the federal excise tax on cigarettes in 1983. A Philip Morris document in 1987 commented on the effects of price increases: "…the 1982-83 round of price increases caused two million adults to quit smoking and prevented 600 000 teenagers from starting to smoke…this means that 700 000 of those adult quitters had been [Philip Morris] smokers and 420 000 of the non-starters would have been [Philip Morris] smokers….we were hit disproportionately hard. We don't need that to happen again."[26] In fact, Philip Morris saw reduced sales through the early 1990s with the expansion of discounted cigarettes and branded generics.[24,29] In 1993, Philip Morris reduced its price on a pack of Marlboro cigarettes by 40 cents,[31] and the other major companies followed suit. Smoking rates among teens increased steadily until 1997, with Gruber and Zinman[32] estimating that the 1993 price reductions were responsible for more than one-fourth of the increase in the prevalence of smoking among youth in the mid-1990s. Thus, keeping prices low while potentially reducing profits in the short-term is critical to the long-term viability of tobacco companies in order to attract new, young, adolescent customers.

Suppressing Health Information

Internal industry documents show that tobacco companies suppressed information on the negative health consequences of their products.[33-35] This included knowledge about the associations between smoking and lung cancer, the addictiveness of cigarettes, the health consequences of secondhand smoking, and the ineffectiveness of methods to make cigarettes "healthier" (such as by lowering tar content or adding filters). In 1956, Doll and Hill[36] published an article that concluded that there were "clear associations between the mortality from lung cancer and the smoking of cigarettes, which we have observed… (p. 1081)." The tobacco companies were well aware of this lung cancer research by the early 1950s.[37] Yet, their reply to the scientific evidence was a counter-argument that was likely to create confusion and reassurance among smokers. In 1954, the Tobacco Industry Research Council, sponsored by the tobacco manufacturers, issued "A Frank Statement to Cigarette Smokers" in newspapers in over 250 cities in the US, which questioned the science of the association between smoking and lung cancer, promoted their product as safe, and assured the public that they would conduct ongoing research on cigarettes and health.[33] A similar pattern of responding to scientific findings has been repeated for addiction, secondhand smoke, other forms of cancer, and cigarette engineering methods.[38] With addiction, for example, all of the chief executive officers of the major tobacco companies swore before Congress in 1994 that their products were not addictive, even though the evidence was strong and consistent. Philip Morris noted, internally, in 1971, that: "The cigarette should be conceived not as a