

**THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE**

DEPARTMENT OF HISTORY

Truth Behind Tobacco: A Dive into the Manipulation of Tobacco Companies

SUSAN PACER
Semester of Graduation of May 2024

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in History
with honors in History

Reviewed and approved* by the following:

Dr. Jacob Lee
Associate Professor of History
Thesis Supervisor

Dr. Howard Smith
Teaching Professor of Criminology
Honors Advisor

* Electronic approvals are on file.

ABSTRACT

During the twentieth century, U.S. tobacco companies perpetrated a calculated campaign of manipulation and disinformation. In response to a growing medical consensus that smoking increases a person's chance of developing lung cancer, these companies hired doctors and scientists to cast doubt on that research and to present their products as safe. Tobacco companies published advertisements promoting cigarettes. Advertisements contained images of women to appease the male gaze—some advertisements called upon doctors to promote cigarettes, claiming cigarettes aided with congestion. However, despite their public statements to the contrary, tobacco company executives and employees knew the dangers of smoking. Internal tobacco documents revealed certain additives and chemical compounds that heightened addiction; Companies altered the tobacco plant to produce a higher nicotine content. By examining tobacco companies' internal reports and public statements alongside medical research, this thesis demonstrates that tobacco companies understood the health risks of smoking as early as 1910 yet continued to deny it publicly.

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ACKNOWLEDGEMENTS

First and foremost, I want to thank my family for their unconditional support. My mother, Stephanie, sisters Caitie, Jordan, and Julia; my brothers Jonathan and Jackson, and last but certainly not least my dad, William. Without all your support and belief in me, I could not complete my work. More specifically, I would like to dedicate this thesis to my dad, who inspired my passion for this topic and ambitions. You are my role model and challenge me in every way to work and be better. I also want to dedicate this to my mom Stephanie, who has always pushed me to do the impossible. Your unwavering encouragement has helped me become who I am today and continue producing the best work possible. I cannot thank you enough for your sacrifices to provide me with these opportunities. I also would like to thank my thesis supervisor, Dr. Jacob Lee, and my honors advisor, Dr. Howard Smith. Your guidance has helped me fulfill a personal goal of mine.

Chapter 1

Introduction

In 1890, the first American cigarette company opened its doors¹. The more traditional forms of tobacco, such as snuff and chewing tobacco, dominated the markets. However, entrepreneurs noticed the niche market of tobacco consumption and invented a new form: Cigarettes. This innovation allowed consumers to consume tobacco easily. More companies began to follow the latest trend and innovate their cigarettes. Additionally, tobacco companies commissioned advertisements promoting this new consumption form. Americans began to transition from chewing tobacco and other forms to smoking cigarettes². Cigarettes offer an easier and quicker way to achieve the nicotine high that comes from consuming cigarettes. The cigarette industry spent the next 70 years catering their product to the consumers by following trends the American public loved. They tracked trends such as consumer flavor and filter preferences. Advertisements targeted specific demographics based on studies; internal tobacco studies framed cigarettes as a friend to lean on or a way to relax after a long day at work.

¹ “History of Tobacco in the World - Tobacco Timeline.” *Tobacco Free Life*, tobaccofreelife.org/tobacco/tobacco-history/.

²Burns, David S., et al. “Cigarette Smoking Behavior in the United States.” *Cigarette Smoking Behavior in the United States*, cancercontrol.cancer.gov/sites/default/files/2020-08/m08_2.pdf.

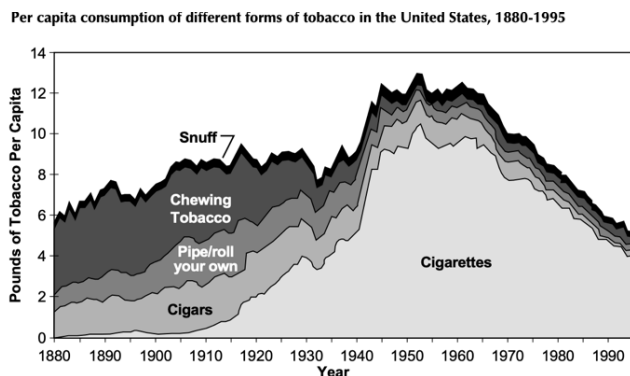


Figure 1: Graph Representing Tobacco Consumption Forms from 1880 to 1990

Companies such as Liggett, RJ Reynolds, Brown and Williamson, Philip Morris, and British American Tobacco Company sought new consumers. There are four prominent companies whose privileged documents are now public record: Philip Morris, RJ Reynolds, American Tobacco, and Brown and Williamson (American Tobacco and Brown and Williamson ceased to exist after merging with RJ Reynolds in 2004). These documents will explain the inner workings of these large tobacco companies and what information they hid from the American public. Each brand produced unique cigarettes with the sole intention of creating a constant flow of money. For example, Philip Morris and Brown and Williamson studied various elements and sections of cigarettes to entice and retain consumers. Some industry members engineered the cigarette filter to cause different inhalation styles; others concocted various tobacco blends, accommodating various flavor palates.

As each company researched and altered its cigarettes, new consumers entered the cigarette market. New advertisements and information enticed new and current consumers. The cigarette industry steamrolled through the 1910s to 1920s with slight disapproval from the American public. However, after cigarettes gained popularity in the 1910s, doctors across the United States noted dramatic increases in the rates of lung cancer. As early as 1910, they began to suspect smoking was the cause. Rare medical occurrences such as lung cancer and respiratory

diseases became prevalent in doctors' offices across the United States; doctors noted these diseases were rarely seen in previous decades and were now rising at significant rates.

Suspicious of a connection between smoking and health rose but lacked substantial evidence. By the 1960s, doctors and researchers concluded a connection between smoking and health, specifically cancers.

These early studies linking smoking and cancer attracted media coverage, and in response, tobacco companies launched an extensive public relations campaign to cast doubt on the findings. They issued press releases and designed advertisements to combat the growing medical consensus. Advertising became critical to tobacco companies' efforts to sway public opinion. The cigarette advertisement market boomed, promoting smoking as healthy. Tobacco companies strategically used women and doctors in their campaigns to represent cigarettes as both safe and sexy. Across the industry, advertisements picturing beautiful women promoted smoking. The images of women drew the male audience in and transitioned to captions describing the benefits of smoking, like acting as a decongestant or aiding digestion. The advertisements created false narratives, promoting cigarettes as healthy and safe. The images drew the attention of many social classes; women aspired to be like the women in the pictures, and men admired them. On occasion, the woman pictured was a socialite or actress. The captions explained various facts sponsored by the tobacco company.

Advertisements also exploited doctors' testimonies. Tobacco companies framed advertisements to suggest doctors supported smoking. Advertisements stated doctors smoke more of a particular brand than another and that smoking improved irritation in the nose and throat. Advertisements represented guides for doctors on patient health and advice on what brand to smoke and healthy options. Philip Morris utilized this tactic to advance their product. Doctors

and patients were in a predicament: believe the well-formed company that produced the product or the independent, new research.

However, internal tobacco research revealed the truths about tobacco and cigarettes; they revealed how companies manipulated cigarettes to make them more addictive. Tobacco companies explored chemical additives and their effects. Some research represented tobacco companies' carelessness towards life. The documents highlight how companies planned to meet their goal each year regardless of the number of people who died from cigarette-related diseases. Even before independent researchers began to link smoking and cancer in the 1940s and 1950s, tobacco companies prepared to combat these studies. As a result, when journalists reported on this research, tobacco companies were poised to respond with carefully crafted press statements and advertisements. Tobacco companies disputed the allegations and asserted that they knew their product best and would continue researching any possible health risks. However, the research of their products continued to support their intended goal: producing a consumer for life. The tobacco industry knew and hid the link between smoking and cancer.

In 1962, the Surgeon General of the United States launched an independent study on smoking and health to clarify the growing concern. His report, released in January of 1964, dominated the news. The surgeon general's findings supported independent studies that tobacco companies wished to discredit. The report explained the various chemical compounds found in cigarettes, including nicotine. This fact disproved many arguments made by tobacco companies which had denied the presence of nicotine or addictive chemical compounds. The Surgeon General's report explained mortality and the concept of 'tobacco habit'—which roughly translated to addictive habits. The tobacco habits described were associated with various daily tasks, creating new mind-muscle connections. As a result, the brain changed with each cigarette

smoked. Each time a smoker brewed coffee, the brain craved a cigarette. The brain whispers for a cigarette while the smoker takes a lunch break. ‘Tobacco habits’ made it difficult to quit, and in turn, caused cancers and high mortality rates. The report found common conclusions from medical research conducted from 1912 to 1963: smokers were at higher rates of developing and dying from respiratory cancers than ordinary individuals. The report validated countless facts that tobacco companies denied. The exposure of the massive manipulation ploy finally became known.

This thesis demonstrates what occurs when companies lack regulations and restrictions. Companies generally strive to increase their profits in many ways regardless of its effects. Tobacco companies demonstrate the measures by which they will gain large-scale consumption. In some cases, the measures taken are destructive to human health, but companies—intentionally or not—will ignore or hide the warning signs. Outside parties, such as doctors and medical researchers, care about human health; they search for answers to problems regarding human health. The paradox of doctor’s warnings and companies’ denials forms a paradox: who do you believe? Government intervention is necessary, as it sets standards and regulations, allowing consumers to be well-educated and aware of their choices.

Chapter 2

What is a Cigarette?

For decades, tobacco companies have dedicated millions of funds towards the parts of the cigarette. Tobacco companies research and test each element of a cigarette for a single intended purpose: an addictive product. Before the popularization of cigarettes in the twentieth century, the most common way Americans consumed tobacco was by chewing it, usually in the form of tobacco leaves mixed with molasses. This method provided the benefits of a nicotine high, but it also created a need to spit and a risk of inadvertently swallowing the tobacco. As a result, individuals wanted a product in which they could consume tobacco without spitting out the tobacco blend. The new product would allow smokers to obtain a nicotine high without residue.

In 1881, America's first rolling paper machine and portable safety matches³ were created to promote smoking tobacco via cigarettes. Cigarettes are slim, paper-wrapped inhalers that contain ingredients such as nicotine, additives, and tobacco. The creation of a cigarette drastically cut the cons of consuming tobacco down. It allowed a more manageable and cleaner way of consuming tobacco; filters prevented the blend of tobacco from entering the mouth and needing to be spit out. From 1881 forward, tobacco companies aimed to produce the best product possible. Each part of a cigarette is meticulously studied and experimented with, perfecting the product.

³Gershon, Livia. "A Brief History of Tobacco in America." *JSTOR Daily*, 10 June 2016, [daily.jstor.org/a-brief-history-of-tobacco-in-america/](https://www.jstor.org/stable/47711111).



Figure 2: Composition of a Cigarette

The Rolling Paper

A thick parchment known as rolling paper or paper roll holds cigarettes together. The paper consists of wood pulp and a mixture of other wood or organic material pressed into long sheets. Each tobacco company developed its rolling paper, the product of rigorous testing to produce an ideal burn rate. Tobacco companies alter the makeup of the paper by adding other chemicals and additives to promote the burning rates⁴.

In 1984, RJ Reynolds produced a study on the effects of paper burn additives on cigarette performance. The study established that rolling paper across the industry contains chemical additives. The purpose of modifying the paper is to alter the burning characteristics of a finished cigarette; “burning rate is reduced, nicotine delivery is enhanced, and most importantly, carbon monoxide delivery is significantly reduced”⁵. This information sets the standard as it proves one of the ways chemical additives affect cigarette smoking. It also confirms the manipulation of rolling paper occurred before the Townsend study in 1984. The Townsend study also disclosed

⁴ FDA. *How a Cigarette Is Engineered*, Oct. 2016, www.fda.gov/media/101198/download.

⁵TOWNSEND DE, RJR. THE EFFECTS OF PAPER BURN ADDITIVES ON CIGARETTE PERFORMANCE. 1984 November 08. Council for Tobacco Research Records; Master Settlement Agreement. Unknown. <https://www.industrydocuments.ucsf.edu/docs/rhrc0005>

that by adding chemicals to the cigarette paper, the burn rate of cigarettes is much slower⁶. The slower the burn rate, the higher the nicotine concentration the smoker receives. The higher the nicotine concentration, the more likely the smoker will become addicted. The consumer inhales the chemicals in the tobacco blend and rolling paper, increasing the ingestion of chemicals. Nowhere on a cigarette package are the chemicals disclosed directly in the paper. The Townsend study represents companies' proactive measures at every stage of cigarette production— including the rolling paper. Although it may not be the primary motive, it is essential to note the increases in cigarette chemicals.

The Concoction of Tobacco Filler

A machine rolls the paper into a small cylinder and fills it with a mixture of tobacco and additives. As with rolling papers, tobacco companies have experimented with various blends and flavors to attract and keep more customers. Two elements are universal in this industry: tobacco and nicotine. However, tobacco is the ingredient noted on the ingredient lists; nicotine is a natural ingredient in the tobacco plant. There are cancer-causing substances found only in cigarette smoke—such as nitrosamine—that are byproducts of tobacco burning. For example, a Lucky Strike active blue cigarette— a popular cigarette in the early 1910s to 1940s— and Newports 100 cigarette—today's most popular choice since 1993—contain different tobacco blends. The blend compounds utilize sugars, keeping the flavoring of the cigarette relatively sweet. The blends vary in intensity and flavoring; the Lucky Strike contains cocoa and cocoa⁷

⁶ Ibid.

⁷ “Brand Compounds; Lucky Strike.” *R.J. Reynolds Tobacco Company*, rjrt.com/commercial-integrity/ingredients/brand-compounds/.

products, while the Newport contains licorice⁸. The blend variations allow smokers to choose their flavor preferences.

Studies prove the goal of creating a sweeter taste was to keep women and children enticed more to smoke cigarettes and to adapt to the flavor profile of youth. The intended consumers of the harsh flavoring or more tobacco-forward-tasting cigarettes were men. The variability in flavor allowed each consumer to feel noticed and pleased by the cigarette. Women and children now have cigarettes that play to their taste buds, creating an entirely new consumer group. Many researchers suggest the flavors represent a form of targeting specific consumers. Many believe flavors such as cocoa purposefully appealed the flavor palate of children. In turn, tobacco companies utilized children's flavor preferences and applied the preferences to their cigarettes. These statistics will be discussed in detail later in the marketing strategies section.

The Tobacco Plant

Different companies manipulate the tobacco plant genetically, enhancing its effects, flavors, intensities, and other factors; this introduces the product to new consumers or improves the relations with their current customers. Machines finely grind down tobacco leaves, stems, and scraps⁹ into cigarettes. In this blending process, tobacco companies blend their well-researched concoctions of additives. These additives and tobacco plant by-products change the burning and smoking process of a cigarette. For example, nicotine is the by-product of burning

⁸ "Brand Compounds; Newport 100s." *R.J. Reynolds Tobacco Company*, rjrt.com/commercial-integrity/ingredients/brand-compounds/.

⁹ FDA. *How a Cigarette Is Engineered*, Oct. 2016, www.fda.gov/media/101198/download.

tobacco¹⁰, creating cravings and addictions in the human brain. Tobacco internal research labs did extensive research to find the best way to enhance the inhalation of nicotine and how nicotine affects the average smoker. Philip Morris experimented with different blends of different tobacco plants to produce the best product. On their websites, Philip Morris discusses the process of creating their product. The first step they discuss is the tobacco plant and processing tobacco. The experts working on behalf of Philip Morris “use their detailed knowledge to carefully select the blend of different tobacco types (such as Virginia, burley, and Oriental) and leaf grades used in our cigarette brands”¹¹.

Philip Morris concedes that their cigarettes contain humectants. “Some ingredients, such as humectants, help maintain the moisture and pliability of the tobacco leaf. Others contribute to the taste and aroma of the tobacco leaf smoke”¹². Humectants are toxic chemicals that lead to degenerative health issues. Humectants chemically change cigarettes by extending their shelf life. Different types of humectants used in cigarettes, such as propylene glycol and glycerol, dilute nicotine into a dense, usable, and potent¹³ solution. This process absorbs nicotine quickly and significantly, allowing rapid absorption into the bloodstream, thus altering the human brain. Other forms of humectants and sugars in cigarettes, such as “acetaldehyde, formaldehyde,

¹⁰ “Nicotine Is Why Tobacco Products Are Addictive.” *U.S. Food and Drug Administration*, FDA, 29 June 2022, www.fda.gov/tobacco-products/health-effects-tobacco-use/nicotine-why-tobacco-products-are-addictive#2.

¹¹ “Making Cigarettes: What’s in a Cigarette.” *Philip Morris International*, www.pmi.com/faq-section/smoking-and-cigarettes/how-cigarettes-are-made.

¹² Ibid.

¹³ Gupta, Alpana K, and Ravi Mehrotra. “Presence of High Level of Sugars, Humectants, and Their Toxic By-Products in Diverse Tobacco Products.” *Oxford Academic*, Oxford University Press, 13 Jan. 2021, academic.oup.com/ntr/article/23/7/1259/6092750?login=false.

acrolein, and acrylonitrile, are prominent features of toxicity in tobacco products¹⁴. Tobacco companies such as Philip Morris mention that they use humectants but do not discuss their dangers. Instead, they promote the use of humectants—stating that they are necessary for Philip Morris to create the best product. The lack of acknowledgment of humectants represents the deception by tobacco companies such as Philip Morris. In this case, the companies take the facts that humectants are dangerous and state that they are necessary and omit their hazardous nature. The consumer must research the products in cigarettes; the company does not explain the chemicals in their products and their dangers.

Nicotine

Nicotine goes together with addiction, as one is dependent on the other. Nicotine provides a stimulant in the brain, causing an individual to feel good or relaxed for a short period. Nicotinic cholinergic receptors (nAChRs) are activated when nicotine enters the brain, releasing dopamine and other neurotransmitters, causing pleasure, stimulation, and mood modulation¹⁵.

A study produced by the National Institute on Drug Abuse explains, “when cigarette smoke enters the lungs, nicotine is absorbed rapidly in the blood and delivered quickly to the brain, so that nicotine levels peak within 10 seconds of inhalation”¹⁶. As a result, the natural wiring in your brain changes, associating cigarettes with this feeling. Repeated use of nicotine causes long-term damage, requiring the consistency of nicotine; without the consistency of

¹⁴ Ibid.

¹⁵ Benowitz, Neal L. *Nicotine Addiction*, 17 June 2010, www.ncbi.nlm.nih.gov/pmc/articles/PMC2928221/.

¹⁶ “Is Nicotine Addictive?” *National Institutes of Health*, U.S. Department of Health and Human Services, May 2022, nida.nih.gov/publications/research-reports/tobacco-nicotine-e-cigarettes/nicotine-addictive.

nicotine, the human body will go through withdrawal symptoms¹⁷. Brain rewiring of this nature can affect people differently, leading to different levels of addiction. The brain of one individual may become highly addicted to nicotine and the feeling that it provides, leading to intense psychological feelings such as withdrawal symptoms manifesting as irritability, depressed mood, restlessness, and anxiety¹⁸.

Nicotine can also condition the brain to associate certain behaviors with the addiction to cigarettes. As previously mentioned, many people associate drinking coffee in the morning with smoking a cigarette. In turn, this becomes a conditioned behavior or a habit. When repeated many times, such situations become a powerful cue for the urge to smoke¹⁹. The dopamine released when nicotine enters the bloodstream rewires the brain to rely on behavioral cues and addiction symptoms to resolve the craving.

The Filter

The machine applies the filter on one end after tightly packing the additives, tobacco, and other additional chemicals. The filter consists of fine fibers tightly pulled together, designed to trap smoke and harmful chemicals from being inhaled. The filter varies depending on the brand and type of cigarette. In doing so, the amount of chemicals and toxins inhaled varies– which the tobacco companies have spent decades researching. The purpose of a filter on a cigarette is not to prevent the chemical additives and nicotine inhalation; it is to prevent tobacco flakes²⁰ and larger

¹⁷ Ibid.

¹⁸ Benowitz, Neal L. *Nicotine Addiction*, 17 June 2010, www.ncbi.nlm.nih.gov/pmc/articles/PMC2928221/.

¹⁹ Ibid.

²⁰ Evans-Reeves, Karen, et al. “The ‘filter Fraud’ Persists: The Tobacco Industry Is Still Using Filters to Suggest Lower Health Risks While Destroying the Environment.” *Tobacco Control*, BMJ Publishing Group Ltd, 22 July 2022, tobaccocontrol.bmj.com/content/31/e1/e80.

tar particles from entering the mouth and lungs. Many associate the cigarette filter with preventative measures, making a cigarette safer. Society assumes the thicker the filter, the safer and better the cigarette. However, the denser the filter, the stronger and longer the smoker would have to inhale for the same effect as a thinner filter. Different types of cigarettes within the same companies have various types of filters. Some filters may have smaller and more holes than a filter of another kind of cigarette with larger holes and less frequency.

In 1967-- two years before a mandatory label act-- Brown and Williamson (which merged with RJ Reynolds in 2004 and now no longer exists) requested Market Research associates to study their filters. The study aimed to determine relative consumer acceptance of two 99 mm experimental filter cigarettes labeled #831 and #851²¹. The study was conducted across multiple US states, providing enough population variability to be considered valid. The experiment proceeded as such:

The researchers gave three hundred participants twenty packs of ten different types of cigarettes such as Kent, L&M, Marlboro, Parliament, Raleigh, Tareyton, Viceroy, Winston, Extra Long Filters, and Other .85mm filters²². Researchers instructed half of the participants to smoke a pack labeled #831 first, while the other half smoked a pack labeled #851 first—the rest of the packs they could smoke in any order they chose. After ten days, the researchers called

²¹ Master Research Associates. DOUBLEBLIND TESTING OF TWO 99 MM. EXPERIMENTAL FILTER CIGARETTES (#831 AND #851) A STUDY OF CONSUMER PREFERENCE. 1967 September. Brown & Williamson Records; Master Settlement Agreement. Unknown.
<https://www.industrydocuments.ucsf.edu/docs/nhcy0131>

²² Evans-Reeves, Karen, et al. "The 'filter Fraud' Persists: The Tobacco Industry Is Still Using Filters to Suggest Lower Health Risks While Destroying the Environment." *Tobacco Control*, BMJ Publishing Group Ltd, 22 July 2022, tobaccocontrol.bmj.com/content/31/e1/e80.

back the participants to question their preferences, buying likelihood, and to rate the quality of the products.

Two hundred eighty-four people completed the study and called back, responding with results favoring the 99 mm filter. 44% of the complete respondents preferred #831, 41% preferred cigarettes #851, and 15% expressed no preference²³. The study also contained some verbatim responses from the participants who explained their preferences. One states that “it has a softer taste and an easier draw. #851 is not so finished; it’s a little sharp– left a burning after a good inhale. #831 burned slow a good long (L&M)”²⁴. Another participant noted, “they had a better taste and stronger– a little fuller taste, you can taste something there. The tobacco taste is there (Winston)”²⁵. Some commonality of opinions is that cigarettes are slower burning and milder in flavoring.

Addiction

There is a term key that describes those who smoke cigarettes: addicted. Addiction can be defined more broadly and varies in studies. Some of the commonalities across definitions are: chronic, relapsing, compulsive, dependence, and causing physical or mental harm. The American Society of Addiction Medicine strictly defines addiction as “a primary, chronic disease of brain reward, motivation, memory, and related circuitry”²⁶. Addiction also varies in strength. Some

²³ Ibid.

²⁴Master Research Associates. DOUBLEBLIND TESTING OF TWO 99 MM. EXPERIMENTAL FILTER CIGARETTES (#831 AND #851) A STUDY OF CONSUMER PREFERENCE. 1967 September. Brown & Williamson Records; Master Settlement Agreement. Unknown.
<https://www.industrydocuments.ucsf.edu/docs/nhcy0131>

²⁵ Ibid.

²⁶ *Public Policy Statement: Definition of Addiction*, American Society of Addiction Medicine, 15 Aug. 2011, www.asam.org/docs/default-source/public-policy-statements/1definition_of_addiction_long_4-11.pdf?sfvrsn=a8f64512_4.

have minor effects, such as getting a craving once a day or weekly. Others may have more potent, more aggressive effects, demanding the substance hourly or multiple times a day. However, it does not mean that the individual with minor effects is not addicted; by definition, they are still considered addicted. Everyone has different feelings or cravings that are associated with addiction to cigarettes, which makes diagnosis difficult. There are some commonalities across studies connected to cigarette addiction.

According to the Mayo Clinic, addiction can present the following symptoms: continuing to smoke, having withdrawal symptoms when attempting to stop, keeping smoking despite health problems, and you give up social activities²⁷. Each of the symptoms has separate descriptions of what that symptom entails. If an individual cannot stop smoking, it means that they have made one or more serious, unsuccessful attempts at quitting smoking²⁸. Withdrawal symptoms also vary. According to Mayo Clinic, it describes the symptoms as: “attempts at stopping have caused physical and mood-related symptoms, such as strong cravings, anxiety, irritability, restlessness, difficulty concentrating, depressed mood, frustration, anger, increased hunger, insomnia, constipation or diarrhea”²⁹. If an individual continues to smoke despite being told of the development of heart or lung problems, they are considered addicted. Lastly, Mayo describes if an individual gives up social activities such as family and friend gatherings or refraining from going to smoke-free venues, that individual is considered addicted.

²⁷ “Nicotine Dependence.” *Mayo Clinic*, Mayo Foundation for Medical Education and Research, www.mayoclinic.org/diseases-conditions/nicotine-dependence/symptoms-causes/syc-20351584#:~:text=Your%20attempts%20at%20stopping%20have,keep%20smoking%20despite%20health%20problems.

²⁸ Ibid.

²⁹ Ibid.

Cigarettes, by their nature, were made to get ordinary people addicted to their product and provide a sensational feeling that only they could replace. Tobacco companies utilized extensive research to perfect the product inside and out, meticulously experimenting with chemical blends, perfecting the filters, and gauging the consumer results. In perfecting their product, the companies realized that if consumers were properly marketed and addicted, they would have a consumer for life. Hence, companies started their mission to create a slim cylinder that would make them billions over the following centuries.

Big Companies

There are thousands of tobacco companies, making it difficult to decipher. There are 17 tobacco companies; however, many have been bought or merged with three major companies.

The British American Tobacco—BAT --- company first embarked in the US under Brown and Williamson in 1927. BAT bought the company Brown and Williamson from a US family and began their tobacco empire in the US. Today, BAT company owns RJ Reynolds American Tobacco Company. British American Tobacco Company is a parent company to RJ Reynold American Tobacco Company, meaning they do not produce cigarettes. RJ Reynolds American Tobacco Company also has multiple branch companies: R.J. Reynolds Tobacco Company, Santa Fe Natural Tobacco Company, Inc., American Snuff Company, LLC, R.J. Reynolds Vapor Company, Modoral Brands Inc., RAI Services Company, and Reynolds Marketing Services Company³⁰. American Tobacco Company no longer exists, as it merged with Reynolds. However, they were the most popular cigarette manufacturer in the 1950s. RJ

³⁰ “Who We Are.” *R.J. Reynolds Tobacco Company*, rjrt.com/transforming-tobacco/who-we-are/#:~:text=Reynolds%20American%20Inc.%20is%20the,and%20Reynolds%20Marketing%20Services%20Company.

Reynolds America Inc. bought Lorillard in 2015, which manufactured Newport, Camel, Pall Mall, and Natural American Spirit³¹.

Philip Morris USA Inc.'s parent company is Altria; However, Altria does not make products and is just the single shareholder of the company. Philip Morris USA Inc. owns over a hundred different brands of cigarettes, most notably Marlboro; it started in London in 1847 but transitioned to the US in 1902, moving to New York. Their headquarters, flavor development, and research plants are in Richmond, Virginia.

Another critical company is Liggett, whose parent company is Vector. Liggett- Vector headquarters are in Durham, North Carolina, and Morrisville, North Carolina, holds their manufacturing plant. Liggett Vector produces major cigarettes: Pyramid, Liggett Select, Eve, Eagle 20s, USA, and Grand Prix³². Liggett Group was originally on its own producing products: Liggett Select, Pyramid, Eve, and Grand Prix³³. Liggett Group was considered a part of the Master Agreement in the US, which was between the tobacco industry and 46 States, and created the Vector-Liggett Group.

Early Testing and Studies on Cigarettes by Various Companies

Philip Morris

One of the primary goals of some companies is to discover why people smoke and how to keep a customer satisfied with their product for life. In January of 1959, Elmo Roper and

³¹ "Reynolds American Completes Lorillard Acquisition." *CSP Daily News*, CSP Daily News, 15 June 2015, www.cspdailynews.com/tobacco/reynolds-american-completes-lorillard-acquisition.

³² "Our Companies." *Welcome to Liggett Vector Brands*, Liggett Vector, liggettvectorbrands.com/about-us/.

³³ Ibid.

Associates presented a multi-volume study about three key questions: why people smoke, what a person is looking for in a cigarette, and how well the cigarette satisfies this need or want³⁴. Elmo Roper and Associates make it clear that the study does not care about predispositions such as what happened to an individual at age three or when the individual smoked their first cigarette. Instead, the study focuses on what makes the individual want to smoke.

The study found that the smokers desired a cigarette when idle or relaxing, tense, or when eating or drinking. A pivotal time was when drinking coffee, which is associated with the start of their day. The study highlights a relationship between coffee and a cigarette; the coffee acts as a stimulant, while the cigarette acts as a relaxant³⁵. The study also establishes a rather scary notion considering the period. Elmo Roper and Associates highlight that “while cigarettes are regarded as ‘bad for you’ to a greater extent than other products we are asked about, there is surprisingly little concern about the health aspect of cigarettes”³⁶. Tobacco companies were aware of the stigma surrounding their product; however, it did not hinder their sales, so they failed to address it. Elmo Roper and Associates discuss health concerns focused on throat irritation, which the subject thought a mildness or filter would solve. The smokers were bothered by the thought that they are victims of a habit but view it positively— as a satisfying habit or experience. Elmo Roper and Associates were shocked as even with the negative publicity and advertising, such as less nicotine and less tar, there is still positivity towards cigarettes.

³⁴ ELMO ROPER AND ASSOCIATES. VOLUME 1. A STUDY OF ATTITUDES TOWARD CIGARETTE SMOKING AND DIFFERENT TYPES OF CIGARETTES. 1959 January; 2012 August 29. Philip Morris Records; Master Settlement Agreement. Unknown. <https://www.industrydocuments.ucsf.edu/docs/nrkj0191>

³⁵ Ibid.

³⁶ Ibid.

The conversation shifts, discussing possible ways to portray cigarettes. For example, Elmo Roper and Associates suggest there was “fertile ground for promoting cigarettes as a ‘good friend’-- a friend that relieves tension, permits one to relax, and is comforting when alone or idle”³⁷. This relationship is a light-hearted way of creating a behavioral cue and associating cigarettes with pleasant behavior, developing a marketing strategy for Philip Morris. For example, advertisements must target working-class males who need a relaxing moment or a ‘friend’ to lean on after a long working day. The discussion continued, mentioning that women tend to smoke in social situations, while men tend to smoke alone. In their study, they gave both men and women a sentence completion question; the question was “I am inclined to smoke when I am_____”³⁸. The most common result was nervousness or tenseness; the second was alone, doing nothing, driving, and variations. The result appeals as a marketing scheme but now applies to both men and women. In the case of women, now Philip Morris knows how to create marketing that involves social gatherings with other women.

Elmo Roper and Associates also discuss how the importance of the filter in the public eye is not to prevent cancer but to help with the mildness in flavor, comfort in smoke inhalation, keeping the tobacco concoction out of their mouth, and overall taste³⁹. Also, neither the public nor general research knows the difference between a good or a bad filter, leaving the companies to their own will on how much of a filter they want to put on their product. This confusion allows Philip Morris to manipulate their advertisements to portray filters in any light they choose. At the time, there was no need to disclose any information about the nature of filters because the public

³⁷ Ibid.

³⁸ Ibid.

³⁹ Ibid.

and general research did not think it was terrible. The document continues, mentioning the current trend with recessed filters in the market. Their study concluded that the recessed filters are not popular but attract a minority group; this study represents an essential step in the marketing strategy. If Philip Morris wants to attract as many consumers as possible, not only do they have to tend to the majority, but they also have to pay attention to the minority. In this case, the minority prefers recessed filters, which may lead to Philip Morris creating a different cigarette with less production to please the minority group.

Y1 Tobacco Plant

The Y1 tobacco engineering represents one form of genetic engineering. In the 1970s, the company Brown and Williamson began genetically engineering their cigarettes to be more potent with nicotine.

Report number RD. 437 R, produced in 1966 by the British American Tobacco Company Research and Establishment, explains “extractable” nicotine and its effects on cigarette smokers⁴⁰. The goal of the study was to discover the association between the smoker and the “extractable” nicotine from a cigarette and why it occurs. The study defines extractable nicotine as the amount of nicotine that can be extracted from the cigarette by the smoker in a vapor form. The amount of nicotine consumed varies on numerous factors and findings.

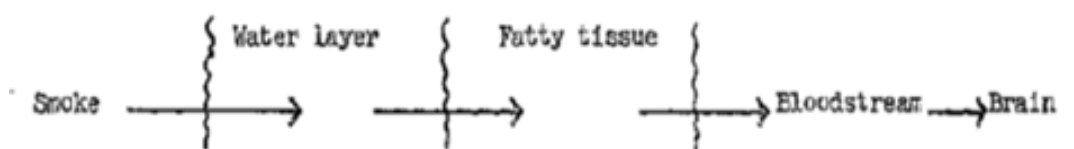
The study makes two critical findings about nicotine consumption. First, “when smoke is inhaled into the lungs, there is a virtually complete retention of nicotine for all cigarettes examined”⁴¹. This fact is essential as it targets where complete nicotine retention occurs. This

⁴⁰ BACKHURST,JD. FURTHER WORK ON \"EXTRACTABLE\" NICOTINE REPORT NO. RD.437-R; FURTHER WORK ON \"EXTRACTABLE\" NICOTINE REPORT NO. RD.437-R. 1966 September 30. Brown & Williamson Records; Master Settlement Agreement. Unknown.
<https://www.industrydocuments.ucsf.edu/docs/khyy0131>.

⁴¹ Ibid.

information allows companies to manipulate cigarettes so that consumers can inhale into their lungs the most amount of nicotine possible. In addition, the study provides the process that smoke goes through in the human system. As pictured below, it goes through multiple stages before reaching the brain.

Figure 3: Interaction of smoke with human system



As a result, the amount of nicotine gets diluted and is less effective. The report concludes that the higher the concentration rate of nicotine, there will be more nicotine in the vapor phase, which the smoker inhales. As a result, the nicotine will rapidly enter the brain as “... increased smokers’ response is associated with nicotine reaching the brain more quickly”⁴². The discoveries in report number RD. 437 R lays the foundation for companies to create an addictive product. Companies such as Brown and Williamson utilize this research to find ways of getting nicotine faster and in more significant amounts to the brain— exposing the smoker to extreme rewiring of the human brain.

Insider meetings between executives of BAT, the parent company of Brown and Williamson at the time, exposed the motives behind the Y-1 studies. As a result, the federal government and the general public began to look into the true nature of Y-1 varied tobacco. In 1994, the criticism against Y-1 and tobacco companies became public. According to the

⁴² Lewan, Todd. “Dark Secrets of Tobacco Company Exposed.” *Tobacco Control*, BMJ Publishing Group Ltd, 1 Sept. 1998, tobaccocontrol.bmj.com/content/7/3/315.

Commissioner of the Food and Drug Administration, the engineering of this “experimental cigarette made of reconstituted tobacco treated with ammonia has almost doubled the nicotine transfer efficiency”⁴³. This research provides further evidence of tobacco’s primary goal: to provide smokers with the highest potency of nicotine possible.

Additionally in 1998, editorials came out discussing various documents and reports released. In a document dubbed the *Y-1 Papers* written by Todd Lewan, he quotes multiple internal documents and interviews from the British American Tobacco Company. For example, Todd pulls quotes from internal memos in 1979 stating, “we are searching for explicitly for a socially acceptable addictive product involving: A pattern of repeated consumption; a product which is likely to involve repeated handling; the essential constituent is most likely to be nicotine as a ‘direct’ substitute for it”⁴⁴. This finding proves that the motive for the genetic engineering of Y-1 tobacco was to create an addictive pattern of users for life. In doing so, the company will have a consumer for life. Todd continues to reference conferences from 1979, stating, “In the B-14 experiment using three levels of nicotine citrate, the high nicotine is more tumorigenic (tumor-creating) and possibly more malignant”⁴⁵; this proves that tobacco companies were aware of the cancerous side effects of their products. Additionally, Todd quotes the senior BAT scientist who states, “If the nicotine delivery is reduced below a threshold ‘satisfaction’ level,

⁴³ WARREN E LEARY. Special to The New York Times. 1994. Head of F.D.A. tells of chemical manipulation: Cigarette company developed tobacco with stronger nicotine, head of F.D.A. testifies. *New York Times* (1923-), Jun 22, 1994. <https://ezaccess.libraries.psu.edu/login?url=https://www.proquest.com/historical-newspapers/head-f-d-tells-chemical-manipulation/docview/109396405/se-2>

⁴⁴ Unknown. US The Y-1 Papers (Embargoed Until 20 September Includes Points from Brown and Williamson Statement). 1998 September 17. British American Tobacco Records. Unknown. <https://www.industrydocuments.ucsf.edu/docs/tqny0202>.

⁴⁵ Ibid.

then surely smokers will question more readily why they are indulging in an expensive habit”²³⁴⁶.

Essentially, BAT understood to have a consumer for life, they must be addicted to nicotine, and their product must contain that addictive level of nicotine.

⁴⁶ Ibid.

Chapter 3

Deception for Demand

Mass media control via Company Interviews

Before extensive tobacco media campaigns, various medical researchers published works linking smoking and health to smokers. Medical experts and doctors saw influxes in cases of cancers and respiratory diseases, which were rare in prior years; they sought an answer to the growing problem. Numerous publications in the early 1910s through the 1940s raised public concern. The rising lung cancer and respiratory disease rates concerned the American public and medical field. In the wake of medical studies and research cultivating throughout the US, tobacco company CEOs and officials scrambled to delay research and fear. Tobacco companies utilized their leverage; tobacco companies know the exact ingredients in a cigarette, and the consumers will believe what the producers of cigarettes say. The American public felt fear surrounding the documents and research becoming more prevalent in the media. The tobacco companies placed roadblocks throughout the media. Tobacco companies conducted studies simultaneously; their research was privately funded and controlled within their labs. The studies conducted in tobacco laboratories sought exploitative results; the objective was to increase nicotine rates and promote cigarettes.

American Tobacco Company 1953 Attack

On November 26, 1953, the President of the American Tobacco Company, Paul Hahn, issued a press release on cigarettes and the research produced. President Hahn discussed smoking and lung cancer. In his release, he stated, “that the public should be reassured on the subject of smoking and health, he pointed out that no one has yet proved that lung cancer in any human

being is directly traceable to tobacco or to its products in any form”⁴⁷. He also said the following:

“Believing as we do that cigarette smoking is not injurious to health, I feel that a statement of reassurance to the public should be made. What the public wants to know about is whether it is true that smoking has been proved to contribute to the incidence of lung cancer. The facts of course, is that it has not been so proved. With all respect to the sincerity of those who have been working in the field of lung cancer research, there has been much loose talk on the subject as reported in the press during recent months. Tobacco is enjoyed by so many millions of people that it is only natural that this kind of comment should create public controversy and therefore result in considerable publicity”⁴⁸. This section of the statement plays two significant roles; first, it assures the public that tobacco companies do not have any reason to believe cigarettes are related to lung cancer. Second, the statement condemns research and studies produced at the time for correlating cigarettes and lung cancer. President Paul Hahn contorts the studies and findings to make it seem their sole purpose is to gather publicity.

President Paul Hahn lists a series of ‘facts’ that the tobacco companies portray as confident facts. “The public is entitled to know the facts. They can be stated briefly, unmistakably, and confidently:

1. Undoubtedly lung cancer is now more common than it was one or two decades ago; also undoubtedly cigarette smoking has increased, as have other habit and conditions of modern life. But that does not prove that cigarette smoking produces or contributes to lung cancer.

⁴⁷ American Tobacco Company. U.S Exhibit 59,809, Press Release, re: Loose talk on smoking in relation to lung cancer, AMERICAN TOBACCO CO., November 26, 1953. 1953 November 26. Depositions and Trial Testimony (DATTA); RICO Privilege Downgrades Collection. Unknown. <https://www.industrydocuments.ucsf.edu/docs/gjdb0035>

⁴⁸ Ibid.

2. With all the research being conducted in this field, no one has yet proved that lung cancer in any human being is directly traceable to tobacco or its products in any form.
3. Authorities themselves differ widely. For every expert who blames tobacco for the increase in respiratory disease there are at least two others who speak with at least equal authority, who say that there is no evidence to show that tobacco is the cause.
 - a. There are scientists are convinced that the growth of cigarette smoking and the increase of lung cancer are grounds for suspecting a link. On the other hand, there are many scientists who report that the statistics which are supposed to show a link between the rise in lung cancer and the increase use of cigarettes are faulty, unreliable, and of ten-times meaningless.
 - b. There are a few scientists who report that by using a high concentration of cigarette smoke—entirely different from the smoke which a person draws from a cigarette—and painting it on the skin of mice, they might have produced skin cancers on the mice. On the other hand, there are many more scientists of high repute who have made similar experiments and have reported that no cancers were produced. Moreover all scientists agree that there is no known relation between skin cancer in mice and lung cancer in humans.
 - c. There are scientists who point to the possibility that numerous other causes may be responsible for the increase in lung cancer. For example, only a few weeks ago it was authoritatively reported to a group of scientists meeting in New York that polluted air over large cities may be the major cause of the increase in this disease”⁴⁹.

In stating these facts, President Paul Hahn creates massive doubts about research and doctors. He makes a new standard that many consumers will believe, which ties back to the argument of excellent cigarette knowledge. People will feel that the CEOs and Presidents are more knowledgeable than the researchers because they oversee the product. In these facts,

⁴⁹ Ibid.

President Hahn belittles any medical research done at this time. He explains that much of the work is too vague because it did not use treatment on humans and utilized animals. President Hahn highlights how much of the work is ‘easily’ disbanded by other medical researchers they have used. However, this form of media and press releases represent the manipulation tobacco companies used to settle the fear in the American public. Although the President says there is no evidence or reason to suspect a link between lung cancer and cigarettes, the tobacco companies created their own studies and gathered information proving the contrary; tobacco companies knew that there was a link and exploited the critical areas in studies that hold a grey area. Tobacco companies used the facts and ethics of studies against research.

The President of American Tobacco assures the American public that research done by tobacco companies is occurring behind the scenes. “The American Tobacco Company is working and supporting scientific research of a fundamental nature in this field, within its own laboratory and independent institutions. It is our policy, within the limit of avoiding duplication of research, to extend our cooperation to projects where we believe that the researchers are approaching and will approach the subject without prejudice and without preconceived opinions on the problem to be investigated”⁵⁰. This press release section explains how American Tobacco Company aids the research. This section portrays a willingness and readiness to support research on healthy tobacco smoking and research. However, particular wording represents the opposite; studies should ‘avoid duplication,’ meaning that current studies produced cannot occur again in their laboratories. Also, ‘without prejudice and without preconceived opinions’ could be spun to suggest that current researchers all have prejudice and preconceived opinions about cigarettes and, therefore, cannot take part in research in their laboratories. The notion of tobacco companies

⁵⁰ Ibid.

using their ‘own laboratory and independent institutions’ is questionable. How does one truly know that these ‘independent institutions’ will be truly unbiased and helpful towards health and not the company? There is no reassurance of true ambiguity. One must remain skeptical of tobacco companies' pay or influence and if they frame the results of studies. The average American will believe that the research produced by independent institutions will reflect the truth. The section also leads to many Americans disregarding the current studies because the ‘new and improved’ studies produced by the tobacco companies will represent accurate studies.

President Paul Hahn wraps up the statement; he believes that the result of the independent studies will sufficiently conclude that there is no correlation between cigarette smoking and lung cancer. “All this represents an intelligent, objective approach to a subject that otherwise is susceptible to more or less sensational exploitation. We are confident that long-range, impartial investigation and other objective research will confirm the view that neither tobacco nor its products contribute to the incidence of lung cancer. We wish the public to know these facts so that they may be informed and also be in a position to deal with the subject when misinformation comes to their attention”⁵¹. President Hahn calls the public to ignore all the research and information disseminated throughout the medical field and take their words as truth. The President pleads that their studies prove that smoking is not dangerous; the independent studies already contain an imposed bias. Interestingly, instead of pulling the products off the shelf and conducting research, the tobacco companies intend the public to continue smoking—if not more—because the tobacco companies say cigarettes are safe.

Philip Morris ‘Facts Versus Fancy’

⁵¹ Ibid.

On February 26, 1954, the Vice President of Philip Morris produced a similar press release to the states of Florida, Georgia, North Carolina, South Carolina, Tennessee, Alabama, and Mississippi. George Weissman, Vice President of Philip Morris, took a more abrupt approach toward research regarding smoking and lung cancer. He starts his statement with Shakespeare, which ties to the title's notion of 'fancy'. "Let me preface my remarks by paraphrasing Shakespeare and saying that I have come here to praise—not to bury—the cigarette industry"⁵². This statement represents immediate bias against any research and information condemning cigarette companies. George Weissman continues, "for there are a lot of black gloomy headlines today with fantastic predictions of 'slumps', 'declines' and 'Disaster' that are just not true"⁵³. Immediately, George Weissman attacks the current research and information by stating it is untrue.

He continues to use a common language, making it simple to understand. "I am here today because of the mutuality of interest in which has existed between the vending industry and Philip Morris these many years. I am here today because I know cigarettes are as much a bread-and-butter proposition with you as with us. I am here today because of the eighth annual census of VEND recently outlined the following picture of your business for 1953:

1. More than \$1 and a half billion in coins were stuffed into your machines last year, an all-time record, surpassing 1952 by \$200 million.
2. Nearly 500,000 cigarette vending machines sold approximately 700 billion cigarettes, or 18% of the national domestic total for \$760,000 vending sales, or half the vending industries total income.

⁵² Unknown. FACTS VERSUS FANCY. 1954 February 26; 2012 August 29. Philip Morris Records; Master Settlement Agreement. Unknown. <https://www.industrydocuments.ucsf.edu/docs/mxmj0191>

⁵³ Ibid.

3. However, this census also noted that cigarette packs sold per machine per week decline from an average 120 to 119. This may be accounted for by the greater number of machines, but there is another factor which I would like to discuss later”⁵⁴.

This section represents the average amount of money the states gather from their cigarette vending machines. It also breaks down the tobacco company’s vending machine sales. It also tells how cigarettes are easily and readily available to anyone with the coins to buy them. Although it does not directly say these sales are more accessible for kids, it does represent the minimal ‘security’ in buying cigarettes; in other words, a child could walk up to the vending machine and buy cigarettes. But that does not matter because the child is a sale – a win—for the tobacco companies.

Vice President Weissman then transitions to how the market—vending machine sales—may be affected by current media. “It is true that people are getting nervous reading stories about the relationship of smoking and health that they are: 1. Giving up reading? 2. Smoking more because they are nervous? Is the industry in decline ranging from anywhere from estimates, I have read, of 2 to 5%? Unfortunately, neither I nor anyone else in this country have the facilities to measure the sale of each package of cigarettes to a retail customer. I can only give you the government figures which correspond most closely to the actual picture”⁵⁵. This statement represents how the tobacco industry is well aware of the studies and information dispersed and is most fearful of how it affects their sales, not the health of their consumers. Vice President Weissman continues to break down the revenue and statistical effects on sales in various states.

⁵⁴ Ibid.

⁵⁵ Ibid.

Most importantly, Vice President Weissman discusses the effects of the ‘scare’ in the media on sales. He states, “I know statistics are boring but I cite these to say that there is no reason for panic, or for the ‘scare’ headlines which have appeared in the press”⁵⁶; this represents that the preventative actions taken by tobacco companies against the press works. Vice President Weissman continues, “Rather, I feel, we in the industry should look on these statistics as proving the second best—and possibly the best year—in the history of the tobacco industry”⁵⁷. This sentiment reassures the states to continue their investment in cigarettes. The Vice President attempts to continue sales consumption and promote their product more. It also represents how the medical press does not deter consumers. He continues to provide evidence against claims of a decline; “In relation to this, I should like to refer to a recent Department of Agriculture Bulletin (October 1953) which estimates that potential smokers have increased at the rate of over 1,000,000 a year since 1940 and will do so until 1960 when there will be approximately 125,000,000 potential smokers. The bulletin pointed out that ‘the rapid widening of the potential smoker base is a factor of utmost importance of the trend in cigarette consumption over the long term, as well as for the near future’”⁵⁸. Once again, this belittles the effects of media. The mainstream news creates publicity for cigarettes; as a result, cigarettes become a buzzword and hot topic that the public wants to take part in. Some may argue that media attention draws new consumers to cigarettes. As the companies produce documents against medical research, more consumers and new consumers feel reassured about smoking.

⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ Ibid.

Vice President Weissman highlights the importance of consumers in their market. He emphasizes how the cigarette market depends entirely on consumers and their money. “The coin receptacle on your machines or the change tray in the retail counter is the ballot box in the marketplace of democracy. The consumer is the person who votes for his choice as to product and either will make it and sell it—or we suffer”⁵⁹. The consumers drive their wealth. Tobacco companies are utterly dependent on their consumers. The States are also at the mercy of the consumers. Many states collect taxes on cigarettes and vending machines, which draws in a profit. If the sales of vending machines and cigarettes drop, the profit the States gain also drops. The states and tobacco companies mutually agree to promote profit for cigarettes.

Using Doctors and Women

Society adores media. Media allows individuals to gather information about topics of their choice. Thousands of Television shows, newspapers, social media platforms, and other forms of media flood the American Public. The media forms have changed over the decades, but many media tactics remain the same. In the 1920s, tabloids fluttered throughout the streets, promoting the new era of Jazz and gender socio-political changes. In the 1930s, the wake of the Great Depression and World War II sent turmoil into the media; Radio journalism entered the stage, supporting the newspapers and tabloids carried over from previous years. Brightness and sadness filled the 1940s but also led to significant media innovations. Media boomed with comic books, broadcast media, newspapers, and televisions. The introduction of various media styles allowed multiple companies to target demographics and fill American’s minds with their products.

⁵⁹ Ibid.

Tobacco companies strategically used women and doctors in their media. Both members of society draw the attention of their consumers. For some consumers, there is great importance in doctor's opinions; their opinions provide accurate information on the health conditions that come with various illnesses or products. For other consumers, image and beauty persuade their decisions on consumption and societal norms. Throughout history, women have been crucial in deeming beauty standards and acceptable behavior. Many tobacco companies, including RJ Reynolds, British American Tobacco, and Liggett Group, used this demographic to portray their cigarettes as desirable and healthy.

Lucky Strike, famous from the 1920s through 1940s, also promoted their cigarettes in a positive light by using doctors' comments and surveys. Lucky Strike began creating advertising featuring doctor statistics and beautiful women as it drew the attention of their primary consumers, men and women. In 1928, Lucky Strike produced an advertisement emphasizing



Figure 4: 1928 "It's Toasted"
Lucky Strike Advertisement

three features: a lovely woman, a Lucky Strike package, and the phrase "It's toasted"⁶⁰. The woman pictured is Betty Compson, a famous silent film actress in the late 1920s and early 1930s. She states, "On the set— they are smooth", suggesting that she smokes mostly Lucky Strike cigarettes. Below that statement, it furthers with quotes from her continuing, "Now I know why men

⁶⁰ "Ad Collections." *SRITA*, 1928, tobacco.stanford.edu/cigarettes/doctors-smoking/20679-physicians/#collection-8.

smoke Luckies. They are certainly marvelous and the only cigarette I know that offers pleasure and throat protection”⁶¹.

These remarks appeal to both men and women; they give men validation for smoking Lucky Strikes from a famous actress and entice women to try to smoke Lucky Strikes because they offer pleasure and protection. After her testimony, the advertisement provides medical statistics. “20,679 doctors in June 1928 had written that Lucky Strikes are less irritating to sensitive throats than other cigarettes”⁶². This ties in with the common theme of Tobacco companies using doctors to promote the thought of smoking being healthy.

Carrying on this advertising method, Lucky Strike published similar styles but adapted



Figure 5: 1930 "20,679 Physicians Say Luckies Are Less Irritating" Lucky Strike Advertisement

the advertisements to trends and popular social culture. For example, the 1930 advertisement places in big lettering that “20,679 Physicians say Luckies are less irritating”⁶³, insinuating that they are better because they are less irritating. In addition, it pictures a beautiful woman smoking, saying, “I too prefer Luckies because toasting removes dangerous irritants...”⁶⁴. The overall composition of this ad promotes the mindset that Lucky Strike cigarettes are healthier because they remove dangerous irritants, and

doctors state that they are less irritating. They also utilize elaborate color schemes, making the

⁶¹ Ibid.

⁶² Ibid.

⁶³ “Ad Collections.” *SRITA*, 1930, tobacco.stanford.edu/cigarettes/doctors-smoking/20679-physicians/#collection-2.

⁶⁴ Ibid.

lettering pop a reader's attention and explicitly catering to the male gaze— picturing a beautiful woman smoking a cigarette and stating why she likes Luckies.

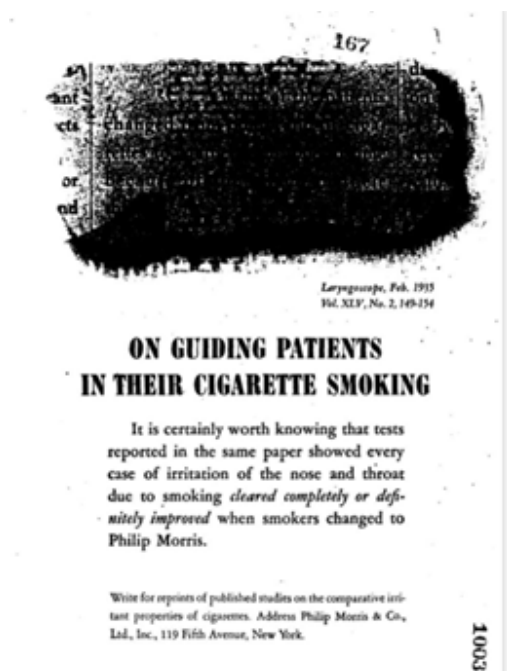


Figure 6: 1935 “On Guiding Patients in Their Cigarette Smoking” Philip Morris Advertisement

Some advertisements outright state their intended audiences: Doctors and their patients. Philip Morris also strategically used their advertisements to guide smokers and patients. In 1935, Philip Morris published multiple advertisements as a guide for various patients. The documents pose as the one pictured below. The articles state that “irritation of the nose and throat due to smoking cleared completely or definitely improved when smokers changed to Philip Morris”⁶⁵; this insinuates that patients who suffer from nose and throat irritation should not stop smoking, just change brands.

Additionally, this advertisement style may cause smokers to doubt the advice they receive from doctors. For example, if a smoker goes to his doctor and complains of throat and nose irritation, the doctor may advise him to stop smoking until these symptoms subside. The smoker will read this article and see a way to lessen these symptoms without stopping, disregarding what a medical professional advises. Also, this advertisement style may cause the smoker to believe that since the company makes the product, they know what is best to minimize symptoms such as irritation. Another possible reader is doctors acting as “guiding patients in

⁶⁵ “Ad Collections.” *SRITA*, 1935, tobacco.stanford.edu/cigarettes/targeting-doctors/advice-for-patients/#collection-5.

their cigarette smoking”⁶⁶. Similarly to a smoker's train of thought, the doctor may think their recommendations are superior since the manufacturer knows the symptoms. Since the company is aware and making active claims of minimizing symptoms, it must be healthier if the symptoms subside.

The advertisement headline follows their strategy of “advising patients on smoking”.

However, this advertisement directly targets doctors in specific sentences. It states that “With the many and varied claims made by cigarettes, *you* can be of assistance to your patients”⁶⁷. This advertisement draws the reader in, both doctors and smokers, as it sheds light on the common disparities during this time. During the 1930s, doctors continued to notice an increase in lung cancer but did not know the cause. Some argued that cigarettes were the cause but had no direct evidence at this time. Producing such advertisements reassures doctors on edge and ensures manufacturers know these concerns. The advertisement continues with efforts to reassure doctors, “due to the use of diethylene glycol instead of glycerin Philip Morris have been proved less irritating than other cigarettes... proved so conclusively that the medical profession recognizes the substantial nature

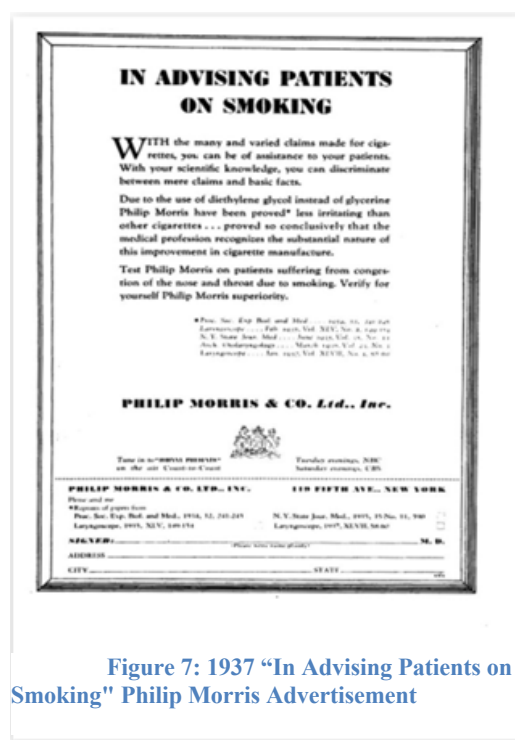


Figure 7: 1937 “In Advising Patients on Smoking” Philip Morris Advertisement

⁶⁶ Ibid.

⁶⁷ “Ad Collections.” *SRITA*, 1937, tobacco.stanford.edu/cigarettes/targeting-doctors/advice-for-patients/#collection-14.

of this improvement of cigarette manufacture”⁶⁸. This statement acts to reassure both doctors and smokers.

Tobacco companies utilize their media department to instill into the American public



mind that smoking is not bad for human health; for example, in 1946, Camel used pictures of both women and doctors promoting smoking. Camel, owned by RJ Reynolds, employed many advertisements in popular newspapers to encourage the use of their cigarettes. As seen in the picture, the article's title states, “More Doctors Smoke Camels Than Any Other Cigarettes”⁶⁹. The article uses a survey to state that Doctors smoke Camel cigarettes. Under this assumption, it poses the thought that if

Figure 8: 1946 “More Doctors Smoke Camels Than Any Other Cigarette” RJ Reynolds

Doctors smoke cigarettes, then it is safe for ordinary people to

smoke cigarettes—specifically camels. In addition, it discusses how to smoke their cigarettes by challenging smokers to use the T-zone. The T-zone at the bottom of the image represents the areas affected by smoking cigarettes: mouth, nose, and throat. It states that the T stands for taste and throat, labeling the throat as the most “critical laboratory for any cigarette”⁷⁰. This statement

⁶⁸ Ibid.

⁶⁹ “Ad Collections.” *SRITA*, 1946, tobacco.stanford.edu/cigarettes/doctors-smoking/more-doctors-smoke-camels/#collection-2.

⁷⁰ Ibid.

promotes the deep inhalation of smoke into the throat, creating high levels of nicotine consumption.

During this time, women were advancing their employment opportunities, such as lawyers, doctors, and other influential fields. However, there was a backlash towards women working in specific fields, and very few women could take on these opportunities. RJ Reynolds and multiple other companies were aware of the social atmosphere at this time and used it to their advantage. The article represents women advancing in the medical industry by plastering a picture of a woman doctor with a small comment thanking women for their perseverance, then discussing how much doctors love their product. It not only entertains the male eye by showing an attractive nurse but also acknowledges the female audience by promoting their freedom of employment. It shines RJ Reynolds as an advocate for the women's movement, which may turn more women to smoke Camel as the brand supports their rights.

Liggett Group was also involved in women- and doctor-focused advertising. Liggett Group produced advertisements specifically for their brand Chesterfield. It highlights both women's and doctor's statements. In this image, it gives three reasons why one should smoke a cigarette. First, it discusses the quality of their product compared to other brands. The advertisement explains that Chesterfields contains 15% higher "good quality"⁷¹ ingredients compared to other competitors; however, it does not list what ingredients— only mentioning the ratio of sugar to nicotine rate.



Figure 9: 1953 "Years Ahead of Them All" Liggett Group Advertisement

⁷¹ "Ad Collections." *SRITA*, 1953, tobacco.stanford.edu/cigarettes/for-your-health/best-for-you/#collection-7.

The second point mentions the health factor of their cigarettes, stating that a medical specialist finds “no adverse effects to nose, throat, and sinuses from smoking Chesterfields”⁷². The ad also features Rhonda Fleming, a famous actress– nicknamed the Queen of Technicolor. The advertisement is very successful for two reasons: it pleases the intended audience’s gaze by utilizing bright colors and a beautiful actress and using statistics and a medical specialist report. This information subdues the continuing fear of cigarettes being dangerous to health and promotes their product as the social culture changes over the decades.

⁷² Ibid.

Chapter 4

Medical Reports

Early Awareness of Illness in Widespread Medical Research

In the late 1940s and early 1950s, most of the American smoking public began to deteriorate in health. Many doctors noticed a drastic increase in lung cancer and determined through their patients the possible causes of this increase. However, evidence suggests scientists were aware of possible health detriments as early as 1912.

In 1912, Dr. Issac Alder published a novel discussing primary malignant growths of the lungs and bronchi. His book is a collection of international studies debating the presence of lung tumors and their tendencies. Aspects of his discuss age, sex, heredity, and race. Dr. Alder notes that statistics prove lung tumors are more common in men than women. He accredits this to “the domestic life led by women, with their consequent retirement and immunity from the irritations and traumatisms which must be frequent in the more unprotected life of men (the abuse of tobacco and alcohol, the many trades and vocations which are accompanied by irritations of the respiratory organs, etc.) has been adduced in explanation of this fact”⁷³. This information represents that tobacco is a crucial feature that doctors deem an irritation and traumatism in a man’s life. Additionally, this is the first mention of tobacco being a cause of lung tumors, which gives doctors a precautionary warning about what they will discover.

In 1939, doctors and researchers noted an increase in lung cancer while other diseases decreased. The researcher notes that usually lung cancer affects those who are in their 50s, never the youth. In addition, the researcher notes that patients with lung cancer were sporadic. He notes

⁷³ Alder, Issac. *Primary malignant growths of the lungs and bronchi; a pathological and clinical study*. New York, NY: Longmans, Green and Co., 1912. 22.

that “as a student in the years of 1915 to 1923, I have not seen a single case of lung carcinoma.... Unfortunately, this kind of cancer is no longer a rare disease in our present time”⁷⁴. He notes that smoking is the reason why most men are getting lung cancer; “tobacco, therefore, is the culprit”⁷⁵. This document represents the spark of questioning in the medical field. From this report forward, private and public research groups dive into the various diseases with possible links to smoking.

In 1953, RJ Reynolds hired various research labs to study their product. A study provided by Fritz Linkint discusses tobacco smoke as a cause of lung cancer. The purpose of this study was to “present as complete as possible a proof of fault of tobacco smoke— specifically of cigarette smoke— for the enormous [above cited] increase in lung cancer”⁷⁶. Fritz acknowledges something very shocking: an even earlier link between smoking and lung cancer. He notes that it was “already suspected in 1912 that a causal relation might exist between tobacco smoke and lung cancer”⁷⁷; this admission is shocking because it represents that tobacco companies were aware of a possible link but did not care to examine it further. The study discusses various regions of the human body that smoking may affect.

A news article in 1959 references the finding by Dr. Harold F. Dorn, chief of the Biometrics Branch, Division of Research Services, National Institute of Health. It states that “a specific study showed the death rate of heavy smokers (two packs or more a day) was nearly

⁷⁴ Huismann, R.. Tobacco and Lung Cancer - Increase of the Disease of Lung Cancer. 1939. Ness Motley Law Firm Documents. Unknown. <https://www.industrydocuments.ucsf.edu/docs/yjjw0040>

⁷⁵ Ibid.

⁷⁶ LICKINT F; UNK. TOBACCO SMOKE AS A CAUSE OF LUNG CANCER.. 1953 January 01; 1985 June 17. RJ Reynolds Records; Master Settlement Agreement. Unknown. <https://www.industrydocuments.ucsf.edu/docs/ljmb0086>

⁷⁷ Ibid.

twice as great as for nonsmokers”⁷⁸. Dr. Dorn surveyed about 200,000 veterans who were dying of their smoking habits, finding “the death rate from lung cancer of men who smoked more than a pack of cigarettes a day was nearly 16 times the rate for nonsmokers”⁷⁹. This is a staggering report, causing many to fear what the true nature of cigarettes is. Additionally, the study revealed that additional illnesses resulting from cigarette smoking, such as esophageal cancer, were double the rate of nonsmokers. In this same article, the tobacco companies’ researchers denied this finding. Timothy V. Harnett, Chairman of the Tobacco Research Committee, adamantly rejected these findings and considered the claims dubious. The article continues by discussing that the researchers in the Tobacco Research Committee question the integrity of the conclusions drawn from this study. This is one of the first substantial reports made by the National Institute of Health regarding the death rates related to smoking cigarettes. It also leads to panic throughout the nation regarding what cigarettes do to the human body.

What Was Behind Tobacco’s Closed Doors

Tobacco companies maintained that they were unaware of the product's health side effects and dangers. Hidden from the view of the public, tobacco companies plotted how to make their product extraordinarily addictive and how to attack the most consumers as possible. The tobacco companies had millions of documents stating that they understood the true nature of their products. Advertisements distracted the American public from the internal work occurring.

⁷⁸ Unknown. Health Risk Seen In Heavy Smoking, US Study Notes Increase In Deaths Due To Illness-Industry Is Dubious. 1959 August 07. American Tobacco Records; Master Settlement Agreement. Unknown. <https://www.industrydocuments.ucsf.edu/docs/fkkm0137>

⁷⁹ Ibid.

As noted in Chapter 1, tobacco companies meticulously selected experts and research companies. The companies understood every inch of their product and how to make it effective; they employed extensive teams of experts and research labs to make the cigarette effective, discover its health effects, and determine how to cover them. These experts and research companies sent private reports to the tobacco companies, disclosing possible illnesses, effectiveness, and other information.

1945

In 1945, a research laboratory created a dense memorandum on the alleged effects of smoking improvement of cigarette tobacco concerning irritation. American Tobacco Company received the report, which discusses: medical and scientific opinions regarding the impact of smoking, constituents of tobacco smoke, the evolution of the smoking machine, composition of cigarette smoke, composition of tobacco related to smoking characteristics, irritation studies, and heat treatment of tobacco – the toasting process.

First, the study acknowledges that only two of the many compounds are considered ‘toxic’ by medical authorities. The two compounds are “carbon monoxide and nicotine”⁸⁰. Carbon monoxide was discovered in cigarettes in the early 1900s and was associated with effects on blood hemoglobin. Various studies “exposed subjects to extremely high concentrations of tobacco smoke and concluded that the maximum amount of carbon monoxide drawn into the lungs under such exaggerated conditions is no greater than the amount encountered on the streets

⁸⁰ American Tobacco Company. Memorandum On a. Alleged Effects Of Smoking, B. Improvement Of Cigarette Tobaccos With Special Reference To Irritation. 1943 January 04.

of large cities with heavy automobile traffic”⁸¹. This fact represents an early awareness of toxic chemicals in cigarettes. Additionally, it parallels chemical consumption to traditional societal features like automobiles. Nicotine, as discussed earlier, leads to addiction. The memorandum states, “Nicotine is present in the smoke of all commercial tobacco products and, in cigarette smoke, bears a very relation to the nicotine content of tobacco”⁸². The memorandum associates the actions of smokers with nicotine. Synapses, the junction between fibers connected to the spinal cord and the organs, are affected by nicotine. Additionally, the central nervous system is affected. The memorandum concedes, “the enjoyment derived from the use of tobacco has never been adequately explained, and it is by no means certain that nicotine is the sole factor contributing to pleasurable results”⁸³.

The report then discusses misconceptions about the nature of tobacco and nicotine at the time. “A great many harmful effects have been ascribed to the use, and particularly the abuse, of tobacco. Some of these have no factual foundations; others have at least some scientific basis”⁸⁴. It denies that lip and tongue cancer is associated with hot and irritating vapor, but traditional symptoms (dyspepsia, loss of appetite, and weight loss) may occur because of irritation. The memorandum discusses “amblyopia, a condition in which vision becomes less acute”, and denies the occurrence purely because of nicotine. Amblyopia occurs when “smoking is accompanied by alcohol excesses”⁸⁵. Next, the memorandum discusses smoking related to the dangers to pregnant

⁸¹ Ibid.

⁸² Ibid.

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Ibid.

women. It denies the association between fetal injury and low milk production, condemning the suggestive evidence as pure speculation.

The study utilizes statistics from the Mayo Clinic, which proves “in some 350 cases... 1.4% were non-users, 0.3% were chewers, 6.8% smoked cigars or pipes, and the remainder, 91.5% used cigarettes”⁸⁶. The memorandum highlights the flaws in research, which allows tobacco companies to be lenient in actual medical effects. The memorandum goes as far as to state, “in any case, we must not charge tobacco with causing sickness, merely because a patient uses it”⁸⁷. This statement pushes the blame of disease and cancer on the patient or user instead of the tobacco companies.

Additionally, the memorandum provides another loophole that tobacco companies can use to deny health effects. Since many studies lack medical evidence and only provide circumstantial coincidences, it is not valid. “This conflicting evidence can only mean that, at most, tobacco is a relatively unimportant factor as a public health problem”⁸⁸. Documents such as this memorandum are vital to tobacco companies. During press conferences and important government meetings, the spectators pushed tobacco companies to provide reports about their product knowledge. In this case, the tobacco industry used this document to deny the relationship between health and tobacco smoking. The tobacco companies would display these

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

memorandums to subside fear of cancer caused by smoking and point the finger at other causal relationships or diminish the results of different studies.

1948

In 1948, *Present Status of Research on Tobacco Smoking and Lung Cancer* contained international information regarding smoking and lung cancer, searching for parallels. The report noted that “the age adjusted death rate among men in the United States in 1948 was nearly four times as high as the rate among women”⁸⁹. It notes smoking caused this change, but specialists do not understand how; “Practically all significant evidence in favor of the view that the increased smoking of cigarettes is definitely related to the increase in cancer of the lung”⁹⁰. The article alludes to the US taking the most aggressive research in the tobacco field, explaining the struggles of developing a proper hypothesis. In Washington, the National Institute of Health discovered the critical flaws in appropriate medical research. The National Institute of Health listed the following causes:

1. “...the effect of smoking may not become manifest for as many as 20 to 30 years after smoking is begun
2. Less than 5% of people who reach 20 years of age would be expected to develop cancer of the lung

⁸⁹ Unknown. *Present Status of Research in Tobacco Smoking and Lung Cancer*. 1948. Ness Motley Law Firm Documents. Unknown.

⁹⁰ Ibid.

3. It is difficult, if not impossible, to control exposure to other cancer stimulating agents during the interval between the time of smoking is started and the time when study for presence of cancer of the lung can be made
4. The inability to control the amount of smoking
5. The tremendous number of people who have to be included in any study because of the relatively small percentage of people who could be expected to develop cancer of the lung”⁹¹.

Each factor represents a loophole that tobacco companies may use to deny health effects. At this point, the American public was concerned with the cause of smoking and health, but it was not a priority. The report represents the international concern but lacks evidence for proper warnings and action. Tobacco companies used this information to cast doubt on current findings, which was in their favor.

1953

In 1953, Claude Teague produced a research report labeled *Survey of Cancer Research with Emphasis Upon Possible Carcinogens from Tobacco* on behalf of tobacco companies. The objective was “to give a broad, general survey of cancer research, with the emphasis on studies actually or potentially related to carcinogens from tobacco”⁹². First, Teague explains the various forms of cancer—such as benign (noninvasive and slow-growing and malignant (invasive and

⁹¹ Ibid.

⁹² Teague, C. Survey of Cancer Research with Emphasis Upon Possible Carcinogens from Tobacco. 1953 February 02. Ness Motley Law Firm Documents. Unknown.

rapid-growing)—and multiple parts of the human body it attacks. Most importantly, he defines that certain cancers begin from the constant occurrence of carcinogens such as “occupational cancer” and “experimental cancer”. Although these forms are similar, Teague highlights their differences; “Occupational cancer is the result of prolonged exposure to known carcinogen agents, such as radioactive materials, x-ray, coal tar, and others. ‘Experimental’ cancer is the result of deliberate and often, repeated, application of carcinogenic agents for the purpose of producing cancer”⁹³. These findings exemplify tobacco companies’ awareness of various types of cancer.

Teague discusses the history of occupational and experimental cancer research. First, in 1915, researchers discovered skin cancer related to coal tar. Secondly, in 1930 researchers found “a large number of polycyclic aromatic hydrocarbons, together with many of their functional derivatives, possessed carcinogenic activities”⁹⁴. However, these required consistent exposure to carcinogens over a long period.

The survey transitions to discussing respiratory system cancers and their relation to carcinogens. Several studies suggest “an abnormal increase in the incidence of such cancers, particularly among men, during the last several decades”⁹⁵. Teague continues, stating, “some carcinogens, either airborne or artificially introduced into the respiratory system, is responsible for cancer of the respiratory system, and that widespread exposure to the carcinogens, particularly in men, has been fairly recent and is increasing”⁹⁶. This finding is significant as it

⁹³ Ibid.

⁹⁴ Ibid.

⁹⁵ Ibid.

recognizes the increase in respiratory cancer is not genetic or a biological cause. The statement validates that the rise in cancer in 1953 is related to a new airborne or artificially inhaled production and widespread production. This study is a terrifying revelation for tobacco companies, as they found an increase in sales during the early 1950s but failed to disclose this information to the public. Even worse, Teague directly correlates this finding to cigarette smoking; “The recent rate of increase of cancer of the respiratory system rather closely parallels the recent introduction and rate of increase of cigarette consumption....”⁹⁷. This fact highlights tobacco companies’ failure to cancer correlations to the general public. Tobacco companies hid this document in confidential files instead of producing a warning or reassuring the public of their awareness.

The survey continues, listing how cigarette smoking may affect cancer rates.

- “1. Excessive and prolonged use of tobacco, especially cigarettes, seems to be an important factor in the induction of lung cancer.
2. The incidence of lung cancer is considerably higher among moderately heavy to chain smokers compared to the general hospital population without cancer.
3. The occurrence of lung cancer in a male nonsmoker is a rare phenomenon.

⁹⁶ Ibid.

⁹⁷ Ibid.

4. Tobacco seems to play a similar but somewhat less evident role in the induction of lung cancer in women. Among this group a greater percentage of nonsmokers were found than among men, with 10 to 25 being smokers.
5. 96.1% of patients with cancer of the lungs who had a history of smoking had smoked for over 20 years. Few women have smoked that long and this is probably the reason for the greater present incidence among men.
6. 94.1% of the male patients with cancer of the lungs were found to be cigarette smokers, 4.0% pipe smokers, and 3.5 cigar smokers (some use more than one form of tobacco product). This prevalence of cigarette smoking is greater among the general hospital population of the same group. The greater practice of inhalation among cigarette smokers is believed to be a factor in the increased incidence of disease.
7. There may be a lag of 10 years or more between the cessation of smoking and the occurrence of clinical symptoms of cancer.
8. Three independent studies have resulted in data so uniform that one may deduce the same conclusion from them”⁹⁸.

This list represents most of the findings and facts of their survey. It is somewhat concerning that in 1953, tobacco companies were aware of these facts but denied them and used the statistics for marketing ploys. The list also acknowledges how long it takes for cancer to form. Also, it recognizes that respiratory cancer is inherently experimental and occupational

⁹⁸ Ibid.

cancer. In a nonsmoker, there are minimal rates of respiratory cancer; this represents a rudimentary understanding of carcinogens in cigarettes.

However, the survey acknowledges research is unsure about what carcinogens are in cigarettes. Although all signs and significant data point towards cigarettes, “very little work on isolation and characterization of carcinogens from tobacco substances has been reported in literature”⁹⁹. This fact represents a loophole in the research; it allows tobacco companies to say no evidence or data backs these claims. There are suggestions for the carcinogen “polynuclear hydrocarbons”¹⁰⁰, but they were aware of no direct evidence or other possible links.

The study concludes that there must be an increase in “carcinogenic stimuli”, which leads to a rise in cancers. Specifically, there is an increase in “experimental” and “occupational” cancer caused by environmental factors. Since it relies on environmental factors, researchers must look at what has changed in American culture from the early 1900s to the 1950s. This study focuses on the tobacco industries and cigarettes as a possible cause. In short, the research has statistical evidence of hospital rates concerning smokers versus nonsmokers but no scientific evidence to suggest that smoking is the root cause.

1955

In 1955, the Mayo Clinic created another letter studying an association between smoking and cancer. Dr. Joseph Berkson discusses the current studies on smoking and their relevance. He wrote, “even the suggestion that they indicated that smoking may be a cause of lung cancer, but

⁹⁹ Ibid.

¹⁰⁰ Ibid.

specifically the conclusion, didactically stated, that an association already had been unquestionably established”¹⁰¹. This statement proves that documents were passed around by various companies, undoubtedly finding a link between cancer and smoking. Dr. Berkson uses direct quotes from other experts; “Hammond and Horn stated it this way: ‘It can no longer be doubted that an association exists between smoking and death rates. --- the finding proves that there is a definite association between smoking habits and death rates’”¹⁰². Dr. Berkson supports this statement in some ways and disagrees in some parts. However, Dr. Berkson does call for the need to study and some form of statistical common ground for research. He states, “There is regrettably no time at the moment to engage in what could undoubtedly be a pleasant, philosophical discourse, on the semantic distinction between the phrases ‘smoking causes lung cancer’ and ‘smoking is associated with lung cancer’”¹⁰³. Dr. Berkson further explains “substances are known—carcinogens—which, when applied to certain tissues, do induce malignant changes and can produce transmissible neoplasms. A substance-related chemically to these compounds has been isolated from cigarette smoke”¹⁰⁴.

The document continues and mentions that earlier references and studies validate this claim. “In the older literature may be found experiments in which mice were exposed to prolonged breathing of cigarette smoke, and developed lung tumors in larger frequency than did

¹⁰¹ Berkson-J, Mayo Clinic. Study Of Association Between Smoking And Cancer. 1955 December. American Tobacco Records; Master Settlement Agreement. Unknown.
<https://www.industrydocuments.ucsf.edu/docs/fzfb0015>

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

corresponding controls and there are some recent findings in the same direction”¹⁰⁵. Dr. Berkson mentions a study produced by Doll and Hill; “The percentage of heavy smokers also was higher in the lung cancer group, than in a non-lung cancer group. So we see that the retrospective study of Doll and Hill showed—as it is frequently expressed—a positive solution between smoking and lung cancer”¹⁰⁶. However, Dr. Berkson challenges the validity of the studies. He calls statistical issues into play.

Dr. Berkson's document claims that, overall, the public will not accept the work of professionals. He explains that the portrayal of data is accurate, and the results are too minimal to raise public concern. “... it will appear obvious to the ordinary mind, if not to a trained statistician, that a set of data which shows smokers to have a lower death rate from lung cancer than the general public does not provide proof that the general public is increasing the hazard of lung cancer by smoking. The data should show the rates to be higher, not equal or lower if the evidence on its face is to indicate an increase of risk”¹⁰⁷. Therefore, if the data remains equal, the public will not be concerned or aware of the danger of smoking. Dr. Berkson states the public cannot deny researchers' findings and that continuous research will shortly advance these theories.

1955 Philip Morris Research

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

In 1955, Robert DuPuis published a report for Philip Morris discussing the challenges in research for tobacco. Robert DuPuis draws parallels between smoking cigarettes and the findings across America. “Probably the first white man to see the smoking of tobacco was Christopher Columbus. He had no idea at the time how important this plant was to become the economic growth of southeast America”¹⁰⁸; the report immediately evokes a sense of patriotism towards tobacco companies. Robert DuPuis highlights similar points that Dr. Berkson discussed in his report; “the statistical work at best may show association, but certainly does not show cause and effect, as stated by some”¹⁰⁹.

1955 HJ Rand Cigarette

Another report, created by HJ Rand Cigarette Company, investigated the dangers of cigarettes. The report discussed some of the risks, specifically in the rolling paper of cigarettes. “Cigarette paper has been notoriously ignored in efforts to isolate a carcinogen from cigarettes”¹¹⁰. The report concluded that the paper contained dangerous tars and carcinogens. “Since Dr. Carroll’s fluorescent work indicated the presence of polycyclic aromatic hydrocarbons and independent work showed that there were cancer-producing agents in this tars, Rand Cigarette Co. initiated a project for the separation and identification of specific compounds, so that a better understanding could be had on the mechanism of their formation”¹¹¹.

¹⁰⁸ DuPuis-RN, Phillip Morris, Inc. Challenges In Tobacco Research. 1955 October. American Tobacco Records; Master Settlement Agreement. Unknown.

¹⁰⁹ Ibid.

¹¹⁰ HJ Rand Cigarette Co. An Investigation Of Possible Cancer Producing Agents In Cigarette Smoke And Their Elimination. 1955 May 03. American Tobacco Records; Master Settlement Agreement. Unknown. <https://www.industrydocuments.ucsf.edu/docs/hhvp0140>

¹¹¹ Ibid.

The study gathered information regarding the chemicals such as benzopyrene and other polycyclic compounds. These compounds specifically are cancerous and dangerous.

“Approximately 1/25 by weight as much 3,4 benzopyrene was found in cigarette paper”¹¹². They tested this on mice to confirm their results. As seen in other tests, the company painted tar water on mice; “painting was started in October 1951, on twenty mice and by January 24, 1952, four skin tumors had developed. At this time, this investigator wrote that it appeared cigarette paper tar was a strong carcinogenic substance. By June of 1952, sixty-three percent of the animals had developed papilloma, and forty-two percent of the animals had developed carcinomas. This was considered by the worker to be a very convincing demonstration of a strong carcinogenic agent”¹¹³. These statistics represent the early understanding of the dangers of cigarettes. It also represents an avenue in which tobacco companies may say their cigarette papers are dangerous. Still, they are actively working towards an additive that will dilute this effect in people. Additionally, tobacco companies could use traditional avenues to deny this occurrence. The tobacco companies could say that since this was a study on animals, there is no prediction of this occurrence in humans. However, human testing is illegal; therefore, this ‘human testing’ issue may continue in a cycle for as long as they wish.

Surgeon General’s Medical Report

The media continued to dump thousands of advertisements and depictions of cigarettes. The cigarette companies steamrolled the American public with notions of positive associations via their campaigns. However, the public was growingly concerned with health effects. Many

¹¹² Ibid.

¹¹³ Ibid.

cigarette companies discredited the information from ordinary doctors, causing the public to trust their medical professionals. The public depended on the tobacco companies to tell the truth about their product and proper resources, but there were still questions. The American Public demanded government intervention and guidance on the effects of cigarettes. As a result, the US Surgeon General published *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Services* in 1964. A committee of leading medical doctors, lawyers, and researchers gathered the information necessary to write a report in response to the current concerns. The report discloses that the topic of smoking and health is somewhat confusing and complex; “The interrelationships of smoking and health undoubtedly are complex. The subject does not lend itself to easy answers. Nevertheless, it has been increasingly apparent that answers must be found”¹¹⁴. The Surgeon General, Eugene Guthrie, demands a proper report of information and research regarding tobacco. The report contains two parts: Introduction, Summary, and Conclusion, as well as Evidence of the Relationship of Smoking and Health.

The introduction discusses a rough timeline and international connections to tobacco. The study notes that “In 1900 an increase in cancer of the lung was noted particularly by vital statisticians, and their data are usually taken at the starting point for studies on the possible relationship of smoking and other uses of tobacco to cancer of the lung and of certain other organs, to disease of the heart and blood vessels (cardiovascular disease in general; coronary disease in particular), and other non-cancerous (non-neoplastic) diseases of the lower respiratory

¹¹⁴ Bayne-Jones, Stanhope, et al. “Smoking and Health - Reports of the Surgeon General - Profiles in Science.” *U.S. National Library of Medicine*, National Institutes of Health, 1964, profiles.nlm.nih.gov/spotlight/nn/catalog.nlm:nlmuid-101584932X202-doc.

tract (especially chronic bronchitis and emphysema)”¹¹⁵. The narration of tobacco-related health and medical knowledge continues, the reports note the next important year as 1930; “when the definite trends in morality and disease- incidence considered in this Report became conspicuous”¹¹⁶. The introduction also notes the difficulty in gathering and conducting medical research on humans, as it is unacceptable to test on humans. This ethical measure poses a challenge in research and leads most studies to pause until someone passes away from associated cancers and diseases.

In chapter 4, the report explains the relevant background information and facts, and some formal conclusions. The study notes, “in 1962, over 500,000 people in the United States died of arteriosclerotic heart disease (principally coronary artery disease), 41,000 died of lung cancer, and 15,000 died of bronchitis and emphysema”¹¹⁷, which is higher than the previously noted rates before the involvement of cigarette smoking. “Lung cancer deaths, less than 3,000 in 1930, increased to 18,000 in 1950”¹¹⁸; this statistic correlates with the rise in the US public. The report collected a series of initial findings and opinions. “Cigarette smoking is associated with a 70 percent increase in age-specific death rates of males, and to a lesser extent with increased death rates of women”¹¹⁹. The list continues, and the Committee breaks down each possible disease's relationship to smoking. First, it discusses lung cancer. “Cigarette smoking is causally related to lung cancer in men; the magnitude of the effect of cigarette smoking far outweighs all other

¹¹⁵ Ibid.

¹¹⁶ Ibid.

¹¹⁷ Ibid.

¹¹⁸ Ibid.

¹¹⁹ Ibid.

factors”¹²⁰. The report then explains the relationship between chronic bronchitis and emphysema. It states, “a relationship exists between cigarette smoking and emphysema, but it has not been established that the relationship is causal”¹²¹. Smoking cigarettes causes an increase in the risk of dying from chronic bronchitis and emphysema. Then, the report discusses cardiovascular diseases. Once again, the Committee notes a possible causal link, but not ultimately confirmed. There is also a considerable link to lip cancer, the study notes.

The section explains the evidence and bulk of information that helped form conclusions. Chapter 5 consists of information regarding tobacco consumption in the US. An estimated 70.1 million people daily consumed tobacco products in 1964¹²². At this point, many cigarettes lacked a filter, leading to direct contact with the tobacco filler and various chemicals; “unofficial estimates for 1950 show that only about half of one percent of cigarettes produced were filter tip. In 1952, unofficial estimates show 1.3 percent of cigarettes produced were filter tip”¹²³. The rise in filters continued until 1962 when an estimated 54.6 percent.

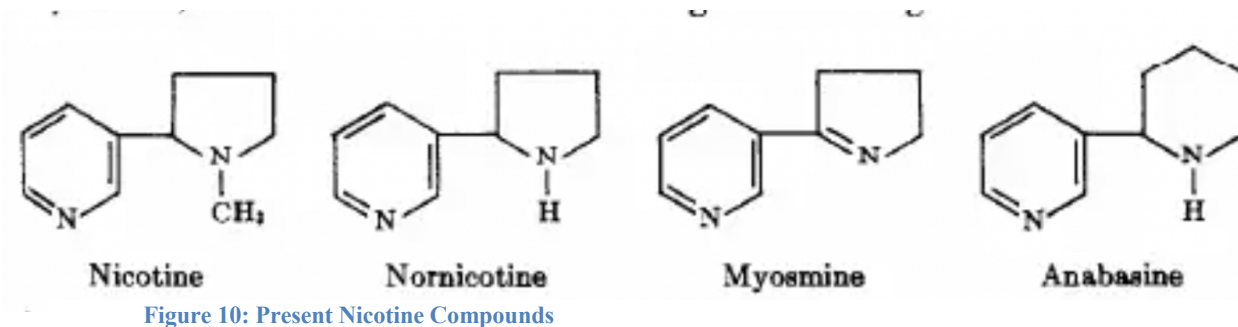
¹²⁰ Ibid.

¹²¹ Ibid.

¹²² Ibid.

¹²³ Ibid.

Chapter 6 explains the chemical and physical makeup of tobacco. The report demonstrates various compounds created by the burning, precisely the different types of nicotine present in tobacco leaves. The study notes the following nicotine compounds present:



In addition to these compounds of nicotine present in tobacco leaves, the study discusses the complexity of cigarette smoke. “Cigarette smoke is an heterogeneous mixture of gases, uncondensed vapors, and liquid particulate matter”¹²⁴. As mentioned, many cigarettes lacked filters. Therefore smoke “enters the mouth the smoke is a concentrated aerosol with millions or billions of particles per cubic centimeter”¹²⁵. The report notes the presence of tar as well. “... tar contains all of the particulate phase of smoke as well as condensable components of the gas phase. The amount of tar from the smoke of one cigarette is between 3 and 40 mg....”¹²⁶. The study also notes the importance of burning rates, as it promotes certain chemical compounds. Some carcinogenic hydrocarbons and heterocyclics contribute to the dangers of cigarettes. They studied these carcinogens on rats and mice by applying a layer of tar on the skin. The skin reacted and grew tumors; “... 50 percent sarcomas at the injection site in 14 weeks and 98

¹²⁴ Ibid.

¹²⁵ Ibid.

¹²⁶ Ibid.

percent tumors in 24 weeks”¹²⁷. The study showed that “Benzo (a) pyrene is one of the two most potent of the seven carcinogens detected in tobacco smoke and it is present in a much larger quantity than any other carcinogens listed”¹²⁸. Researchers brushed mice with a dilute tar solution in another study and studied for possible effects. Once again, it found great dangers; “the total tar from cigarettes has about 40 times the carcinogenic potency of the benzo (a) pyrene presents in the tar”¹²⁹. However, the study concedes that elements may cause extreme effects; for example, it was a direct skin connection, nonhuman biology, and the potency of the carcinogens.

Chapter 8 focuses mainly on male death rates, as their population makes up the most significant number of smokers. This section utilized data from multiple US states and research in England.

Table 1: Mortality ratios for Current Smokers of Cigarettes Only, By Amount Smoked

Cigarettes per day	British doctors	Men in 9 States	U.S. veterans	California occupational* 1	California Legion*	Canadian veterans	Men in 25 States
Less than 10.....	1.06	1.33	1.35	1.44	} 2 1.30	{ 1.55	1.45
10-20.....	1.31	1.66	1.76	1.79			1.75
21-39.....	3 1.62	1.93	1.99	2.27	6 1.64	5 1.84	1.90
40 and over.....	4 2.50	2.20	2.22	1.83	7 1.85		2.20

*Current and ex-cigarette smokers combined.

1 “Less than 10” is “less than 5” plus “about ½”; “10-20” is “about 1”; “21-39” is “about 1½”.

2 Less than 1 pack.

3 20-34.

4 35 plus.

5 More than 1 pack.

6 About 1 pack.

7 More than 1 pack.

¹²⁷ Ibid.

¹²⁸ Ibid.

¹²⁹ Ibid.

The studies asked for each individual's current type and amount of smoking. It found “for males smoking cigarettes only, the overall death rate is higher than that for non-smokers in all studies, the increase ranging from 44 percent for the British doctors to 83 percent in men in 25 states. For smokers of other forms of tobacco as well as cigarettes the increase in death rates are in all cases lower than for those smokers of cigarettes only”¹³⁰. These statements highlight that smoking causes higher death rates in men. Additionally, it notes that smoking cigarettes is much different than other forms of tobacco. The table below represents some of the findings on mortality rates and their correlation to the amount smoked.

As seen, most smokers in each category smoked over 40 cigarettes a day. This statistic highlights how many individuals who passed away had assumingly high levels of addiction to the product. Not only that, but it is also a universal problem as people in Canada and England are also part of the statistics. The report found a relation between the length of smoking and mortality rates utilizing the same data. “There is a rise of about 50 percent in the mortality ratio for those who had smoked 15-35 years, with a further rise for those smoking longer than 35 years”¹³¹. Another critical factor in the study of smoking and mortality was inhalation. The study group of US men found that only “6 percent of the subjects stated that they did not inhale, 14 percent inhaled slightly, 56 percent moderately, and 24 percent deeply”¹³². Additionally, the data found that “the mortality rate is .89 for non-inhalers and 1.39 for inhalers”¹³³. The study then tackled statistics on the death rate related to cancers.

¹³⁰ Ibid.

¹³¹ Ibid.

¹³² Ibid.

¹³³ Ibid.

Table 2: Total Numbers of Expected and Observed Deaths and Mortality Ratios for Smokers of Cigarettes Only in Seven Prospective Studies

Underlying cause of death	Expected	Observed	Mortality ratio	Median mortality ratio	Non-smoker deaths
Cancer of lung (162-3)	170.3	1,833	10.8	11.7	123
Bronchitis and emphysema (502, 527.1) ¹	89.5	546	6.1	7.5	39
Cancer of larynx (161)	14.0	75	5.4	5.8	8
Cancer of oral cavity (140-8)	37.0	152	4.1	3.9	27
Cancer of esophagus (150)	33.7	113	3.4	3.3	19
Stomach and duodenal ulcers (540-1)	105.1	294	2.8	5.0	67
Other circulatory diseases (451-468)	254.0	649	2.6	2.3	170
Cirrhosis of liver (581)	169.2	379	2.2	2.1	96
Cancer of bladder (181)	111.6	216	1.9	2.2	92
Coronary artery disease (420)	6,439.7	11,177	1.7	1.7	4,731
Other heart diseases (421-2, 430-4)	525.0	868	1.7	1.5	395
Hypertensive heart disease (440-3)	409.2	631	1.5	1.5	334
General arteriosclerosis (450)	210.7	310	1.5	1.7	201
Cancer of kidney (180)	79.0	120	1.5	1.4	59
All other cancer	1,061.4	1,524	1.4	1.4	742
Cancer of stomach (151)	285.2	413	1.4	1.3	203
Influenza, pneumonia (480-493)	303.2	415	1.4	1.6	169
All other causes	1,508.7	1,946	1.3	1.3	1,038
Cerebral vascular lesions (330-4)	1,461.8	1,844	1.3	1.3	1,069
Cancer of prostate (177)	253.0	318	1.3	1.0	196
Accidents, suicides, violence (800-999)	1,063.2	1,310	1.2	1.3	627
Nephritis (592-4)	156.4	173	1.1	1.5	98
Rheumatic heart disease (400-416)	200.6	309	1.1	1.1	185
Cancer of rectum (154)	207.8	213	1.0	0.9	150
Cancer of intestines (152-3)	422.6	395	0.9	0.9	307
All causes	15,653.9	26,223	1.68	1.65	11,158

¹ Current cigarettes only for four studies: all cigarettes (current and ex-) for the two California studies and the study of men in 25 States.

² "Bronchitis and emphysema" includes "other bronchopulmonary diseases" for men in nine States and Canadian veterans.

*The individual results for the seven studies are shown for reference purposes in Table 26.

This highlights key findings noted earlier in the study. The highest rates of observed cancer were cancer of the lung (1,833) and coronary artery disease (11,177)¹³⁴. As earlier mentioned, some forms of tobacco carcinogens lead to both cancer types. Across all the studies used in this section, lung cancer remained the highest; "Lung cancer shows the highest mortality ratio in every one of the seven studies, the combined ratio is 10.8. Other causes that exhibit substantially higher mortality ratios than the ratio of 1.68 for all causes of death in Table 19 are bronchitis and emphysema, cancer of the larynx, cancer of the oral cavity and pharynx, cancer of

¹³⁴ Ibid.

the esophagus, stomach and duodenal ulcers...”¹³⁵. The report then mentions and presents data on the mortality rates, cancer, and smoking.

Table 3: Mortality Ratios for Coronary Artery Disease for Smokers of Cigarettes only by Amount Smoked

Number of packs per day	British doctors	Men in 9 States	U.S. veterans	Canadian veterans	Men in 25 States
<½	1.0	1.2	1.3	1.7	1.3
½-1	1.5	1.9	1.8	1.7	2.0
1-2	¹ 1.7	2.1	1.7	¹ 2.0	2.1
Over 2		2.4	1.9		2.5

¹ More than one pack.

TABLE 22.—Lung cancer mortality ratios for current smokers of cigarettes only by amount smoked

Number of packs per day	British doctors	Men in 9 States	U.S. veterans	Canadian veterans
<½	4.4	5.8	5.2	8.4
½-1	10.8	7.3	9.4	13.5
1-2	¹ 43.7	15.9	18.1	¹ 15.1
Over 2		21.7	23.3	

¹ Over one pack.

The data proves a correlation between smoking and an increased ratio of lung cancer and coronary artery disease. It further highlights the previously mentioned connections between data and international scientific research. Overall, this section of the report discloses important information regarding smoking and its mortality rate. “The death rates increase with the amount smoked”¹³⁶.

Overall, the report represents the complexity of a cigarette. The report breaks down each issue with a cigarette and how it correlates to the health epidemic. The cigarette contains invasive chemicals, such as carcinogens and nicotine compounds, which directly affect smokers.

¹³⁵ Ibid.

¹³⁶ Ibid.

In many studies, the carcinogens cause various forms of cancer. However, a significant issue in their studies is that there cannot be human testing. That leaves the Committee with two options: animal testing or waiting until a smoker passes away and obtaining an autopsy. Additionally, the report discusses the importance of a ‘tobacco habit’ and the terms of it. It labels a tobacco habit as “the habitual use of tobacco is related primarily to psychological and social drives, reinforced and perpetuated by the pharmaceutical actions of nicotine on the nervous system”¹³⁷.

The Surgeon General and his colleagues gathered immense amounts of data about the correlations of cancer and gender. Their research allowed informative conclusions about the state of the population in the 1960s. The Surgeon General's report notes a significant increase in cancer since 1937. Cancer brutally attacks the human body without rhyme or reason. Cancer forms for various reasons; some cancers form genetically, while others form due to environmental effects. The Surgeon General's report on cancer dives into multiple types of cancers, but for the sake of discussion, the most important cancers are lung and esophagus.

The Surgeon General's report discusses the sex ratio of 6 different forms of cancer: larynx, lung and bronchus, oral cavity, esophagus, stomach, and urinary bladder. The rates consisted of the following:

Table 4: Ratios of Cancer Rates Based on Gender and Race

	<i>Whites</i>	<i>Nonwhites</i>
Larynx -----	10.8	7.6
Lung and bronchus-----	6.7	6.2
Oral cavity-----	3.8	3.3
Esophagus-----	4.1	4.2
Stomach -----	2.0	2.3
Urinary bladder-----	1.3	1.6

¹³⁷ Ibid.

The data highlights the increase in certain cancers over the past thirty to forty years. Most importantly, lung and bronchus cancer increased consistently over the period. The Surgeon General report discloses that “the lung cancer sex ratio was 1.5 to 1 [men to women] in 1930 and has steadily increased during the intervening period to the current value of 6 to 1”¹³⁸. The statistics support the claims that an environmental change in human life is causing an increase in the presence of lung and bronchus cancer. Most specifically, an environmental factor in men starting in the 1930s has caused this increase. Researchers found a connection between something inhaled heavily by men and lung and bronchus cancer. The report also establishes that income levels maintain higher rates of lung and bronchus cancer. “The rates of males in the lowest income class for esophagus and lung [cancer] were about double those for high-income males;...”¹³⁹. This explains how some of the highly stressful and tasking lifestyles correlated with cancers. The report also explains what members of occupations common victims of lung and bronchus cancers were “...a large variety of occupational groups in metal working trades, such as molders, boil makers, plumbers, coppersmiths, sheet metal workers, etc.”¹⁴⁰. These workers are in long-hour, low-paying jobs; these workers are susceptible to the stressors of work, affording a living, and supporting a family. The tobacco companies utilized these stressors for marketing. As noted earlier, the cigarette companies advertised their products as a reliever of stress and a ‘friend to turn to when life was stressful’.

¹³⁸ Ibid.

¹³⁹ Ibid.

¹⁴⁰ Ibid.

The trends consider what societies worldwide face from the 1930s to the 1960s. Overall, there has been a shift in respiratory cancer in men. However, all other cancers did not increase at the same rate. Once again, this proves a product that working-class men inhale is the environmental factor that causes their respiratory cancer. The answer is simple: these men smoke cigarettes; therefore, the cause of their cancer is cigarette smoking. For women, smoking was less common for various reasons. As a result, their respiratory cancer rates did not grow exponentially.

Not only did the Surgeon General and his team find the increase in lung cancer, but large hospitals around the US also supported their findings. “The records of large general hospitals where diagnostic accuracy of lung cancer has been uniform and excellent for many years also support the thesis of a real increase in lung cancer”¹⁴¹. The report notes hospitals such as the University of Minnesota Hospital, Presbyterian Hospital, and Massachusetts General Hospital. In Massachusetts General Hospital, there is a particular increase in lung cancer noted. The Massachusetts General Hospital studied autopsies from 1892 to 1961. Their study found that “only 17 cases of bronchogenic carcinoma, 11 males and six females, were diagnosed in 5,300 autopsies from 1892 to 1929 (autopsy rate 33 percent), compared to 172 cases, 140 males and 32 females, in 5,000 autopsies from 1956 to 1961”¹⁴². This presents further evidence of increased carcinomas entering the lungs and bronchus. The Surgeon General notes the increase in lung and bronchus cancers is not immediate. The reports admit the growth has been gradual since 1930, but there is now ample evidence of lung and bronchus cancers throughout the US.

¹⁴¹ Ibid.

¹⁴² Ibid.

The focus shifts towards carcinogenesis, also known as the formation of cancer-causing cells. These cells can occur in many ways, such as organically (within the body) or environmentally (caused by environmental factors). The Surgeon general admits that cancers such as lung and bronchus have variability in causes, but the goal of their report is to study a correlation between smoking and health. In tobacco, the report explains that many chemical mixtures, such as polycyclic aromatic hydrocarbons and inorganic compounds,¹⁴³ are carcinogenic in animals. In other words, there are chemical compounds in cigarettes that cause cancer in animals. Since it is unethical to test on humans, one can infer the same result may occur in humans. The Surgeon General report notes that “almost every species that has been adequately tested proved to be susceptible to the effect of certain polycyclic aromatic hydrocarbons identified in cigarette smoke and designated as carcinogenic based on tests in rodents. Therefore, one can reasonably postulate that the same polycyclic hydrocarbons may also be carcinogenic in one or more tissues of man with which they may come in contact”¹⁴⁴.

The Surgeon General outlines the basic principles of carcinogens and their effects on the human body. The Surgeon General again notes the variability in causes of cancer but highlights the importance of the ‘delivery styles’ of cancers. “The chemical properties, the physical state of a substance, and the vehicle in which the substance is introduced into the body can influence the carcinogenic potency of environmental agents, e.g., insertion of a plastic membrane into tissues can cause cancer, but a fine powder of the same plastic has not done so”¹⁴⁵; this exemplifies how

¹⁴³ Ibid.

¹⁴⁴ Ibid.

¹⁴⁵ Ibid.

some who smoke less may not develop cancer, as the amount of carcinogens is less compared to that of a heavy smoker. Additionally, this proves that the introduction vehicle is crucial. One could say that before the creation of cigarettes, tobacco's vehicle involved chewing or in the form of a cigar—which diluted the chemicals entering the body. The introduction of cigarettes brought a new vehicle for tobacco and new carcinogens to enter the body in more 'efficient' ways.

Interestingly, the report also notes studies that contradict many of the theses drawn from various evidence sources. “Experimental studies have demonstrated the presence of substances in tobacco and smoke which themselves are not carcinogenic but can promote carcinogenesis or lower the threshold to a known carcinogen. There is also some evidence for the presence of anticarcinogenic substances in tobacco and tobacco smoke. Although this may appear contradictory, it makes sense. Before cigarettes, many people consumed tobacco via chewing tobacco or cigar smoking. Both still involve tobacco but have lower rates of lung and bronchus cancers; this supports the claims that tobacco and smoke are anticarcinogenic. Also, this leads to questioning why cigarettes cause cancer if they contain tobacco and smoke.

Since researchers and scientists cannot test on humans, the Surgeon General drew connections from animal studies in previous years. The Wynder study consisted of tobacco placed on rat and rabbit skin. The Wynder study found tobacco tar-induced papilloma (a growth on the skin) and carcinomas”¹⁴⁶. The Wynder study involved placing a 50 percent solution of tobacco smoke on shaved rat skin over 15 months. As a result, the Wynder study found that 5 gm

¹⁴⁶ Ibid.

led to the induction of epidermoid carcinoma, and 3 gm led to the induction of papillomas¹⁴⁷.

However, the Surgeon General and Wynder study discuss a flaw in their research; “Extracts of tobacco usually have weaker carcinogenic activity than do condensates of cigarette smoke”¹⁴⁸.

The ‘flaw’ in this study does not minimize their findings and causes concern for consumers.

Only a small or weak amount of tobacco smoke causes papilloma and carcinogens, but American consumers inhale large amounts of tobacco smoke. Additionally, researchers diluted the solution of tobacco smoke to 50 percent. American consumers do not dilute their tobacco smoke scientifically speaking; Smokers dilute their tobacco smoke in their mouths via saliva or inhalation, but not nearly diluted by 50 percent. In other words, the Wynder study significantly dilutes the tobacco smoke on the skin of rats compared to the dilution of tobacco smoke by the smoker himself.

An additional study by Gellhorn and Roe reports carcinogenic properties in condensates of cigarette smoke. Once again, the Gellhorn and Roe study placed a mixture of condensates of tobacco smoke and benzo(a) pyrene on the skin of mice. The study found the mixture led to the production of neoplasms (growth on the body associated with cancer), while a mixture of only benzo(a)pyrene did not lead to tumors¹⁴⁹. The Gellhorn and Roe study supports the findings of the Wynder study; both studies produce similar results due to the condensates of tobacco smoke. Additionally, the Gellhorn and Roe study makes a ‘control’ group that receives a ‘base’ mixture, the benzo(a)pyrene, to prove that adding benzo(a)pyrene does not cause neoplasms or tumors.

¹⁴⁷ Ibid.

¹⁴⁸ Ibid.

¹⁴⁹ Ibid.

The results confirm that condensate tobacco smoke does cause neoplasms or tumors on the skin of mice.

The Surgeon General solidifies the Wynder and Gellhorn conclusions as evidence for carcinogens in condensates of tobacco smoke. From both studies, the Surgeon General gathers two fundamental hypotheses. First, “promoting agents present in tobacco and tobacco smoke, such as various phenols, enhance the potency of all the carcinogenic hydrocarbons so as to account for the biological activity of the tobacco products”¹⁵⁰. Phenol is a chemical compound traditionally used for disinfectants, antiseptics, and medicinal preparations¹⁵¹. Although it may appear a helpful compound, phenol is toxic by ingestion, inhalation, and skin absorption¹⁵². Cigarettes contain phenols. According to the U.S. National Library of Medicine, “The content of phenol in the smoke, depending on the smoking conditions altered from 101 to 185 micrograms/l cigarette”¹⁵³. This information proves that cigarettes enhance the carcinogenic properties of tobacco. Although phenols may not be dangerous in small amounts, heavy smokers consistently intake phenols and are exposed to carcinogens. Secondly, “possible synergism between low levels of the several known carcinogens in the tobacco condensates and extracts may also

¹⁵⁰ Ibid.

¹⁵¹ “Phenol.” *National Center for Biotechnology Information. PubChem Compound Database*, U.S. National Library of Medicine, pubchem.ncbi.nlm.nih.gov/compound/Phenol.

¹⁵² Ibid.

¹⁵³ Czogala, J, and W Wardas. “Exposure of Smokers to Phenols in Cigarette Smoke Depending on the Conditions of Smoking.” *U.S. National Library of Medicine*, U.S. National Library of Medicine, 1993, pubmed.ncbi.nlm.nih.gov/8016550/#:~:text=The%20content%20of%20phenol%20in,to%20185%20micrograms%2F1%20cigarette.

enhance the carcinogenic potency”¹⁵⁴. Synergism loosely means the interaction between two substances, in this case the carcinogens. In short, this hypothesis believes that interactions between low carcinogen levels lead to higher potency. Both hypotheses believe that chemicals in tobacco and tobacco smoke enhance the potency of carcinogens, which promotes cancers and diseases.

After amply discussing the evidence and animal research, the Surgeon General's report transitions to discussing second-hand effects noted on humans. A scientist, Klarr, noted “an epithelial tumor on his left forearm that appeared three months after termination of an experiment in which mice were painted with .25 percent benzo(a)pyrene in benzene”¹⁵⁵. Benzene is considered a polycyclic aromatic hydrocarbon, which may cause cancer. This finding represents the unintended effect of certain chemicals on human skin. Additionally, two researchers named Cottini and Mazzone tested on volunteers’ skin. Twenty-six volunteers had 1.0 percent benzo(a) pyrene in benzene applied to their skin daily for three months and observed erythema, pigmentation, desquamation, and verrucae¹⁵⁶ developments. Erythema is skin redness and irritation due to infection or reaction to medicine¹⁵⁷. Desquamation is the medical term for

¹⁵⁴ Bayne-Jones, Stanhope, et al. “Smoking and Health - Reports of the Surgeon General - Profiles in Science.” *U.S. National Library of Medicine*, National Institutes of Health, 1964, profiles.nlm.nih.gov/spotlight/nn/catalog.nlm:nlmuid-101584932X202-doc.

¹⁵⁵ Ibid.

¹⁵⁶ Ibid.

¹⁵⁷ “Erythema Multiforme.” *Johns Hopkins Medicine*, www.hopkinsmedicine.org/health/conditions-and-diseases/erythema-multiforme.

skin peeling¹⁵⁸. Verrucae is the medical term for warts caused by a skin infection¹⁵⁹. These connections prove benzene's benzo(a) pyrene causes skin irritation and rawness. Although we cannot test in the traditional form, volunteer studies such as this one provide a basic understanding of the effects of chemicals. It makes one wonder if benzo(a) pyrene was ingested or inhaled, what effects it would have on different organs.

Once again, the Surgeon General's report considers alternative reasons for various illnesses and cancers. The Surgeon General's report lists other possible industrial sources of the skin conditions listed previously. For example, soot from chimneys led to cancer of the scrotum. Benzo(a) pyrene was one of the critical chemicals that chimney sweepers encountered, leading to an association between benzo(a) pyrene and cancer of the scrotum. In the cold tar and pitch industry, workers also faced an influx in cancer and skin conditions. "The distillation of coal tar yields many different organic compounds with a residue of pitch containing polycyclic aromatic hydrocarbons"¹⁶⁰. This means that many coal tar workers also come in close contact with carcinogens but in a different form compared to tobacco smokers. In the Mineral Oil industry, workers may be diagnosed with paraffin cancer due to exposure to oil impurities during the purification process. Each industry source blames another product or company for skin cancer. Also, each industry, in some form, encounters polycyclic aromatic hydrocarbon, which creates

¹⁵⁸ "Peeling Skin: Causes, Diagnosis & Treatment." *Cleveland Clinic*, my.clevelandclinic.org/health/symptoms/17832-peeling-skin.

¹⁵⁹ "Warts | Plantar Warts | Verruca." *MedlinePlus*, U.S. National Library of Medicine, 4 Apr. 2016, medlineplus.gov/warts.html.

¹⁶⁰ Bayne-Jones, Stanhope, et al. "Smoking and Health - Reports of the Surgeon General - Profiles in Science." *U.S. National Library of Medicine*, National Institutes of Health, 1964, profiles.nlm.nih.gov/spotlight/nn/catalog.nlm:nlmuid-101584932X202-doc.

variability in findings. One may argue there is no way to ‘pinpoint’ when these ‘patients’ encountered the hydrocarbon. The tobacco industry could blame the chimney industry, and vice versa. This leads to confusion and difficulty in finding the origin of the cancer.

The chapter transitions, discussing the historical context of various cancers. The first cancer thoroughly discussed is lung cancer. A series of studies note the consistent tracking of tobacco smokers, cancer, and unfortunately death. “The earliest suspicions of an association between smoking and lung cancer were undoubtedly evoked by the provocative clinical observations that lung cancer patients were predominantly heavy smokers of tobacco”¹⁶¹. The Surgeon General report notes early studies produced, such as a study by Lombard and Doering in 1928, Müller in 1939, and Schairer and Schoeniger in 1943, which documented high rates of tobacco smokers among lung cancer patients. Additionally, there was a “rise in the percentage of lung cancer in autopsy series in Cologne and Jena”¹⁶².

The Surgeon General's report first elaborates on the study produced by Lombard and Doering in 1928. The study consisted of monitoring patients’ daily habits in Massachusetts, noting that “any study of habits of individuals with cancer is of little value without a similar study of individuals without cancer”¹⁶³. This represents a focus on a control group, which allows the researchers to establish key differences in habits that may lead to different illnesses, health issues, and cancer. The study utilized 217 cases of individuals with cancer and 217 cases of individuals without cancer. The Lombard and Doering study found “an association between

¹⁶¹ Ibid.

¹⁶² Ibid.

¹⁶³ Ibid.

heavy smoking (all types combined) and cancer in general, and between pipe smoking and oral cancer in particular. The pipe smokers then constituted the bulk (73.1 percent) of the heavy smokers”¹⁶⁴. Although the Lombard and Doering study did not draw a particular conclusion on lung cancer and heavy smoking, the study did recognize lung cancer in 5 individuals of the test group (individuals who heavily smoked and had cancer). It is important to note during this period, lung cancer was still relatively rare, and smoking cigarettes was becoming increasingly popular. This represents the lack of data on those who had lung cancer. However, the findings of Lombard and Doering introduce the research and scientific world to a key factor of various cancers: smoking tobacco. Although this study finds important information on pipe smoking and oral cancer, it also sets the foundations for research on tobacco smoking and lung cancer.

The Surgeon General then elaborates on the Müller study presented in 1939. The Müller study focused on finding a systematic association between lung cancer and smoking. Müller asked about smoking habits in a series of 86 lung cancer patients and 86 control patients (healthy patients). This study found “the increase in percentage of primary carcinomas of the lung being diagnosed at autopsy between 1918 to 1937 in Cologne, an increase almost entirely in males”¹⁶⁵. The study concluded a significant number of heavy smokers were among the lung cancer patients. The Müller study identifies an association between lung cancer and heavy smoking; this represents one of the first studies to target the correlation between smoking and health specifically. The study allows a proper timeline for important public studies acknowledging correlation. Some may argue the number of patients is too small to be significant. However, it is

¹⁶⁴ Ibid.

¹⁶⁵ Ibid.

essential to note the rarity of lung cancer in the first place. In early studies, as indicated in prior chapters, lung cancer was extremely rare; doctors rarely saw a lung cancer patient in their career. This study's observational group represents the gradual growth of lung cancer patients.

The Surgeon General's report also encompasses retrospective studies in the section discussing lung cancer. The Surgeon General's report utilizes 29 retrospective studies and compacted the data into various tables. The first table notes the location, year, sex of cases, number of persons, method of selection, and data collection. The table includes studies such as the Müller study, Schairer and Schoeniger study, Levin study, Wynder study, and many others. The Surgeon General's report draws striking conclusions from data collection. "It is indeed striking that every one of the retrospective studies of male lung cancer cases showed an association between smoking and lung cancer. All have shown that proportionately more heavy smokers are found among the lung cancer patients than in the control populations and proportionately fewer non-smokers among the cases than among the controls"¹⁶⁶. This notes a continuous growth in rates of lung cancer found in heavy smokers. From 1939 forward, the number of lung cancer patients continues to grow. This represents an increasing number of doctors and researchers who became aware of a rise in lung cancer and began to find correlations.

As more research became available from 1939 to 1963, the tobacco companies combatted this with their own forms of research from their labs. The tobacco companies worked tirelessly to produce advertisements, press conferences, industry-funded research, and other media forms to block out research proving a correlation between smoking and health. Tobacco maintained a goal

¹⁶⁶ Ibid.

to prevent current smokers or potential consumers from worrying about the true nature of their product. Research such as the Wynder study or the Müller study would disrupt the growing consumer rate of smokers. As a response, the media was flooded with advertisements, as seen in previous chapters; the tobacco companies utilized media strategies such as promoting smoking via doctor testimony.

By using doctor testimony, the consumers trust what doctors say over one study that may not fit their exact demographics. The advertisements allow consumers to doubt what researchers and scientists are finding. Additionally, CEOs and official statements made by tobacco companies placed doubts on these studies as well. As mentioned in a previous chapter, the companies would produce various statements to the media to settle the rising concern about smoking and health. The statements would deny any possible connection to poor health and smoking, instead employing tactics such as ‘the company knows what their product is best; therefore, as the company, you must trust me over these researchers’. For most of the American public, these tactics worked. Many dismissed the evidence provided by these researchers because they trusted the corporations that created the product more. Others dismissed the medical evidence based on the advertisements they saw or easily obtainable information.

It is essential to highlight that medical research, such as the studies of Müller and Wynder, is challenging to read and is not readily available to the public. One must know where and how to find reliable sources. Before the invention of the internet, one must find a library that supplies the latest medical research. In many cases, this research has various blocks set in place. Research such as this may only be available in specific medical libraries requiring clearances or a possible admission payment. Some of the research may be too new to be universally dispersed,

forcing those interested to travel to a center where it is available. Once one obtains the book, many of the conclusions and evidence contain medical terminology. The terminology, organization, and other factors make it confusing for many members of the American public. The lack of conversational English leads to confusion and frustration, making it difficult to understand what the study concludes. Research such as the Wynder and Müller studies is not simply at the hands of cigarette consumers. The consumer must go beyond traditional media to gather the truth about cigarettes. In a world filled with readily available media such as advertisements, magazines, commercials, movies, and other forms, gathering necessary research is complicated and often blinded by the advertisements. Overall, the Surgeon General's report destroyed the false claims made by tobacco companies. The report forced tobacco companies to acknowledge the truth and face the consequences of abusing the American public.

Chapter 5

Conclusion

From the 1910s to the 1960s, tobacco companies pursued profit at the expense of human health. Cigarette companies manipulated their products to make them more addictive and challenged or concealed evidence that demonstrated the dangers of smoking. They pumped advertisements and press releases into mainstream media to ease public fear. The scheme worked, and tens of millions of Americans have perished from illnesses that tobacco companies denied.

The various companies meticulously studied every section of the cigarette --- filter, paper, and tobacco. Tobacco companies created filters to provide a security blanket for smokers; smokers assumed that filters kept the chemicals and detrimental additives out of the smoke they consumed. In reality, the filters caused smokers to inhale deeper; the chemicals and various additives reach deeper into the body. As a result, smokers received higher nicotine concentration rates. Some cigarette filters had smaller holes, making inhaling the tobacco blend and the desired smoke difficult. Other cigarettes had larger holes, allowing effortless inhalation of the tobacco blend and smoke. Tobacco companies manipulated the rolling paper to cause a longer burning cigarette session. Because cigarettes burned more slowly in between drags, consumers smoked more of each cigarette and inhaled more of the chemicals and additives in it. At the same time, the substances that extended the burn rates were also dangerous to human health. Finally, tobacco companies modified the blend of tobacco filling of their cigarettes to please their

consumers, including by adding flavors such as licorice and chocolate. Each blend was unique to the various tobacco companies and brands.

Tobacco companies also studied the habits and effects of their consumers throughout the twentieth century. Internal research detailed the preferences and nicotine effectiveness in smokers. In January of 1959, Philip Morris hired Elmo Roper and Associates presented a multi-volume study about three key questions: why people smoke, what a person is looking for in a cigarette, and how well the cigarette satisfies this need or want¹⁶⁷. Elmo Roper and Associates focus on what makes the individual wish to smoke. The study explains how ammonia also enhances the production of nicotine, which promotes addiction in smokers. The increase in nicotine causes smokers to crave cigarettes and the nicotine high. The study breaks down activities that smokers associate with smoking; this information allowed companies to form advertisements and campaigns for their targeted audiences. The Brown and Williamson study proves that consumers may notice some difference in filters, but not nearly as much as initially assumed. The report number RD. 437 R greatly emphasized the forms of extra cable nicotine. Extractable nicotine is nicotine drawn from the cigarette in smoke. At this time, the addictiveness of nicotine was a fact. He concludes that the higher the concentration rate of nicotine, there will be more nicotine in the vapor phase, which the smoker inhales. As a result, the nicotine will rapidly enter the brain as "... increased smokers' response is associated with nicotine reaching the brain more quickly"¹⁶⁸. The discoveries in report number RD. 437 R lays the foundation for

¹⁶⁷ ELMO ROPER AND ASSOCIATES. VOLUME 1. A STUDY OF ATTITUDES TOWARD CIGARETTE SMOKING AND DIFFERENT TYPES OF CIGARETTES. 1959 January; 2012 August 29. Philip Morris Records; Master Settlement Agreement. Unknown. <https://www.industrydocuments.ucsf.edu/docs/nrkj0191>

¹⁶⁸ Lewan, Todd. "Dark Secrets of Tobacco Company Exposed." *Tobacco Control*, BMJ Publishing Group Ltd, 1 Sept. 1998, tobaccocontrol.bmj.com/content/7/3/315.

companies to create an extremely addictive product. Tobacco companies succeeded in making cigarettes more enjoyable to consume and more addictive, and by the mid-twentieth century, smoking rates continued to grow.

Yet, by the 1950s, doctors and medical researchers noticed that a substantial increase in the occurrence of lung cancer in the United States followed the growth of smoking. Illness across America is raging like wildfire, leaving many doctors stunned and confused. As early as 1912, medical researchers loosely linked smoking with an increased risk for various health problems, including lung cancer. As more and more Americans became smokers, doctors further documented the correlation. The 1912 study is the first mention of tobacco being a cause of lung tumors, which gives doctors a precautionary warning about what they will discover. In 1939, doctors and researchers noted that, overall, disease rates in the United States were declining, but lung cancer was becoming more prevalent. Tobacco companies faced more pressure from the 1930s onwards due to mass research.

In response, tobacco companies pumped thousands of advertisements and press releases that sought to reassure the public that smoking is safe. The advertisements and press releases give tobacco companies enough time to strategize combatting the reports. Advertisements used women and doctors to draw the attention of their consumers—and potential consumers—and promote smoking. Tobacco companies planted strategic phrases and medical terms in their advertisements to ease the public's worries. These advertisements created a false narrative of the true nature of cigarettes. Additionally, in press conferences, CEOs and official officers of tobacco companies denied all claims that cigarettes were dangerous, even though they knew that cigarettes contained chemicals, additives, and nicotine. They insisted that the studies linking smoking and cancer were less conclusive than media coverage suggested. Tobacco companies

reassured the public that cigarettes were safe. If anyone should know the safety of cigarettes, it would be the companies that produced them.

Behind closed doors, however, scientists at tobacco companies documented the dangers of smoking and produced extensive internal reports and memos detailing these risks. Tobacco companies cultivated studies about their product and various additives. Early internal studies revealed the dangers of different chemicals and additives on human health.

In 1964, the groundbreaking Surgeon General Report on Health and Smoking validated the studies and research linking smoking and health. The report explored the death rates, cancer, and other aspects of smoking and health. The report found direct links between smoking and health; smoking directly led to higher rates of lung and esophagus cancer. Cancer and lung diseases correlate with rising deaths in the United States. Overall, it confirmed tobacco companies manipulated the American public for decades without consequences. The Surgeon General's report shocked the public and dismantled the manipulation scheme tobacco companies relied upon. Regulations soon flooded the media and markets; laws regarding advertisements and the selling of cigarettes altered tobacco sales. The Cigarette Label and Advertising Act forced companies to label their cigarettes with warnings of adverse health effects and effectively canceled all cigarette marketing strategies.

Tobacco companies successfully executed a manipulation campaign targeting American consumers. Tobacco companies preyed on their consumers; they utilized unique marketing strategies and press releases to deny all possible links to health problems. Tobacco companies attacked researchers who stood between them and their profit. False reassurance of accurate studies scrambled through the media. Presidents and Vice Presidents promised independent studies; these studies were funded and controlled by tobacco companies to promote one outcome.

Smoking cigarettes did not cause cancer. However, behind closed doors, tobacco companies were aware of the dangers of their products. In many ways, they enhanced the hazards of their products but lied to the American public. Tobacco companies advertised filters as a healthy way of filtering out the chemicals and tobacco tars. However, Tobacco companies were aware of the dangers of smoking. They bluntly ignored the warning signs to continue to profit, even if it meant destroying the dreams and lives of the American public.

Until the early 1960s, tobacco companies perpetrated a large-scale manipulation of the U.S. public. As more and more medical researchers linked smoking and adverse health outcomes, major cigarette producers waged a multifaceted public relations campaign to cast doubt on medical research that linked tobacco use with increased rates of disease, including cancer. In public statements, tobacco executives asserted that the scientific findings were not as confident as some scientists and journalists suggested. They promised to fund their own research to settle the question. At the same time, these companies launched extensive advertising campaigns that featured doctors vouching for the safety and even the health benefits of smoking. However, internal tobacco companies' documents prove that, despite their public statements to the contrary, not only did they know the health risks that came with using their products, but they also actively sought ways to make cigarettes more addictive. After the 1964 Surgeon General's report, Congress restricted tobacco companies' ability to mislead the public, requiring them to place health warnings on their products and prohibiting them from advertising in broadcast media. In the decades that followed, tobacco companies continued to manipulate their products. They found new ways to shape public opinion, but they could no longer convincingly claim that smoking was safe.

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