Feasibility Analysis: Lung Cancer Research Weighing Advantages, Limitations, and Mortality Rates

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ABSTRACT

Lung Cancer Research: Weighing Advantages, Limitations, and Morality Rates summarizes the relevancy of lung cancer research and early cancer screenings, to encourage a notable drop in mortality rates within a five-year scope. It weighs the value and purpose of funding lung cancer research, additional benefits and risk factors of early detection screenings, and also discusses the health advances and financial and medical limitations involved with lung cancer research. It highlights additional emphasis on dollars funded for research, and furthering education for lung cancer awareness in general. This report concludes the benefits of research and early detection screenings overshadow the limitations. It further recommends various lung cancer research should continue to be actively funded and supported.



INTRODUCTION

Lung cancer is an accelerated growth of abnormal cells on one or both lungs. The abnormal cells will not carry out functions of normal lung cells. As they continue to grow, these cells form tumors and interfere with the overall standard functioning of the lung, causing issues like cough, shortness of breath, and various flu-like symptoms. It can also be disguised as other lung diseases, such as bronchitis or emphysema.

This particular cancer is the deadliest of all cancers – with an estimated 234,000 individuals diagnosed each year, and roughly 154,000 American lives lost to this disease. The current five-year survival rate for lung cancer is only 20%. However, with increased funding provided for research, more new treatments are made available, and survival rates ideally improve (LCRF, 2018. p 1). The overall problem with lung cancer research is that not many actively seek to donate for this type of research, because of the increasingly low mortality rates, since most lung cancer cases are caught in the later stages, and by then, treatment options are more limited. Sadly, these percentages in general have remained unchanged for the past five years.

This feasibility analysis seeks to weigh the significance of lung cancer research and early lung cancer screenings, using both to promote saving lives, to encourage a lower mortality rate, as surveyed during a five-year scope. It also strives to formally answer the important question regarding whether this research should continue to be funded due to the high mortality rates over the past five years, and will further examine some of the relevant advantages and potential limitations of continued lung cancer research. It strives to prove that the benefits of research and early lung cancer screenings outweigh many of the drawbacks. It will also propose ways on how to go about doing so as well, and provide additional research and insights on lung cancer in general.



DATA SECTION

Is Funding a Good Idea? The Purpose and Value of Lung Cancer Research

Every day, researchers find new and exciting developments for the treatment of lung cancer. In the past 5-10 years alone, there have been several major breakthroughs in detection and treatment options for this disease. According to the *Lung Cancer Foundation of America*, there have been at least 1,000 clinical trials regarding the latest discovery of advanced treatment, Immunotherapy (LCFA, 2018b. p 1). However, to run these trials require adequate funding and resources. Unfortunately, there continue to be major discrepancies and stigmas involved.

Most wrongly assume that since lung cancer is the deadliest of all cancers, it receives the most funding – however, in many cases, this is simply not true. Regarding one example, in the particular case of the *National Cancer Institute* (NCI), the majority of millions spent goes to breast cancer. But *why*? One lung cancer survivor named Dave Bjork asks – the NCI states: "when making decisions about which research projects to fund, NCI leadership focuses on supporting the best science, not setting funding targets for specific research categories or disease areas" (Lungcancer.net, 2017. p 1). Though it does seem like a logical response, it is still a bitter pill to swallow for some – low research funding for a cancer that kills the majority of Americans. Professional advocates, and those this disease has personally impacted, continue to strive to encourage active involvement, and not understate the value and purpose of lung cancer research. For without it, more lives would be lost.

The aspect of research is fundamental in exploring new treatment options, encouraging early detection practices, targeted therapies, and more. Despite a high mortality rate, with ongoing research, there has been progress made in the past five years alone. There have been several more advances in both lung cancer education and treatment options – and this continues to be relevant.



Importance of Early Detection: Lung Cancer Screenings

Catching lung cancer in its early stages helps greatly increase an individual's potential for survival. Aside from the high mortality rate, great advances still continue to be taken for appropriate preventive measures. One of these essential measures is cancer screening. The ultimate goal of this screening is to detect lung cancer early and quickly, before it spreads. Please note: these cancer screenings are <u>not</u> a guarantee that lung cancer will be altogether prevented, they are simply <u>one</u> step in the process to detect and treat it. There are both key benefits and risks of screening. These are highlighted below.

Possible benefits involved with screening may include:

- > Detecting lung cancer early, thereby leading to effective treatments in the long run.
- Reducing mortality rate of deaths from lung cancer. For example, according to the *Centers for Disease Control and Prevention*, percentages from a recent national lung cancer trial screening process showed there was a 16% reduction in the mortality rate among those with a history of heavy smoking.

Possible risk factors involved with screening may include:

- False-positive test results. The screening could show cancer is present when it is not, which may possibly lead to additional anxiety and unnecessary follow-up procedures.
- False-negative test results. The screening could show cancer is <u>not</u> present, when it is, which leads to further delays in seeking proper treatments.
- Increased radiation exposure. There is always the slight risk of exposure to radiation from repeated screenings that can cause cancer in healthy individuals (CDCP, 2018. p 6).



Though it seems the risks outweigh the benefits – it is also important to note these detection screenings are the easiest, quickest way to detect the lung cancer, <u>if</u> it is caught in the earliest stages. *The Cancer Journal for Clinicians* notes that approximately 50% of patients survive at least five years, if the disease is diagnosed while still localized, and in stage 1. Survival rates have raised slightly with tumors smaller than 3 centimeters, as opposed to larger ones. That said, only 16% of new patients that are diagnosed are classified in this localized, early stage (CA Cancer J Clin 2001. P. 59-60). So, it is vital to begin lung cancer screenings as directed by medical physicians. There are helpful age guidelines suggested by organizations such as the *American Cancer Society* and *American Lung Association* – both of which recommend starting no later than between the ages of 55-79, especially if an individual has a smoking history. These early lung cancer screenings, along with more in-depth research and an increase in funding given towards it, will help further raise the low morality rates for survival.

Advances and Benefits of Lung Cancer Research

As technology continues to further advance, life expectancy rates will also steadily rise. In-depth research continues to give hope to lung cancer patients, and encourages them to keep fighting to combat this disease. Dr. David Johnson, of the *Lung Cancer Foundation of America*, (LCFA) states it best: "research is <u>imperative</u> to improve treatment and management of all diseases and that's particularly true of lung cancer. It's creation of new knowledge, it's discovery. It's how we learn to improve management of symptoms, to improve survival" (LCFA, 2018b. p 4). Most of the relevancy of this research centers on the causes of and early detection of lung cancer. As previously aforementioned, catching lung cancer in its earliest stages helps greatly increase chances for survival. When able, researchers continue to closely study these causes and patterns, showing benefits to individuals being aware of the risk factors, i.e.: smoking, and in knowing the risks of developing this deadly disease.



Researchers continue to actively find new ways to detect lung cancer as early as possible, to keep raising the low mortality rate. Unfortunately, it still sits between 17-20%, but with continued funding and early detection, for every 100 people diagnosed while in the earliest stages, 56 of them will still be living five years later (LCFA, 2018b. p 2).

The benefits of continued research have also shown that not everyone's lung cancer tumor is the same – and that there are other options besides surgery. Further tumor mutation studies or more commonly known as biomarkers, have also revealed such significantly different understandings of this cancer, and its related treatments in the past five years. Researchers emphasize the study of an individual's particular biomarkers, giving rise to yet another important aspect of research that's an additional benefit for lung cancer patients: biomarker testing. Targeted therapies, used along with unique biomarkers, actively work to inhibit or shut down mutations that might cause cancer cells to grow. Currently, over 200 distinct biomarkers have been discovered, with in-depth research given toward those that occur most often. The latest of these relevant breakthroughs, immunotherapy, develops further research to understand why some immune systems will recognize "bad" cancer cells to destroy them, while other immune systems will not. Immunotherapy is designated to teach a person's own immune system to attack these deadly cells. Ideally, it will become the go-to treatment, before chemotherapy (LCFA, 2018b. p 3). With new breakthroughs happening frequently, research and early detection continue to be vital in helping to raise low mortality rates.

Financial and Medical Limitations of Lung Cancer Research

With the unfortunate stigma attached to lung cancer and smoking, funding is not always readily available – despite the glaring fact that up to an estimated 24,000 non-smokers died from lung cancer in 2016, and this number continues to grow, especially among women (Lungcancer.net, 2017. p 1). However, this discrepancy does offer certain limitations toward further lung cancer research.



The sad truth is, despite lung cancer claiming more lives each year than breast, pancreatic, and prostate cancer combined – these three other cancers receive an average of 5.4% times <u>more</u> research funding <u>per life lost</u> than lung cancer. The charts and figures below provide a much clearer estimate of dollars funded for each cancer, compared with current death rates, as well.





The stigma is clearly shown and unfortunate – as there is a marked difference between prostate funding and lung. With death rates continuing to be on the rise, individuals need to understand that no one deserves cancer, and that this disease does **not** discriminate.

Despite the advances in technological studies and research of lung cancer, several mysteries remain as to the additional causes of this cancer, besides the clear risk of smoking. Another downside, despite encouraging those who are at higher risk to participate in early detection, is that many lung cancers are diagnosed at a much later stage, since several patients do not exhibit key symptoms. Unfortunately, a little over 80% of these lung cancers are identified when the cancer is already at an advanced stage.



Surgery or chemotherapy are also not always guaranteed options, since there is a possibility the tumors could start growing again at any time. Targeted therapies are not noted to always be a successful tactic either, because certain tumors treated with particular targeted therapies in mind can develop a resistance to a certain drug over a period of time. The tumor cells simply learn to overcome the drugs, allowing the cancer to continue growing. Lastly, researchers are still trying to grasp how advanced immunotherapy will work for some patients, but not others, despite trying to combine both this and chemotherapy for greater results (LCFA, 2018b. p 2-3).

Lung Cancer Funding and Awareness: Additional Studies

It is important to note in the past two years, more advanced treatments for lung cancer have been approved by the United States Food and Drug Administration (FDA) than in the previous ten. Certain organizations, such as the *Lung Cancer Foundation of America* (LCFA), and one of the most thriving – raised close to an astounding \$3,000,000 dollars for lung cancer awareness and related research programs, with a strong emphasis placed on furthering education and research grants (LCFA, 2018a. p 1). With these continuous developments in research and early screenings, it shows a slow reduction of lung cancer deaths from 16% to 20% – and while this does not seem like a large jump, it remains significant in the fight against lung cancer (LCFA, 2018c. p 1).

Until researchers and lung cancer advocates alike can help further remove the biased stigma that follows this deadly cancer killer, it will not be as easy to encourage others to donate funds needed for further research – but spreading awareness is always a key factor. Providing knowledge and encouraging early testing to combat it are just two of the important steps necessary to help further the goals of lung cancer research, to save lives. Funding for additional research remains relevant despite the high mortality rates, and vital to survival.



CONCLUSION

Clear understanding of this disease and additional research go hand in hand in combating lung cancer. Awareness is key. Knowing the risk factors and encouraging early detection are two of the most important aspects. Funding for lung cancer research goes a long way in raising the mortality rates. This report maintains that without proper funding, adequate research, and making new discoveries based on this funded research, millions of countless lives would be tragically lost. The table below serves as another reminder of the relevance of research funding and early detection:

Lung cancer kills 433 Americans every day. That's the same number of seats

on a 747.

Every 3.3 minutes someone in the U.S. dies of lung cancer.

Less time than it takes to sing Breathless (3:42 min).

Lung cancer kills almost 2x as many women as breast cancer.

The #1 Cancer Lady Killer since 1987.

Table 2 (LCFA, 2018d. p 1).

Based on further findings and various statistics, like the ones highlighted above, it is highly recommended to continue to support collecting sufficient funding for various types of lung cancer research, and to encourage individuals who may be at higher risk to get a cancer screening. This essential funding and research endure on to give lung cancer patients hope for survival – and provides a beacon of precious light in the darkness for those of us whom have lost cherished loved ones.



For Momma Sue March 17, 1948 – February 25, 2011



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