Lung Cancer

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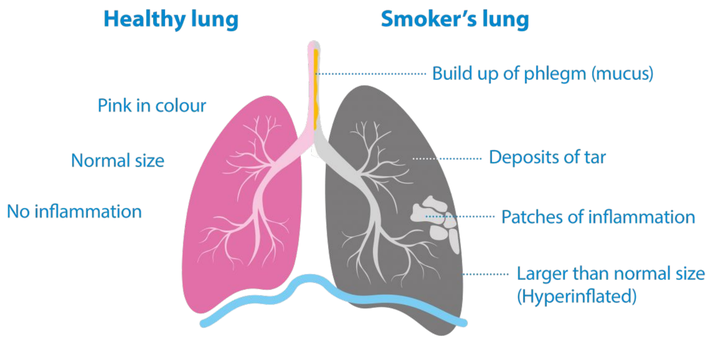
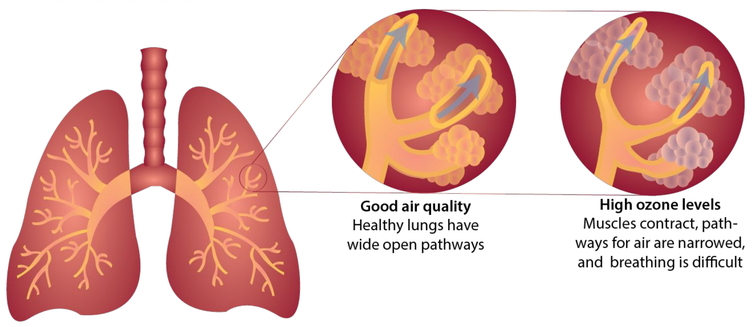
INTRODUCTION

- Lung cancer is when the cells that reside in the lungs grow and replicate uncontrollably, leading to the cancer cells disrupting the air passage leaving people unable to breathe properly
- After continuously smoking cigarettes numerous times, the substances or carcinogens enter your lungs and develop over time, slowly damaging the cells inside your body which could result in cancer development



Differences between Healthy Lung and Smokers Lung

- Over these past years, smoking rates have seen a decline which is beneficial for public health as it results in a decrease of lung cancer. However, lung cancer still grows by the day and is seen more commonly in non-smokers than previously seen before
- Another risk factor for lung cancer is air pollution. Tiny harmful particles/substances in the air can build up in the lungs and damage DNA in cells which can cause cancer to "non-smokers"



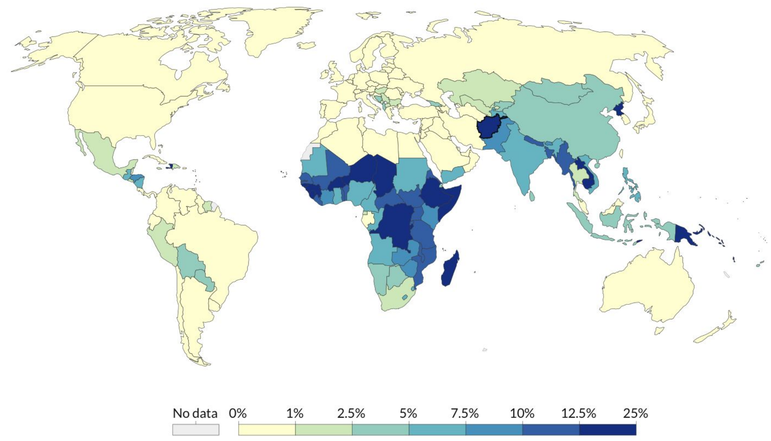
Effects of long term exposure to high ozone levels on lungs

- In terms of the type of cancer, "non-smokers" are afflicted with non-small cell lung cancer, mainly adenocarcinoma

METHODS

- Before I started looking for scientific articles, I did a little bit of research on what exactly is lung cancer to give me an idea of what I was working with
- I utilized PubMed and Google Scholar to find scientific articles that specialized on my topic of interest. I used keywords including "lung cancer" and "air pollution" in my search
- The next thing was filtering out all the articles. I made sure that the articles I chose were fairly relevant. Most of my articles were published within the last five years. Something I took into consideration was the amount of citation the articles had
- Then I skimmed through the abstract, introduction, and conclusion of each article and picked out ones that I felt related the most to my topic of interest
- I found ten scientific articles on lung cancer but some of them were off topic so I minimized it down to five
- When I was going through the articles, I took a closer look at each of the graphs, data charts, and figures. Then I selected a few of them to describe why it is significant and how it relates to my topic

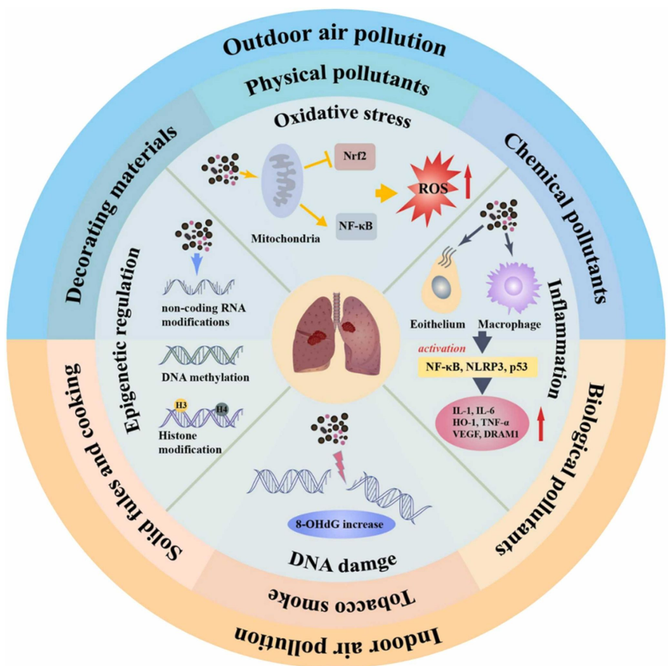
DATA



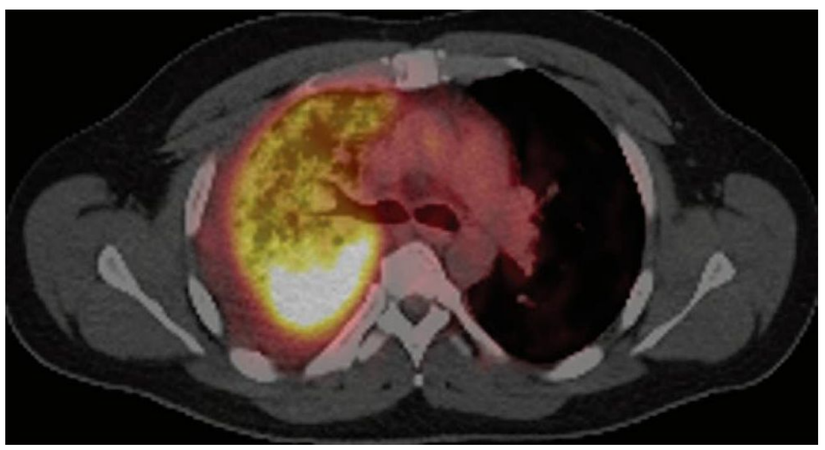
Share of deaths, from any cause, which are attributed to indoor air pollution, ***Fig.1***

Lung cancer		
	Smokers	**Non-Smokers**
Age at diagnosis	66 years	67 years
Sex predominance	Male	Female
Most common subtype	Adenocarcinoma (65%)	Adenocarcinoma (93%)
Time to seek medical care	2 months	3 months
EGFR mutations	8%	36%
ALK mutations	4%	26%
Stage IV at diagnosis	49%	62%

Lung Cancer - Smokers vs Non-Smokers, ***Fig. 2***



Factors leading to lung cancer caused by air pollution, ***Fig. 3***



Radiographic appearance of adenocarcinoma of the lung on PET imaging, ***Fig. 4***

RESULTS

- ***Figure 1*** is a map showing the share deaths caused by indoor air pollution across the world. The map compares the extent of indoor air pollution and the severity in each country. As depicted on the map, the countries that are impacted the most by air pollution and other risk factors that causes lung cancer are countries with the lowest income
- ***Figure 2*** is a chart comparing lung cancer in Smokers and Non-Smokers. From the chart, smokers who are diagnosed with lung cancer are predominantly male while non-smokers diagnosed with lung cancer are predominantly female. Additionally, the most common lung cancer subtype in non-smokers is adenocarcinoma. Adenocarcinoma is a type of non-small cell lung cancer that occurs when abnormal lung cells are reproducing at the uncontrollable rate which forms a tumor
- ***Figure 3*** is a infographic demonstrating the different types of outdoor and indoor air pollutants causing lung cancer. Environmental factors and indoor pollutants can all cause lung inflammation, epigenetic regulation, and DNA damage which leads to the development of lung cancer
- mRNA is the primary coding sequence for translation while lncRNA is in charge of linking the chromatin-modifying proteins to chromosomes
- ***Figure 4*** is positron emission tomography (PET) imaging of adenocarcinoma of the lung. When is comes to lung cancer screening in non-smokers it can be difficult because are no guidelines. However, people with increased risk based on family history must be monitored for early symptoms of lung cancer in order to ensure that the patient receives early treatment

CONCLUSIONS

- Learning and studying the risk factors of lung cancer is very significant as it will help reduce the mortality rate while increasing the survival rate and possibly eliminating cancer
- Even though smoking is the number one cause for lung cancer, non-smokers often overlook and completely ignore the other risk factors. Some of the risk factors include outdoor pollution (harmful gases and chemicals), indoor pollution (cooking fume and second-hand smoking), and environmental exposures
- Long-term exposure to the risk factors can cause DNA damage, mRNA and lncRNA modifications, and inflammation will result in developing lung cancer
- This is an important topic and people should pay more attention to pollution in order to minimize the exposure to risk factors especially in low socioeconomic areas. Some measures that could help reduce the rate of lung cancer could be prohibiting smoking in public areas, improving the air quality, eliminating the usage of harmful substances/chemicals, and taking care of the environment

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