



# Lung Cancer Project

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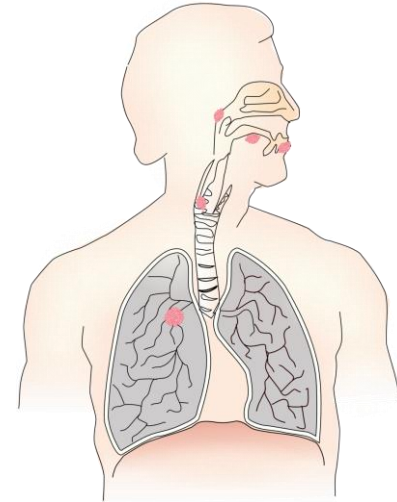
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# TUMORNATORS

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# Abstract

Lung Cancer the #1 cause of cancer deaths among men and the #2 cause of cancer deaths among women. Lung Cancer, which can be activated by two types, affect a majority of low to middle-income countries and can spread to nearby countries like a virus. This research aims to inform the public about the risks and effects of lung cancer and show how it is currently affecting the world. In order to gain valuable information about this research, we used a variety of websites like PubMed and online sources that have (.gov) and (.edu). From our research, we have observed the high number of deaths lung cancer has caused and how deadly it can be. We can conclude that based on the amount of research done will not be enough to prevent lung cancer and so we need more funding and more attention toward this hazardous topic.

Small Cell

# What is Lung Cancer?<sup>1,3</sup>

Non-Small Cell

The lungs are a pair of air-filled organs located on both sides of the chest. Lung cancer is a rapid growth of cells within the lungs that is abnormal. The body has systems in place to stop the spread of cancer such as the Tumor Suppressor Gene, which trigger within the cell, and will instantly kill the cell. There are two types of lung cancers: Small cell lung cancer and non-small cell lung cancer. Small cell lung cancer, which is more common, occurs mostly in heavy smokers. Non-small cell lung cancer is for different cancers that act the same, which includes squamous cell carcinoma, adenocarcinoma, and large cell carcinoma.

# Signs and Causes<sup>4</sup>

There are many ways that lung cancer can be identified. Symptoms of lung cancer can include **continual coughing, coughing blood, shortness of breath, chest pain, bone pain, and severe headaches**. The primary cause of lung cancer is smoking, which contains harmful substances like **nicotine, hydrogen cyanide, formaldehyde**, and other **carcinogens** that lead to a change within lung tissues. Which then, the body will try to repair the damage, but with repeated exposure, this can cause the cells within the lungs to be abnormally leading to cancer.

# Ways to Prevent Lung Cancer<sup>8</sup>

There are various ways to prevent lung cancer. A significant way is in diets. A **diet** that is high in fruits and vegetables can have a protective and positive effect against many cancers. Another is participating in **regular physical activity** and maintaining a healthy body weight can considerably reduce the chance of any cancer. Also, **healthy eating habits** that prevent the development of diet-associated cancers can lower the risk of other non-diet related diseases. Finally, **radiation** that is used in medicine can help save lives as well as prevent the need for more invasive procedures. However, excessive use may cause harm from the high levels of radiation doses in patients. Most importantly: **No smoking!!**

# Origins<sup>12</sup>

Approximately 58% of all lung cancers occurred in less developed nations. Among men, the highest rates are found in Central and Eastern Europe with 53.5 per 100,000 having lung cancer. Among women, the highest rates are found in Northern America, with 33.8 per 100,000 having lung cancer. This study shows declining trends in men and increasing incidence of lung cancer for women.

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**Table 2**

Ratios of age-standardized incidence to mortality rates by world region and genders.

Countries	Men			Women		
	ASR (I)	ASR (M)	I:M	ASR (I)	ASR (M)	I:M
North America	44	34.8	1.26	33.8	23.5	1.44
Micronesia	47.5	41.7	1.14	22.9	20.8	1.10
Eastern Asia	50.4	44.8	1.13	19.2	16.2	1.19
More developed regions	44.7	36.8	1.21	19.6	14.3	1.37
Western Europe	44	35.3	1.25	20	14.8	1.35
Central and Eastern Europe	53.5	47.6	1.12	10.4	8.3	1.25
Southern Europe	46.4	39.1	1.19	12.8	10	1.28
Northern Europe	34.6	29.7	1.16	23.7	19.1	1.24
Australia/NZ	32.7	23.5	1.39	21.7	15	1.45
Polynesia	39.3	36	1.09	13.5	14.8	0.91
<b>World</b>	<b>34.2</b>	<b>30</b>	<b>1.14</b>	<b>13.6</b>	<b>11.1</b>	<b>1.23</b>
Western Asia	37.6	34	1.11	7.1	6.2	1.15
Less developed regions	30	27.2	1.10	11.1	9.8	1.13
South-Eastern Asia	29.6	26.6	1.11	10.5	9.4	1.12
Caribbean	25.8	23.7	1.09	13.5	12.1	1.12
Southern Africa	26.1	23.8	1.10	10.2	9.1	1.12
South America	20.8	18.4	1.13	10.7	8.9	1.20
Melanesia	14.3	13.3	1.08	5.8	5	1.16
Northern Africa	15.6	14	1.11	3.1	2.8	1.11
South-Central Asia	11.9	10.7	1.11	3.4	3.1	1.10
Central America	10.2	9	1.13	4.9	4.3	1.14
Eastern Africa	3.8	3.5	1.09	2.2	2	1.10
Middle Africa	2	1.8	1.11	0.8	0.7	1.14
Western Africa	1.7	1.5	1.13	1.1	1	1.10

ASR: Age-standardized rates; I: incidence; M: mortality.

# **Lung Cancer vs COPD.<sup>10</sup>**

**COPD and Lung Cancer causes airflow obstruction, which then can lead to lung cancer. Chronic obstructive pulmonary disease is the fourth leading cause of death in the United States. COPD is an inflammatory disorder with numerous cons, including an increased risk of primary lung cancers. Similarly, chronic inflammation related to COPD plays a role in the pathogenesis of lung cancer. Inflammation in COPD may result in repeated epithelial injuries and result in cell turnover rates and propagation of DNA errors. Although all lung cancer cell types occur in the setting of COPD, airflow obstruction has explicitly been associated with an increased risk in squamous cell carcinoma.**

## **Worldwide Statistics <sup>2</sup>**

- The leading cause of cancer death among men and the second leading cause of cancer deaths among women is lung cancer.**
- Low and-middle income countries account for more than 50% of lung cancer deaths each year.**
- More people die of lung cancer each year than colon, breast, and prostate cancers combined.**
- The chance that a man will develop lung cancer in his lifetime is about 1 in 15. The chance that a woman will develop lung cancer in her lifetime is about 1 in 17.**
- About 13% of all new cancers are lung cancer. (65 or older is the most common age requirement)**



# Similarities between the 2 Types<sup>1,3</sup>

- Risk factors include smoking, secondhand smoke, exposure to radon, arsenic in drinking water, dietary supplements, air pollution.
- Symptoms: coughing, chest pain, trouble breathing, weight loss, feeling tired, infections, bone pain, dizziness, yellowing of skin.
- Lung cancer starts when cells of the lung become abnormal and grow out of control. When many can cells form, they can develop into a tumor and spread across the body like a virus.
- 3 pieces of information used for the staging system: the size and extent of the tumor, the spreading to nearby lymph nodes, and spreading to distant sites.

## **Real Life Perspectives<sup>5</sup>**

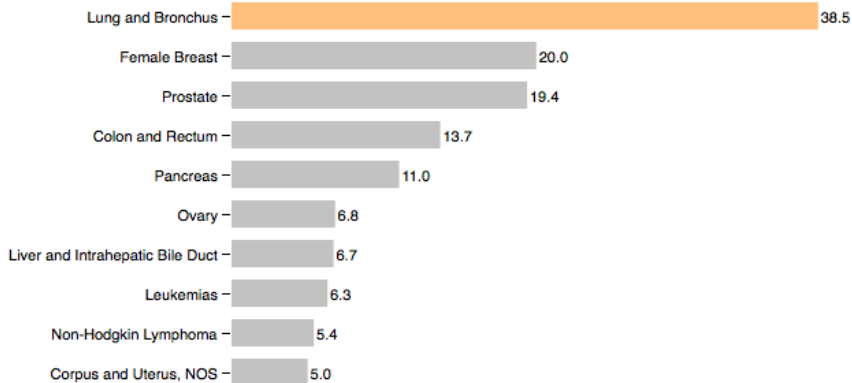
**Felicia had her causal routine of working at Core-Mark International when she started to experience a bad cold that prevented her to breathe. Because of this, she went to urgent care and found out that she became contracted with Stage IV lung cancer after CT scans. Felicia reacted very badly to this and was disappointed for being the victim of lung cancer. After years of her experiencing symptoms of hearing loss, blood infections, pneumonia and rhinovirus, Felicia changed gears to promoting awareness of lung cancer and felt the need for more deep research as well as volunteering for organizations that promote the events relating to lung cancer. (Free to Breathe Walk)**

# Lung Cancer vs Other Popular Cancers<sup>9</sup>

## Top 10 Cancers by Rates of Cancer Deaths

United States, 2016, Male and Female  
Rate per 100,000 people

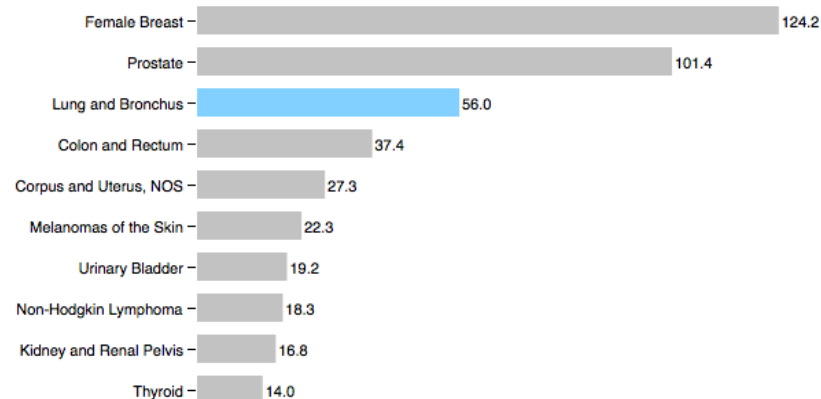
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## Top 10 Cancers by Rates of New Cancer Cases

United States, 2016, Male and Female  
Rate per 100,000 people

Chart Table Export



# Treatments of Lung Cancer<sup>4,7</sup>

Non-small cell lung cancer can be treated in various ways including methods like surgery, chemotherapy, radiation therapy, targeted therapy, or immunotherapy. Radiation therapy and chemotherapy are normally most common for lung cancer. Also, surgery can be used to cut out cancer tissue if it's in a small surveillanced area. Chemotherapy, however, uses medicine to shrink or kill the cancer. The medicine can either be pills you take or the drugs given in your veins. Radiation therapy using high-energy rays to kill the cancer and targeted therapy, at last, uses drugs to block the growth and spread of cancer cells.

# **Side Effects after Lung Cancer Treatments<sup>6</sup>**

**Clotting of blood, bone problems, diarrhea, hair loss, fatigue, nausea, and excessive weight gain or weight loss are all effects of lung cancer. Cancer that starts in or spreads to the bones can lead to bone pain and can lead to an increase in risks like weakening of the bone, fractures, and high calcium levels in the blood. Cancer treatments may also affect the bones and can possible lead to tooth decay and other mouth issues, like dry mouth and mouth sores. Fatigue is probably the most commonly reported side effect of lung cancer making it pose a massive threat to those who get diagnosed with cancer. Hair loss from treatments like chemotherapy occur because of hair follicles being weakened leading to hair falling out much more quickly than it would normally.**

# Lung Cancer Statistics<sup>2</sup>

- 1 in 16 people are diagnosed with lung cancer in their lifetime
  - 60% to 65% of all new lung cancer diagnoses are from nonsmokers or former smokers.
  - Every 2.3 minutes, someone is diagnosed with lung cancer
  - Lung Cancer takes more lives than the next three common cancers combined
  - Lung Cancer kills 1.5 times as many women than breast cancer
  - Lung Cancer accounts for only 6% of federal research dollars
  - Lung Cancer takes about 156,000 lives every year
  - Blacks are 20% more likely to get lung cancer than white men
- Mainly affects older people and diagnosed commonly at 75

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