ABOUT LUNG CANCER

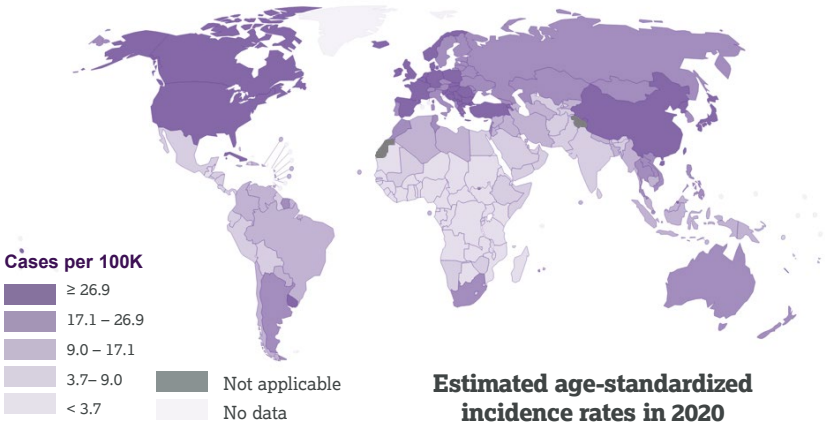
Global burden in 2020[1]

2nd MOST COMMON CANCER

#1 CAUSE OF CANCER DEATH

2.2M NEW CASES

1.8M DEATHS



Estimated age-standardized incidence rates in 2020

18% of all cancer deaths are caused by lung cancer

19% of patients are alive five years after diagnosis[2]

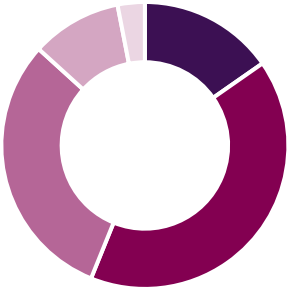
Types of lung cancer[3]

Non-small cell lung cancer (NSCLC)

NSCLC originates from the larger cells in the lungs, such as epithelial cells lining the lung airways or mucus-producing cells.[4]

Small cell lung cancer (SCLC)

SCLC is less common, and originates from small, hormone-releasing cells. SCLC is more aggressive and fast-growing compared to NSCLC.[5]



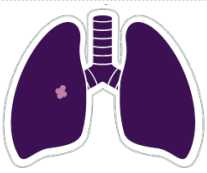
Small-cell lung cancer	**15%**
Non-small cell lung cancer	**85%**
Adenocarcinoma	40%
Squamous cell carcinoma	30%
Large cell carcinoma	10%
Other	3%

Stages of disease

Identifying the stage is important for doctors to determine patients' prognosis and help assess treatment options. NSCLC is staged on a **scale of I to IV***, according to the severity of disease.[6] In addition to the traditional four stages, SCLC is divided into two groups: **limited stage (I-III)** and **extensive stage (IV)**.[7]

Stage I NSCLC

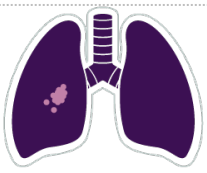
Tumour has not spread beyond the lungs and is less than 5cm wide.[8]



Five-year survival rate: 68-92%[8]

Stage II NSCLC

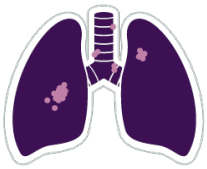
Tumour can be between 5 and 7 cm, and is categorised as Stage IIB once it has reached the lymph nodes.[8]



Five-year survival rate: 53-60%[8]

Stage III NSCLC

Stage III lung cancer is often referred to as locally advanced disease. The tumour may have spread outside the lung and can be of any size.[9]

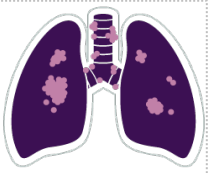


Divided into **3 sub-categories (IIIA, IIIB and IIIC)**, defined by how much the cancer has spread locally and the possibility of surgery.[8]

Five-year survival rate: 13-36%[10]

Stage IV NSCLC

The most advanced form of lung cancer, often referred to as metastatic disease. Tumour has metastasised (spread) beyond the lung throughout the body.[6]



Five-year survival rate: 0-10%[11]

Diagnosing and treating patients in earlier stages of disease can maximise the potential for long-term disease remission and the possibility of cure.

***Staging is more complex than the examples shown here**

Document Number: Z4-33368 Date of prep: May 2021

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The importance of biomarker testing

Lung cancer is a **diverse disease**, characterised by a variety of different genetic and molecular characteristics.[12] These characteristics, known as **biomarkers**, can serve as indicators of various types of cancer and many promote tumour growth. Some biomarkers arise as a result of **point mutations** (changes within genes), and some reflect **altered expression**.[12-14]

Up to 50% of NSCLC cases are associated with biomarkers[12]

Doctors use tumour samples to diagnose NSCLC, and test for biomarker mutation status and levels of biomarker expression. Biomarker testing is critical to learning more about each patient's tumour type and can be used to help determine **treatment options.** Based on the test results, patients may be matched with **targeted therapies aimed at specific biomarkers** present in their genetic profile.[15]

Established biomarkers

EGFR mutations

The **epidermal growth factor receptor** is a protein that helps cells grow. EGFR mutations can cause higher than normal amounts of the protein on cancer cells, allowing them to grow more rapidly.[16]

Approximately **10-15% of patients in the US and Europe**, and **30-40% of patients in Asia** have EGFR mutations.[17-19]

10-40% of patients

MET gene alterations

The **MET** gene is involved in protein creation. The MET gene can drive growth of tumour cells when it mutates, is amplified or if overexpression occurs.[20]

- **Exon 14 mutations: 3-4%** of patients[21]
- **Amplification**: **1-6%** of patients[21]
- **Overexpression: 15-70%** of patients[22]

Studies suggest that MET gene alterations are a key mechanism of acquired resistance to EGFR targeted therapies.[22]

1-70% of patients

BRAF mutations

The **BRAF gene** makes a protein that helps control cell growth. Mutations in the BRAF gene can cause uncontrolled cell growth, leading to cancer.[23,24]

1.5-3.5% of patients

ALK mutations

The **anaplastic lymphoma kinase** gene is involved in cell growth and division. When rearranged, ALK genes can result in tumour growth.[25-27]

4-7% of patients

KRAS mutations

The **kirsten rat sarcoma gene** is involved in regulating cell division. KRAS mutations can cause uncontrolled cell growth, division and duplication. KRAS mutations occur in **5-15% of patients in Asia** and **25-50% of patients in Western populations**.[28,29]

5-50% of patients

PD-L1 expression

Programmed death-ligand 1 is a protein expressed on the surface of cancer cells that helps them evade the immune system. For patients whose cancer is not associated with a known mutation, abnormal PD-L1 expression may help characterise their disease.[15,30]

19-100% of tumours have abnormal PD-L1 expression

Exploratory targets

HER2 gene alterations

Human epidermal growth factor receptor 2 is a protein that regulates cell growth. HER gene alterations, such as mutations or overexpression, can facilitate excessive or uncontrolled growth that may promote the formation of tumours.[31]

TROP2 overexpression

Trophoblast cell-surface antigen 2 is a transmembrane glycoprotein involved in cell self-renewal, proliferation, invasion and survival. TROP2 expression has been associated with poor overall and disease-free survival in several types of solid tumors.[32,33]

Document Number: Z4-33368 Date of prep: May 2021

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