Screening for lung cancer is the next big opportunity for early detection

Detecting lung cancer via screening before symptoms occur may transform lung cancer from a fatal to a treatable condition

The lack of clear symptoms during the early stages means that lung cancer is often **diagnosed late**.[1]

Screening via low-dose computed tomography (LDCT) can **reduce the time to diagnosis, increase access to curative surgery** and **improve survival**.[2]

LDCT screening for lung cancer meets all key criteria for screening programmes, including the Wilson and Jungner criteria:[3]
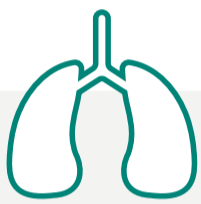
Lung cancer is a significant public health issue

Globally, **one fifth of all cancer-related deaths** are due to lung cancer.[4]

Lung cancer also incurs the **greatest economic burden of all cancers**.[5]

Lung cancer has a detectable early stage of the disease, for which effective treatments are available

Most people with lung cancer are diagnosed late (stage IV), when **five-year survival is <10%**.[6][7]

If diagnosed earlier (stage I), five-year survival increases to **68–92%**[7] as treatment (such as surgery) can be **potentially curative**.[8]

LDCT screening is recognised as a suitable test for lung cancer

When optimised, targeted LDCT screening has been shown to be **effective** and **does not lead** to a high proportion of unnecessary procedures or treatments.[9–12]

Lung cancer screening is cost-effective

LDCT screening is also potentially **more efficient** than other cancer screening programmes.[13–15] In other words, fewer people need to be screened to avoid one death from lung cancer than with other cancer screening programmes.

There is an extensive evidence base supporting the implementation of LDCT screening

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Targeted LDCT screening can help address underlying health inequalities in lung cancer

Lung cancer disproportionately affects people with a lower socioeconomic position
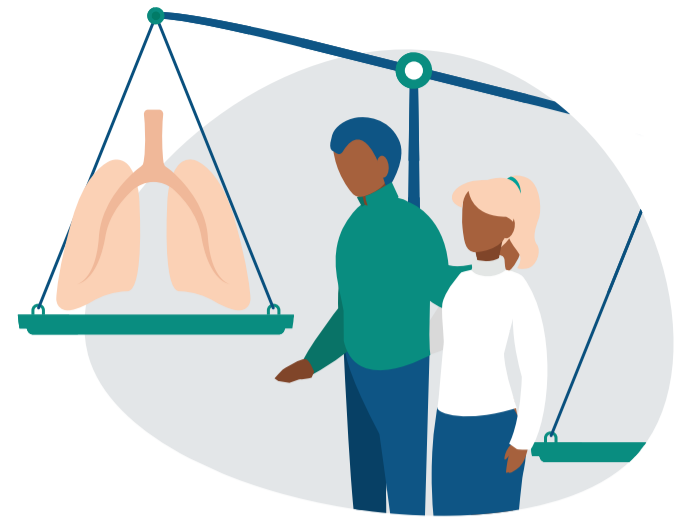
Lung cancer is responsible for the **greatest inequalities in cancer deaths** related to socioeconomic position, both between and within countries.[1-3]
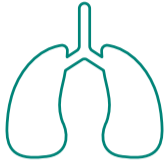
Socioeconomic inequalities result in **significant gaps in survival, outcomes and quality of life** for people diagnosed with lung cancer.[2-4]

Ensuring access to targeted low-dose computed tomography (LDCT) screening would help address health inequalities in lung cancer

Inequalities experienced	✓ Opportunities to address these through screening
Greater exposure to risk factors for lung cancer and related conditions (comorbidities)	Physical, financial, informational, social or cultural barriers to accessing health services[5 6]
✓ Targeted screening uses an understanding of risk factors to inform whom should be offered screening	✓ Flexible models of screening can address barriers to screening (e.g. mobile CT brings screening to underserved communities)
Lower health literacy and/or limited contact with health services	Later-stage presentation with symptoms
✓ Screening provides an opportunity to engage a high-risk population with health information and services such as smoking cessation	✓ Screening addresses low awareness of lung cancer as it detects lung cancer before symptoms start to show
Lower treatment rates, fewer options for treatment, poorer quality of life and survival	
✓ Screening enables early detection of lung cancer, improving survival and offering more options for potentially curative treatment (e.g. surgery)	

The impact of LDCT screening would be maximised by securing the attendance of groups who are at a high risk

Designing **tailored approaches** to help secure participation from high-risk groups is needed to promote greater health equity.[7-9]

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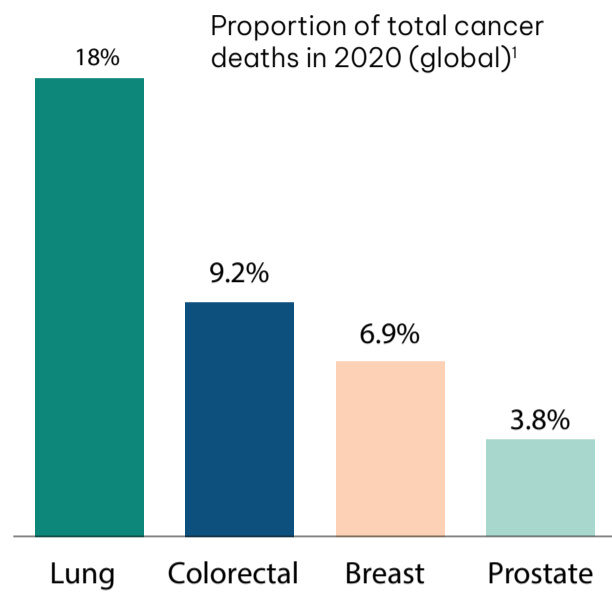
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Reducing mortality from lung cancer is essential to improving overall cancer control

Addressing the poor survival of lung cancer is a public health imperative

Proportion of total cancer deaths in 2020 (global)[1]

- Lung: 18%
- Colorectal: 9.2%
- Breast: 6.9%
- Prostate: 3.8%

Globally, cancer is responsible for **10 million deaths** every year and lung cancer accounts for approximately **one fifth** of these deaths.[1]
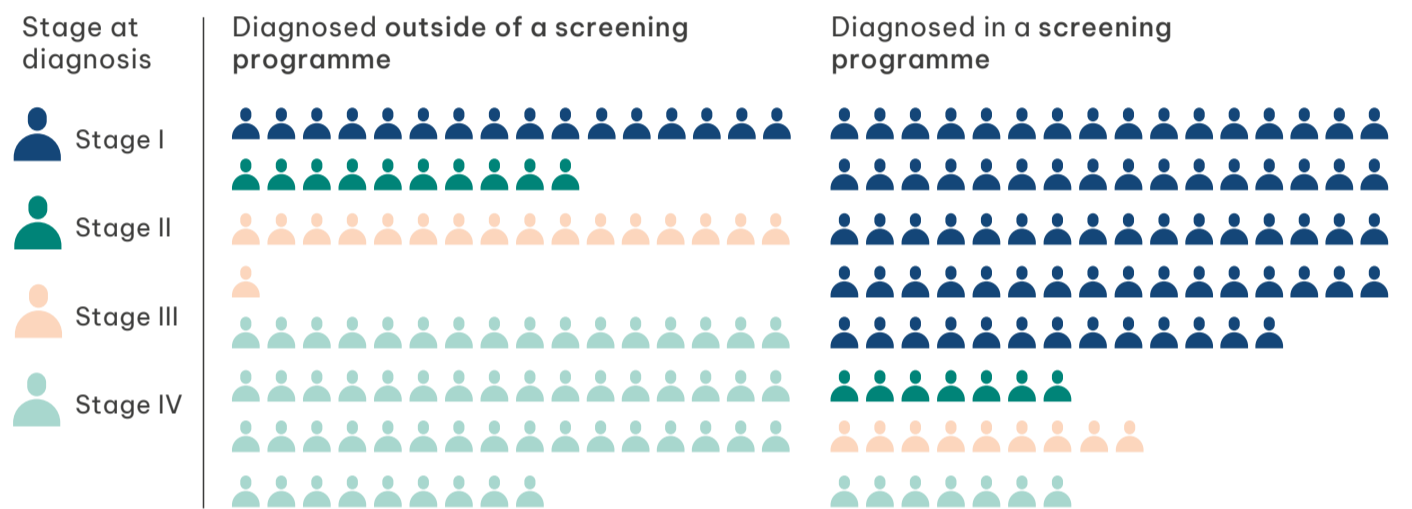
In contrast with other common cancers, lung cancer is most often diagnosed at an advanced stage (stage IV), when survival is poorest.[2]

Detecting lung cancer earlier via screening would enable more people to access potentially curative treatment, such as surgery.[3]
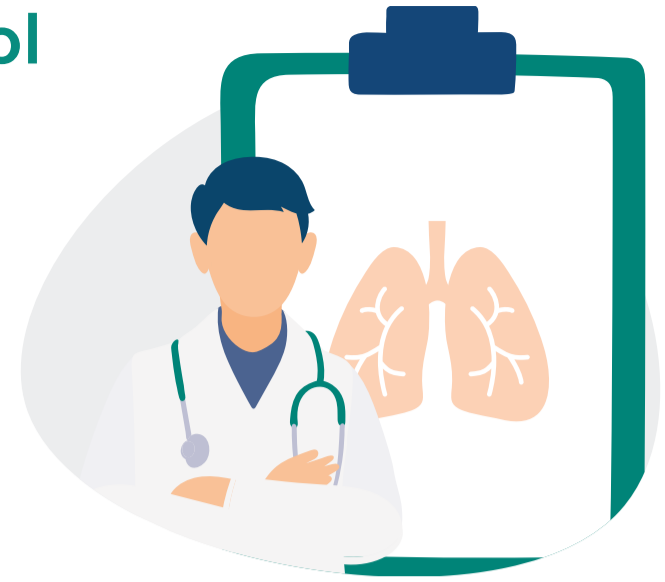
Diagnosing lung cancer earlier (stage I) can increase five-year survival from less than 10% (at stage IV) to as high as 92%[4]

Clinical trials show that targeted low-dose computed tomography (LDCT) screening reduces lung cancer mortality by nearly **one quarter**[5] – and the true impact on population health could be even greater.[6–8]

Stage at diagnosis
- Stage I
- Stage II
- Stage III
- Stage IV

Diagnosed **outside of a screening programme**

Diagnosed in a **screening programme**

Data from Sands *et al.* (2021)[9]

Lung cancer will remain an important public health challenge that screening can help address in the coming years

People who used to smoke remain at high risk of developing lung cancer: compared with the risk for people who have never smoked, this risk remains 3× higher for 25 years after stopping smoking.[10]

Smoking rates are decreasing for men but rising among women in some countries.[11] In low- and middle-income countries, rates are increasing for both sexes.[12]

Increased exposure to other risk factors (e.g. air pollution) is expected to lead to a rise in deaths from lung cancer.[12 13]

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LDCT screening offers a targeted approach for early detection of lung cancer in people at highest risk

LDCT screening is an effective way to detect lung cancer in a high-risk population

Targeted low-dose computed tomography (LDCT) screening involves only offering a scan to people at high risk of lung cancer; extensive evidence shows that it is cost-effective.[1]

Smoking is a well-known cause of lung cancer but **other risk factors** are increasingly recognised (e.g. air pollution, family history, socioeconomic position).[2][3] In some countries, such as Taiwan, >50% of cases of lung cancer occur among people who have never smoked.[4]

Developing eligibility criteria informed by multiple risks factors relevant to a specific population's chance of developing lung cancer means that **screening can be targeted to those at highest risk**.[5]

Using a targeted approach to LDCT screening minimises unnecessary follow-up or treatment and increases the chances of early detection

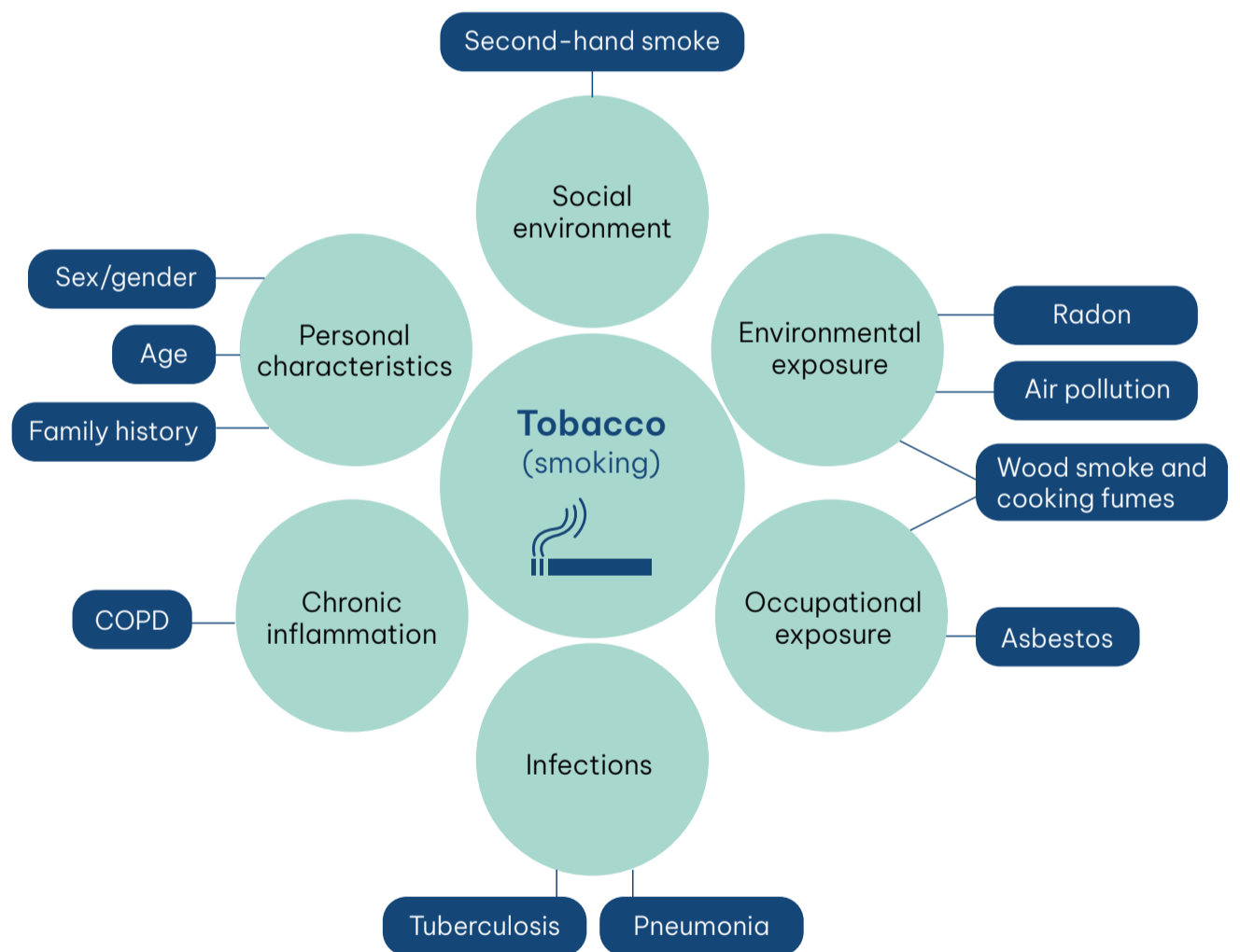**High-quality LDCT screening targeted at people at high risk of lung cancer:**

does not result in many unnecessary interventions[6-8]

requires **fewer people to be screened** to prevent one death compared with breast or colorectal cancer screening.[9]

Examples of common risk factors for lung cancer

COPD: chronic obstructive pulmonary disease. Figure adapted from Corrales *et al.* (2020)[2]

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# There is a strong economic case for implementing LDCT screening for lung cancer

Lung cancer is responsible for the greatest economic burden of all cancers

Cancer is estimated to cost the global economy over **$25 trillion*** between 2020 and 2050.[1]

Five cancers are responsible for **over 50%** of this burden, with lung cancer contributing the highest costs:[1]

Lung	Colorectal	Breast	Liver	Leukaemia
15.4%	10.9%	7.7%	6.5%	6.3%
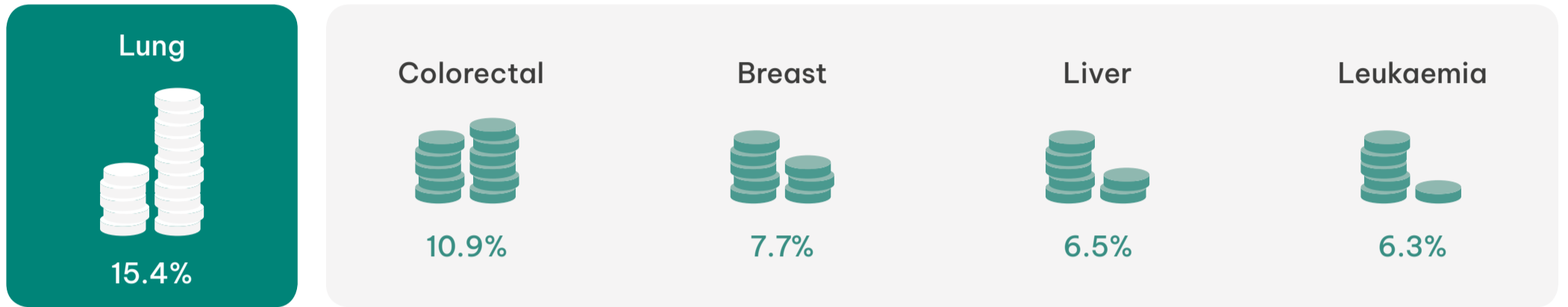
*Estimates use international dollars; broken down by the proportion of total cancer burden (%) for each of the five cancers.[1]

Targeted low-dose computed tomography (LDCT) screening would reduce the impact of lung cancer on society

Early death from lung cancer results in **significant productivity losses**.[2][3]

Detecting lung cancer earlier would:[4]

- **increase** the likelihood of successful treatment
- **improve** survival rates and overall quality of life for people living with lung cancer.

The costs of lung cancer are highest at advanced stages of the disease[5][6]

Direct medical costs linked to treatment and care are **significantly higher for advanced lung cancer** than for earlier-stage disease.[5][6]

+

Many people living with advanced lung cancer **stop working and are not able to return to work**.[5] Their loved ones may also stop or limit work to provide **unpaid care**.[7][8]

There is a clear business case for investing in LDCT screening for lung cancer

The **majority of studies** conclude that LDCT screening is a cost-effective tool to reduce the number of deaths from lung cancer.[9]

Compared with other common cancers, fewer people need to be screened to prevent one death from lung cancer, making lung cancer screening more efficient.[10]

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