

Are you at risk for lung cancer?

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Every year, 1.6 million people die of lung cancer. But if you think that these are just older heavy smokers, you're wrong.

A new Norwegian-Greek study in *The Lancet*-affiliated *EBioMedicine* journal shows that you may also be at [risk](#) even if you're younger and haven't smoked a lot.

Researchers from the HUNT study in Norway have used survey responses of 65000 Norwegians between the ages of 20 and 100, followed them for 16 years and identified the strongest [risk factors](#).

A large American study from 2011 showed that computer tomography (CT) screening for people who smoked 20 cigarettes for more than 30 years could save lives, but 70 per cent of smokers at risk were not included. But CT scans are expensive and should not be used unnecessarily, since repeated small radiation doses can be harmful over time. So the researchers wanted to come up with a tool that could identify people at high risk with high precision.

94 per cent smokers

Oluf Dimitri Røe is senior oncologist at the Department of Oncology, Levanger Hospital in Trøndelag county and an associate professor at NTNU's Department of Clinical and Molecular Medicine.

Røe came up with the idea of using data from the large Norwegian HUNT study to find the right combination of risk factors that could

predict [lung cancer](#) with high accuracy. HUNT, the Nord-Trøndelag Health Study, has collected large amounts of health data during three different periods from most of the residents of Nord Trøndelag county. The database contains information on nearly 120,000 people. Røe pulled together an international research group to look into the topic.

In addition to Røe, the research group consisted of professors Arnulf Langhammer and Kristian Hveem from HUNT and bioinformaticians at the University of Crete, in Greece, including first author Maria Markaki, Ph.D.; Vincenzo Lagani, Ph.D.; and Ioannis Tsamardinos, a professor from the University of Crete who conducted the statistical analyses.

After three years of work, the group found that 94 per cent of the patients diagnosed with lung cancer were smokers or ex-smokers. No clear risk factors were found for the 6 per cent who had not smoked.

In addition, they found that 21 per cent of the lung cancer cases occurred in people under age 55 at the time they participated in the HUNT survey. People who had smoked fewer than 20 cigarettes a day for less than 20 years accounted for 36 per cent of the cases.

The seven risk factors

The results enabled the research group to pinpoint individuals among smokers and ex-smokers who are more likely to develop lung cancer. Researchers identified seven risk factors culled from 36 variables.

The group then created a risk calculator that allows you to calculate your personal risk of developing lung cancer within 6 years and within 16 years. This online calculator has been named the HUNT Lung Cancer Risk Model.

Five contributing risk factors are already well known:

- Increasing age
- Pack-years (Based on how many years you've smoked 20 cigarettes daily.)
- How many cigarettes you've smoked daily (A few cigarettes a day for many years is more harmful than many cigarettes for a few years.)
- How long it's been since you quit smoking (The risk drops over time.)
- Body mass index (BMI; the lower your BMI the higher the risk.)

Two new factors have been added:

- Periodical daily cough (Increases risk.)
- How many hours a day you're exposed to smoke indoors (Increases risk.)

Fewer CT scans needed

The research group used these seven factors to see if they could predict lung cancer in 45000 individuals who had all answered the same questionnaires and had been follow for as much as 20 years. They were all participants in ten CONOR (Cohort of Norway) health studies.

When they paired people up, the group was able to predict with nearly 88 per cent accuracy who would develop lung cancer first.

Using the model, only 22 per cent of smokers and ex-smokers would need a CT scan to identify up to 85 per cent of those who would develop lung cancer within the next six years.

"The method can reduce the number of people exposed to radiation from unnecessary CT scans, and maximise identification of persons with true risk," says Røe. "It is also the first model that can accurately predict lung

cancer in light smokers, younger people, and people who quit smoking many years before."

The United States has already implemented CT scan screening of heavy smokers, but screening in Europe will possibly be introduced once a bigger European study is completed. Future screening of smokers will be more accurate with this kind of risk calculator.

Fortunately, few people are developing lung cancer, even in the high-risk group. Among those who had ever smoked in the HUNT study, the frequency was about two per cent in 16 years. This statistic also reflects the fact that the population in North Trøndelag were on average light smokers. general weren't heavy [smokers](#).

It is important to find alternative methods to detect [lung cancer](#) early, and the research group is now working on developing a simple blood test that can be combined with the risk calculator. This could provide even better results and further reduce the number of people who need to undergo repeated CT scans.

[You can calculate your own risk here.](#)

More information: Maria Markaki et al. A Validated Clinical Risk Prediction Model for Lung Cancer in Smokers of All Ages and Exposure Types: A HUNT Study, *EBioMedicine* (2018). [DOI: 10.1016/j.ebiom.2018.03.027](#)

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