

# Cystic Fibrosis Research News

## Title:

Seasonal fluctuation of lung function in cystic fibrosis: A national register-based study in two northern European populations

## Authors:

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## What was your research question?

How do the four seasons of the year affect lung function in people with cystic fibrosis (CF)?

## Why is this important?

Many of the risk factors for CF lung disease vary with the seasons. The most well-known examples are seasonal influenza outbreaks, which lead to pulmonary exacerbations during winter epidemics. Likewise, infection with *Pseudomonas aeruginosa* and other sources of CF infection have been shown to vary with the season. There are also seasonal effects that are more difficult to measure such as altered clinic opening hours during vacation periods and the positive influence of more vitamin D in summertime. So, there are marked changes in the weather and the surrounding environment during the year. It is however not well understood, how the four seasons affect lung function in CF.

## What did you do?

We developed a statistical model to evaluate changes in lung function over the year in people with CF and applied it to people with CF in the UK and also in Denmark. We used registry data from 1996 to 2015 in the UK and 1974 to 2014 in Denmark. Lung function was measured as

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the percentage of the amount of air a person was expected to exhale during one second based on their sex, height and age.

## What did you find?

We found no significant recurring seasonal variation in lung function in either country. The maximum variation in lung function around the yearly average was between 0 and 0.29 percentage points in the UK and between 0 and 0.21 percentage points in Denmark. In the UK we additionally found that lung function was higher in spring compared to winter by 0.34 percentage points. Differences of this size equal just a few millilitres of air and are generally not of clinical significance.

## What does this mean and reasons for caution?

When looking at the population level, lung function in people with CF may dip slightly in autumn and winter and rebound in the spring and summer months, but the effect is small and maybe of no clinical importance. So while seasonal variations in risk factors have previously been seen, other, differently distributed and more dominant effects may lessen the impact of seasonal changes. For example it is possible that CF maintenance therapy and exacerbation management in the UK and Denmark is able to mitigate any negative effects of the winter season.

## What's next?

Contrary to our findings, a study in the USA and Australia previously found that lung function was higher during periods of colder temperatures. This may be explained by climatic differences among the four countries. It would be interesting to repeat our analysis with data from other countries linking geographical location to climate data.

## Original manuscript citation in PubMed

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