

# Pollen may impair pupils' performance

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Spring is exam time – and pollen season. It's also a bad combination for pupils suffering from pollen allergies, or hay fever.

About a million Norwegians walk around sniffing and sneezing during [allergy](#) season, with itchy, watery eyes and runny noses. Hay fever can trigger or exacerbate asthma, and many people find it harder to breathe. Allergy sufferers may also get tired and lose concentration in [pollen season](#), and the side effects of allergy medicine cause a lot of the same symptoms.

Simon Bensnes at the Norwegian University of Science and Technology's Department of Economics is writing his doctoral dissertation on education economics, and has studied the interplay between [pollen](#) levels and [exam](#) performance among secondary pupils. According to his study, [pollen allergies](#) can have a negative effect on the exam results of pupils with hay fever, which may affect their subsequent career paths.

## One in 10 dropped a grade

Bensnes looked at the results of written end-of-year exams from the period 2008-2011. According to Norway's asthma and allergy federation, between 25 and 30 percent of Norwegian young people suffer from pollen allergy symptoms, with the majority of pollen allergies affecting boys.

Bensnes linked the test data to each exam location and date, as well as to

information on the local pollen count on the given exam day. He compared individual [pupil](#) performance on days that pupils experienced different pollen count levels. Bensnes did not have information about which pupils suffered from hay fever.

The results from the study show that exposure to pollen has a major effect on exam performance for pupils with pollen allergies.

When the pollen count increased by one standard deviation – i.e. by 20 pollen grains per cubic metre – the exam grade of the average pupil decreased by 2.5 per cent. Assuming that pupils who are not allergic to pollen are also not affected by the pollen count, the results show that one in ten pupils with hay fever dropped one grade when the pollen count increased by a standard deviation.

This may indicate that allergic pupils get poorer grades on exams relative to their non-allergic peers.

"We also find this effect when we take into account other variables, like weather or air pollution – and it's higher among boys than girls," says Bensnes.

## **Affects university studies**

Bensnes has tried to track this effect on into higher education. The pupils in the study typically had four exams each during the spring semester, with the exam grades constituting about 15 per cent of their graduation requirements. Pollen levels can therefore be crucial for pupils' further studies.

Bensnes has investigated whether the pupils in the study are pursuing higher education upon completing their upper secondary schooling, and if so, whether they started their studies in STEM subjects. STEM

subjects – science, technology, engineering and mathematics – traditionally have higher entrance grade requirements.

His findings suggest that random increases in [pollen counts](#) reduce the scores for allergic pupils relative to their non-allergic peers. This appears to affect allergic pupils' subsequent study opportunities, since they compete with non-allergic pupils for university slots on the basis of grades.

It is likely that hay fever has major socioeconomic consequences.

"The results appear to show that pupils with pollen allergies don't have the same opportunities to study what they want to at university – not because their skills are inferior, but because they are suffering from hay fever symptoms during the exams," says Bensnes.

## **Affects productivity in working life**

The results from the study also show that pollen allergies can affect performance outside the classroom and the exam room. Hay fever is the most common chronic disorder among Norway's younger population, and it is well documented that the condition significantly reduces the quality of life, general health, sleep patterns and cognitive functions of those affected.

Pollen allergies affect work productivity as well and thus are likely to have major socioeconomic consequences.

Figures from Sweden show that hay [fever](#) costs Swedish society SEK 2.7 billion a year, mainly due to employee absenteeism. Figures from the United States show that US schoolchildren miss two million school days each year due to pollen allergies.

Pupils with allergies are entitled to exam accommodations in the form of extended exam times. Bensnes says that his study results show allergic pupils are at a disadvantage even with such measures in place.

Bensnes points out that it may be possible to reduce the impact of [hay fever](#) in the school system by properly diagnosing and medicating more pupils who have pollen allergies.

**More information:** Simon Søbstad Bensnes. You sneeze, you lose:, *Journal of Health Economics* (2016). [DOI: 10.1016/j.jhealeco.2016.05.005](#)

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