Our followup study to explain the seasonality for COVID-19 by looking at pollen, its antiviral and immuno-activating (hay fever) properties, has just been concluded. We also controlled for meteorological variables as solar radiation, relative humidity and temperature, and analyzed their interaction with pollen and flu-like incidence as well. The preliminary study is already published by Elsevier Science’s *Science of The Total Environment*.

An interview in *De Telegraaf*, most read newspaper in The Netherlands, with a bit provocative title invoked big online discussions. Someone posted an English translation of this *De Telegraaf* article. The item became De Telegraaf’s most read article, the same what happened with the *FD* item after the preliminary study one month earlier. Next *RTL News* had an item (@2m10s) about it as well. It’s clear that COVID-19, hay fever, and multi-cycle pandemics are big subjects, as is the riddle of flu-like-seasonality. We identified the predictor.

The followup study is submitted on May 19, 2020, and is now under review by the respective journal. But, we can at least share the *abstract* of the paper written with my co-authors Eric van Gorp, professor virology at Erasmus MC, and Ellen Hoogeveen, epidemiologist/internal medicine at Jeroen Bosch Ziekenhuis. The new study is not yet online, but here’s the abstract:

# Abstract “Pollen Explains Flu-Like and COVID-19 Seasonality in The Netherlands“

By Martijn Hoogeveen (corresponding author), Eric van Gorp & Ellen Hoogeveen.

*Current models for flu-like epidemics insufficiently explain multi-cycle seasonality. Meteorological factors alone do not predict seasonality, given substantial climate differences between countries that are subject to flu-like epidemics or COVID-19. Pollen is documented to be antiviral and allergenic, play a role in immuno-activation, and seems to create a bio-aerosol lowering the reproduction number of flu-like viruses. Therefore, we hypothesize that pollen may explain seasonality of flu-like epidemics including COVID-19. In this follow-up study, the Pollen-Flu Seasonality Theory is tested for 2016-2020 flu-like*

*seasons, including the COVID-19 pandemic, in The Netherlands with its 17 million inhabitants. We combined changes in flu-like incidence per 100K/Dutch citizens with weekly pollen counts and meteorological data for the same period. Finally, a predictive model is tested using pollen and meteorological threshold values displaying inhibitory effects on flu-like incidence.*
*We found a highly significant inverse association of -.38 between pollen and changes in flu-like incidence corrected for incubation period, confirming our expectations for the 2019/2020 COVID-19 season. We found that our predictive model has the highest inverse correlation with changes in flu-like incidence of -.48 when pollen thresholds of 610 total grains/m3 per week, 120 allergenic grains/m3 per week, and a solar radiation threshold of 510 J/cm2 are passed. The passing of at least the pollen thresholds preludes the beginning and end of flu-like seasons. Solar radiation is a supportive factor, temperature makes no difference, and relative humidity even associates with flu-like incidence increases and pollen reductions.*
*We conclude that pollen is a predictor for the inverse seasonality of flu-like epidemics including the COVID-19 pandemic, and solar radiation is a co-inhibitor. The observed seasonality of COVID-19 during Spring, suggests that COVID-19 may revive in The Netherlands after week 33, the start being preceded by the relative absence of pollen, and follows standard pollen-flu seasonality patterns.*

Read further: Covid-19 Lab, News, Covid-19, flu-like, pollen, seasonality

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