

Studies on resistance against influenza

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There is a connection between age and susceptibility to the influenza virus. It can't be explained by frailty in general, because it is not obvious that very small children and the very old are the biggest risk groups. In a study of the connection between age and the risk of suffering from the flu, Timpka and his colleagues show that the 2009 swine flu affected age groups 10-19 and 20-29 the worst.

They studied how five different [influenza epidemics](#) struck in Östergötland County of East Sweden between 2005 and 2010. Except for the [swine flu](#), they were all what are known as seasonal flu. The difference in those taken sick among age groups varies up to ten times in certain cases, they state, for example, with [swine](#) flu. 2.3 cases per thousand inhabitants were diagnosed in the 10-19 age group, compared with 0.2 cases per thousand in the 70 and older age group. This was before they were able to start up the vaccinations.

For all five outbreaks, the risk of falling ill was greatest in the 30-39 age group, and least for those aged 70 and over. The researchers, however, point out that this data should be interpreted carefully, since many of the elderly are regularly vaccinated against seasonal [influenza](#). On the other hand, their study does not support the hypothesis that school [children](#) are a bigger risk group in general.

However, Timpka says, it's clear that the risk of being infected by the flu is equally great in various [age groups](#), and he wants to study theories as to why:

"One hypothesis is that the first influenza infection you get in your life affects your immune system. This means that your immune system learns to react to one category of influenza, but has a poorer defence against other types. This is one of the theories we want to study."

Which type of [flu](#) you suffer from as a child should thus be able to affect your [immune system](#) for the rest of your life.

The body has two types of defences against infections, Timpka explains. On the one hand antibodies, which are formed as a response to an infection and then remain, make us less susceptible to an infection of that type. Antibodies thus cannot help up the first time we suffer from an infection. However the second defence type, T-cells, can; they're released immediately once the body is infected and they kill off the virus.

"Very small children have their mother's antibodies. The most vulnerable group is children between the ages of one and three; they still lack their own antibodies. As a rule, they develop them in some form later."

With the help of the unique ABIS register (Alla Barn i Sydöstra Sverige, All Children in South-east Sweden), Timpka and his colleagues want to study which antibodies against various types of influenza are found in children. In ABIS, there are blood tests from most of the children born in the region between October 1997 and October 1999, a total of over 17,000 children. The researchers want to follow a selection of these children up to the age of 16, that is, through 2015 at the latest. They hope to see the first results in 2013.

"Today we know very little about immunity in children against influenza and flu-like illnesses. This is knowledge that's necessary, especially to better plan future vaccination programmes," Timpka says.

As he points out in his project description, the dearth of knowledge is painfully obvious in the wake of the 2009 mass vaccinations and the cases of narcolepsy it gave rise to.

More information: Age as a Determinant for Dissemination of Seasonal and Pandemic Influenza: An Open Cohort Study of Influenza Outbreaks in Östergötland County, Sweden by Timpka T, Eriksson O, Spreco A, Gursky EA, Strömgren M, et al. (2012) *PLoS ONE* 7(2): February 23, 2012

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