

## What's a Normal Number of Snotty Nose Episodes in Young Children?

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I wish I had a definitive answer to this question, I suspect pediatricians would be forever grateful. This current prospective cohort study tries to address this, but as usual raises more questions than answers.

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**Source:** Toivonen L, Karppinen S, Schuez-Havupalo L, et al. Burden of Recurrent Respiratory Tract Infections in Children: A Prospective Cohort Study. ***Pediatr Infect Dis J.***

**2016;35(12):e362-e369**; doi:10.1097/INF.0000000000001304. See **AAP Grand Rounds commentary by Dr. Daniel Lesser** (subscription required).

Investigators in Finland reported on a large prospective study of a cohort of over 1000 children under 2 years of age, followed longitudinally via illness diaries and some viral testing for upper respiratory infections (URIs). A subset of this group, numbering 714 children, were studied more intensively with clinical examinations and nasal swab testing for every URI. Results showed that children had a median number of 9.6 acute respiratory infections and 44.2 respiratory symptom days per year (more on this later). They then looked at the children in the top 90th percentile of infection episodes and compared them to the rest. This top group accounted, not surprisingly, for a disproportionate share of diagnoses of acute otitis media, use of antibiotics, hospitalizations, and surgical procedures such as tonsillectomy and adenoidectomy. Rhinovirus was by far the most common virus detected, including in 8-9% of asymptomatic children in the bottom 90% of the illness frequency group. (This isn't too surprising either, rhinovirus PCR positivity tends to persist for long periods.)

Comparing the "normal" versus top 10 percenters, the only significant associated factor was presence of older siblings in the top group. However, the information collected about day care center attendance wasn't very detailed, so I wouldn't exclude that as another possibility in this study. Also, the authors brought up an interesting point about why parental smoking wasn't found to be an associated risk, as it has been in other studies. In this study, prior to adjustment for confounding variables, parental smoking seemed to be associated with a *lower* risk of recurrent URIs, exactly the opposite of what would be expected. The association disappeared after adjustment for other factors. The authors speculated that non-smoking parents also had higher socioeconomic class and may have documented their children's illnesses more accurately than smoking households, an interesting thought that highlights the problems with prospective studies that rely on reporting by patients/families.

Even if this study had no limitations, I would still be hesitant to quote this information to parents in the US. Finland has a relatively homogeneous population from a racial and ethnic standpoint, and if we are looking for illness frequency to use in deciding about immunodeficiency evaluation for a given child, it may be difficult to apply any information from a predominantly Scandinavian population to a more diverse group of children in the US. Remember, primary immunodeficiency diseases are genetic diseases, and thus could have dramatically different frequencies in different ethnic groups. The authors have a **followup article** in the same journal now available online.

Finally, just a word about those median numbers I mentioned in the first paragraph above. Median, rather than average, is a descriptive statistic used for data that are not normally distributed. The **definition** of median is simply the middle value of a set of data. As such, when looking at a number of days, or a number of infections per year, the median cannot be a number with a decimal point, it must be a whole integer. (The only way a number of days could be a decimal point would be if the study authors asked parents to report illness days as some proportion of a day, i.e my child had a cold for 2.3 days, which I doubt they did.) Throughout this article, however, the authors report medians with decimal point numbers, and I suspect they are actually reporting averages. As an example, if you consider the data set of numbers 1, 9, 14, 26, and 94, the mean (average) is 28.4, but the median is 14. That's a big difference! I hope the difference isn't as striking in the current study.

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