Journal of Cystic Fibrosis
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Citation:

Nonparametric analysis of competing risks data with event category missing at random. Gouskova NA, Lin FC, Fine JP. Biometrics. 2017 Mar;73(1):104-113.

What was your research question? (50 words maximum)

We proposed a statistical method to better estimate the occurrence of *Pseudomonas aeruginosa* (Pa) infections in children ten years and younger with cystic fibrosis (CF).

Why is this important? (100 words maximum)

Pseudomonas aeruginosa (Pa) is one of the most widespread respiratory pathogens in cystic fibrosis (CF). It is considered a risk factor for lung function decline and decreased survival. To better understand the progression of the infection, it is critical to estimate the frequency of infection. Without the appropriate statistical methods, we would likely underestimate the actual possibility of contracting Pa.

What did you do? (100 words maximum)

We analyzed the Pa infection history of 6,823 patients in the United States Cystic Fibrosis Foundation Patient Registry (CFFPR). We then calculated the rate of various types of Pa infections after birth to 10 years of age. Most importantly, we did not discard infections where the infection type (mucoid or smooth-type Pa) was unknown, which allowed us to include more data in our analysis.

What did you find? (100 words maximum)

We found that about 70% of CF patients would acquire a Pa infection in non-mucoid type within 10 years after birth. This is about 8% more likely than if we discarded the infections with unknown type. About 6% of the patients would

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acquire a mucoid-type Pa infection in 10 years, thus making it a relatively rare form of the infection. However, there are an additional 5% of patients acquiring both types of infections. The mucoid Pa infection is also more frequent if we only included infections with a known type.

What does this mean and reasons for caution? (100 words maximum)

Missing data can be problematic when calculating the frequency of Pa infections. Without appropriate adjustments, one would underestimate the actual likelihood of an infection in young children with CF. A better estimate of Pa infection rate should lead to a better understanding of its connection to the chronic lung disease.

What's next? (50 words maximum)

In this paper, we focused only on estimating the occurrence of infections when missing data are problematic. Using similar methodology, we will study risk factors to better understand their associations with various types of Pa infections.