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Background

Chronic respiratory disease is a risk factor for severe COVID-19 disease, but there are little data on rare diseases such as primary ciliary dyskinesia (PCD).

Aim

We studied incidence of a reported SARS-CoV-2 infection and associated risk factors in people with PCD from May 2020 to May 2022. We also aimed to assess severity of COVID-19 disease.

Methods

COVID-PCD is an international participatory study set up in collaboration with PCD patient support groups (www.covid19pcd.ispm.ch). It includes persons of any age with a confirmed or suspected diagnosis of PCD.

Data collection

Participants completed a baseline and weekly follow-up questionnaires (figure 1).

Registration + baseline questionnaire

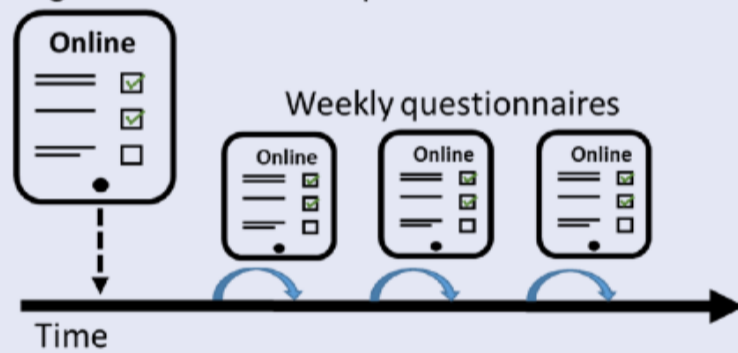


Figure 1: Data collection procedures

Definitions

- A SARS-CoV-2 infection reported in the baseline or follow-up questionnaires was counted if a participant reported a positive PCR, antibody, or antigen test.
- Severity of COVID-19 disease (self-reported) was grouped into asymptomatic, mild (e.g. mild fever or cough), moderate (e.g. high fever, cough, headache). We also studied how many people were treated in hospital.

Statistical methods

We studied incidence rate and predictors of SARS-CoV-2 using Poisson regression with a logarithmic link function and follow-up days as offset variable with results reported as incidence rate ratios (IRR). We included age, country, sex, vaccination status, and virus variant as explanatory variables.

For self-reported severity of disease, we studied associations with age, sex, bronchiectasis, FEV₁, comorbidity, and vaccination status.

Collaborating PCD patient support groups



Results

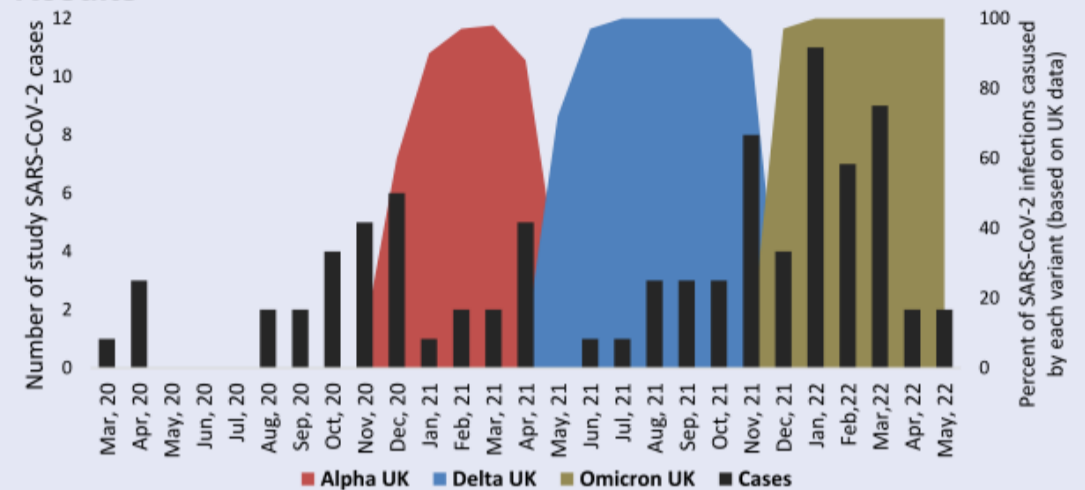


Figure 2: Number of people infected with SARS-CoV-2 per month between March 2020 and May 2022 (left axis) and dominant SARS-CoV-2 variants (right axis)

By May 2022, 728 people with PCD from 48 countries participated. Median follow-up time was 60 weeks (range 1-100) and median age was 27 years (range 0-85); 434 (60%) female.

87 (12%) reported a SARS-CoV-2 infection. Most infections were reported when the Delta and the Omicron variants were dominant (figure 2).

62 of the 87 SARS-CoV-2 infections were reported during follow-up (716 person years) with an incidence rate of 8.7 per 100 person years (95% CI: 6.8-11). Factors associated with incidence were age, country, and variant (table 1).

Severity was overall mild; 12 (14%) reported asymptomatic disease, 50 (57%) reported mild, and 25 (29%) reported moderate disease. Only 4 people reported hospitalization; nobody was in the ICU and nobody died. Most common symptoms were cough, runny nose, tiredness, headache and fever (figure 3). No factor strongly predicted severity of disease.

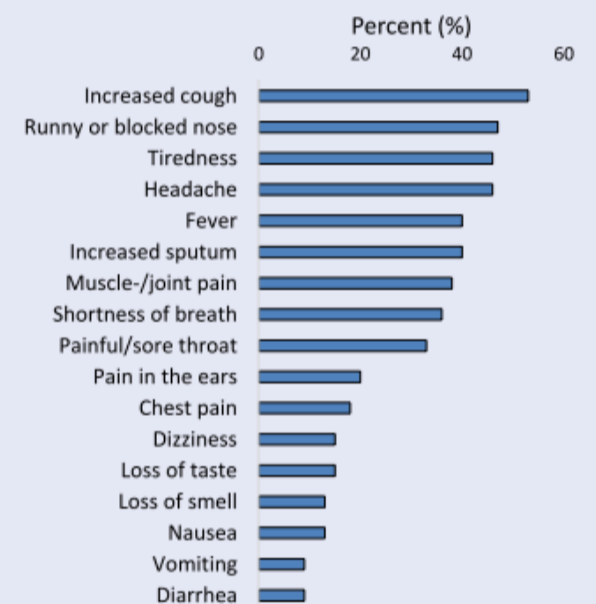


Figure 3: Reported symptoms among 87 participants with SARS-CoV-2 (in percent)

	IRR	95% CI
Age		
0-14 y	1	
15-49 y	0.42	0.21-0.85
50+ y	0.39	0.17-0.92
Country		
UK	1	
USA	0.52	0.21-1.32
Germany	0.46	0.21-1.03
Other Europ. countries	0.58	0.31-1.08
Other non-Europ. countries	0.57	0.17-1.94
Sex		
Male	1	
Female	0.91	0.54-1.55
Vaccination		
Not fully vaccinated	1	
Fully vaccinated	0.62	0.29-1.34
Virus variant		
Original strain	1	
Alpha	2.69	1.14-6.36
Delta	4.52	1.92-10.64
Omicron	13.28	5.22-33.81

Table 1: Factors associated with incidence rate of SARS-CoV-2

Conclusions

This is the first international participatory study with a prospective follow-up of people with PCD during the COVID-19 pandemic. Incidence of SARS-CoV-2 remained low and severity overall mild.



Study website: