



Early View

Research letter

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Respiratory healthcare professionals' views on long-term recommendations of interventions to prevent acute respiratory illnesses after the COVID-19 pandemic

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During the Coronavirus-19 (COVID-19) pandemic, health care authorities adopted measures to reduce the spread of severe acute respiratory syndrome coronavirus-2 (SARS-COV-2). These were lockdowns, social distancing, using facemasks and increased hand sanitizing. People with chronic respiratory conditions were encouraged to comply with these measures(1). Furthermore, it was suggested that nebulization may facilitate the transmission of COVID-19 (2,3), therefore respiratory societies recommended using inhalers where appropriate(2,4,5). During 2020, significant reductions in the incidences of acute respiratory illnesses including influenza(6–8) and acute exacerbations of chronic airway diseases(9–11) were reported. These reductions may be attributed to the effects of the measures implemented for COVID-19 prevention. It is undetermined whether these measures should be extended to prevent acute respiratory illnesses, in future times when the threat of COVID-19 is lifted. To obtain respiratory professionals' views, we conducted an online anonymous survey (available at: <https://www.surveymonkey.com/r/T6B3HS2>) regarding recommending continued measures to reduce respiratory illnesses after the end of the COVID-19 pandemic. The survey asked respondents under which conditions they would recommend wearing a facemask (Indoors/ on flights and airports/ in crowded places/ in places of concentration of patients/ in physiotherapy).It also specified three groups of people to adopt continued hygiene measures: (1) patients with a chronic lung disease; (2) patients with conditions associated with COVID-19 adverse outcomes (cardiovascular disease, diabetes, overweight) (12); (3) immune suppressed individuals. We also asked about circumstances where using inhalers over nebulizers should be preferred due to safety in preventing aerosolization. Respondents were asked to choose their answers from a Likert-type scale of: strongly agree/ agree / neither agree nor disagree / disagree / not relevant to my occupation, with given statements. The survey was promoted by the European Respiratory Society (ERS) Newsletter and by e-mail to members of ERS assemblies (Airway diseases, Interstitial lung disease, Pediatric respiratory diseases, Pulmonary vascular diseases, Respiratory infections, and Thoracic oncology assemblies). It was available between 19th July -31st October 2021.

Results were analyzed using IBM statistics SPSS vs.24. Recommendations for infection control measures were compared between the physician's seniority and physician's specialization using the Chi Square test or Fisher exact test, as appropriate. Variables with more than two categories were evaluated with pairwise comparisons followed by Bonferonni correction. The McNemar's test was used to determine if there were differences between the recommendations to use facemasks or hand sanitizing and the recommendation for social isolation. $P < 0.05$ was considered statistically significant.

Three hundred and twenty respiratory professionals answered the survey. 73% of them self-identified as pulmonology specialists, 24% - pediatric pulmonologists, and the rest as nurse practitioners in respiratory medicine. 70% treat mostly adults, 24% - mostly children, and 6% treat both adults and children. Among physicians, 59% had experience of over 15 years, 26% - 5-15 years, 12% - up to 5 years, and 3% are in training. 62% work in a hospital, 18% - in a clinic, and 20% work integrated (inpatient and outpatient care). Professionals from 65 countries answered the survey, mostly from the UK (11%), Israel (10%), Australia (7%), Italy (6%), and Germany (5%).

Recommendations to wearing facemasks was agreed/strongly agreed (combined) by 307 (96%) in places where ill people are concentrating such as clinic waiting rooms; 298 (95%) - on flights and in airports; 292 (91%) - in other crowded places (like buses, concert halls, prayer houses); 288 (90%) - at concentrations of respiratory patients (physiotherapy or pulmonary rehabilitation centers), and 215 (68%) - indoors. Replies of adult and pediatric pulmonologists were similar except for the recommendation to wear a mask on flights (adult pulmonologists agreed/strongly agreed- 195/201 (97%), pediatric pulmonologists, 59/67 (88%, $P=0.009$)).

We further asked to which group of people would respondents recommend continuing sanitation measures. This item considered: a. wearing facemasks, b. disinfection of hands, and c. continuing partial social isolation. Examples given were avoiding the use of public transportation and attending movie theatres or concert halls. The majority of respondents strongly agreed or agreed that they will recommend these measures to the following: 1. Patients with conditions or medications that cause immunosuppression (a. 300 (94%), b. 285 (90%), and c. 238(74%), respectively); 2. Patients with a chronic lung disease (a. 295 (93%), b. 275 (87%) and c. 189 (60%), respectively); 3. Patients at high risk for COVID-19 such as a cardiovascular disease (a. 268 (85%), b. 264 (83%) and c. 184(58%), respectively).

When we compared the recommendations for different infection control measures (defining a recommendation as a "strongly agreed" response), recommendations for wearing facemasks

and hand disinfection were significantly more likely to be endorsed in comparison to continuing partial social isolation ($P < 0.0001$ in all disease groups) (Figure 1).

Regarding circumstances in which using inhalers are preferred over nebulizers, most respondents strongly agreed or agreed to recommend use of inhalers in inpatient wards (213, 68%), in emergency rooms (209, 66%), and in patients' homes with shared rooms (182, 58%), but not in the patients' homes with separate room and open windows (128, 41%). The overall results did not change when comparing with different years of experience, by stratifying physician's seniority with over 15 years' experience vs all other (resident+ specialist with up to 5 years' experience+ specialist with 5-15 years' experience). The only statistical difference was by looking on the strongly agree group vs. all other (agree/ neither agree nor disagree/ disagree) where 126 (72%) of the more experienced respondents recommended wearing a facemask in physiotherapy, as opposed to 68 (57%) of the less experienced respondents ($P = 0.006$).

We have demonstrated that most respiratory physicians recommend adopting some of the measures that were originally taken to reduce the spread of COVID-19 after the end of the pandemic. Continued social isolation was significantly less likely to be recommended in comparison to wearing facemasks and hand disinfection ($P < 0.0001$), probably due to consideration of the emotional consequences of social isolation. The COVID-19 pandemic is now entering its 3rd year, and it is therefore possible that, while the survey asked about recommendations to prevent non-COVID-19 illness, some of the respondents' reasoning may be the expectation that COVID-19 may become endemic and the restrictions may be required to prevent COVID-19 as well as other illnesses.

There is growing literature on the impact of personal protective measures on the transmissibility of SARS-COV-2 and other respiratory infections(13). Transmission of viruses is reduced with physical distancing(14), and using facemasks was associated with reductions in infections(14,15). A meta-analysis which included 8 studies found a reduction in the incidence of COVID-19 with handwashing, mask wearing, and physical distancing(16). Hand sanitizing was found to be effective in reducing transmission of non-COVID-19 acute respiratory infections(13).

A recent online survey among people living with respiratory diseases by the Asthma UK – British Lung Foundation Partnership has shown good acceptability of increased handwashing (79.5%), social distancing (68.6%), and less acceptability for wearing facemasks in indoor

public places such as public transport (45.7%)(17). These findings in patients and our findings in professionals are in contrast with pre-COVID-19 conventions. A summary of recommendations for travelling with bronchiectasis developed through a collaboration between patients and respiratory specialists, did not support the use of a face mask during air flights due to inconvenience and concern of the associated stigma(18). Our results and others' suggest that physicians and patients have changed their views concerning this precaution, not only for the COVID-19 pandemic but thereafter.

Our survey was conducted online for a few months in the second half of 2021, so there was representation to recommendations that varied within and between countries, and over time, but we acknowledge these findings do not take into account any change in attitudes that may accompany the emergence of the more transmissible but less severe Omicron variant.

Another limitation is that some respondents could interpret the questions in different ways, which could influence the results. Moreover, we did not address seasonal risks and how attitudes may vary with regards to seasons- as the seasonality in acute infections changed considerably during the COVID-19 pandemic.

In summary, respiratory professionals support the continuing use of protective measures for respiratory patients following the COVID-19 pandemic. The optimal use of these measures should be considered in clinical guidelines and public health recommendations.

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Figure 1 legend:

Comparison between different infection control measures in various health conditions based on respiratory healthcare professionals' survey recommendations:

The Y axis represents the percent of respondents who strongly agree to continuing the measure on X axis after the end of COVID-19. *P<0.0001 for comparison.

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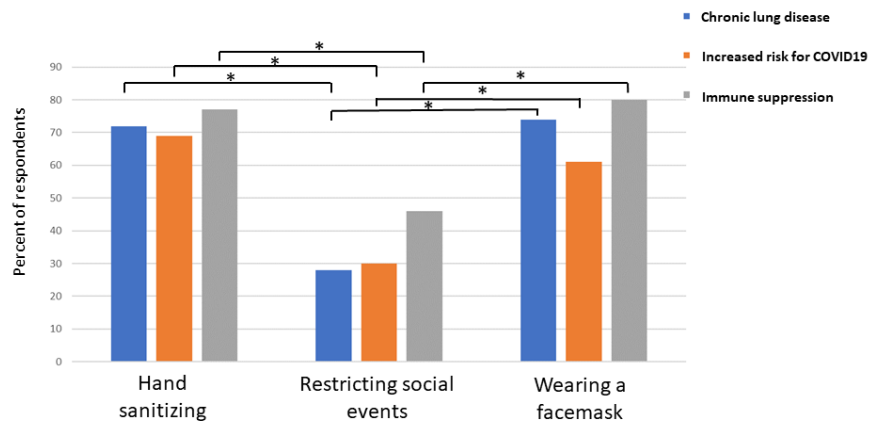


Figure 1