European Journal of Pediatrics (2021) 180:1965–1967
https://doi.org/10.1007/s00431-021-03986-4

EDITORIAL

Changes in pediatric infections during the COVID-19 pandemic: 'a quarantrend for coronials'?

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Published online: 1 March 2021

Every year, the paediatric workforce prepares for the arrival of the winter season that brings respiratory syncytial virus (RSV) and influenza infections, leading to a steep increase in consultations, emergency department workload and hospital admissions. But, in this respect, as well as in other aspects, 2020 proved to be a different year. In April 2020—only a few weeks after the WHO declared the new coronavirus pandemic and announced measures to counter widespread transmission—influenza cases dropped rapidly and the annual influenza season ended early. Reports from the Southern hemisphere [1, 2] then showed in July 2020 that the incidence of respiratory infections due to RSV and influenza had dropped immensely (99% reduction). In this European Journal of Pediatrics issue, we can find three studies from Denmark, Belgium, and the UK [3–5] that describe similar epidemiological data for the Northern hemisphere in 2020. It seems that many infection-related hospitalizations such as bronchiolitis and asthma have all but disappeared, but also that diseases such as otitis media, the common cold and gastroenteritis affect fewer children.

At first glance, all these studies suggest that the mitigation measures taken globally to reduce the spread of SARS-CoV-2 and the impact of the COVID-19 disease have also reduced the transmission of other respiratory viruses. These reductions are far more pronounced than the typical annual and geographical fluctuations observed from season to season for these infections. At present, the impact of every individual measure is not yet clear, but several hypotheses have been put forward.

First, the direct person-to-person transmission of respiratory viruses has probably been reduced by social distancing and stay at home orders. Logically, the diminished social contacts in both adults and children (be it by the increased physical distance or reduced encounters) prevent viral spread between individuals. Furthermore, face masks—even if they are not perfect—may also significantly impact the spread of respiratory diseases by adding a physical barrier in front of the nose and mouth [6].

Next, the overall hygiene measures such as hand washing and the use of hand disinfectant can contribute. RSV and influenza are enveloped RNA viruses—as is SARS-CoV-2—and their lipid layer is relatively sensitive to soaps and detergents, which will reduce their survival on the skin and other surfaces. It is interesting to note that rhinoviruses which have a capsid rather than an envelope are more resistant to these substances and do not seem to follow the same epidemiological patterns as the other respiratory viruses. The current distancing and hygiene measures in schools do not seem to prevent rhinovirus transmission as profoundly, yet if its sturdy capsid is the only reason for this remains unclear [7].

Another measure that may significantly impact respiratory infections are travel restrictions and quarantine periods upon arrival. These lead to a decreased import of viruses and prevent the creation of a sizeable local reservoir for further spread. The annual shift of influenza in the cold season between the northern and southern hemisphere has often been linked to the intense airline travel between these regions [8].

One of the most drastic measures to reduce childhood transmission has been the school closures. Even though they can have a massive impact on aerogenic viral spread in the paediatric and adolescent population, their effect on children's psychosocial well-being and their academic future may be detrimental in the long term.

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Next to the abovementioned strategies to reduce viral spread, other causes that could explain the reduction in respiratory infections have been suggested. One of these is the hypothesis that the fear for COVID-19 may have altered the population's healthcare-seeking behaviour. If fewer people visit their physicians or the emergency departments, this will reduce the number of documented infections. Nevertheless, the data suggest that the reduced emergency department volume did not impact the number of higher acuity patients that presented there, nor did it result in a delayed higher mortality (non-COVID-19 related of course) during the subsequent weeks or months. This is also suggested by the studies in this journal that did not show a lower number of urinary tract infections or other severe medical conditions that are not impacted by the social distancing measures. Overall, people seemed to stay at home with self-limiting diseases, but did seek medical care with more severe conditions [9–11].

This huge reduction in infection-related morbidity may seem to be a 'positive observation' at a societal level. Fewer infections mean that the healthcare force that was already burdened significantly by the COVID-19 pandemic did not have to cope additionally with these patients. However, all measures to counteract the spread of the coronavirus also had many collateral effects. Cancelled elective care (with financial implications for many hospitals or healthcare systems due to reduced revenue) will have to be caught up by doctors, nurses and other healthcare workers; many of whom are still dealing with second or third waves of the SARS-CoV-2 pandemic. Reports of increased psychosocial problems, accidental poisonings of children who stayed at home, increased cases of child abuse and neglect, increased alcohol consumption and substance abuse in adolescents, academic backlog, parental job loss and resulting poverty, definitely show that the consequences may be with us for quite some time.

When we look at the future in the context of respiratory infections, it is not yet clear if what we experience now is just a transient 'quarantrend' or may develop into something closer to a 'quarantapocalypse'.

For instance, the consequences of the reduced RSV infections may not be all beneficial. Many countries have an excellent system to protect the vulnerable paediatric population (such as infants with premature birth and/or infants with severe chronic illnesses) using a passive immunisation programme utilising monoclonal antibodies. As the current RSV infections' dynamics were not anticipated, many countries have planned these administrations during the 'regular RSV season'. In doing so, many children have been given this treatment in vain. However, as Australian data show a resurgence of RSV infections after loosening government restrictions (Government of Australia, Communicable Disease Intelligence, Vol 45), some of the immunised children may have reduced titers that may no longer protect them from infection in this 'delayed' season. It is also unclear if the RSV season next year will be impacted. It is known that the virus often has a biennial epidemiological variation where a low and high season seem to follow each other [12].

Also, the reduction of influenza cases in the southern hemisphere may have significant consequences. On the one hand, less circulation of fewer strains in the population may result in the reduction of some of the less common strains, which may even disappear. On the other hand, a reduced dataset of influenza surveillance may prove detrimental for vaccine development. A selection of the strains that need to be incorporated in the vaccine for the northern hemisphere is made based on prediction models fed with epidemiological data from influenza cases in the southern hemisphere.

However, this natural experiment that our global society is undergoing may also lead to additional scientific insights. Many researchers are already planning prospective studies where the impact of the current measures will be investigated in the context of future infectious seasons. New data and insights will be gathered from these challenging times.

Authors' contributions The three authors developed concept and content of this editorial. JT wrote the draft and NR/PdW provided feedback and suggestions. All authors agree on the published version.

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