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Reductions in the detection of respiratory pathogens during SARS-CoV-2 pandemic lockdown: Evidence from two cohort studies in Lima, Peru

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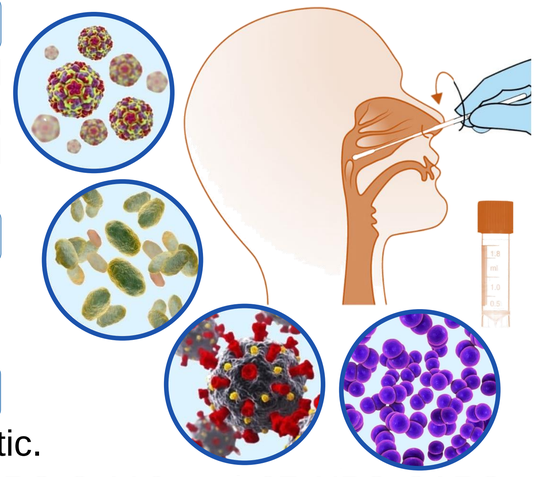
Introduction

- ✓ Whether social restrictions (i.e., lockdown) imposed in response to the COVID-19 pandemic affected circulation of other respiratory pathogens remains understudied.
- ✓ This study aimed to investigate changes in the detection of respiratory pathogens before and during the pandemic using the TrueMark™ Respiratory Panel 2.0 TaqMan Array Card (TAC), capable of identifying up to 41 pathogens, including SARS-CoV-2.
- ✓ We analyzed a subset of nasopharyngeal samples (NPS) collected from two cohorts in Lima, Peru, before (Dec 2019 - Mar 2020) and during a pandemic lockdown period (Dec 2020 - Mar 2021).

Methods

Study Design

- Weekly NPS were collected from household members in two cohorts from the same peri-urban community in Lima. Samples were obtained systematically, regardless of symptoms.



Cohorts

- Pre-pandemic: Dec 2019 - Mar 2020
- Pandemic: Dec 2020 - Mar 2021

Sample Groups

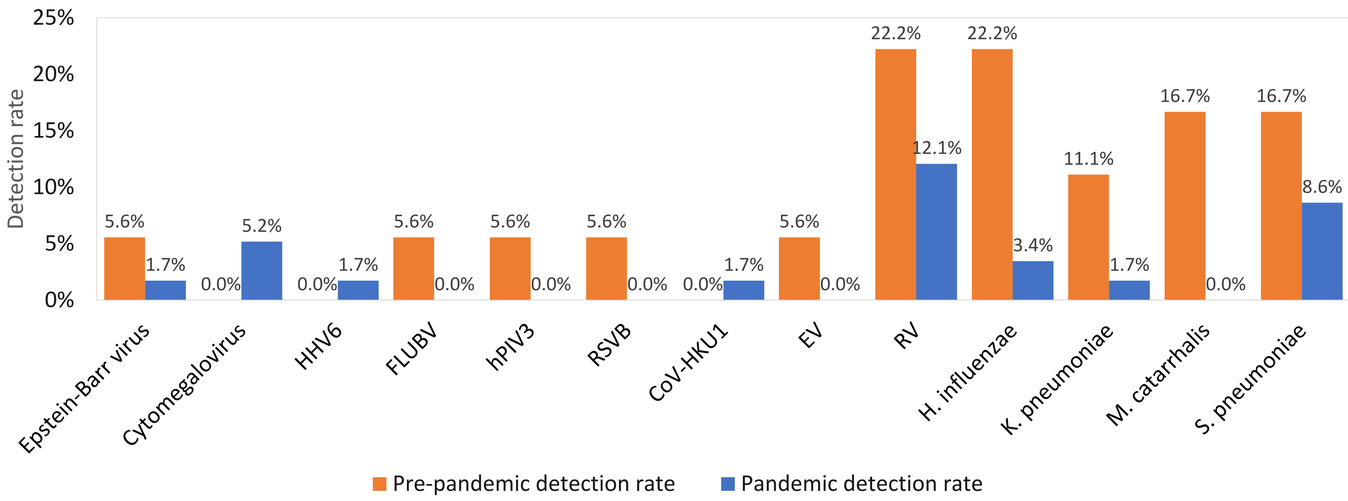
- Pre-pandemic group (n=18): NPS from symptomatic.
- Pandemic group (n=58): 21 NPS positive for SARS-CoV-2 and 37 NPS SARS-CoV-2 negative.

Pathogen Detection

- The TAC respiratory panel was used for simultaneous detection of 41 pathogens in the QuantStudio™ 7 Real-Time PCR System.

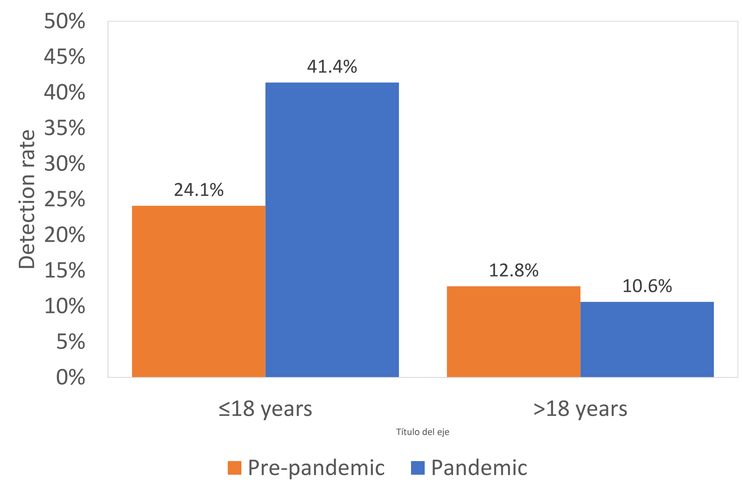
Results

Common pathogens detected by cohort, excluding SARS-CoV-2



- ✓ Overall, excluding SARS-CoV-2 detections, common pathogens' detection declined from 72.2% in the pre-pandemic period to 29.3% during the pandemic (p=0.002).
- ✓ The figure shows the most commonly detected pathogens in both periods, including Rhinovirus and *Streptococcus pneumoniae.*

Pathogen detection by period and age-group



- ✓ In the age group comparison, excluding SARS-CoV-2 detections, we found a higher detection rate of pathogens in participants ≤18 years (65.5%) compared to those >18 years (23.4%) (p<0.005).

Discussion

- ✓ The reduced detection of pathogens like Rhinovirus and *H. influenzae* during a period of pandemic lockdown suggests that limited social interaction, particularly among children, contributed to the decline. This aligns with findings from other studies showing that interventions restricting social interaction, reduce the circulation of various respiratory viruses.[1-3]
- ✓ The lockdown in Peru, including extended school closures, led to a significant decrease in the detection of respiratory pathogens, especially in children, consistent with other studies showing reduced circulation of non-SARS-CoV-2 respiratory pathogens.[1]
- ✓ Our study's limitations include a small sample size. However, a key strength is the use of an efficient diagnostic strategy that detects multiple pathogens, simultaneously.

Conclusions

- ✓ The pandemic control measures were associated with a reduction in respiratory pathogen circulation in the community.
- ✓ Respiratory pathogens were often detection in children before the pandemic, as evidenced by higher detection rates in those ≤18 years of age.
- ✓ Our study highlights the possible impact of non-pharmaceutical interventions (e.g., lockdowns) on pathogen detection beyond SARS-CoV-2.

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