

Covid-19 antibody seroprevalence higher in slums than in non-slum areas

The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) was first detected in Wuhan, China during late 2019, and it spread all over the world within a very short period of time. The WHO officially named the disease caused by SARS-CoV-2 as COVID-19 (Lai et al. 2020; Cheng & Shan 2019) and declared the worldwide outbreak of COVID-19 a 'pandemic' on March 11, 2020.

Serosurveys in community levels help in determining actual rates of infections in populations. The objectives of the study are to examine levels and socio-demographic differentials of:

- (a) determine seroprevalence of SARS-CoV-2 virus in slum and neighbouring non-slum populations aged 10 or more years
- (b) association of seroprevalence with sociodemographic, biological, behavioural and nutritional factors

The COVID-19 infected people can transmit the virus whether they have symptoms or not. The goal of this study was to look at the seroprevalence of SARS-CoV-2 to see how far the virus has transmitted, taking into consideration both symptomatic and asymptomatic population in slum and non-slum population.

Introduction

The Covid-19 pandemic, just like the Spanish Flu that ravaged the world over a century ago, wrought devastation on the life of millions of people across the world. It took the life of thousands of people and damaged the physical and mental health of millions.

The scourge had brought the healthcare system around the world to its knees. It will take the world many decades to recover from the cumulative damages done by Covid-19 to human civilization.

Against such a grim backdrop this study was undertaken in order to obtain some pertinent data to help understand the distinctive nature of Covid-19 infection.

The number of confirmed Covid-19 cases globally is determined on the basis of PCR-positivity of nasopharyngeal samples from mainly symptomatic patients for SARS-CoV-2.

The World Health Organization (WHO) has recommended that all nations conduct population-based SARS-CoV-2

seroprevalence surveys in order to quickly screen ongoing epidemics, determine the degree of spread, and calculate the proportion of symptomatic and asymptomatic infected subpopulations.

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The goal of this study was to look at the seroprevalence of SARS-CoV-2 to see how far the virus has transmitted, taking into consideration both symptomatic and asymptomatic population in slum and non-slum population.

To develop disease prevention and mitigation strategies, it is critical to understand what characteristics were linked to seropositivity, such as socioeconomic status, chronic health issues, physical activities, BCG vaccination status, the presence of antibodies to commonly circulating viral infections, and nutritional factors, such as Vitamin D and Zinc.

Methods

Between October 2020 and February 2021, a cross-sectional survey was conducted among 10,050 peoples for reported COVID-like symptoms and 3,220 for serosurvey data living in slums and non-slum areas in Dhaka and Chattogram cities.

Four slums - Korail, Mirpur, Dhalpur, and Ershad Nagar were selected in and around Dhaka and two slums -Shaheed Lane and Akbar Shah Kata Pahar were selected from Chattogram were among them. The survey was concurrently conducted in both cities and in both slum and non-slum neighbourhoods. Following the selection of households by a cluster random sampling process, all eligible individuals aged 10 years or older in each household were enrolled.

A household questionnaire survey was prepared to gather information on sociodemographic characteristics, preventive behaviour in the last six months, chronic health conditions, and ongoing Covid-like symptoms or in the preceding six months, the presence of positive cases in the household, physical activity assessment, and BCG vaccination status.

Interviewee's height, weight, and blood pressure were assessed, and a venous blood sample was taken. Antibodies against SARS-CoV-2, respiratory syncytial virus (RSV), human coronavirus HKU1 (HCoV-HKU1), influenza virus B, parainfluenza virus, dengue virus, and chikungunya virus were determined using plasma isolated from blood. Vitamin D and zinc levels in plasma were also tested.



3 Seroprevalence was associated with lower income.

2 Approximately 36% of the participating household members reported ongoing Covid- like symptoms or occurrences in the previous six months. Individuals who reported a fever, a dry cough, a sore throat, or any three symptoms together had a higher prevalence than those who did not have any symptoms.

1 The overall weighted seroprevalence of SARS-CoV-2 was higher among slum dwellers (71.0%) than non-slum dwellers (62.2%). Dhaka city had a greater seroprevalence (72.9%) than Chattogram (54.2%).

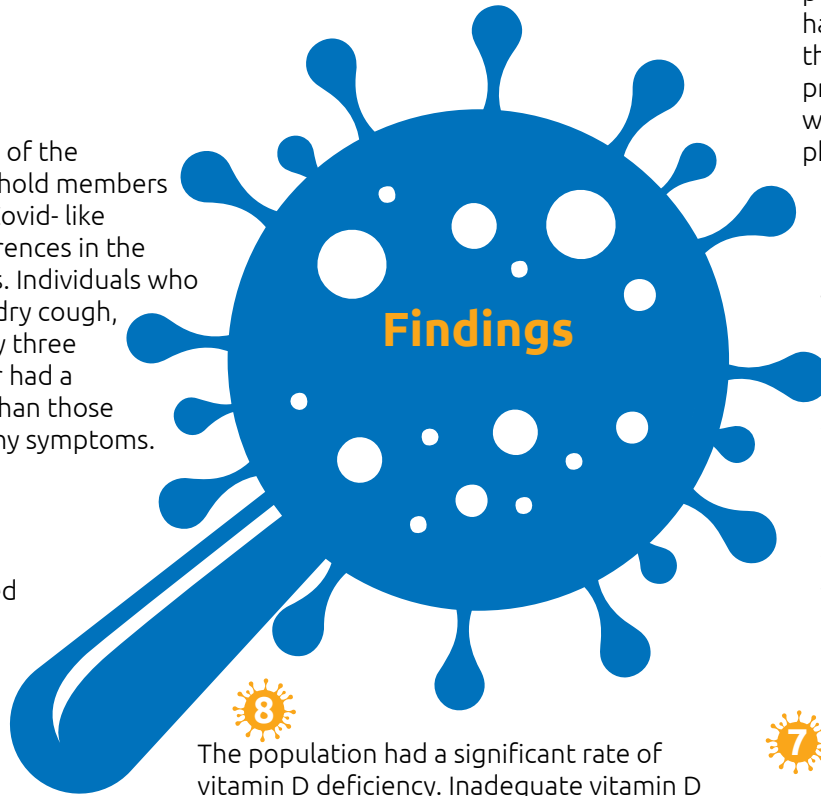
4 Seroprevalence was associated with overweight.

5 The risk of SARS-CoV-2 infection was lower among people who frequently washed hands, did not put fingers on their faces/ in their nose, had prior BCG vaccination), and were engaged in moderate physical activities.

6 The risk of SARS-CoV-2 infection was lower in individuals who had previously been infected with respiratory syncytial virus or human coronavirus HKU1. Conversely, participants who had previously been infected with dengue or chikungunya viruses were at higher risk of contracting SARS-CoV-2 infections.

7 When compared to seronegative people, seropositive patients appear to have appropriate serum zinc levels.

8 The population had a significant rate of vitamin D deficiency. Inadequate vitamin D status had no effect on seropositivity.

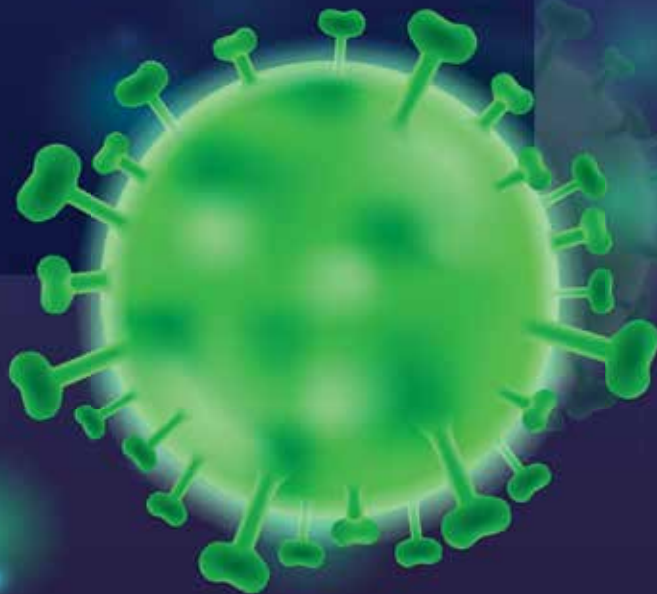


Conclusion

- The findings show that estimated antibody seroprevalence for SARS-CoV-2 was more prominent in slums than in adjacent low-to-middle-income non-slum areas.
- Obesity and diabetes, already known risk factors for disease severity in clinical patients, were discovered to be linked to infections in the urban communities.
- Moderate physical activity was found to be protective against SARS-CoV-2 infections, which is a unique finding that necessitates more well-planned prospective studies.
- Previous respiratory viral infections, such as RSV or HCoV-HKU1, may protect against SARS-CoV-2 infection, but exposure to dengue or chikungunya viruses can be a risk factor.
- Controlling vector-borne diseases alongside managing the Covid-19 pandemic in arbovirus-endemic areas require appropriate interventions.
- More surveys, particularly sentinel surveillance, should be carried out throughout the country, targeting both urban and rural communities, to enable us to grasp the scope of the disease's spread. Such data is crucial for public health initiatives aimed at offsetting the effect of the Covid-19 pandemic.

Recommendations

1. Important to collect seroprevalence data to identify real infection to assess infection level
2. Gap in knowledge of prevalence needs to be narrowed
3. Reporting on symptoms among slum dwellers needs to be increased
4. Bias in reporting symptoms must be removed
5. There is a need for creating wider awareness in communities
6. More surveys, particularly sentinel surveillance, should be carried out throughout the country.



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