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Epidemiology on the Move: Comparison of COVID-19 incidence between migrant populations in transit and the local population in Colombia

Carlos Efraín Montúfar Salcedo *

Department of anthropology online, Salesian Polytechnic University. Ecuador.

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Abstract

Between 2020 and 2022, Colombia faced a significant migration challenge due to the massive influx of Venezuelan migrants and the transit of individuals from various nationalities heading to North America. Concurrently, the COVID-19 pandemic spread globally, prompting an examination of its impact on migrant populations. This study compares the incidence of COVID-19 among migrants in transit with that of the local Colombian population. Between November and December 2022, 302 rapid antigen tests (Basepoint Abbott COVID-19) were conducted on migrants in transit through humanitarian aid routes in Tunja, Bogotá, Cali, and Ipiales. All tests yielded negative results. In contrast, during the same epidemiological weeks (47 to 50), Colombia reported 20,744 confirmed cases and an incidence rate of 45.80 cases per 100,000 inhabitants. The study hypothesizes that the constant mobility and prolonged exposure to open-air environments among migrants may have played a protective role against COVID-19 transmission. However, potential underreporting and differences in diagnostic strategies between populations must also be considered. These findings highlight the need for further research on environmental factors as protective elements in future respiratory epidemics.

Keywords: COVID-19; Migrants in transit; Epidemiology; Incidence rate; Environmental factors

1. Introduction

Between 2020 and 2022, Colombia faced one of the most significant migratory challenges in its history due to the massive influx of Venezuelan migrants and the transit of migrants from various nationalities en route to North America (1). Since 2015, Colombia has become the primary destination for Venezuelan migrants due to the socioeconomic and political crisis in Venezuela. By 2022, it was estimated that more than 2.5 million Venezuelans resided in the country (2). At the same time, while thousands of migrants in transit were crossing Colombia, the World Health Organization (WHO) declared the COVID-19 pandemic on March 11, 2020 (3). The first case in Colombia was confirmed on March 6, 2020, in a patient arriving from Milan (4), and ultimately, the WHO declared the end of the international health emergency on May 5, 2023 (5).

COVID-19 is caused by SARS-CoV-2, a virus from the Coronaviridae family, Betacoronavirus genus. It is a positive single-stranded RNA virus with a lipid envelope that facilitates its entry into human cells through the Spike (S) protein, which binds to the ACE2 receptor. Its structure also includes the envelope protein (E) and membrane protein (M), involved in the formation of new viral particles, as well as the nucleocapsid (N), which protects the RNA and regulates its replication (6,7,8). The virus is transmitted through respiratory droplets and aerosols expelled when speaking, coughing, or sneezing. In enclosed spaces, these aerosols can remain suspended in the air for longer periods. Without air renewal, viral particles accumulate, increasing the likelihood of inhalation by other people (9,10).

Between November and December 2022, during humanitarian aid activities in Colombia, rapid Basepoint Abbott COVID-19 tests were conducted on migrant populations in transit in cities such as Tunja, Bogotá, Cali, and Ipiales.

* Corresponding author: Carlos Efraín Montúfar Salcedo

Comparing the COVID-19 incidence between the Colombian local population and migrants in transit allowed for reflection on the possible influence of environmental factors on virus transmission. Specifically, the hypothesis is proposed that constant mobility and staying in open spaces may have reduced the incidence of infection in these migrant populations.

2. Material and methods

This was an observational, descriptive, and comparative incidence study based on primary and secondary data, conducted between November and December 2022. Primary COVID-19 incidence data from migrant populations in transit were compared with national data from the Colombian local population. The study population consisted of migrants who voluntarily agreed to testing in key cities of Colombia. Migrants who did not wish to undergo testing due to urgency in their travel were excluded. Secondary data from the local population were identified based on a literature review of COVID-19 diagnoses from national health institutions.

Tests were conducted at four rural points along the migration route: Tunja (a transit area in the Cundiboyacense highlands), Bogotá (the country's main urban center), Cali (a migration corridor towards the southwest), and Ipiales (a border city with Ecuador). Rapid antigen tests from Basepoint Abbott COVID-19, approved by the National Institute of Health of Colombia, were used. Nasopharyngeal swabs were collected following biosafety protocols. Variables such as age, sex, vaccination status, and presence of symptoms were recorded. Positivity rates among migrants in transit were calculated and systematically compared with data obtained from state health institutions for the local population. Informed consent was obtained from all participants, and confidentiality and anonymity of the data were guaranteed. The study was approved by an institutional ethics committee from the cooperation organization

3. Results

A total of 302 swab tests detecting viral proteins were conducted between November 21 and December 15, 2022, on an equal number of migrants along humanitarian aid routes in Colombia. No positive results were found.

Table 1 COVID-19 Indicators by Age Group Among Migrants. Colombia, Epidemiological Weeks 47 to 50, 2022

Age Group	Positive Cases	Total Tests Conducted
0-4 years	0	0
5-11 years	0	12
12-19 years	0	14
20-39 years	0	228
40-59 years	0	46
60+ years	0	2
Total	0	302

Source: Author

Between epidemiological weeks 47 and 50, 20,744 cases of COVID-19 were reported nationwide from 471 municipalities, along with 158 deaths from 47 municipalities. During this period, an incidence rate of 45.80 cases per 100,000 inhabitants was recorded. From January 1, 2022, to December 22, 2022, Colombia confirmed 958,032 laboratory cases and 10,559 COVID-19 deaths in 38 territorial entities at the departmental and district levels, affecting 1,119 municipalities. The accumulated national incidence for 2022 was 1,889.19 cases per 100,000 inhabitants (11). The Colombian Ministry of Health primarily used Abbott rapid tests as complementary tools to RT-PCR, prioritizing antigen tests for rapid diagnoses and serological antibody tests for seroprevalence studies.

4. Discussion

The importance of environmental conditions as a protective factor in the COVID-19 epidemic gained prominence as research evolved. Anthony Fauci (12) explained the significance of social distancing in epidemic control. María Van Kerkhove (13) helped determine that COVID-19 spread mainly through aerosols, and Raina MacIntyre (14) was among

the first to warn that COVID-19 was airborne and that N95 masks were key to prevention, demonstrating that improved ventilation in enclosed spaces reduced the risk of transmission.

Regarding local incidence in Colombia, the Venezuelan migrant population had a lower cumulative incidence of COVID-19 than the general Colombian population. Specifically, by September 22, 2020, the cumulative incidence rate among Venezuelan migrants was 43.21 per 10,000 people, compared to 154.3 per 10,000 people in the general population (15).

This same analysis indicates that the impact of COVID-19 on the Venezuelan migrant population occurred later, with a median delay of 73.3 days from the first case in the general population. These data may be influenced by factors such as underreporting among migrants due to barriers to healthcare access, fear of deportation, or lack of documentation. Additionally, socioeconomic conditions and limited access to diagnostic testing may have affected reported incidence rates, as migrants tend to be a younger, working-age population less prone to disease. Nevertheless, no positive cases were found in transit migrants during the tests. The study's findings are linked to varied laboratory techniques used among the local and migrant populations and sample disparities, which are not easily comparable. However, environmental influence remains relevant, as the two populations do not share similar epidemic levels, with continuous outdoor exposure due to migration being a key variable.

5. Conclusion

The period 2021-2022 established Colombia as a key country in the regional migration crisis, both as a recipient of Venezuelan migrants and as a transit point for other migration flows. In this migratory context, SARS-CoV-2 emerged as a highly transmissible virus capable of causing mild to severe disease. Health systems and global society faced challenges that exceeded their capacities. However, constant mobility and staying in open rural spaces may have reduced infection incidence among these populations, raising questions about the importance of environmental conditions as a protective factor in future human epidemics, particularly respiratory ones.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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