Coronavirus Disease 2019 in Vietnam: A Model of Early and Decisive Containment

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Authors' contributions

This work was carried out in collaboration among all authors. Author TH Study concept and design. Author TH data acquisition and statistical analyses. Authors TH, SS, GR and AN Interpretation of data. Author TH drafting of manuscript. Authors TH, SS and GR critical revision of the manuscript for important intellectual content. All authors read and approved the final manuscript.

Short Research Article

ABSTRACT

This paper examined the demographic, temporal and spatial distribution of the coronavirus (COVID-19) epidemic in Vietnam. COVID-19 data abstracted from the official website of Vietnam Ministry of Health, which provides details of each new, infected case, including age, sex, place of residence, and travel history. Vietnam has only had 268 confirmed cases of COVID-19 and no reported fatality as of April 19, 2020. Of those who tested positive, 223 (83.2%) have recovered and discharged from hospitals. Younger age and men were significantly associated with a history of international travel. Women were more likely to get infection inside the country. Vietnam's early and aggressive responses including a locally developed diagnostic test, a rapid rollout of suspected cases, tracing of contacts and self-isolation of contacts and communities in which there had been a positive case was effective in limiting spread and keeping the incidence of Covid-19 low. The Vietnamese response could serve as a model for other countries.

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1. INTRODUCTION

The outbreak of a novel coronavirus (COVID-19), first reported in Wuhan China [1], has spread to 171 countries around the world [2]. As of April 16, 2020, a total of 2,090,110 cases and 139,469 deaths (6.6%) were reported globally [4]. On January 23, 2020, Vietnam had its first incident case of a Chinese visitor who came from China [3], resulting in the decision to halt all flights to and from Wuhan. Since Vietnam also shares a northern border with China, which at that time had the highest number of cases in the world [2], the country was on high alert, developing its own diagnostic test, rapidly identifying and testing suspected cases, treating positives, tracing contacts and requiring quarantine and self-isolation of the contacts and community. Because of these decisive measures, Vietnam has only had 268 reported cases of COVID-19 and no reported fatality as of April 19, 2020 [5]. This paper seeks to characterize the demographic, temporal, and spatial distribution of the COVID-19 epidemic in Vietnam.

2. METHODS

COVID-19 data, abstracted from the official website of Vietnam Ministry of Health [5], provides details of each new infected case, including age, sex, place of residence (e.g., commune, district, province/city), and travel and personal contact history. Descriptive, bivariate correlation and Chi-square test analyses were conducted using SPSS 22.0 (IBM Corp., Armonk, NY).

3. RESULTS

Of a total 180,067 tests conducted, 268 (.01%) have tested positive for COVID-19 in Vietnam (Table 1) as of April 19, 2020. Of those who tested positive, 223 (83.2%) have recovered and discharged from hospitals and no case fatality. The median age of all patients was 30.0 years (range: 3 months-88 years old). Nearly 90% of the cases were below 60 years old. Fifty-four percent (n=145) were female.

Of those who tested positive, 82.1% were Vietnamese while the remainder (17.9%) were foreigners. Over 63% patients (n=166) were imported outside Vietnam and only 102 cases (38.1%) were infected within the country. Results of person correlation indicated that younger patients were associated with abroad travel history [r (2680=-.169, p<.01]. Men were significantly associated with a history of international travel [r (2680=.174, p<.001]. Only 36.9% of patients had the symptoms and 63.1% did not show symptoms. Among those with symptoms, 23.1% had fever, 18.7% had cough, 10.1% had sore throat and only 3.4% reported having shortness of breath. In addition to the current confirmed cases, 568 people are being monitored for suspected cases.

4. DISCUSSION

Since a majority of individuals who have contracted COVID-19 came from abroad, the government aggressively screened those coming to the country, quarantined cases, isolated contacts, and made a decision to halt the entry of all foreigners may further help in limited domestic transmission.

Over 63% of the COVID-19 cases in Vietnam were asymptomatic when confirmed positive combined with no reported case fatality might suggest that Vietnam early and swift response in isolating those who are infected and their contacts helps prevent all the asymptomatic cases from spreading the virus in the community.

In contrast to findings from other countries [6,7] in which men were more likely to get infection with COVID-19 than women, more women in Vietnam were infected with COVID-19 than men. Results of the Chi-square test indicated that women (46.6%) were more likely than men (29.5%) to get COVID-19 infection inside the country [X^2 (1, N = 268) = 8.2, p < .001]. It could be that Vietnamese women are more likely than men to be caregivers for the original COVID-19 infected people and hence they were more likely to be infected. Other possibilities include a deficiency on knowledge and education about COVID19 among women. More research is needed to explore the gender disparities of COVID-19 infection in Vietnam.

Our study also found that nearly 48% of the patients was those in the age below 30 indicating that young people face a substantial risk of the disease not only older people. This study also found that children are at risk for the disease and confirmed the previous finding from China that children are vulnerable to COVID-19 [8].

Table 1. Characteristics of patients with COVID-19 (n=268) in Vietnam

	No. (%)
Age	
Mean (Range)	(3 months–88 years old)
<10	8 (3.0%)
10-19	21 (7.8%)
20-29	98 (36.6%)
30-39	42 (15.7%)
40-49	40 (14.9%)
50-59	31 (11.6%)
≥60	28 (10.4%)
Sex	
Male	123 (45.9%)
Female	145 (54.1%)
Route of transmission	
Vietnamese contracting abroad	136 (44.9%)
Foreigners contracting abroad and on the flight to Vietnam[a]	33 (14.9%)
Foreigners contracting individuals with COVID-19 in Vietnam	15 (4.1%)
Vietnamese contacting with individuals with COVID-19 in Vietnam	80 (33.3%)
Medical facilities in Vietnam	4 (1.8%)
Nationality	
Vietnamese	220 (82.1%)
United Kingdom	19 (7.1%)
Brazil	6 (2.2%)
French	5 (1.9%)
American	4 (1.8%)
South Africa	3 (1.1%)
Germany	2 (0.7%)
Chinese	2 (0.7%)
Danish	1 (0.4%)
Swedish	1 (0.4%)
Canadian	1(0.4%)
Latvia	1 (0.4%)
Irish	1 (0.4%)

[a]*Nine foreigners tested for COVID-19 shared the same flight to Vietnam with one Vietnamese who were early tested positive for COVID-19. Note: Data were as of April 19, 2020. Further details can be found from the Vietnam Ministry of Health (https://ncov.moh.gov.vn/)*

While we did not directly calculate the reproduction number, defined as the average number of the secondary individuals in a complete susceptible population infected by a single infected person during duration of the infection [9], in this study, the reported early reproduction number of covid-19 in Vietnam was 1.1 [10] which is lower than China (3.58) [11], Iran (2.37) [12], South Korea (1.5) [13], 14 European countries (3.58)and the U.S. (3.6) [14]. The dynamics of baseline reproduction number (R_0) and the instantaneous reproductive number (Re) in different countries with various containment strategies will be very useful to understand the pandemic. It is apparent that at the present time Vietnam represents a baseline for such comparisons since the country was able to contain R_0 and hence hold a stable Re throughout the period up to this writing.

This study should be interpreted in light of certain limitations. While there is no case fatality yet, 45 patients remain in the hospital and with outcomes yet to be known. The Vietnam Ministry of Health database represents only cases confirmed by testing, and misses those who are asymptomatic and have not been tested. At this time, no serological data is available on antibody responses in the population.

5. CONCLUSION

Vietnam's early and aggressive responses including early testing, widespread tracing of contacts by health and local authorities, and aggressive quarantine and self-isolation of those having contact with positive cases and communities in which there had been a positive

case was effective in limiting spread and keeping the incidence of Covid-19 low. The Vietnamese response could serve as a model for other countries experiencing the outbreak.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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