Epidemiological Characteristics of COVID-19 Patients in Vietnam and a Description of Disease Control and Prevention Measures in Thai Binh Province

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Abstract

Introduction

The aim of this study is to describe the epidemiology of all COVID-19 patients in Vietnam and to describe the measures of disease control and prevention implemented.

Methods

Data were recovered from Wikipedia regarding the 2020 coronavirus pandemic in Vietnam. The period covered was from 23 January to 20 April 2020. Descriptive analysis was stratified by gender, age, country of origin, travel history, clinical symptoms and outcome. A survey of disease control and prevention measures was conducted at the Centre for Disease Control in the Thai Binh province, which is responsible for screening and isolating individuals at high risk of COVID-19.

Results

As of 20 April 2020, Vietnam had recorded 268 confirmed COVID-19 patients. 55.2% were female. 67.9% were aged 20-49 years and 82.5% were Vietnamese. 60.4% of cases were imported from outside Vietnam. Other cases were acquired in Vietnam by individuals in close contact with imported cases. Only one patient who had not travelled had had no known contact with a confirmed case. 63.1% of patients were asymptomatic. 75.7% of patients were discharged. No deaths were recorded. The Thai Binh CDC surveyed a total of 2,203 persons at risk of COVID-19. 336 persons (15.2%) were isolated at hospitals and 1,411 (64.0%) in dedicated isolation facilities. 16.4% reported at least one respiratory symptom. No positive cases confirmed by RT-PCR have been reported in the Thai Binh province to date.

Conclusion

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The effect of the systematic screening and isolation strategy made it possible to limit local transmission in Vietnam. Vietnam needs to reinforce diagnostic capacities, prevention measures and provide the necessary epidemiological data on which to base interventions. The wider use of rapid serological tests is also advisable in order to be able to conduct extensive screening in the community.

Keywords: COVID-19; SARS-CoV-2; Vietnam; Epidemiology; control; screening

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Introduction

In December 2019, an outbreak of a respiratory infectious disease (COVID-19) due to a novel coronavirus (at the time officially named SARS-CoV-2) emerged in the city of Wuhan, in the Chinese province of Hubei [1]. The outbreak was declared a public health emergency of international concern on 30 January 2020, and a pandemic on 12 March 2020 [1]. As of midnight, on 25 April 2020, this pandemic had affected 210 countries and territories around the world with 2,480,861 confirmed cases and 177,677 deaths [2].

Vietnam reported the first two cases in the country on 23 January 2020. A Chinese traveller from Wuhan, China (Case 1) visited and infected his son (Case 2), a Chinese expatriate living in Vietnam [3]. The next day, the Ministry of Health ordered the activation of the emergency prevention system against SARS-CoV-2 [4]. At the time of writing, the country had carried out 206,253 PCR tests (2,119 tests for a population of one million) and recorded 268 confirmed cases, 203 of which have recovered. No deaths have been recorded [2,4].

The prime minister instructed a number of ministries to act quickly to prevent the spread of COVID-19 [5]. The Ministry of Health plays a central role in disease control, in coordination with the Ministry of Public Security, the Ministry of National Defence, and the Ministry of Culture, Sports and Tourism. The Ministry of Labour, War Veterans and Social Affairs closely monitored the health status of workers returning from epidemic areas. The Ministry of Information and Communications directed local media to publish accurate and timely epidemiological reports and to promote individual measures to prevent and fight the epidemic [5].

The Ministry of Health has set up a specific website to publicly report positive cases (anonymously) and hotlines in order to answer to queries from the public [4]. This data on COVID-19 patients in Vietnam are also available on Wikipedia [6,7]. Using the available

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data, we describe the epidemiology of COVID-19 in Vietnam. We also describe the disease control and prevention measures implemented by the Centre for Disease Control (CDC) in the Thai Binh province.

Materials and methods

To describe the epidemiologic characteristics of COVID-19 patients in Vietnam, we used the data available in Wikipedia [6,7]. This data includes date of diagnosis, gender, age, country of origin, travel history, clinical symptoms and outcome.

To describe the disease control and prevention measures, we conducted a survey at the CDC in the Thai Binh province, in the northeast of Vietnam. Thai Binh (20°30′N, 106°20′E) is a coastal eastern province in the Red River Delta region of northern Vietnam. It is about 110 km from the country's capital, Hanoi. This province covers a 1,542 km^2 area and had 1,860,447 inhabitants in 2019 [8,9], spread over eight district-level sub-divisions including seven districts and one provincial city. The Thai Binh CDC is an agency of the Thai Binh Department of Health dealing mostly with the prevention of infectious diseases, vaccination campaigns, occupational health, the prevention of non-communicable diseases, school health, reproductive health care, HIV/AIDS prevention, health education, and water and food control. This centre has been working to prevent COVID-19 disease since 24 January 2020. Main activities were focused on screening and isolation of individuals with high risk of exposure such as being in contact with a confirmed case or returning from an endemic area.

According to the guidelines prepared by the Vietnamese Ministry of Health for classifying and isolating infected and suspect COVID-19 cases, the isolation measures were categorised into five groups [10].

F0: Confirmed COVID-19 cases were treated at the hospital.

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F1: Individuals in close contact F0 were asked to wear a surgical mask and were isolated at hospital for 14 days.

F2: Individuals in close contact with F1 were asked to wear a surgical mask and were isolated at home or in dedicated accommodation facilities for 14 days.

F3: Individuals in close contact with F2 were asked to wear a surgical mask and were isolated at home for 14 days.

F4: Individuals in close contact with F3 were asked to wear a surgical mask and were isolated at home for 14 days.

Healthcare facilities were notified about F2, 3 and 4 cases.

The Thai Binh CDC manages 11 dedicated accommodation facilities, including three in Thai Binh provincial city and eight in different districts in the province. In these 11 isolation areas, subjects F1 and F2 subjects were evaluated twice a day for symptoms (fever, cough, shortness of breath, fatigue, and diarrhoea) by medical doctors or nurses. F3 and F4 subjects were isolated at home and were cared for by nurses from the village and community health services. F3 and F4 subjects took their own body temperature twice a day and reported symptoms to nurses.

When symptomatic, patients were transferred to isolation facilities and were sampled for testing. Suspect cases were allowed to leave the isolation area after 14 days without symptoms and two consecutive negative PCR results at day 13 and 14. The samples were initially sent to the National Institute of Hygiene and Epidemiology in Hanoi for PCR diagnosis. The Thai Binh CDC then became a referral centre for real-time PCR for SARS-CoV-2, starting from 31 March 2020. SARS-CoV-2 RNA was assessed by real-time reverse transcription-PCR using a hydrolysis probe-based system that targets the E gene as the first-line screening tool, followed by confirmatory testing with the RdRp gene assay, as previously described [11]. PCR test and treatment (when positive) are provided free of charge. People are also provided with free

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meals during isolation, in line with standard Vietnam practice. Anonymous data was collected with the agreement of the Thai Binh Department of Health and the Thai Binh CDC.

Data were analysed using STATA software version 14.2 (Copyright 1985-2015 StataCorp LLC, http://www.stata.com). Continuous variables were analysed and expressed as medians and interquartiles (IQR). Categorical variables were presented as percentages.

Results

Epidemiological characteristics of COVID-19 patients in Vietnam

Between 23 January and 20 April 2020, Vietnam recorded 268 confirmed COVID-19 cases, distributed into two periods. From 23 January to 13 February 2020 16 cases were recorded and from 6 March to 20 April 2020, 252 cases were recorded. Figures 1 and 2 show the distribution of cases over time and by region.

Females accounted for 55.2% of cases. Most patients were aged 20-49 years (67.9%) and were Vietnamese (82.5%). Most cases (162/268, 60.4%) were imported from outside Vietnam (Table 1), including through Vietnamese expatriates returning home (118/162, 72.8%) (Table 1). Other cases (105, 39.2%) were acquired in Vietnam by individuals in close contact with imported cases, including four healthcare workers. It is notable that one patient (0.4%) who did not travel had no known contact with a confirmed case, but with two people who had returned from the capital city, Hanoi, where most COVID-19 cases in Vietnam have been described. Epidemiological study is underway, and the person's village is under quarantine. A majority of patients (63.1%) were asymptomatic and were diagnosed by screening people in close contact with confirmed cases. Fever was the most frequent symptom (23.1%), followed by a cough (18.7%) and sore throat (10.1%). Only 3.4% patients reported dyspnoea. At the

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time of writing, 75.7% of patients had been discharged according to WHO criteria [12]. No deaths were recorded (Table 2).

COVID-19 prevention activities in the Thai Binh province

From 24 January to 20 April 2020, the Thai Binh CDC surveyed at total of 2,203 persons at risk of COVID-19 (118 persons per 100,000 inhabitants). Of them, 336 persons (15.2%) were isolated at hospitals and 1,411 (64.0%) in dedicated isolation facilities. 456 (20.8%) individuals were isolated at home. A total of 1,221/2,203 people (55.4%) were males with a median age of 37 years (Table 3). Sixty-four (2.9%) people were international travellers and 177 (8.0%) were inhabitants of other provinces in Vietnam who were visiting the Thai Binh region. A total of 362 people (16.4%) reported at least one respiratory symptom. To date, no positive cases have been reported and confirmed by RT-PCR test in the Thai Binh province.

Discussion

The socio-demographic characteristics of COVID-19 patients in Vietnam are different to those reported in other countries [13-15]. In a systematic review and meta-analysis including 19 studies, the authors showed that mean age of patients was 52.0 years and 55.9% were men [13]. Our results showed that the median age of COVID-19 confirmed cases in Vietnam was 30.5 years and 44.8% were men. These characteristics are similar to the general population of Vietnam with a mean age of 30.4 years and a proportion of 49.4% males [16]. Moreover, 60% of cases in Vietnam were imported cases, mostly through Vietnamese people returning from overseas. Most Vietnamese “returnees” were young students or workers, which may explain the overall youth of the population of COVID-19 patients in Vietnam. About two-thirds of patients were asymptomatic and no deaths were recorded. This favourable outcome is likely to result from the young age of patients with mild clinical presentations.

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One key to controlling the transmission of infectious diseases is to decrease the source of infection and transmission within the community. Since Vietnam has a long border with China– the country where COVID-19 disease outbreak started – the government has been proactive. After identification of two first cases, a series of public health measures were implemented to control the outbreak with the participation of several Ministries [4]. These measures included stringent exit screening at international airports, a travel ban, lockdown in regions or villages where positive case had been reported, and application of information technology in the identification of potential cases. These measures were largely followed by the public. On 31 March 2020, the Vietnamese government ordered a nationwide lockdown period of 15 days from 1–15 April 2020. [17,18]. Schools were closed, festivals, conferences and activities for large crowds were cancelled, and authorities encouraged people to stay home to minimise exposure and transmission. The use of face masks and hand sanitiser was also highly recommended [18]. The Vietnamese government implemented a series of rigorous measures, including a temporary suspension of entry of all foreigners who have come from or transited through COVID-19 affected areas, and a new mandatory regulation that all incoming travellers to Vietnam had to be quarantined at centralised facilities for 14 days [18]. In the Thai Binh province, under the direction of the President of the province and the Department of Health, the Thai Binh CDC focused on managing individuals at risk for COVID-19, according to the recommendation of the Ministry of Health [4]. The effect of the systematic screening and isolation strategy made it possible to limit local transmission in Vietnam. However, the number of diagnosed tests conducted was limited, (2,119 tests for a population of one million) and it is possible that cases of COVID-19 in the community remain undetected. Currently, the epidemic is still ongoing in many countries, and the recurrence of positive SARS-CoV-2 samples in patients who have recovered from COVID-19 has been documented in Vietnam and other countries [19-22]. Vietnam must reinforce its diagnostic

capacities, prevention measures and provide the necessary epidemiological data upon which to base interventions. The widespread use of rapid serological tests is also advisable in order to conduct extensive screening in the community.

This study has some limitations, including the lack of detailed clinical and therapeutic data precluding assessment of the severity of the disease. Patient comorbidities were also not documented. Studies on patient epidemiological data are needed, which would enable epidemiologists to build a model of the outbreak in Vietnam and calculate the number of new infections triggered by each case. Only control and prevention measures in the Thai Binh province were described, and they are not representative of the whole country.

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Conflict of Interest

Van Thuan Hoang, Thi Dung Pham, Thi Loi Dao, Duc Thanh Nguyen, Van Nghiem Dang, Thanh Tung Dao, Van Luong Nguyen, Duy Cuong Nguyen, Nang Trong Hoang, Quang Huy Dang, Xuan Cap Do, Van Thom Nguyen, Van Diu Pham, Phong Tuc Vu and Philippe Gautret declare that they have no conflict of interest.

Author Contributions Statement

VTH, TDP, TLD, TTD, VLN, QHD, XCD and VTN collected the data, VTH, TLD and PG contributed to experimental design, data analysis, statistics, interpretation and writing. VND,

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DTN, NTH, VDP and PTV contributed to critically reviewing the manuscript. VTH and TDP contributed equal work. PG and DCN coordinated the work.

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Table 1: Epidemiological characteristics of 268 COVID-19 patients in Vietnam.

Characteristics	n	%
Gender		
Male	120	44.8
Female	148	55.2
Age		
Median	30.5	
Interquartile	23.5 – 48.0	
Min-max	3 months – 88 years	
0-19 years	27	10.1
20-49 years	182	67.9
50-59 years	32	11.9
60-69 years	21	7.8
≥70 years	6	2.2
Country of origin		
Vietnam*	221	82.5
United Kingdom	19	7.1
Brazil	6	2.2
United States of America	5	1.9
France	5	1.9
China	2	0.7
Germany	2	0.7
Others	8	3.0
Imported cases		
Yes	162	60.4
No	106	39.6

* 118 expatriate Vietnamese returning from overseas (imported cases).

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Table 2: Clinical symptoms and outcomes among 268 COVID-19 patients in Vietnam, as of 20 April 2020.

	n	**%**
Asymptomatic	169	63.1
Fever	62	23.1
Cough	50	18.7
Sore throat	27	10.1
Myalgia	18	6.7
Dyspnoea	9	3.4
Rhinitis	5	1.9
Outcome		
Discharged	203	75.7
Being treated	65	24.3
Died	0	0.0

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Table 3: Sociodemographic characteristics and isolation methods in COVID-19 suspected cases in the Thai Binh province, as of 20 April 2020.

	n	%
Age (years)		
Median	37	
Interquartile	27 - 54	
Min - Max	0 - 90	
0-19 years	123	5.6
20-49 years	1412	64.1
50-59 years	273	12.4
60-69 years	249	11.3
≥70 years	146	6.6
Gender		
Male	1221	55.4
Female	982	44.6
Habitants of Thai Binh	1962	89.1
Habitant of other provinces in Vietnam	177	8.0
International travellers	64	2.9
Isolation methods		
In hospital or medical centres		
Discharged	237	10.8
Ongoing	99	4.5
Dedicated isolation facilities		
Discharged	1391	63.1
Ongoing	20	0.9
Home under the supervision of community health services		
Finished	456	20.7
Ongoing	0	0

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Figure 1: Number of COVID-19 patients by day in Vietnam, as of 20 April 2020.

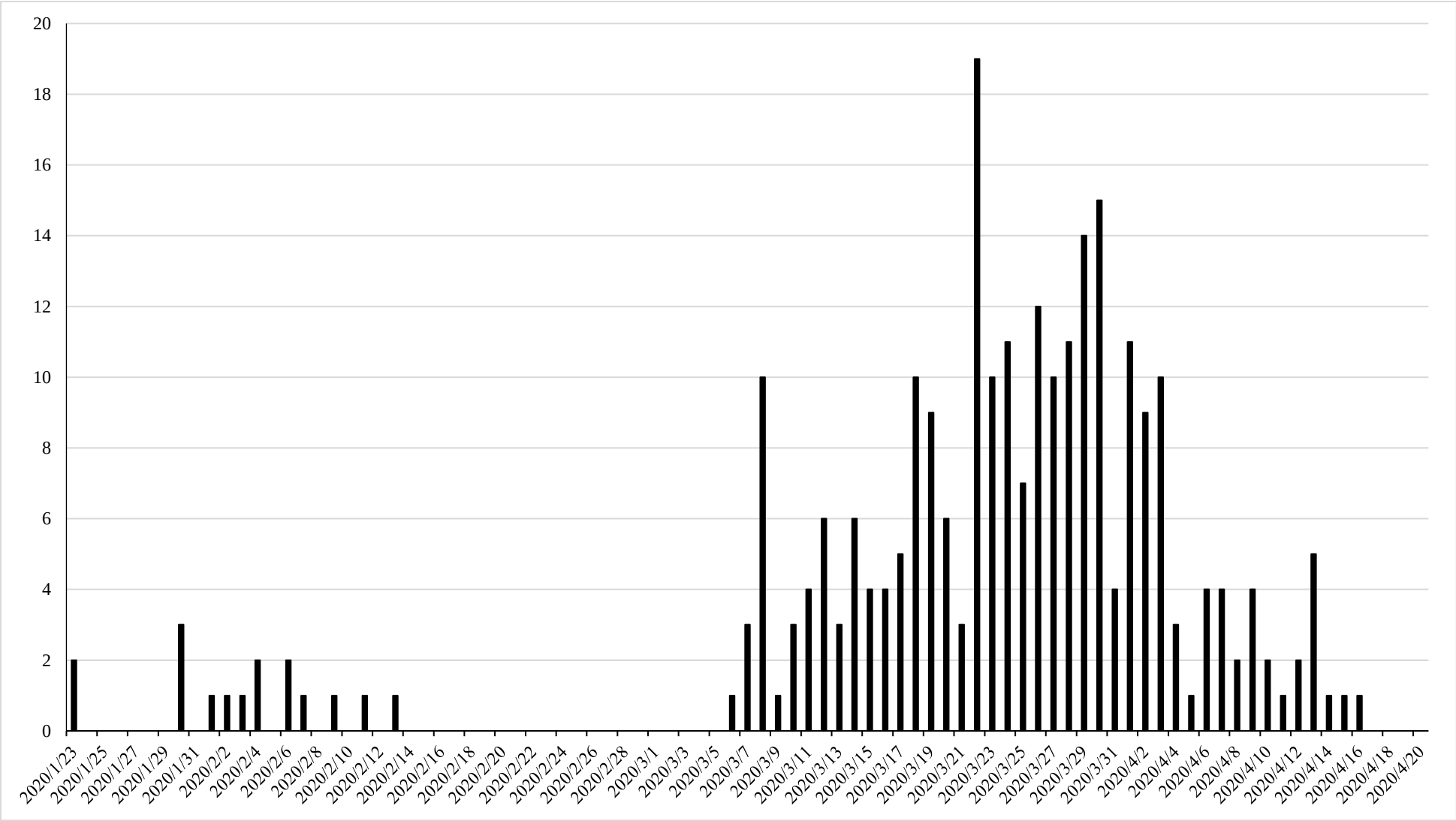

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Figure 2: Geographical distribution and outcomes of 268 COVID-19 patients in Vietnam, as of 20 April 2020.