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Clusters of Coronavirus Disease (COVID-19) in Pubs, Bars and Nightclubs in Bangkok, 2020

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Abstract

Two clusters of COVID-19 cases were identified in Bangkok, Thailand linked to entertainment areas, including pubs, bars and nightclubs in March 2020. A joint investigation was carried out by healthcare staff and epidemiologists from the Division of Epidemiology of Department of Disease Control and the Urban Disease Control and Prevention. A descriptive cross-sectional study was performed to describe characteristics of the outbreak clusters, perform contact tracing, and provide recommendations for outbreak control. In total, there were 15 cases in the first cluster and 31 cases in the second cluster; including both the index cases and cases that were later identified from contact tracing. Sharing utensils, glasses and cigarettes was a key risk behavior. Moreover, active case finding was done among the personnel of a pub linked to the majority of the cases. Eighteen percent of the workers in this pub was infected with SARS-CoV-2. After the reopening of pubs, bars and nightclubs, a sentinel surveillance policy and close monitoring program among people with a history of travelling to or working at entertainment places was implemented.

Keywords: coronavirus disease, COVID-19, Thailand, nightclub, contact tracing, sentinel surveillance

Introduction

Many countries around the world, including Thailand, are struggling to cope with the public health and economic impacts of the coronavirus disease (COVID-19).[1] The disease is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The main route of transmission of COVID-19 is mainly through direct contact with droplets spread from infected persons.[2] People infected with COVID-19 usually develop mild to moderate symptoms, for example, fever, muscle aches and rhinorrhea. Those who are at greater risk of severe symptoms and death include people over 60 years and/or those with underlying medical conditions. As of 19 Sep 2020, there have been over 30 million cases of COVID-19 worldwide, with more than 956,000 deaths.[3]

COVID-19 cases were first identified in Wuhan, China, in December 2019.[4] Thailand was the first country outside China to experience COVID-19 cases, with most of the early cases linked to a history of travelling to or from China.[5] On 31 Jan 2020 the first confirmed case from local transmission in Thailand was reported.[6,7] The number of locally transmitted cases has risen since then. Many cases were identified as having a linkage with entertainment areas such as pubs, bars and nightclubs.

On 9 Mar 2020, the COVID-19 operation team of the Division of Epidemiology (DOE), Department of Disease Control (DDC), Ministry of Public Health (MOPH), received a notification from the Institute for Urban Disease Control and Prevention (IUDC) in Bangkok that there were clusters of COVID-19 that might have originated from a common source. The source(s) were suspected to be pubs, bars, nightclubs, restaurants, or other entertainment venues along a street for nightlife activities in Bangkok. The joint operation team comprising staff members from the DOE and IUDC commenced an outbreak investigation on 10 Mar 2020. The aims of the investigation were to describe characteristics of the outbreaks, perform

contact tracing to identify likely sources and prevent further transmission, and provide recommendations for outbreak control.

Methods

The team conducted a descriptive cross-sectional study. Data collection techniques consisted of reviewing medical records of confirmed cases and conducting in-depth interviews with cases and all contacts by phone. The definition of a patient under investigation of COVID-19 case was any person who had fever (body temperature ≥37.5 degree Celsius) or history of fever and any respiratory symptoms (e.g. cough, rhinorrhea, sore throat or dyspnea) with a history of exposure to high-risk places, e.g. entertainment areas, or being in close contact with any person who had a history of exposure to high risk places between 17 Feb 2020 and 20 Mar 2020. A confirmed COVID-19 case was a person who was later reported to have tested positive for SARS-CoV-2 detection from nasopharyngeal or throat swabs during 9 to 22 Mar 2020. Asymptomatic infection was a confirmed COVID-19 case showing no signs and symptoms. Positive test of SARS-CoV-2 was determined by Polymerase Chain Reaction (PCR) from two laboratories certified by Department of Medical Sciences, MOPH.[8,9]

Contact tracing was performed among household members, relatives, friends and any persons who were exposed to the cases during the presence of symptoms. Contacts were divided into two categories; (i) high-risk contacts, defined as any person who contacted with or communicated with, or stayed in a closed space with poor air ventilation (such as air-conditioned room or car) with a case(s) within a one-meter distance for at least five minutes without adequate protective equipment such as face mask or face shield; and (ii) low-risk contacts defined as any person who contacted or communicated with a case but did not meet the high-risk criteria.[10]

High-risk contacts had throat and nasopharyngeal swabs collected on the fifth day after the last exposure date with a confirmed case. High risk contacts were self-quarantined for a further 14 days after the last exposure date if laboratory results were negative for SARS-CoV-2. Low-risk contacts were asked to self-monitor and report their symptoms to the local healthcare providers every day until the 14-day quarantine period ended.

An epidemic curve was constructed to inform characteristics of the outbreak. An exploratory social network analysis (SNA) was applied to determine the connection between cases and contacts. A sociogram was constructed to visualize the SNA findings.

Ethical clearance was waived as this study was performed as part of the routine outbreak investigation of the Thailand-DDC.

Results

In early March 2020, there was a suspected COVID-19 case with no history of travelling abroad but had travelled to nightclubs in the Thong Lo area, Wattana District, Bangkok. After the laboratory confirmation of SARS-CoV-2 infection, this case (index case in Cluster#1) became the first case of a COVID-19 outbreak with a history of visiting a nightclub.

Cluster Number 1

Index case description

The index case was a 29-year-old Thai female who lived in Bangkok. She had a sore throat on 3 Mar 2020. On the following day, she visited the outpatient clinic of Hospital AA to receive treatment. She received only symptomatic treatment without any specific laboratory testing. On 8 Mar 2020, she developed fever with chills and cough. Subsequently, she re-visited the same hospital and was admitted. Nasopharyngeal and throat swabs were collected and were positive for SARS-CoV-2. The result was reported to the IUDC on 11 Mar 2020.

The interview with the index case showed that she went to pub BA and pub BB on 21 to 22 Feb 2020 with five Thai friends and six foreign friends (five from Hong Kong and one from Singapore). No one had respiratory symptoms and the foreign friends reported no symptoms after they went back to their home countries. On 27 Feb 2020, the index case and her husband (B) had dinner with 7 friends (K, L, M, N, R, U and Q) at Restaurant BC. On 29 Feb 2020, she and her husband had a major gathering with 10 friends (C, D, E, F, G, H, I, J, S and T) at pub BD, pub BE and pub BF, all located in Thong Lo area, Wattana District, Bangkok. All of the party members reported that they shared utensils, glasses, cigarettes and a microphone for karaoke. No one wore a mask during the gathering. After the index case developed symptoms (3 Mar 2020), she and her husband had lunch with four friends (K, L, M and N) at the index case's house. After lunch she travelled to Nakhon Ratchasima Province with her husband and one of her friends (L) during 4 to 5 Mar 2020 to join a wedding ceremony with other friends (L, K, M, and N) in Saraburi during 6 to 8 Mar 2020. The index case wore a mask continuously after she had symptoms, except during mealtimes.

Contact tracing

A total of 17 contacts were identified, including three household contacts and 14 non-household close contacts.

Among the three household contacts, her husband developed cough on 5 Mar 2020. No other household contact developed any symptoms. The husband was later identified as a confirmed case. Among the 14 non-household close contacts, there were two main groups of friends who joined the party on 29 Feb 2020 and had lunch on 3 Mar 2020. The attack rates among both groups were 80% (8/10) and 75% (3/4), respectively. The contact tracing was expanded to cover all contacts of the infected people; two of these were friend of the index case's friend (C) who joined the party and were later identified with the COVID-19 virus (Figure 1).

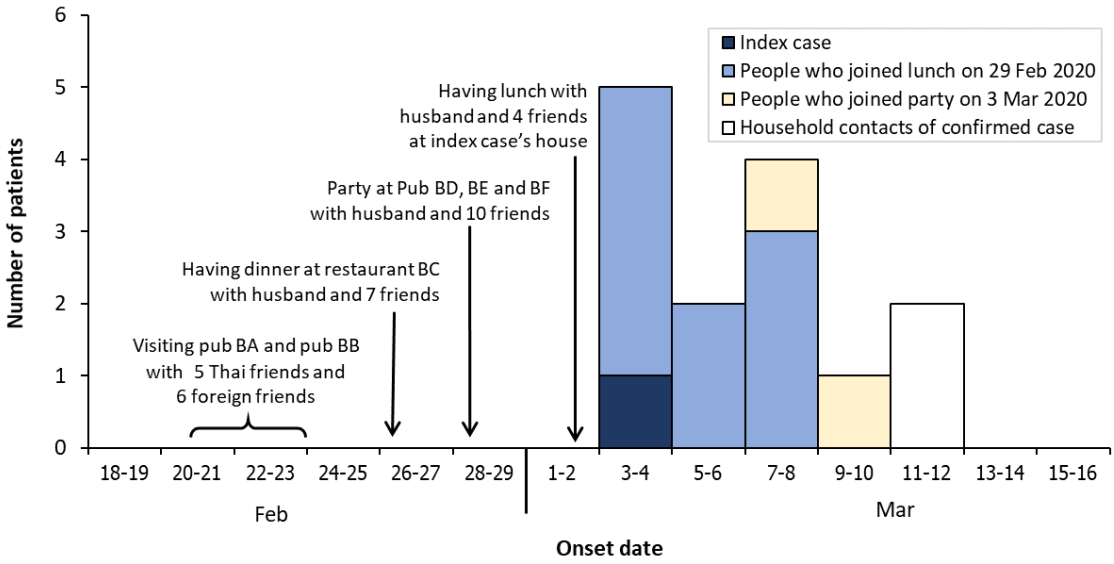

Figure 1. Epidemic curve and risk activities of COVID-19 patients in cluster#1 (N=13)

The majority of cases (13/15; 87%) had at least one symptom. Fever, headache and myalgia were the most common symptoms (62%). Other symptoms were cough (54%), sore throat (46%), rhinorrhea (38%), dyspnea (31%), fatigue (31%) and having sputum (31%). The median age of the patients in this cluster was 33 years (interquartile range: 5.5 years (Q1=31.5, Q3=37)). The male to female ratio was 1.5. All patients were admitted and isolated until their specimen tested negative for SARS-CoV-2 for at least two consecutive tests.

Social network analysis

The onset of illness for the first case was 3 Mar 2020. People who joined the party on 29 Feb 2020 had onset of illness on 4 Mar 2020. Most of the people who shared a meal with the index case on 27 Feb 2020 also shared another meal with the index case on 3 Mar 2020. However, people who only joined the meal on 27 Feb 2020 did not get infected (Figure 2).

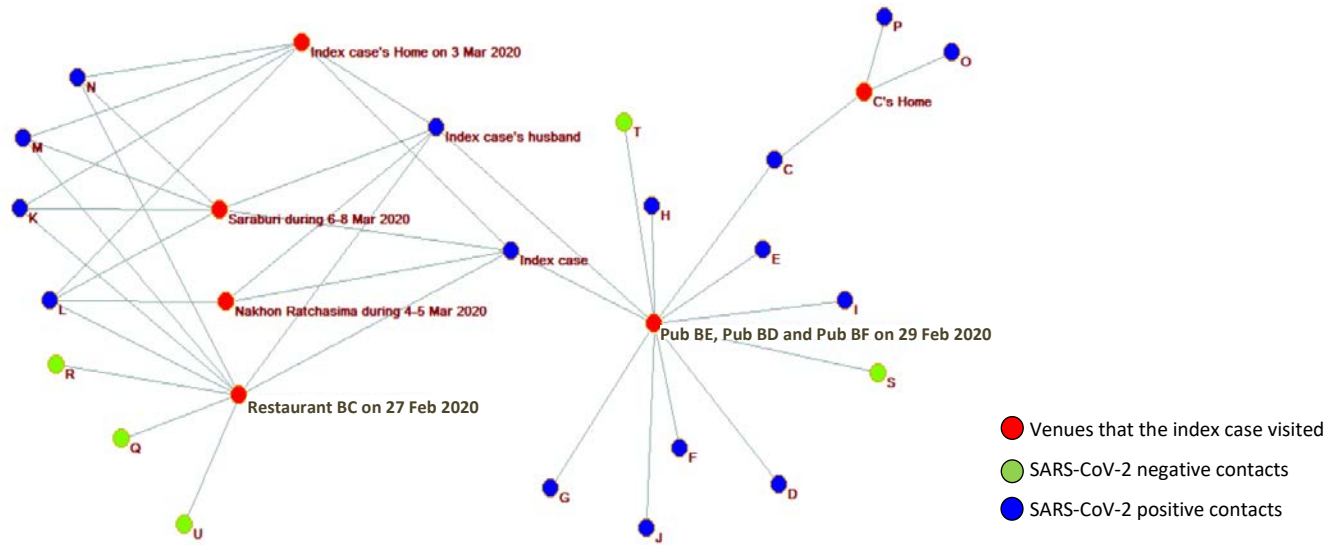

Figure 2. Sociogram illustrating the connection of cases, contacts, and venues that the index case visited in cluster#1 (N=21)

Cluster Number 2

Index case description

The index case was a 27-year-old Thai male living in Bangkok. He developed fever with a body temperature of 37.9°C, cough, and rhinorrhea on 10 Mar 2020. He visited an outpatient clinic in Hospital AB on the same day where he submitted nasopharyngeal and throat swabs. On 11 Mar 2020 the specimens were positive for SARS-CoV-2 by RT-PCR. He was admitted and isolated in the hospital. The index case reported that he travelled to Japan with his four friends during 25 Jan to 2 Feb 2020. No one had symptoms. From 2 Feb to 9 Mar 2020 the index case reported going to several pubs with his wife and 12 of his friends almost every night. The common venues were pub BG, pub BH and pub BI, which were located in Thong Lo area, Wattana District, the same district as cluster#1. The index case and his friends reported sharing utensils, glasses and e-cigarettes during their time in the pubs.

Contact tracing

A total of 13 contacts were identified including the index case's wife and 12 friends. His wife developed fever and myalgia on 8 Mar 2020 and was found to be infected with COVID-19. Likewise, 5 of 12 friends of the index case were infected with COVID-19. Contact tracing was expanded to cover all the contacts of the cases. Three additional friends of friends of the index case were identified as SARS-CoV-2 positive. Active case finding was performed on the staff working at pub BI because many of the cases had reported a history of visiting there. Of the 98 staff who submitted nasopharyngeal and throat swabs to be tested for SARS-CoV-2 by RT-PCR, 20 (18%) were infected with COVID-19. One additional household contact was later identified as positive for COVID-19 (Figure 3).

Figure 3. Epidemic curve and risk activity of COVID-19 patients in cluster#2 (N=20)

Most of the cases (65%) had symptoms; fever was the most common (57%), followed by cough (50%), and myalgia with anosmia (27%). The median age of the patients was 31 years (interquartile range: 11.5 years (Q1=24, Q3=38.5)). The male to female ratio was 1.4. All patients were admitted and isolated until their nasopharyngeal and throat swabs were found negative for at least two consecutive days.

Social network analysis

The first contact person identified by contact tracing who became infected with COVID-19 was the index case's wife with illness onset on 8 Mar 2020. This was almost the same onset date as the index case and workers at pub BI (Figure 4).

Government's Actions

According to the investigations of two clusters of COVID-19 infection in Bangkok nightclubs, the definite source of infection could not be identified. However, there was an epidemiological linkage in terms of place as the affected nightclubs were located in Thong Lo area, Wattana District, Bangkok and these clusters happened in the same period. This outbreak, among other things, caused the Government to take immediate actions to control COVID-19 in nightclubs.

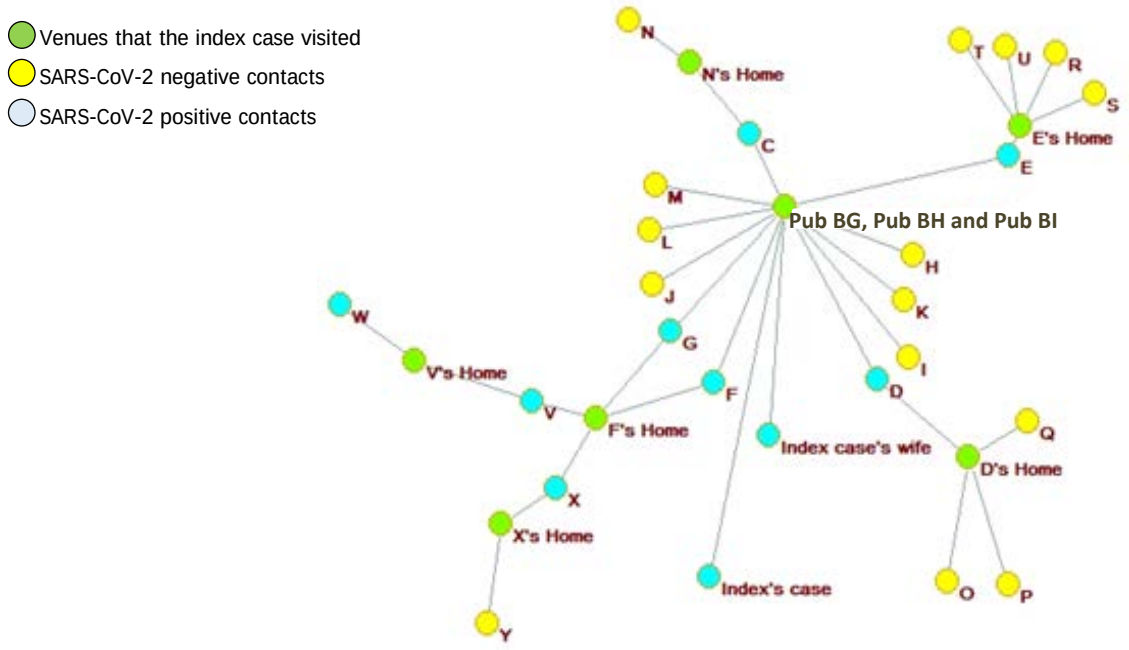

Figure 4. Sociogram illustrating the connection of cases, contacts, and venues that the index case visited in cluster#2 (N=25)

Promptly after this investigation, the Thai Government closed all pubs and nightlife events in Bangkok. This measure was expanded country-wide on 22 Mar 2020.[11,12] There were no reports of COVID-19 cases related to entertainment areas after 5 Apr 2020.[13]

Discussion

These two COVID-19 clusters originated within the same area (Thong Lo, Wattana District) and it is an area that always has a high number of nightlife tourists. Overall, we could identify 46 COVID-19 patients (both the two index cases and those who were identified by contact tracing) and 98 contacts who were not infected with COVID-19. This fact indicates that pubs and bars are among very high-risk areas for COVID-19.

Other countries also faced a similar situation. Japan, South Korea and Hong Kong were reported to experience super spreading events of COVID-19 related to pubs, bars and night clubs.[14-16] These places probably contributed to a high risk area for COVID-19 as they are usually located in a closed indoor space with poor air ventilation and crowded with people.[17,18] These entertainment areas also attract tourists from all over the world, such as Itaewon in South Korea, Lan Kwai Fong in Hong Kong, and Ginza in Japan.[19-22] However, the primary source of these outbreaks could not be exactly identified. We were unable to contact six foreigners who were reported in the first cluster as they had already left Thailand before the outbreak investigation.

At the same time, the investigation team contacted the International Health Regulation (IHR) focal point in Thailand to communicate with the focal point of these foreigners' home countries about the risk of COVID-19 spreading.

Contact tracing is an important public health response to control COVID-19.[23] In this study, we found 14 additional cases in cluster#1 and 9 additional cases in cluster#2 through the investigation and contact tracing process. Most cases were linked with a history of visiting pubs in Thong Lo area, Wattana District and having meals together with the index case. The attack rates among close contacts in both clusters were 80% and 75%, far greater than the attack rate of previous COVID-19 outbreaks in Thailand. On 5 Mar 2020, the attack rate among a cluster of COVID-19 Thai businessmen returning from Italy was 50%.[24] This could be partly explained by the high-risk characteristics of entertainment areas that can facilitate the spread of COVID-19.[17,18]

The behaviors of people attending pubs, bars, and nightclubs increase their risk of COVID-19 infection. These include sharing of utensils, glasses, cigarettes and microphones. This is because COVID-19 transmission can occur via direct contact with objects contaminated with the virus.[25,26] Furthermore, the virus can survive for several hours on a fomite surface (four hours on copper, 24 hours on cardboard and up to two to three days on plastic and stainless steel). In fact, the virus might survive longer than expected, conditional upon the environment and ambient temperature.[27] Additionally, some activities in these

entertainment areas may aggravate the risk of COVID-19 spreading, such as drinking alcohol, singing karaoke, shouting and/or talking loudly may increase the production and spread of respiratory droplets.[28] The consumption of alcohol may also cause people to be less aware of the risk of COVID-19; subsequently, some protective behaviors against the disease were relaxed, for instance, keeping a physical distance from others and wearing a protective face mask.

Thailand had previously adopted the practice of screening high risk populations, such as migrants and people who had frequent contact with foreigners, for COVID-19. In this investigation, we identified entertainment area staff and visitors to these places as high risk populations for contacting COVID-19 infection. Therefore, we initiated active case finding among workers of pub BI and found that 18% tested positive for COVID-19 infection, of which 60% were symptomatic. Additionally, during May 2020, the MOPH introduced a nationwide COVID-19 sentinel surveillance policy on populations at risk using pooled saliva samples. People working in pubs, bars and nightclubs are populations at risk. Other high-risk populations include migrants, people living in slum communities, people working in the public transportation sector such as bus drivers, and prisoners.[29]

There were some limitations in this study. First, it is likely that reports of travel history during the active case finding were biased due to the fear of stigmatization and discrimination. During the time of the interviews the volume of COVID-19 cases in Thailand was rising and the public response towards COVID-19 was very strong. It was likely that people involved in a super-spreading event would be strongly criticized.[30] Nonetheless, we tried to validate this information by interviewing a number of people. Secondly, the two index cases and their contacts travelled to numerous entertainment areas with a large number of people. Therefore, recall bias might have occurred. Thirdly, we could not contact and retrieve the history of some contacts in the first cluster, especially the foreign friends of the index case. This was a missed opportunity to identify the exact sources of infection.

Public Health Recommendations

The findings from this investigation were provided to the Emergency Operating Center (EOC) of the MOPH. We recommended that the sentinel surveillance and active case finding strategy should be conducted among people who had a history of visiting pubs, bars and nightclubs in Thong Lo area, Wattana District, Bangkok. In late March 2020, the Government imposed a stringent policy on all entertainment venues in the country that required them to stop operating until the COVID situation in Thailand was under control. Since 1 Jul 2020 this measure has been relaxed and these venues have been allowed to re-open, but with strict physical distancing measures.[31] We recommended that close monitoring of high risk populations, including visitors of entertainment areas, should continue. This requires collaboration with the owners of these venues to ensure that all guests wear masks, register themselves on arrival to and departure from the venue, and comply with all hygiene measures stipulated by the Thai Government.[32]

Conclusion

In March 2020, active case finding and contact tracing was conducted as a response to two clusters of COVID-19 cases in a popular entertainment area of Bangkok. As a response to this investigation, the Thai Government issued a stop-operating order until the COVID situation in Thailand was under control. Active case finding and contact tracing was initiated with the identified high-risk groups of employees and customers of pubs, bars and nightlife restaurants in other parts of the country. We recommend close monitoring of high-risk groups with regular sentinel surveillance.

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Suggested Citation

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