

Containing Coronavirus Disease 2019 (COVID-19) in Belize

Kyle A. Habet (✉ kyle.h94@gmail.com)

Washington University of Health and Science <https://orcid.org/0000-0002-2109-5331>

Dionne Habet

Government of Belize Press Office

Gliselle Marin

University of Belize Environmental Research Institute

Report

Keywords: Epidemiology, Public Health, Central America, Caribbean

DOI: <https://doi.org/10.21203/rs.3.rs-32462/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Objective:

To demonstrate how Belize, a small country in Central America with limited resources, contained the spread of SARS-CoV-2 (COVID-19).

Methods:

Information was gathered from official press releases from the Government of Belize. Statistics were accessed from the Ministry of Health's website. Additional information was acquired from internet searches on Pubmed and the World Health Organization.

Results:

Total Cases: 18; Male to female ratio: 1:1; Deaths: 2; Total Tests Done: 1,128; Percentage of positive tests: 1.59%, New cases per day since first case to plateau: 0.812.

Conclusion:

Early intervention on a national level was key to preventing importation of cases and subsequent community transmission. Limiting the conglomeration of people, curfews, closures of school and universities, government-mandated social distancing, and extensive contact tracing may have mitigated the exponential spread of COVID-19. Mandatory mask-wearing in public may have helped to prevent spread between asymptomatic carriers to susceptible individuals. A low population density may have also contributed to containing the virus.

Introduction:

Belize has a population of approximately 408 thousand people.[1] It consists of six districts and over 200 islands, including three island municipalities. The first confirmed case of SARS-Co-V-2 (COVID-19) was diagnosed in Belize on March 23, 2020. However, anticipatory measures to mitigate the spread of the virus were taken before the first case was confirmed.[2]

During the outbreak, drastic measures were taken to prevent exponential spread of the virus. These measures are described below. The first confirmed case of COVID-19 was on March 23, 2020.[3] On April 14th the last confirmed positive case was reported. After 20 days with no new confirmed cases, the economy was reopened. The reopening was not a complete return to normal because mask-wearing in public and social distancing guidelines were enforced by law. Belize reached zero active cases on May 5th 2020.

The World Health Organization has outlined six guidelines to transitioning to and maintaining a steady state of low-level or no transmission in its Strategy Updates.[4] Many of the recommendations in the

WHO's plan were implemented by Belize and may have led to a successful handling of the pandemic in the country.

Methods:

Information was gathered from official press releases from the Government of Belize. Statistics were accessed from the Ministry of Health's website. Additional information was acquired from internet searches on Pubmed and the World Health Organization.

Results:

Precautionary Measures: Pre-COVID-19 Outbreak

A task force co-chaired by the Prime Minister and the Leader of the Opposition Party was assembled to implement precautionary measures including the closure of schools, day-care centers and universities. These measures were adopted with bipartisan endorsement, which may have combatted any unwillingness to cooperate by the general public due to political biases.[5][6] Persons who were travelling from countries where COVID-19 was endemic were prohibited entry into Belize. Belizean nationals returning to the country from areas of native spread were urged to self-quarantine for 14 days. Social gatherings were limited to 100 people. Ports of entry on the ground, except the northern border with Mexico, were also closed.[5] Campaigns were conducted countrywide to educate the public on the importance of proper hand-washing hygiene and cough and sneeze etiquette. Recommendations were issued to the general public that rely on public transportation to avoid overcrowded buses, and employers were instructed by the government to be accommodating to their employees with working hours, as the situation evolved. All forms of public transportation were mandated to disinfect all vessels following each run.[7] As cases began to appear throughout Central America, social gatherings were further reduced from 100 to 25 people, including supermarkets, grocery stores, restaurants and bars.[2] These mandates were heavily upheld by law enforcement.

COVID-19 Outbreak Phase

Following the first confirmed case of COVID-19 on Ambergris Caye, the country's most populated island, a state of emergency was declared on the island which grounded all vessels entering or leaving Ambergris Caye for 72 hours. During this time the Ministry of Health conducted a mapping and tracing exercise of contacts.[8][3] Residents on the island were encouraged to stay at home and not leave except in the case of unavoidable circumstances. All bars, restaurants, casinos, clubs, and lounges were ordered to close within two days countrywide.[8] These measures were set in place to contain the first identified cluster of COVID-19.

In preparation for a potential health crisis, a brigade of Cuban medical professionals specialized to assist in times of disaster and pandemics was received two days after the first case of COVID-19 was confirmed.[9] The Judiciary of Belize closed all criminal cases being tried by the Supreme Court and

excused all jurors. Civil and family court cases were addressed by written submissions and over the telephone. Where persons had to attend court in person, the guidelines with regards to gatherings and social distancing were enforced.[10]

On March 29th 2020, the third confirmed case was identified on mainland Belize. The patient was placed into self-isolation and a mapping exercise of the patient's contacts was conducted.[11] This led to the declaration of a national state of emergency which included a curfew from 5:00 a.m. to 8:00 p.m. that restricted movement, except for health emergencies.[12] A heavy monetary penalty or two years imprisonment was enforced for anyone who did not adhere to the curfew. Social gatherings were limited to 10 persons along with the closure of all services deemed non-essential. Measurements were set in place on the basis of evidence gathered from other countries and the advice from local experts. The agreed upon conclusion was that the best way to at least slow, and hopefully stop, the spread of the virus, was by strictly enforcing physical distancing, restricting movement of non-essential workers across district lines, quarantining, and self-isolation of COVID-19 patients.[12][13]

Services deemed essential were allowed to operate during the business hours of 5:00 a.m. to 7:00 p.m. Public social distancing of three feet was enforced. Working from home was strongly encouraged wherever possible and social gatherings were prohibited with the exception of funerals capped at a maximum of 10 persons. Movement across district boundaries was restricted except for essential workers and it was announced that even Belizean nationals were not allowed entry into the country.[14] [15]

On April 7th, additional measures were implemented to quarantine the Cayo district where a potential second cluster of infections had been identified.[16] This included restricted movement in and out of the district and reduced working hours for essential services from 8:00 a.m to 4:00 p.m.[17] Additional legislation prohibited movement across district lines.[18] On April 17th, movement on Sundays was completely restricted for a period of 14 days, except for essential workers and emergencies.[19]

Plateau and Recovery Phase: Returning to a New Normal

On April 18th 2020 Belize plateaued at 18 confirmed cases (see Fig. 1.1). Daily public briefings were made on social media, the Government's platform of choice, and other news outlets. As regulations subsequently became slowly lifted, movement of people was allowed on Sunday, curfew hours were reduced, and non-essential businesses such as hotels and hair salons were allowed to operate within specified protocols to limit social contact.[20] Despite no new cases, on April 30th, it was made mandatory for all citizens to wear face masks in public. Businesses that were allowed to reopen were instructed to ensure a distance of at least six feet between employees and all employees were required to wear masks. Certain establishments remained closed including casinos, gaming establishments, gymnasiums, sporting complexes, discotheques, bars and nightclubs. Movement during non-curfew hours had to be purposeful and all citizens were subject to questioning by law enforcement officers when outside. Social distancing and sanitization continued to be enforced and encouraged.

On May 4th 2020, new legislation was signed into effect to allow almost all businesses to reopen with the exception of schools and daycare centers.[21] Belize's largest industry, the tourism sector, took the hardest economic hit when all borders were closed. The indefinite closing of the tourism industry by COVID-19 made reopening the local economy a priority. Social distancing protocols were to remain enforced with an emphasis on wearing face masks, regularly sanitizing hands, and maintaining a six-foot distance in between patrons. A strict curfew and restriction on movement across district lines remained in place to minimize unnecessary movement.[22]

Discussion:

On May 5th, 2020 there were no active cases in Belize. The measures taken by the Task Force were based on data from other countries and the advice of local experts.

The WHO outlines six guidelines for transitioning to and maintaining a steady state of low-level or no transmission. Table 1.1 states these guidelines and compares them with the situation in Belize on May 4th, when most businesses were allowed to reopen.

COVID-19 has an incubation period of up to 14 days and may be asymptomatic in some individuals.[23] [24] This characteristic makes it challenging to detect and isolate asymptomatic patients and patients in the incubation phase who are potentially infectious.[25] For this reason, closure of schools and universities, as well as limiting social gatherings before any cases of COVID-19 were confirmed may have played a major role in minimizing or eliminating spread between asymptomatic or patients during incubation.

During the outbreak phase, GOB enforced draconian measures to enforce physical distancing and limiting movement of people which may have mitigated community spread. After the first case of COVID-19 was confirmed on Ambergris Caye, the entire island was quarantined and placed under a State of Emergency. After the third confirmed case was identified, the entire country was placed under a state of emergency. When clusters were identified in Cayo, the entire district was also quarantined and movement between district lines was prohibited by non-essential workers.[16] In every instance, contact tracing was conducted and self-isolation of contacts was mandatory.

The closure of borders and non-essential businesses had a heavy impact on the livelihoods of many Belizeans. Government initiatives and assistance received from the international community aimed to alleviate the hardships created by the unemployment and loss of the tourism industry.[26][27] Additional aid came in the form of donations of personal protective equipment for frontline workers, food, monetary donations and human resources from other countries.[9][26][28] Without aid, increased pressure from the general public due to economic hardship might have led to a premature opening of the economy and a decrease in community engagement.

Conclusion:

Early intervention on a national level was key to preventing importation of cases and subsequent community transmission. Regulations limiting the conglomeration of people, curfews, closures of school and universities, and government-mandated social distancing, and extensive mapping of the three main clusters of COVID-19 identified in the country are all factors which may have mitigated the exponential spread of COVID-19. Only symptomatic patients and those in close contact with patients with a confirmed positive result for COVID-19 were tested, so many asymptomatic infections may have been undiagnosed. However, early interventions, restricted movement across district borders, and physical distancing contributed to control the spread of COVID-19. Mandatory mask-wearing in public in the absence of new cases for 18 days may have helped to eliminate the virus from the country by preventing the spread of the virus from asymptomatic or minimally symptomatic carriers to susceptible individuals.

Another major factor that may have contributed to the mitigation of the spread of COVID-19 is the low population density of Belize (16.79 people per km²).[29]

Limitations:

The exact specificity and sensitivity of the deep nasopharyngeal swab RT-PCR test for SARS-CoV-2 was unknown at the time of this study. Only symptomatic patients and those in close contact with patients with a confirmed positive result for COVID-19 were tested, so many asymptomatic infections may have been undiagnosed.

Table 1

The World Health Organization’s guidelines for transitioning to and maintaining a steady state of low-level or no transmission compared with the situation in Belize on May 4th 2020, when most businesses were allowed to reopen

WHO Guidelines [5]	Situation in Belize on May 4th, 2020
<p>COVID19 transmission is controlled to a level of sporadic cases and clusters of cases, all from known contacts or importations and the incidence of new cases should be maintained at a level that the health system can manage with substantial clinical care capacity in reserve.</p>	<p>No new cases for 20 days. Contact tracing exercises were carried out for each positive case. [4]</p>
<p>Sufficient health system and public health capacities are in place to enable the major shift from detecting and treating mainly serious cases to detecting and isolating all cases, irrespective of severity and origin:</p> <p>Detection: suspect cases should be detected quickly after symptom onset through active case finding, self-reporting, entry screening, and other approaches;</p> <ul style="list-style-type: none"> • Testing • Isolation • Quarantine 	<p>Total Cases in Belize was 18 and the public health system never reached a point of saturation. Most cases were monitored from home. Hotlines were made available in case patients deteriorated. [20]</p> <p>Testing was done were cases were suspected. Asymptomatic individuals were tested when a history of close contact with a positive case was identified.</p> <p>COVID-19 isolation units available.</p> <p>Patients with a suspected case of COVID-19 are mandated to self-quarantine until results are negative. Positive results are mandated to self-quarantine until recovered (defined as a negative test result) [14]</p>
<p>Outbreak risks in high-vulnerability settings are minimized</p>	<p>No outbreaks occurred in high-vulnerability settings such as schools, prisons or nursing homes documented.</p>
<p>Workplace preventive measures are established</p>	<p>The provisions of Statutory Instrument 66 lay out strict social distancing guidelines for workers and employees, instruct that hand sanitizer be available to all employees and directs the general public to wear a facemask at all times when not indoors. [22]</p>
<p>Risk of imported cases managed</p>	<p>Boarders remained closed. Automatic imprisonment was the penalty for entering Belize illegally even for Belizean nationals. [25]</p>
<p>Communities are fully engaged</p>	<p>The level of community engagement could not be objectively measured.</p>

Declarations

Ethics approval and consent to participate:

Not applicable.

Consent for publication:

I, Dr. Kyle Habet, corresponding author, give my consent for information about myself to be published in Global Health Research and Policy for the manuscript entitled "Containing Coronavirus Disease 2019 (COVID-19) in Belize".

Availability of data and material:

The datasets generated during and/or analyzed during the current study are available in the Government of Belize's COVID-19 tracker at <https://www.covid19.bz/> and at the COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU) at <https://coronavirus.jhu.edu/map.html>.

Competing interests

The authors have no conflicts of interests to declare.

Funding:

None

Authors' contributions:

Corresponding Author:

Kyle Habet, e-mail: kyle.h94@gmail.com, Phone: +501 610 6652

Other Authors:

Diomne Habet, email: diomnehabet@gmail.com, Phone +501 601 7808

Gliselle Marin, email: gliselle@gmail.com, Phone +501 635 7909

Compliance with Ethical Standards:

Conflict of Interest:

The authors declare that they have no conflict of interest.

Acknowledgements:

None

References

1. Statistical Institute of Belize. Stat Inst Belize n.d. <http://sib.org.bz/> (accessed May 4, 2020).
2. New Measures Announced to Protect Against COVID-19 – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/new-measures-announced-to-protect-against-covid-19/> (accessed April 11, 2020).
3. Ministry of Health Announces First Case of COVID-19 – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/ministry-of-health-announces-first-case-of-covid-19/> (accessed April 11, 2020).
4. Strategic preparedness. and response plan for the novel coronavirus n.d. <https://www.who.int/publications-detail/strategic-preparedness-and-response-plan-for-the-new-coronavirus> (accessed May 4, 2020).
5. GOB. Belize Announces New Measures in Response to COVID-19 – Government of Belize Press Office 2020. <https://www.pressoffice.gov.bz/belize-announces-new-measures-in-response-to-covid-19/> (accessed April 11, 2020).
6. GOB. Closure of Daycare Centers – Government of Belize Press Office. 2020. <https://www.pressoffice.gov.bz/closure-of-daycare-centers/> (accessed April 11, 2020).
7. GOB. Public Transportation Protocol for COVID-19 – Government of Belize Press Office. 2020. <https://www.pressoffice.gov.bz/public-transportation-protocol-for-covid-19/> (accessed April 11, 2020).
8. State of Emergency Declared for Ambergris Caye – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/state-of-emergency-declared-for-ambergris-caye/> (accessed April 8, 2020).
9. Cuban Medical Professionals Help Belize Fight COVID-19 – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/cuban-medical-professionals-help-belize-fight-covid-19/> (accessed April 8, 2020).
10. The Judiciary of Belize. – Response to COVID-19 Preventative Measures – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/the-judiciary-of-belize-response-to-covid-19-preventative-measures/> (accessed April 8, 2020).

11. Ministry of Health Confirms Third Case of COVID-19 in Belize – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/ministry-of-health-confirms-third-case-of-covid-19-in-belize/> (accessed April 8, 2020).
12. Prime Minister Rt
Prime Minister Rt. Hon. Dean Barrow Announces Countrywide State of Emergency – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/prime-minister-rt-hon-dean-barrow-announces-countrywide-state-of-emergency/> (accessed April 22, 2020).
13. How To Self Isolate – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/how-to-self-isolate/> (accessed May 7, 2020).
14. GOB. All Borders Closed to the Entry of Belizean Nationals – Government of Belize Press Office. 2020. <https://www.pressoffice.gov.bz/all-borders-closed-to-the-entry-of-belizean-nationals/> (accessed May 7, 2020).
15. Belize Constitution. Belize Constitution. Statutory Instrument No 47 of 2020, (Emergency Powers) (Amendment) Regulations, 2020. 2020.
16. Prime Minister Announces Lockdown of Cayo District and Additional Nationwide Measures – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/prime-minister-announces-lockdown-of-cayo-district-and-additional-nationwide-measures/> (accessed May 7, 2020).
17. Belize Constitution. Belize Constitution. Statutory Instrument No 52 of 2020, (Emergency Powers) (Amendment) (No. 3) Regulations, 2020. 2020.
18. Belize Constitution. Belize Constitution. Statutory Instrument No 54 of 2020, (Emergency Powers) (Amendment) (No. 4) Regulations, 2020. 2020.
19. Belize Constitution. Belize Constitution. Statutory Instrument No 55 of 2020, (Emergency Powers) (Amendment) Regulations, 2020. 2020.
20. Prime Minister Rt. Hon. Dean Barrow Updates the Nation on the Existing State of Emergency – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/prime-minister-rt-hon-dean-barrow-updates-the-nation-on-the-existing-state-of-emergency/> (accessed May 7, 2020).
21. Belize Constitution. Statutory Instrument No 66 of 2020, (Emergency Powers) (Amendment) Regulations, 2020. n.d.
22. Belize Constitution. Belize Constitution. Statutory Instrument No 67 of 2020, (Emergency Powers) (Amendment) (No.2) Regulations. 2020. n.d.
23. Guan W, Ni Z, Hu Y, Liang W, Ou C, He J, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med*. 2020. <https://doi.org/10.1056/NEJMoa2002032>.
24. Belize Constitution. Belize Constitution. Statutory Instrument No 65 of 2020, (Emergency Powers) Regulations. 2020. n.d.
25. Yu P, Zhu J, Zhang Z, Han Y, Huang L. A familial cluster of infection associated with the 2019 novel coronavirus indicating potential person-to-person transmission during the incubation period. *J Infect Dis*. 2020. <https://doi.org/10.1093/infdis/jiaa077>.

26. COVID-19 eServices Citizens Portal for Unemployment Relief Program – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/covid-19-eservices-citizens-portal-for-unemployment-relief-program/> (accessed May 6, 2020).
27. Hotline & Focal Point For Covid-19. (Ministry Of Health) – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/hotline-focal-point-for-covid-19-ministry-of-health/> (accessed May 7, 2020).
28. UNICEF Scales Up Support to Belize Ministry of Education’s School Feeding Program during COVID-19 Pandemic – Government of Belize Press Office n.d. <https://www.pressoffice.gov.bz/unicef-scales-up-support-to-belize-ministry-of-educations-school-feeding-program-during-covid-19-pandemic/> (accessed May 6, 2020).
29. Population density (people per sq. km of land area) - Belize | Data n.d. <https://data.worldbank.org/indicator/EN.POP.DNST?locations=BZ> (accessed May 4, 2020).

Figures

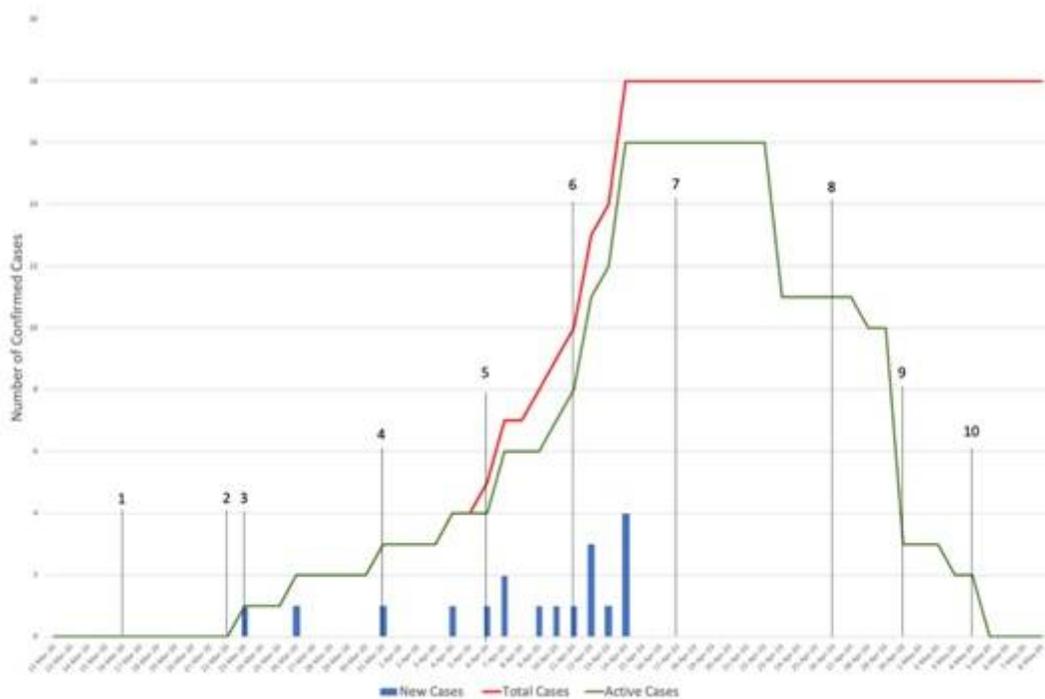


Figure 1

Number of confirmed cases (red line), new cases (blue vertical bars) and active cases (green line) of Coronavirus Disease 2019 in Belize from May 12 to May 8th with measures taken (numbers) by the Government over time. 1. Announcement to close schools, daycares and universities [6] 2. Announcement to close the international airport[3] 3. Quarantine of Ambergris Caye[9] 4. Declaration of national state of emergency and curfew[13] 5. Belizean nationals prohibited entry to Belize, quarantining of Cayo district[15,17] 6. Movement across district lines prohibited [19] 7. Total Sunday Lockdown [20] 8. Total Sunday Lockdown lifted [21] 9. Gradual reopening, mandatory mask-wearing[24] 10. Most businesses allowed to open, schools and borders remain closed[23,24]

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [StatsBELIZE.xlsx](#)