

COVID-19 in Costa Rica: Achieved Goals and Imminent Risks

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ABSTRACT

Coronavirus diseases 2019 (COVID-19) emerged in China in December 2019 and it rapidly widespread around the world. As of May, 2020, there had been 3.618.325 confirmed cases of COVID-19, 253.381 deaths and 1.184.145 recovered persons reported globally. In this review we present the evolution of the infection in Costa Rica and analyze preventive measurements taken to contain a potential explosive dissemination of COVID-19 infection. In Costa Rica, the accumulated incidence per 100.000 habitants of COVID-19 was 14.5 and the death rate 0.81 per 100.000 habitants. By May 3, the number of recovered patients were identical to those with active disease. So far, the health care system has not collapsed as most of the COVID-19 patients have being managed at home. However, the battle is not over yet. Due to the fact that re-opening of the country gradually will take and the number of new cases of undocumented immigrants, children and youngsters is steadily increased, unfavorable consequences in the following weeks might be anticipated. The Costa Rican health authorities are vigilant and diligently managing the COVID-19 pandemic.

Keywords

COVID-19, SARS-CoV-2, Pandemic management, Diabetes.

Introduction

On December 31, 2019, the province of Wuhan, China reported pneumonia cases of uncertain cause that were subsequently characterized as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1,2]. COVID-19 affects all age groups and severely affect elderly persons with risk factors including hypertension, diabetes and respiratory disease in Europe and in the United States [3-4]. Although the clinical presentation was like an upper respiratory diseases, many persons developed dyspnea and systemic manifestations within 2 to 14 days after exposure [5-6].

Due to the widespread of COVID-19, the World Health Organization (WHO) declared COVID-19 a pandemic the 11 of March 2020 [7]. As of May, 2020, there had been 3.618.325

confirmed cases of COVID-19 reported globally, 253.381 deaths and 1.184.145 recovered persons [8].

The first case of COVID-19 in Central America was diagnosed on March 06 2020 in Costa Rica in a North American female who came from the United States [9].

Upon recognition of the first case the Costa Rica health authorities took specific and gradual steps aiming to prevent the dissemination of COVID-19 infection [10-11].

In this report, we describe and interpret the pertinent actions conveyed by the National Health System (NHS) during the first two months of the pandemic and highlight the actions taken to prevent potential imminent risks that could present a menace to the Costa Rican population.

Health Care System

In Costa Rica the NHS comprises a number of institutions including the Ministry of Health, the Costa Rican Social Security System (CCSS for its acronym in Spanish), the University of Costa Rica, the National Institute of Aqueducts and Sewers, and the National Insurance Institute. The Ministry of Health has stewardship roles with experts in public health all over the country. CCSS provides country- based health medical coverage at first level of medical care of the country's 82 cantons and seven health regions with 1,113 Basic Teams for Comprehensive Health Care (EBAIS, for its acronym in Spanish) [10]. Also, CCSS deliver second level of medical care through 117 Health Areas Headquarters located in main town and manages third level of attention through 29 general and specialized hospitals [10].

Health Care Actions

On March 8, the Ministry of Health and the CCSS took a multifaceted approach involving gradual and stringent measurements as the number of COVID-19 cases appeared. Among them, social distancing, hand sanitation, avoidance of massive events, closure of educative centers, gymnasiums, theaters, churches, beaches, bars and casinos. A week after a state of emergency was declared and traffic restriction from 7 pm to 5 am was executed. Further, restrictions to recreation places during the Eastern week were accomplished. By March 24, frontiers were closed and the borders were strictly supervised by security guards [11].

The used of mask was not encouraged for the general population but personal protective equipment was appropriately used in the hospital setting according to the regulation of the Ministry of Health [11]. By March 31, a medical rehabilitation facility with approximately 88 rooms was conditioned and equipped to receive ill-COVID-19 patients. Furthermore, the CCSS fortified intensive care units in the hospitals and established guidelines for the clinical management of COVID-19 patients and preventive actions for health providers [10]. According to guidelines, upon detection of a positive COVID-19 (typical symptoms of COVID-19 infection and a positive RT PCR test [11-12]), the health care providers trigger a close search of the patient's precedence and clusters cases were identified and has a close follow-up. Clusters were tested for SARS-CoV-2 only if the develop respiratory symptoms. All initiate a quarantine at home for 14 days and were contacted by telephone by residents of family medicine. In case any contact developed related COVID-19 symptoms within the quarantine, they were attended in a health care center, who evaluate and decide when the COVID-19 patient requires hospitalization [11].

In addition, telemedicine system was implemented for ambulatory care and medicines for patients with chronic conditions were delivered to the patient's home. Public and private clinics and hospitals received at the emergency department only urgent cases. By May 4, an immunization plan with Flu vaccine was initiated [13]. Concomitantly, flexibilization of the restriction measurements was implemented when the evolution of the pandemic showed a decline in active cases and a rise in the recovered cases (Figure 1).

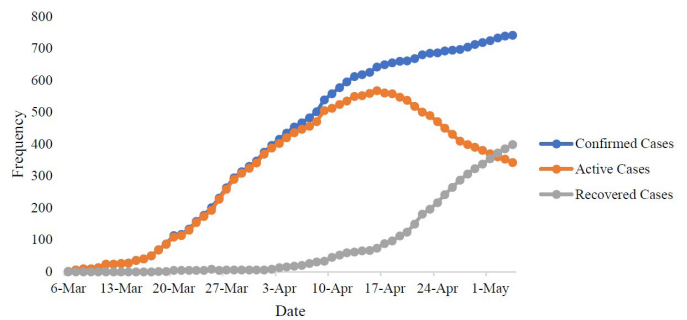


Figure 1: Number of COVID -19 cases in Costa Rica 2020. Confirmed accumulated (●), active (●) and recovered (●) cases. Approximately two months after the first case, the number of recovered patients exceeds the active cases.

Evolution of the COVID-19 pandemic [14]

As of May 4, there were a total of 742 cases (390 males corresponding 52.6% and 352 females 47.4%), 399 cases were recovered. The accumulated incidence per 100.000 habitants of COVID-19 infection was 14.5 and the number of tests performed were 13.988.

According to age, 5.4 % were < 18 years-old; 89.5 %, between 18 - 65 years-old and 5.1 % > 65 years old. Mean age was 37.5 years old ranging from 1 to 87 years old. There were confirmed cases around the country. However, the majority of them reside the San José and Alajuela. Notable, 9.4 % of the infected patients with COVID-19 required hospital admission and the cumulative number of patients admitted at the intensive care unit by May 4 were 22. Eighty-nine percentage the COVID-19 patients were people from Costa Rica. Six males died (aged 84, 69, 54, 45 and two aged 87 years-old). Death rate due to COVID -19 infection was 0.81 per 100.000 habitants being the last decease in April.

The evolution of the pandemic is illustrated in figure 1. It is evident that the confirmed cases follow a logarithm trend, which was apparent 10 days after the detection of the first case and continued raising. Of note, the active cases plateau on April 13 and then gradually decline by May 4.

The number of new cases of COVID-19 per day during the pandemic is shown in figure 2. The peak of new cases was in March 27 and 28 with 32 cases and the highest in April 9, with 37 new cases. During the last 12 days less than 10 cases per day were reported.

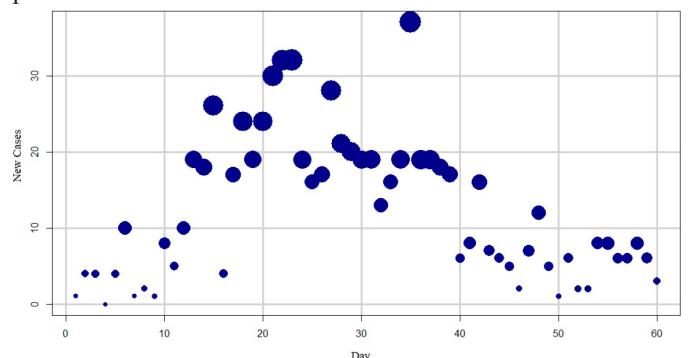


Figure 2: New cases of COVID -19 infection per day in Costa Rica 2020. On March 27 and 28 there were 32 new cases and 37 new cases on April 9. Subsequently, a steady decline in new cases occurred. During the last twelve days less than 10 cases per day have been reported.

Figure 3 depicted the COVID-19 cases in minors (< 18 years old) in people older than 65 years old and in immigrants. In the immigrants, the increment of cases was arithmetic, gradual and occurred in waves with an approximate grow-up each four days. COVID-19 cases decreased in elderly people, while in children, youngsters and undocumented immigrants increased. Fortunately, according to the Ministry of Health the SARS CoV-2 has no communitarian spread [14].

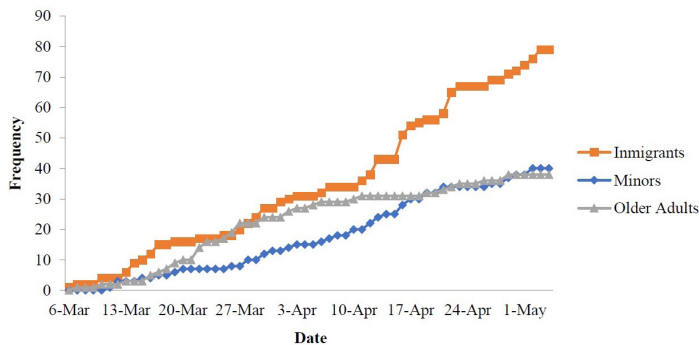


Figure 3: Cases of COVID-19 in immigrants (■), in older than 65 years old (▲) and in minors (●) (< 18 years old).

Impact of the COVID-19 pandemic

The burden of the COVID-19 pandemic on the social, economic and industry sectors is unmeasurable. For instance, the reduction in workdays, layoffs, falling of agricultural exports [15], decline of local and business market, the reduction of tourism, food services and accommodation facilities across the country are happening [16]. This will also have a potential impact on people's health. Other components of this crisis limited education at all levels and in terms of environmental issues, the disposition of solid waste management due to increased usage of personal protective equipment need to be pondered [17].

It is clear that all the preventive actions taken in Costa Rica promoting staying at home for the majority of the Costa Rican people resulted in positive out-comes in the short term, made the crisis manageable and have prevented a collapse of the health system [13]. On the other hand, the impact on mental health such as anxiety, depression, sedentarism, domestic violence had surfaced [18].

Chronic diseases such as hypertension and diabetes are risk factors of severe complications with COVID-19 [19,21]. In Costa Rica the NHS implemented telemedicine programs allowing physicians to contact patients. However, a marked reduction in the contacts with the health providers was noticed. Worth mentioning, diabetics have not performed routine laboratory tests during the pandemic. In this context, the reduced or lack of contacts with the health providers and absence of laboratory tests might impact glycemic control in the following months [11]. People with diabetes are

more susceptible to a variety of infections. Hyperglycemia and dysfunction of the immune system are some of the related factors associated the propensity of diabetics to acquire infections [21]. Even more, COVID -19 diabetics with pneumonia represent up to 22 percent of admission into the intensive care unit [1-3]. Therefore, ideally, in people with diabetes improvements in glycemic control would be mandatory [22].

Imminent risks

At this point it is important to consider that as the trends of positive cases in minors increases and if schools will re-opened, the potential spreadable risk of COVID-19 may be enhanced. Moreover, as compared to Costa Rica, the pandemic prevailing in the neighbor countries has had a different evolution [7] and re-opened of the frontiers would represent a significant risk as asymptomatic COVID-19 persons from those countries, upon arrival to Costa Rica, may be undetected. Likewise, the risk which represents the undocumented immigration trigger by the adverse developments of the pandemic in the nearby countries deserves close attention by migration authorities.

Conclusion

Costa Rica is a small democratic Central American country of approximately five millions inhabitants. A robust health care system established since more than 50 years-ago and strengthened in 1980s execute preventive medicine to specialized and complex medical care. In the past, this country successfully faced the cholera epidemic and more recently the SARS, H1N1. Currently, COVID -19 pandemic constitutes a challenge the Costa Rica NHS.

Unquestionable, many factors have been associated to curtail the COVID-19 pandemic in Costa Rica. From the epidemiologic point of view all the actions taken so far were based on data analysis of the progression of the pandemic and with a very solid commitment of capable health authorities and especially of the CCSS health care team.

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