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COVID-19 situation in Honduras: lessons learned

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SUMMARY

Introduction: *Several emerging and re-emerging diseases in the last decade have shown the global weakness to detect and act in a timely manner in situations that threaten the health of the planet. Latin America has been vulnerable to outbreaks as a result of increased poverty, social inequity and the poor response capacity of the public health system.* **Objective:** *Describe the situation of COVID-19 in Honduras and the challenges it presents.* **Methodology:** *Analysis of the epidemiology and control strategies applied in the country to contain the spread of SARS-CoV-2, in the context of the social and economic reality until September 18, 2020.* **Results:** *Honduras ranks fifth in Central America in the number of tests performed; the cumulative incidence rate of cases is 7 105 per million inhabitants. The country has an accelerated growth in the percentage of positivity with intense community transmission. Some 63.4 % of cases are concentrated in the group 20-49 years old (43 624 cases); 15.2 % in adults 60+ (10 440 cases) and 7.5 % in children under 20 (5 133 cases). With a disjointed health system and a chronic and recurrent shortage of physical and human resources, the National Risk Management System (SINAGER), which includes the Ministry of Health (SESAL), implemented various strategies to reduce the spread of the virus. Some control measures were border closures, physical distancing and the use of masks were made mandatory by legislative decree. The serious impact on the weak national economy forced an intelligent opening coinciding with the rise of cases.* **Conclusions:** *Current data show that the age group most affected is adults between 20 and 49 years old. The country's socioeconomic situation has been aggravated by the pandemic; the continuous rise in the number of cases, hospitalizations and deaths has collapsed the public health system leaving the majority of Hondurans in continuous vulnerability. Primary care clinics and mobile medical brigades have been implemented as a new way to contain the spread and impact of transmission. Several European countries and cities in the Americas have had to reverse the process of economic reopening when faced with successive waves of outbreaks. Honduras has demonstrated limited capacity to deal with catastrophic*

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situations. The national epidemiological surveillance system and access to timely and quality diagnostic tests remain weak and fragmented. There is an urgent need to improve the health and surveillance system to guide strategic evidence-based decision making and to prevent future pandemics.

Key words: *SARS-CoV-2 Infection, COVID-19 pandemic, 2019 novel coronavirus infection, Honduras.*

RESUMEN

Introducción: *Diversas enfermedades emergentes y reemergentes en la última década han evidenciado la debilidad global para detectar y actuar de forma oportuna ante situaciones que amenazan la salud del planeta. América Latina ha sido vulnerable a brotes como consecuencia del incremento de la pobreza, la inequidad social y la pobre capacidad de respuesta del sistema de salud público.* **Objetivo:** *Describir la situación de COVID-19 en Honduras y los desafíos que presenta.* **Metodología:** *Análisis de la epidemiología y estrategias de control aplicadas en el país para contener la propagación de SARS-CoV-2, en el contexto de la realidad social y económica hasta el 18 de septiembre del 2020.* **Resultados:** *Honduras ocupa el quinto lugar en Centroamérica en número de pruebas realizadas, la tasa de incidencia acumulada de casos es 7 105 por millón de habitantes. El país tiene un crecimiento acelerado del porcentaje de positividad con una intensa transmisión comunitaria. Un 63,4 % de los casos se concentran en el grupo 20 a 49 años (43 624 casos); 15,2 % en adultos 60+ (10 440 casos) y 7,5 % en menores de 20 años (5 133 casos). Con un sistema de salud desarticulado y una escasez crónica y recurrente de recursos físicos y humanos, el Sistema Nacional de Gestión de Riesgo (SINAGER), que incluye a la Secretaria de Salud (SESAL), implementó diversas estrategias para disminuir la propagación del virus. Algunas medidas de control fueron el cierre de fronteras, distanciamiento físico y el uso de mascarilla fueron de carácter obligatorio mediante decreto legislativo. El grave impacto en la débil economía nacional obligó a una apertura inteligente coincidiendo con el ascenso de casos.* **Conclusiones:** *Los datos actuales muestran que el grupo de edad más afectado son los adultos de 20 a 49 años. La situación socioeconómica del país se ha agravado por la pandemia; el continuo ascenso en el número de casos, hospitalizaciones y muertes ha colapsado el sistema sanitario público dejando en continua vulnerabilidad a la mayoría de los hondureños. Como una nueva forma de contener la dispersión y el impacto de la transmisión se han implementado clínicas de atención primaria y brigadas médicas móviles. Varios países europeos y ciudades del continente americano han tenido que revertir el proceso de reapertura económica al enfrentar olas sucesivas de brotes. Honduras ha demostrado una limitada capacidad para enfrentar situaciones catastróficas. El sistema nacional de vigilancia epidemiológica y el acceso a pruebas diagnósticas oportunas y con calidad continúan siendo débiles y fragmentados. Se plantea la necesidad urgente de mejorar el sistema de salud y de vigilancia para orientar la toma de decisiones basada en evidencia estratégica y para prevenir futuras pandemias.*

Palabras clave: *Infección por SARS-CoV-2, COVID-19 pandemia, enfermedad por coronavirus 2019, Honduras.*

INTRODUCTION

In the last 10 years, the world has faced several events that have shown the global weakness to detect and act on time in situations that threaten the health of the planet. Among them are various health emergencies: in 2001 the attack by Al-Qaeda, also known as Amerithrax (1) and the emergence of Acute Respiratory Distress Syndrome (SARS) (2); the outbreak of Middle East Respiratory Syndrome (MERS) (3) in 2012; and the outbreak of Ebola (4) in 2014 in West Africa that counted more than 10 000 deaths. Recently, two African viruses were introduced to the American continent, Chikungunya in 2013 (5) and Zika (6) in 2015.

In October 2019, The Center for Health Security at John Hopkins University published the results of its annual report on the Global Health Security Index (GHS) (7). This report analyzed 195 countries and its primary purpose is to assess the global and national capacity to deal with global risks and disasters. The GHS consists of 140 questions organized into six categories: prevention, detection and reporting, rapid response, health system, compliance with international standards, and environmental risk. Out of a total score of 100, the average for participating nations was 40.2. The average for developed countries was 51.9, and for Honduras, it was 27.6. The results are conclusive with respect to the low global capacity to confront situations of global threat. In the case of Honduras, the result obtained is similar to that of several of the most neglected African countries.

COVID-19 is the name given to the condition

caused by the new SARS-CoV-2 virus (8). As a completely new virus, unless an effective vaccine is discovered to protect against infection, the entire world population is at risk of being infected with this highly contagious new airborne pathogen. The pandemic has evolved in epidemic waves that began in southern China, rapidly spread to neighboring Asian countries, to Southeast Asia, then advanced to the Arabian Peninsula, to spread to the European continent, and as early as the second quarter of 2020 began its rapid expansion in the Americas and Africa (9).

COVID-19 was officially declared a pandemic by the World Health Organization (WHO) on March 11, 2020 (10). From a few cases reported in the first weeks of January to WHO from southern China, a total of 30.3 million cases and about 950 493 deaths in 215 territories/countries around the world are reported as of September 18, 2020 (11). On February 25, 2020, the Ministry of Health of Brazil confirmed the first case in Latin America, and since May, this country has become the epicenter of the pandemic in the region (11). The situation in the Americas is equally worrying, with 15.6 million cases reported (51 % of global cases), making it also the new global epicenter of pandemic transmission. Several American countries report figures that exceed one million cases, such as the United States with 6.9 million, Brazil with 4.4 million, Argentina, Mexico, Colombia, and Peru, which individually report more than 600 000 cases (12).

The speed of spread and the impact of the pandemic on morbidity and mortality in each affected country are related to:

- Social exclusion of large sectors of the population from basic health services due either to their irregular migration status or to poverty conditions (13-15) leading to late diagnosis and management of complicated cases of COVID-19.
- Fragility and disarticulation of health systems and epidemiological surveillance subsystems, with poor access to diagnostic tests and timely strategic information for decision making (16,17).
- Our living conditions that favor overcrowding, low schooling, and poor access to prevention services.
- Demografic transition in the region with significant changes in the age structure of the population (16).
- Patterns of undiagnosed and/or poorly controlled comorbidity in the population, with highly prevalent chronic diseases, such as Diabetes mellitus, Arterial Hypertension, Obesity, among the main ones (17,18).

Latin American and African countries show multiple deficiencies in their health care systems and infrastructure, especially a deficit of critical and intensive care beds and mechanical ventilators and high flow equipment required to support patients with a severe respiratory infection so that the risk of an overwhelming increase in deaths is always latent (7).

The crisis in the health sector is multi-causal. Latin America consumes about 4 % of the gross domestic product (GDP) in health, far below the health expenditure in middle- and high-income countries in other latitudes of the world. The relatively low social investment contributes to deficits in health infrastructure, low health workforce, and insufficient and inadequate inputs to address emergencies where response time is vital as it has been in the current pandemic. In Honduras, a tertiary level health services approach predominates, oriented to the management of pathology and its complications, with little emphasis on primary health care (PHC) models. Additionally, scarce highly trained health human resources and diagnostic and clinical management technology are concentrated in the major cities of Honduras. This urban concentration of resources favors the constant flow of cases with complicated pathology from the most neglected areas, which represent almost 75 percent of the national territory, to hospitals (19).

The International Health Regulations (IHR-2003) is a binding document signed by Honduras, which obliges it to create the appropriate sanitary conditions to contain an event that puts national and international health at risk, at all border points (air, land, and sea). The strengthening of health services at these points has been limited. In addition, the national surveillance system and the information system of the Secretary of Health (SESAL) is fragmented, with little capacity to

detect and monitor these events in real-time.

Honduras registered its first case in the first week of March 2020 and as of September 18, 2020 reports 70,611 cases (20,21). The country ranks fifth in Central America in the number of tests performed; fifth and forty-seventh in the number of cases reported in the isthmus and worldwide, respectively (Table 1).

Despite low access to testing, Honduras' cumulative case incidence rate is 7,397.8 cases per million populations, the third-highest in the region and one of the highest in the continent (Table 2).

Table 1

Central America: Indicators of the evolution of the pandemic by COVID-19 (as of September 18, 2020)

Country	Total cases	Total deaths	Tot cases/ 1M hab.	Deaths/ 1M hab.	Total tests	Total 1M hab.	Population
Panama	104 879	2 229	24 226	515	423 054	97 720	4 329 267
El Salvador	27 346	804	4 211	124	359 765	55 405	6 493 351
Guatemala	84 344	3 076	4 689	171	286 730	15 942	17 985 890
Costa Rica	63 374	686	12 220	134	196 377	38 474	5 104 190
Honduras	70 611	2 146	7 105	216	167 103	16 814	9 938 225
Belize	1 590	20	3 983	50	12 429	31 138	399 161
Nicaragua	4 961	147	747	22	-	-	6 641 520

Source: Worldmeter´s COVID-19 Data.

Table 2

Honduras: Cumulative incidence rate per COVID-19 in departments (up to epidemiological week 37, 2020), in descending order

Department	Reported Cases	Cumulative rate/ million hab.
Atlántida	4 910	13 222,70
Islas De La Bahía	953	12 717,20
Cortés	21 595	12 095,50
Francisco Morazán	18 512	11 052,00
Valle	1 709	9 009,40
Colón	2 604	7 539,90
Yoro	4 524	7 176,20
Gracias a Dios	746	7 155,10
La Paz	1 206	5 370,70
El Paraíso	2 329	4 700,10
Choluteca	2 206	4 641,40
Santa Bárbara	1 789	3 809,80
Ocotepeque	571	3 450,50
Comayagua	1 662	2 957,10
Intibucá	775	2 924,50
Olancho	1 450	2 504,70
Copán	901	2 182,00
Lempira	387	1 063,60
Total	68 832	7 397,80

Source: Cases reported by SINAGER until September 16, 2020. Calculations based on the number of positive PCR-TR tests reported by SINAGER, and performed by the Health Surveillance Laboratory, Ministry of Health of Honduras. Data analyzed through Epidemiological Week 37. Comunicado Número 13, Plataforma "Todos Contra el COVID-19". The population data used comes from projection figures from the National Institute of Statistics.

With figures close to 60 %, the country shows accelerated growth in the percentage of positivity to RCP-TR tests conducted by the Health Surveillance Laboratory, Ministry of Health of Honduras, especially since the date that SINAGER authorized the premature opening of the economy on June 8 (Figure 1).

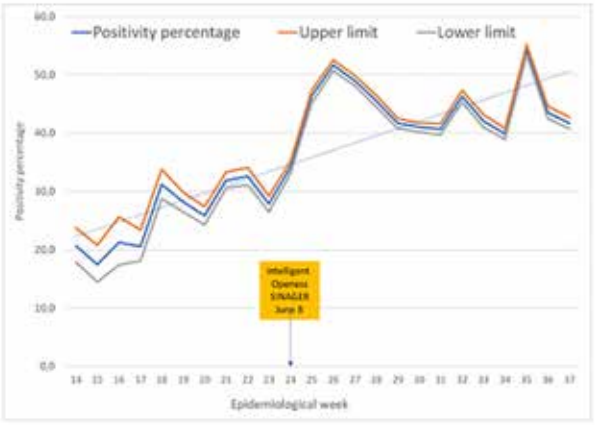

Figure 1. Honduras: Percentage of RCP-TR positivity by epidemiological week, 2020.
Source: Plataforma "Todos contra el COVID-19".

All Honduran population centers with more than 50 000 inhabitants have community transmission, and there are already sixteen departments (of the country's 18) that have a rate per million inhabitants greater than 1,000, with the three most affected: Francisco Morazán, Cortés and Valle (Table 2).

Of the total number of tests performed with positive results, a total of 35,731 (51.9 %) correspond to men and 33 096 (48.1 %) to women. Confirmed cases are concentrated in the group 20-49 years old, with 43,624 cases (63.4 %) (Table 3). In the older age group (60+) there are 10 440 cases (15.2 %) and in the younger age group, there are a total of 5,133 cases (7.5 %).

In accordance with Executive Decree Number PCM-005-2020 published in the Official Gazette "La Gaceta", dated February 10, 2020, Honduras declared a State of Sanitary Emergency throughout the national territory. In the third week of March, the National Risk Management System (SINAGER) was activated, and with the support of the Ministry of Health (SESAL), various provisions were issued to reduce the spread of SARS-CoV-2, such as the implementation of a respiratory code when coughing and/or sneezing, management and isolation of confirmed and suspected cases, physical distancing, use of a mandatory mask, frequent hand washing and the prohibition of events that lead to crowding of people, among the main ones (22).

Table 3

Honduras: Distribution of confirmed cases by RT-PCR test, stratified by age group and sex

Age Group	Sex				
	No data	Female	Male	Total	%
< 1		84	87	171	0.2
1-4	1	215	211	427	0.6
5-9		338	343	681	1.0
10-14		631	559	1 190	1.7
15-19	2	1 426	1 236	2 664	3.9
20-29	1	7 341	8 290	15 632	22.7
30-39		7 914	8 242	16 156	23.5
40-49	1	7 737	6 098	11 836	17.2
50-59		4 332	4 554	8 886	12.9
60-69		2 748	3 263	6 011	8.7
70-79		1 386	1 660	3 046	4.4
80-89		522	644	1 166	1.7
90+		93	124	217	0.3
No data		329	420	749	1.1
Total	5	33 096	35 731	68 832	100.0

Source: Cases reported by SINAGER up to September 16, 2020.

Despite the limited capacity of its hospital infrastructure, with 70 611 confirmed cases and 2 146 deaths, the country reports 3 % mortality and a cumulative mortality rate of 216 per million inhabitants (Table 1). This low mortality rate is perhaps related to the fact that groups of doctors in San Pedro Sula and Tegucigalpa alerted society and the profession to the importance of early management of the inflammatory and thrombotic phenomenon in cases of COVID-19. However, the hospital capacity is already reaching its limit in all the cities of the country and it is possible that, when exceeding this capacity, a catastrophic

growth in the number of deaths will occur.

After 120 days of lookdown and economic shutdown, Honduras has had to resort, for the first time in its history, to international loans to pay public wages. State revenues have declined dramatically, the tourism industry is paralyzed as are most exports, there is an estimated 30 percent reduction in remittances from the United States and Europe, the unemployment figure is unquantifiable, and the outlook is bleak for the next 2.5 years.

The following is a presentation of the various measures implemented in the country to contain the spread of SARS-CoV-2 and a critical analysis of each in the context of their effectiveness and the social and economic reality that Honduras is experiencing.

Border Closure and Intensified Epidemiological Surveillance at Border Points

After confirming the first imported case and the spread of several contacts at the national level, Honduras took the step of closing national borders and suspending national and international flights. Similarly, individuals confirmed as cases, suspects, or from countries with transmission were followed up for early identification of new cases.

Honduras is the center of the Southern Hemisphere migration corridor to the United States and Canada. Most migration occurs in "blind" spots, so many of the early cases went unnoticed in communities and were not properly monitored. Additionally, surveillance was concentrated in Tegucigalpa, and the epidemiological curve shows that the first cases and the initial planting of the virus in the population occurred on the country's North Coast, especially in the department of Cortés.

Measures to increase the physical distance between people

Several studies have demonstrated the effectiveness of various measures that increase physical distancing to decrease the spread of SARS-CoV-2 such as quarantine, staggered opening, closure of schools, universities, churches, and any activity considered non-essential (23-25).

Honduras was one of the first countries in the Central American isthmus to decree the quarantine in all its territory and this possibly achieved a delay in the growth of the number of reported cases that accelerated until June, when the "Intelligent Opening" of the economy began.

Various factors have contributed to the fact that these measures have not been fully complied with. In the country's cities, up to 70 % of work is part of the informal economy, where the population lives in a daily subsistence economy. Also, there is a big difference in the prices of food sold in supermarkets and those sold in open markets and on the streets. For this reason, street vendors have saturated various sites in the cities and open markets have become transmission sites for SARS-CoV-2.

Poverty belts in Latin America constitute almost 80 % of the urban population (26,27), where overcrowding and precarious housing conditions also favor the spread, and where compliance with minimum measures for home management of confirmed and suspected cases is impossible.

Mandatory use of masks, application of biosecurity protocols

Through Legislative Decree No. 58-2020, published in the Official Gazette "La Gaceta" on May 23, 2020, the National Congress decreed the mandatory use of masks, the observation of social distancing measures, and the mandatory application of biosafety protocols issued by SINAGER.

Since the end of March 2020, the Platform "Todos contra el COVID-19" (All Against COVID-19), recommended the use of obligatory masks (N95 certified for health and surgical personnel for the general population) and personal protective equipment for health personnel not only in the sites assigned for the care of patients suspected by COVID-19 but in all public and private hospital emergencies (28). The shortage of these supplies has been and continues to be one of the main obstacles to the adequate protection of health personnel that has caused multiple infections and deaths.

Compliance with the use of obligatory masks among non-healthcare personnel and the general population has been erratic due to various factors, including hoarding and price speculation that has resulted in little access for the population, low-risk perception and low schooling that condition the lack of use or the inadequate and intermittent use of this protection measure.

Access to public services must also be considered, since in some areas of the country access to drinking water is reduced by various factors, making it difficult to use water for frequent hand washing. Besides, the use of gel was also affected by hoarding and lack of quality control.

Even though the Intelligent Opening law decreed by SINAGER on June 8 obliges companies to provide their employees with biosafety equipment, compliance with which has not been monitored.

Formation of brigades for the detection and home management of confirmed or suspected cases of COVID-19

This strategy began to be implemented in mid-June in the main cities and municipal capitals. It is a new strategy and taking into account that the majority of the population is in denial in the face of the national emergency, it has not achieved the expected results. In addition to the deficit in logistics for health personnel.

Opening of care sites for people suspected or confirmed with COVID-19

Since the beginning of the pandemic, adequate measures were not taken to prevent the National Reference Hospitals with the greatest response capacity in specialties from being affected by the pandemic, such is the case of the Mario Catarino Rivas Hospital (HMCR) and the Honduran Institute of Social Security (IHSS) in San Pedro Sula and the Hospital Escuela and IHSS in Tegucigalpa. Progressively, the various sectors of society are collaborating to open sites that are accessible 24 hours a day, seven days a week in the affected cities and municipalities for the health care of people with symptoms compatible with COVID-19. A major constraint is the lack of qualified health human resources for the management of people with severe illness due to COVID-19. The stigma and discrimination generated by this pandemic has prevented many people from seeking early medical care

Recruitment of personnel for COVID-19 areas

As part of the opening of new care centers and the formation of community brigades, health personnel have been hired. However, Honduras, because it lacks a sustained policy for the development of human resources for health, faces a lack of specialized personnel without risk factors, who can handle various health aspects of the pandemic. The provision of personal protective equipment and supplies continues to be another constraint that has contributed to the nearly 20 % prevalence of infection and the high number of SARS-CoV-2 deaths among health workers.

Border Closure and Intensified Epidemiological Surveillance at Border Points

From March 16, when the borders were closed, until September 18, 2020, a total of 21 879 (29) Hondurans have returned to the country from Mexico and the United States. Since 2018, Central American caravans, mostly Hondurans, have made their way to the U.S.-Mexico border and now, amidst border closures and uncertainty about the pandemic, hundreds of Hondurans have been left vulnerable in areas where cases of coronavirus are on the rise.

On the other hand, the hardening of migration policies has managed to reduce migratory flows in relation to 2019, however, the migrant population returning to the country continues to need medical assistance and to be tested for asymptomatic cases.

CONCLUSIONS

Despite the many measures adopted in the country, the expected result has not been achieved, and many factors influence this. The health personnel hired to provide primary health care

have been limited to direct intervention with the population through education on biosecurity measures and in the care of patients who require hospital or outpatient management.

There is a leadership crisis in the country's health system that is leading to a high turnover of decision-makers during the pandemic, the creation of parallel structures, and the dismantling of the different actors involved in the national response.

Access to timely testing with quality control remains one of the country's main challenges. It is estimated that the arrears in swab samples that have been taken and not processed exceed seven thousand.

The "Todos Contra El COVID-19" platform has a volunteer team of experts in infectious diseases, Internal Medicine, epidemiology, public health, pharmacology, risk management, disaster management, and the use of information and communication technology. The importance of a technology platform is transcendental in the current situation of the country.

An "Intelligent Opening" of the economy is insisted on when only data from swab samples, taken in suspicious cases, contacts, and personnel at risk are available. The data reported is approximately two weeks late. A technology platform can be very helpful in monitoring in real-time the appearance of case outbreaks with compatible symptoms, identifying trends in hospitalizations and mortality.

In the near future, consideration should be given to strengthening weakened health systems in some Latin American countries to provide a better response in cases such as the COVID-19 Pandemic. Good primary care services are required as a basis for any emergency response (9) and to ensure that infection is prevented by the strategies implemented, thus achieving control of the pandemic.

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