

# PATHWAYS



Pan American  
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AMERICAS

# PAHO TO HEALTH

BULLETIN OF PAHO/WHO IN CUBA

Vol. 25 No.1 JANUARY-MARCH 2021

## CUBA: ONE YEAR INTO THE PANDEMIC

04

### OUR NEWS:

Interview  
with Cuba's  
Minister  
of Public Health,  
Dr. José Angel  
Portal Miranda

43

### NOTEWORTHY:

Benefits  
of a *Cúrcuma longa*  
project during  
the pandemic

46

### OVER A CUP OF COFFEE WITH...

Concepción  
Campa  
Huergo

50

### A STORY TO TELL:

Dr. Ricardo  
Pereda González:  
Coordinator of  
the COVID-19 Clinical  
Experts Commission

# PATHWAYS TO HEALTH



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*Pathways to Health* is a bulletin prepared by the office of the Pan American Health Organization/World Health Organization (PAHO/WHO) in Cuba. Its main aim is to share the most important aspects of the Representation's technical cooperation with the country's Ministry of Public Health (MINSAP) and other institutions.

At the one-year anniversary of the pandemic in Cuba, this issue is dedicated to systematically review key aspects of the national response over the last months. In particular, it includes an interview with the Minister of Public Health, Dr. José Ángel Portal Miranda, who reflects on the range of work and milestones achieved in confronting the novel coronavirus in the island nation.

It also carries articles related to the epidemiological situation, treatment protocol, Cuban vaccine development, work carried out under the National Maternal-Child Health Program, and contributions by the country's PAHO/WHO Collaborating Centers, among others.

As an exception, we publish this special issue in English. The bulletin is usually published in Spanish.

March, 2021

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## EDITORIAL

On March 11, 2020, the Director-General of the World Health Organization (WHO) declared the novel coronavirus a pandemic, which at the time already affected 114 nations. Coincidentally, that same day, the Pedro Kourí Tropical Medicine Institute (IPK) in Havana confirmed the first COVID-19 cases in Cuba.

One year into the pandemic, more than 115 million cases and close to 2.6 million deaths have been reported from the disease worldwide. About half of both these cases and deaths have been registered in the Americas, with results differing according to how well the response has been organized, how robust the healthcare delivery systems and how great the magnitude of social inequalities.

During this first year, we have witnessed the exponential rise in disease transmission rates, as first and second waves, forcing massive confinement of children, young people and adults, in turn affecting mental health. Just as it appeared that case numbers were declining and countries had begun to progressively resume economic activities, new variants appear that have provoked epidemic waves greater than the first, more highly contagious, with shorter incubation times and new deaths to mourn.

In this grave context created by the pandemic, we underscore the historically unprecedented efforts by hundreds of research centers the world over, dedicated to the search for COVID-19 vaccines. There are already 250 vaccine candidates, 67 of which are in clinical stages, and a dozen have presented final phase-3 clinical trial results. With emergency use authorization by national regulatory agencies, many countries have begun the complex task of immunizing their populations, not without problems related to limited vaccine availability, given the concentration of supplies in the high-income countries.

In April, 2020, precisely in order to assure equitable vaccine distribution worldwide, the COVAX mechanism was launched, led by the Global Alliance for Vaccines and Immunizations (GAVI), WHO/PAHO and the Coalition for Epidemic Preparedness Innovations (CEPI). This mechanism allows 20% of each country's population access to vaccines, including health workers and older adults.

Some countries that have signed COVAX agreements will receive the vaccines as donations, while others will purchase them,

according to price accords previously reached with pharmaceutical laboratories. One condition is that the vaccines must be prequalified by WHO, which happens only after detailed review by the organization's experts once the vaccines have completed phased clinical trials and published their results.

COVAX vaccine distribution began in February and will continue progressively throughout this year, thus contributing to the protection of health personnel, especially those on the front lines: doctors, nurses, biologists, aides and all those working in health care delivery in hospitals and communities.

Nonetheless, control of transmission and thus of the pandemic will only be achieved when at least 70% of the population is vaccinated, thus reaching herd immunity and enabling protection of the most vulnerable people while reducing the threat to global public health from new strains or variants.

Cuba reaches the one-year anniversary of the pandemic informed by accumulated knowledge that has allowed it to maintain epidemiological surveillance as well as active case finding and contact tracing at the community level, with follow-up in health services organized throughout the country. Laboratory molecular diagnosis has been maintained and considerably expanded for precise case management and transmission chain containment.

Noteworthy in Cuba is also the experience accumulated in patient management, with the treatment protocol applied in all health services now in its sixth edition. Various specialists review and assess evolution of cases; adjust medication doses; and define new prevention, treatment and recovery strategies. The premises rely on timely diagnosis, clinical observation, and early application of medications according to risk levels and disease stage (whether viremic, pulmonary or inflammatory). Each phase requires certain medications—most domestically produced—that, on the basis of ongoing clinical trials, continue to improve case management as demonstrated by the low overall case fatality rate.

Of course the most important achievement for Cuba is the fact that it has four vaccine candidates in development, as a result of the experience and knowledge amassed over decades by its scientific institutions dedicated to vaccine research and production. The Finlay Vaccine Institute (IFV) has proposed Soberana 01, Soberana 02 and even Soberana Plus, the latter for convalescing patients. The Genetic Engineering and Biotechnology Center (CIGB) has advanced its Mambisa and Abdala vaccine candidates, heading for phase 3 clinical trials. Once results are presented and the vaccine candidates are approved for population use by the Center for State Control of Medicines and Medical Devices (CECMED), this will enable millions of Cubans to be vaccinated, reaching the collective immunity desired.

Nevertheless, in the remaining months ahead, as Cuba has experienced an increase in COVID-19 transmission since the reopening of international flights last November, it is important to maintain the preventive measures introduced very early by the Ministry of Public Health (MINSAP): mask use, social distancing, crowd avoidance, proper ventilation and frequent handwashing.

*Dr. José Moya Medina  
Permanent PAHO/WHO Representative in Cuba  
March, 2021*

## OUR NEWS

**04** ADVANCES AND MILESTONES IN CUBA'S RESPONSE TO COVID-19: INTERVIEW WITH CUBA'S MINISTER OF PUBLIC HEALTH, DR. JOSÉ ÁNGEL PORTAL MIRANDA

**12** COVID-19 SITUATION IN CUBA: ONE YEAR INTO THE PANDEMIC

**19** CUBA'S NATIONAL COVID-19 TREATMENT PROTOCOL: AN UPDATE

**24** PROGRESS IN CLINICAL STUDIES FOR THE FOUR CUBAN COVID-19 VACCINE CANDIDATES

**30** CONFRONTING COVID-19 IN CUBA: A VIEW FROM THE NATIONAL MATERNAL-CHILD PROGRAM

**32** CUBA'S INTERNATIONAL COOPERATION: EXPANDING SOLIDARITY TO CONFRONT COVID-19

**37** PAHO/WHO COLLABORATING CENTERS' CONTRIBUTIONS TO CUBA'S COVID-19 RESPONSE

**40** PAHO/WHO COVID-19 RESPONSE: CRISIS COMMUNICATION

## NOTEWORTHY

**43** BENEFITS OF A *CÚRCUMA LONGA* PROJECT DURING THE PANDEMIC

## OVER A CUP OF COFFEE WITH...

**46** CONCEPCIÓN CAMPA HUERGO

## A STORY TO TELL

**50** DR. RICARDO PEREDA GONZÁLEZ: COORDINATOR OF THE COVID-19 CLINICAL EXPERTS COMMISSION



# ADVANCES AND MILESTONES IN CUBA'S RESPONSE TO COVID-19: INTERVIEW WITH CUBA'S MINISTER OF PUBLIC HEALTH, DR. JOSÉ ÁNGEL PORTAL MIRANDA

One year after the first cases of COVID-19 were diagnosed in Cuba, the country and its health system have accumulated an array of experiences and results emerging from the pandemic response implemented by the Ministry of Public Health (MINSAP), accompanied by other sectors of government and society.

From young students and health professionals to accomplished specialists with long track records in various disciplines—all have come together to face down the pandemic, dedicating long hours of work and multiplying their efforts in research and innovation.

Cuba's Minister of Public Health, Dr. José Ángel Portal Miranda, reflects on the work

carried out during these last 12 months, comments on milestones, lessons learned, good practices and future perspectives. Undoubtedly, his words provide shape and form to the battle waged by the island nation against COVID-19.

### WHAT ARE THE MOST IMPORTANT MILESTONES IN THE PANDEMIC'S EVOLUTION IN CUBA OVER THESE LAST MONTHS?

If I had to characterize the context in which we have addressed the COVID-19 pandemic in our country, I would have to say that it is a complex one, but also enriching. Two fundamental premises have guided our approach to this epidemiological situation in Cuba: first, deliberate political will that defines people's health as a priority, and second, risk anticipation and prevention.

It's been a year of intense work to control COVID-19, demanding constant learning and dynamic decision-making, based on results from science and innovation.

This has meant adopting measures throughout the country that respond to health and social needs at each stage of the epidemic's evolution. Every decision corresponds to a strategy, based on integrating epidemiological elements with those of patient care and the potential of Cuban science, as we aim for the essential goals of prevention and clinical management of infection.

Thus, guided by a comprehensive pandemic approach, our national response to the health emergency was structured from primary health care through the rest of the health care delivery levels in the health system. Virus





Cuba's Minister of Public Health,  
Dr. José Angel Portal Miranda. Photo: MINSAP



containment actions begin in the community and also finalize there, through surveillance and other preventive measures, as well as attention to the recovery and rehabilitation phases once patients have been discharged.

The health response is also grounded in a statistical information system and health surveillance. This includes an integrated, comprehensive surveillance system for all epidemiological phases; an intersectoral approach in all actions; transdisciplinary interventions; agile decision-making; and personalized care with no exclusions. This conception incorporates Cuba's biotechnology and pharmaceutical industry.

Thus, as we have sought to address and control the COVID-19 epidemic in Cuba, we can refer to several milestones—from handling of epidemiology, patient care and health care services organization to scientific activity.

In this sense, it is noteworthy that in January 2020, well before the first cases were detected in Cuba, actions had already been designed to contain the disease, contained in a broad National Coronavirus Prevention and Control Plan that was approved by the Communist Party of Cuba's Political Bureau, the full Council of Ministers and its Executive Committee. Government agencies and civil-society mass organizations were involved in drawing up the Plan, which has been continually updated since then, specifying indicators that determine changes in the different phases established, according to the epidemic's evolution.

On a daily basis, the President and Prime Minister monitor the National Plan, in coordination with the main agencies involved.

This Plan, together with infrastructure, organization and human resources capacities; our public health system's strengths; and our population's

discipline have all contributed to the results obtained to date.

Government validated a system for managing the epidemic based on science and innovation, that linked government activities as well as production and service sectors with the knowledge and learning sector.

By February 3, the national health system had initiated the first phase of capacity building on biosafety issues for our health professionals and employees in the Central State Administration agencies. And on February 12, 2020, the Scientific Group to Address COVID-19 was created.

The COVID-19 Health Observatory was established on February 17, and the Innovation Committee on February 26. On the 28th, the first five COVID-19 research projects were approved, and by early June, 460 studies were under way, 85 of these directed by the Scientific Group of the National Technical Group. Today, this number has grown to over 900



Medical sciences students participating in active community-based screening.



President of the Republic of Cuba, Miguel Diaz-Canel Bermudez, meets with the Temporary COVID-19 Working Group.

projects, including studies and clinical trials, health interventions and innovations, among others.

Particularly important over the last year have been the meetings held by the President of the Republic, Miguel Díaz-Canel Bermúdez, with this group of scientists and experts, which number over 40 since they began on April 1, 2020. These exchanges have facilitated an intense and systematic dialog between government and experts.

The first SARS-CoV-2 infections in Cuba were detected on March 11, 2020, marking the beginning of the epidemic in the country.

Rapid organization by the public health system was decisive, creating and outfitting the capacities needed to ensure medical care throughout the country. As a result, COVID-19 patient care was gradually extended regionally in hospitals and other centers exclusively for those whose infection was confirmed or suspected, or who were their contacts, as well as necessary intensive care unit (ICU) capacities for serious and critical patients. All this prevented collapse of our health care delivery facilities

and enabled us to maintain patient care.

Primary health care professionals and medical sciences students also carried out active community screening to detect, isolate and provide timely treatment for people with respiratory symptoms. More than 28,000 students joined this important effort and their contribution to our communities was essential for early case detection, which translated into breaking the virus's chain of transmission.

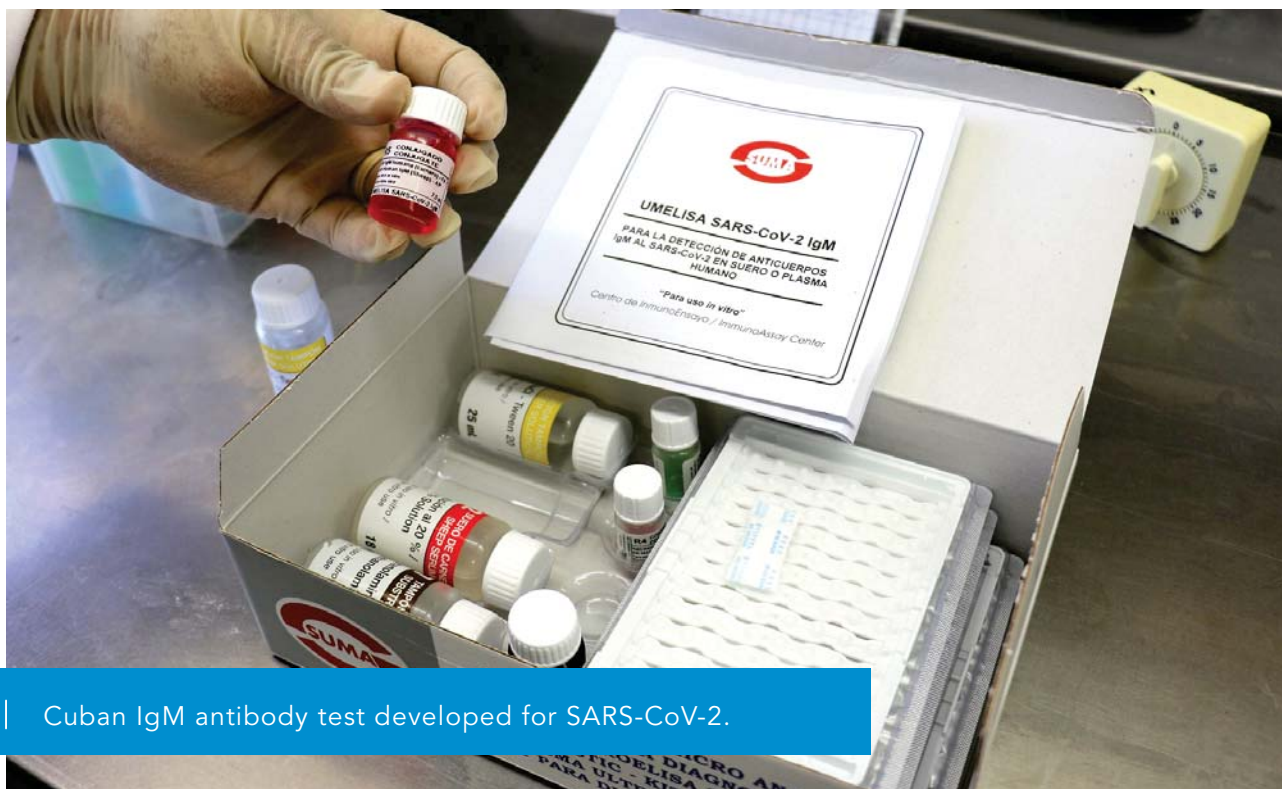
Just as important was the launch of an innovative technology application for self-screening, developed by the Informatics Sciences University in cooperation with the Ministry of Public Health (MINSAP) and Ministry of Communications (MINCOM). This virtual screener is a personal tool for online surveys, available free, and is built into the Cuban Telecommunications Company (ETECSA) infrastructure, permitting real-time identification by people who recognize their respiratory symptoms and whose infection may be suspected. As a reflection of individual responsibility for health, not as a substitute for active screening, this tool contributed

to increased timeliness of decision-making and strengthened health surveillance at the level of community polyclinics and their corresponding health areas.

Also noteworthy over the last few months is the launch of molecular biology laboratories across the country: we had only 4 at the start of the epidemic, but by the close of February 2021, the number had grown to 22. All the labs were duly equipped and had the requisite biosafety conditions as well as the necessary personnel to process RT-PCR tests for viral detection. By enhancing our diagnostic capabilities, we were able to continually increase the numbers of RT-PCR tests, so that from a daily capacity of 100 tests in March, 2020, by February 2021, we were able to process some 18,000 samples daily, or 185 times our initial number.

Today, we are moving ahead in the computerization of these diagnostic results, to provide more immediate information to patients online using technological monitoring platforms and systems. At the same time, these systems will help us improve management of capacities in hospitals and





Cuban IgM antibody test developed for SARS-CoV-2.

isolation centers, since beds can be made available much earlier, right after test results are posted.

Also decisive was approval of the Clinical Management Protocol, conceived in both preventive and therapeutic contexts, with a scale of services depending on complexity. The protocol is in its sixth edition, its actions refined and improved over time in accordance with the scientific evidence and best experiences internationally. The first edition was approved on February 16, 2020; the second in March, the third in April, the fourth in May and the fifth in June, 2020. The sixth was published in February, 2021.

Amidst the pandemic, one of the milestones for Cuban science is that it has placed Cuba in the small group of countries that have managed to develop vaccines specific to SARS-CoV-2. The country has four vaccine candidates: Soberana 01 and Soberana 02 of the Finlay Vaccine Institute (IFV); as well as Abdala and Mambisa of the Genetics

Engineering and Biotechnology Center (CIGB). These are in various phases of clinical trials, and thus far have shown evidence of safety and efficacy.

Our reference laboratories are paying particular attention to monitoring entrance into the country of the virus's new genetic variants. To date, genetic sequencing reveals that 99.3% of the samples studied belong to the D614G mutation of the G strain, present in the country since the epidemic's beginning.

#### **WHAT ARE ASPECTS COMMON TO CUBA'S RESPONSE TO THE PANDEMIC OVER TIME, AND WHAT ASPECTS ARE DIFFERENT, SPECIFIC TO THE VARIOUS WAVES OF DISEASE RESURGENCE?**

Our handling has been constant, ordered and based on science. Epidemiological management, organization of patient care, and scientific evidence provide the premises for our approach to the pandemic over these long months here in Cuba.

Each stage we have passed through has contributed to consolidating Cuba's model for addressing COVID-19, whose principles applied during each epidemic resurgence have prioritized adequate isolation of cases, timely diagnosis, individualized care and follow-up of convalescent patients.

Always, the most important thing is to keep our people from getting sick, and if they get sick, to keep them from becoming seriously ill, and if they do become seriously ill, to prevent them from dying. To accomplish this, we continue to apply innovative medications developed by Cuban biotechnology, use preventive and therapeutic pharmaceuticals in vulnerable groups, and implement interventions in populations at risk.

Differences in managing the pandemic's various waves or moments of epidemic resurgence are summarized in the modifications made to the Clinical Management Protocol over its six editions, as well as



changes related to epidemiological management, in particular in the diagnostic algorithm and in case isolation.

Each of these stages has been accompanied by changes, such as those related to the isolation protocol, and particularly the decision in October 2020 to make it more flexible, permitting persons who were contacts of confirmed and suspected cases to self-quarantine at home, and for international travelers to do the same.

The Clinical Management Protocol contains modifications as to when best to administer innovative medications that prevent the so-called cytokine storm. These changes have been made in the various Protocol revisions and in the latest edition, we have also included the concept of high-risk patients and the need to hospitalize them in units permitting intensive monitoring.

In summary: one of COVID-19's biggest lessons has been to demonstrate that we have the capacity to adopt measures according to a changing context, and it's possible to do this quickly and based on scientific evidence.

#### **WHAT IS YOUR ASSESSMENT OF CUBA'S FOUR VACCINE CANDIDATES AND WHAT ARE YOUR EXPECTATIONS FOR THEIR RESULTS?**

From the very start of the epidemic in Cuba, a priority set for Cuban science was to move ahead on research and development of our own vaccine, one that would prevent transmission of the SARS-CoV-2 coronavirus and give the country technological sovereignty in terms of its production and availability.

Leading this effort have been the Finlay Vaccine Institute (IFV) and the Genetics Engineering and Biotechnology Center (CIGB), as well as other scientific institutions, such as the Molecular Immunology Center (CIM).

Today Cuba has four vaccine candidates that use the same type of antigen: the receptor binding domain (RBD), the means by which the virus penetrates cells. Soberana 01 has gone through three phase 1 clinical trials, one of these in convalescing patients with low antibody titers who are thus at risk of re-infection. Soberana 02 is now in a phase 2 trial, and is expected to enter phase 3 in March. The Genetic Engineering and Biotechnology Center's Abdala and Mambisa candidates are both in phase 1/2 trials. One of these with Mambisa uses essentially intranasal administration.

The regulatory strategy approved for these studies has permitted overlap of clinical trial phases for each of the vaccine candidates, in an effort to shorten running times without affecting the trials' quality. Decisive for this process has been constant accompaniment by the regulatory agency, the Center for State Control of Medicines and Medical Devices (CECMED). Another advantage of having several SARS-CoV-2 vaccine candidates is that we can contemplate each one's use for specific population groups, according to the candidate's characteristics.

Thanks to rigorous application protocols for our country's biotechnology pharmaceuticals and the vaccines in development, Cuba has gained important independence in this complex epidemiological context.

Results thus far are promising, particularly when it comes to

safety and already accrued evidence of the candidates' immunogenicity, which makes us expect that they can prove their efficacy in the new clinical trial phases.

#### **WHAT HAS BEEN INCORPORATED INTO THE DAY-TO-DAY FUNCTIONING OF THE NATIONAL HEALTH SYSTEM AS A RESULT OF LESSONS LEARNED DURING THIS PANDEMIC?**

Cuba itself provides an example of one of the most noteworthy lessons learned over the last few months: that it is no luxury for countries to guarantee access to universal health of their citizens, by strengthening health systems that place people at the center of their priorities. Cuba has done this, and it is the essence of a universal public health system, accessible, free and humanistic.

Nonetheless, there are a number of lessons learned that we'll need to incorporate into the post-COVID functioning of the national health system. I would summarize them along these strategic lines:

1. Organization and regionalization of services
2. Use of molecular diagnostics on a national scale
3. Preventive approaches to acute respiratory infections
4. Individualized care for seriously ill patients using innovative Cuban medications
5. Strengthening hygiene and sanitary measures in health institutions
6. New forms of management for science and technology
7. Linking students more closely to problem-solving in health at the community level



The Cuban population in times of pandemic.

A number of things can also help optimize the system's functioning. Among the noteworthy are improvements in medical care patient flow, restricting companions to those hospitalized patients who require it and suspending companion visits.

Making maximum use of the molecular biology laboratories' installed capacities will be especially important, particularly for

studying cancers, opening a field for personalized medicine and high-impact research to address one of the main causes of morbidity and mortality in the Cuban population.

The epidemiological context also prompted accelerated design and testing of new medications and active screening tools for preventively approaching acute respiratory infections.

The inclusion of registered, innovative Cuban pharmaceuticals—those used for COVID-19 patients and others in development—will undoubtedly facilitate individualized care for seriously ill patients.

At the same time, a new management style adopted in science and innovation has allowed us to streamline mechanisms for approval and implementation of high-impact clinical studies. This relies on the creation of an Innovation Committee, integrating actions by MINSAP, the BioCubaFarma corporate group and the regulatory agency (CECMED).

Linking many academic and scientific institutions to the health sector—as we searched for the best solutions to address the epidemic—also shed light on contributions by the different fields of science on improvements in the population's health status. Of course, work by many of these makes and impact on the various determinants of health.

Especially deserving of mention is the active participation by thousands of medical sciences students who, with their pertinent, committed and active involvement,

**1. National Coronavirus Prevention and Control Plan approved (January 28, 2020)**

**2. Technical Group constituted to direct the Plan (January 28, 2020)**

**3. First phase initiated of capacity building for workers in health and public administration sectors (February 3, 2020)**

**4. Scientific Group to Address COVID-19 created (February 12, 2020)**

**5. First edition of Clinical Management Protocol approved (February 16, 2020)**

**6. COVID-19 Health Observatory established (February 17, 2020)**

**7. Virtual Screener presented, an app for self-screening (February 17, 2020)**

**8. Innovation Committee established (February 26, 2020)**

**9. First five COVID-19 research projects approved (February 28, 2020)**

2020

|      |                  |      |      |      |      |      |
|------|------------------|------|------|------|------|------|
| 1 2  | 3 4 5<br>6 7 8 9 | 10   | 11   |      |      | 12   |
| JAN. | FEB.             | MAR. | APR. | MAY. | JUN. | JUL. |





demonstrated the new generation's capacity to carry out timely actions directed at solving health problems at the community level. This dovetails with the essential premises of Cuban medicine, focused as they are on health promotion and disease prevention.

Bringing together all the country's sectors and actors to confront this dangerous disease—in doing so,

expressing the political will to put every resource into the health of our people, since nothing is more precious than life itself—more than a lesson learned constitutes a ratification of the importance of approaching health from an intersectoral perspective.

No less important has been public participation in the virus's control, complying

with the health measures oriented, the willingness of thousands of our citizens to be admitted to isolation centers, their sincere appreciation for the work of our health professionals who have labored ceaselessly in red zones for nearly a year and in every one of the essential health services that have never stopped. This has been everyone's battle, and in the lead have been the Cuban people.

**10.** First cases of SARS-CoV-2 infection detected in Cuba (**March 11, 2020**).

**11.** Meetings initiated between Cuba's President groups of scientists and experts (**April 1, 2020**)

**12.** Soberana 01 clinical trials announced (**August 13, 2020**)

**13.** Start of Soberana 02 clinical trials approved (**October 29, 2020**)

**14.** Mambisa y Abdala clinical trials begun (**December 7, 2020**)

**15.** Soberana 02 phase 2 clinical trials begun (**December 22, 2020**)

**16.** Abdala phase 2 clinical trials begun (**February 1, 2021**)

**17.** Sixth edition of Clinical Management Protocol approved (**February 12, 2021**)

**18.** Twenty-second molecular biology laboratory inaugurated to process RT-PCRs (**February 21, 2021**)

**19.** Phase 3 clinical trials authorized for Soberana 02 (**March 3, 2021**).

2021

|      | 13   |      | 14 15 |      | 16 17 18 | 19   |
|------|------|------|-------|------|----------|------|
| SEP. | OCT. | NOV. | DEC.  | JAN. | FEB.     | MAR. |

# COVID-19 SITUATION IN CUBA: ONE YEAR INTO THE PANDEMIC

When the first cases of COVID-19 were reported in Cuba on March 11, 2020, the COVID-19 Prevention and Control Plan, drafted at the end of January that same year, was already being implemented. From that moment on, the Temporary COVID-19 Working Group at the highest level of government had begun putting the plan into action.

In the first months of response to the epidemic, a series of preventive measures and progressive restrictions on population mobility were established. These included mandatory use of face masks throughout the country, cancelling international flights, curtailing urban and interprovincial public transportation, and suspending in-person classes in schools and universities. Restrictions on activities in different provinces and municipalities were applied in line with the epidemic phase in each territory, according to previously defined epidemiological indicators.

Throughout 2020, all outbreaks that emerged in the provinces were controlled by

multisector public health measures, successful epidemiological surveillance, and a broad communications program promoting key information in all media.

Good transmission control in the country made it possible for Cuba to apply a new plan of measures in October 2020, aimed at reestablishing social and economic activities, marking different phases by province and municipality, and a final "new normal" phase, thereby encouraging responsible reopening while involving the public in maintaining broadly disseminated preventive measures.

One group of provinces (Santiago de Cuba, Guantánamo, Holguín, Granma, Camagüey, Las Tunas and Cienfuegos) remained in the "new normal" phase, with no cases of local transmission for more than five months.

Considering that the country had managed to maintain low incidence of disease, it was decided to resume international flights on

November 15, 2020. This measure included an initial RT-PCR test upon arrival in Cuba and a second test on the fifth day. During those first days, incoming travelers had to isolate in a residence, attended by their local family doctor-and-nurse team, or in a hotel with on-site medical staff.

However, failure to comply with these indications, relaxation of preventive measures, and family and social gatherings at New Year's combined to detonate a sustained increase in case numbers. The initial increase in this latest wave was due fundamentally to travelers, but the infection spread widely, and in both January and February 2021, local transmission occurred in most provincial capitals, as well as in all Havana municipalities.

Guantánamo and Santiago de Cuba Provinces, which reported no cases of local transmission for many months, have had widespread outbreaks and very high incidence rates. In February 2021, transmission also increased in Mayabeque and

## NEW NORMAL

### INDICATORS

RT-PCR positivity last 15 days  $\leq 0.35\%$  Rate x 100,000 population last 15 days  $\leq 5$

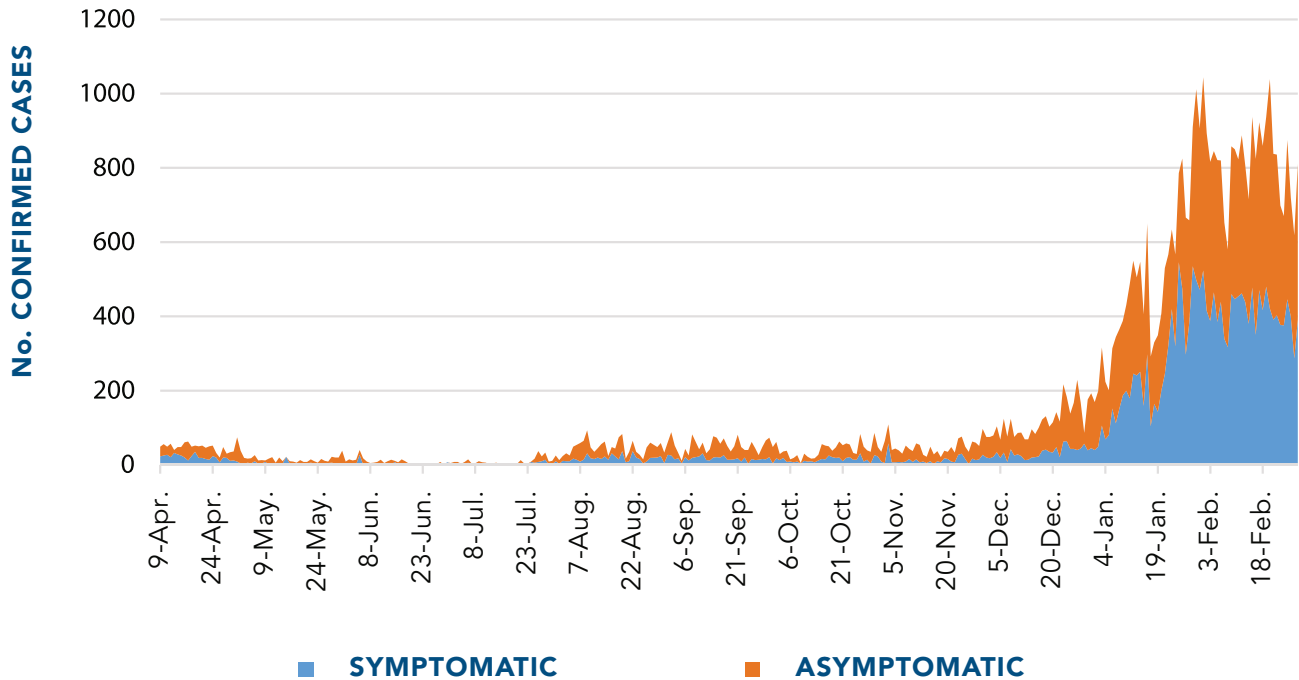
### DEFINITION

Production and service activities resumed with strengthened epidemiological surveillance, compliance and control of health and safety measures.

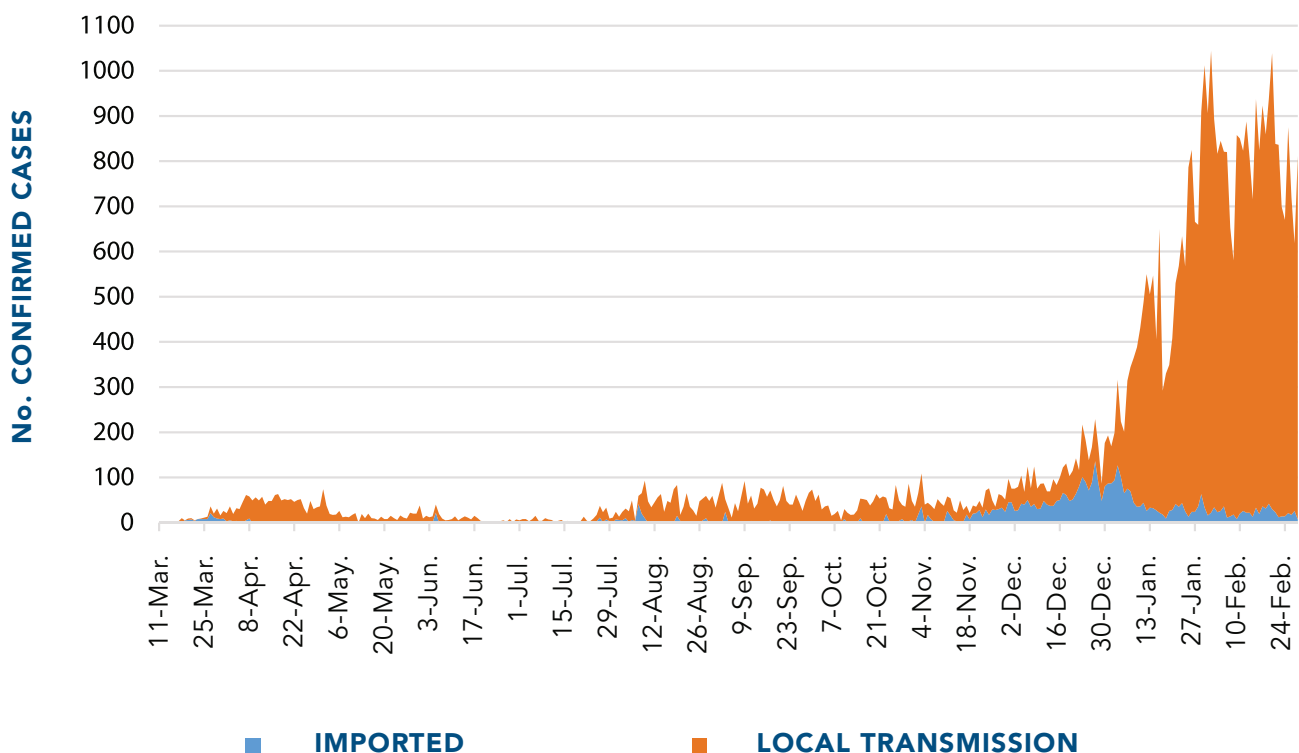
Implementation of other health protection measures with responsible participation of individuals, by adopting a new code and lifestyle.



## CUBA: EVOLUTION OF CONFIRMED COVID-19 CASES, BY SYMPTOM STATUS (APRIL 2020–FEBRUARY 2021)



## CUBA: EVOLUTION OF CONFIRMED COVID-19 CASES, BY INFECTION SOURCE (MARCH 11, 2020–FEBRUARY 28, 2021)

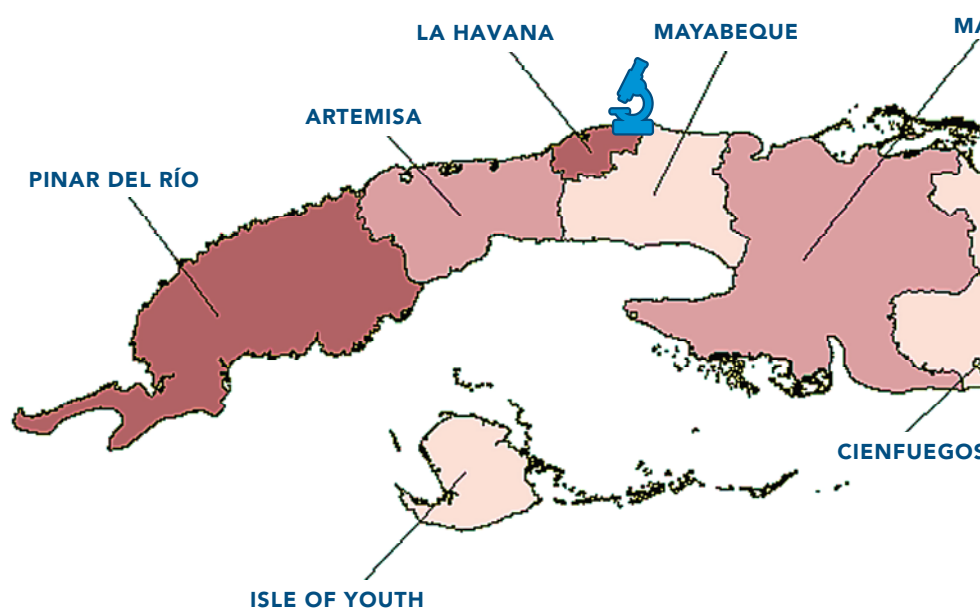


Artemisa, the Isle of Youth Special Municipality, and the provincial capitals of Pinar del Río, Camagüey, Granma and Holguín.

Thus, since December 2020 and during the first two months of 2021, Cuba has faced a new epidemic scenario with higher transmission rates. In January of this year alone, 15,536 cases were registered, 3480 more than the total detected during 2020. Numbers in February were even higher, with 22,998 positive cases. The progressive increase in active cases during January and February, reaching a record 38,534 nationally, called for increased hospital capacity to meet the growing demand for medical care.

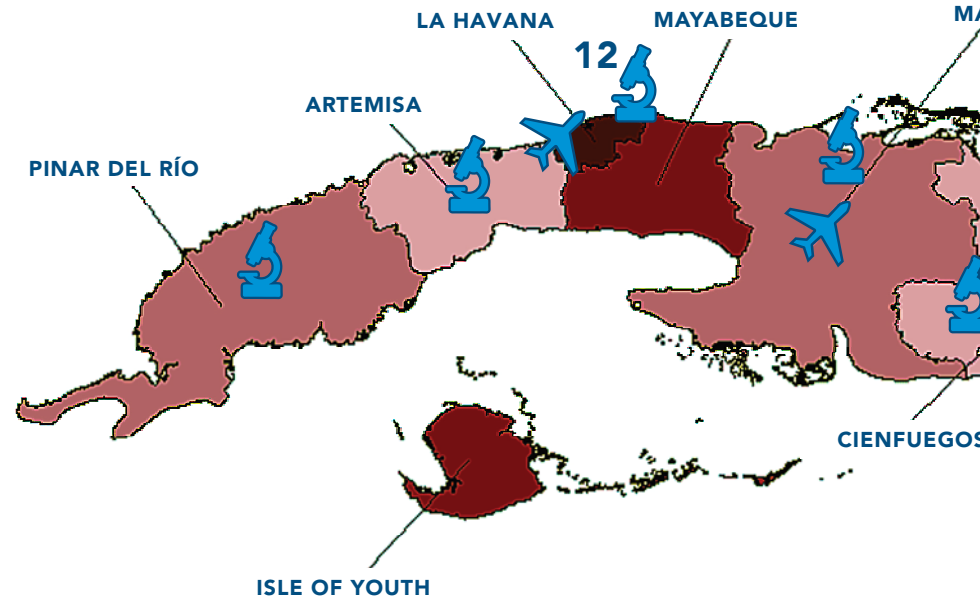
It is important to note that these outbreaks were managed with the experience acquired in the first months of the pandemic. Currently, Cuba has more diagnostic, medical and preventive tools available, taking into account local scientific advances, including increased SARS-CoV-2 RT-PCR diagnostic capacities with the inauguration of new molecular biology laboratories (MBL).

In fact, the first tests were conducted in February 2020 in the National Reference Laboratory at the Pedro Kourí Tropical Medicine Institute (IPK). Between March and May 2020, four more laboratories were opened in Havana and two in other provinces (Villa Clara and Santiago de Cuba). In the third trimester of last year, six more labs were added in the capital, the territory with the largest population and the most affected by the epidemic. Between October and December, MBL were inaugurated in four more provinces (Matanzas, Ciego de Ávila, Holguín and Artemisa), and during January and February 2021, new MBL opened in four other provinces (Camagüey, Pinar del Río,



**Rate X 100,000 pop.  
(March–December, 2020)**

|           |      |
|-----------|------|
| 200–240.0 | (3)  |
| 100–199.9 | (3)  |
| 23.2–99.9 | (10) |



**Rate X 100,000 pop  
(January–February, 2021)**

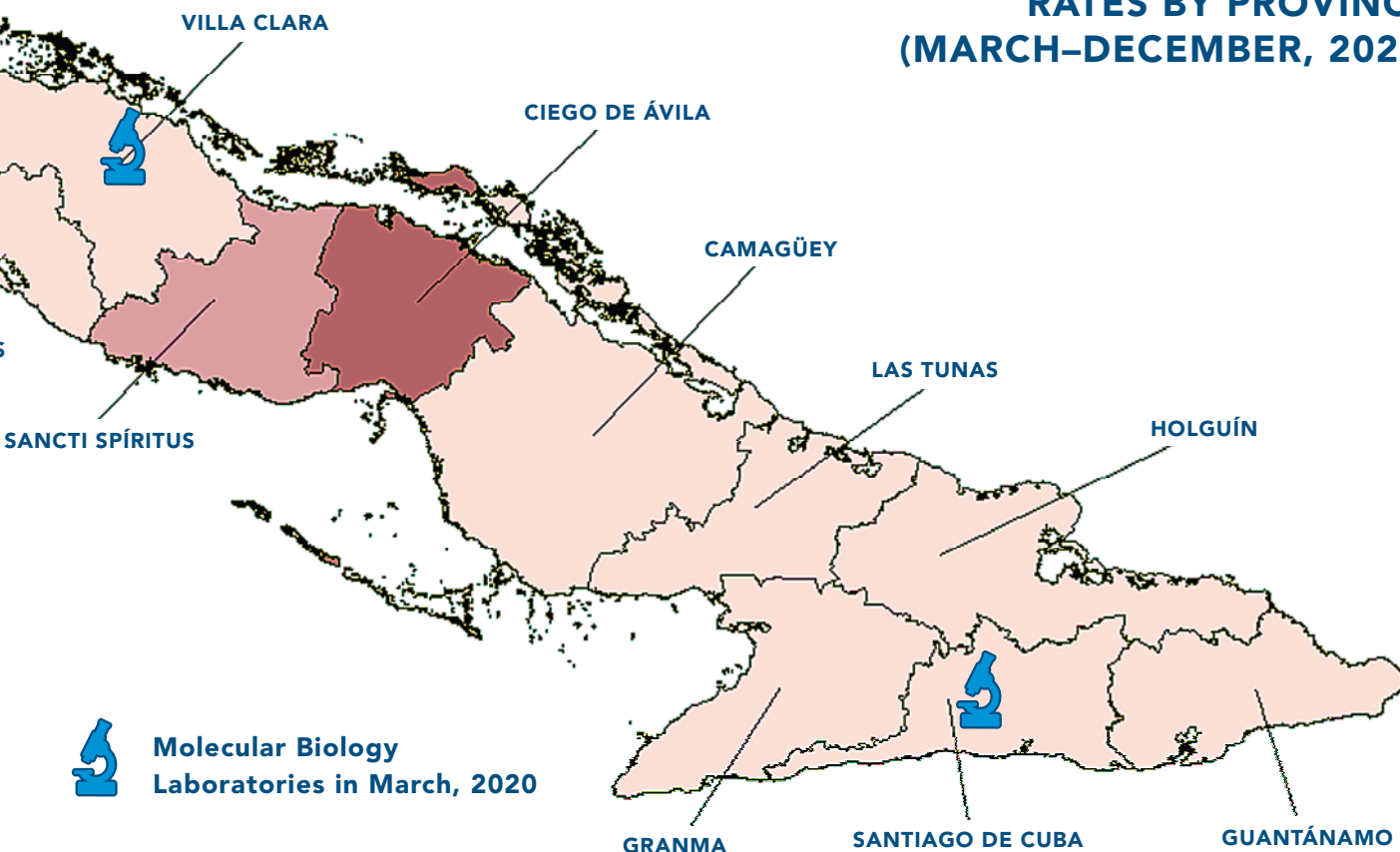
|                    |     |
|--------------------|-----|
| 400– (478.4–823.4) | (3) |
| 300–399.9          | (2) |
| 200–299.9          | (3) |
| 100–199.9          | (4) |
| 44.8–99.9          | (4) |

 **International  
Airport**



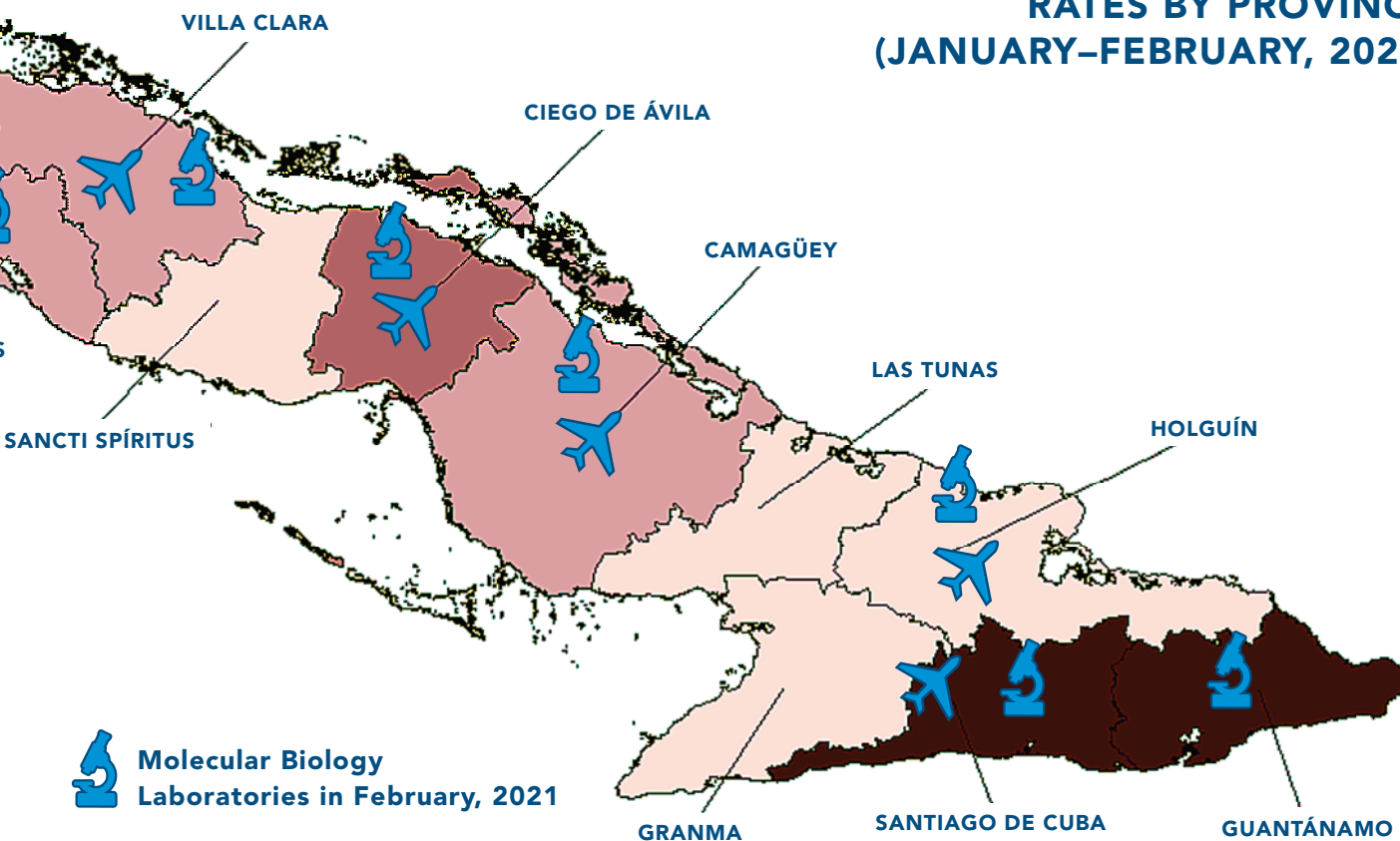
ATANZAS

## CUBA: CUMULATIVE INCIDENCE RATES BY PROVINCE (MARCH–DECEMBER, 2020)

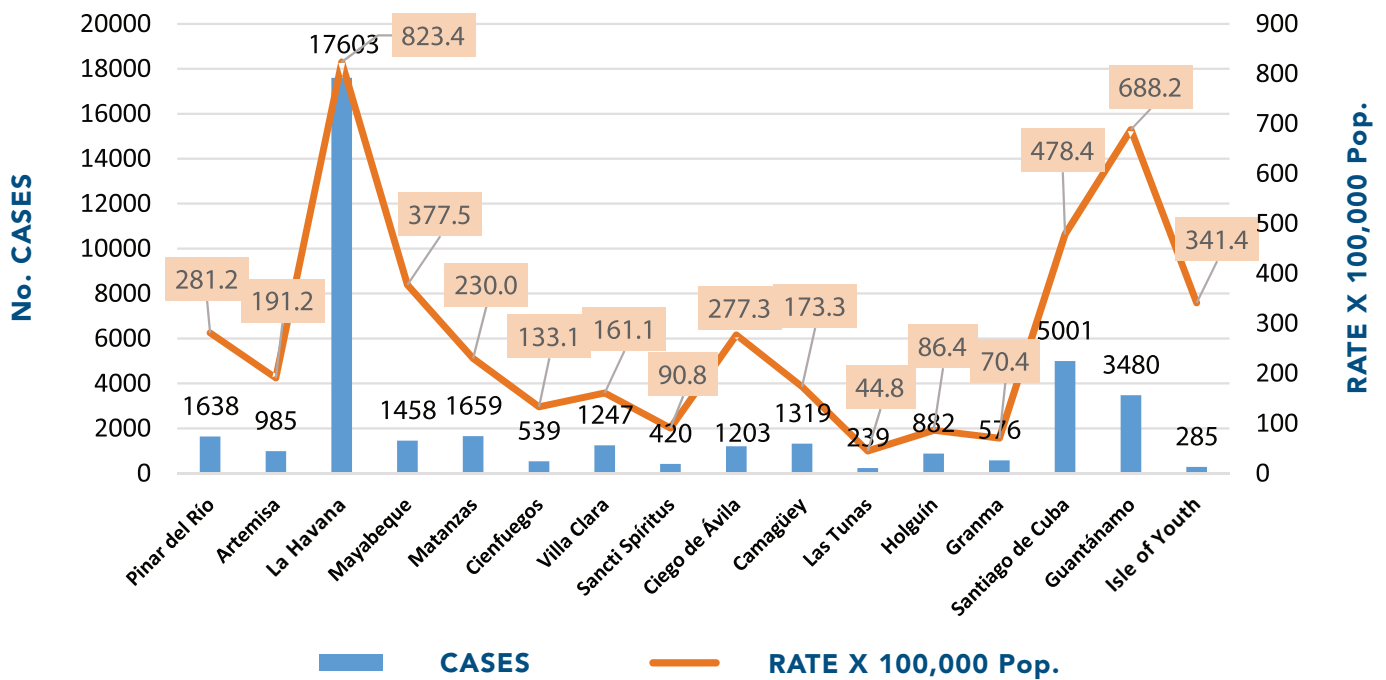


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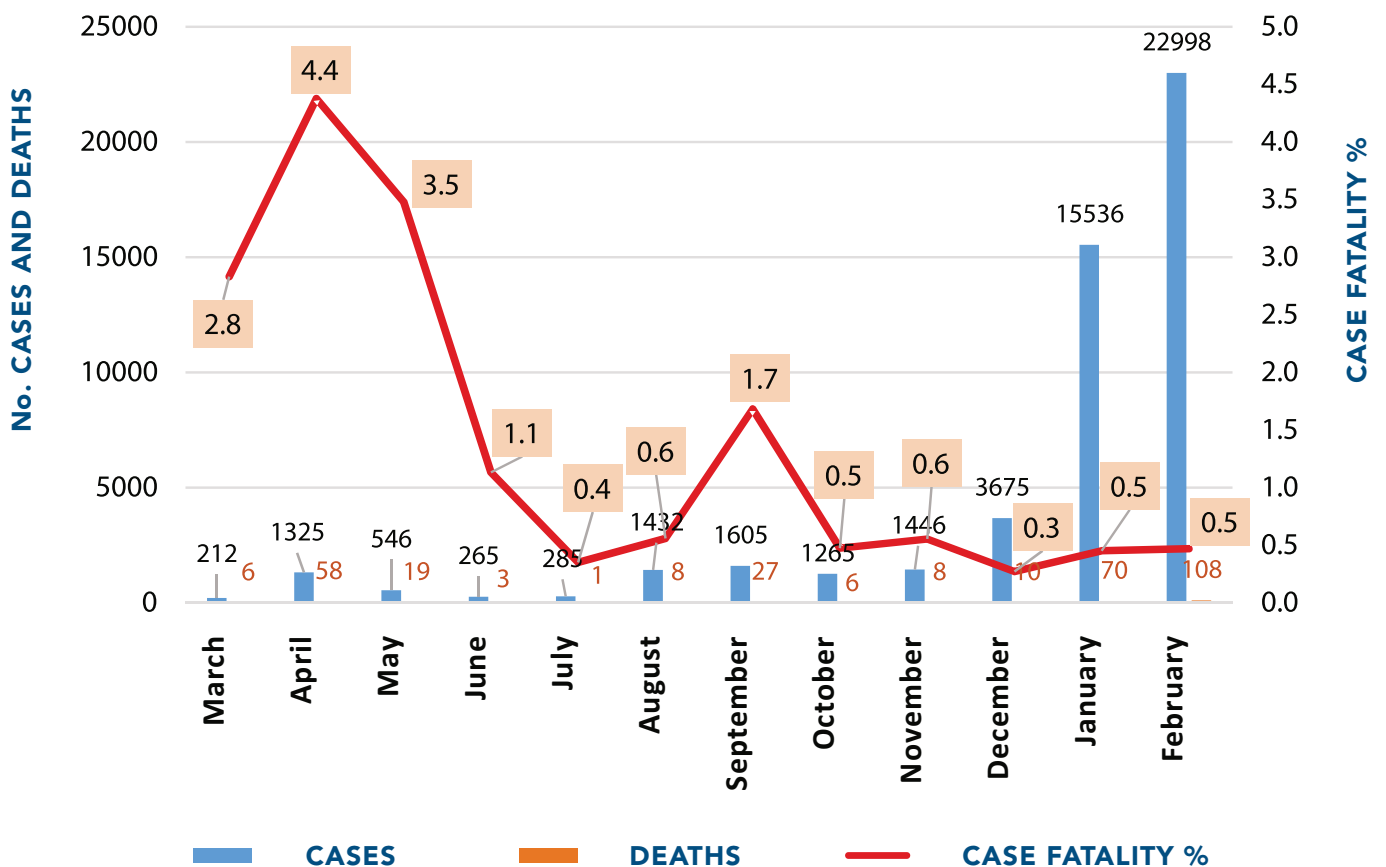
## CUBA: CUMULATIVE INCIDENCE RATES BY PROVINCE (JANUARY–FEBRUARY, 2021)



## CUBA: CONFIRMED CASES AND CUMULATIVE INCIDENCE RATES BY PROVINCE (JANUARY–FEBRUARY, 2021)



## CUBA: COVID-19 CASES, DEATHS AND CASE FATALITY RATES (MARCH 11, 2020–FEBRUARY 28, 2021)





Guantánamo and Cienfuegos), plus one more in Havana.

There are currently 22 laboratories, 12 in the capital and 10 in the same number of provinces. Another five are under construction to give all provinces MBL testing capacities.

In response to the new wave, flights have been restricted again to reduce the entry of imported cases and the possible introduction of new variants or strains of the virus. By the end of January, hospital monitoring of all positive cases had been reinforced, regardless of clinical status. All contacts of positive cases, as well as international travelers, are also isolated in centers equipped to for their medical monitoring.

Intensified surveillance is currently provided in designated health facilities prepared to care for people at

high risk of developing serious forms of the disease.

In terms of indicators observed in one year of the COVID-19 epidemic in Cuba, from March 2020 to February 2021, 50,590 positive cases were reported, with a cumulative incidence rate of 449.5 per 100,000 population. The highest rates occurred in Havana, Guantánamo, Santiago de Cuba and Ciego de Ávila. There were 322 deaths, with 0.6% overall case fatality. Villa Clara Province reported the highest rate, 0.9%, whereas the capital, Havana, accumulated 44.6% of cases in the country and 52.2% of deaths. Granma is the only province reporting no deaths from COVID-19.

Between March and December 2020, the majority of detected cases were asymptomatic at diagnosis, having been discovered through contact tracing and traveler surveillance. However, in

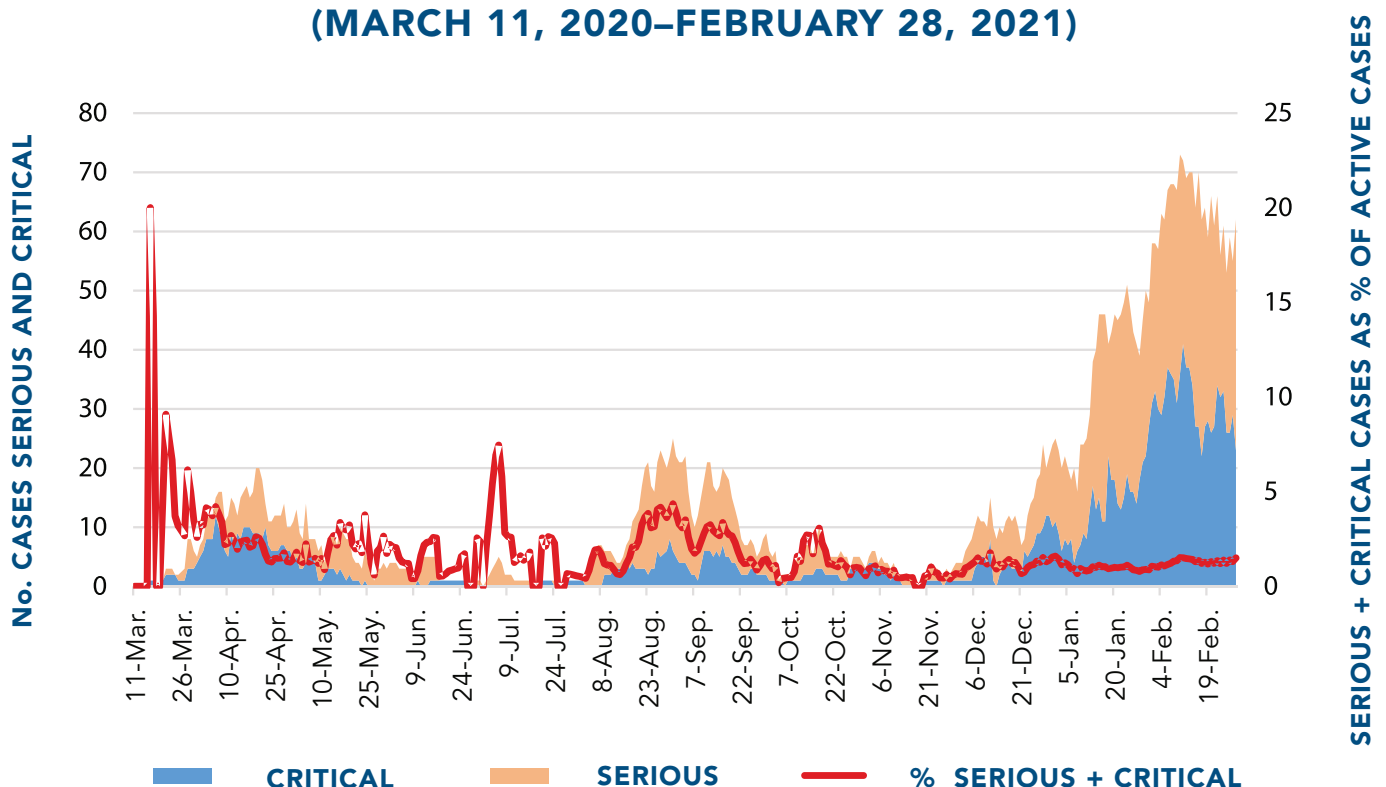
January and February 2021, the months with highest transmission, the proportion of symptomatic cases rose along with intensified surveillance.

Following the reopening of international flights last November, a high proportion of imported cases was noticed at first, followed by a progressive increase in locally transmitted cases.

The incidence rate has risen notably during the first months of 2021, reaching 344.5 per 100,000 population, a 68.8% increase with respect to the cumulative rate in March–December 2020. Sancti Spíritus was the only province in which the rate declined, and the greatest increases occurred in Guantánamo (94.6%), Santiago de Cuba (89.1%), Camagüey (79.7%), Mayabeque (79.5%) and the Isle of Youth Special Municipality (79.3%).

Conversely, the case fatality rate, which reached 4.4% in April 2020,

## CUBA: SERIOUS AND CRITICAL CASES, AS TOTALS AND AS PERCENT OF TOTAL ACTIVE CASES (MARCH 11, 2020–FEBRUARY 28, 2021)



gradually declined during the year as effective treatments were applied based on experience acquired in managing critically ill patients. Nevertheless, as cases increased in December, January and February, so did the number of severe cases and deaths, although mortality remained low, between 0.3% and 0.5%. By February 28, 2021, 324 deaths had been reported for an overall mortality of 0.6%. There were 178 deaths in the first two months of 2021, 32 more than in March–December 2020.

The proportion of severe cases (serious and critical) has remained at about 1% with respect to total active cases between November 2020 and January 2021. In February, however, this proportion rose to 1.3% as a result of the increase

in cases nationally, including patients with underlying comorbidities at higher risk of severe disease and death.

In March–December 2020, 1308 COVID-19 pediatric patients were reported. In January–February 2021, that number rose to 4240, including 212 children aged <1 year (5%). Pregnant and postpartum women accounted for 401 patients, and 291 of these (72.6%) were reported in January–February 2021. However, no infant or maternal deaths have been reported. In general, the numbers of cases and deaths in Cuba are much lower than those reported by the majority of countries in the Americas and the world.

In Cuba, the pandemic has presented two epidemiological scenarios, one in

March–November that can be defined as very good response, with controlled transmission and very low incidence in the population. The second scenario, characterized by higher transmission, began in November, increased steadily in December and January, and maintained a high plateau in February with daily averages of about 900 cases.

Despite this increase, however, the health system continues to provide a timely response through surveillance and case management, and is hopeful that results of the final community trials of Cuba's four vaccine candidates will enable the country to control the pandemic and return to the normality desired.

By: *Susana Borroto  
Gutiérrez PhD*

#### **TOTAL CASES AND DEATHS, CASE FATALITY AND CUMULATIVE INCIDENCE BY CUBAN PROVINCE** (March 11, 2020–February 28, 2021)

| PROVINCE                | CASES        |              | RATE<br>X 100 000 pop. | DEATHS     |              | CASE FATALITY<br>% |
|-------------------------|--------------|--------------|------------------------|------------|--------------|--------------------|
|                         | No.          | %            |                        | No.        | %            |                    |
| <b>PINAR DEL RÍO</b>    | 2 897        | 5,7          | 493,9                  | 21         | 6,5          | 0,7                |
| <b>ARTEMISA</b>         | 1 702        | 3,4          | 331,6                  | 4          | 1,2          | 0,2                |
| <b>LA HAVANA</b>        | 22 545       | 44,6         | 1 060,8                | 1 685      | 2,2          | 0,7                |
| <b>MAYABEQUE</b>        | 1 756        | 3,5          | 457,9                  | 3          | 0,9          | 0,2                |
| <b>MATANZAS</b>         | 2 390        | 4,7          | 333,0                  | 17         | 5,3          | 0,7                |
| <b>VILLA CLARA</b>      | 1 809        | 3,6          | 437,4                  | 16         | 5,0          | 0,9                |
| <b>CIENFUEGOS</b>       | 729          | 1,4          | 93,3                   | 4          | 1,2          | 0,5                |
| <b>SANCTI SPÍRITUS</b>  | 1 043        | 2,1          | 223,1                  | 7          | 2,2          | 0,7                |
| <b>CIEGO DE ÁVILA</b>   | 2 252        | 4,5          | 514,7                  | 19         | 5,9          | 0,8                |
| <b>CAMAGÜEY</b>         | 1 588        | 3,1          | 208,2                  | 10         | 3,1          | 0,6                |
| <b>LAS TUNAS</b>        | 3 93         | 0,8          | 72,7                   | 2          | 0,6          | 0,5                |
| <b>HOLGUÍN</b>          | 1 164        | 2,3          | 112,4                  | 8          | 2,5          | 0,7                |
| <b>GRANMA</b>           | 766          | 1,5          | 91,5                   | 0          | 0,0          | 0,0                |
| <b>SANTIAGO DE CUBA</b> | 5 544        | 11,0         | 527,2                  | 31         | 9,6          | 0,6                |
| <b>GUANTÁNAMO</b>       | 3 668        | 7,3          | 712,9                  | 10         | 3,1          | 0,3                |
| <b>ISLE OF YOUTH</b>    | 344          | 0,7          | 408,0                  | 2          | 0,6          | 0,6                |
| <b>TOTAL</b>            | <b>50590</b> | <b>100,0</b> | <b>449,5</b>           | <b>322</b> | <b>100,0</b> | <b>0,6</b>         |



Photo: José M. Correa. Granma

## CUBA'S NATIONAL COVID-19 TREATMENT PROTOCOL: AN UPDATE

As soon as the National Coronavirus Prevention and Control Plan was formulated in January 2020, a Scientific Group of experts was established to develop a treatment protocol for the country, which would be continually revisited and updated according to new evidence gleaned from national and international research.

Thus, this Scientific Group, comprised of medical

specialists and researchers from various scientific institutions, has reviewed and periodically updated the national Clinical Management Protocol, whose sixth edition was released in February, 2021.

The Protocol is a tool for case management based on the country's strategic actions for epidemic control, including care for pediatric, pregnant and older-adult patients as well vulnerable groups. It also

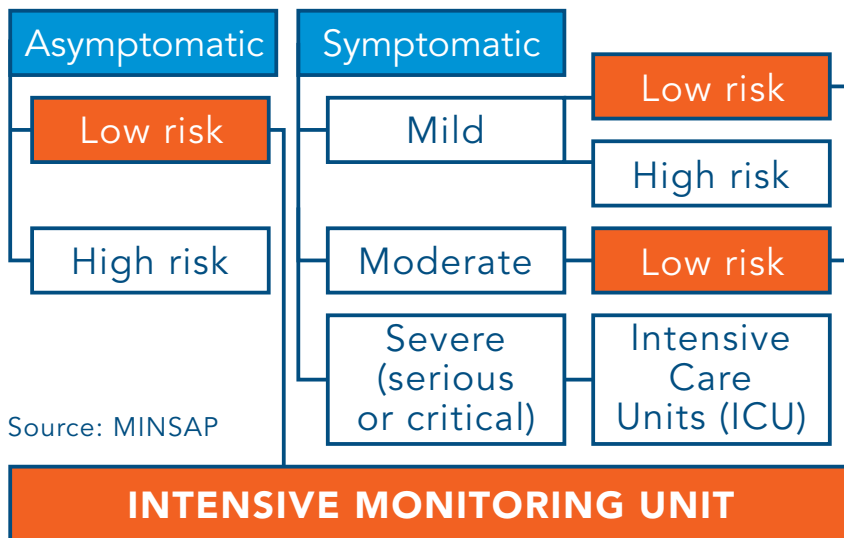
guides procedures for managing both asymptomatic and symptomatic patients with confirmed infections; their evolution according to severity; rehabilitation of recovering patients; and new measures for international health controls.

The Protocol prescribes how to ensure strict fulfillment of biosafety norms for physician, dental and nursing care in all healthcare delivery services, including family doctor-and-

*In suspected or confirmed COVID-19 cases, a high-risk patient is defined as one who presents as clinically stable, but who has comorbidities, risk factors, morbid obesity or advanced age, thus requiring intensive monitoring.*



## ALGORITHM FOR CLASSIFICATION OF COVID-19-CONFIRMED PERSONS AT HIGH RISK: CASE MANAGEMENT PROTOCOL, Edition 1.6



nurse offices, community polyclinics, hospitals and other health institutions, emphasizing those caring for vulnerable populations, such as people in nursing homes, psychopedagogical centers, or without permanent housing.

Important since the Protocol's first edition has been the concept of community-based active screening for the entire population, involving the primary health care level, which has proven successful for early identification of cases. Thus, each family doctor-and-nurse team makes weekly visits to the families in the geographic area under their care, or daily when it comes to vulnerable people at higher risk.

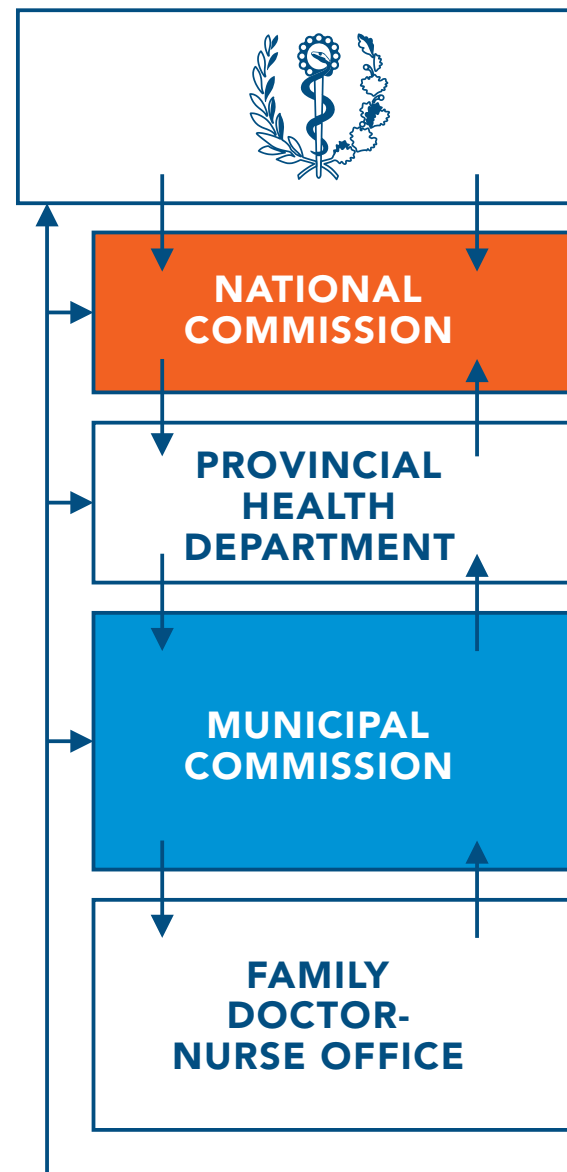
The Protocol's 1.6 edition adopts stay-at-home isolation for contacts of confirmed cases, with daily monitoring for first-degree contacts and RT-PCR on the fifth day. If the RT-PCR is positive, they are hospitalized, and if negative, they remain at home during a total of 14 days. The Protocol also provides for identification

and follow-up of second-degree contacts.

If the contact of a laboratory-confirmed COVID-19 patient is a person with a decompensated chronic illness, is socially vulnerable or due to distance is difficult to monitor daily, then they may be transferred to a healthcare institution equipped for medical observation and follow-up.

Another aspect included in this latest edition of the Protocol is identification and classification of cases (whether suspected or confirmed, asymptomatic or symptomatic) into risk categories: low, moderate and high, as well by severity of symptoms. This information is used to prompt timely response to avoid complications and progression to severe forms of the disease.

Identification and timely treatment of possible complications—along with control of comorbidities such as diabetes, hypertension, obesity, heart disease and

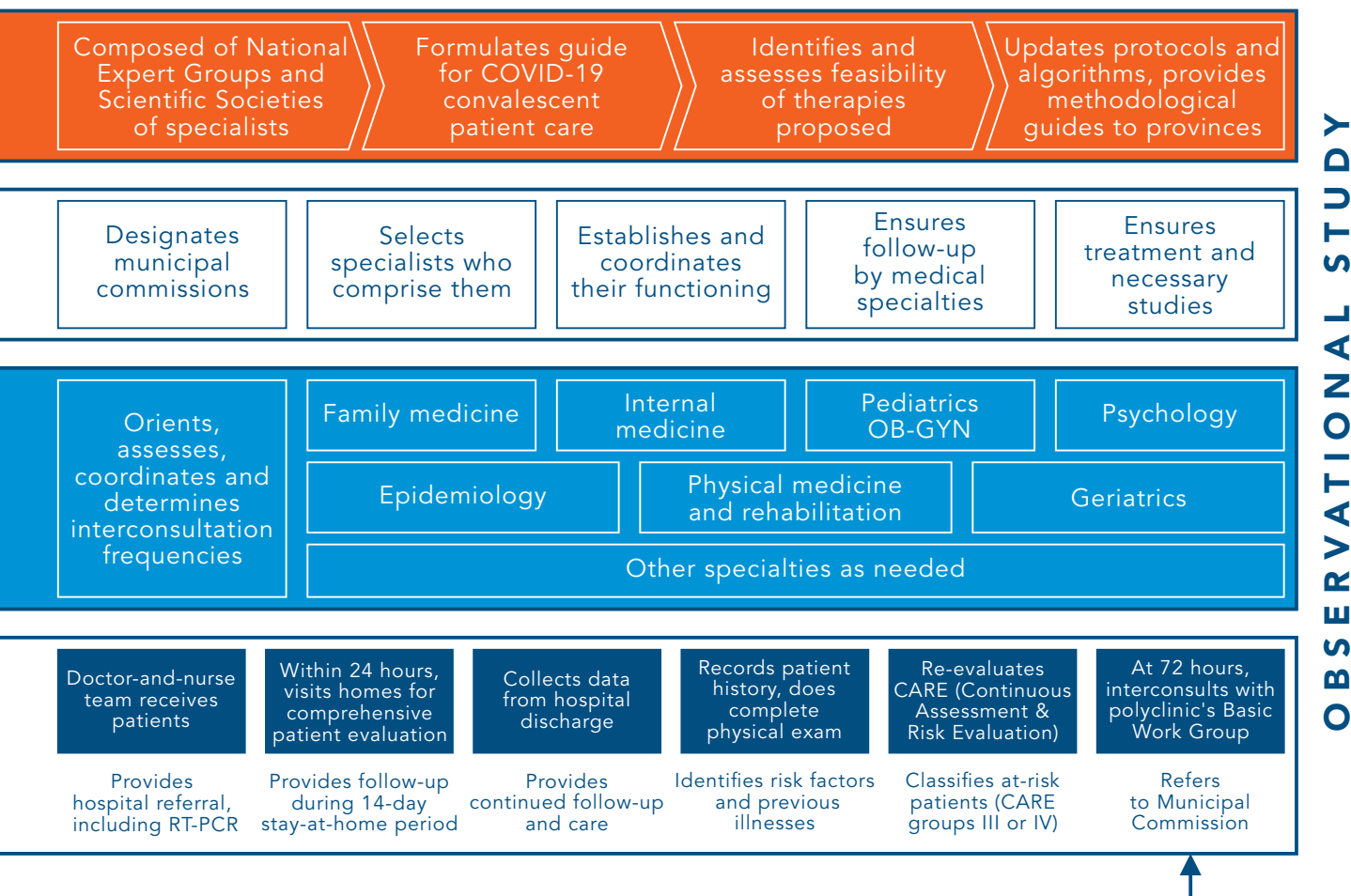


cancer, all associated with severe COVID-19—led to inclusion of a definition of high-risk patient, aimed at avoiding progression to serious or critical stages. Suspected, low-risk patients are remitted to isolation centers, while moderate- and high-risk patients are remitted to intensive-monitoring hospital units.

These units were created for high-risk COVID-19 patients

# PRIMARY HEALTH CARE TREATMENT ALGORITHM FOR CONVALESCENT COVID-19 PATIENTS

## MINISTRY OF PUBLIC HEALTH Republic of Cuba



as part of the health system's reorganization in response to the pandemic, in an effort to begin early treatment and monitor every detail of their evolution. They are staffed by internists, critical care specialists and other health personnel specially trained for COVID-19 clinical case management, and conditions have been created to carry out daily laboratory and other complementary tests.

The post-acute phase of COVID-19 leads to a convalescent phase that can be complex and prolonged, depending on how aggressive the disease was and the immune system's capacity for response.

Given the short time that COVID-19 has existed, it has not been possible to define either the duration or severity of sequelae, although they are appearing more

frequently in patients who have experienced severe forms of the disease. Asymptomatic patients have also developed pulmonary lesions. The program designed to care for recovering patients includes research to identify sequelae, as well as psychological support and therapy by a multidisciplinary team in the health area served by patients' community-based polyclinic.

## INTERFERONS

Cuba's biotechnology industry took off during the 1980s. In 1981, it produced the first human-origin interferon and in 1986, human recombinant interferon alfa-2b, which generated introduction of various interferon types and formulas by the recently inaugurated Genetic Engineering and Biotechnology Center (CIGB) in Havana.

To date, these interferons have demonstrated antiviral and immunomodulatory

properties, justifying their inclusion in the national Clinical Management Protocol for COVID-19 since its first edition. Scientists agree that, while interferons do not represent a cure, they could be effective when used early in the disease's viremic phase.

**Recombinant alfa-2b interferon (Heberón Alfa R)**, registered since 2003, has been used for viral infections such as HIV/AIDS, papilloma (HPV), viral hepatitis, dengue, some neoplasms and

hematological diseases, among others. In Cuba, it has been approved for emergency use against COVID-19, in vials of 3000 units, via intramuscular administration. Its use is recommended for adults who are suspected or confirmed with COVID-19, as well as pregnant women, asymptomatic high-risk patients, and pediatric patients in early stages of the disease.

Another interferon therapy option is **human interferon alfa-2b combined with**

## ITOLIZUMAB

This anti-CD6 monoclonal antibody (MAB) was developed by the Molecular Immunology Center (CIM), and recognizes domain 1 of the human CD6 glycoprotein. CD6 is expressed on the surface of mature T cells, in B-1 lymphocytes and immature B cells and, along with CD166, plays an important role in cell proliferation and proinflammatory cytokine secretions.

Due to its immunomodulatory properties, **Itolizumab** has been used in Cuba to treat autoimmune diseases such as psoriasis and rheumatoid arthritis, with proven safety and no evidence of adverse

effects.[1] In SARS-CoV-2 infections, **Itolizumab** inhibits over activation of effector T cells, and prevents or diminishes secretion of multiple inflammatory cytokines.

Given all this, the Cuban regulatory authority, CECMED (Center for State Control of Medicines and Medical Devices), authorized emergency use of **Itolizumab** in July 2020, incorporating it into the national Clinical Management Protocol (beginning with the 1.2 edition) to treat serious and critical patients with pneumonia provoked by SARS-CoV-2. The aim is to reduce pulmonary function

deterioration, decreasing the rate of patients requiring mechanical ventilation or reducing their time on a ventilator.

**Itolizumab** has resulted in recovery of 89% of all patients receiving the treatment, particularly moderate and serious cases, including 97% of moderately ill high-risk patients. Studies to date[2] indicate early application is preferable, for which use of biomarkers is recommended, permitting better prediction of onset of the disease's inflammatory phase. Results are encouraging: case fatality rates have declined and clinical trials continue to better assess use of this medication.

<sup>1</sup>Saavedra D et al. An anti-CD6 monoclonal antibody (itolizumab) reduces circulating IL-6 in severe COVID-19 elderly patients. *Immunity & Ageing* [Internet]. 2020 [cited 3 Mar 2021]; 17(34). Available at: <https://immunityageing.biomedcentral.com/articles/10.1186/s12979-020-00207-8>

<sup>2</sup>Caballero A et al. An anti-CD6 antibody for the treatment of COVID-19 patients with cytokine-release syndrome: report of three cases. *Clinical & Translational Immunology* [Internet]. 2020 [cited 3 Mar 2021]; 9. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/cti2.1218>



**human interferon gamma (Heberferón)**, registered in 2016 and indicated for local treatment of basal cell carcinoma. It has been authorized for emergency use against COVID-19, in vials lyophilized for intramuscular injection, and has demonstrated high levels of antiviral and immunomodulatory activity, keeping patients from progressing to serious or critical stages of disease.

CIGB is directing a phase 2 clinical trial evaluating safety

and effectiveness of Heberferón against Heberón Alfa R in patients infected with SARS-CoV-2. It is expected that patients will reach RT-PCR negativity sooner and in general, will have a more favorable evolution. Preliminary results are encouraging, since only 4% of patients treated with interferons have evolved to severe forms of COVID-19.

**Nasalferón** is administered intranasally, with high levels of absorption and immunological and antiviral

response, thus reinforcing the body's defenses against COVID-19. It has been approved for emergency use as a preventive medication, and has been used in health workers, contacts of confirmed COVID-19 patients and persons in risk groups. Studies reveal that just 1.5% of persons who have received this medication have contracted COVID-19. While scientists agree that it is not a cure, they think the medication could be effective when used early in the viremic phase of the disease.

## JUSVINZA

This is a peptide with immunomodulatory effects that was initially called CIGB 258, now **Jusvinza**. The molecule was first designed to treat autoimmune diseases, mainly rheumatoid arthritis, and was approved by CIGB early in 2000. **Jusvinza's** expected effect on COVID-19 is to curb the exaggerated inflammatory reaction produced by the immune system, known as the cytokine storm—responsible for nearly 70% of fatalities in serious and critical COVID-19 patients.[3]

At the start of the pandemic, it was approved for compassionate use in this type of patient, and later CECMED gave authorization for emergency use aimed at reducing COVID-19 case fatality, the time patients spent on ventilators and pulmonary damage. First trial results have been quite encouraging, demonstrating survival of 76% for critical patients and 87% for serious patients.

In April, 2020, a total of 1325 COVID-19 cases were

reported in Cuba, with a case fatality of 4.8%. Over the next months, the technical group reviewed other experiences, adapting and improving treatment protocols, with good results. In January, 2021, 15,536 cases were registered, but case fatality had declined to 0.45%. This clearly responds to the experience accumulated in case management, reflected in the national Clinical Management Protocol, which is continually reviewed and updated.

<sup>3</sup>Venegas R et al. Péptido inmunomodulador CIGB-258 para el tratamiento de pacientes graves y críticos con la COVID-19. *Revista Cubana de Medicina Militar* [Internet]. 2020 [cited 3 Mar 2021]; 49(4). Available at: [http://www.revmedmilitar.sld.cu/index.php/mil/article/view/926/625#:~:text=EI%20CIGGB%2D258%20es%20capaz,de%2060%20kDa%20\(HSP60\).](http://www.revmedmilitar.sld.cu/index.php/mil/article/view/926/625#:~:text=EI%20CIGGB%2D258%20es%20capaz,de%2060%20kDa%20(HSP60).)



Photo: Cubadebate

## PROGRESS IN CLINICAL STUDIES FOR THE FOUR CUBAN COVID-19 VACCINE CANDIDATES

August 13, 2020 is a date to remember since that day, the Finlay Vaccine Institute (IFV) announced the start of its phase 1 clinical trial for its first COVID-19 vaccine candidate, Soberana 01. That also meant that Cuba entered the select list of 30 countries—and as the first in Latin America—with their own vaccine candidates in human clinical trials, according to the World Health Organization (WHO) registry.

That began the step-by-step progress that has led to Cuba's development of four

vaccine candidates: two from IFV and two more from the Genetic Engineering and Biotechnology Center (CIGB), both highly regarded institutions nationally and internationally.

IFV was officially founded in 1991, although initially called the National Center for Meningococcal Vaccine Development in the 1980s, since at the time it was dedicated to research and development of the world's first vaccine for B-group meningococcal disease. From

then on, it accumulated extensive experience formulating important vaccines for such diseases as leptospirosis, tetanus and diphtheria. It has developed a tetanus and diphtheria toxoid vaccine (in single and combination presentations), and a triple vaccine adding inactivated Bordetella pertussis cells, commonly called DTwP. In addition, the Institute's current director, Vicente Vérez Bencomo PhD, also led the team that obtained the world's first synthetic vaccine for

## BASIC CONCEPTS CONCERNING VACCINES

**SAFETY:** Process involving production, storage and manipulation of vaccines that ensures greatest vaccine efficacy with a minimum of adverse reactions. Vaccine safety is essential for immunization programs.[1]

**REACTOGENICITY:** A vaccine's capacity to provoke adverse reactions. Reactogenicity studies evaluate adverse events following immunization, and if these are directly related to the vaccine or are coincidental.

**IMMUNOGENICITY:** A vaccine's capacity to induce an immune response, whether measured by antibodies (humoral immunity) or y T cells (cellular immunity). Clinical studies on immunogenicity measure the immune response induced by a vaccine.

**EFFICACY:** The direct effect of a vaccine measured in randomized clinical trials prior to licensing (that is, under optimal conditions). Vaccine efficacy is the percentage reduction of disease in a vaccinated group of people compared to an unvaccinated group, and is the measure used to describe how well a vaccine prevents disease.[2]

**EFFECTIVENESS:** The probability that a vaccine, when used in the field under routine vaccination circumstances (real-world as opposed to optimal conditions) confers immunity in a population. A vaccine's capacity to prevent disease, expressed as a percent.[3]

Haemophilus influenzae type b (Hib) in 2003.

All this has made it possible for IFV to assume development of synthetic vaccines, such as the one for pneumococcal disease, which is in advanced phases of clinical evaluation.

IFV also provides an example of collaboration among Cuba's scientific institutions: it supplies purified, concentrated antigens of diphtheria toxoid, tetanus, and inactivated suspensions of Bordetella pertussis for CICB's production of its pentavalent vaccine, incorporating two more antigens (for hepatitis B and Hib).[4]

CIGB, inaugurated in 1986, is the flagship of Cuban

biotechnology. One of its main achievements was obtaining a recombinant hepatitis B (HBV) vaccine, included in Cuba's National Immunization Program since 1991. Both HBV and Hib vaccines are single vaccines.

Thanks to these two institutions' accumulated experience, 8 of the 12 vaccines now included in the National Immunization Program are domestically produced.

The four Cuban vaccine candidates for COVID-19 use the protein involved in the receptor-binding domain (RBD). They use antigen subunits recognized by the human immune system, and are thus known as subunit vaccines.[5]

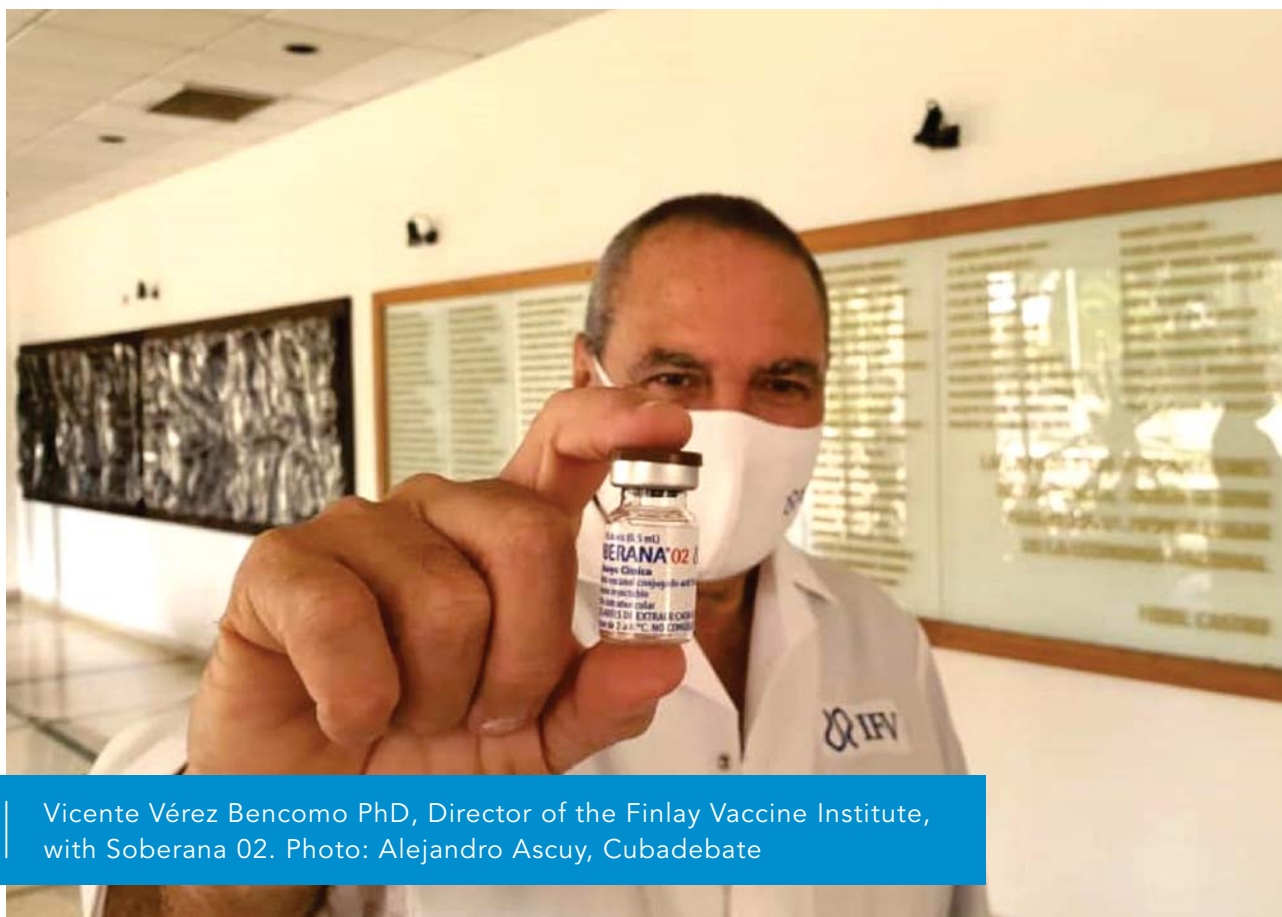
Soberana 01 and Soberana 02 are the vaccine candidates developed by IFV, while CIGB has its Abdala (CIGB 66) and Mambisa (CIGB 669) in clinical trials.

### FINLAY VACCINE INSTITUTE (IFV)

**Soberana 01** began phase 1 clinical trials in August, 2020. Based on the novel coronavirus RBD antigen, it is produced with mammalian cells and its formula also contains meningococcal B outer membrane vesicles plus aluminum hydroxide as an adjuvant. About 130 volunteers participated in phases 1 and 2, which tested five different formulations of the vaccine.

All received 2 doses on days 0 and 28. The vaccine candidate was shown to be safe, and the





Vicente Vérez Bencomo PhD, Director of the Finlay Vaccine Institute, with Soberana 02. Photo: Alejandro Ascuy, Cubadebate

only adverse events were reported were those common to any vaccine administration. The first results observed during the trial led to a modification that involved application of a third dose as a booster to one of the three groups included in the study. With this additional dose, improved response in antibody titers was achieved, a finding that prompted application of the booster to the other two groups in the trial.

In November 2020, a new clinical trial was registered, called Soberana 01B, to evaluate safety and reactogenicity, as well as to explore immunogenicity of this vaccine candidate in persons who had already suffered mild or asymptomatic COVID-19, that is, in convalescent patients. A single dose was administered to 60 persons, aimed at generating a good antibody response and thus protection

for those who had already been affected by this novel coronavirus. With the results in hand, IFV recently announced a fifth vaccine candidate, Soberana Plus, for COVID-19 convalescent patients.

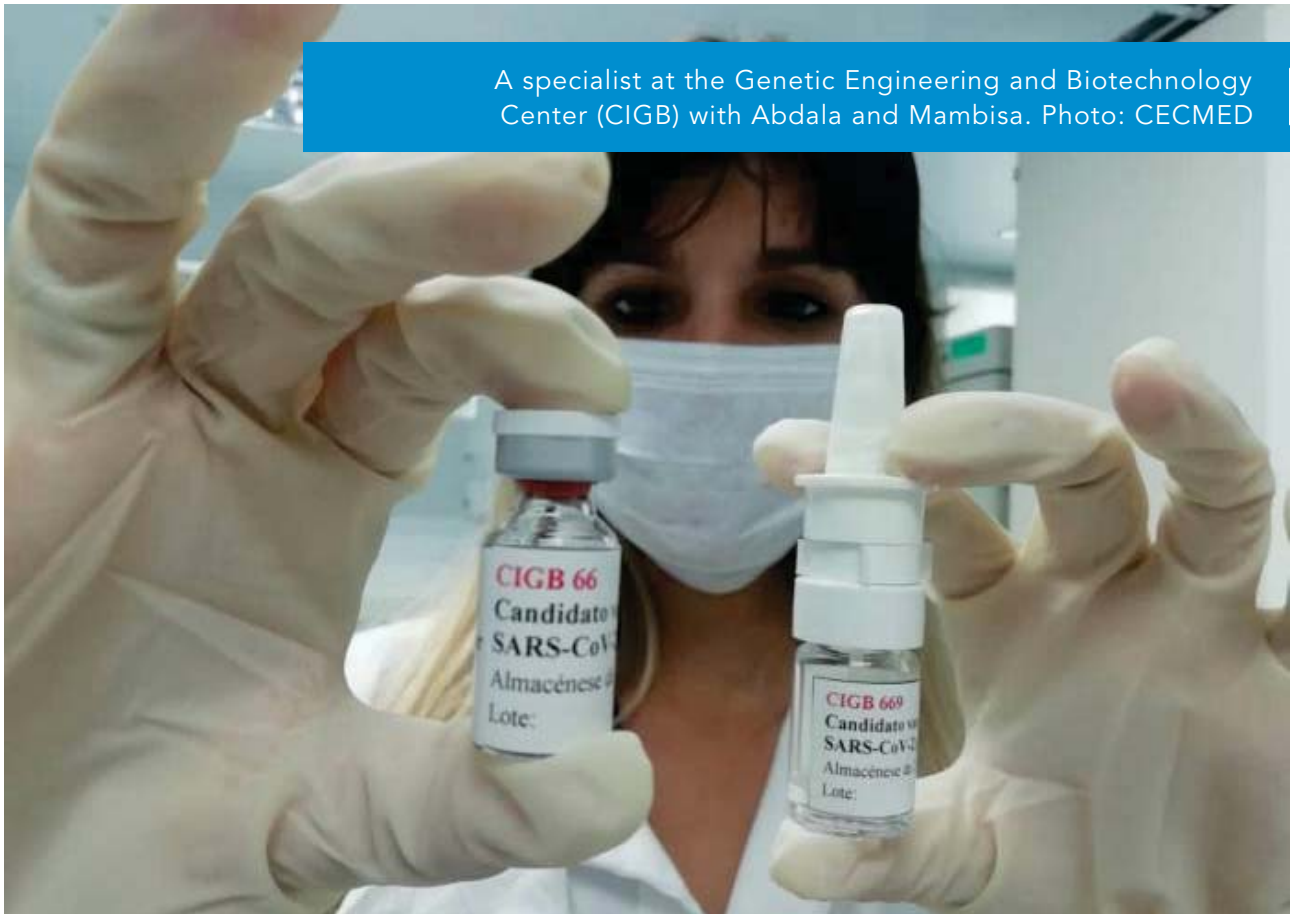
Researchers are now preparing the dossier of Soberana 01 phase 1 results for submission to the national regulatory agency, the Center for State Control of Medicines and Medical Devices (CECMED). If results are favorable, a phase 2 study is expected to begin in Cienfuegos Province in the coming weeks in 700 volunteers.

**Soberana 02** is a conjugate vaccine that combines the same SARS-CoV-2 RBD antigen with tetanus toxoid. After successfully completing preclinical studies, CECMED authorized a phase 1 trial on October 29, 2020. The trial included 40 healthy

volunteers between the aged 19–59 years, divided into 2 groups, which received different formulations of the vaccine candidate (high- and low-dose). Preliminary results showed the high-dose formula provoked a strong immune response, just one week after first application. This permitted overlapping of trial phases, leading researchers to propose phases 2a and 2b.

This second period of clinical trials began on December 22, 2020, and meant that Soberana 02 was the first Latin American vaccine candidate to reach this stage of development. Phase 2a included some 100 participants, with an expanded age range that included male and female volunteers up to 80 years of age. On January 18, 2021, phase 2b was begun at 2 Havana clinical sites, with some 800 volunteers (100 of

A specialist at the Genetic Engineering and Biotechnology Center (CIGB) with Abdala and Mambisa. Photo: CECMED



whom received a placebo). On March 3, 2021, CECMED authorized a phase 3 clinical trial for the Soberana 02 vaccine candidate, based on evidence from preclinical studies, as well as phase 1 results and preliminary results from phase 2 trials. The IFV research team explained that 44,010 volunteers in Havana will be included, divided into 3 groups: one receiving 2 doses, another receiving a placebo, and a third receiving 2 doses plus a booster consisting of a Soberana 01 formula.

This phase 3 trial will be carried out at 47 clinical sites distributed in 8 of the capital's municipalities, with the accompanying challenges for organization and supervision. Health authorities have also said that phase 3 studies could be pursued in other countries to broaden the scope of research and ensure better consistency of results.

On February 10, the biopharmaceutical industry announced production of the first lot of 150,000 vials of Soberana 02, and more recently that it was scaling up production at BioCen (National Biopreparations Center), another entity belonging to BioCubaFarma, in its plant usually dedicated to production of parenteral formulations. Large-scale production is designed to provide sufficient doses to carry out the phase 3 trial, and to reach 1 million doses by April.

IFV also announced plans to begin the first phase 1/2 clinical trial in pediatric population (5–18 years old) with Soberana 02 in the coming weeks.

#### GENETIC ENGINEERING AND BIOTECHNOLOGY CENTER (CIGB)

CIGB's strategy led to development of two

candidates, based on the RBD protein, both recombinant vaccines in yeast cells. This is a technology already widely used in Cuba and the world to obtain subunit vaccines. On December 7, 2020, phase 1 clinical trials were begun for both candidates.

Commonly known as **Abdala**, the CIGB 66 vaccine candidate is formulated from the protein's RBD, with aluminum hydroxide as adjuvant, for intramuscular administration. Its clinical evaluation began at the Saturnino Lora Provincial Clinical–Surgical Teaching Hospital in Santiago de Cuba, and the phase 1 study included 132 volunteers aged 19–54 years divided into 6 groups, which received 3 doses of 2 formulations with different concentrations: 25 and 50 micrograms (mcg). Its administration used 2 schemes for the 3 doses: a short-course cycle at 0, 14 and



Development of the Soberana 02 vaccine candidate.  
Photo: Alejandro Ascuy, Cubadebate

28 days; the other a long-course cycle at 0, 28 and 56 days.

First results indicated only minimal and mild adverse effects reported for both formulations used in the trial. Immune response measured about day 42 in short-course participants indicated satisfactory immunogenicity, allowing start of phase 2 to be expedited, while concluding phase 1 of the long-course group.

On February 1, phase 2 was started with 660 volunteers (19–80 years old), including those receiving a placebo. Results of the randomized double-blind trial are being assessed by an independent committee charged with evaluating clinical trials. Its report of results is expected in the coming days, and work on a phase 3 trial has started, a study slated to begin by the end of March.

Abdala's phase 3 study is expected to include some 42,000 volunteers (30,000 in Santiago de Cuba and 12,000 in Guantánamo) who will be immunized at 20 clinical sites in the provinces' capital cities. BioCubaFarma has already initiated large-scale production of the candidate for this study at the Aica Laboratories in Havana. Its directors note that the industry has experience producing pharmaceuticals according to good manufacturing practices and has sufficient installed capacities with the technology needed to produce more than 100,000 vials per day.

The second candidate, known as **Mambisa**, is CIGB 669, a formula based on the same protein RBD, plus the antigen of the nucleocapsid of hepatitis B, intranasally administered. Phase 1 and 2 clinical trials were carried out at the National Toxicology

Center (CENATOX) in Havana. These studies aim to evaluate safety and immunogenicity in Mambisa alone and in combination with Abdala.

The 88 volunteers (19–54 years) were divided into 4 groups that received 3 doses of different combinations of the vaccine candidates: 2 groups received Mambisa alone, intranasally; and 2 groups first received 1 intramuscular dose of Abdala, followed by 2 intranasal doses of Mambisa. The study evaluates an administration short course of 0, 14 and 28 days, as well as a long course of 0, 28 and 56 days.

In this first clinical phase only mild adverse events were observed. Researchers are now evaluating immune response and preparing the dossier of results for presentation to CECMED, in order to proceed to phase 2 trials for Mambisa's selected dosage and immunization





Development of the Soberana 02 vaccine candidate.  
Photo: Alejandro Ascuy, Cubadebate

schemes. At the same time, consideration is being given to study its use in convalescent patients.

### SCIENTIFIC RIGOR MAINTAINED

Cuba's experience in vaccine development—as well as the strength of its regulatory system that is a reference for the Americas Region—has facilitated accelerated progress towards clinical trials implementation, even overlapping some phases in consideration of the urgency imposed by the pandemic.

Nonetheless, scientific rigor and fulfillment of all regulatory requirements have been a priority, never sacrificed. Based on recommendations by the Pan American Health Organization and the World Health Organization (PAHO/WHO), a centralized joint committee (Comité Centralizado Adjunto) was

established to evaluate the clinical studies for the Cuban COVID-19 vaccine candidates, including bioethical aspects. All current and future clinical trials are being registered in the Cuban Public Registry of Clinical Trials (rpcec.sld.cu), a WHO Primary Registry (<https://www.who.int/clinical-trials-registry-platform/network/primary-registries>).

The regulatory agency CECMED has approved each of the trials and inspected clinical sites for phases 1 and 2. Accordingly, it is designing follow-up work on phase 3 of both Soberana 02 and Abdala, including inspections of the entire manufacturing process.

<sup>1</sup> World Health Organization (WHO). [Internet]. Covid-19 vaccines: safety surveillance manual. Geneva: WHO; 2020 [updated 22 Dec 2020; cited 5 Mar 2021]. Available at: <https://>

[www.who.int/publications/item/10665338400](https://www.who.int/publications/item/10665338400)

<sup>2</sup> Hanquet G et al. Vaccine effects and impact of vaccination programmes in post-licensure studies. *Vaccine*. 2013; 31(48):5634- 5642.

<sup>3</sup> *Ibídem*

<sup>4</sup> Organización Panamericana de la Salud (OPS). *Experiencia cubana en la producción local de medicamentos, transferencia de tecnologías y mejoramiento en el acceso a la salud*. 2ª edición. Delgado BM, Uramis E, Fajardo EM, editores. Havana: Editorial Ciencias Médicas; 2019.

<sup>5</sup> Organización Mundial de la Salud (OMS). [Internet]. Los distintos tipos de vacunas que existen. Ginebra: OMS; 2021 [updated 12 Jan 2021; cited 5 Mar 2021]. Available at: <https://www.who.int/es/newsroom/featurestories/detail/the-racefor-a-covid-19-vaccineexplained>

By: Eng. Ileana Fleitas Estévez

# CONFRONTING COVID-19 IN CUBA: A VIEW FROM THE NATIONAL MATERNAL-CHILD PROGRAM

The Cuban Ministry of Public Health's Maternal-Child Department, together with the national expert groups and scientific societies devoted to neonatology, pediatrics, and obstetrics and gynecology, have followed the evolution of the novel coronavirus since the first reports of atypical pneumonia in Wuhan, China, and have devoted themselves to preparing the country's health services to properly manage people affected by COVID-19.

This was a daunting task, considering the initial dearth of information available on COVID-19 in these population groups. The premise was that children were less susceptible to the virus—both less likely to catch it, and more likely to be asymptomatic if they were infected. This prompted strategies that included further study of the disease; organization of care for children, adolescents, and pregnant women affected by COVID-19; and training and preparation of personnel involved in patient care.

The Cuban health sector, responsible for leading the fight against the virus, designed an integrative epidemiological and clinical care plan using the latest available science, which has guided action to date.

Cuba's national COVID-19 Clinical Management Protocols are both dialectic and robust, focused on providing individualized care. Services have been established at all levels, from

family doctor offices to intensive care units (ICUs). That first pillar of care, located in the community, is in the hands of family doctors and nurses, whose primary aim has been prevention. They encourage families to stay home and seek medical care promptly at the first appearance of symptoms.

Both maternal-child services and sexual and reproductive health services have been considered essential during the pandemic, and reorganization strategies protect them. As such, they have continued to function, and intersectoral protocols were designed guaranteeing patients' safe and timely arrival.

Clinical-epidemiological triage was established in all pediatric emergency services, in order to both minimize subjectivity and to classify patients as either suspected cases or contacts of confirmed or suspected cases, when appropriate. If thus determined, these pediatric patients were hospitalized, initiating the established action protocol that included RT-PCR SARS-CoV-2 confirmation.

At the same time, "ICUs without walls" were established and in the red zones, teams included pediatricians, critical care doctors, nurses and paramedics with proven pediatric competencies. Multidisciplinary teams guaranteed adherence to therapeutic protocols and timely diagnosis, avoiding late arrivals to the ICU.

An alert on multisystem inflammatory syndrome in children (MIS-C) was launched in April 2020. This alert mobilized health authorities and prompted preparatory videoconferences. A MIS-C surveillance system was established, allowing timely detection of a case in July 2020, which evolved satisfactorily after compliance with medical protocols. Children with MIS-C have polyserositis, myocarditis, pericarditis, coronaritis and various forms of vasculitis. Some also experience significant respiratory compromise.

Guidelines were also established for convalescent consultations, to be carried out at the primary care level at family doctor-and-nurse offices with further comprehensive evaluation and assessment by related specialists at the secondary care level. Such consultations have resulted in the diagnosis of myocardial and pericardial alterations, pulmonary fibrosis and psychological alterations. It should be noted that innovative Cuban biotechnology products, especially interferon and Jusvinza, have been quite valuable in the treatment and satisfactory evolution of most cases.

Protocols for the care of pregnant and postpartum women were drawn up using what little evidence was available at the beginning of the pandemic. Integrated



Cuban girls and boys  
in pandemic times.

into the national COVID-19 Clinical Management Protocol, they have been enriched and updated as more information has become available, incorporating transdisciplinary actions that cover the entire scope of the disease, ranging from prevention to convalescent patient care. Pregnant and postpartum women were considered vulnerable groups, among those more likely to fall ill and develop complications.

Suspected and confirmed COVID-19 obstetric patients have been treated in regional hospitals, where specialized human resources, equipment, supplies and medicines were made available for their care, including that related to possible deliveries or obstetric complications. The regionalized system has proven to be a strength in the Cuban COVID-19 response, as it allows patients to be seen at specialized institutions, organizing priorities according to the demands of the

pandemic without affecting care required by other health issues.

The first pediatric case in Cuba was diagnosed on March 21, 2020 in Granma Province. By the end of that year, 1279 pediatric patients were confirmed positive for the virus. Most were between 15 and 18 years old. By the end of 2020, 90% of pediatric COVID-19 patients in Cuba had recovered.

The first COVID-19-positive pregnant woman in Cuba was diagnosed on April 1, 2020. By the end of 2020, 95 pregnant women, 17 postpartum women and 2 patients who underwent operations for ectopic pregnancies had been diagnosed. All these patients recovered without requiring intensive care or ventilatory support, and all had satisfactory clinical evolution.

Throughout the pandemic, health protocols have paid

special attention to care for pregnant and postpartum women and pediatric patients, while at the same time guaranteeing essential services so as not to lose advances made by the National Maternal-Child Health Program (PAMI). The fact that no deaths have been reported in these populations is noteworthy. The Program has received collaboration from UN agencies such as the Pan American Health Organization/World Health Organization (PAHO/WHO), the UN Population Fund (UNFPA) and the UN Children's Fund (UNICEF), which have provided personal protective equipment, contraceptives, medicines, and other essential supplies and technical expertise.

By: *Dr. Lissette del Rosario López González MS,*  
*Dr. Mercedes Piloto Padrón*  
*and Dr. Duniesky Cintra*





Photo: Cubaperiodistas

## CUBA'S INTERNATIONAL COOPERATION: EXPANDING SOLIDARITY TO CONFRONT COVID-19

WHO's Director-General declared the novel coronavirus a public health emergency of international concern on January 30, 2020, and a pandemic on March 11 the same year. From then on, the Cuban government began receiving requests for collaboration from various countries interested in receiving help from Cuban health professionals to confront the pandemic. The Ministry of Public Health (MINSAP) evaluated the requests and started organizing teams of the Henry Reeve Contingent to provide assistance to other nations.

The Henry Reeve Emergency Medical Contingent

(officially, the 'Henry Reeve International Contingent of Physicians Specializing in Disaster Situations and Serious Epidemics') was created on September 19, 2005, aimed at providing assistance to countries requesting cooperation. Its members are health professionals in different fields, specially trained to work in situations of natural disasters or health emergencies.

Since its creation and before the pandemic, the Contingent had sent 28 teams to 22 countries, mobilizing 7950 health professionals to confront the effects of 16 floods, 8 hurricanes, 8 earthquakes and 4 epidemics.

Their greatest challenge came with the 2014 Ebola outbreaks in Guinea, Sierra Leone and Liberia—West African countries affected by the disease for the first time. In recognition of its work there, WHO awarded the Henry Reeve Contingent the Dr. Lee Jong-Wook Memorial Prize for Public Health during the 2017 World Health Assembly.

Before providing services abroad, team members receive specialized training on infectious diseases at the Pedro Kourí Tropical Medicine Institute (IPK). Over the last few months, given the teams' COVID-19 mission, training has focused on the disease, emphasizing prevention measures and the

necessary protocols. The teams created to address the pandemic are composed primarily of physicians specializing in family medicine, critical care and epidemiology. They are joined by nurses specializing in emergency situations and allied health workers. Some of these teams have been dispatched to countries where Cuban medical collaborators are already posted—more than 59,000 Cuban health professionals serving in 28 countries—bolstering this cooperation to confront the COVID-19 pandemic.

To address the pandemic, 56 brigades have been mobilized to 40 countries. Many of these teams have already returned to Cuba so that by February, 2021, 25 were active, with 2500 members. A

total of 4941 Cuban health professionals have served abroad during the pandemic, 2821 of them women, providing care for some 1,090,799 people in various regions: Europe; Latin America and the Caribbean; and Africa and the Mideast.

In Europe, for the first time in the history of Cuban medical cooperation, teams were sent to Italy and Andorra. In Italy, professionals from that nation were joined by two teams of Cuban professionals, one in Lombardy and the other in Piemonte. Those dispatched to Lombardy reported 5000 patient-care visits by physicians and 3668 by nurses. They worked in the region's main hospital as well as in a field hospital and an assisted-living facility for older adults. In each, they

cared for people with COVID-19.

The Contingent also traveled to the Principality of Andorra and Azerbaijan, as well as the British Overseas Territories of Anguilla, Turks and Caicos Islands, British Virgin Islands and Montserrat; and the French Department of Martinique.

In the Mideast, health professionals were dispatched to Kuwait, United Arab Emirates and Qatar. In Qatar, two teams joined 500 Cuban health professionals already staffing the Cuban Hospital of Dukhan, which was converted into the main hospital for care of COVID-19 patients. After 8 months of difficult work, the teams returned, reporting some 270,342 patient-care visits by



Cuban medical team dispatched to collaborate in Barbados. Photo: Cubadebate



# TEAMS OF THE HENRY REEVE CONTINGENT:

## LATIN AMERICA:



**Honduras**



**Mexico**



**Nicaragua**



**Panama**



**Peru**



**Suriname**



**Venezuela**

## CARIBBEAN



**Anguilla**



**Antigua and Barbuda**



**Barbados**



**Belize**



**Dominica**



**Grenada**



**Haiti**



**Turks and Caicos Islands**



**British Virgin Islands**



**Jamaica**



**Martinique**



**Montserrat**



**St. Kitts and Nevis**



**St. Vincent and the Grenadines**



**St. Lucia**



**Trinidad and Tobago**



## AFRICA



physicians and 338,772 by nurses.

Cuban teams have been sent to the Caribbean: to Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Haiti, Jamaica, St. Kitts and Nevis, St. Vincent and the Grenadines, St. Lucia, Suriname, and Trinidad and Tobago. The latter country received the Contingent's first-ever all-women team, composed of 11 university-trained nurses, 45% of whom had already served abroad.

Mexico and three Central American countries—Nicaragua, Honduras and Mexico—also received Cuban medical collaboration. Noteworthy is the fact that on August 13, 2020, Honduras's National Congress decorated the Henry Reeve Contingent with the 'Cruz de Comendador' award, citing its distinguished contribution to the population's health. Honduran physicians, who were graduates of Havana's Latin American School of Medicine (ELAM), joined the

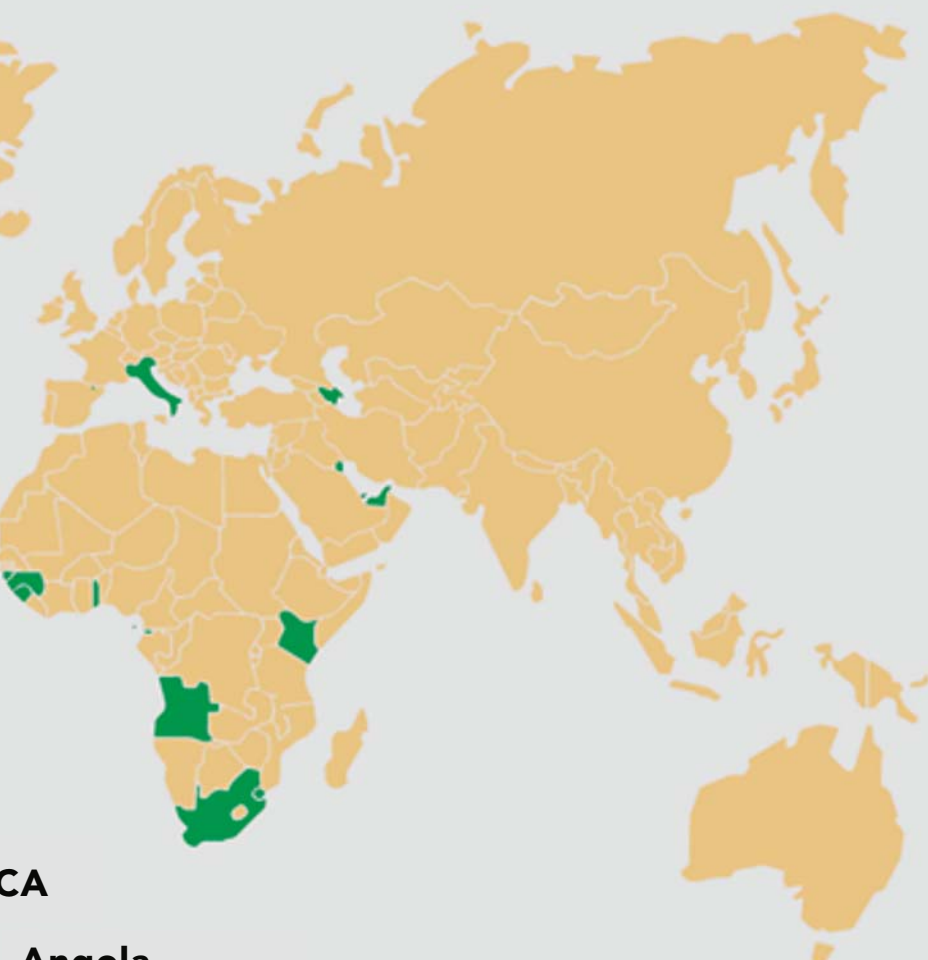
Cuban teams to confront the pandemic.

In South America, Peru and Venezuela received the Contingent. On August 20, 2020, the Cuban team received the Francisco de Miranda Order in Caracas, after providing medical services for five months to combat the pandemic.

Four teams totaling 85 health professionals served in the Peruvian regions of Ancash, Piura, Ayacucho and Moquegua. By virtue of a










# COLLABORATION TO CONFRONT COVID-19



## EUROPE AND ASIA:

-  **Azerbaijan**
-  **United Arab Emirates**
-  **Italy**
-  **Kuwait**
-  **Principality of Andorra**
-  **Qatar**

## CA

- Angola**
- Cape Verde**
- Guinea-Bissau**
- Guinea**
-  **Equatorial Guinea**
-  **Kenya**
-  **Kingdom of eSwatini**
-  **Sao Tomé and Príncipe**
-  **Sierra Leone**
-  **South Africa**
-  **Togo**

Source: MINSAP

bilateral government agreement, the Cuban specialists served alongside Peruvian professionals. In Ancash, the Cubans received thanks from the residents in the city of Huaraz, many of whom recalled the Cuban medical teams and field hospitals sent after this Andean region suffered the 1970 earthquake.

The African continent was the first to receive Cuban medical assistance 57 years ago. To address the current pandemic, Henry Reeve

Contingent teams have been sent to Angola, Cape Verde, Guinea-Bissau, Guinea, South Africa, Togo, Sao Tomé and Príncipe, Equatorial Guinea, Sierra Leone, eSwatini and Kenya.

Cuba's ability to offer medical cooperation abroad relies on university programs that have resulted in nearly half a million trained health professionals and the highest doctor-patient ratio in the Americas. During their studies, these programs foster student competencies

in international health cooperation, among populations with the greatest needs, learning about different cultures, languages and traditions and the importance of respecting them. In their encounters with health professionals from other countries, they share experiences and mutual learning in an atmosphere of respect, friendship and solidarity that accompany them throughout their professional lives.

By: *Dr. Duniesky Cintra Cala*







# PAHO/WHO COLLABORATING CENTERS' CONTRIBUTIONS TO CUBA'S COVID-19 RESPONSE

Cuban scientists and other experts have been directly involved in the country's response to the COVID-19 pandemic since it first began, turning their efforts toward developing protocols, treatments, vaccines, laboratory tests and other elements to help combat the disease. In this context, digital platforms have been developed, giving greater visibility to their work both nationally and internationally.

In the Americas, various institutions have been working to support the COVID-19 response, including coordination of international virtual events to address issues related to evidence, policies, protocols, mental health and health promotion, among others.

McMaster University in Canada co-directed the COVID-19 Evidence Network (COVID-END), guiding the preparation of rapid evidence profiles designed to help guide government decision-making during the pandemic. Brazil's Center for Studies, Research and Documentation on Healthy Cities (CEPEDOC) developed an online repository of tools, materials and publications related to COVID-19. Santander Industrial University's Proinapsa Institute in Colombia developed and led virtual academic events on diverse topics such as breastfeeding, adolescence and COVID-19; and E-MERS (Strategies for Healthy Municipalities, Environments and Ruralities)[1] and the pandemic.

In Cuba, Pan American Health Organization/World Health

Organization (PAHO/WHO) Collaborating Centers have contributed to the fight against the novel coronavirus, aiding in its prevention, diagnosis and treatment. Some of their most important activities are highlighted below.

## **PEDRO KOURÍ TROPICAL MEDICINE INSTITUTE (IPK),**

which houses both the Collaborating Center for the Study and Control of Dengue and the Collaborating Center for Tuberculosis Elimination, has devoted its laboratory resources, working groups and experts to COVID-19 research and treatment since the pandemic's start. IPK joined other health, scientific and academic institutions in preparing the National Coronavirus Prevention and Control Plan to address the novel disease, and also played a major role in establishing the Cuban network of SARS-CoV-2 diagnostic laboratories.

IPK has distinguished itself in evaluating SARS-CoV-2 serological and molecular diagnostic kits, as well as other equipment, reagents and supplies used in the pandemic response. IPK specialists and experts continue to carry out epidemiological studies involving patients with suspected COVID-19 infection and their contacts, and to explore chains of transmission. They also study the disease's behavior and have made decisive contributions to knowledge on the clinical presentation, immunology, and genetic and epigenetic aspects of COVID-19. IPK research delves into symptomatic and asymptomatic patients; examines the epidemic's prognosis, severity and

SARS-CoV-2 immunological biomarkers; and assesses the cost and social aspects of the pandemic.

IPK has provided advice at the national level on issues pertaining to biosafety, including on proper use of personal protective equipment and biosafety cabinets certified for personnel in the laboratory network. At the same time, it has continued to systematize experiences of the Cuban National Program for Prevention and Control of Tuberculosis in times of COVID-19 and to monitor possible impact of the disease on the country's plan for TB elimination.

IPK has also been responsible for training Cuban national health system personnel, including members of the Henry Reeve Medical Contingent currently fighting COVID-19 in various regions of the world.

## **THE NATIONAL MEDICAL GENETICS CENTER (CNGM)**

has undertaken national monitoring (through prenatal ultrasounds) of COVID-19-positive pregnant women and is working on the diagnosis and possible teratogenic effects of SARS-CoV-2; in addition to monitoring possible teratogenic effects of therapies used in COVID-19 disease management. Women and their infants receive follow-up care after delivery by medical genetics services offered nationwide.

CNGM also designed and executed a national research project aimed at identifying genetic risk factors influencing

COVID-19 severity in Cuban patients. The project was a cross-sectional, case-control study including Cuban patients who tested positive for the SARS-CoV-2 virus who had been discharged and were free of the disease, as well as any first-degree relatives who were living in the same epidemiological 'bubble' but who did not become ill and whose RT-PCR tests came back negative.

**THE NATIONAL ENDOCRINOLOGY INSTITUTE'S CENTER FOR HUMAN REPRODUCTION RESEARCH** conducted a review of COVID-19's effects on sexual and reproductive health that covered general aspects of the disease, as well as gender and health system services during the pandemic. The Center also developed two research protocols for COVID-19 –positive Cuban patients: one on the sexual and reproductive effects of COVID-19 convalescent women, and the other on quality of semen from men affected by the virus.

In addition, Center experts joined WHO's Sexual Health and Reproductive Cancers (SRC) group in Geneva to carry out a systematic review entitled "Presence and persistence of SARS-CoV-2."

**CUBA'S NATIONAL MEDICAL SCIENCES INFORMATION CENTER (CNICM/INFOMED)** created the Coronavirus Infections Portal (<https://temas.sld.cu/coronavirus/covid-19/>) and developed an application for mobile devices that provides current, reliable information on COVID-19. Also, with the aim of monitoring, compiling, analyzing and visualizing scientific and technological information published worldwide on the disease, they designed and implemented a Scientific Observatory (<https://temas.sld.cu/coronavirus/covid-19/observatorio-cientifico/>)

as well as a COVID-19 Publication Repository (<http://covid19.sld.cu/>).

Additionally, they adapted Cuba's SORMAS Epidemic Management Software to aid in the surveillance, analysis and management of epidemic outbreak response. This software fully integrates these processes, facilitating multidirectional, independent work flows for each illness, based on cases.

**THE COLLABORATING CENTER IN PUBLIC HEALTH AND AGING AT THE RESEARCH CENTER ON AGING, LONGEVITY AND HEALTH (CITED)** prepared documents for managing older-adult patients, for strategies in nursing homes and therapies in Urgent Care Units, as well as informational materials for caregivers and older adults confined at home. CITED personnel joined other experts to develop and update clinical management and follow-up protocols for convalescent patients aged 60 years and older, including those who had developed severe forms of COVID-19.

**GUSTAVO ALDEREGUÍA LIMA HOSPITAL'S COLLABORATING CENTER IN HOSPITAL MANAGEMENT, ORGANIZATION AND QUALITY** has carried out training and continuing education initiatives for health workers at different levels of care. As part of its leadership in health services organization, the Collaborating Center has supported hospitals and other institutions in healthcare delivery, helping to guarantee early identification, adequate isolation, timely confirmation and best treatment of COVID-19 patients. This has included advising on reorganization of emergency medical services to facilitate

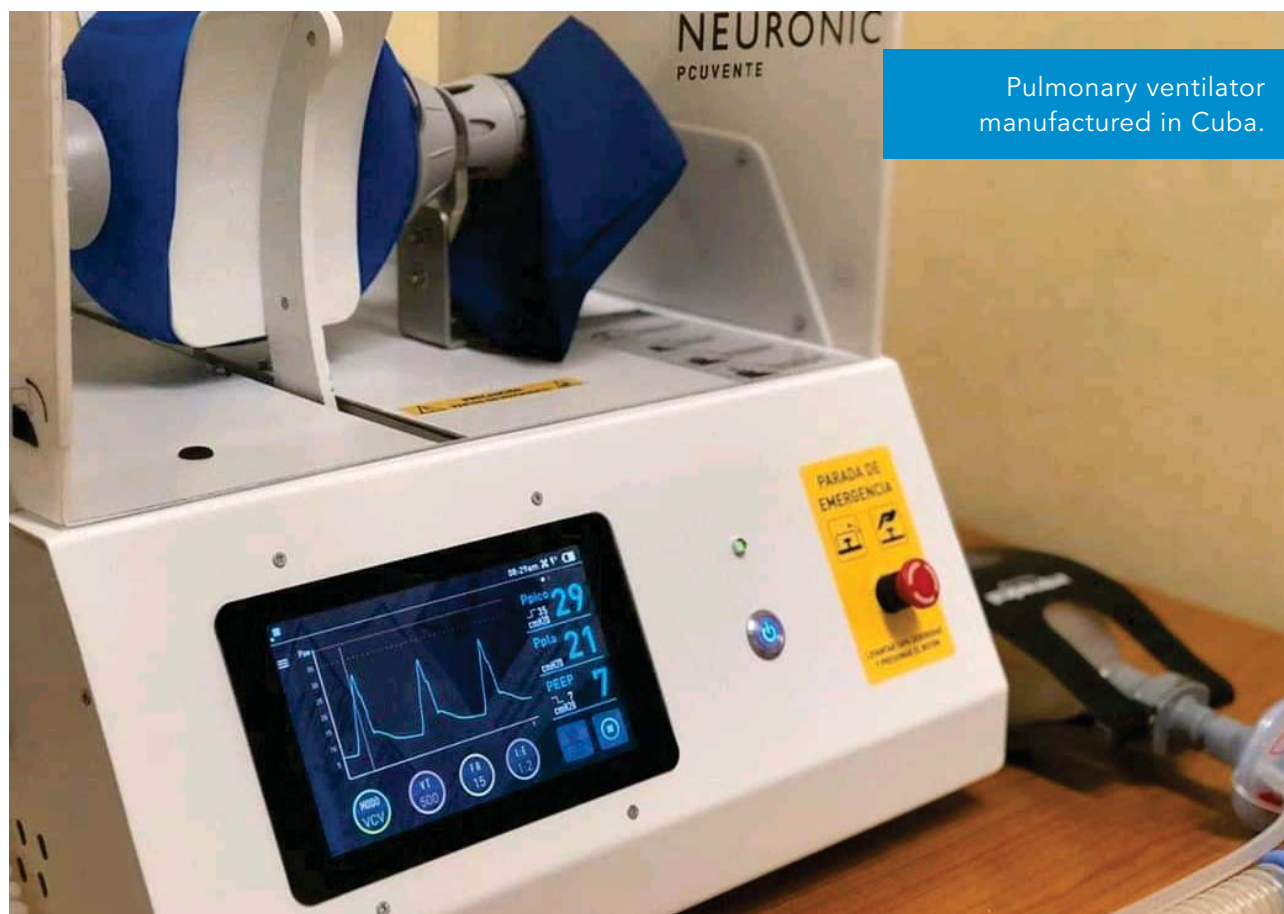
COVID-19 patient flow that avoids contact with other patients and health personnel, plus training of health workers in proper use of personal protective equipment, of disinfectant solutions for cleaning hands, surfaces and fomites, and of sodium hypochlorite solutions for foot traffic at all facility entrances and exits.

During the pandemic, the Collaborating Center's experts have thus far authored seven publications (four national and three international) and have continued supporting hospital management in other Cuban provinces.

**THE COLLABORATING CENTER FOR THE REGULATION OF HEALTH TECHNOLOGIES AT CUBA'S CENTER FOR STATE CONTROL OF MEDICINES AND MEDICAL DEVICES (CECMED)** has participated actively with other national regulatory authorities in the region in seminars and virtual meetings convened by PAHO and WHO for regulatory updates and technical discussion on issues relevant to the evolution of the COVID-19 pandemic.

CECMED participated in the Ventilator Working Group where regulatory and management issues on equipment use were discussed and information provided on national strategies for ventilator development and production, as well as use of emergency ventilators. In its role as part of PAHO's Regional Working Group on Medical Devices, CECMED's Collaborating Center also addressed the prolonged use, reuse and reprocessing of N-95 masks and other equipment, given shortages that arose during the pandemic. CECMED developed regulations and procedures establishing emergency-use authorizations





Pulmonary ventilator  
manufactured in Cuba.

for In Vitro Diagnostic Medical Devices (IVDs), ventilators and ultraviolet lamps, and established transitory regulations extending the times during which certifications granted remain valid.

At the same, CECMED's Collaborating Center has actively and systematically maintained regulatory support for national manufacturers developing medical equipment and devices in response to the pandemic. As of August 2020, six registrations had been granted for IVDs (four domestic and two imported), and authorizations issued for use and marketing of 80 oxygen concentrators manufactured in China. They also evaluated emergency-use authorization requests for manufacture of germicidal ultraviolet lamps, manufacture of PCUVENTE lung ventilators; and production of swabs used in RT-PCR sampling. They are currently supporting several projects, notably one to

develop a continuous positive airway pressure (CPAP) device and an automatic resuscitator.

CECMED also actively monitors use of medical devices used in priority health programs, including those for care of persons with confirmed and suspected COVID-19 and their contacts. Since the pandemic's beginning, 15 risk communications, 10 manufacturer communications and 3 safety alerts have been issued, allowing timely dissemination of information related to the safe use of medical devices for the Cuban health system. PAHO's Regional Working Group on Medical Devices has highlighted the importance of the role played by the Report Exchange Program on Medical Devices between National Regulatory Authorities in the Region of the Americas (REDMA), developed at the Collaborating Center, for sharing information on adverse events related to the use of

medical devices during the COVID-19 pandemic. As the competent authority charged with evaluating and authorizing clinical trials in Cuba, CECMED designed and established prioritized, fast-track evaluation procedures for applications submitted related to COVID-19. To evaluate Cuban vaccine candidates, CECMED established a multidisciplinary team of its specialists—including pharmacists, physicians, biochemists, microbiologists and veterinarians, all with extensive experience in vaccine development—which managed to speed up the evaluation process without sacrificing scientific and technical rigor.

CECMED also carries out inspections at vaccine candidate clinical study sites, ensuring that data is both impartial and of high quality, and that results obtained are reliable, credible and acceptable for both Cuba and abroad.

By: *Roxana González López MS*



PAHO Director  
Dr. Carissa F. Etienne

## PAHO/WHO COVID-19 RESPONSE: CRISIS COMMUNICATION

The development of information and communications technologies, as well as the appearance of new, more interactive platforms, has greatly modified communication processes. Currently, communication does not always flow linearly from a sender to a receiver, or even from an issuer to an audience. They occur rather between different actors in ways that could be characterized as chaotic or disorderly. This has also related to modifications in

communication actors' roles. It is no longer possible to speak absolutely of transmitters or receivers because in practice these functions alternate: people consume content, but they also produce it.

In this context, what has been termed an 'infodemic' has thrived, alongside false or 'fake' news. According to the "COVID-19 Glossary: Outbreaks and Epidemics. A resource for journalists and communicators,"<sup>1</sup> prepared by the Pan American Health

Organization (PAHO), an infodemic is "an overabundance of information on a problem that makes it hard to find trustworthy sources and reliable guidance." False, or 'fake' news constitutes untrue content that is disseminated through various channels to purposely misinform.

Unfortunately, these communications phenomena have accompanied the COVID-19 pandemic since its beginning. This problem has been exacerbated by the

daily flood of information on COVID-19, much of which comes to people who lack the necessary elements to critically evaluate information on a novel virus that is affecting the entire world at the same time. Accordingly, a lot of inaccurate content has circulated during this information avalanche.

Due to the above issues, and given that information and communications management must be an important part of the response to any crisis situation, PAHO leaders and communicators have worked intensely on targeted communication strategies designed to provide clear and precise information to different audiences, clarifying issues of public interest.

For example, PAHO has provided accurate information and reliable guidance through the organization's official social networks, part of which has involved separating myths from reality. It has also promoted training and updating activities, including seminars and virtual exchanges aimed at helping public health communications professionals manage the infodemic and the circulating rumors. Part of this initiative has involved publishing technical papers with useful recommendations.

At the same time, various informational sessions have been organized by leaders and experts from PAHO, WHO and other prestigious organizations with long scientific track records. Among these, the weekly "Ask an Expert" session stands out, in which people have been able to address their concerns to specialists at the highest levels; as well as the weekly information session with PAHO Director, Dr. Carissa F. Etienne. Other

members of PAHO's leadership team also appear at these sessions for the region's media, including Assistant Director, Dr. Jarbas Barbosa.

These sessions have been held since COVID-19 was first declared a pandemic in March 2020. To date, more than 40 have been organized, making it possible to delve into multiple issues of public interest related to the novel coronavirus, including the effects it has had on the Americas and the rest of the world and useful measures for its prevention and control. This is in addition to offering consistent updates on the effects of the pandemic on the region: case numbers, deaths, countries' existing capacities for medical care and circulating COVID-19 variants, among other aspects related to the current and evolving epidemiological situation. Much emphasis has been placed on public health actions needed to mitigate transmission of the virus.

Other socioeconomic and health problems have also been addressed, including the need to organize services to continue caring for chronic disease patients; the importance of addressing mental health during the pandemic, coupled with the urgency of strategies for offering psychological care; the effects of the pandemic on certain population sectors, such as women, Indigenous peoples and Afro-descendants; and steps taken to mobilize resources needed for adequate response and to boost medical supplies during the emergency.

Lately, the information sessions have devoted a good part of their exchanges to the vaccination campaigns now beginning in several countries of the Americas.

Some of the most discussed topics underscore the priority that should be given to the region, as the pandemic's epicenter; the need for global and regional cooperation to facilitate access; the call for nations to prepare for vaccination and to reduce gaps in vaccine coverage in each territory; as well as detailed information about the COVAX mechanism and plans established for vaccine acquisition.

"Expanding equitable access to COVID-19 vaccines in the Americas must be a global priority," said Dr. Etienne on March 3, 2021. "Wealthy countries are rolling out vaccines, while many nations have yet to receive a single dose. This disparity harms our principles of solidarity. But more than that, it's a self-defeating strategy. As long as COVID-19 endures in one part of the world, the rest of the world can never be safe."

In relation to vaccine deliveries through COVAX, she commented: "As vaccine production increases, there will be more shipments to the region month after month. In the short term, doses will continue to be limited, and we must use them wisely, prioritizing those at greatest risk, such as our healthcare workers, older adults and people with pre-existing conditions," she concluded.

Dr. Jarbas Barbosa has also provided detailed information on COVAX, a coalition led by WHO, the Global Alliance for Vaccines and Immunizations (GAVI) and the Coalition for Epidemic Preparedness Innovation (CEPI), in an effort to ensure equitable access to COVID-19 vaccines. "The Pan American Health Organization has provided technical support to the Member States to support them in each phase of their participation in the





PAHO Assistant Director  
Dr. Jarbas Barbosa

COVAX Mechanism and in preparation of their national COVID-19 vaccination plans," he stated in a press release dated January 31, 2021.

Under COVAX, vaccines will be donated to one group of countries, while another will purchase them. All these nations have signed agreements with COVAX to formalize their inclusion in the program, which is designed to cover 20% of the world's population, with priority given to healthcare workers and persons with risk factors.

A prerequisite for accessing the COVAX platform is that the vaccines to be used must be prequalified by WHO. This

means that vaccine candidates must have completed clinical research phases; reports have been prepared on their safety, immune response and efficacy for protection against the virus; and these reports have been evaluated by the national regulatory agency, which then can give authorization for use in emergency situations.

All these documents and processes are thoroughly reviewed by WHO's prequalification team, which, after detailed consultations and evaluations, decides if the vaccines are accepted. To date this has only happened with the Pfizer and AstraZeneca vaccines,

including the ones produced in India and South Korea. There are a number of other vaccine candidates awaiting this rigorous approval process. During March, 2021, four countries in the Americas will begin receiving some vaccines and delivery will continue throughout the year until the predefined agreements are fulfilled.

<sup>1</sup> Pan American Health Organization (PAHO). COVID-19 Glossary: Outbreaks and Epidemics. A resource for journalists and communicators [Internet]. Available at: <https://www.paho.org/en/documents/covid-19-glossary-outbreaks-and-epidemics-resource-journalists-and-communicators>

By: Tania del Pino Más PhD





## BENEFITS OF A *CÚRCUMA LONGA* PROJECT DURING THE PANDEMIC

Tania Valdés González heads Calixto García University Hospital's Theragnostics Laboratory and is passionate about natural, traditional and complementary medicine; especially the use of *Cúrcuma longa* (Curcuma) in benefitting human health.

This intelligent, motivated professional is currently a senior researcher at Cuba's Ministry of Public Health (MINSAP), where she is leading two interesting projects: "Nutraceutical and Phytopharmaceutical Development of *Cúrcuma longa*" and "Developing *Cúrcuma longa* Nutritional Supplements: Evaluating *Cúrcuma longa*'s Preventative Effects on Cognitive Deterioration and Infectious Respiratory Disease in Geriatric Patients."

The first of these initiatives tells us a little more about *Cúrcuma longa*, as well as Curmeric, a natural product containing *Curcuma longa* extracts, and their uses during the COVID-19 pandemic.

### HOW AND WHEN DID THE IDEA FOR THIS PROJECT ARISE?

Calixto García University Hospital's Theragnostics

Laboratory was inaugurated in 2015 in Havana, Cuba, in collaboration with the Center for Applied Nuclear Technology Development (CEADEN). The laboratory was founded with the conviction that scientific testing of natural products' medicinal properties is essential for developing therapeutic nutritional supplements and phytopharmaceuticals

The laboratory's creation, dedicated to the search for clinical applications of natural products to different pathologies, gave rise to the project "Nutraceutical and Phytopharmaceutical Development of *Cúrcuma longa*" in MINSAP's National (now Sectorial) Natural and Traditional Medicine Program, in coordination with Havana's Provincial Health Department (DPS).

*Cúrcuma longa* supplements developed by the Theragnostics Laboratory for use in clinical research are produced in facilities run by Havana's Provincial Pharmacy Company's (FARMABANA) Natural and Homeopathic Products Pharmacy.

### CÚRCUMA LONGA'S PROPERTIES AND HEALTH BENEFITS

*Cúrcuma longa* is used in traditional Chinese, Unani and Ayurveda medicine. It has antioxidant and anti-inflammatory properties, and has reported medicinal effects for arthritis, atherosclerosis, liver dysfunction, and respiratory and gastrointestinal disorders. Its antiviral, antibacterial, antifungal and tissue-healing properties have also been described.

*Cúrcuma longa*'s disease prevention qualities have been reported in neurodegenerative diseases and cancer. Its medicinal properties are attributed to the bioactivity of the components produced in its secondary metabolic routes: phenolic compounds (mainly curcumin) and volatile oils. Most studies have been either preclinical or related to traditional uses.

*Cúrcuma longa* supplements developed by the Theragnostics Laboratory have been used since 2018 by chronic disease patients in Calixto García University Hospital's outpatient service dedicated to monitoring hypertension and nutrition. Results obtained have demonstrated positive changes in body composition in overweight and obese



Community-based team working on the project during the pandemic.

patients, and decreases in blood sugar levels, cholesterol and triglycerides in patients with diabetes and dyslipidemia.

Wide use has not yet been observed in Cuba, although reports on scientific research on the plant and cultivation has become more widespread as its beneficial properties become more widely acknowledged. These reports also promote knowledge about *Cúrcuma longa*'s health benefits so that individuals can choose whether or not to consume it after taking into account their specific needs.

### CONTRIBUTIONS DURING THE COVID-19 PANDEMIC IN CUBA

The natural product Curmeric, developed by the Theragnostics Laboratory and registered with the regulatory entity of Cuba's National Hygiene, Epidemiology and

Microbiology Institute (INHEM), contains among its components *Cúrcuma longa* extracts and was formulated to be used as a gargle/mouthwash or as nasal drops, forming a natural preventive screen against respiratory diseases.

Curmeric has demonstrated antibacterial activity against different bacterial strains isolated from respiratory disease patients at the Calixto García University Hospital. It also has demonstrated antiviral activity, as it inhibits bovine coronavirus, according to in vitro results obtained in joint studies with Cuba's National Center for Animal and Plant Health (CENSA).

As part of actions promoted at the beginning of the COVID-19 pandemic to protect Cuban health personnel, Curmeric was provided to health workers at

Havana's Calixto García University Hospital during March and April 2020. There were no positive cases among the 91 health professionals working in high-exposure areas who used Curmeric. However, 12 positive cases were reported among 108 health professionals working in less exposed areas who were not using the product.

Following these results, facilities at the National and Homeopathic Products Pharmacy were used to produce Curmeric. Since April 2020, more than 25,000 units of Curmeric mouthwash have been produced through large-scale cooperative production between FARMABANA and CEADEN, with the support of the Provincial Health Department (DPS), the government of Havana, and MINSAP's Pharmaceutical Services Department. Curmeric nasal drops were added as a new product and began



production in September. Following COVID-19 outbreaks in May 2020 in different areas of the Cuban capital (such as Cuatro Caminos, Puentes Grandes, Punta Brava, Arroyo Arenas, Santa Felicia, Manduley), distribution of Curmeric mouthwash began in the municipalities where the outbreaks occurred, in the pharmacies closest to the epicenter of each event: Cotorro Municipality (3 pharmacies), Centro Habana (4 pharmacies), La Lisa (3 pharmacies) Marianao (3 pharmacies), San Miguel del Padrón (1 pharmacy), Habana del Este (1 pharmacy) and Plaza (5 pharmacies).

These pharmacies were responsible for public education about Curmeric and training of personnel involved. Students from the University of Havana's Nutrition and Pharmacy School joined in the packaging of the Curmeric mouthwash for the COVID-19 outbreak areas from May to August, which also served as a practicum for their university studies.

Under the guidance of an Innovation Committee organized by MINSAP to study drugs capable of combatting COVID-19, three observational clinical intervention studies of Curmeric mouthwash and Curmeric nasal drops were carried out in primary health care in populations under COVID-19 quarantine in the capital municipalities of Plaza de la Revolución and Regla from September to the end of November, 2020.

In order to confirm the safety and prophylactic effects of Curmeric, in January 2021 a study was initiated in dental clinics in the Plaza Municipality to confirm the effectiveness of the product in preventing COVID-19 transmission in those services.

CEADEN, FARMABANA, Calixto García University Hospital, municipal health institutions, Havana DPS and the National Clinical Trials Coordinating Center (CENCEC) participate in this

research. Studies are carried out with the support of MINSAP's Pharmaceutical Services and Natural and Traditional Medicine Departments.

Clinical studies are published in Cuban Public Registry of Clinical Trials (RPCEC), the results of which have prompted authorization of a Curmeric clinical trial designed to investigate its use in primary health care for COVID-19 prevention.

MINSAP's National Program for Health, Longevity and Aging recently approved a project entitled "Developing *Cúrcuma longa* Nutritional Supplements: Evaluating *Cúrcuma longa*'s Preventive Effects on Cognitive Deterioration and Infectious Respiratory Disease in Geriatric Patients." The final objective of these projects is to generalize the use of natural *Cúrcuma longa*'s products based on scientific evidence, thus contributing to solving our population's health problems.





**OVER A CUP OF COFFEE WITH...  
CONCEPCIÓN CAMPA HUERGO**



The Finlay Vaccine Institute (IFV) and its VA-MENGOC-BC meningococcal vaccine have come up often in Cuba during the last few months. IFV is leading development of two Cuban vaccine candidates for COVID-19, an achievement with roots in that meningitis vaccine developed 30 years ago.

Concepción Campa Huergo PhD is closely related to both the Institute and the original vaccine. She is a founder of Finlay, was its first director, and headed the research that resulted in the world's first vaccine effective for serotype B meningococcal disease.

Listening to her is both interesting and moving, since not only does she speak with feeling, but also offers details about the more recent history of science in Cuba. In this issue of *Andar la salud (Along the Path to Health)*, Conchita (the name most people know her by) shares reflections and memories related to her fruitful career, which is also linked to natural, traditional and complementary medicine.

#### **YOU DIRECTED THE FINLAY INSTITUTE FOR MANY YEARS. WHAT WERE SOME OF THE MOST IMPORTANT CHALLENGES YOU FACED AND WHAT DOES THE INSTITUTE MEAN TO YOU?**

The Finlay Institute is just like a child for me. And likewise, the challenges remind me of the ones we have when we conceive a child, watch them be born and go through all the stages growing up to reach maturity. Finlay was born amidst the great battle against meningococcal disease. There were only two of us when we started on the mission to see what we could do about it. At that time, in the 1980s, a great epidemic in Cuba was killing at least one child a day, and those who managed to survive

suffered very severe sequelae: deafness, blindness, loss of limbs or intellectual disabilities. It was very hard, and the children and adolescents were the most affected.

The world had vaccines for other types of meningococcal disease, for groups A and C, but not for group B, the one that was ravaging Cuba. So we had to cultivate these highly pathogenic micro-organisms in the lab without the protection of a vaccine, and at the same time, with the risk of becoming asymptomatic carriers, since that's also possible with meningitis. In such a case, the bacteria colonize the nasopharyngeal region and the infected person can transmit the disease to their families and others.

We were a small group. Ten of us were the vaccine patent's authors, and you could say that Finlay was born from that group. We put together the institution with the help of many centers, many people and scientists, not only in Cuba but from the whole world. We had tremendous collaboration; everyone we called responded.

We carried out a clinical trial that was advised and conducted by the Centers for Disease Control and Prevention (CDC) in Atlanta, USA, always with assistance from the Pan American Health Organization (PAHO), which facilitated contacts with those and other international experts who also hoped to find a solution to the problem of B-group meningitis.

The clinical trial was carried out with 110,000 students between 12 and 14 years old, in which we also used a placebo vaccine for comparison. The result showed that VA-MENGOC-BC was indeed effective, the first one effective against group-B meningitis, protecting against this terrible disease.

So, it was decided to carry out a massive vaccination in the whole country, which was also a big challenge since until then, we had produced 100,000 doses but on a small scale. Now, we had to scale up to industrial production with the same biological risks and also making certain to pass on our knowledge and the technology to new workers. From the 10 people who developed the vaccine, we suddenly ballooned to 1000 working on it. This was a huge challenge, because we were making vaccines for healthy children, and very small children at that. It was a great responsibility.

That vaccine was produced for all of Cuba at the end of the 1980s, between 1988 and 1989. Once the epidemic ended, we went on to help other countries. There was a huge epidemic in Brazil in 1990, and they requested millions of doses, I think ten million in all if I recall correctly. All that manufacturing was done in Cuba, at Finlay. Later, the vaccine production plant was built and we began producing other vaccines: the triple bacterial vaccine; for leptospirosis; for typhoid fever; conjugated vaccines.

Later came the great epidemic in Africa of meningitis A, C, Y and W-135. We had been prequalified by the World Health Organization (WHO) and the vaccine was produced in collaboration with Brazil, since here we didn't have the capacities for the millions of doses requested. In Cuba, we produced the antigens and finish-and-fill was done in Brazil.

In general, I worked a great deal in the world of meningitis, and all of it at Finlay, which at the beginning was called the Meningococcal Vaccine Center. In addition, since there were so many

seriously ill children, in order to treat them we produced a meningococcal gamma globulin by transfusing some of the people already vaccinated. Thus, the vaccine prevented the disease and the gamma globulin saved many lives.

#### **HOW DO YOU ASSESS CUBA'S EFFORTS TO DEVELOP FOUR VACCINE CANDIDATES FOR COVID-19?**

I feel a great deal of respect, admiration and satisfaction when I see our scientists making such great efforts to help address this pandemic with Cuban vaccines. I'm also pleased to see that there are four candidates because this means that there are many groups determined to find solutions. There is nothing simple about attempting a vaccine for a new disease.

To make a vaccine, first you have to have a good understanding of the disease, the causal agent's behavior and that of the people infected. In the case of COVID-19, vaccines are being developed in various parts of the world at the same time that scientists are gaining an understanding of the disease and the virus. Viral disease vaccines are also more challenging than bacterial disease vaccines, since virus mutations can jeopardize the work already carried out. It all depends on the mutation's speed and the form it takes. Developing a vaccine in the midst of an epidemic for a virus that is so contagious, so lethal, and so mysterious has great merit.

Here in Cuba, we have well-trained scientists, installed technology, knowledge and skills, quality control systems, experience in clinical trials, a strong regulatory authority that monitors the whole process

*Developing a vaccine in the midst of an epidemic for a virus that is so contagious, so lethal, and so mysterious has great merit.*

and, in general, Cuba has all the necessary conditions for these vaccines to help the country, the region and the world.

#### **WHY WERE YOU INCLINED TOWARDS NATURAL, TRADITIONAL AND COMPLEMENTARY MEDICINE? WITHIN THIS, WHAT AREAS HAVE YOU CONCENTRATED ON? AND WHAT DO YOU THINK ABOUT ITS USE IN CUBA TO HELP ADDRESS COVID-19?**

I knew nothing about natural medicine, but in the 1990s, we had a neuropathy epidemic in Cuba and in that context, the National Operational Group was created, including experts from a number of fields. There were great debates among the scientists, since those of each specialty wanted to demonstrate that the epidemic's causes resided in their field. The nutritionists thought that it was a nutritional problem; the biologists believed the cause was a pathogen, specifically a Cocksackie virus; the toxicologists said it was a toxin. The debate went on for several months. International experts came from each of these fields, and finally the most interesting thing was that the causes turned out to relate to all three factors.

That epidemic taught me that any illness—whether in one person, a group, a country or

the entire world—is a complex system. So it's through the lens of complexity that the causes must be viewed. I remember a visiting epidemiologist once told us: epidemics are denunciations of social conditions. That is, just as illness in a person demonstrates individual imbalances, an epidemic in a society exposes social imbalances; but when there is a pandemic, it is a denunciation of imbalances involving all of humanity.

So then I learned to give nutrition, emotions and other aspects their due, and thus I understood that epidemics and pandemics are multifactorial complex systems. You can't limit analysis to just one element. Pasteur himself said that the causes of disease don't depend on micro-organisms alone, but rather where these organisms settle as well. Otherwise, how can it be explained that this coronavirus isn't harmful at all for some people, such as those who remain asymptomatic, while for others it manifests as a simple cold and for others still, it leads to an intensive care unit and death?

Natural medicine's fundamental philosophy is rooted in the concept of complexity, and I fell in love with the approach understood and used by this medicine to address health problems, as well as its approach to prevention, mitigation and cure of disease. During the neuropathy epidemic, I came in contact with experts in different specialties of natural medicine. This field has a million methodologies, techniques, visions, but always these are cosmic views that start with a multifactorial analysis of any disease process. At that time, from my post at Finlay, I encouraged exchanges with experts in all the related modalities: homeopathy, floral therapy, magnet therapy and aroma therapy, among others.





Concepción Campa Huergo PhD

What I have most tried to promote is homeopathy, which has been applied during various epidemics here in Cuba, including those of leptospirosis, conjunctivitis, hepatitis A in eastern Cuba, A/H1N1 influenza and dengue. Another of my favorites is floral therapy, which works on the emotions. Managing emotions is quite important for maintaining health.

In the context of COVID-19, I'm very pleased with the use of PrevengHo-Vir as part of the country's response to the pandemic. This PrevengHo-Vir formula was developed with help from the international homeopathic community. Curmeric, that comes from *Cúrcuma longa*, is another pharmaceutical that has been used, and is also very good. *Cúrcuma longa* has many properties.

Additionally, I think that any aspect of natural medicine that promotes equilibrium is going

to help prevent and mitigate symptoms, and make this pandemic more bearable. This is the case with diet therapy, for example, that helps people decide what to eat when, at what point during the year, and also emphasizes the need to avoid toxic habits like smoking, as well as the importance of getting enough rest and avoiding unnecessary stress. It's vital to maintain such balance, whether nutritional, environmental, emotional or biological, so that the immune system is at peak performance to better combat disease.

Within natural medicine, you can find many things that help the immune system. One example is moringa, with which I'm working now, a magnificent immune system stimulator that contains many antioxidants, vitamins, minerals and essential amino acids.

**YOUR REPUTATION AS A SCIENTIST PRECEDES YOU BOTH IN CUBA AND**

#### **INTERNATIONALLY. WHAT WOULD YOU SAY TO COLLEAGUES IN CUBA AND AROUND THE WORLD RIGHT NOW?**

First, I would pay tribute to all those who are making such an effort to help control this situation, and I would wish them all the best, and most importantly, great success in their work. I'd also say they should do their work with great love and tranquility, since this is vitally important. That way, you can better observe processes and phenomena, with greater precision and at the same time, with a broader perspective.

We have to realize that COVID-19 is a disease influenced by many factors, including mental health. The sadness that some people may feel that comes with isolation or confinement isn't good. And that is something also deserving of research, of our attention.

# A STORY TO TELL

## DR. RICARDO PEREDA GONZÁLEZ: COVID-19 CLINICAL EXPERTS COMMISSION COORDINATOR



During the pandemic in Cuba, Dr. Ricardo Pereda González has worked in one of the most sensitive areas, since he is responsible for coordinating clinical patient care and related to it, the performance of health professionals in hospitals and especially in intensive care units (ICUs) for all serious and critical patients.

Dr. Pereda González is a first-degree specialist in internal medicine and a second-degree specialist in critical care medicine; as well as an associate professor and adjunct researcher at the Medical University of Havana. He coordinates the Clinical Experts Commission that has been part of the island's response to the pandemic. He shared his thoughts on what this assignment has meant to him:

"Above all it has been a huge challenge—both personally and professionally. I have felt the great trust that the Ministry of Public Health (MINSAP) has placed in this group of clinical experts, from the National Commission to those in each health institution participating in the COVID-19 response.

"At the same time, I have had the opportunity to learn by systematically interacting with doctors in the red zone and with expert commissions in the different hospitals of the country. To my personal stores of knowledge, I have been able to add lessons from the daily practice and experiences of these specialists caring for patients on the front lines of the pandemic.

On a daily basis, I have witnessed the immense potential of the Cuban scientific community: doctors,



Dr. Ricardo Pereda González (left) with MINSAP's National Director of Epidemiology, Dr. Francisco Alberto Durán García

engineers, mathematicians, sociologists and geographers; people who, with the greatest possible humility and transparency, have shared the experience they have gained through years of dedicated research. The results of these Cuban scientists and the island's magnificent research centers have been made available for whoever needs them.

"Interacting with the scientific community has always provided new perspectives regarding action in the face of challenges posed by a novel disease that is still not yet fully understood, but these challenges have enabled the individual and collective growth of the Cuban medical community.

"Additionally, I have had the chance to work directly with the President and the country's highest leadership as part of our work in confronting the COVID-19 pandemic, which is a testament to the high priority the Cuban state has given to addressing the disease.

"The Clinical Experts Commission constitutes an

operational working group that goes from the ministerial level to each health institution dedicated to COVID-19 patient care. Several times a day, the group discusses and evaluates the clinical situation of the people who are sick, and makes decisions regarding therapeutic strategies or changes, and the follow-up they require, based on these analyses.

The main strengths of this process lie in its transparency and the intellectual and professional enrichment made possible by such ample debates. The scientific or academic rank of the participants doesn't matter; much has been learned from excellent young physicians working in the red zone. They are the true heroes of the Cuban response, who with great sacrifice have contributed to the results we have seen. We are also constantly learning from our scientists and evaluating the best international experiences.

"Regarding international experiences, activities convened by the Pan

American Health Organization (PAHO) have been very useful, including the innumerable conferences and exhibits featuring each member country's experiences during the pandemic. Likewise, WHO guidelines have been a great asset in our understanding and management of the virus. Collaborative work and collective intelligence have both been promoted in a true expression of the socialization of knowledge.

"In general, the fight against COVID-19 has been very intense, and rest has been put on the back burner by most of the people working in the country's response to the pandemic. One of the most interesting things about this pandemic is that it is not an individual phenomenon, but a collective one. During this context of dedication and solidarity, I have experienced great human, spiritual and scientific growth. I am proud to be part of the medical community that, together with the state and the government, has confronted this situation in Cuba. Being able to offer my modest contributions to help our society fills me with joy."



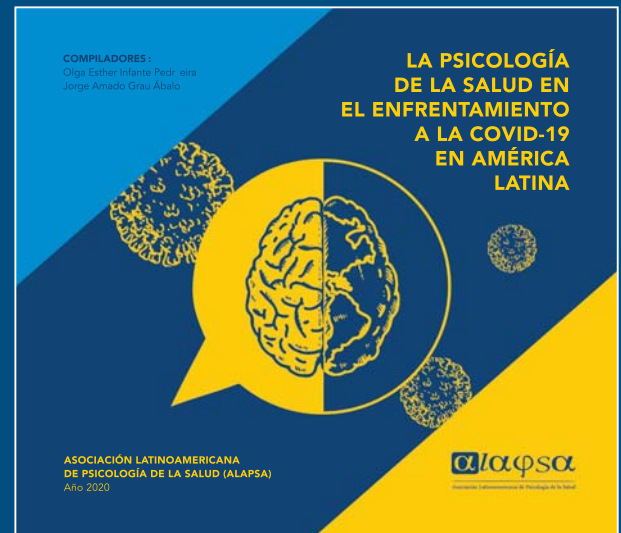
PUBLICATIONS:  
**HEALTH PSYCHOLOGY'S ROLE  
IN ADDRESSING COVID-19  
IN LATIN AMERICA (Spanish)**

Read the book at: <https://alapsa.net/wp-content/uploads/2021/02/alapsa2021a.pdf>

This book was compiled by the Latin American Health Psychology Association (ALAPSA) with support from the PAHO/WHO Offices in Cuba and CEDEM publishers.

Its aim is to share the experiences of psychologists in 11 Latin American countries in their professional, scientific and academic endeavors since the beginning of the COVID-19 pandemic.

The book offers a sample of the psychological intervention strategies used to address the difficult epidemiological conditions and growing demand for services as a result of the disease itself and measures to control it, obliging professionals to search beyond traditional means for providing psychological care.



The Pan American Health Organization (PAHO) works with the countries of the Americas to improve their populations' health and quality of life. Founded in 1902, it is the world's oldest international organization dedicated to health. It acts as the Regional Office for the Americas of the World Health Organization (WHO) and is the Inter-American system's agency specializing in health.



**PAHO**



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