



# Eliminating Hepatitis C in Mexico: A Primary Health Care Approach

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In Latin America, an estimated 10 million people are infected with the hepatitis C virus (HCV),<sup>1,2</sup> while the prevalence rate in Mexico is estimated to be between 0.4% and 0.6%. According to published models, in 2010, Mexico was the country with the highest cirrhosis mortality rate in the region,<sup>3</sup> and by 2019, liver diseases were the fourth leading cause of death reported in the country, with HCV accounting for about 35% of liver transplants.<sup>4</sup>

The Mexican health system is composed of two sectors, public and private. The public sector is further divided according to either the type of employer a person works for (social security institutions) or those institutions and programs that serve those proportions of the population without any social security. The main institution in this latter case is INSABI (National Institute of Health for Wellbeing). Thus, although all people in the country have access to

public health care, not all treatment pathways and criteria are necessarily the same.

In Mexico, direct-acting antiviral (DAA) treatment for HCV was licensed for clinical use in 2017 by the national regulatory agency (COFEPRIS). However, it was very difficult for people to access treatment because of selection criteria that limited those patients deemed treatment eligible. As a result, few public tertiary care centers were authorized to provide DAA treatment. By the end of 2019, the Ministry of Health (MoH) designed a program, led by the National Center for the Prevention and Control of HIV (CENSIDA), with the objective of having a coordinated response across all public health care institutions in Mexico and to expand the coverage of services for the prevention, detection, and treatment of people with HCV. The purpose of this report is to describe the pillars that Mexico has adopted toward the 2030 global hepatitis elimination goals.<sup>5</sup>

Abbreviations: CENSIDA, National Center for the Prevention and Control of HIV; COVID-19, coronavirus disease 2019; DAA, direct-acting antiviral; HCV, hepatitis C virus; HIV, human immunodeficiency virus; INSABI, National Institute of Health for Wellbeing; MoH, Ministry of Health; PLHIV, people living with human immunodeficiency virus.

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## TRANSITION FROM TERTIARY CARE TO A PRIMARY HEALTH CARE APPROACH

The national program was developed through consensus with the main national stakeholders, including public health institutions and financial authorities, hepatology and infectious diseases specialists, and social civil society. The program is then based on four main pillars (Table 1):

1. National procurement strategy to ensure universal free access to HCV screening, diagnosis, and treatment: Currently, screening is focused on high-risk populations and the general population in regions with high prevalence (Fig. 1).
2. A primary health care approach, unifying actions independently of the public health care providers, regions, and states: Because transient elastography is not available in primary care clinics, patients are stratified based on noninvasive methods, including the aspartate aminotransferase-to-platelet ratio index, which allows primary care physicians to identify those patients where additional studies or guidance is needed.
3. Social communication and a telementoring network strategy: Because most patients are treated by primary health care physicians, a network of gastroenterologist, infectious diseases, and mental health specialist was created to help guide complex cases and facilitate referrals when necessary.
4. Universal online registry to measure the health outcomes that are important to people, as well as to promote benchmarking, direct improvement strategies, and research

These pillars have the objectives of avoiding missed opportunities for prevention and care, providing timely screening, diagnosis, and treatment of patients at early stages of HCV disease.

The program was launched in July 2020. Due to the coronavirus pandemic, we decided to focus on the elimination of hepatitis C in people living with human immunodeficiency virus (PLHIV) as the first step for the rolling out of the national implementation strategy (Fig. 1). In Mexico, at least 190,000 persons are living with human immunodeficiency virus (HIV) and are receiving treatment, of which about 4% were estimated to have an HCV coinfection. This initial goal was set based on the adverse health outcomes of PLHIV in those cases where the HCV coinfection is not treated. In addition, it represented a pragmatic

national implementation strategy during the pandemic as PLHIV are already treated in a primary health care basis, and there is a strong network and interest from clinical and community leaders to help promote and catalyze an HCV elimination program.

## IMPLEMENTATION PROGRESS

The national procurement strategy required three stages: (1) updating the national clinical guideline recommendations for all public institutions starting treatment without restrictions based on fibrosis stage or genotype; (2) public health approach to ensure all populations, such as patients with cirrhosis, renal failure, or drug use were covered by the program; and (3) economic strategy to ensure more competitive prices as the complete public health institutions demand was consolidated and increased, meaning pharmaceutical companies were able to offer additional benefits based on treatment thresholds achieved. As a result, there was an overall 45% reduction on the price of the DAAs. Thus, the entire focus of the strategy changed completely from detecting and treating a few people into a universal access program, including screening, diagnosis, and treatment at no cost to patients.

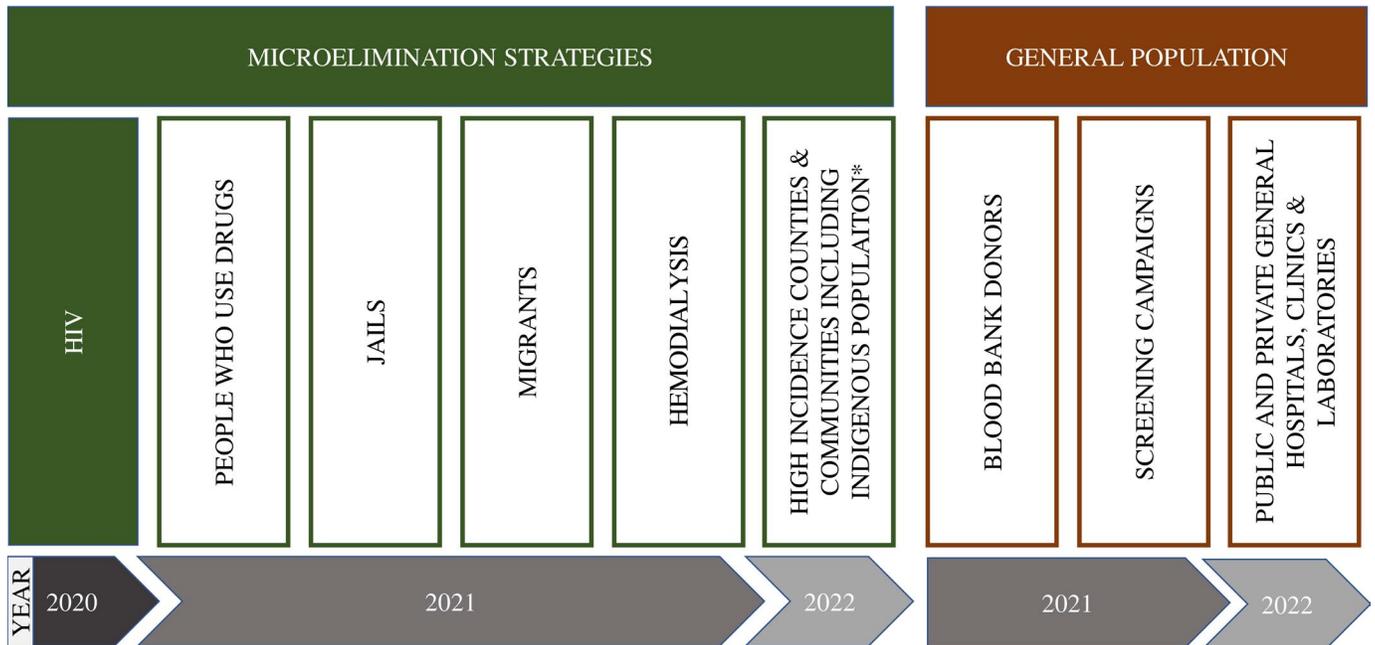
After access to testing and treatment was ensured, a new accreditation protocol was developed allowing primary health care clinics to be certified to treat patients with HCV. This change was instrumental in increasing the number of health care centers across Mexico that are able to treat patients with HCV, particularly during the main waves of the pandemic, where the majority of tertiary care centers were focused on the coronavirus disease 2019 (COVID-19) response. To date, the number of all public health care institution units has increased from 106 to 390 across the country. This includes health care centers for PLHIV without any social security institution, which increased from 17 (located in only 11 of 32 states) to 110 units across the 32 states (Fig. 2). Since the start of the program, more than 90,934 PLHIV have been screened for HCV, of whom 1406 have had a confirmed diagnosis, and all of them have started treatment.

It soon became evident that to have a primary health care approach, it was essential to build on the skills and capabilities of the health care force across the country. Hepatology and infectious diseases specialists were already scarce and focused on the national pandemic response. An online course that helped clinicians receive accreditation

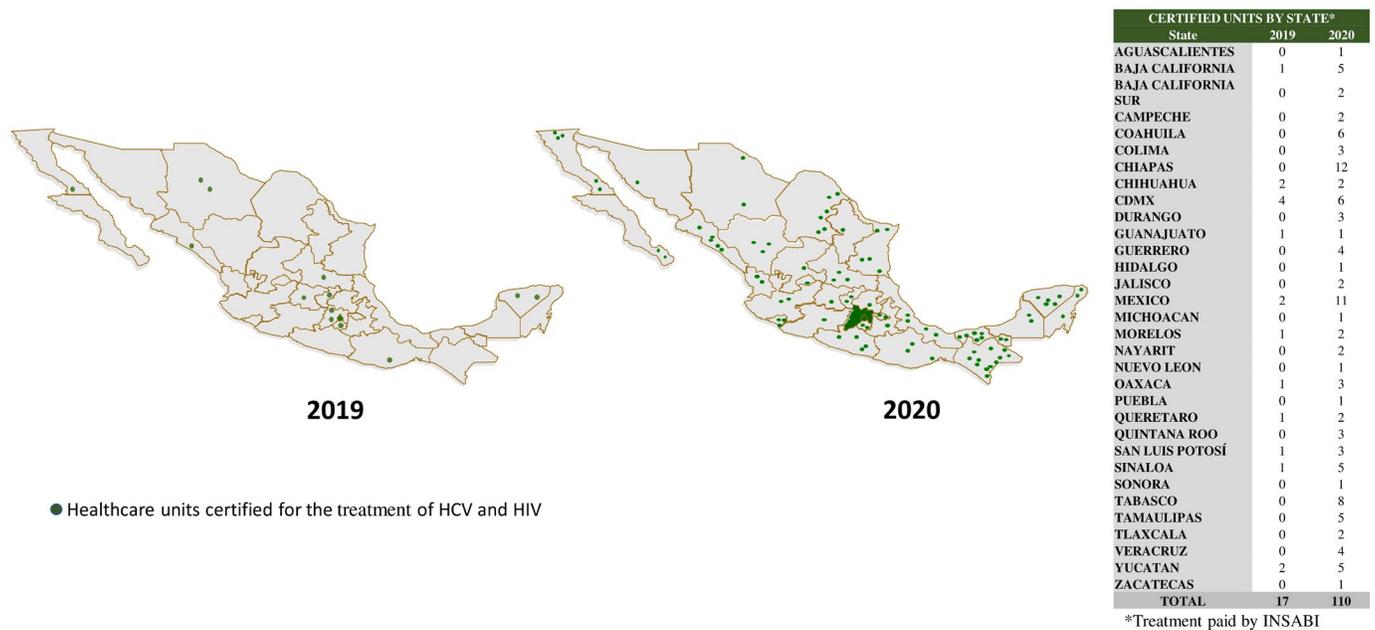
**TABLE 1. NATIONAL PROGRAM FOR THE ELIMINATION OF HEPATITIS C IN MEXICO: PROGRESS AND COORDINATION**

	Actors	Deliverables
National Program Strategy	<ul style="list-style-type: none"> <li>• MoH</li> <li>• National Center for the Prevention of HIV and STD</li> <li>• Public health care providers: IMSS, ISSSTE, INSABI, PEMEX</li> <li>• Jail services</li> <li>• Epidemiology national program</li> <li>• Health promotion national program</li> <li>• Addiction and mental health national program</li> <li>• National program of transfusion</li> <li>• Direction of Education and Quality of Care</li> <li>• Academic organizations</li> <li>• Researchers</li> <li>• Pan-American Health Organization</li> </ul>	<p>Published national strategy</p> <p>Creation of a National Observatory for the Elimination of Hepatitis C Program, with bimonthly meetings to follow up the implementation strategy and propose improvements</p> <p>Public bulletins on the progress of the strategy published quarterly</p>
Usage of epidemiological data and online registry	<ul style="list-style-type: none"> <li>• MoH</li> <li>• CENSIDA</li> <li>• National Program of Epidemiology</li> <li>• National Technology and Informatics Direction</li> </ul>	<p>Mining and analysis of epidemiological information for the identification of high-risk groups and counties across the country</p> <p>A detailed analysis was sent to each state for the planning of their implementation strategies</p> <p>A person-centered online platform to follow up the strategy from screening to diagnosis, treatment, and cure of patients</p>
Update of national guidelines	<ul style="list-style-type: none"> <li>• MoH</li> <li>• CENSIDA</li> <li>• Public health institutions</li> <li>• Academia and researchers</li> <li>• Civil Society</li> </ul>	<p>Recommendations for starting treatment without restrictions based on fibrosis stage or genotype</p> <p>Recommendations for special populations, such as PLHIV, patients with chronic renal failure, and transplant recipients</p> <p>Published updated clinical guidelines (<a href="https://www.gob.mx/censida/documentos/guia-rapida-para-la-atencion-de-personas-con-virus-de-la-hepatitis-c-vhc-en-los-establecimientos-de-salud">https://www.gob.mx/censida/documentos/guia-rapida-para-la-atencion-de-personas-con-virus-de-la-hepatitis-c-vhc-en-los-establecimientos-de-salud</a>)</p>
Appointment of state-level hepatitis C leaders	<ul style="list-style-type: none"> <li>• MoH of each state</li> </ul>	<p>32 Hepatitis C leaders to implement the strategy and to facilitate communication and follow up the administrative procedures</p>
Health care workers training and telementoring network	<ul style="list-style-type: none"> <li>• CENSIDA</li> <li>• Public health institutions</li> <li>• Academia and researchers</li> <li>• National Education and Quality of Care program</li> <li>• Civil Society</li> </ul>	<p>Online course based on a primary health care approach to diagnose and treat patients with HCV</p> <p>The course provides points for health care workers certification process</p> <p>Training of nurses for screening and diagnosis strategies in clinics and communities</p> <p>To date, &gt;56,655 health care workers have been trained (<a href="http://educads.salud.gob.mx/sitio/vRes/pag_0.php?x=38">http://educads.salud.gob.mx/sitio/vRes/pag_0.php?x=38</a>)</p>
Supply chain deployment	<ul style="list-style-type: none"> <li>• MoH</li> <li>• Public health care institutions</li> <li>• CENSIDA</li> <li>• Pharmaceutical industry</li> </ul>	<p>Development of the strategy for the supply chain for tests, diagnosis, and treatment</p> <p>Feasibility to confirmed diagnosis in 32 states</p>
Certification of primary health care clinics	<ul style="list-style-type: none"> <li>• MoH of each state</li> <li>• Hepatitis C leaders</li> <li>• National Education and Quality of Care program</li> </ul>	<p>All HIV primary health care clinics were selected to start the implementation strategy, increasing from 17 clinics in 2019 to 110 in 2020</p> <p>The MoHs of each state have selected the clinics that will be certified for the next stages based on a primary health care approach</p>
Political engagement	<ul style="list-style-type: none"> <li>• MoH of each state</li> <li>• Public health institutions</li> <li>• CENSIDA</li> <li>• National public health programs</li> <li>• Academia and clinical leaders</li> <li>• Civil Society</li> </ul>	<p>Selected units to focus the strategy</p> <p>Presentation of the national program to the governors and MoHs of the 32 states in Mexico</p> <p>Implementation progress</p>
Communication campaigns	<ul style="list-style-type: none"> <li>• National Communication Direction</li> <li>• National Health Promotion Direction</li> <li>• CENSIDA</li> <li>• Public health institutions</li> <li>• Civil Society</li> <li>• Academia</li> </ul>	<p>Two national campaigns to provide information to general population</p>

IMSS, Mexican Social Security Institute; ISSSTE, Institute for Social Security and Services for State Workers; PEMEX, Mexican Petroleum.



**FIG 1** Planned implementation strategies for the elimination of hepatitis C in Mexico. \*Based on modeling and data mining of previous stages.



**FIG 2** Distribution of units certified to treat PLHIV and people living with HCV.

was developed, as well as a telementoring network strategy to be able to help health care workers across the country to identify and treat patients for the first time outside tertiary care centers. By the end of May 2021, approximately 56,655 health care workers, including physicians,

nurses, social workers, and mental and addiction practitioners, had completed the online training, becoming accredited, which provided points for their accreditation councils for continuing education ([http://educads.salud.gob.mx/sitio/vRes/pag\\_0.php?x=38](http://educads.salud.gob.mx/sitio/vRes/pag_0.php?x=38)).

A social communication strategy was deployed to increase awareness that hepatitis C is a preventable and curable disease. Through social media, newspapers, radio, television, webinars, and community leaders' outreach, the program aimed to inform the population about risks for HCV infection and access to screening and treatments. E-mail and automated call centers were created to help people access official information and help them engage with their corresponding health care provider to receive testing and care.

To assess the results and impact of the program, a case registry was created to monitor gathered data and supporting communications among the different states in Mexico. The national person-centered online registry was created to monitor program outcomes in real time. The platform uses graphical user interface dashboards to present data demographics, stages of liver disease, risk factors, coinfection with hepatitis B and HIV, treatment, and cure. We hope this information will help, through benchmarking, to promote competition across units and improve the results.

To coordinate the national program, a hepatitis C observatory was created, which includes community leaders, health care providers, the epidemiology national program, the addiction and mental health national program, the national program of transfusion, researchers, and Pan-American Health Organization representatives. The progress, challenges, and improvement strategies are discussed in bimonthly meetings. Finally, to gain political interest, the results are publicly available in quarterly bulletins and have been presented to the MoHs of all the states for them to continue promoting the strategy.

## DISCUSSION

Hepatitis C is a global public health problem. Due to the general lack of information and strategies in low- and middle-income countries, a significant proportion of patients are still diagnosed in the later stages of liver disease.<sup>5</sup> Hepatitis C elimination programs need to be put in place and expanded.

We report the design of an HCV elimination program and its implementation in Mexico. The main characteristics of the program are its political commitment to the development of a national program, convening relevant stakeholders, procuring affordable diagnostics and treatments, and creating

a case registry to monitor program performance and training of clinicians to simplify delivery of HCV care. Indeed, the integrative primary health care approach transfers the task of HCV diagnosis and treatment to general practitioners through early detection of cases, leaving those with advanced fibrosis, cirrhosis, and hepatocellular carcinoma to specialized centers. The implementation of telementoring networks and the online training program for HCV is set to facilitate the implementation across the country even in remote regions, improving access to care for patients.<sup>6</sup>

The HCV elimination program in Mexico considers the need to put in place a national surveillance system dedicated specifically to monitoring the care of persons with HCV, the number of persons with identified patients, those accessing treatment, their medical adherence, and the recognition of previously unknown practical barriers. Real-time quality data are essential for improvement and innovation.

The program is gaining commitment across all the public health care institutions and states, with the aim of eliminating the coinfection HCV in PLHIV who know their HIV diagnosis by the end of 2021. In addition, several states have already started the other phases of the program, such as focusing on people in jails, migrants, hemodialysis, and addiction centers, and finally communities with higher incidence. For the program to be successful, data mining integration, modeling, and research are crucial for defining the next steps in this public health policy; the integration of the private sector and increasing awareness are fundamental.

## CONCLUSIONS

Elimination of hepatitis C requires a national commitment to the planning of the program. This commitment requires the coordination of different stakeholders to scale up testing and treatment for persons living with hepatitis C, improve their quality of care, and reach Mexico's hepatitis C elimination goals.

Despite the necessary diversion of resources to respond to the COVID-19 pandemic, the launch of this program shows how Mexico and other nations can bring together innovation and pragmatic strategies that accelerate progress toward the elimination of hepatitis C.

## CORRESPONDENCE

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