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# Challenges in the development and implementation of the National Comprehensive Cancer Control Program in Mexico

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**Reynoso-Noverón N, Meneses-García A, Erazo-Valle A, Escudero-de los Ríos P, Kuri-Morales PA, Mohar-Betancourt A. Challenges in the development and implementation of the National Comprehensive Cancer Control Program in Mexico. Salud Publica Mex 2016;58:325-333.**

## Abstract

Chronic noncommunicable diseases (NCDs), including cancer, have become the leading cause of human morbidity and mortality. In Mexico, cancer is the third leading cause of death, with a high incidence among the economically active population, a high proportion of advanced stages at diagnosis and limited care coverage for patients. However, no public policy aimed at managing this important public health problem has been developed and implemented to date. This manuscript describes the first interinstitutional proposal of a National Program for Cancer Control, considering the known risk factors, early detection, treatment, palliative care and patient rehabilitation. This manuscript also outlines a series of thoughts on the difficulties and needs that the Mexican health system faces in achieving the main objectives of the program: to decrease the incidence of cancer, to increase survival and to improve the quality of life for this group of patients.

**Keywords:** cancer; program; control; Mexico

**Reynoso-Noverón N, Meneses-García A, Erazo-Valle A, Escudero-de los Ríos P, Kuri-Morales PA, Mohar-Betancourt A. Retos del desarrollo e implementación del Programa Nacional de Control Integral del Cáncer en México. Salud Publica Mex 2016;58:325-333.**

## Resumen

Las enfermedades crónicas no transmisibles (ECNT), incluido el cáncer, se han convertido en la principal causa de morbilidad y mortalidad de la humanidad. En México, el cáncer es la tercera causa de muerte, con una frecuencia elevada en población económicamente activa, una alta proporción de etapas avanzadas al momento del diagnóstico y una limitada cobertura de atención a quienes la padecen. No obstante, hasta el momento no se ha desarrollado e implementado una política pública dirigida al control de este importante problema de salud pública. Este manuscrito muestra la primera propuesta interinstitucional de un Programa Nacional para el Control del Cáncer, considerando los factores de riesgo conocidos, la detección temprana, el tratamiento y los cuidados paliativos y la rehabilitación del paciente. Asimismo se hacen una serie de reflexiones sobre las dificultades y necesidades a las que el sistema de salud mexicano se enfrenta para alcanzar los objetivos principales del programa: reducir la incidencia, incrementar la supervivencia y mejorar la calidad de vida de este grupo de pacientes.

**Palabras clave:** cáncer; programa; control; México

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In recent decades, neoplasias have ranked as leading causes of morbidity and mortality worldwide. For 2012, the International Agency for Research on Cancer (IARC) reported 14.1 million new cases, 4.6 million deaths and a prevalence of 32.6 million people, a number that may increase substantially in the coming years.<sup>1</sup>

The need to control this catastrophic disease requires that 55% of countries worldwide (107 nations) have a plan, policy or strategy to fight cancer by 2010.<sup>2</sup> In general, these plans consider four basic elements: primary prevention (protection of the environment or health promotion), secondary prevention (screening), comprehensive care (diagnosis, treatment and organization of services), palliative care and/or psycho-oncology.<sup>3-4</sup>

The cancer control programs implemented in developed countries have demonstrated successful reductions in cancer incidence and mortality rates. For example, in Australia, an incidence reduction from 370.0 to 323.0 cases per 100 000 persons between 2008 and 2012 has been described, with a mortality reduction from 119.5 to 96.4 deaths per 100 000 persons during the same period, with a relative survival rate of 66.1% for all cancers from 2006 to 2010.<sup>5-7</sup> Another example is the United Kingdom, where cancer death rates have fallen by 24% since the mid-1980s. This decrease is due to improvements in treatment, early diagnosis and population awareness, achieving a doubled cancer survival rate over the last 40 years.<sup>8-9</sup> A significant decline in age-adjusted incidence rates has been observed in the United States between 2008 and 2012, from 552.6 to 318.0 cases per 100 000 persons; the age-adjusted mortality rate from cancer for the same period also decreased, from 215.3 to 105.8 deaths per 100 000 persons. The five-year relative survival in the period 2004-2010 for all cancers combined was 81.2%.<sup>10-12</sup>

In Latin America and the Caribbean, the incidence of cancer reported by the IARC for 2012 was 1.1 million, with more than 600 000 deaths and a prevalence of 2.6 million people with cancer, mainly due to prostate, breast, colon, lung and cervical cancers.<sup>13</sup> Unfortunately, there are few countries in this region that have efficient national programs against cancer, indicating difficulties related to their implementation, in addition to the low coverage of social security affiliation and use of services; the lack of local and/or regional programs and policies articulated in the national health system; the lack of specialized human resources; the underdevelopment of palliative care, support and rehabilitation services; and limited technical and operational capacities for the verification of compliance with service quality standards.<sup>14-17</sup>

Cancer was the third leading cause of death in Mexico in 2013, contributing to 12.84% of all deaths that occurred in that year.<sup>18</sup> No data are available on the incidence and prevalence of cancer; however, cancer has been reported as a leading cause of hospital morbidity. The high prevalence of known risk factors, such as smoking, alcoholism, obesity and overweight, among others,<sup>19</sup> are known to be associated with high hospital morbidity. Therefore, the demand for health services for cancer patients is expected to increase substantially.

Currently, we know that approximately 70% of cancer cases in the country are diagnosed in advanced stages.<sup>20</sup> This timing reduces the chances of cure and raises treatment costs for both families and society. Neither health infrastructure nor access to health care for all cancer patients is available. The Fund for Protection against Catastrophic Expenditures (FPCE) covers only certain types of cancer: those that occur in children and adolescents, and cervical (CeCa), breast (BC), testicular, and prostate cancers as well as non-Hodgkin lymphoma in adults.<sup>21</sup>

Even in this context, Mexico does not have a single coordinating body for cancer prevention and control. As already mentioned, no national policy exists in this regard, and there are no complete and accurate data on the extent and social impact of this disease. Moreover, the health system is fragmented, which makes it difficult to maintain the continuity of treatments and reference and counter-reference actions between different levels of care. In addition, the frequent financial crises and the existence of priorities competing for funding have undermined the development of an appropriate infrastructure for detection, treatment and palliation.

For this reason, in 2008, the Health Secretariat summoned institutions including research centers, academia, non-governmental organizations and society as a whole to the National Cancer Institute (Instituto Nacional de Cancerología, INCan) to participate in the planning, implementation and evaluation of the National Cancer Control Program in Mexico (NCCP). The main objective of this manuscript is to analyze the challenges that NCCP development has faced and the strategies that we consider indispensable for the implementation and evaluation of the NCCP.

### Current status of cancer care in Mexico

The Mexican health system consists of two sectors: public and private. The social security institutions [Mexican Social Security Institute (*Instituto Mexicano del Seguro Social*, IMSS), Institute for Security and Social Services for State Workers (*Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*, ISSSTE),

*Petróleos Mexicanos* (Pemex), Secretary of Defense (Sedena), Secretariat of the Navy (Semar) and others] and the institutions and programs that serve the population without social security [Secretariat of Health (*Secretaría de Salud*, SSA), State Health Services (*Servicios Estatales de Salud*, SESA), IMSS-*Oportunidades* (IMSS-O) program, People's Insurance (*Seguro Popular*, SPS)] are within the public sector. The private sector includes insurance companies and service providers who work in offices, clinics and private hospitals, including alternative medicine service providers.<sup>22</sup>

In this context, formal cancer care in Mexico began in 1946 with the creation of INCAN, supported by the SSA. Since then, the care of cancer patients and the launch of primary prevention and early detection programs began at INCAN and other institutions in the health system. However, there have been important deficits in both human resources and infrastructure and in the acquisition of specialized equipment for the prevention and care of this population.

Currently, according to data provided by the main health institutions in Mexico, there are 25 High Specialty Medical Units (*Unidades Médicas de Alta Especialidad*, UMAEs) in the IMSS, of which 18 offer cancer care, including eight specialty hospitals; four obstetrics and gynecology hospitals; two pediatric hospitals; a gynecology pediatric hospital; a general hospital; a trauma hospital, and an oncology hospital. These UMAEs have 128 outpatient offices, of which 68 (53.1%) are related to surgical treatment care and 60 (46.9%) to medical oncology care. Most clinics are centralized in the oncology hospital of the National Medical Center Siglo XXI (19 for medical oncology and 35 for surgical oncology). The IMSS provides services to cancer patients, such as specialty consultation, surgery, radiotherapy and chemotherapy. The demand for care has increased since 2005, in part due to better preventive measures and early diagnosis, early treatment and increased patient survival. Currently, there are estimates of 735 surgical oncologists, 50 gynecologic oncologists, 269 medical oncologists, 151 pediatric oncologists and 180 radiation oncologists at IMSS nationally. These numbers already show a clear shortage of qualified personnel, which will worsen as the population ages and with the concomitant increase of people developing some type of cancer.

The ISSSTE has second- and third-level hospitals for cancer patient care. The ISSSTE includes 13 regional hospitals, 24 general hospitals and a National Medical Center, where oncology consultations rank first in terms of total consultations. The ISSSTE also has reference units for hematology as well as pediatric oncol-

ogy units and units to provide psychological support. In total, the ISSSTE has 1 180 units providing care to cancer patients, in which 201 medical specialists and 66 trainees work. In this institution, the treatment of cancer patients is based on care models according to disease complexity.

The SSA counts on federal hospitals and national institutes with oncology services (Hospital Juárez de México, General Hospital of Mexico and the National Institute of Medical Sciences and Nutrition Salvador Zubirán), INCAN specific for the attention of cancer patients. In addition, a Network of Cancer Centers (*RED de Centros Oncológicos*) exists, although this network has yet to reach seven states: Zacatecas, Queretaro, Hidalgo, Tlaxcala, Morelos, Quintana Roo and Mexico State (in which even when there is a equipped center, it only provides medical care to the population affiliated with the ISSEMYM). The SSA provides care to children and adolescents in 51 Accredited Medical Units (UMAs) in all entities except Baja California Sur, through the services of 106 pediatric oncologists and 47 pediatric hematologists. The institution has five medical units of reference.

Mexico rates far below international recommendations for staff and specialized equipment for cancer treatment.<sup>23-25</sup> In 2009, the IMSS had between 5.9 and 8 oncologists per million affiliates. Additionally, there are approximately 176 devices (103 linear accelerators and 73 cobalt bombs), representing 1.5 devices per million inhabitants.

The available information on cancer morbidity only includes the numbers of hospital discharges from public health institutions, without the possibility of identifying incident or prevalent cases. On average, cancer hospital discharges represented 6% of total annual discharges of public institutions from 2004-2010. Cancers with higher numbers of hospital discharges included malignant breast tumors and lymphoid leukemias.<sup>18</sup> Cancer remains among the ten leading causes of hospital morbidity in all of these institutions. In the ISSSTE, for example, in 2010, it ranked sixth (16 923 cases, 4.35% of total discharges). In the IMSS, the three main types of cancer that merited hospitalization were BC, leukemias and lymphomas; in this institution, 49% of these hospitalizations were women, 34% men and 17% individuals under 20 years of age.

Given the scientific evidence available in Mexico, the population structure and the World Health Organization (WHO) recommendations, mass population screening is justified only for BC and CeCa using mammography and simple cytological screening or enhanced to human papillomavirus (HPV) detection. However, there is still ample room for improvement because many

of the indicators have suboptimal performance levels and there are interinstitutional differences in target populations, coverage and infrastructure. Specifically for BC, the insufficient human and material facilities for screening and early detection by mammography have been strongly described.<sup>23</sup> Similarly, cost-effective screening methods should be evaluated in our population for cancers with high mortality rates, such as prostate, lung and colon cancers.

Meanwhile, the comprehensive management of cancer patients in the country is determined by the allocation of resources defined by the priorities of each institution. It is of utmost importance to ensure quality care based on the best available evidence and to adhere to homogeneous Clinical Practice Guidelines (CPG) and internationally accepted performance indicators.

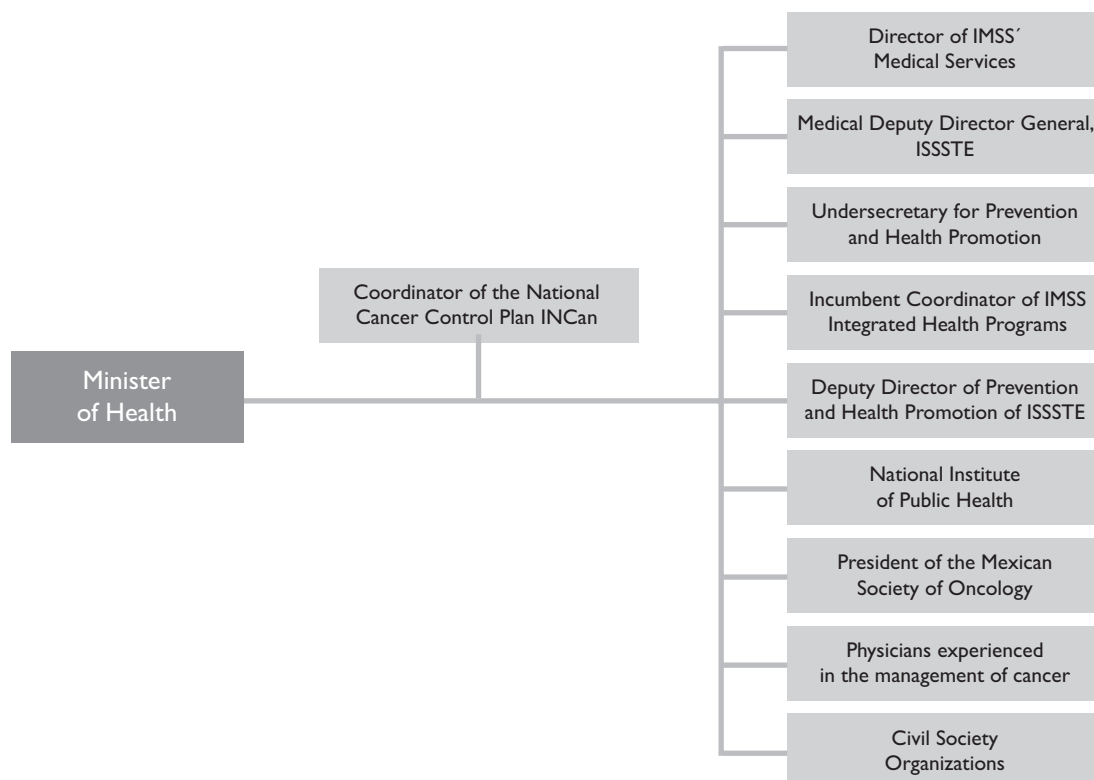
Under this scenario, the cancer control strategy should have the following general objectives:

- To promote education and information about cancer and primary prevention measures

- To reduce cancer incidence and mortality rates by strengthening specific screening programs
- To improve the survival rate of cancer patients through early cancer detection
- To make optimal cancer treatment accessible and universal
- To improve the quality of life of cancer patients and their families
- To define the priorities in cancer research

To meet these objectives, an inclusive proposal was raised, and meetings were held with leaders of chronic disease control from each of the Mexican health system institutions and with representatives of the Civil Society Organizations actively involved in cancer. The structure of the team responsible for the development, implementation and evaluation is shown in figure 1.

In this context, the objectives, action lines, indicators and targets were defined for the strategic priorities: risk factor control, screening and early diagnosis, treatment, palliative care and rehabilitation.



**FIGURE 1. TASK FORCE OF THE NATIONAL CANCER CONTROL PROGRAM**

## Strategic priorities

### Primary prevention

**Objective and Indicators:** To reduce the incidence of the most common cancer diseases in the Mexican population (Table I).

### Screening and early diagnosis

**Objective:** To establish an efficient national model with wide population-based coverage (> 80%) and early detection for the main types of cancer affecting the Mexican population to ensure access to treatment in a timely manner, a better quality of life and longer survival (table II).

### Treatment

**Objective and Indicators:** To provide the entire Mexican population health infrastructure and access to cancer

services by strengthening mechanisms of free, efficient, high-quality multidisciplinary care (table III).

### Palliative care

**Objective and Indicators:** To improve the quality of life of cancer patients and their families through the prevention of suffering and its relief through appropriate treatments for pain and other problems (physical, psychological and spiritual) (table IV).

### Rehabilitation

**Objective and Indicators:** To restore physical, social, psychological and occupational functionality to patients in the shortest time possible (table V).

### Other needs

In addition to the above strategic priorities, there are other needs, such as the existence of a National Cancer

**Table I**

Indicator	Current status in Mexico
National prevalence of smoking	The National Survey on Addictions (Encuesta Nacional de Adicciones, ENA) 2011 reported an active consumption prevalence of 21.7%, corresponding to 17.3 million Mexican smokers in the population 12-65 years of age. <sup>26</sup>
National prevalence of obesity	According to the National Health and Nutrition Survey (Ensanut) 2012, the prevalence rates of obesity were 14.6% for children 5-11 years of age, 13.3% for adolescents 12-19 years of age and 32.4% for adults. <sup>27</sup>
National prevalence of alcoholism	According to the ENA 2011, the prevalence of alcohol use in the last year was 51.4% in people from 12 to 65 years of age. <sup>26</sup>
National coverage of hepatitis B virus and HPV vaccine implementation	According to data from Ensanut 2012, vaccination coverage rates for hepatitis B were 84.7% in children under 1 year, 94.9% in people aged 15 to 24 months, and 45.5% in adolescents from 12 to 19 years of age (at least one dose). <sup>27</sup> Regarding vaccination coverage for HPV, according to the Public Account 2011 of the Secretariat of Health, the coverage rates achieved in girls aged 9-12 years were 67% in 2010 and 77.9% in 2011.
Percentage of the population by age group that meets the recommendations for fruit and vegetable consumption.	In Ensanut 2006, the average intake values of fruits and vegetables were 87.5 g in preschool-aged children (61.3 g fruits, 26.2 g vegetables), 103.1 g in school-aged children (68.9 g fruits, 34.2 g vegetables), 116.3 g in adolescents (72.9 g fruits, 43.4 g vegetables) and 122.6 g in adults (65.8 g fruits, 56.8 g vegetables). <sup>28</sup>
Percentage of the population by age group that complies with the recommendations for physical activity.	The prevalence rates of physical inactivity were 58.6% for children 10-14 years of age, 11.9% for adolescents 15-18 years of age, and 16.5% for adults 20-69 years of age. <sup>27</sup>

**Table II**

Indicator	Current status in Mexico
Units, equipment and staff specialized in early detection	The country has approximately 124 radiologists trained in breast and approximately 572 mammograms available in public institutions in 2012, with a potential productivity of 2 172 500 mammograms, covering just over 11% of women older than 40 years of age. <sup>29</sup>
Coverage of BC and CeCa screening programs	According to the Public Accounts (Cuenta Pública) 2011, the coverage of mammography in women 50-69 years of age was 11.1%, and the screening percentages for CeCa were 67.5% in women 25-64 years of age and 41.2% in women 25-34 years of age.
Time between the screening test and diagnostic confirmation of BC	According to the Comprehensive Evaluation of the detection of BC in 7 federative states, conducted by the National Institute of Public Health (unpublished data), the median times were 7 days from the screening mammography to the delivery of results in the selected states, 2 days from the diagnostic mammography to delivery of the result, 2 days from the delivery of mammography result to the diagnostic evaluation, 12 days from the diagnostic evaluation to delivery of the biopsy results, 18 days from biopsy results delivery until the start of treatment and 45 days from the mammography screening to the start of treatment. The median time from mammography screening to diagnostic confirmation was 21 days.
Proportion of patients with breast tumors smaller or equal to 1 cm	According to the National Cancer Institute data in relation to the distribution by clinic stage at BC diagnosis, only 0.4% were found in stage 0, and 9.2% were in stage I, indicative of lesions smaller than 2 cm (own analysis).



Table III

Indicator	Current status in Mexico
Units, equipment and staff specialized in cancer management	Described previously
Population with social security for cancer care	In addition to the coverage by the IMSS, ISSSTE, etc., The Fund for Protection against Catastrophic Expenditures (FPCE) covers certain cancers, offering medical care to patients accredited through a network of 153 centers for cancer in children and adolescents, 48 for CeCa, 44 for BC, 16 for testicular cancer, 13 for non-Hodgkin lymphoma in adults and 2 for prostate cancer. <sup>30</sup>
Survival rate	A survival rate of approximately 70% was found in 6 years of follow-up of the Seguro Popular affiliates in 2007 (own analysis) according to National Cancer Institute data.

Table IV

Indicator	Current status in Mexico
Level of organization and basic equipment in the Health System for the provision of palliative care to cancer patients	The efforts have been scattered, driven by actors from different origins, from different angles and in different regions from the country. In 2009, with the modification of the General Health Law in the field of palliative care (DOF, January 5, 2009), palliative care was recognized as a right, and the federal government created the National Palliative Care Program (PALIAR) <sup>31</sup> as part of a larger program called the Comprehensive Health Quality System (SICALIDAD) <sup>32</sup> (ROP 2011), which is facing the decentralized logic of the Mexican National Health System in its recent implementation.
Research on the best cost-effective strategies related to palliative care in the national context.	There is still no similar public or strategic policy addressing this issue that meets the minimum requirements in Mexico.
Quality of life of cancer patients	According to data recently published in the Atlas of Palliative Care in Latin America, <sup>33</sup> there are 10 third-level Units/Services of palliative care; four of these units offer only palliative care (National Cancer Institute, National Institute of Pediatrics, National Institute of Neurology, National Institute of Cardiology), and six institutions serve dual functions as pain clinics and palliative care centers. In the second level of palliative care, 34 services were identified, most with dual functions as pain clinics and palliative care centers. Several organizations at the state level and privately have implemented level-one palliative care, with palliative care activities, home visits, psychological support, counseling, etc.

Table V

Indicator	Current status in Mexico
Level of organization and basic equipment in the Health System for cancer patient rehabilitation	There is no national information on this subject
Research on rehabilitation, including more cost-effective strategies in the national context.	
Quality of life of cancer patients.	

Registry to enable the knowledge and monitoring of the epidemiology of this disease and the development of basic strategies. For this registry, it is necessary to create institutional and interinstitutional records of cancer cases using homogenized and systematized information, strengthening the epidemiological surveillance system to provide timely and quality decision-making information, to foster the development of population-based cancer registries in the country, and to generate and/or adapt and validate information systems technologies.

Given the complexity of cancer, it is essential to promote and strengthen cancer research through an interinstitutional and multidisciplinary network to generate knowledge about the burden of the disease, causal factors, effects of the implementation and evaluation of interventions for healthy lifestyles including diet, physical activity and smoking prevention, biotechnological

innovations in primary (prophylactic and therapeutic vaccines) and secondary (new early detection tests) prevention and cost-effective population programs for cancer prevention and control in our context.

#### *Implementation and evaluation*

The NCCP should be a universal care model immersed in every care institution and with national coverage, which should require a national coordination team responsible for the collection, management, reporting and analysis of information generated by the NCCP.

## Discussion

In Mexico, cancer has become one of the leading causes of death. The known risk factors for this group of diseases

es are described as highly prevalent in our population; therefore, the need for a National Control Program is now imminent. The national status of cancer is described here, along with strategies and interventions that could help to control this epidemic. This proposal includes strategies considered internationally.<sup>34</sup> However, the national scene involves some implementation complexity that we must overcome.

The control of some cancer risk factors in the country, such as smoking, alcohol, overweight and obesity,<sup>35-37</sup> has been favored by linking with other health policies aimed at Non-Communicable Diseases (NCD) other than cancer. In addition, the NCCP proposed here considers actions to avoid other preventable factors, such as vaccination against HPV infections, promoting use of clean-burning and efficient stoves, education programs for UV protection, and regulating the use of known carcinogens in work areas.

At the national level, there are specific programs for the early detection and screening of BC and CeCa.<sup>38,39</sup> However, some health institutions have also developed their own guidelines, hindering the systematization of actions on this issue.

Thus, even if the strategy consists of the generation of specific lines of action, the contrasts between health institutions may hamper their implementation. As an example, the structures of IMSS and ISSSTE should function to enable referencing and counter-referencing and should mediate the granting of early treatment within their system, but that is not the case. The situation is worse in other sectors, such as SSalud, which does not have a second level of attention allowing for patient monitoring, therefore saturating hospitals with high degrees of speciality.<sup>22</sup> At the same time, the budget handled by each institution is different; thus, the provision of medicines is heterogeneous throughout the health system, creating the need to develop national clinical management guidelines with the most cost-effective treatment and palliative alternatives for all cancer patients. For this reason, the accreditation of feasible actions for all institutions must be the first step.

The deficient infrastructure available in the country has been mentioned above; for instance, in 2012, the existence of 269 certified medical oncologists for a population of over 100 million people was reported. Additionally, medical specialists are centralized in the larger cities in the country: there are 119 oncologists in Mexico City, 22 in Nuevo Leon, 21 in Jalisco, 14 in the State of Mexico, 9 in Baja California Norte and 8 in Puebla, while there are less than four medical oncologists for the other states of the Republic.<sup>40</sup> The role of primary care physicians, such as general practitioners, family physicians and internists, is essential to provid-

ing primary prevention information to the population, to promoting practices in early cancer detection and to first diagnosing the majority of tumors before referring the patient to cancer specialists. However, most tumors in Mexico are diagnosed in advanced stages, reflecting the lack of knowledge of health staff and the general population as well as the poor distribution of screening programs in these sectors.

Thus, the Mexican health system has serious deficiencies in its physical infrastructure and personnel that will be difficult to amend in the short term. The NCCP should be implemented under the current conditions, and the challenge is to ensure that active cross-sectoral and community collaborations promote effective changes in the lifestyles of the population and in the detection and care to reduce cancer morbidity and mortality in the long term.

In addition to these factors, it is impossible that the huge economic costs associated with cancer can be exclusively undertaken by the public sector and are even less likely to be assumed by individual families. Thus the financing, construction, renovation, management and maintenance of the needed infrastructures for cancer care require the involvement of other sectors, especially the private sector. In this context, it is necessary to define a clear framework and a methodology for the collaboration between public and private stakeholders in the health system.

The creation of a cross-sectoral coordinating body may contribute to the better design, implementation and evaluation of all of these proposed actions. A link between the government sector and a cross-sectoral working task force with actors with technical, academic and research profiles is needed to advance toward key objectives, as has been achieved in some other nations.

Achieving the sustainability of the integrated management of NCDs, including cancer, represents a huge challenge for the health system in Mexico. The economic component is of great importance for both the health system itself and the macroeconomics of the country. To gauge the economic impact that cancer will have on our country, estimations of cancer's macroeconomic impact (i.e., the indirect cost or productivity cost) were performed in two scenarios between 2000 and 2020: the first scenario assumes that the short- and long-term benefits are given to the entire working-age population (PET) who develop cancer, while the second scenario assumes that only the economically active population, consisting of employed and salaried individuals (PEAOA) who develop cancer is the beneficiary, such as that established by the governing law on social security in 2012.<sup>41</sup> Under the scenario of universal social security coverage, the indirect cost generated by cancers among PET in 2010



amounted to almost 36 500 million Mexican pesos (mp). This amount includes revenue lost due to premature deaths (64% of the total), allowances for temporary or permanent disability (30% of the total) and opportunity costs for the person caring for each patient (6% of the total). Under this scenario, the greatest impact (58% of the total, on average) is felt by the female population. According to the current trends of mortality and incidence-prevalence and due to the non-strengthening of prevention and early diagnosis interventions, the macroeconomic cost of cancer is estimated to be at just over 50 500 billion pesos (mp) by 2020.

In the second scenario, the indirect cost generated by cancer in PEOA amounts to just over 21 500 million pesos in 2010. The amount includes 68% of revenue lost due to premature death, 22% for temporary or permanent subsidies and 10% opportunity cost. In the absence of prevention and early diagnosis interventions, it is estimated that the macroeconomic cost of cancers would reach 30 120 million pesos in 2020, then requiring cancer prevention and early detection action in adults, which will contribute to the financial sustainability of comprehensive care cancer in the medium and long term.

The care and treatment of some cancers in people without Social Security are covered by the *Seguro Popular* in Mexico. However, the general population does not have full coverage in the care of other types of cancers. This recent opening of financial protection creates great pressure on the health system to meet the treatment needs of people with cancer.

The FPGCC, created for this purpose, provides health care to accredited patients through a network of centers that do not have national coverage, and the attention it provides has other limitations, such as insufficient numbers of specialists and technical staff for the operation and maintenance of radiotherapy and brachytherapy equipment.<sup>42</sup> In addition, diagnosis confirmation is necessary for FPGC coverage; thus, these women usually receive care in the later stages of cancer. Therefore, the policy of BC treatment inclusion in the FPGC is negatively affected by the lack of an equally wide policy on prevention and early detection.

This reality has led to the exploration of options for increasing the use of the first- and second-level centers, along with private health care facilities, through systems of co-responsibility and schemes of negotiated prices. The increase in demand for care, which is a product of this strategy, should foster better price negotiations for both drugs and treatments.

Similarly, the implementation of a program of this magnitude should consider its evaluation via a transparency and accountability method, for which a statistical information system that calculates the inci-

dence, prevalence, survival and quality of life of cancer patients is needed. These measures are essential to the institution of population-based cancer registries, one of the most urgent needs of the country and a central part of the NCCP.

Therefore, generating an inclusive program that is standardized under equity standards that promote greater survival and improved quality of life for patients is an urgent task in Mexico. These measures will require the effort of the national health system to face the challenges posed here and to have positive effects on the incidence and mortality of one of the leading causes of mortality in the country: cancer.

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