

chronic
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care

Improving
**Chronic
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through Integrated
Health Service
Delivery Networks



**Pan American
Health
Organization**

Regional Office of the
World Health Organization



110th ANNIVERSARY

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Improving Chronic Illness Care through Integrated Health Service Delivery Networks

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Executive Summary

Integrated Health Service Delivery Networks (IHSDNs) are a group of organizations that provide, or arrange for the provision of, equitable and integrated health services to a defined population. IHSDNs are held accountable for their clinical and financial outcomes and, in general, for the health of the population they serve. The objective of the PAHO/WHO IHSDN initiative is to contribute to the development of health systems based on primary health care and on the equitable and efficient delivery of services of the highest technical quality that meet citizens' expectations.

The Chronic Care Model is a comprehensive system for organizing chronic disease care within IHSDNs. The CCM is patient-centered, as well as evidence and population-based and it has been successfully applied in strategies to organize and improve chronic care in developed and developing countries.

The objective of the Disease Management Line of Action under PAHO's Regional Strategy and Plan of Action on Chronic Diseases is to strengthen the capacity of health systems and competencies of the workforce for the integrated management of chronic diseases and their risk factors, using the CCM to organize and improve services. The Regional Strategy promotes the integrated management of non-communicable diseases with a preventive focus, based on equity, the participation of the individual, his or her family, and the community, and a multisectoral approach conducive to developing resources trained in chronic care and quality improvement programs.

PAHO supports the strengthening of primary health care (PHC) and the integrated, population-based management of chronic diseases which features clinical guidelines and evidence-based protocols, monitoring, and improvement of care, and the organization of proactive care. PAHO recognizes the patient's central role in managing his or her health care through self-management programs, supported by health policies and community organizations. These characteristics are critical to achieve functional, successful IHSDNs that are accountable for providing equitable and quality services to the population served.

Introduction

The burden of non-communicable diseases continues to increase worldwide and tackling it is one of the main development challenges of the 21st century. Non-communicable diseases, mainly cardiovascular disease, diabetes, cancer, and chronic obstructive pulmonary diseases, caused an estimated 35 million deaths in 2005, and accounted for 60% of all deaths globally.¹

This is a growing problem in developing countries, since 80% of deaths from non-communicable diseases occur in low- and middle-income countries, and approximately 16 million of these deaths in people under 70 years of age. Deaths from non-communicable diseases are projected to rise over the next 10 years.

Non-communicable diseases are largely preventable and the total number of deaths, especially premature deaths, can be reduced substantially through the modification of four common risk factors: tobacco use, improper diet including excessive salt intake, physical inactivity, and harmful alcohol use. In light of these shared risk factors, a similar approach is recommended for the prevention and control of these diseases. Prevention programs should take the main determinants of health into account in order to boost their effectiveness and ensure a lasting impact.²

An aging population and the growing prevalence of non-communicable diseases (NCDs) are expected to pose an even greater public health challenge in the near future, particularly for primary health care. The first level of care is ideally situated to provide the ongoing, effective contacts with health care providers that chronically ill people require on a community scale.³

In 2006, the 47th Directing Council of the Pan American Health Organization (PAHO) adopted the Regional Strategy and Plan of Action on an Integrated Approach on the Prevention and the Control of Chronic Diseases, including Diet, Physical Activity, and Health. ⁴ The Strategy and Plan of Action proposes specific objectives, activities, and indicators for chronic disease management in order to achieve the goal of preventing and reducing the burden of chronic diseases and their related risk factors. PAHO's chronic disease strategy is consistent with the Regional Declaration on the

new Orientations for Primary Health Care (adopted by the 46th Directing Council)⁵ and with Resolution CD45.R7,⁶ which prioritizes access to essential medicines and other public health supplies.

In September 2011, the United Nations General Assembly issued a political declaration recognizing the burden of chronic diseases for development and calling on Heads of State to promote prevention and control activities, in collaboration with different sectors of society, to combat the global epidemic of chronic diseases.⁷

Health services need to be reoriented in order to provide effective, efficient chronic disease care, since they tend to be fragmented and designed to respond to the demand from acute diseases and maternal and child health problems. PAHO proposes an Integrated Health Service Delivery Network (IHSDN)⁸ approach to the reorientation of health services. This network-based approach is premised on the need to surmount the existing fragmentation of health service delivery that leads to difficulties in access; services that are of poor technical quality, economically unsustainable, and inefficient; unnecessary increases in production costs; and low user satisfaction, among other shortcomings.

Chronic care requires a solid, interconnected first level of care, which should be closely coordinated with more specialized services sometimes located at the second or third levels of care and supported by community resources. It should also employ strategies to improve technical quality, reinforced by increased access to care and adequate funding through appropriate financing mechanisms.

This document examines the linkages between the chronic care models and the Integrated Health Services Network (IHSDN) approach. It describes the main components of the Chronic Care Model (CCM) and the IHSDN and then identifies points of intersection, with an emphasis on the care requirements of the chronically ill.

I. THE CHRONIC CARE MODEL AND INTEGRATED HEALTH SERVICE DELIVERY NETWORKS



1. The Chronic Care Model

Figure 1. The Chronic Care Model



The Chronic Care Model (CCM) was developed by Wagner et al⁹ in 1993 as an approach to organize and deliver health care for persons with non-communicable diseases (NCDs). Now widely accepted and applied worldwide, the model has been assessed positively in a variety of settings.¹⁰ The available information indicates that the CCM can bring about tangible improvements in care and outcomes.^{11,12,13,14,15,16} Multidimensional interventions that encompass different aspects of care have been found to be more effective than those focusing on certain specific aspects.¹⁷

The model has continued to be enhanced and tailored to specific circumstances. The most prominent adaptations are:

- the Expanded Chronic Care Model developed in British Columbia, Canada;¹⁸ and
- the Innovative Care for Chronic Conditions Framework (ICCC) developed by the World Health Organization.¹⁹

Since both proposals are essentially modifications of the original, this report will discuss the model first developed by Wagner et al. That notwithstanding, the Expanded Chronic Care Model of Care developed in British Columbia and the WHO Innovative Care for Chronic Conditions Framework are also valid proposals for implementation.

The CCM is suitable framework for describing the elements that should be present, in a coordinated and harmonious manner,—in a system intended to provide high quality care to the chronically ill. It emphasizes the importance of population-based care, basic principles of improving services, safety, and patient-centered care.

The CCM comprises the six components outlined below (Figure 1):

a) Health care organization: an organization or institution that promotes planned, safe, continuous, and high-quality care, focuses on improvement strategies, and enables patients to navigate among all levels of the health system and among various providers, as necessary.

b) Service delivery design: to ensure effective and efficient clinical care delivery and support patient self-management by assigning roles and tasks among healthcare providers that enable them to engage in planned, culturally-appropriate interactions.

c) Decision support: evidence-based clinical guidelines should be steeped in daily practice; these guidelines and information should be shared with the patient to encourage his or her participation in their care.

d) Clinical information systems: to organize patient and population data for the delivery of efficient and effective health care, by facilitating appropriate planning, the identification of subpopulations, and coordination of care. These systems generate timely reminders for patients and providers to reinforce compliance with improvement protocols and strategies.

e) Support for self-management: to empower and prepare patients to play a central role in their own health. To this end, strategies are used to support patient self-management, including evaluation, goals, action planning, problem-solving, and monitoring.

f) Community support: to mobilize resources to meet the needs of patients that participate in effective community programs. The health care organization can establish partnerships with community organizations that fill gaps in services, and advocate to improve health care services.

Ultimately, the model promotes a productive interaction between a well-informed patient and a well-prepared health team, in order to produce better health outcomes.

2. Integrated health service delivery networks

The Integrated Health Service Delivery Network approach is designed to progressively overcome the fragmentation and limited coordination among services by acting on key categories called IHSDN attributes.⁸

Integrated Health Service Delivery Networks are defined as a group of organizations that provide, or make arrangements to provide, equitable, integrated health services to a defined population. IHSDNs are held accountable for the health status and clinical outcomes of the population served. IHSDNs are comprehensive, since the services they provide cover all levels of prevention and care, and are coordinated or integrated among all care levels and settings, including the community. These services are also continuous over time, meaning that they are provided throughout the population's life cycle.

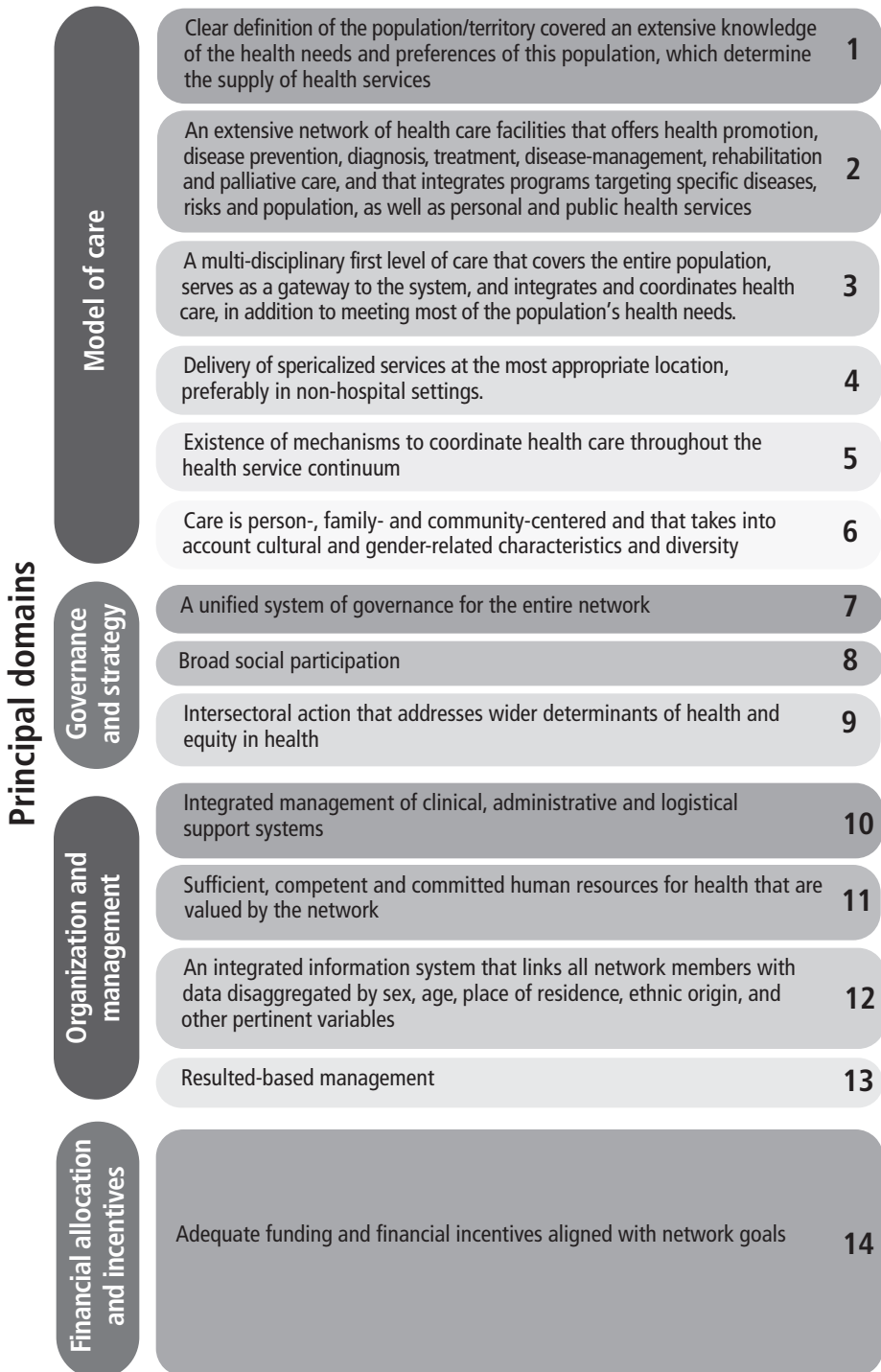
Essential attributes of the IHSDN

The essential elements of the IHSDN (Figure 2) are grouped around four general domains: 1) model of care, 2) governance and strategy, 3) organization and management, and 4) financial allocation and incentives. The specific attributes of the IHSDN are listed under each general domain.

MODEL OF CARE:

1. Clear definition of the population/territory covered and extensive knowledge of its health needs and preferences, which determine the supply of health services. Through this population base, it is possible to identify and address inequities in health coverage, access, and outcomes.
2. An extensive network of health care facilities that offers health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation, and palliative care, and that integrates programs targeting specific diseases, risks, and populations, as well as individual and public health services.
3. A multidisciplinary first-level of care that covers the entire population, serves as a gateway to the system, and integrates and coordinates health care, in addition to meeting most of the population's health needs.
4. Delivery of specialized services at the most appropriate location, preferably in non-hospital settings.
5. Existence of mechanisms to coordinate health care throughout the health service continuum.
6. Care that is person-, family-, and community-centered and that takes into account cultural and gender-related characteristics and diversity.

Figure 2. Essential Attributes of the Integrated Health Delivery Networks



GOVERNANCE AND STRATEGY:

7. A unified system of governance for the entire network.
8. Broad social participation.
9. Intersectoral action that addresses wider determinants of health and equity in health.

ORGANIZATION AND MANAGEMENT:

10. Integrated management of clinical, administrative and logistical support systems.
11. Sufficient, competent, and committed human resources for health that are valued by the network.
12. An integrated information system that links all network members with data disaggregated by sex, age, place of residence, ethnic origin, and other pertinent variables.
13. Results-based management.

FINANCIAL ALLOCATION AND INCENTIVES:

14. Adequate funding and incentives aligned with network goals.

II. INTEGRATING THE IHSDN APPROACH AND THE CHRONIC CARE MODEL



This section explores the points of intersection and complementarity offered by a combined IHSDN and CCM. This integrated approach should take advantage of the merits of each model, as described earlier, in order to strengthen the synergies and more effectively and efficiently address the challenges associated with each individual approach.

The attributes most relevant to chronic care in each of the IHSDN general domains are explored. It should be noted that some IHSDN attributes, particularly in the model of care category, have been adapted to accommodate the CCM. Similarly, the IHSDN attributes relate to the organization and management of services in general and not to specific diseases.

MODEL OF CARE

1. Population-based approach for the prevention and control of NCDs

The population base will be understood as it is defined in the IHSDN approach, namely a clear definition of the population and territory covered and extensive knowledge of its health needs and preferences. An identification is needed of inequities in health coverage, access, and outcomes, which then determine the provision of health care.

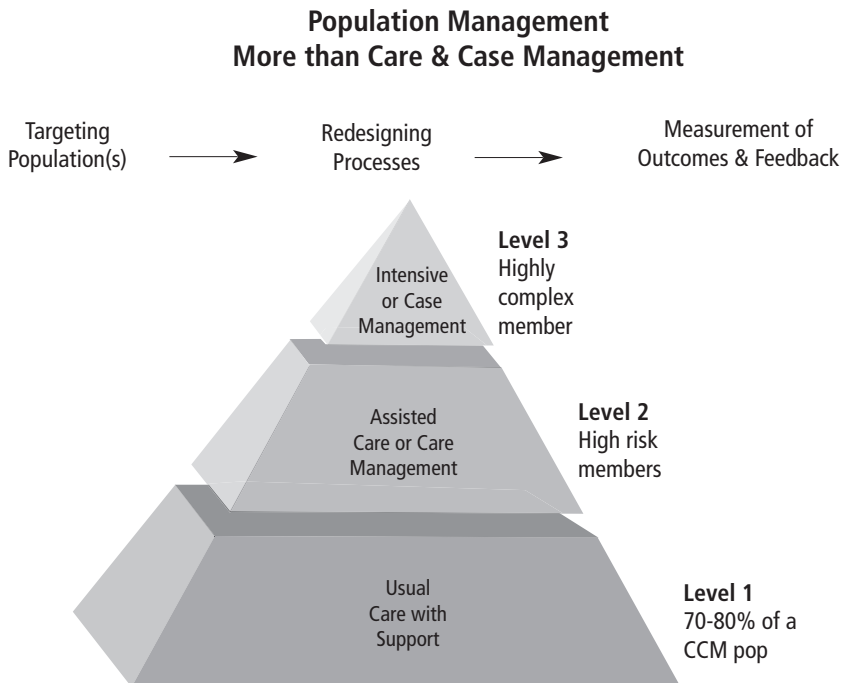
NCD prevention and control is more effective when actions are targeted and concentrated in a defined population and territory, as the IHSDN approach proposes. This territory has an administrative structure that facilitates the actions taken and sufficient information is available about community needs and cultural preferences. NCD prevention and control also require a reorientation of services around a population-based initial contact that allows health services to appropriately plan their resources, with broad coverage and access to prevention and control services.

An optimally functioning health care system should be designed to offer universal coverage and ensure effective access, preferably free of charge at the point of service delivery. Chronic care includes the services offered by the relevant state entity, as well as benefits offered by other entities such as non-governmental organizations. Universal coverage and effective access have a positive influence on the quality of services and on reducing health inequities.

Universal coverage is an important factor in the optimal management of chronic diseases. A health system that offers universal access free of charge at the point of delivery is essential when it comes to chronic conditions that require frequent scheduled contact between health workers and patients. A payment system at the point of delivery limits access and leads to impoverishment.²⁰ On the other hand studies have shown that people with access to free medical services report a better state of health than those lacking such access.²¹

In population-based chronic care, population groups can be stratified based on their needs for services. One way of approaching stratification based on health care needs is the Kaiser Permanente risk pyramid (Figure 3). According to the pyramid, the majority of chronically ill individuals require routine care that is generally uncomplicated and can be provided by clinic management support staff. This group's needs are limited to regular monitoring by the health team and self-management support and it accounts for 70% to 80% of chronic care patients. A group of patients classified as level 2 is high-risk and requires assisted care or care management. A third, even smaller group classified as highly complex requires intensive and highly specialized management.

Figure 3. The Kaiser Permanente Pyramid



The organization of chronic care in a defined population or geographical area with sufficient trained personnel at the first level of care will contribute to the more rational use of human resources and avoid imposing an excessive workload on more specialized personnel. It would also help reduce the inappropriate use of secondary and tertiary services by patients who could be monitored at the first level of care. Effective monitoring can, in turn, reduce the frequency of critical episodes and resulting hospitalizations. Besides being an inappropriate use of financial resources, the use of complex care hospitals to treat chronic disease can be an indication that patients did not receive optimal care during monitoring. In other words, unplanned hospital admissions of chronically ill individuals are often a sign of a failure of the care system.²²

The population-based approach to chronic care also has the advantage of facilitating personalized care. When a health team is responsible for a community and its families, it gets to know their problems and needs. This type of care also facilitates effective communication between a well-trained team and an activated patient, which is the desired outcome of the CCM. "Medical homes"²³ are one example of this kind of interaction. This health service is accessible to patients through telephone contacts with the medical team and the care team is familiar with the patient's complaints and medical history and in a position to effectively coordinate his or her care. Patients from seven countries have given satisfactory ratings to medical homes.²⁴

The population-based approach also facilitates understanding of the specific characteristics of the covered population in a defined territory and the generation of case registries and information systems that strengthen management and monitoring of chronic patients. Health team members can use case registries to get to know the patients and their families. This helps them improve clinical management and allows them to be proactive, rather than reactive, in providing services.

Similarly, population-based or geographical disease registries provide information on the frequency of diseases, their complications, and related mortality, facilitating, for example, epidemiological surveillance of the incidence of different kinds of cancer, case-fatality and survival, and the effectiveness of different therapeutic options.

A system recently developed in Costa Rica,²⁵ a country that has universal health care coverage, is illustrative of the use of population-based care for chronic disease surveillance. Every year, a national survey on chronic diseases and risk factors—including a questionnaire and laboratory tests—is conducted on a population-based sample, by skilled personnel who are already working in the communities and have been given special training. This surveillance system has already published its first report, which includes estimates of the national prevalence of diabetes, hypertension, obesity, smoking, and lack of physical activity, as well indicators for the quality of chronic care.

2. A first level of care

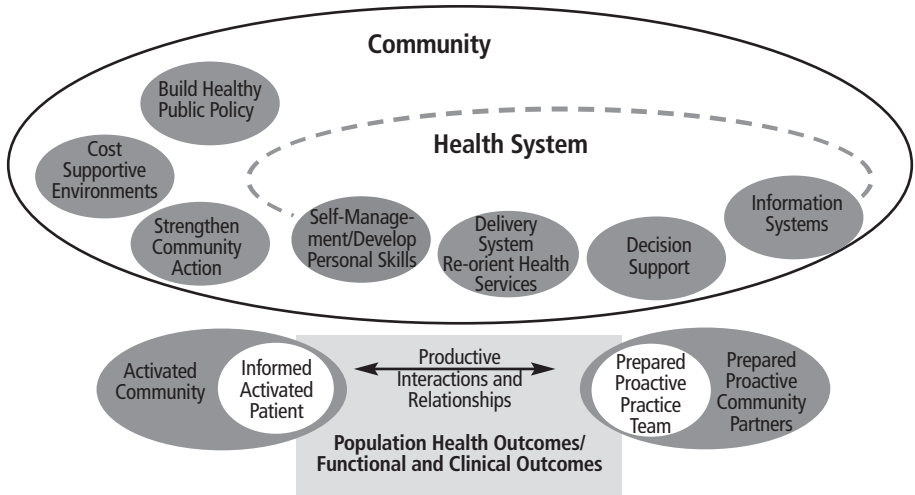
Prevention and control of common NCD risk factors:

The first level of care should offer a combination of preventive and curative services that includes not only chronic diseases but also common risk factors such as unhealthy diet, lack of physical activity, tobacco and harmful use of alcohol.

Strengthening primary care for NCD prevention and control is an essential task that involves organizational restructuring, staff education and training, reorientation of supply, and coordination of the care network.

With this goal in mind, the Expanded Chronic Care Model¹⁸ (Figure 4) was developed in Canada based on Wagner's chronic care model. The expanded model retains the original six components and adds activities on health promotion, giving especial attention to the social determinants of health.

Figure 4. The Expanded Chronic Care Model: Integrating Population Health Promotion



The following are some of the activities that have been implemented in Canada and that Barr et al¹⁸ suggest should be included in the implementation of an expanded CCM:

- Antismoking laws and smoking cessation programs;
- Promotion of safe and well-lit streets to facilitate physical activity; bicycle paths, parks, subsidized public gymnasiums, etc.;
- Advocacy to keep down the prices of healthy foods such as whole wheat flour;
- Development of guides on best practices for promotion and prevention;
- Preventive programs specifically targeting the most vulnerable populations;
- Analysis of the impact of social determinants (poverty, geographical location, etc.) on access to health care and treatment programs.
- Use of population data on poverty, transportation, and violence in preventive programs;
- Care programs to keep the elderly in their own homes for as long as possible to avoid institutionalization;
- Community support for accessible safe housing programs.

b) Early diagnosis and screening for the main non-communicable diseases: Screening and early diagnosis of the main NCDs are key for timely detection and treatment that expands and improves quality of life. The first level of care plays a very important role in early diagnosis and screening for NCDs and their risk factors.

The American Cancer Society (ACS), the American Diabetes Association (ADA), and the American Heart Association (AHA)²⁷ proposed routine screening of apparently healthy people for the early diagnosis of diabetes, several types of cancers, and cardiovascular diseases as an integral part of standard clinical practice, taking advantage of the opportunity provided by each patient-provider contact. Screening of apparently healthy individuals should only be performed when there is an adequate access to treatment. The idea is that these visits could be used for preventive actions such as the periodic review of family history and of the common risk factors of chronic disease such as poor diet, physical inactivity and tobacco and harmful use of alcohol. They also propose revisiting the concept of the annual physical check-up in the United States. Figure 5 below illustrates the general guides for preventive checkups of all at-risk adults, based on age and gender.²⁶ Note that the effectiveness of population based prostate cancer screening with the Prostate-Specific Antigen (PSA) test is controversial and should be considered with caution.

Figure 5. General Prevention Guidelines

GENERAL PREVENTION GUIDELINES				
TEST	20	30	Age 40	50+
BMI			Each regular health care visit	
Blood Pressure (BP)			Each regular health care visit or at least once every 2 years if BP < 120/80 mm Hg	
Lipid Profile			Every 5 years	
Blood Glucose Test			Every 3 years	
Clinical Breast Exam (CBE) and Mamography		CBE every 3 years	Yearly CBE and Mamography	
Cervical Cancer Screening		Every 1-3 years, depends on type of test and past results		
Colorectal Screening			Frequently depends on test preferred	
Prostate Specific Antigen Test and Digital Rectal Exam			Offer yearly; assist informed decisions	

Early detection guidelines such as these can only be applied if health teams share prevention guides and protocols and are in a position to apply them to all at-risk adults. As shown in the table above, the diagnostic tests should be performed according to the established timetable, taking advantage of patient visits. This would enable teams to act on the level of common risk factors for these diseases, as well as screening and early diagnosis, and basic general recommendations such as physical activity, adequate diet, and smoking cessation.

It is also important to organize prevention and early diagnosis based on the life cycle since, while chronic diseases tend to be more common after the age of 50, exposure to certain risk factors begins very early in life for example tobacco smoke or smoking initiation, unhealthy diet, harmful use of alcohol, and physical inactivity. What is more, it is increasingly evident that obesity can begin early in life, even during childhood; that hypertension starts to be common in men of over the age of 30, and in women a decade later; that changes in lipid profiles and blood glucose levels can begin in young adults; and, that certain types of cancers, particularly among individuals who are at high risk and have a family history, require an early screening strategy, based on gender as in the case of cervical, breast, or prostate cancer.

3. Specialized services, coordination, and integration

Care coordination mechanisms must be in place throughout the health services continuum in order to standardize service delivery and ensure integration with other levels. NCD care employs resources that are not available at the first level of care because of their technical complexity, degree of specialization, or other factors relating to patient safety. This is true of certain diagnostic and treatment procedures or therapies such as radiotherapy, cardiac bypass, or dialysis. There should be effective access from the first level of care, along with coordination with the more technically complex levels of the system. Effective coordination and integration of chronic care should be ensured across all levels of the health system.

Services network should be set up in such a way that chronic disease patients can get oriented and navigate among the different levels of the system, accessing general and specialized services, support for self-management, and the support of community organizations, in order to obtain the ongoing and differentiated care they need. Given the complexity of chronic care, the services of a care coordinator are often needed to help patients get oriented and navigate the system to obtain the care they need. The American Cancer Society's (ACS) Patient Navigator Program²⁷ offers an example of effective care coordination. After a cancer diagnosis,

the ACS gives the patient the option of working with a navigator, a person who is trained, familiar with the health care system, and serves as a care coordinator. The navigator helps coordinate treatment, procedures, and examinations, while offering psychological support to the patient and his or her family.

While there are different ways of describing this concept, for the purposes of this document, integration²⁷ is defined as a coherent set of models and methods that the different organizational, clinical, and service delivery levels use to create connectivity, alignment, and collaboration within and between components of care. The purpose of these methods and models is to improve quality of care and quality of life, patient satisfaction, and the efficiency of the system for patients with complex, long-term problems, by forging linkages between multiple services, providers, and settings.

There is a distinction between clinical integration and services integration.

Clinical integration occurs when the care offered by professionals and providers is organized into a single, coherent process, for example, through the use of common guidelines and protocols. Services integration occurs when clinical services are integrated at the organizational level, for example, through multidisciplinary professional teams.

Services integration occurs at different levels, such as:

- Horizontal integration: a merger of two or more health organizations that provide services at a similar level, for example, acute care hospitals or foundations that offer combined health and social services.
- Vertical integration: when two or more organizations that offer services at different levels join forces, for example, acute care hospitals with community health services, or tertiary services working in conjunction with those at the secondary level.

Horizontal or vertical integration may occur physically, such as organizational mergers, or virtually, through partnerships, associations, and networks.

Clinical integration can also play a role in workforce training. Inter-consultations with specialists have been identified as an effective training strategy for staff at the first level of care^{28,29,30} This is why many organizations have adopted the concept of integrating the first level care with specialists in order to offer more complete care. Kaiser Permanente³¹ and the United States Veterans Administration³²

offer two examples of effective integration of the full spectrum of services required by the populations they serve.⁸

To summarize, in terms of services networking and strengthening, chronic care will have to be organized in such a way as to ensure appropriate coordination between the primary and secondary levels and a reorientation of health worker practices through appropriate training.

4. Patient-centered care

Prevention and control of chronic conditions can be approached more effectively by offering patient-centered care³³ as described below, rather than focusing on a particular disease.

Patient-centered care³⁴ involves:

- Ensuring the accessibility and continuity of care;
- Strengthening patient involvement in care by making it easier for patients to express their concerns and for health care service providers to respect their patients' values, preferences and needs and offer emotional support, especially to relieve their anxieties and fears;
- Supporting self-management across all levels of the system by facilitating therapeutic goal-setting and boosting the confidence of patients and their families in self-care;
- Establishing more efficient mechanisms for inter-unit coordination and integration.

Patient-centered care also means that health network staff are aware of these principles and appropriately trained to offer this type of care, which may include bringing in community resources.

When organizing patient-centered care it is necessary to undertake the following:

- define roles and distribute tasks among multidisciplinary team members;
- use planned interactions to support evidence-based care;
- ensure regular patient monitoring; and
- provide care that patients can understand and that is culturally appropriate.

Another measure that can improve patient-centered care outcomes is the appropriate use of advanced technology to enhance communication with the patient. The use of email to follow up on the problems and requests of patients has been shown to be effective in decreasing the number of office visits as well in improving quality

of care and patient satisfaction indicators.³⁵ Because chronic care patients frequently require the services of several different practitioners who may not be located in the same physical space, they may be asked for the same information over and over again. This can be resolved by creating a care coordinator role at the first level of care to reduce communication problems and help the patient navigate the system. Other helpful tools include referral and counter-referral forms, printed materials, patient-managed cards, electronic files, and the clinical information system.

The health provider, in turn, should consult and come to an agreement with the patient on the objectives of his or her care plan. The relevant care guidelines and protocols should be shared with the patient. The self-management goals established for each patient should take into account his or her background and living situation as well as any potential barriers. Collaborative, rather than directive, counseling approaches that involve the patient in his or her care plan should be used. This allows the patient to become an informed consumer, an activated patient, a co-producer of his or her treatment, and a collaborator in quality improvement strategies.³⁶ In order for this to occur, however, each patient visit has to be planned and prepared ahead of time, and all of the relevant information must be up-to-date and available at the time of the visit.

GOVERNANCE AND STRATEGY

1. A unified system of governance for the entire network

Fragmentation is a common problem in medical care, and especially when it comes to chronic care. The fragmentation of systems, evidenced by disparities in the accessibility and coverage of services, medicines, diagnostic procedures, and essential therapies, has a powerful impact on the management of chronic diseases requiring coordinated, ongoing care.

In some countries persists a dual social protection system, consisting of subsidized social welfare and a social security system.³⁷ As a consequence of different social protection and social security systems, it happens often that within a single country different guidelines and protocols, service delivery networks, information systems, and self-management programs are used. These differences sometimes constitute an outright duplication of services that leads to the irrational use of resources, lack of coordination, and wasted efforts.

This lack of relationship between social welfare and social security systems has roots exceeding the borders of the health sector, but it has direct consequences in terms of benefits. The disconnection arises from the way in which each system is funded. Social security is sustained through contributions from formal sector workers and their employers, allowing them access to certain social benefits. Those outside the formal labor market, benefit or can benefit from social assistance, funded by the state.

Although the benefits that the formal market workers receive remain on average much higher than those received through social welfare, the funding mechanisms used are, in effect, a tax on formal sector employment, along with a subsidy to the informal sector.

However, other countries have organized single payer unified care systems. A unified system of governance ensures the implementation of treatment guidelines and protocols throughout the health care system and enlists the patients as well as health workers. In this way, the care provided is consistent throughout the system and maintains its focus on the patient and on care outcomes. A unified system of governance for the entire health care network is therefore key to improving chronic disease care.

Network governance includes the following responsibilities:

- Goal-setting (vision, mission and strategic objectives): quality of care and a commitment to quality improvement strategies should be reflected in the network's vision, mission, and objectives.
- Coordination among the different governing bodies of the entities that make up the network to ensure that the care system is prevention-focused and covers the most pressing health problems, such as improving maternal-child health services, or control of tuberculosis or AIDS. As far as chronic ailments are concerned, this should include health promotion in the schools, the creation of appropriate opportunities for physical activity, policies on the accessibility and availability of nutritious foods, and initiatives to discourage alcohol and tobacco use by regulating prices and the areas where they can be consumed.
- Ensuring that the vision, mission, objectives, and strategies are consistent throughout the network. The network's objectives should support chronic care through subsystems or service components that allow patients to move easily between levels and services during the care process.
- Ensuring that the network operates at optimal performance level through monitoring and evaluation of outcomes and processes; the information generated through clinical care should guarantee proper monitoring of actions that contribute to the continuous improvement of the care system.

- Standardization of the network's clinical and administrative functions; members of the multidisciplinary chronic care teams should have well-defined roles in order to optimize resources and ensure that all duties are carried out in a coherent manner.
- Ensuring adequate funding for the network; payment systems for services and medicines should be insured continuously during chronic care. Universal coverage is the ideal method for obtaining continuous long-term medical care.
- Responsibility for the effectiveness of its performance as a governing body, by making quality improvement a permanent fixture.
- The capacity to channel international cooperation, and align it with the system. Donor funded projects in middle- and low-income countries frequently target specific diseases, such as diabetes or cancer. The network should integrate international cooperation into the system such that it maximizes its effectiveness and reduces implementation costs.²

2. Broad social participation

Social participation, understood as one of the components of IHSDN governance and strategy, is key to the prevention and control of chronic diseases. At least three forms of participation are relevant to this goal:

a) Social and community participation in advocating on behalf of public policies and resource allocations for chronic disease prevention. This type of social participation is particularly critical in low- and middle-income countries where there is a prevailing myth that these sorts of ailments are the problems of rich countries or only affect the elderly.³⁸ Such myths hamper the ability to act on risk factors and the early detection of diseases in the countries that most need it since, as noted earlier, the burden of this type of disease affects them very strongly, in particular their disadvantaged populations.

b) Patient and support organizations and groups. Since these diseases are chronic and require lifetime care, it is important that patients join volunteer organizations that help them cope with their disease, learn to live with it, and give and receive support. There are a number of clubs for people living with diabetes and heart disease or cancer survivors, for example, as well as nongovernmental organizations that promote support for education and peer support, such as Peers for Progress.³⁹

c) Nongovernmental organizations and private, religious, or charitable foundations providing services that are not available through public systems. These include Cancer Societies, which offer patient services, early detection, treatment and education, or specialized clinics, which receive funding from outside the health system to offer free health care. An example of the latter is the Homestead diabetes clinic in the United States,³⁹ which provides services such as free health care, nutrition education, and access to practicing specialists.

3. Intersectoral action and addressing health determinants and health equity

The main determinants of health must be addressed given the high prevalence of chronic diseases in middle- and low- income countries as well as the existence of shared risk factors.⁷ It is particularly important to improve living conditions and tackle inequities by acting on social and environmental settings that are conducive to making healthy decisions.

The CARMEN network in Latin America is one initiative for intersectoral action to address health determinants and health equity.⁴¹ CARMEN aims to improve the health status of populations in the Americas by reducing risk factors associated with non-communicable diseases through public policy-making, implementation and evaluation; social mobilization; community-based interventions; epidemiological surveillance of risk conditions; and preventive health care services. Interventions in the CARMEN framework take place in a defined population area (local, provincial or national) and are distinguished by their integration, and their promotion of health equity. Similar networks have been established in other regions of the World Health Organization.

Another relevant experience comes from Brazil, which has implemented a community-based primary care program. A team made up of at least one doctor, one nurse, one clinical assistant, and four to six trained community health agents provides services in community clinics, make home visits, and carry out neighborhood health promotion activities. Launched in 1994, this program has contributed to a significant reduction in hospitalizations for diseases that can be managed through ambulatory care, including cardiovascular conditions, strokes, and asthma. Hospitalization rates for chronic diseases were 13% lower in municipalities with high enrollment levels in the Family Health Program, compared to those with low enrollment levels.⁴²

ORGANIZATION AND MANAGEMENT

1. Integrated management of clinical, administrative, and logistical support systems

In addition to the elements of the care model, which must be incorporated into health services to ensure high quality chronic care, the organization and management of integrated networks must also be taken into account to ensure that the care model works properly. Among the most important of these are coordination and integrated management of clinical, administrative, and logistical support systems; the installation and appropriate use of information systems; and results-based management.

Clinical, administrative, and logistical support systems, including pharmacies, must also be managed in an integrated manner through multidisciplinary teams responsible for managing specific clinical services. Integration may be contractual, such as occurs with providers, or organizational. The latter may include multispecialty groups, aligned incentives, the use of information technology and guidelines, accountability for performance and target populations, partnerships between physicians and the administration, effective leadership, and a collaborative culture. All of these components of integrated systems contribute to good performance. However, the sole organizational integration does not ensure clinical and service integration.

Accountable Care Organizations,^{43,44} a new form of coordination recently introduced in the United States, bring together groups of service and care providers to promote competition and balance the budget, while combating fraud and abuse of the system.

Referral and counter-referral systems are particularly important in chronic care delivery. As noted earlier, health care systems should ensure that patients requiring care beyond the scope of the first level of care are seen in a timely manner at either the secondary or tertiary levels. The first level of health care, in turn, should see patients after they have obtained more complex services and should be informed of the results and recommendations made at that level.

2. Sufficient, competent, and committed human resources that are valued by the network

The IHSDN approach emphasizes the need for sufficient, competent, and committed human resources that are valued by the network. The health care network must also include technical staff specialized in chronic diseases.

The first level of care team should serve as a gateway to the system, integrating and coordinating with more specialized services. WHO⁴⁵ offers the following guidance based on the identification of five core competencies that should be created and developed in the workforce caring for the chronically ill:

- patient-centered chronic care that includes: interviewing and communicating effectively; assisting changes in health-related behaviors; supporting self-management; and using a proactive approach
- partnerships with patients, providers, and communities
- quality improvement strategies: measuring care delivery and outcomes; learning and adapting to change; translating evidence into practice
- use of information and communication technologies: designing and using patient registries, using computer technologies, and communicating with partners
- public health perspective: providing population-based care; systems thinking; work across the care continuum; working in primary health care-led systems.

A health care network requires health workers with specific competencies in management and direction. Human resources will have to be trained in these new competencies including, for example, a systems approach, negotiation and conflict resolution, continuous improvement, network management, and teamwork. It may also be necessary to create new positions, such as directors of clinical integration, planning, and network development.

3. Information system

Chronic care services must be equipped with integrated information systems that connect all members of the network; include information on planning and processes for monitoring and evaluation purposes and tools to support clinical decision-making; and produce aggregated data to inform continuous quality improvement. These systems should be integrated with surveillance or epidemiological information systems traditionally used to track morbidity and mortality from communicable diseases.

Specifically, clinical information systems for chronic care are used to:

- offer timely reminders for providers and patients
- identify subpopulations in order to provide proactive care
- facilitate individual care planning
- share information with patients and providers for the purpose of coordinating care
- monitor the performance of clinical teams and of the care provided.

Box 1: Chronic Disease Information System in Calgary, Canada



The information system developed in Calgary⁴⁶ is people- rather than disease-centered, meaning that data from all of the patients included in the program is inputted, regardless of the disease they present. Results indicated that blood glucose and hypertension management had improved ostensibly among high risk patients. -Emergency visit declined by 34%, while hospitalizations and bed day use declined by 41% and 31% respectively.

These results were achieved using a chronic disease control program, applying continuous quality improvement methods, and measuring the impact on the population and on system use.

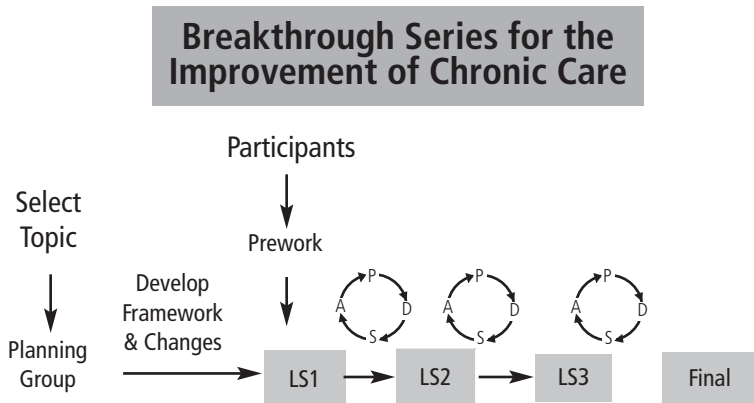
4. Results-based management and continuous quality improvement

An integrated health network requires results-based management that ensures strategic planning and management at all levels, guides the services provided towards measurable results, and incorporates continuous quality improvement.

Effective and consistent leadership is essential when installing high-quality chronic care models with an integrated networks approach in order to carry out the necessary changes and identify desired outcomes. And while this may involve multiple levels of leadership, they must be aligned with the highest managerial level and adopt a management style, such as results-based management, capable of bringing about coherent and measurable changes.

The Breakthrough Series (BTS, Figure 6) developed by the Institute for Healthcare Improvement (IHI)⁴⁷ is the quality improvement model most frequently used to improve chronic disease care. A Breakthrough Series Collaborative is a short-term (6 - 15 months) learning system, which involves successive Plan, Do, Study, Act (PDSA) cycles accompanied by periodic measurements to determine the effects of the changes and whether they represent an improvement. Examples of the application of this methodology are summarized below.

Figure 6. The Breakthrough Series



Box 2: The VIDA project in Mexico

The VIDA Project (Veracruz Initiative for Diabetes Awareness)¹⁶ aimed to improve the quality of diabetes care using the chronic care model and the BTS (Breakthrough Series) collaborative methodology for quality improvement. A comparative study was conducted on 10 primary health care centers with and without intervention, and patients were monitored over 18 months. The study included 196 cases and 111 controls. The percentage of people with good blood sugar control ($A1c < 7\%$) rose from 28% prior to the intervention to 39% post intervention. In addition the percentage of patients who met three or more quality improvement goals rose from 16.6% to 69.7%, while this figure dropped from 12.4% to 5.9% in the non-intervention group.

The methodology focused strategically on the primary health care team and the participation of people living with diabetes. The participants introduced modifications to address health care problems that they had identified in four areas of the chronic care model (self-management support, decision-making support, service delivery design, and information systems).

Box 3: Improvement of cervical cancer prevention and control in El Salvador

The objective of this project⁴⁸ was to improve the delivery of prevention and diagnostic services for cervical cancer in El Salvador based on continuous quality improvement—BTS—and a communications strategy with users, with pre- and post-measurements taken in a rural primary health care service. The intervention consisted of the implementation of 4 Plan-Do-Study-Act (PDSA) cycle, facilitating links between work processes, and establishing a quality control group. The project involved decision-makers, service-providers and the community. Project results indicated that overall 3,408 women were screened for the first time in their lives in the regular health services over one year. Unsatisfactory samples of pap smear were reduced by half. The turnaround time of sample analyses were reduced to 1/3 and follow-up of women with positive results increased from 24% to 100%

These results were achieved through modifications to strengthen the links between detection and diagnosis by reinforcing team work and operational coordination, which also helped to improve follow-up. The linkages between screening and sample reading were restored, which improved turnaround time. Trained health promoters helped to identify women who had never been screened for cervical cancer and facilitated access to regular health centers for this purpose.

ALLOCATIONS AND INCENTIVES: adequate funding and financial incentives aligned with network goals

Chronic diseases have considerable economic consequences. Costs related to diabetes, for example, have been estimated at US\$65 billion annually⁴⁹ and range from 1.8% of the Gross Domestic Product in Venezuela to 5.9% of the GDP in Barbados. In Mexico, meanwhile, chronic conditions such as type 2 diabetes, hypertension, chronic renal failure, cervical cancer, breast cancer, and HIV/AIDS accounted for an estimated over 12% of total spending by the Mexican Social Security Institute in 2007.⁵⁰

There is evidence that cost-effective interventions can be implemented through the first level of care. Certain secondary prevention interventions for cardiovascular diseases are very cost-effective. For example, using a combination of medicines (aspirin, two antihypertensives, and a statin) to treat individuals with high total cardiovascular risk (defined as a 25% probability of experiencing a cardiovascular event in the next ten years) will cost an estimated \$1.20 per capita and could reduce cardiovascular mortality by 20%.⁵¹ Also It has been suggested that simplified non-laboratory risk screening method to identify the 6% of the population with cardiovascular risk greater than 25%, which costs approximate \$1.20 per capita, could reduce cardiovascular mortality by 20%.⁵²

A relevant aspect of allocations and incentives is that there must be sufficient funding to ensure access to appropriate technologies and equipment for NCD prevention and control. Other relevant aspects include payment arrangements that encourage prevention and service integration, given that not all payment systems act as incentives for coordination. Traditional payment systems applied separately by each facility and level of care (for example, fee for procedure, fee for service, or budget payments) discourage coordination between levels of care.

IHSDNs have responded to this by introducing resource allocation mechanisms and financial incentives, such as risk-adjusted per capita payments,⁷ which are designed to promote coordination among service providers and treatment of health problems in the most appropriate setting along the continuum of care. In other cases, fee-for-services or fee-for-procedure structures have been replaced by methods such as services packages that create incentives for efficient, evidence-based service delivery, or offer payments to patients who use educational services. Brazil's federal law, for example, recommends tying the delivery of diabetes supplies such as glucose meters and insulin to patient's participation in a diabetes education course.⁵³

Another method is Pay-for-Performance (“P4P”), which involves funds or goods transfers in exchange for performing a measurable action or meeting a predetermined performance goal. Its aim is to improve the use of services, mainly preventive, and/or the quality of the services provided. This method is distinguished by its link to performance, quality, or specific actions on the demand or supply side. It does not include wage increases or any subsidies that are not directly tied to performance indicators closely associated with improved health outcomes.⁵⁴ Direct payments to the demand side, called conditional transfers to the demand side, include subsidies for transportation, meals, or for preventive services-seeking behaviors.

Still another approach to improving chronic disease care is to offer a set of guarantees of government financial protection against disease, such as the Explicit Health Guarantees⁵⁵ (also known as AUGÉ) in Chile. This system provides the following legally-regulated guarantees:

- a) Access: ensuring access to benefits, whether in public or private health systems.
- b) Quality of the benefits.
- c) Timeliness of the benefit, which is binding on each provider included in the benefit.
- d) Financial protection: regulating the copayment amount.

Innovative financing arrangements include using revenues from tobacco and alcohol tax increases for NCD prevention and control programs. A 50% increase in tobacco taxes could generate US\$1.42 billion in additional funds in 22 low-income countries.²⁰ Tax increases on unhealthy foods and beverages might also be an effective fund-raising method.⁵⁶ Finland’s diabetes program⁵⁷ uses slot machine revenues as a funding mechanism and exemplifies effective community collaboration.

In brief, NCD prevention and control requires IHSDNs to reorient their financing by allocating sufficient funding to ensure access to high-technology services and procedures, by shifting from fee-for-services payment systems towards arrangements that are more conducive to efficient, evidence-based care by designing incentives on the supply and demand side to promote prevention and early diagnosis of chronic disease, and by offering financial protection to those suffering from these costly conditions, particularly the most disadvantaged.

Conclusions

The development of IHSDNs is extremely beneficial for the implementation of comprehensive chronic care, as described in this document. Specifically, an integrated health service delivery network facilitates NCD prevention and control efforts in the target population, based on the social determinants of health and aided by the knowledge acquired by health teams in close touch with the target population. It also affords chronically ill people with broader access to the services network through the system's gateway, the first level of care, and facilitates their transit between the other levels of complexity required as part of an integrated supply. Another point of intersection between IHSDNs and the CCM is their focus on the needs and preferences of the patient. The efforts IHSDNs are making to develop more equitable and accessible financing systems will improve the access of chronically ill patients to services that often constitute a burden for them. At the same time, the shared, evidence-based treatment protocols proposed under the CCM can help reinforce the IHSDN and foster a culture of improving health care in all of the areas that an IHSDN should cover, as well as improving its performance and the satisfaction of users and health workers.

List of Abbreviations

ACS:	American Cancer Society
ADA:	American Diabetes Association
AHA:	American Heart Association
AIDS:	Acquired Immune Deficiency Syndrome
AUGE:	Universal Access to Explicit Guaranties (from the Spanish Acceso Universal a Garantías Explicitas)
BTS:	Breakthrough Series
CARMEN:	Actions for the Multi Factorial Reduction of Non Communicable Diseases, from the Spanish Conjunto de Acciones para la Reducción Multifactorial de Enfermedades Crónicas
CCM:	Chronic Care Model
GDP:	Gross Domestic Product
HIV:	Human Immunodeficiency Virus
IHI:	Institute for Health Improvement
IHSD:	Integrated Health Service delivery Networks
NCD:	Non Communicable Diseases
P4P:	Pay for Performance
PAHO:	Pan American Health Organization
PDSA:	Plan-Do-Study-Act
PSA:	Prostate Specific Antigen
VIDA:	Veracruz Initiative for Diabetes Awareness
WHO:	World Health Organization

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