

# Innovative Care for Chronic Conditions

Organizing and Delivering High Quality Care for Chronic Noncommunicable Diseases in the Americas



**Pan American  
Health  
Organization**



**World Health  
Organization**

REGIONAL OFFICE FOR THE **Americas**



# Innovative Care for Chronic Conditions:

Organizing and Delivering High Quality Care for  
Chronic Noncommunicable Diseases in the Americas



# Innovative Care for Chronic Conditions:

Organizing and Delivering High Quality Care for  
Chronic Noncommunicable Diseases in the Americas



**Pan American  
Health  
Organization**



**World Health  
Organization**  
REGIONAL OFFICE FOR THE **Americas**

Washington, DC. 2013

PAHO HQ Library Cataloguing-in-Publication Data

Pan American Health Organization.

Innovative Care for Chronic Conditions : Organizing and Delivering High Quality Care for Chronic Noncommunicable Diseases in the Americas. Washington, DC : PAHO, 2013.

1. Chronic Disease. 2. Health Care Quality, Access, and Evaluation. 3. Innovation. 4. Americas I. Title.

ISBN 978-92-75-117385

(NLM classification: WT500 DA1)

The Pan American Health Organization welcomes requests for permission to reproduce or translate its publications, in part or in full. Applications and inquiries should be addressed to Editorial Services, Area of Knowledge Management and Communications (KMC), Pan American Health Organization, Washington, D.C., U.S.A., which will be glad to provide the latest information on any changes made to the text, plans for new editions, and reprints and translations already available.

© Pan American Health Organization, 2013. All rights reserved.

Publications of the Pan American Health Organization enjoy copyright protection in accordance with the provisions of Protocol 2 of the Universal Copyright Convention. All rights are reserved.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the Pan American Health Organization concerning the status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the Pan American Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the Pan American Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the Pan American Health Organization be liable for damages arising from its use.

*This document was prepared by Alberto Barceló, JoAnne Epping-Jordan, Pedro Orduñez, Silvana Luciani, Irene Agurto, and Renato Tasca.*

*The preparation of this document benefited from contributions by Claudia Pescetto, Rubén Suárez, Victor Valdivia, Anand Parekh, Rafael Bengoa and Michael Parchman.*

Design and layout: Sandra Serbiano, Buenos Aires, Argentina

Photo Credits: WHO: Page 8/ PAHO: Pages 10, 12, 14, 17, 18, 21, 70, 74, 83, 86/ Shutterstock.com: Pages 22, 28, 36, 42, 58, 72, 76, 80/ Depositphotos.com: Pages 48, 54, 64, Front Cover/ Photl.com: Page 5



# Table of Contents

Executive Summary .....	11
Background .....	13
Introduction.....	15
THE CHALLENGES .....	17
PREMATURE DEATH AND DISABILITY.....	17
ECONOMIC HARDSHIP .....	17
POOR-QUALITY CARE.....	18
The Chronic Care Model.....	23
PRODUCTIVE INTERACTIONS.....	24
EXPERIENCE SHOWCASE .....	26
Self-Management Support.....	29
EXPERIENCE SHOWCASE .....	34
Delivery System Design .....	37
EXPERIENCE SHOWCASE .....	40
Decision Support.....	43
EXPERIENCE SHOWCASE .....	46
Clinical Information Systems .....	49
EXPERIENCE SHOWCASE .....	52
The Health Care Organization.....	55
EXPERIENCE SHOWCASE .....	57

Community Resources and Policies .....	59
EXPERIENCE SHOWCASE .....	61
Beyond the Chronic Care Model: Macro Level Considerations .....	65
POLICY IMPLICATIONS .....	65
INTEGRATION OF SERVICES .....	66
FINANCING.....	69
LEGISLATION .....	70
HUMAN RESOURCES AND INFRASTRUCTURE .....	72
PARTNERSHIPS.....	74
LEADERSHIP AND ADVOCACY .....	75
A Method for Introducing Change.....	77
Implementing and Improving CNCD Care in the Americas .....	81
THE CHRONIC CARE MAP: EXPERIENCE SHOWCASE.....	82
Conclusions.....	87
Recommendations .....	90
List of Abbreviations.....	92
References.....	94
Annex 1: Contributors .....	102



**DR MARGARET CHAN,  
DIRECTOR GENERAL, WHO**

“ Universal [health care]  
coverage is the single most  
powerful social equalizer ”

Opening Remarks by the Director-General of the  
World Health Organization at the 64th Session of the  
WHO Regional Committee for The Americas  
*Dr. Margaret Chan*  
*17 September 2012*  
*Washington DC*



“ I will work to enhance this Organization’s [PAHO’s] ability to work side-by-side with our Member States to develop health systems and services, and promote models of care, which advance universal access. ”

Change in Health, Health for Change  
Inaugural Address of Dr. Carissa F. Etienne as  
Director of the Pan American Health Organization  
31 January 2013  
Washington DC

# Executive Summary

Care for chronic noncommunicable diseases (CNCDs) such as cardiovascular disease (CVD), diabetes, cancer, and chronic obstructive pulmonary disease (COPD) is a global problem. Research demonstrates that the vast majority of people with CNCDs do not receive appropriate care. This report describes a model of health care that could deliver integrated management of NCDs within the context of primary health care (PHC), and provides practical guidance for health care program managers, policy-makers, and stakeholders on how to plan and deliver high-quality services for people with CNCDs or CNCD risk factors. Key implications of integrated management at the policy level are also discussed, including the financial and legislative aspects of care and human resource development. The report includes a list of examples of effective intervention for each component of the Chronic Care Model. Furthermore, unpublished country based examples of the implementation of good practices in chronic care are showcased throughout the document. The document concludes that the Chronic Care Model should be implemented in its entirety since its components have synergistic effects, where the whole is greater than the sum of the parts. Policy reforms and universal access to care are critical elements leading to better outcomes and reducing disparities in chronic disease care. It is critical to integrate PHC-based chronic care into existing services and programs. Chronic diseases should not be considered in isolation but rather as one part of the health status of the individual, who may be susceptible to many other health risks. A patient-centered care system benefits all patients, regardless of their health conditions or whether his/her condition is communicable or noncommunicable. A care system based on the Chronic Care Model is better care for all, not only for those with chronic conditions. Primary care has a central role to play as a coordination hub, but must be complemented by more specialized and intensive care settings, such as diagnostic labs, specialty care clinics, hospitals, and rehabilitation centers. Finally the ten recommendations for the improvement of quality of care for chronic conditions are:

1. Implement the Chronic Care Model in its entirety.
2. Ensure a patient centered approach.
3. Create (or review existing) multisectoral policies for CNCD management including universal access to care, aligning payment systems to support best practice.
4. Create (or improve existing) clinical information system including monitoring, evaluation and quality improvement strategies as integral parts of the health system.
5. Introduce systematic patient self-management support.
6. Orient care toward preventive and population care, reinforced by health promotion strategies and community participation.
7. Change (or maintain) health system structures to better support CNCD management and control.
8. Create PHC-led networks of care supporting continuity of care.
9. Reorient health services creating a chronic care culture including evidence-based proactive care and quality improvement strategies.
10. Reconfigure health workers into multidisciplinary teams, ensuring continuous training in CNCD management.



## Participants in the Working Group Organizing and Delivering High Quality Care for Chronic Noncommunicable Conditions in the Americas

13-14 December 2012  
Washington DC

Front row: Tomo Kanda, Elisa Prieto, Lisbeth Rodriguez, Sonia Angel, Tamu Davidson-Sadler  
Back row: Frederico Guanais, Micheline Meiners, Rafael Bengoa, Anand Parekh, Alberto Barceló, Renato Tasca, Sandra Delon, Maria Cristina Escobar, JoAnne Epping-Jordan, Sebastian Laspiur, Silvana Luciani, Anselm Hennis, Pedro Orduñez

# Background

This report describes a model of health care that could deliver integrated management of NCDs within the context of primary health care (PHC), and provides practical guidance for health care program managers, policy-makers, and stakeholders on how to plan and deliver high-quality services for people with CNCDs or CNCD risk factors. Key implications of integrated management at the policy level are also discussed, including the financial and legislative aspects of care and human resource development. The implications of this type of care for health care systems, as well as patients and communities, are also analyzed. Recommendations and suggestions are made based on evidence and practical experiences. This report is not an exhaustive review of models for integrated management of NCDs and does not attempt to capture the full breadth of experiences across all countries in the Region. Many individuals contributed with examples that are showcased along the document. A full list of contributors appears in annex 1.

The working group **Organizing and Delivering High Quality Care for Chronic Noncommunicable Conditions in the Americas** took place on December 13-14, 2012 in Washington DC with the participation of 20 experts and health officials from 10 countries. During this two day working group, participants reviewed different aspects of the Chronic Care Model, including specific evidence for interventions and a set of general recommendations. A complete list of participants is presented in Annex 1. As a result of the working group, for each component of the Chronic Care Model, a list of examples of evidence-based interventions is included in this report under sections named **Examples of Effective Interventions**. These evidence based interventions come from articles that were identified in a rapid review of literature using the PubMed and the Cochrane databases. The initial review included more than 200 articles, while a total of 37 high quality articles (mainly systematic reviews) were finally included in the list. The identified evidence-based interventions should be considered with care since some adaptation may be necessary, given that the original interventions may have been developed in settings with different social and economic contexts. Details about the literature search and the working group are available from the authors.

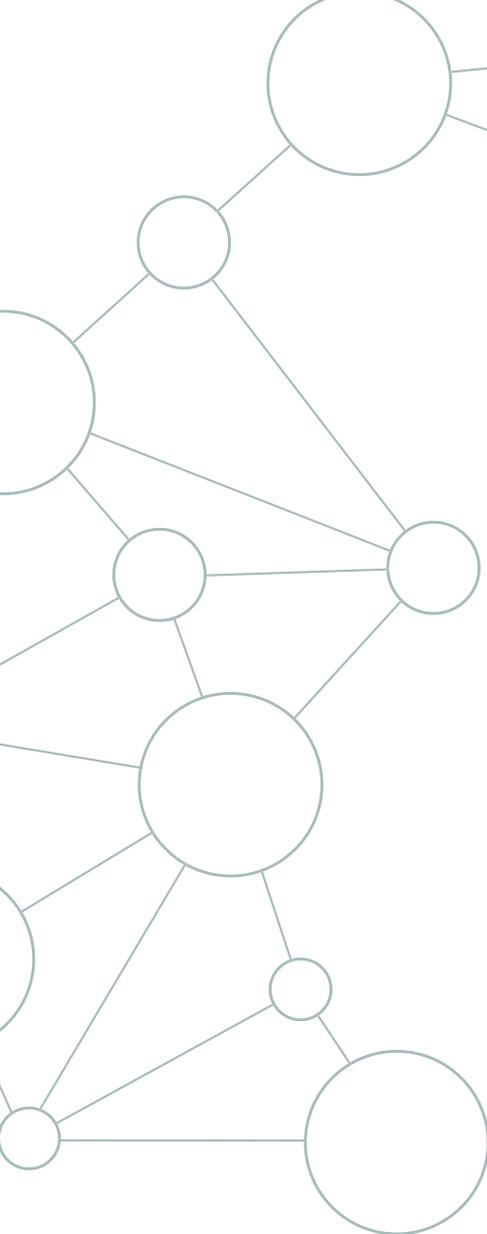
The report is divided into ten main sections:

1. **Executive Summary.** This session presents a summary of the issues covered by this document.
2. **Challenges.** This section describes the current mismatch between the CNCD burden (a rapidly changing epidemiological profile, and ever-increasing economic impact) and the outdated ways in which most health care systems are organized to manage and deliver care for these conditions.
3. **Model of care.** This section summarizes approaches and models that can help inform and organize efforts to improve health care for the effective prevention and management of CNCDs.
4. **Policy implications.** In most parts of the Region, a positive policy environment that supports integrated CNCDs care can help reduce the CNCD burden. Financing, legislation, human resources, partnerships, and leadership and advocacy are some of the policy-level domains that influence the quality of integrated CNCDs management.
5. **Method for introducing change.** The Breakthrough Series (BTS) and the underlying principles of quality improvement provide a structure for bringing about improvement in health systems.
6. **Implementing and improving CNCD care in the Americas.** Numerous initiatives have been undertaken in the Region to improve the integrated management of CNCDs; a set of case studies is showcased for each component of the Chronic Care Model.
7. **Conclusion.** This section reviews the most important issues outlined throughout the document for the implementation of the Chronic Care Model.
8. **Recommendations.** This section identifies key actions to improve outcomes across a range of health systems. These recommendations were discussed during the previously mentioned working group.
9. **References.** A complete list of references with links to documents available online.
10. **Annex 1.** This section contains a full list of contributors.



# Introduction

Care for chronic noncommunicable diseases (CNCDs) such as cardiovascular disease (CVD), diabetes, cancer, and chronic obstructive pulmonary disease (COPD) is a global problem. Research demonstrates that the vast majority of people with CNCDs do not receive appropriate care. Only about half are diagnosed, and among those patients, only about half are treated. Among the quarter of people with CNCDs who do receive care, only about half achieve the desired clinical treatment targets. Cumulatively, only about 1 in 10 people with chronic conditions are treated successfully (1). This is mainly the result of inadequate management, but also of insufficient access to care and the existence of numerous financial barriers (2).



Political and public health leaders increasingly recognize the need to take urgent action to address the problem of CNCDS. International action is under way, as shown at the United Nations (UN) High-level Meeting (HIM) on the Prevention and Control of Non-communicable Diseases (NCDs) held in New York in September 2011(3), and the World Conference on Social Determinants of Health, held in Rio de Janeiro in October 2011 (4). At these meetings, world leaders recognized that the global burden and threat of NCDs constitute one of the major challenges for development in the 21st century, undermining social and economic growth and threatening the achievement of development goals. They also acknowledged governments' leading role in and responsibility to respond adequately to this challenge. Among other things, the political declaration of the UN HIM called for "promot[ing] access to comprehensive and cost-effective prevention, treatment and care for the integrated management of non-communicable diseases ... ."

Integrated management of CNCDS makes sense for at least three important reasons. First, most people have more than one risk factor and/or CNCDS (e.g., hypertension and obesity, or hypertension and diabetes and/or asthma) (5). Therefore, it makes sense to treat their conditions within an integrated framework of care. Another reason that integrated care makes sense is that most CNCDS place similar demands on health workers and health systems, and comparable ways of organizing care and managing these conditions are similarly effective regardless of etiology. Third, most CNCDS have common primary and secondary risk factors. For example, obesity is a major risk factor for

diabetes, hypertension, heart disease, and certain types of cancers, and heart disease may be a long-term complication of more than one chronic condition, such as diabetes and hypertension.

In addition to integrated management of CNCDS, general integration of this type of care within health services is also essential. A person with a chronic condition should be managed in a holistic manner within the context of other existing health problems and programs (e.g., integrated programs for management of chronic or communicable diseases, or maternal and child health issues). This makes sense because there are several associations between various chronic diseases and communicable diseases (e.g., diabetes and tuberculosis (TB); viral infections and cancer, including human papillomavirus (HPV) and cervical cancer, and hepatitis B and liver cancer; AIDS and cancer; and AIDS and the metabolic syndrome). Chronic disease should not be considered in isolation but rather as one part of the health status of the individual, who may be susceptible to many other health risks. A patient-centered care system benefits all patients, regardless of their health conditions.

The optimal solution for effective CNCDS prevention and management is not merely scaling up "business-as-usual" health care delivery systems but rather strengthening and transforming these delivery systems to provide more effective, efficient, and timely care. The solution is not to create a system that is exclusive for CNCDS but rather to ensure that the health system is fully prepared and equipped to provide high quality continuous care for those who need it, which is the vast majority of the population under care.

## THE CHALLENGES

The global burden of CNCs continues to grow, both globally and in the Region, placing even more demands on already-strained health systems.

## PREMATURE DEATH AND DISABILITY

Worldwide, in 2008, CNCs caused an estimated 36 million deaths, representing 63% of all deaths. These deaths were due mainly to CVDs (48%), cancers (21%), chronic respiratory diseases (12%), and diabetes (3%). CNCs are a major concern among ageing populations not only in high-income countries but also in low-income countries, where the burden of these diseases is rising disproportionately (6). Major risk factors for CNCs are unhealthy diet and physical inactivity, leading to overweight and obesity, as well as tobacco use and harmful use of alcohol. Macro-level catalysts of these conditions include population growth and ageing, urbanization, poverty, and inequity.

The Region of the Americas presents a similar pattern. Annually, almost 4 million people in the Region die from CNCs, comprising 76% of all deaths. More than one-third of these deaths are premature (occurring before age 70), and most are preventable and can be postponed. Important CNC risk factors in the Region are hypertension (affecting 20%–40% of the population); obe-

sity (affecting 26% of adults—more than any other region); diabetes (affecting 5%–10% of the population); and tobacco use (about 22% of the population). Without appropriate action, it is projected that these factors will contribute enormously to the increase in the burden of disease in the Americas (7).

## ECONOMIC HARDSHIP

CNCs also place a grave burden on countries at the macroeconomic level. In 2010, the global cost of CVDs was estimated at US\$ 863 billion; this figure is estimated to rise to more than US\$ 1 trillion by 2030—an increase of 22%. For cancer, the 13.3 million new cases reported in 2010 were estimated to cost US\$ 290 billion, and CNC-related costs are expected to reach US\$ 458 billion by the year 2030. Diabetes costs the global economy nearly US\$ 500 billion in 2010, a cost that is projected to rise to at least US\$ 745 billion by 2030, with developing countries assuming a much greater share of the outlays (8).

Other data from the Region of the Americas provide similar results. The current cost of diabetes treatment is estimated to be double the current cost of HIV treatment—reaching as much as US\$ 10.7 billion in Latin America alone. In 2010, spending on diabetes accounted for 9% of the total health expenditure in South and Central America and reached 14% in North America, including the English-speaking Caribbean countries and Haiti. In Brazil, researchers predict that the projected national income loss attributable to CNCs as a percentage of gross



domestic product (GDP) is expected to reach 3.21% by 2015 (8). In Trinidad and Tobago, the current cost of hypertension and diabetes is estimated to represent 8% of GDP. In Mexico, assuming that the prevalence of diabetes and hypertension continues to rise as predicted, it has been estimated that national health spending will have to increase by 5%–7% per year just to meet the needs of the newly diagnosed (9).



## POOR-QUALITY CARE

Many people with CNCDS fail to receive appropriate care. This failure to provide appropriate care can be attributed to both access and quality issues, and is often experienced to a greater extent among disadvantaged subgroups of the population (10). A survey of adults with "complex care needs" across 11 countries, including Canada and the United States, revealed substantial gaps in coordination (11). This study showed that in the United States, approximately 40% of respondents reported that they did not receive adequate health care once a chronic condition became apparent. Furthermore, of those that received care, 20% of cases were deemed to receive clinically inappropriate care (12).

The quality of health care for CNCDS in low- and middle-income countries is also of concern. These countries often struggle with the complexity of having insufficient resources combined with inadequate access to necessary services, drugs, and technologies. At the same time, many of these countries are still struggling with communicable diseases, as well as maternal and infant health issues. Health facilities frequently lack the key examination supplies, diagnostic tests, and medications needed to provide essential care for CNCDS.

Data from PAHO suggest that about 90% of adults may require some sort of medical action related to CNCDS. Around 40% of adults are reported with diagnosed CNCDS (diabetes, hypertension, hypercholesterolemia or obesity), while 30% have undiagnosed conditions which puts them at high risk to develop

those diseases; an additional 15% of the population engage in behaviors which increase their risk for CNCDS, such as smoking and physical inactivity; and 5% require preventive services because they are in the at risk age groups for breast, cervical or prostate cancer. Overall only around 10% of the adult population may be considered as having low risk for CNCDS and therefore not at apparent immediate need for any chronic care action (Barceló A, calculated with data from the Central America Diabetes Initiative, unpublished observation, 2013).

Another factor influencing the quality of care for chronic conditions is the workload and the capacity of the health system for effectively seeing all those in need. Overcrowded waiting rooms and clinics may be a common environment nowadays in many settings because of the massive increase in the number of patients seeking care for CNCDS. A rational use of the available resources for the management of CNCDS is thus critical. For example an adequate amount of health provider's time is needed for medical encounters to effectively carry the myriad of tasks required for chronic care, including medical and psychological management, self-management support and data collection, among others.

The consequences of poor-quality care are substantial. From an economic perspective, health care costs become excessive when CNCDS are poorly managed. Poor execution or lack of widespread adoption of known best care processes (such as preventive care practices that have been shown to be effective) results in wasted resources. Waste also occurs when patients "fall through the cracks" due to fragmented care. Poor-quality care results in health complications,

hospital readmissions, decline in functional status, and increased dependency, especially for those with CNCDs, for whom coordination of care is essential (13). Individuals, families, health care organizations, governments, and taxpayers collectively pay the price.

Across the Region, poor-quality care also results in poor patient outcomes. More than half of those diagnosed with diabetes or hypertension do not achieve treatment goals. Research in both population and clinical settings conducted between 2003 and 2010 showed that among those with hypertension or diabetes, less than 50% achieved good blood pressure (14) or glycemic control (15–20) respectively. A study on quality of diabetes care provided by general practitioners in private practice in nine countries of Latin America (Argentina, Brazil, Chile, Costa Rica, Ecuador, Guatemala, Mexico, Peru, and Venezuela) based on 3,592 patient questionnaires answered by physicians revealed that 58% of patients had a poor diet, 71% were sedentary, and 79% were obese or overweight. Poor glycemic control was observed in 78% of the patients; the proportion of patients with glycosylated hemoglobin (A1c) < 7.0% was 43%; and comorbid conditions associated with type 2 diabetes were reported in 86% of patients (17). Other studies indicated similar gaps in care. Along the U.S.-Mexico border, many adult Hispanics with diabetes do not receive evidence-based care (19). In Brazil, patients with hypertension and/or diabetes are not prescribed medications at sufficient levels to control these diseases (21). In southern Brazil, 58% of patients with CNCDs did not undergo measurement of their weight, height, and blood pressure, and did not receive preventive recommendations (22). Although cancer incidence remains

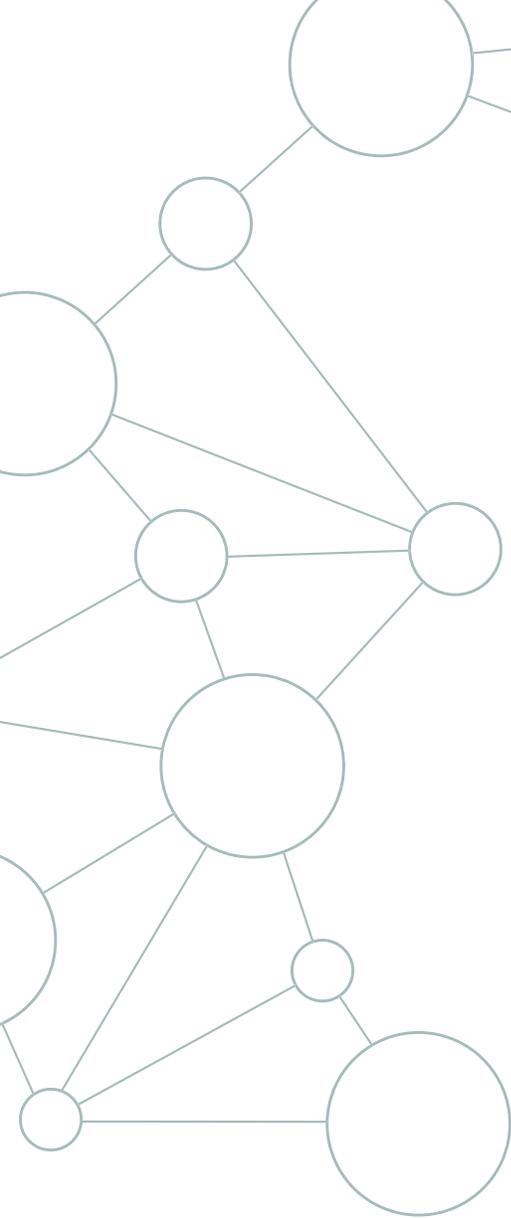
## Strategic Approaches: WHO Global Strategy and Action Plan for the Prevention and Control of NCDs

The World Health Organization (WHO) Global Strategy for the Prevention and Control of NCDs (26) (“Global Strategy”) and corresponding Action Plan provide key policy guidance to assist decision-makers in reshaping health systems and services to tackle CNCDs, particularly in settings where resources are limited. The guidelines for national governments include the following:

- Use a unifying framework to ensure that actions at all levels and by all sectors are mutually supportive;
- Use integrated prevention and control strategies, focusing on common risk factors and cutting across specific diseases;
- Combine interventions for the whole population and for individuals;
- Use a stepwise approach, particularly in countries that do not have sufficient resources to carry out all recommended actions;
- Strengthen intersectoral action at all stages of policy formulation and implementation to address the major determinants of the chronic disease burden that lie outside the health sector;
- Establish relevant and explicit milestones for each level of intervention, with a particular focus on reducing health inequalities.

Forming key partnerships with the private sector, civil society, and international organizations is also recommended as the best way to implement public policies.

*Source: Reference (26).*



high globally, death rates for many cancer types have declined in recent years in the United States and other developed countries owing to better treatments. However many developing countries are still experiencing extremely high case fatality rates as consequences of late diagnosis, lack of access to early detection and care and sub-optimal management (23). Breast cancer for example, is diagnosed in more than 100,000 women in Latin America and the Caribbean, and causes approximately 37,000 deaths annually. Although some improvements have been seen recently in some countries, in the Region of the Americas still 30-40% of women with breast cancer are diagnosed at late stages, compared to only 10% in industrialized countries (24). Collectively, these results indicate that despite some progress in the Region, management of CNCDs—particularly diabetes hypertension and cancer—is suboptimal overall.

What is the cause of this care failure? In essence, there is a mismatch between the most prevalent health problems (CNCDs) and the ways in which health care systems in many countries are organized to deal with them. This mismatch is historical in nature and can be understood by looking back to previous eras when acute, infectious diseases were the most prevalent health problems. Today, the epidemiological profile has shifted considerably,

but the organization of health care has not (25). Although some countries have taken steps to redesign their health care systems to accommodate the growth in the CNCD burden, most systems have not kept pace at the level that is needed to meet changing population needs, and quality gaps remain. Other countries are still using approaches that were designed for a set of prevailing health problems that are no longer the main causes of morbidity and mortality. While acute medical problems will always require the attention of health workers, approaches that are oriented toward acute illnesses are becoming increasingly inadequate to address the growing population of people with CNCDs.

The attributes needed for optimal management of CNCDs are summarized in Table 1. Care should be integrated across time, place, and conditions. Health care team members need to collaborate with one another as well as with patients and their families to develop treatment goals, plans, and implementation strategies centered on patient needs, values, and preferences. Collectively, health care personnel must be able to provide the full spectrum of health care services, from clinical prevention through rehabilitation and end-of-life care. Planned, proactive care and self-management support are other hallmarks of this type of care.

As described in the following section, integrated health care models that transcend specific illnesses and promote patient-centeredness provide a feasible solution for introducing effective care. Including evidence-based approaches can bring increased coherence and efficiency to health care systems and provide a means for improving quality across a range of CNCDs.

**TABLE 1.** Attributes of Effective Care for Chronic Conditions

OUTDATED CARE	EFFECTIVE CARE
• Disease-centered	• Patient-centered
• Specialty care/hospital-based	• PHC-based
• Focus on individual patients	• Focus on population needs
• Reactive, symptom-driven	• Proactive, planned
• Treatment-focused	• Prevention-focused

## Strategy for the Prevention and Control of Noncommunicable Diseases 2012–2025

Complementary to the WHO Global Strategy, the updated Regional Strategy and Plan of Action (27) for the Prevention and Control of NCDs 2012–2025

(“Regional Plan”), which was spurred by

the 2011 political declaration of the UN HIM on NCDs, highlights four key objectives:

(a) Multisectoral policies and partnerships for NCD prevention and control: Build and promote multisectoral action with relevant sectors of government and society, including integration into development and economic agendas.

(b) NCD risk factors and protective factors: Reduce the prevalence of the main NCD risk factors and strengthen protective factors, with emphasis on children and adolescents and on vulnerable populations; use evidence-based health promotion strategies and policy instruments, including regulation, monitoring, and voluntary measures; and address the social, economic, and environmental determinants of health.

(c) Health system response to NCDs and risk factors: Improve coverage, equitable access, and quality of care for NCDs and risk factors, with emphasis on primary health care and strengthened self-care.

(d) NCD surveillance and research: Strengthen country capacity for surveillance and research on NCDs, their risk factors, and their determinants; and utilize the results of this research to support evidence-based policy and program development and implementation.

*Source: Reference (27)*





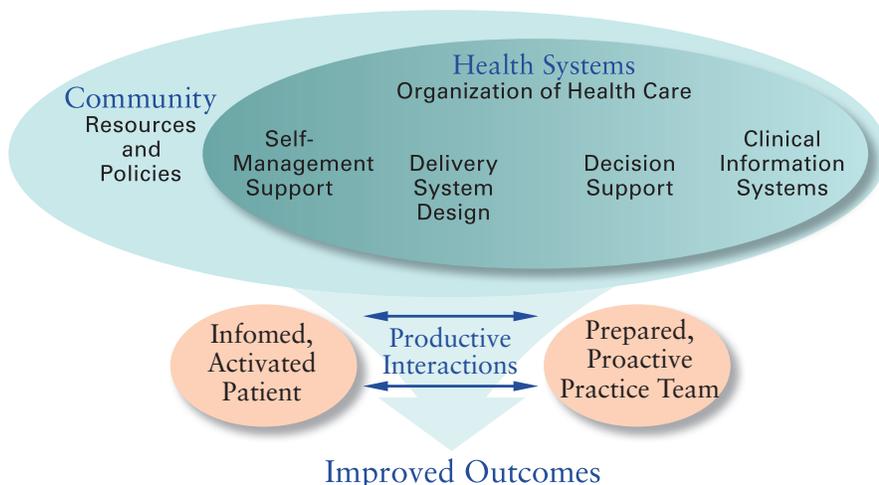


# ■ The Chronic Care Model ■



Several organizational models for CNCD management have been proposed and implemented internationally. Perhaps the best known and most influential is the Chronic Care Model (CCM; see Figure 1) (28, 29), which focuses on linking informed, activated patients with proactive and prepared health care teams. According to the CCM, this requires an appropriately organized health system linked with necessary resources in the broader community.

FIGURE 1. The Chronic Care Model



## PRODUCTIVE INTERACTIONS

All system elements described in the CCM are designed to support the development of an informed, proactive patient population and prepared, proactive health care teams. On the provider side, preparation means having the necessary expertise, information, and resources to ensure effective clinical management. It also means having timely access to the necessary equipment, supplies, and medications needed to provide evidence-based care. Proactivity implies the ability to anticipate patients' needs, to prevent illnesses and complications through risk factor reduction, and to plan care in a manner that does not depend on acute exacerbations or symptoms as the sole trigger for clinical encounters. On the other side of the interaction, patients must have information, education, motivation, and confidence to act as partners in their care.

The central role of this partnership between providers and patients is a substantial change from traditional ways of organizing and delivering care. According to the CCM, chronic disease management (CDM) is most effective when patients and health workers are equal partners and both experts in their own domains: health workers with regard to clinical management of the condition, and patients with regard to their illness experience, needs, and preferences (43). Health workers' ability to elicit and discuss patients' beliefs and to activate patient participation shared decision-making has been shown to improve adherence to treatment plans and medication as well as a range of other health outcomes (44–46).

A number of countries have implemented (adopted or adapted) the CCM (30). In 2002, WHO produced an expanded version of the model—the Innovative Care for Chronic Conditions (ICCC) Framework, which gives greater emphasis to community and policy aspects of improving health care for chronic disease (31, 32). Other related models are being used to guide the provision of CNCD care with in certain countries (33–35).

The CCM and related models emphasize the central importance of PHC and the recognition that the best clinical outcomes can be obtained when all model components are interconnected and working in a coordinated manner. The success of this approach is borne out by evidence on what works: research to date has shown that multidimensional changes have the greatest effects (36–39).

The CCM and related models espouse principles that are highly consistent with PAHO's approaches for strengthening health systems,

which are based on primary care and integrated service networks. PAHO's Integrated Health Service Delivery Network (IHSDN) is the recommended response for the health care organization to the PHC strategy. IHSDNs are responsible for optimizing the health status and clinical outcomes of a defined population. They are comprehensive in that 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. IHSDNs also aim to provide services that are continuous over time (i.e., provided throughout the population's life cycle), proactive and not reactive. Other points of intersection between the CCM and IHSDN are their emphases on 1) multidisciplinary teams, 2) care that is patient-centered, and 3) integrated information systems that link the network with data. The relation between IHSDNs and the CCM is explored in more detail in another PAHO publication (40).

## Improving Chronic Illness Care

Improving Chronic Illness Care (ICIC) is a national program of the Robert Wood Johnson Foundation dedicated to the idea that United States health care can do better. ICIC has worked for more than a decade with national partners toward the goal of bettering the health of chronically ill patients by helping health systems, especially those that serve low-income populations, improve their care through implementation of the Chronic Care Model. Some of the most useful ICIC tools are the Assessment of Chronic Illness Care (ACIC) and the Patient Assessment of Chronic Illness Care (PACIC). The ACIC questionnaire is a quality improvement tool developed by ICIC to help organizations evaluate the strengths and weaknesses of chronic condition care delivery in six areas: community linkages, self-management support, decision support, delivery system design, information systems, and organization of care. The content of the ACIC derived from evidence of the implementation of the Chronic Care Model and it has shown to be responsive to system changes and other measures of quality improvement interventions. The ACIC is being used thoroughly across the world and has been translated to various languages. The PACIC is a questionnaire measuring specific items related to the application of the Chronic Care Model from the patient point of view. When paired with the ACIC, the PACIC survey offers consumer and provider perspectives of the provided services.

*Source: References (29, 41-42).*

## The Institute for Healthcare Improvement

The Institute for Healthcare Improvement (IHI), an independent not-for-profit organization based in Cambridge, Massachusetts, is a leading innovator in health and health care improvement worldwide. IHI is dedicated to optimizing health care delivery systems, driving the Triple Aim for populations, realizing person- and family-centered care, and building improvement capability. IHI professional development programs — including conferences, seminars, and audio and web-based programs — inform every level of the workforce, from executive leaders to front-line staff. For the next generation of improvers, IHI provides online courses and an international network of local chapters through its Open School. IHI provides a wealth of free content through its website.

*Source: The Institute for Healthcare Improvement (IHI). For more information visit <http://www.ihl.org>*



**Canada:** Chronic Disease Management, Alberta Health Services

This intervention encourages a collaborative, integrated community approach to CDM. It emphasizes patient-centered care and coordination across the care continuum, from health promotion and prevention to early detection and primary, secondary, and tertiary care. Between baseline and one-year follow-up, there was a 17% increase in the number of diabetes patients with an A1c test (essential for diabetes monitoring), a 13% increase in the number of patients with dyslipidemia and triglyceride test, a 19% decrease of hospitalization among patients with COPD, and a 41% and 34% decrease in hospitalizations and emergency visits, respectively.

Source: Reference (47).



**Mexico:** Veracruz Initiative for Diabetes Awareness

A demonstration project was conducted in five centers (with an additional group of five centers providing usual care and serving as a study control). The CCM was implemented to improve the quality of diabetes care in the twin cities of Veracruz and Xalapa, Mexico. Specific interventions included in-service training for health professionals, a structured diabetes self-management program, and the strengthening of a referral/back-referral system. Post-intervention measures improved significantly across intervention centers. The percentage of people with good blood glucose 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 control group. The methodology focused strategically on the primary health care team and the participation of people living with diabetes. Health team participants introduced modifications to address health care problems that they had identified in four areas of the chronic care model (self-management support, decision support, service delivery design, and information system). The project was monitored by completing the ACIC questionnaire at the beginning (LS1) and at the end (LS3) of the intervention. The component achieving the highest score at the end of the intervention was self-management support. By LS3 all intervention centers improved their ACIC scores, most of them going from level C to level B. The project demonstrated that an integrated approach can improve the quality of diabetes care in primary health care settings.

Source: References (48, 49).



### **Honduras:** Honduras Fighting Diabetes

Honduras Fighting Diabetes is an ongoing intervention project that began in 2012 and it is expected to be implemented during the next three years with support from the World Diabetes Foundation (WDF). Its main purpose is ensuring access to a comprehensive diabetes prevention and control program in primary and secondary care in 14 units from the Ministry of Health and the Honduran Institute of Social Security. The project promotes the use of a package of interventions based on the PEN strategy (Package of Essential Intervention) of WHO, at the same time it devises mechanisms to organize chronic care and strengthens preventive activities at the grass roots level. Activities for this project include the strengthening of integrated care by producing and disseminating evidence based guidelines and professional training. In addition these activities will be paired with community activities promoting healthy nutrition, physical activity, and the prevention of smoking and of the excessive use of alcohol. The Chronic Care Passport is used to foster patient and health provider collaboration. It is expected that after the success of the implemented activities in the 14 demonstration sites, the project will be expanded to a national strategy that will result in improvements of the quality of integrated care as well as a reduction in the burden of diabetes and of other chronic diseases in Honduras.

*Source: Montoya R, PAHO Honduras (personal communication)*



### **Dominican Republic:** Program for the Prevention and Control of Non-Communicable Diseases (PRONCEC)

The purpose of this ongoing collaborative project is to improve, on a continuous basis, the quality of care for people with chronic diseases. PRONCEC is based on the application of the CCM and the BTS methodology. Five provinces located on the Dominican-Haiti border participate in PRONCEC. These border provinces are considered underserved populations with a demonstrated high prevalence of CNCD. In addition the region hosts an economically challenged population with a high concentration of displaced persons from Haiti. The project began with the assessment of the services provided by the National Primary Care Units (UNAP) in participating provinces. The assessment included visits by the intervention team, the completion of the ACIC questionnaire as well as a clinical chart review. Gaps in chronic care were evident across the evaluated centers. An intervention plan was developed in accordance with the results of the assessment, in collaboration with health authorities and providers. The plan includes the training of multidisciplinary teams in the integrated clinical management of CNCDs as well as in self-management support. Other measures include the strengthening of the referral/back-referral system and increasing the capacity of the second level of care to provide high quality integrated specialized services. PRONCEC is monitored through periodic evaluations and learning sessions.

*Source: Estepan T, Ministry of Health, Dominican Republic (personal communication, 2013)*





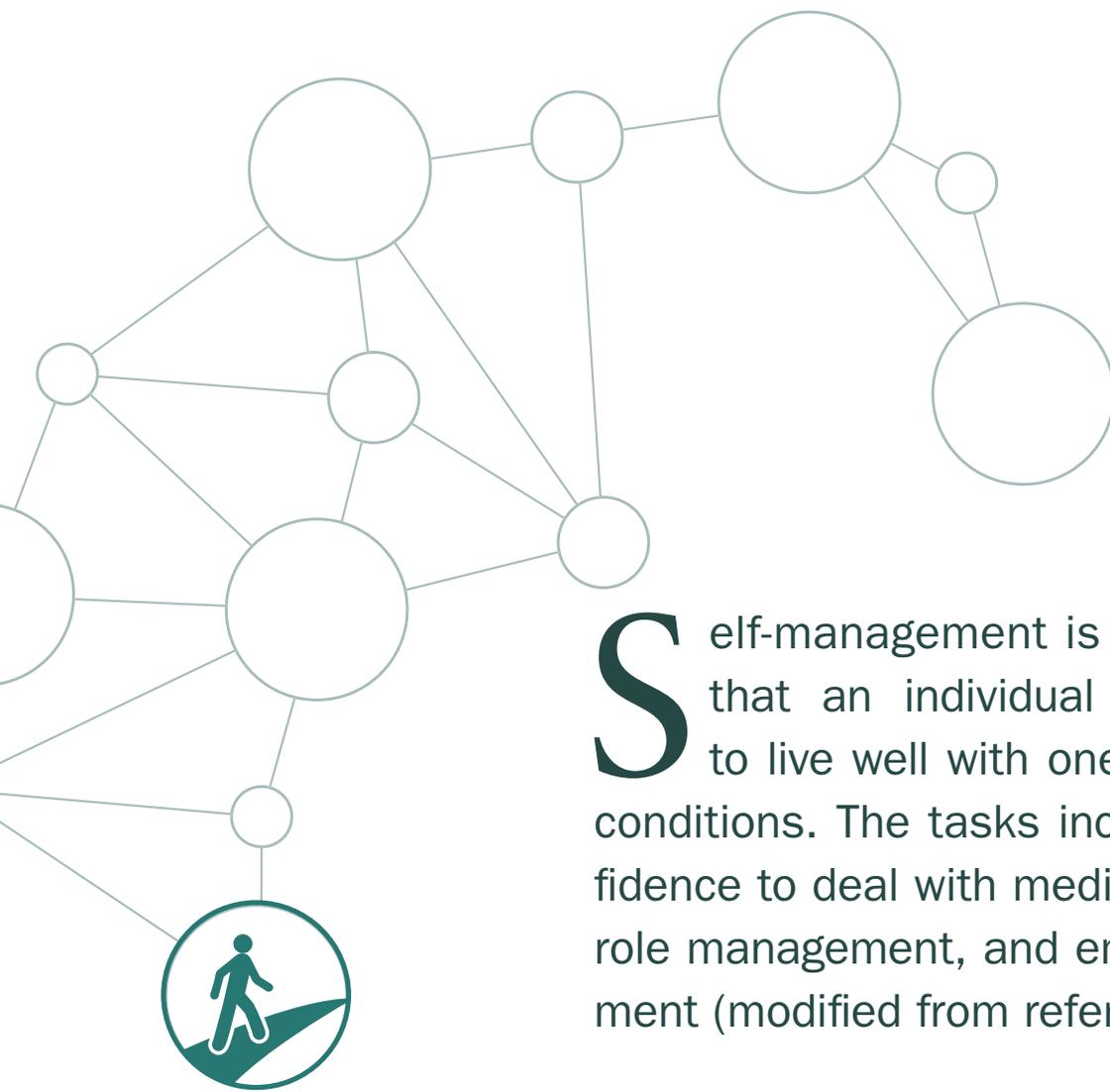
# Self-Management Support

## KEY ACTIONS FOR SELF-MANAGEMENT SUPPORT

- Ensure patient participation in the process of care;
- Promote the use of lay or peer educators;
- Use group visits;
- Develop patient self-regulatory skills (i.e., managing health, role and emotions related to chronic conditions);
- Promote patient communication skills (especially with regard to interactions with health professionals and the broader health system);
- Negotiate with patient goals for specific and moderately challenging health behavior change;
- Stimulate patient self-monitoring (keeping track of behaviors);
- Promote environmental modification (creating a context to maximize success);
- Ensure self-reward (reinforcing one's behavior with immediate, personal, and desirable rewards);
- Arrange social support (gaining the support of others);
- Use the 5As approach during routine clinical encounters.

## EXAMPLES OF EFFECTIVE INTERVENTIONS

- ✓ Group based self-management support for people with type 2 diabetes (50)
- ✓ Self-monitoring of blood pressure specially adjunct to care (51)
- ✓ Patient educational intervention for the management of cancer pain alongside traditional analgesic approaches (52)
- ✓ Patient educational intervention using the 5 As for reducing smoking, harmful use of alcohol and weight management (53)
- ✓ Training for better control blood glucose and dietary habits for people with type 2 diabetes (54)
- ✓ Lay educator led self-management program for people with chronic conditions, including arthritis, diabetes, asthma and COPD, heart disease and stroke (55-57)
- ✓ Self-management support that involves a written action plan, self-monitoring and regular medical review for adults with asthma (58)
- ✓ Self-management support for people with heart failure to reduce hospital readmission (59)
- ✓ Patient oriented interventions such as those focused on education or adherence to treatment (60)



**S**elf-management is a group of tasks that an individual must undertake to live well with one or more chronic conditions. The tasks include gaining confidence to deal with medical management, role management, and emotional management (modified from reference 61).

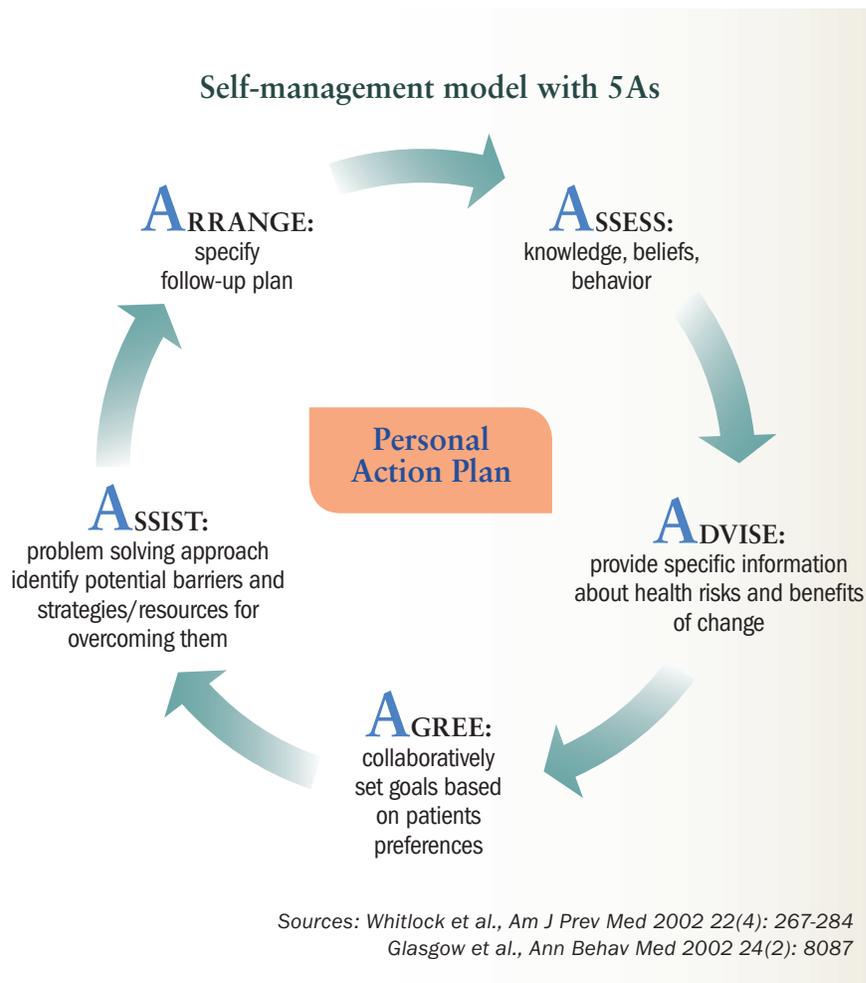
Self-management support is defined as the systematic provision of education and supportive interventions by health care staff to increase patients' skills and confidence in managing their health problems, including regular assessment of progress and problems, goal setting, and problem-solving support (61).

Self-management support is a key element of the CCM because all CNCDs require the active participation of patients in promoting their health and preventing the emergence and development of chronic diseases and related complications. Typical self-care activities include healthy lifestyle, prevention of complications, adherence to treatment plan and medication, and home monitoring of symptoms and objective illness indicators. Other essential self-management functions include recognizing and acting upon "red flags"—symptom chang-

es or exacerbations; making appropriate decisions concerning when to seek professional assistance; and communicating and interacting appropriately and productively with health workers and the broader health system (62). Major research reviews have found that self-management support is an important element of improved health outcomes for CNCDs (36, 43, 63). One review found that 19 of 20 studies that included a self-management component effectively improved care (37).

In the conceptual framework of the CCM (see Figure 1), self-management support is positioned across the community and the health system, reflecting the fact that it can be provided in a range of venues and formats. Routine clinic visits provide excellent opportunities to build and reinforce self-management skills. Alternatively, self-management support can be provided during health

FIGURE 2. The “5As” Self-Management Model



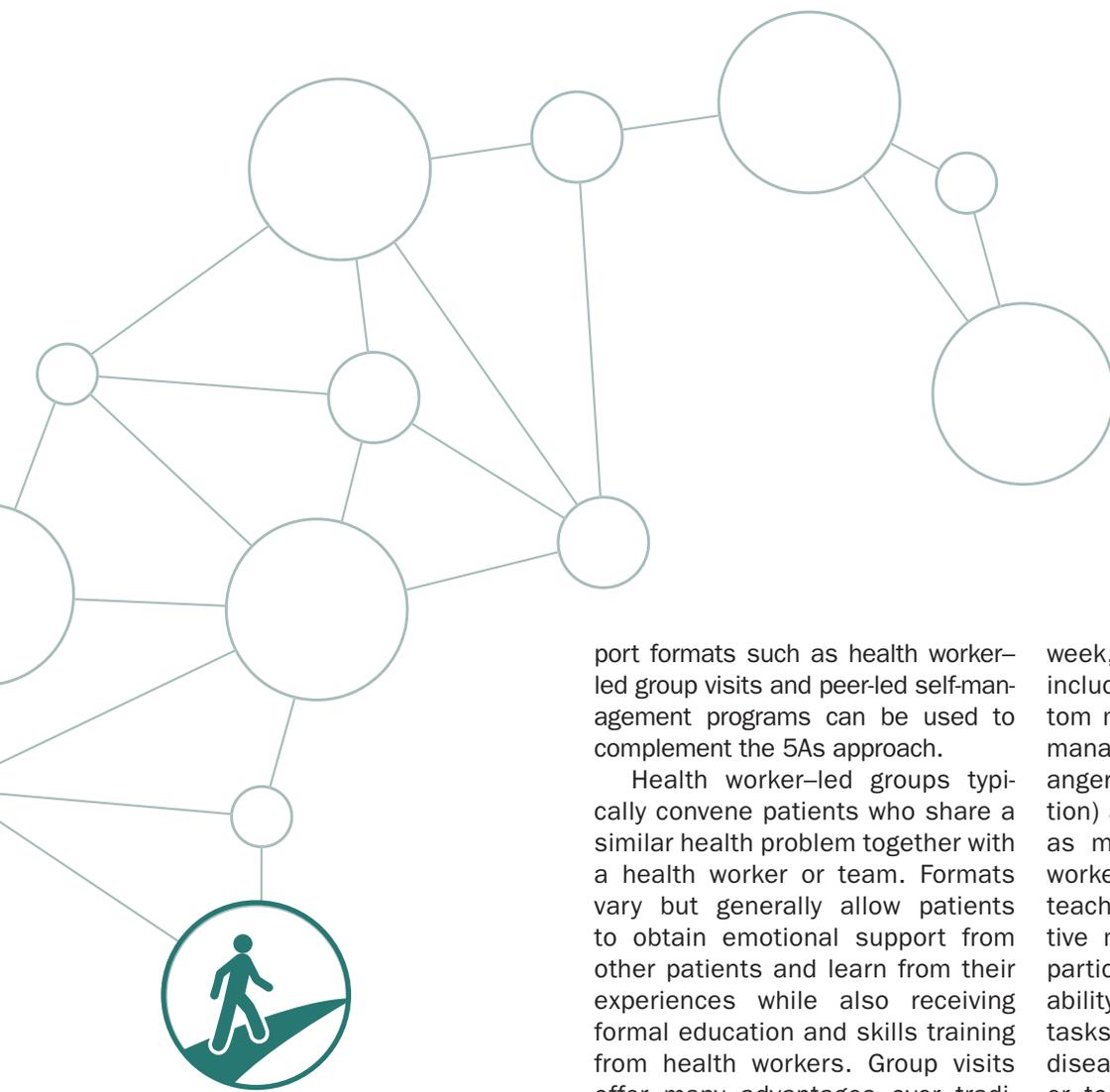
worker-led group sessions, or in groups run by lay leaders in health care settings or community venues. Telephone- and Internet-based self-management programs are also very promising modalities.

Within the formal health care system, the “5As” model (64-65) (see Figure 2) can be used to develop self-management plans for patients. This model is a series of five interrelated and iterative steps (assess, advice, agree, assist, and arrange). A major advantage of the 5As approach is that it is easy to understand, remember, and use. It also serves as a flexible approach that can be applied in the course of routine clinical encounters (i.e., it is not a stand-alone self-management intervention but rather an approach designed to be integrated into normal professional practice).

The 5A sequence begins with an assessment that obtains current information on patient status regarding multiple health behaviors. Based on the patient’s risk profile combined with information on behavior, family history, personal beliefs, and any other available data, the health professional then provides clear and specific, personalized advice to change one or more behaviors. It is important that this advice be provided in an interactive manner that includes a discussion of what the patient thinks and feels about the health professional’s advice and recommendations. A collaborative goal-setting process (agree on

a mutually negotiated, achievable, and specific plan) then follows. The planning should include assistance with problem-solving, identifying potential barriers or challenges to achieving the previously identified goals and generating solutions to overcome them. The final “A” (“arrange”) refers to the setting up of follow-up support and assistance. While this aspect of the behavior change model is often omitted, it is essential for long-term success.

Stand-alone self-management sup-



port formats such as health worker-led group visits and peer-led self-management programs can be used to complement the 5As approach.

Health worker-led groups typically convene patients who share a similar health problem together with a health worker or team. Formats vary but generally allow patients to obtain emotional support from other patients and learn from their experiences while also receiving formal education and skills training from health workers. Group visits offer many advantages over traditional one-to-one visits with health workers (66). They make more efficient use of health workers' limited time; allow for more detailed provision of information; facilitate peer support from patients facing similar self-management challenges; and facilitate the participation of families and other types of health care professionals.

Some programs use peers (rather than health workers) as educators and trainers. Peers are thought to be especially effective as leaders because they serve as excellent role models for participants. Many peer-led programs around the world are modeled on the principles and format of Stanford University's Chronic Disease Self-Management Program (CDSMP) (67). The CDSMP is administered in 2.5-hour sessions, once a

week, over six weeks. The program includes training in cognitive symptom management and methods for managing negative emotions (e.g., anger, fear, depression, and frustration) and discussion of topics such as medications, diet, health care workers, and fatigue. Lay leaders teach the courses in an interactive manner designed to enhance participants' confidence in their ability to execute specific self-care tasks. The goal is not to provide disease-specific content but rather to use interactive exercises to build self-efficacy and other skills that will help participants better manage their chronic conditions and live an active lifestyle. A vital element is exchange and discussion among participants and with peer leaders. The CDSMP has proven to be effective (55). The CDSMP has recently incorporated an online training program. Similarly in the United Kingdom, the Expert Patient Program is a self-management initiative led by trained lay people with experience in long-term conditions. The program is designed to enable participants to develop appropriate self-care skills(68). An evaluation found that the program was effective in improving self-efficacy and energy levels among patients with long-term conditions, and was likely to be cost effective (56).

## Region of the Americas: The Chronic Care Passport

The Chronic Care Passport (69) is a patient-held card used by patients with CNCs such as diabetes, hypertension, and COPD. The Passport includes prevention advice on nutrition, physical activity, and toxic habits as well as preventive measures for cervical, breast, and prostate cancer. It also contains a summarized meal plan with a food exchange list. The Care Plan shown on the Passport's central page itemizes a complete list of laboratory tests, health exams, and self-management education issues for the main chronic diseases (i.e., diabetes, hypertension, hypercholesterolemia, and obesity). The Care Plan lists a series of clinical standards from international evidence-based guidelines and protocols for all enumerated laboratory tests and exams, including the total cardiovascular risk evaluation. The Passport has spaces for establishing targets with patients and recording the results obtained during different patient visits. It was designed for the PHC level but can be used or adapted to other settings. The Passport is one of the products of PAHO's technical collaboration with various member states and it is accompanied by two additional materials: The Health Provider and the Patient brochures.

As of May 2012, demonstration projects have been established in 13 countries throughout the Region. The Passport is being implemented in Antigua, Anguilla, Argentina, Belize, Chile, the Dominican Republic, Grenada, Honduras, Jamaica, Paraguay, Santa Lucia, Suriname, and Trinidad and Tobago.

*Source: Reference (69).*





**Caribbean:** Improving Quality of Chronic Care in the Caribbean (Antigua, Anguilla, Barbados, Belize, Guyana, Grenada, Jamaica, St. Lucia, Suriname, and Trinidad & Tobago)

The CCM is being implemented in 10 Caribbean countries (142 centers providing care for more than 40 000 patients). The objective of Caribbean Quality of Diabetes Care Improvement Project is to strengthen the capacity of health systems and competencies of the workforce for the integrated management of chronic diseases and their risk factors. The project promotes the integrated management of chronic diseases with a preventive focus, based on equity, the participation of the individual, his or her family, and the community. The evaluation of this demonstration project included 1,060 patients with diabetes using the Chronic Care Passport at the first level of care in eight countries. Preliminary results are promising. Comparing baseline to follow-up measures revealed an important decrease in mean HbA1c (8.3% to 7.6%). There was also a substantial increase in the proportion of patients with a preventive practice, such as nutritional advice (12% to 52%), foot exam (28% to 68%), or eye exam (21% to 61%). Overall the proportion of patients meeting three or more quality-of-care indicators increased from 12% to 56%.

Source: Reference (70).



**Chile:** Tele-Care Self-Management Program in Santiago

The prevalence of diabetes in Chile increased from 4.2% to 9.2% between 2005 and 2010. The increased demand for better care for people with type 2 diabetes and the needs for improving the efficacy of the health system prompted a group of researchers from the Catholic University of Chile to create a self-management service using cellular phones. A program of telephone counseling called ATAS (from the Spanish Apoyo Tecnológico para el Automanejo de Condiciones Crónicas de Salud ) was added to usual care for people with type 2 diabetes in a low income area of Santiago de Chile. The ATAS model promoted active participation of patients and family caregivers in health-related decision making and fostered continuous contact between patients and the health care team. After 15 months of intervention the results indicated that patients receiving the intervention (n = 300) maintained blood sugar level, as measured by A1c before and after intervention, while an increase of 1.2% was recorded for patients receiving usual care alone (n = 306) during the same timeframe. Other positive results found, when comparing the group receiving the intervention to their peers receiving only usual care, were: an increase in attendance to medical appointments; a reduction in the number of emergency room visits; an increase in self-efficacy; and an increase in client satisfaction .

Source: Reference (71).



### **Mexico:** Unit of Medical Specialties (UNEMES)

In response to the current epidemic of NCDs and obesity, the government of Mexico created the Units of Medical Specialties (UNEMES, from the Spanish Unidades de Especialidades Médicas) in 2008. The UNEMES are clinics providing primary integrated care with an innovative approach, to people with obesity, diabetes and cardiovascular risk. The UNEMES are financed by the popular insurance, which provide comprehensive integrated care to low income people (that are not otherwise covered by any program) in Mexico. The UNEMES initiative came from the Integrated Health Care Model (MIDAS, from the Spanish Modelo Integrado de Atención a la Salud). The UNEMES provide evidence based care that integrates multiple specialties. UNEMES health services are patient centered preventive services with emphasis on treatment adherence, nutritional behavior, and physical activity for individuals and families. The UNEMES services include detection and integrated management of overweight, diabetes and cardiovascular risk, nutritional counseling, diagnosis of children and adolescent obesity and overweight, diagnosis of gestational diabetes, and detection and management of complications of diabetes and hypertension. UNEMES' staff includes physicians, nutritionist, social workers, as well as information technology and support personnel. Team members in UNEMES are trained to follow a standard national protocol for NCD management.

*Source: Reference (72).*

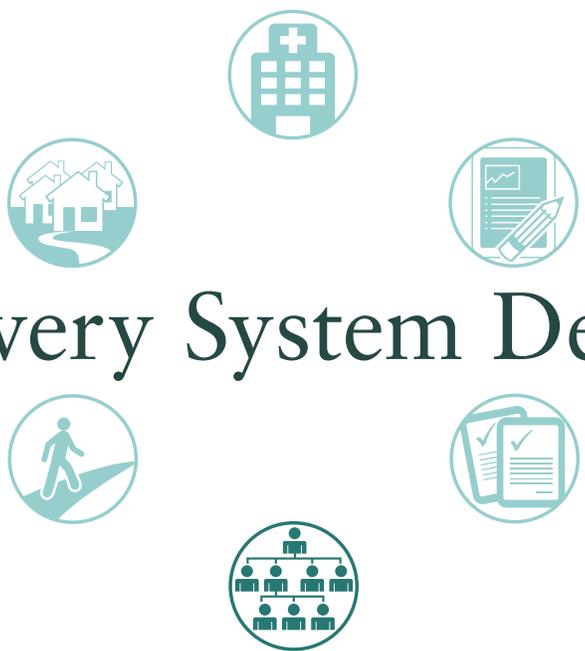


### **Central America:** The Central America Diabetes Initiative (CAMDI) Intervention (El Salvador, Guatemala, Honduras and Nicaragua)

The CAMDI Intervention was a quality improvement collaborative project involving 10 health Centers and 4 hospitals from El Salvador, Guatemala, Honduras, and Nicaragua. During this 18 month intervention health teams selected their own objectives and activities and participated in three learning sessions with national and international experts. The activities of the CAMDI intervention included the review of national norms and protocols for the management of diabetes, training in diabetes and foot care education as well as the implementation of diabetes clubs. A total of 1,290 patient participated in the intervention. The evaluation of 240 randomly selected patients indicated a reduction of the mean A1c from baseline to the end of the intervention from 9.2% to 8.6%. Results also indicated remarkable improvements in process indicators, when comparing baseline to follow-up measures the proportion of patients with eye exam increased from 14% to 52%, the proportion of patients with foot exam went from 21% to 96% and the proportion of patients receiving diabetes education increased from 19% to 69%. The intervention demonstrated that the quality of diabetes care can be improved when health teams dedicate additional time to training in clinical care and patient education.

*Source: Barceló A, Pan American Health Organization (personal communication 2012).*





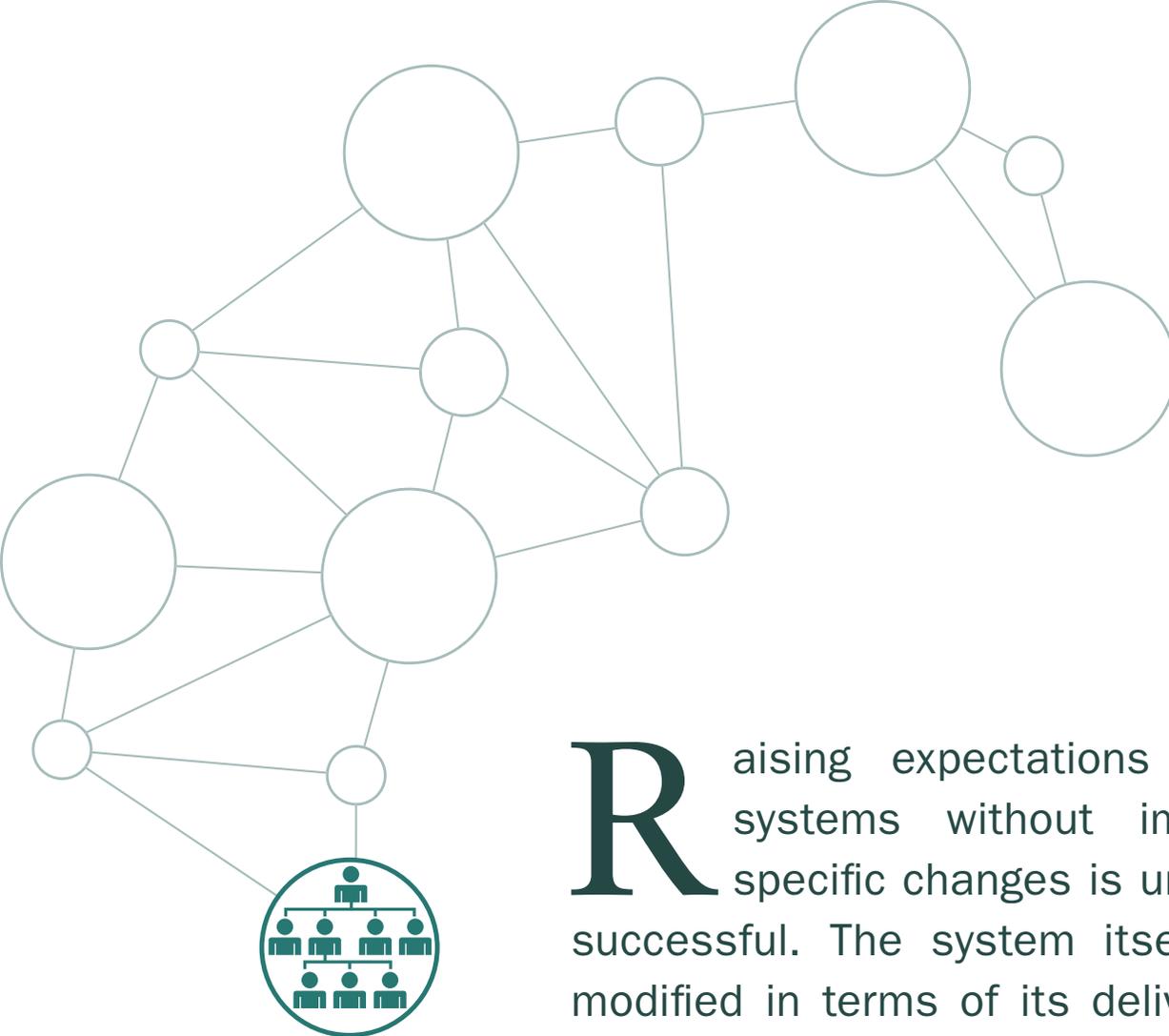
# Delivery System Design

## KEY ACTIONS FOR DELIVERY SYSTEM DESIGN

- Organize PHC based care;
- Define roles and distribute tasks among team members;
- Ensure proactive care and regular follow-up;
- Use risk stratification;
- Provide case management or a care coordinator for patient with complex diseases;
- Give care that patients understand and that conforms to their cultural background;
- Develop integrated health service delivery networks.

## EXAMPLE OF EFFECTIVE INTERVENTIONS

- ✓ Clinical record audit and feedback (73)
- ✓ Assigning a role in self-management, decision support and delivery system design to a designated clinical provider (74)
- ✓ Implementing a personalized structured discharge plan (75)
- ✓ Referral guidelines and forms (76)
- ✓ Using regular planned recall of patients for appointments (77)
- ✓ Chronic care management programs for diabetes (78)
- ✓ Program of nurses contacting frequently with patient (60)



**R**aising expectations for health systems without implementing specific changes is unlikely to be successful. The system itself must be modified in terms of its delivery system design, another component of the CCM.

Improving the health of people with CNCDs requires transforming systems that are essentially reactive (responding mainly when a person is sick) to those that are proactive and focused on keeping a person as healthy as possible. Productive interactions are made more likely by planning visits or other interactions in advance and scheduling regular follow-up visits.

Multidisciplinary teams are another crucial component of effective CNCd care and can include a wide range of allied health professionals. Evidence indicates that non-physician clinicians can function just as effectively as physicians (and sometimes better) within a supported context (79-80).

IHSDNs (described above) provide a good approach for redesigning CNCd care. These networks em-

phasize the importance of multidisciplinary PHC that covers the entire population, serves as a gateway to the system, and integrates and coordinates health care across levels, in addition to meeting most of the population's health needs (40).

Patients with more complex conditions and/or care needs often benefit from clinical case management services from nurse care managers and outreach workers, who provide close follow-up and help increase adherence (81-82). Case management is often provided by a care coordinator. The care coordinator is responsible for identifying an individual's health goals and coordinating services and providers to meet those goals. The care coordinator may be a nurse care manager, a social worker, a community health worker, or a lay

person (83). Case management by a person other than the patient's PHC worker has also been shown to be effective in producing positive health outcomes for people with chronic conditions (63, 84).

The Kaiser Permanente Risk Pyramid (85) (see Figure 3) has been used in many countries to help stratify people with CNCs and provide different levels of care. In this model, care is divided into three different levels. Level 1, which comprises about 70%–80% of the clinical population, provides supported self-care—collaboratively helping individuals and their caregivers to develop the knowledge, skills, and confidence to care for themselves and their condition effectively. Level 2 is designed for patients who need regular contact with multidisciplinary team to ensure effective management (about 15%–20% of the clinical population). Disease-specific care management provides people who have a complex single need or multiple conditions with responsive, specialist services using multidisciplinary teams and disease-specific protocols and pathways. Level 3 targets people who require more intensive support. This is the highest level of care. Care for Level-3 patients uses a case management approach to anticipate, coordinate, and link health and social care.

The Kaiser Permanente Risk Pyramid has been modified to address issues such as population-wide prevention, health improvement, and health promotion (see Figure 4). A second layer at the bottom of the pyramid targets inequalities among those at high risk for CNC. This layer is denominated level zero and is relevant to health services, so implementation of primary prevention is recommended in clinical settings (86).

FIGURE 3. The Kaiser Permanente Risk Pyramid

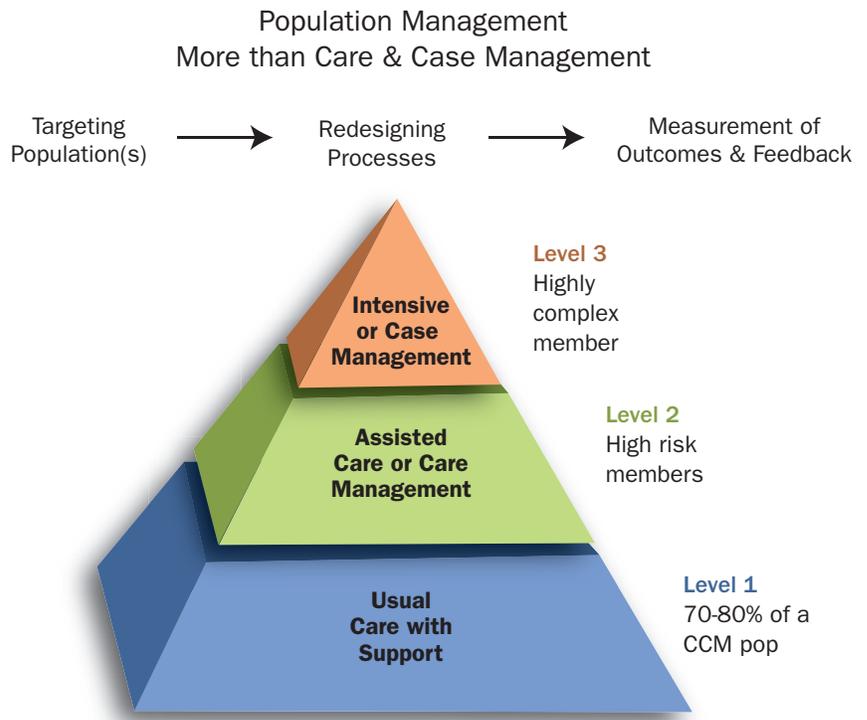
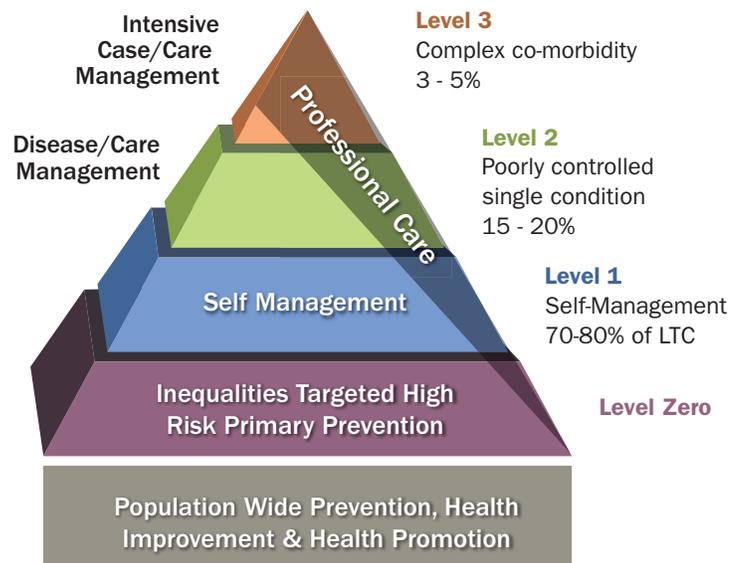


FIGURE 4. The Modified Kaiser Permanente Risk Pyramid





### United States: Focusing on those with Multiple Chronic Conditions

In recognition of the prevalence, cost, and quality of life issues that affect U.S. citizens living with multiple chronic conditions (MCCs), the U.S. Department of Health and Human Services (DHHS), in concert with hundreds of external stakeholders, developed a Strategic Framework on Multiple Chronic Conditions ([www.hhs.gov/ash/initiatives/mcc/mcc\\_framework.pdf](http://www.hhs.gov/ash/initiatives/mcc/mcc_framework.pdf)). This framework provides a road map to coordinate and guide national efforts aimed at improving the health of individuals with MCCs. Disseminated to the public in December 2010, the MCC Strategic Framework

is designed to address the challenge of MCCs across the spectrum of all population groups through four main goals:

1. Fostering health care and public health system changes to improve the health of individuals with MCCs;
2. Maximizing the use of proven self-care management and other services by individuals with MCCs;
3. Providing better tools and information to health care, public health, and social service workers who deliver care to individuals with MCCs;
4. Facilitating research to fill knowledge gaps about individuals with MCCs, and interventions and systems to benefit them.

Within each of the four goals, the MCC Strategic Framework specifies multiple objectives and specific strategies. The strategies are designed to guide actions that can be taken by clinical and social service providers, public health professionals, and the public to prevent and reduce the burden of MCCs. Since the framework’s release, DHHS agencies and external partners have worked to align their respective programs, activities, and initiatives with and in support of the framework’s goals, objectives, and strategies. Over 100 such efforts are now being conducted. Examples of the framework’s impact include the numerous research grants and demonstration projects that focus on improving care for the MCC population; the new MCC quality measurement framework for health care; and the more than 100 000 people that have received self-management support through this program, which is modeled on the CDSMP).

Source: Reference (87), and Parekh A, DHHS, United States of America (personal communication, 2012).



### Uruguay: Redesigning Health Care Delivery

Uruguay’s health system has been caught off guard by the rapidly increasing prevalence of CNCDs. Its initial response consisted only of sporadic health promotion and prevention activities. More recently, it initiated a pilot program (“Preveniando”) for redesigning health care delivery through the strengthening of PHC. The program is currently established in three of the country’s 19 administrative regions, with 13 health centers covering a population of 113 000 patients. Routine screening is conducted for hypertension, diabetes, overweight/obesity, and colon cancer. Early diagnosis facilitates patient care according to the level of risk and is informed by current practice guidelines. An information system is also in place. After less

than one year of implementation, 12.6% of the target population has been screened and 16.7% of patients have been followed up. The program will be scaled up to other departments, once successful results have been confirmed.

Source: Solá L, Ministerio de Salud Pública, Uruguay (personal communication, 2011).



### **Brazil:** The Minas HyperDia Network (Rede HiperDia Minas)

In 2009, the Government of the State of Minas Gerais in Brazil, started the implementation of a Priority Network for people with hypertension, diabetes and chronic kidney disease. More than 4,000 Family Health Teams participated in this initiative working in 13 specialized centers across 15 health regions with coverage of more than 2 million inhabitants. The network promotes the use of evidence-based guidelines and protocols as well a risk stratification approach. These centers are designed to provide care to patients classified as high complexity cases. The creation of this network represents a government investment of more than US\$ 15 million. The centers provide planned proactive continuous care, as well as face-to-face and distance continued education programs. A preliminary analysis from a specialized health center (Sao Antonio do Monte) with more than 700 patients referred by Family Health Teams in several municipalities, reported that most people with hypertension (87%) or diabetes (71%) met treatment targets after three medical visits. None of the patients under care required hospitalization during the one-year period, indicating a potential cost savings. Source: Alves, AC. Secretaria de Saúde de Minas Gerais, Brazil (personal communication, 2012).



### **United States:** Improving Chronic Disease in Small Primary Care Clinics in South Texas

In the fall of 2007, 40 small primary care clinics in the South Texas region of the United States participated in a 5-year project designed to improve diabetes outcomes by better implementing elements of the Chronic Care Model. Each clinic was assigned a “practice coach” who did an assessment at each site, then worked with an improvement team in the clinic to make changes designed to improve diabetes care. Practice coaches are individuals trained in quality improvement methods, workflow redesign and other skills that help them work with primary care settings. The coach had a toolkit of improvement ideas and suggestions for the teams to choose from that included enhanced self-management support, redesigning care around shared appointments or “group visits,” more proactive care using a disease registry, and point of care A1c testing, among others. Coaches visited each clinic at least monthly for up to one year to assist them in their work. Clinics were given the Assessment of Chronic Illness Care survey to complete at baseline and one year later. Scores improved in clinics that worked with a coach, but not in the clinics that had not yet worked with a coach. That is, clinics that worked with a coach were much more likely to have organized and delivered care consistent with the Chronic Care Model compared to those that had not worked with a coach. In addition, the percentage of patients with an elevated A1c (over 8.0) declined from 32% to 28% in clinics that worked with a coach, but increased in clinics that had not. When allowed to tailor and adapt strategies to improve diabetes to their local context and resources, clinics that work with an improvement coach are able to implement the Chronic Care Model in a manner that improves diabetes care and outcomes. Source: Parchman ML, Director, MacColl Center for Health Care Innovation Group Health Research Institute, Seattle, WA. (personal communication, 2012).



### **Chile:** Evaluating Nurse Case Management for Patients with Hypertension and Diabetes

Research is currently under way in Chile to evaluate the effectiveness of nurse case management for people with hypertension and diabetes. The primary care-based intervention consists of a standardized approach for treatment planning, case coordination, and ongoing patient monitoring. Health care teams, led by a nurse, are guided by structured care pathways. Clinical information is processed through an information system. The intervention clinic, Centro de Salud Familiar San Alberto Hurtado (CESFAM) (part of the Ancora Network of Family Health Centers [Red de Centros de Salud Familiar Ancora] at the Pontifical Catholic University of Chile), has a study population of almost 2 000 patients. Services from this clinic are being compared to those from two other clinics providing usual care (the Centro de Salud Familiar “Malaquías Concha” in La Granja, and the Centro de Salud Familiar “Trinidad” in La Florida). The three clinics have a collective study population of about 4,000 patients. Each clinic has about 80 health workers. Study results are not yet available. Source: Poblete Arrué F, Pontificia Universidad Católica de Chile (personal communication, 2011).





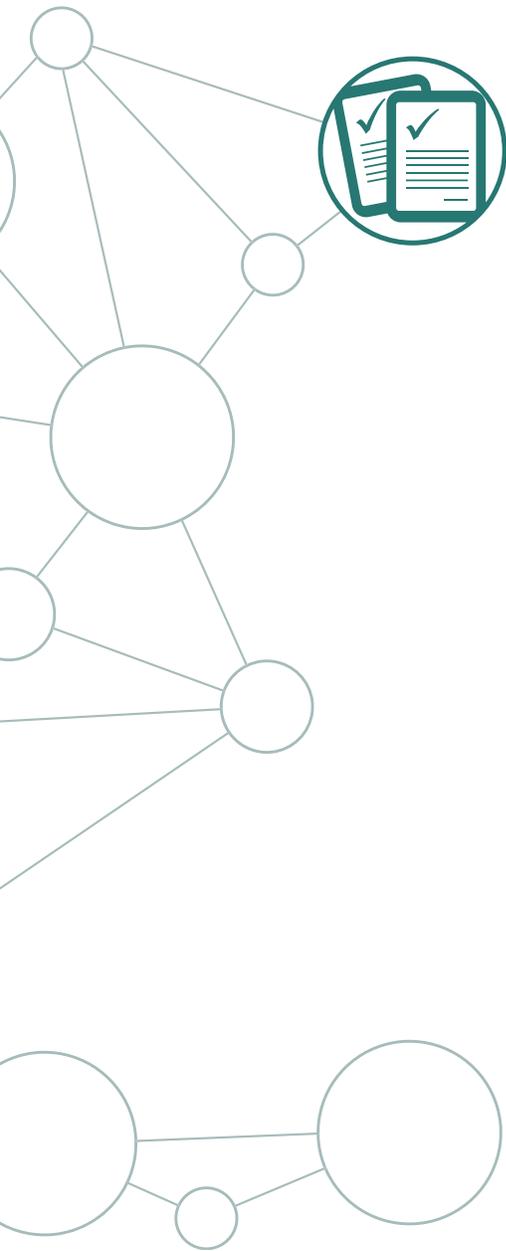
# Decision Support

## KEY ACTIONS FOR DECISION SUPPORT

- Disseminate CNCDs evidence-based guidelines;
- Use technically-sound methodology to develop new or adapt existing evidence-based guidelines;
- Ensure evidence-based guidelines are updated periodically;
- Embed evidence-based guidelines into daily clinical practice;
- Integrate specialist expertise and primary care;
- Use the shared care modality;
- Use proven health worker education methods;
- Share guidelines and information with patients.

## EXAMPLES OF EFFECTIVE INTERVENTIONS:

- ✓ Clinical decision-support systems (88)
- ✓ Guideline-driven care (89)
- ✓ Mailing printed bulletin with a single clear message containing systematic review of evidence (90)
- ✓ Shared care (91)
- ✓ Educational meetings, giving healthcare professionals feedback, learning materials, and using patient decision aids (92)
- ✓ Use of computerized clinical decision support systems in primary care (93)
- ✓ Aids and support for clinical decisions (94)
- ✓ Assigning a role in decision support to a clinical provider (74)



The next component of the CCM is decision support. Decision support includes (but is not limited to) the dissemination of evidence-based guidelines. Evidence based clinical practice guidelines should be in place and adequately disseminated across health settings and levels of care. Evidence-based guidelines should be developed and evaluated by multidisciplinary teams incorporating patient’s perspectives. The AGREE Collaboration as well as the ADAPTE Collaboration are excellent tools to evaluate and adapt clinical guidelines. In addition the WHO Handbook for Guideline Development provides step-wise advice on the technical aspects of developing guidelines following international standards (95).

The guidelines must be integrated into health workers’ decision-making process via chart reminders, standing orders, or other prompts (see Table 2). Health workers and care teams benefit from problem- or case-based learning, academic detailing (service-oriented outreach education), or modeling by expert providers. Ongoing support and supervision from those are familiar with standards for CNCD care is another aspect of this component that strengthens decision support. Collaborative or shared care, in which joint consultations and interventions are held between primary

care workers and CNCD specialists, is a proven approach for consolidating new skills. In addition to appropriate training, health workers need access to the medications, services, and procedures described in the guidelines. Shared care has been defined as the joint participation of primary care physicians and specialty care physicians in the planned delivery of care, informed by an enhanced information exchange over and above routine discharge and referral notices (91). Shared care has been shown to have the potential of improving quality of care for chronic conditions.

## The AGREE Collaboration

In order to address the issue of variability of practice guideline (PG) quality, an international team of PG developers and researchers (the AGREE Collaboration) created the Appraisal of Guidelines for Research and Evaluation (AGREE) Instrument. The Appraisal of Guidelines for Research and Evaluation (AGREE) Instrument evaluates the process of practice guideline development and the quality of reporting. Since its original release in 2003, the AGREE Instrument advanced the science of PG appraisal and quickly became the standard for PG evaluation and development. The AGREE Resource Center contains information about practice guidelines, training tools, publications related to AGREE and AGREE Translations.

*Source: The AGREE Collaboration. Available at <http://www.agreetrust.org/>. Accessed on 28 February 2013.*

## The ADAPTE Collaboration

The ADAPTE Collaboration is an international collaboration of researchers, guideline developers, and guideline implementers who aim to promote the development and use of guidelines through the adaptation of existing guidelines. The group's main endeavor is to develop and validate a generic adaptation process that will foster valid and high-quality adapted guidelines as well as the users' sense of ownership of the adapted guideline.

To learn more about the ADAPTE Collaboration and its process, and to obtain information on ADAPTE in a timely manner, please contact [contact@adapte.org](mailto:contact@adapte.org).

*Source: The ADAPTE Collaboration. Available at <http://www.adapte.org>. Accessed on 26 March 2013.*

**TABLE 2.** Converting Guidelines to Practice: Use of the Decision Support Approach in Diabetic Foot Exams

GUIDELINE PROCESSES FOR DIABETIC FOOT EXAMS	PERSON RESPONSIBLE	WHEN/HOW/WHY
Foot Sticker placed on front of chart for all patients with diabetes	Front Desk	At check-in/on MD's advice/after a new diagnosis
Determine date of last foot exam	Medical assistant or person doing vitals	Taken from flow sheet in chart. Annual exam unless otherwise noted. Flowsheet placed on front of chart.
Shoes and socks removed (if due)	Medical Assistant or person doing vitals	Date of last exam triggers removal of socks and shoes
Explanation of foot exam (when needed)	Medical assistant or person doing vitals	As shoes and socks are being removed and other vitals being assessed
Monofilament placed on top of chart	Medical assistant or person doing vitals	To make sure right equipment is at hands of provider
Sensate test performed	Trained provider (RN, PA, NP, MD)	Results recorded on flowsheet

*Source: Reproduced from reference (96).*



### Argentina: Integrated Care Plan for Diabetes and Cardiovascular Health

The intervention applied the CCM and a series of tools for CVD, including evidence-based risk stratification and treatment guidelines, medical record forms, and self-management support materials. More than 3 000 training sessions were conducted across 10 Argentine provinces. Preliminary results showed that quality of care indicators increased significantly after one year, compared to baseline, including registration of global cardiovascular risk (0%–45%), registration of BMI (11%–41%), and registration of tobacco use (20%–56%).

Source: Laspiur S, Ministry of Health, Argentina (personal communication 2012).



### Costa Rica: Using a Risk Factor Surveillance System to Improve Guideline Implementation

Costa Rica is using clinical guidelines to help standardize the management and care of people with diabetes, hypertension, and dyslipidemia (96). Guidelines are updated regularly and are being implemented throughout the public health care system, which covers 93% of the population. A national health surveillance system helps establish the extent to which these guidelines are implemented. A representative sample of adults is questioned to measure the prevalence of risk factors in the Costa Rican population, and to monitor access to care and disease control for major chronic diseases. Survey results revealed that 9.5% of the population had newly or previously diagnosed diabetes, while 31.5% had newly or previously diagnosed hypertension; 25.9% were obese; and 50% had a low level of physical activity. Among those with diagnosed diabetes and hypertension, 91.6% and 87.6% respectively had access to public health care services. Overall, 46.4% of those with diabetes and 76.1% of those with hypertension were deemed to have good control of their conditions. This national program features two commonly linked CCM components: 1) decision support, using guidelines established in regular practice and continually updated, and 2) clinical information systems (see section below), which in this case have been established using the country's existing surveillance system.

Source: Reference (97).



### El Salvador: Cervical Cancer Screening

An intervention was implemented across 14 health centers in a semi-rural area, with a population of 17 550 women aged 30–59 years. The objective was to enhance cervical cancer screening and diagnosis services, using continuous quality improvement and an outreach strategy. The intervention entailed the involvement of policy, service provision, and community levels in quality improvement cycles, facilitating linkages between work processes, and a quality control group. Over one year, 3 408 women were screened for the first time in their lives; unsatisfactory cervical samples were reduced by half; turnaround time for results was reduced by almost one-third; and follow-up of women with positive results increased from 24% to 100%.

Source: Reference (98).



### Brazil: Innovation Laboratory in Curitiba

The objectives of the Innovation Laboratory of Curitiba, in the state of Parana, is to produce and disseminate knowledge on chronic diseases, as well as to develop practical experiences and innovative solutions in the management of chronic diseases. The program is designed to improve the management of hypertension, diabetes and depression in primary care and it is led by designated groups at the various administrative levels in the city of Curitiba. These groups periodically review directives and protocols for the delivery of preventive services, behavioral counseling, and self-management support. Innovative clinical practices are being tested in a pilot conducted in 12 clinics (6 applying the new model while 6 applying usual care). The new model of care is an adaptation of the Chronic Care Model to local and national conditions. For the implementation of the pilot, primary health care teams participated in workshops on the new model of care for chronic conditions, as well as trainings to improve clinical skills in the management of diabetic foot, insulin use, screening and management of depression, support for self-care and group medical visit. Activities for the implementation of the Curitiba Laboratory include a program for Self-Management Support as well as evaluations using the ACIC and the PACIC surveys that have been culturally adapted locally. The Curitiba's Innovation Laboratory evaluation is ongoing.

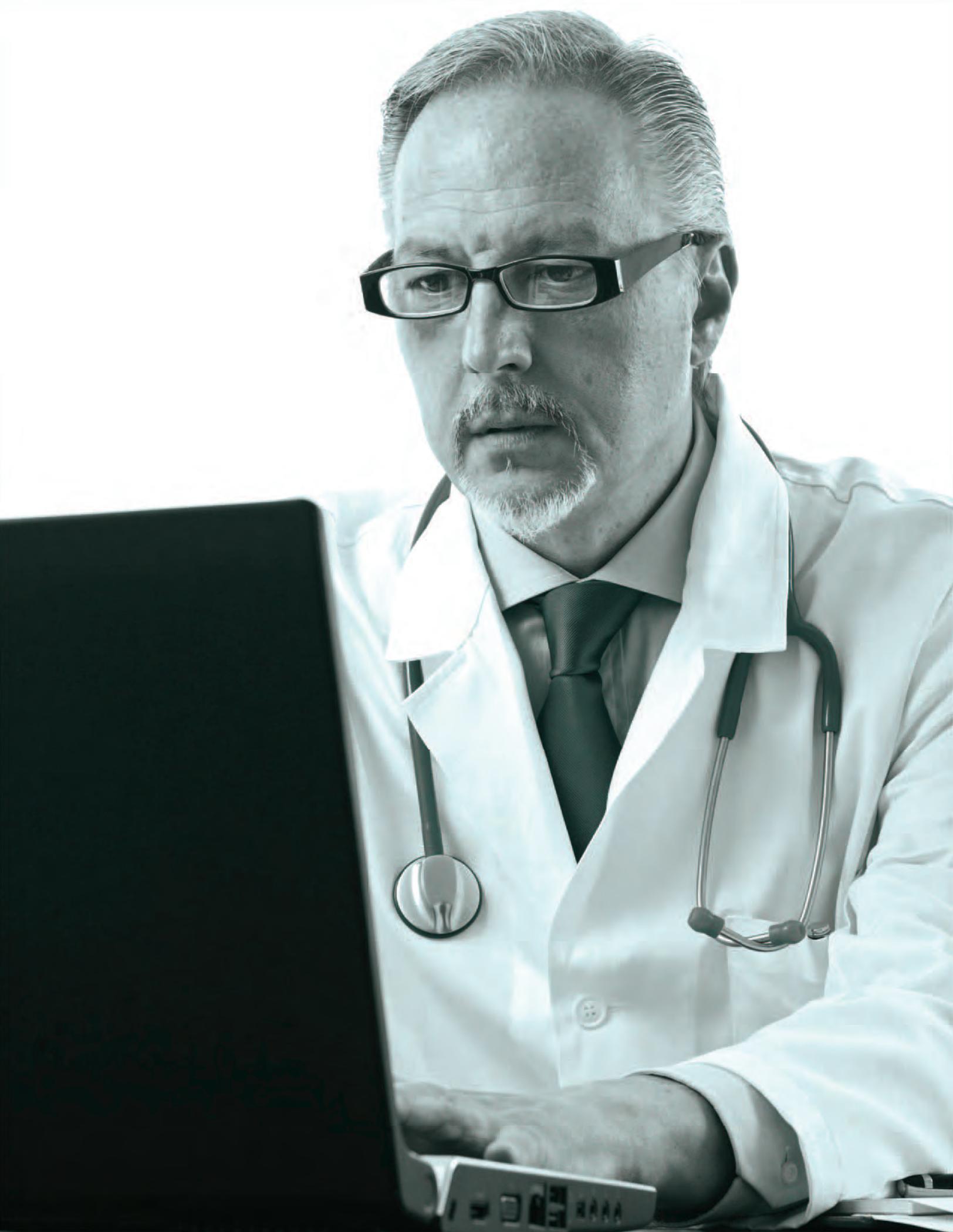
Source: Reference (99) and da Veiga Chomatas, ER (personal communication, 2012).



### Honduras: Training Health Care Teams to Manage Metabolic Syndrome among High-risk Patients

In 2001, the National Cardiopulmonary Institute (Instituto Nacional CardioPulmonar, INC) in Tegucigalpa initiated a project demonstrating strategies for prevention and improved management of diabetes, hypertension, and CVD. Participants received an educational intervention, and results were measured after 18 months. Positive outcomes led to the expansion of the services through the establishment of a specialized clinic. A multidisciplinary team of nine health professionals, including physicians, nurses, nutritionists, physical activity specialists, psychologists, and social workers, was trained in the management of metabolic syndrome among high-risk patients. Clinical protocols were followed and all patients received health-related education. Participating patients achieved good blood pressure control lifestyle changes, and treatment adherence. The clinic has successfully managed 4 400 patients to date.

Source: Palma R, Fundación Hondureña de Diabetes, Honduras (personal communication, 2012).



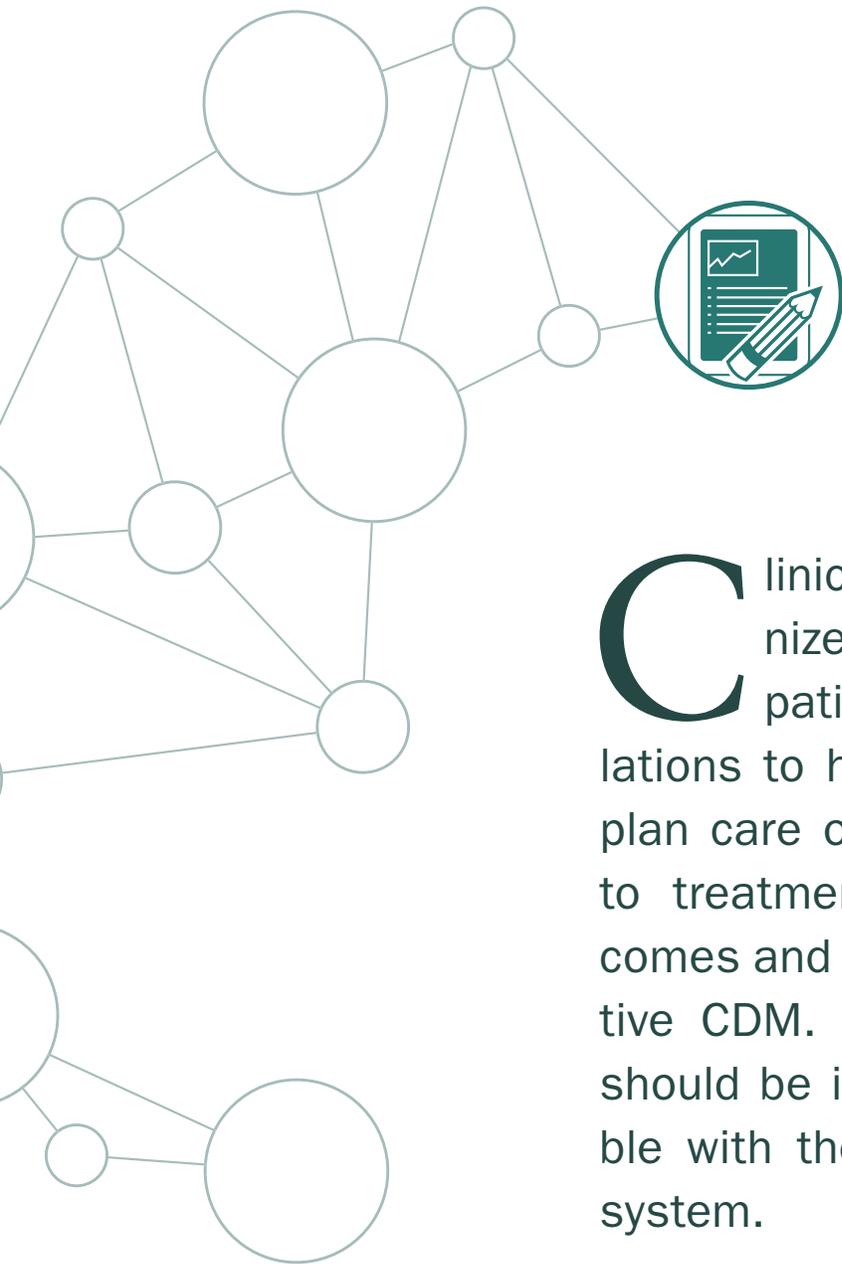


## KEY ACTIONS FOR CLINICAL INFORMATION SYSTEMS

- Monitor response to treatment;
- Supervise individual and group of patients;
- Provide timely reminders for providers and patients;
- Identify relevant subpopulations for proactive care;
- Facilitate individual patient care planning;
- Share information with patients and providers to coordinate care;
- Monitor performance of practice team and care system;
- Use care plan reminders.

## EXAMPLES OF EFFECTIVE INTERVENTIONS

- ✓ Introducing health information technology, in particular electronic medical records (100)
- ✓ Conducting periodic audit of medical records (101)
- ✓ Giving feedback to providers about the quality of care (101)
- ✓ Point of care computer reminders (63, 102)
- ✓ Case management in conjunction with disease management for diabetes (84)
- ✓ Education, reminders and patient support interventions for diabetes (84)
- ✓ Organizational interventions that improve regular prompted recall (60)
- ✓ Reviewing patients in a central computerized system (60)



**C**linical information systems organize information about individual patients and entire clinical populations to help identify patients' needs, plan care over time, monitor responses to treatment, and assess health outcomes and are thus at the heart of effective CDM. Clinical information systems should be integrated as much as possible with the general health information system.

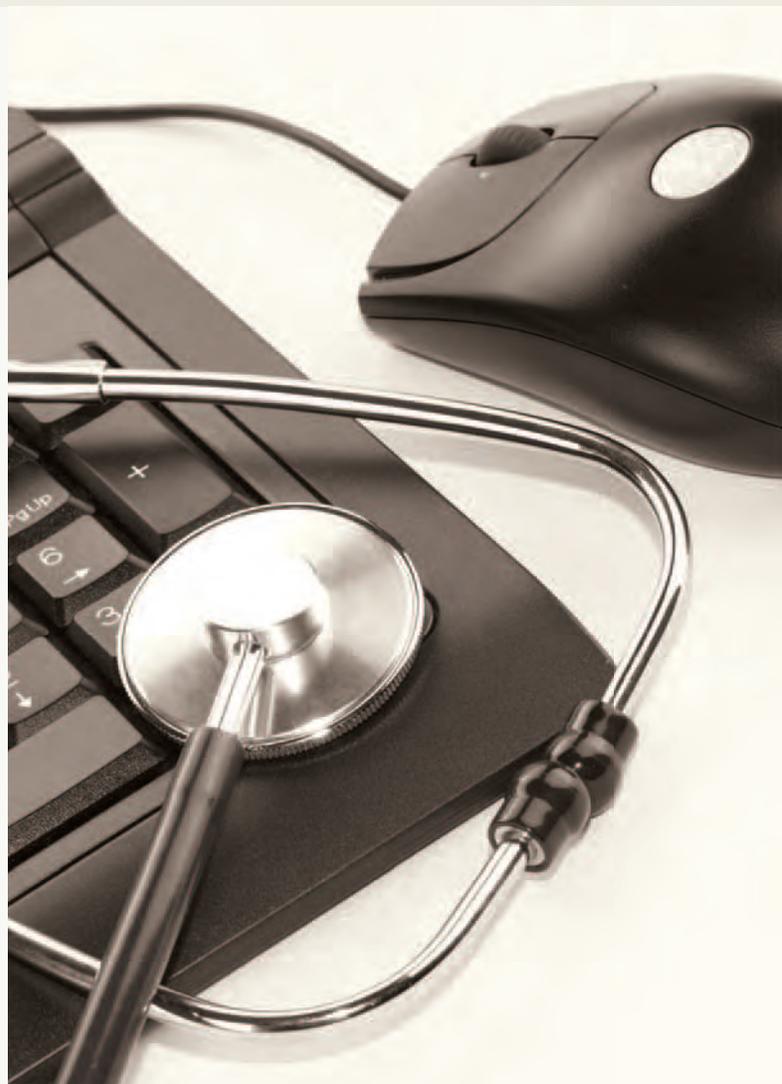
Computerized information technologies are available in many health facilities, particularly in urban areas. This capacity, even if limited, can be used to establish clinical information systems that can be optimized to serve several purposes in CNCD management. Where electronic record-keeping is not feasible, paper-based systems can be used to serve many basic functions, such as monitoring individual patients' treatment and outcomes, reminding health professionals about care plans, and providing information about the prevalence of conditions in the clinical population (103).

Both paper- and computer-based patient monitoring typically involves the use of individual patient records that are subsequently aggregated to provide information about the clinical population. The system can also generate timely reminders for patients and providers to support compliance and improvement strategies. In addition, by summarizing process and outcome variables, the health care organization can compare clinics, physicians, and groups of patients, which facilitates quality improvement initiatives. Specific clinical information system characteristics recommended for management of chronic diseases may also be suitable for management of other diseases and conditions.

## Chronic Disease Electronic Management System

One of the best-known clinical information systems is the Chronic Disease Electronic Management System (CDEMS). The CDEMS is an open-source software application developed by the Washington State Diabetes Prevention and Control Program in 2002. It can be used by a range of health settings, including community health centers, primary care practices, rural clinics, and hospitals. The CDEMS facilitates health care planning for individual patients providing timely reminders for patients and providers; enables population-based analyses of care for patients with chronic conditions; tracks the performance of health workers and care systems; and provides simple templates for customized reports. The CDEMS is highly customizable and can be easily adapted to monitor different diseases and health conditions, including communicable diseases and maternal and child health issues.

*Source: Reference (104).*





### Argentina: Expanding the Use of Clinical Information Systems

Austral University Hospital (Hospital Universitario Austral) in Pilar is conducting a three-year project focused on implementing an integrated clinical information system consisting of an electronic health record, a computerized physician order entry system, and an integrated back office system for the health sector delivery network. The system facilitates electronic interchange with patients; handles tests and procedures; provides electronic diagnostic treatment results; handles electronic prescriptions (only for inpatients due to current legislation); manages health records; and creates automatic reminders.

Source: Reference (105).



### Spain: Tele Assistance Service in the Basque Country

The Public Services of Tele Assistance is a project implemented by the Basque Government promoting the improvement of home care and community participation for the elderly and persons with disabilities. Since December 2011, the more than 25,000 users of this program received a wireless device to provide remote assistance, counseling and appointment management with either physicians or nurses. Every month around 1,000 remote consultations are carried throughout this program, 30% of which are solved without medical visit and 97% are responded in less than 20 seconds.

Source: Reference (106).



### **Brazil:** Promoting Monitoring of Diabetes. The QualiDia Project

An intervention using the Chronic Care Model was developed in 10 Brazilian municipalities and it was coordinated by the Ministry of Health, with participation of the Pan American health Organization, the Council of Secretaries of Health (CONASS) and the Council of Municipal Secretaries of Health (CONASEMS). The project involved 145 health units, with 3,469 health professionals (266 health teams) and a target population of one million inhabitants. Project activities included advocacy, community mobilization, continuous evaluation and the implementation of a diabetes quality of care improvement program.

Results were measured by applying the ACIC questionnaires before and after the intervention. The results indicated modest improvement in all six components of the Chronic Care Model when comparing the base line to the final measures.

Source: Meiners M, Universidade Federal de Brasilia, Brazil (personal communication, 2013).



### **Costa Rica:** Diabetes Quality of Care Improvement in Goicochea 1, San Jose.

This project was developed between 2005-2007 in clinics of the health area of Goicochea 1 in the capital city of San José, Costa Rica. The objective of the intervention was improving the quality of care for people with diabetes through comprehensive interventions using the Chronic Care Model and the methodology of the Breakthrough Series (BTS) from the Institute for Health Improvement (IHI).

Quality improvement activities included training in clinical management of diabetes, as well as diabetes prevention and education; implementation of a clinical information system; creation of groups of self-help; as well as implementation of a prevention program for cardiovascular health. Additional efforts were made for the improvement of coordination throughout the network of care, within the centers and with other levels of care. The results were measured through the monitoring of 450 randomly selected patients. Data analysis indicated that the proportion of patients with good glycemic control ( $A1c < 7\%$ ) increased from 31% to 51% between the baseline and the end of the intervention.

Source: Ramírez L, Tuckler N, Health Area Goicochea 1 (personal communication, 2011)





# ■ The Health Care Organization ■

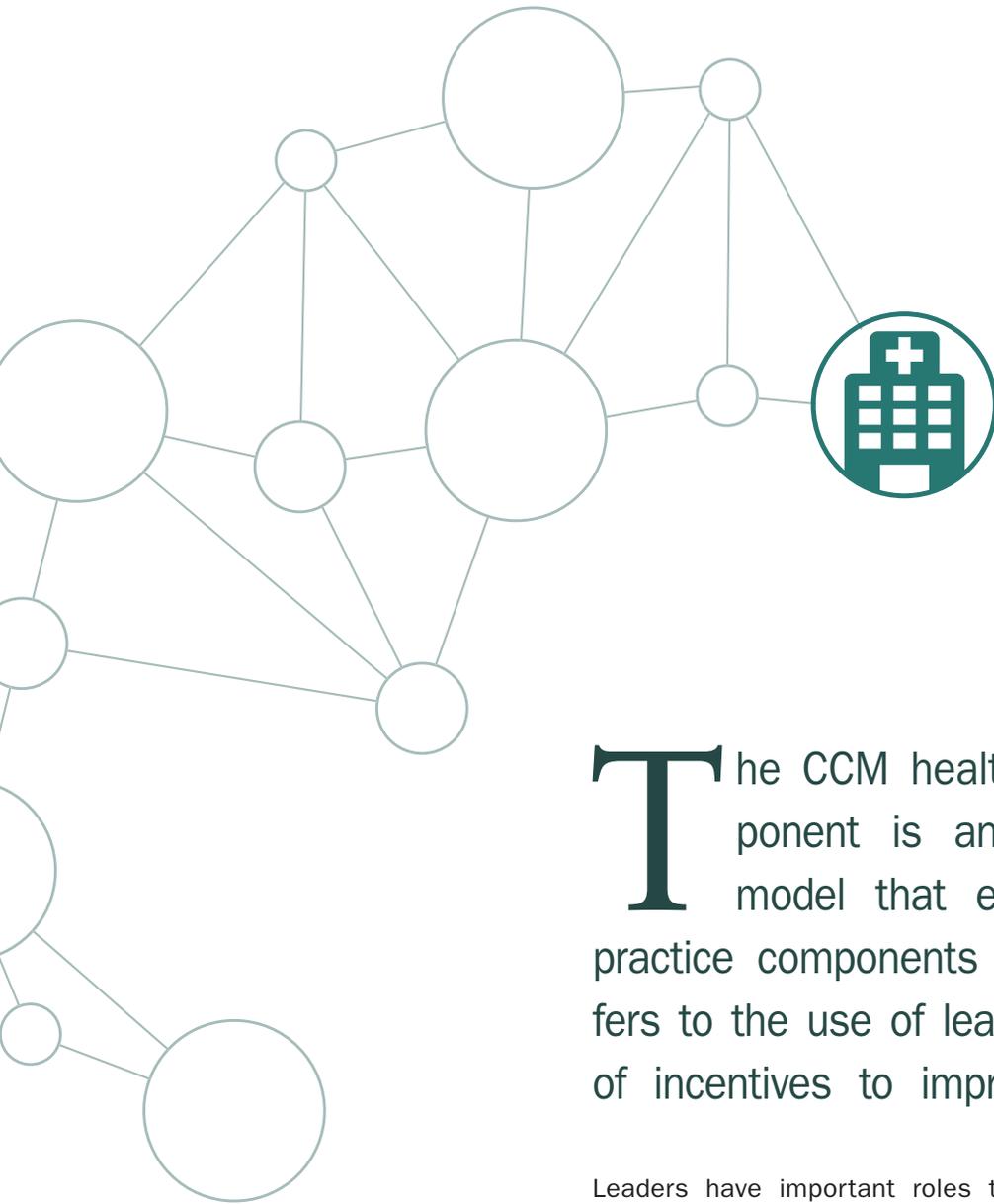


## KEY ACTIONS FOR THE HEALTH CARE ORGANIZATION

- Visible support improvement at all levels of the organization, beginning with senior leadership;
- Promote effective quality improvement strategies aimed at comprehensive system change;
- Encourage open and systematic handling of errors and quality problems to improve care;
- Provide incentives (financial or otherwise) based on quality of care;
- Develop agreements that facilitate coordination within and across different treatment settings and levels of care.

## EXAMPLES OF EFFECTIVE INTERVENTIONS

- ✓ Structuring monitoring of risk factors and prescribing (77)
- ✓ Ambulatory comprehensive care programs (107)
- ✓ Use of the Chronic Care Model as a framework for interventions aiming to improve asthma therapy adherence (108)
- ✓ Interventions focused on specific risk factor or functional difficulties for people with multiple chronic conditions (109)
- ✓ Financial incentives in particular the modality of group level financial incentives (110-111)
- ✓ Multifaceted professional interventions (60)
- ✓ Enhancing performance of health professionals (60)
- ✓ Hypertension care quality improvement strategy involving physicians and other team members (112)



**T**he CCM health care organization component is an important part of the model that encompasses the clinical practice components described above and refers to the use of leadership and the provision of incentives to improve the quality of care.

Leaders have important roles to play in identifying gaps, proposing clear improvement goals, and implementing policies and strategies, including the use of incentives, to encourage comprehensive system change. Effective health care organizations prevent errors and other quality gaps by reporting and studying mistakes and making appro-

appropriate changes to their systems.

By including this component, the CCM acknowledges that improvement in the care of patients with CNCs will occur only if system leaders—both private and governmental—make it a priority and provide the leadership, incentives, and resources required for improvement.



### United States: The Patient-Centered Medical Home

Following the principles established by the Institute of Medicine (IOM) on patient-centered care, an approach known as the Patient-Centered Medical Home (PCMH) was developed to provide comprehensive primary care to adults, adolescents, and children, broadening access and enhancing care coordination .

The Patient-Centered Primary Care Collaborative is a coalition of major employers, consumer groups, organizations representing primary care physicians, and other stakeholders who have joined to advance the PCMH. The Collaborative believes that implementing the PCMH will improve the health of patients as well as the health care delivery system.

According to the PCMH approach, clinicians should take personal responsibility and be accountable for ongoing patient care; be accessible to patients on short notice, through expanded hours and open schedules; be able to conduct consultations through e-mail and telephone; utilize the latest health information technology and evidence-based medical approaches; maintain updated electronic personal health records; conduct regular checks with patients to identify looming health crises; initiate treatment/prevention measures before costly, last-minute emergency procedures are required; advise patients on preventive care based on environmental and genetic risk factors; help patients make healthy lifestyle decisions; and coordinate care, when needed, ensuring the procedures are relevant, necessary, and performed efficiently.

Restructuring primary care reimbursement is key to the success of this model. Providers are compensated for face-to-face consultations as well as those conducted via e-mail and telephone. They also receive reimbursement for services associated with coordination of care and monitoring of test results and procedures performed by other providers. Overall, their compensation is derived from a hybrid model of payment that includes fee-for-service, based on hours of contact with patients, and performance-based incentives and compensation for achieving measurable and continuous patient health improvements.

Source: Reference (113).



### Brazil: Diadema, São Paulo, Brazil

This initiative was implemented in the Municipality of Diadema, São Paulo, with about 400 000 inhabitants and 19 PHC centers. The objective was to expand the capacity of the family health strategy in chronic diseases (particularly diabetes and hypertension) and to train a network of health care providers in the comprehensive, integrated management of chronic conditions. Learning sessions were organized to improve collaboration and integration among health team members. Treatment protocols for diabetes and hypertension were reviewed and disseminated. The Assessment of Chronic Illness Care (ACIC) was used to measure teams' baseline capacity and care practices. Overall, the municipality's system was deemed to be providing "Basic Support" (based on a score of 4 points out of 11), with some centers rated as providing "Reasonably Good Support" (7.7 points out 11). Post intervention results are not yet available.

Source: Reference (114).



### Spain: Developing a Proactive Health Care System in the Basque Country

The Basque Country in Spain used the concept of chronicity in its main health policies to introduce system-wide transformations. A Proactive Care Health System has been under development in the Basque Country since 2009 to manage services for a population of 2.5 million people. This transformation was the response to multiple challenges affecting the health system in Spain and in particular the Basque Country such as the increased demand for services among the elderly due to the epidemiological transition, as well as the local and national financial crisis. The aim of this transformation was to build a care system that would be proactive instead of reactive and collaborative instead of fragmented. A series of activities implemented through top-down and a bottom-up approaches are being used to integrate the system around three main objectives: 1) improve health and social outcomes; 2) focus on the health of the population; and 3) provide optimum efficient care. The top-down approach includes a series of activities such as risk stratification, creation of a call center, the formation of a financial joint commission as well as new electronic medical record and prescribing systems. The bottom-up approach includes health center based programs such as case management by nurses, patient empowerment, coordination of health and social care, creation of a sub-acute center and the promotion of integrated care.

Source: Rafael Bengoa (personal communication, 2013). More information on this change process is available at English, French and Spanish at <http://cronicidad.blog.euskadi.net/pagina-descargas/> . Accessed on 18 February 2013.







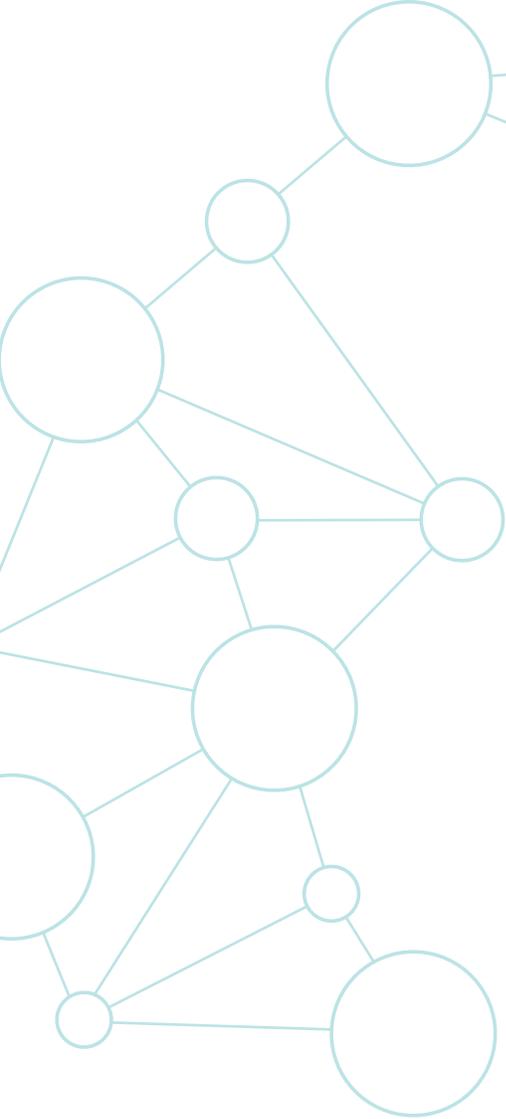
# Community Resources and Policies

## KEY ACTIONS FOR COMMUNITY RESOURCES AND POLICIES

- Encourage patients to participate in effective community programs;
- Form partnerships with community organizations to support and develop interventions that fill gaps in needed services;
- Advocate for policies to improve patient care and community care facilities;
- Provide a lay care coordinator;
- Self-management and social support.

## EXAMPLES OF EFFECTIVE INTERVENTIONS

- ✓ Home care by outreach nurses programs (115)
- ✓ Volunteer care coordinator (116)
- ✓ Patient navigator for colorectal cancer screening (117)
- ✓ Patient navigator for breast cancer (118)
- ✓ Peer education for prostate cancer (116)
- ✓ Lay health worker educational program for increasing breast cancer screening (119)



**C**ommunity resources and policies are the broadest component of the CCM. This component comprises the health system described above as well as families and households, employers, religious organizations, the physical and social environment, various types of community organizations, social services, and educational services, among other stakeholders.

Due to the inherent nature of CNCDs, affected individuals spend the vast majority of their time outside the walls of health care settings, living and working in their communities. Health systems that establish formal linkages with their communities leverage untapped resources and help to ensure healthy and facilitative environments for people living with CNCDs. Linkages can range from loose or sporadic collaboration to full integration between health care organizations and community services, where the latter can be leveraged as a health care partner.

The Region has a strong tradition of mobilizing community resources to improve health care. In many countries, lay community health workers (ranging from volunteers to partially paid persons) undertake important roles in the community with regard to CNCN prevention and management. Organized community groups also have a long-standing tra-

dition in the Region of providing peer support to those with CNCNs.

In many geographic areas, formal links to community resources can be further strengthened to fill gaps in care, particularly for older patients, who often require both health and social services. Nongovernmental organizations (NGOs), social enterprises, and medical care funds can provide services that 1) health facilities do not offer, 2) the private health sector does not consider to be within its mandate, and 3) patients cannot afford. Examples include institutions like cancer, diabetes and heart associations, which have important advocacy and awareness-raising roles. These institutions operate with public funds, donations, and volunteerism, and profits are reinvested in the service itself (120-121). The navigation program from the ACS is an excellent example of using volunteers from the community as care coordinators (122).



**United States:** Communities Putting Prevention to Work

Communities Putting Prevention to Work (CPPW) is a CDC-led program created by the DHHS. The initiative is locally driven and supports 50 communities in their efforts to tackle obesity and tobacco use—two leading preventable causes of death and disability in the United States. More than 50 million people—or one in six Americans—live in a city, town, county, or tribal community that benefits from the initiative, which is based on the concept that five evidence-based strategies (“media,” “access,” “point-of-decision information,” “price,” and “social support/services”), when combined, can have improve health behaviors by changing community environments. The five evidence-based strategies, described in detail elsewhere, are drawn from peer-reviewed literature as well as expert syntheses from the CDC Guide and other peer-reviewed sources. In the United States, local communities and states have carried out successful interventions based on this initiative. Initiative participants are expected to use the five strategies to design comprehensive and robust interventions.

Source: Reference (123).

**United States:** Promoting Screening and Timely Treatment via the American Cancer Society Patient Navigation System

Poor people experience substantial barriers when seeking timely screening, diagnosis, and treatment of cancer. The American Cancer Society (ACS) is a U.S. nationwide community-based voluntary health organization dedicated to eliminating cancer as a major health problem by preventing cancer, saving lives, and diminishing suffering from cancer, through research, education, advocacy, and services. The ACS has developed a program known as the Patient Navigation System (PNS) that has proven successful in promoting increased screening and timely treatment. Patient navigation in cancer care refers to the provision of individualized assistance to patients, families, and caregivers to help overcome health care system barriers and facilitate timely access to quality medical and psychosocial care. Cancer patient navigation begins at pre-diagnosis and continues through all phases of the cancer experience. Cancer patient navigation can and should take on different forms in different communities, as dictated by the needs of the patients, their families, and their communities. Within each patient navigation program, the stakeholders—the health care system, the community system, “patient navigators” (usually lay people selected from the community), the consumers, and any other participating entities—should collectively determine how patient navigation will be defined and operationalized. The patient navigators should ensure that any barrier a patient encounters in seeking screening, diagnosis, and treatment is eliminated. Barriers most frequently encountered by patients include financial, communication, medical system, and emotional/fear barriers.

Source: Reference (122).





**Paraguay:** Engaging Community Leaders in Integrated Diabetes Management

In the municipality of Misiones in Paraguay, a primarily rural area with 100 000 people, training programs were provided for health professionals in integrated diabetes management. In addition, community leaders were trained to act as liaisons, connecting the community to health services.

Results showed widespread improvements across all indicators. Participants showed better control of their diabetes 12 months after the baseline study, with their average fasting blood glucose declining from 270 mg/dL to 171 mg/dL, and their average A1c declining from 11.3% to 7.2%.

Source: Cañete F, Ministerio de Salud, Paraguay (personal communication, 2012).



**United States:** Improving Diabetes Care in the Clinica Campesina

One example of a successful implementation of the BTS method is a project from Clinica Campesina, a U.S. health clinic that serves a population of 15 000 patients. Forty percent of the clinic's patients are Hispanic, 50% are uninsured, and 100% are medically underserved. Diabetes management was identified as an area ripe for improvement. The BTS method was used to promote rapid change in the management of this chronic condition. A reduction in the average patient's A1c level from 10.5% to 8.5% was observed by the end of the study period. These clinical improvements occurred without additional resources.

Source: *Curing the system: stories of change in chronic illness care.* Washington: National Coalition on Health Care; 2002. Available at [www.improvingchroniccare.org/downloads/act\\_report\\_may\\_2002\\_curing\\_the\\_system\\_copy1.pdf](http://www.improvingchroniccare.org/downloads/act_report_may_2002_curing_the_system_copy1.pdf) . Accessed on 31 May 2012.



### **Bolivia:** Addressing CNCND Risk Factors Through a Community-based Program

A national program to address diabetes, hypertension, CVD and cancer risk factors was established in the nine departments of Bolivia. This program, known as “Puntos VIDA”, promotes healthy habits with regard to alcohol and tobacco use, physical activity, diet, and weight management. Community members are also offered regular checkups of blood pressure, weight, and body mass index (BMI). Those deemed at increased risk are referred to their closest health center. Puntos Vida is a community-based program that uses volunteers and establishes partnerships with key community organizations such as universities, Lions Clubs (volunteer service clubs), and police. This program was initially launched in three departments and later expanded to the capital cities of the nine departments. There is current demand to further extend the program to other cities in the country. This program features well-integrated linkages between the community and the health centers and capitalizes on a diverse set of community resources, including volunteers teams, which makes it feasible for replication in other low-resource settings.

*Source: Caballero D, PAHO Bolivia (personal communication, 2012).*



### **Mexico:** Project Camino a la Salud in the Mexico-United States border

The project Camino a la Salud (The Road to a Healthy Life) is a community intervention applied by Promotoras (Community Health Promoters) trained in the prevention and management of chronic diseases. The objectives of Camino a la Salud are to prevent chronic diseases, increase early detection of risk factors among persons with obesity and overweight, as well as to strengthen the institutional capacity of primary care centers to control CNCND. During the development of the intervention the Promotoras develop an educational program directed to selected people of the community, and measure the presence of CNCND risk factors among participants. Camino a la Salud is being implemented in three sites in the cities of Juarez, Reynosa and Tijuana. Overall 50 health promoters have been trained, and 337 people are receiving the intervention. It is expected that the results of the intervention (anticipated to be available in mid- 2013) will demonstrate the feasibility of the use of Promotoras for the detection and prevention of NCD.

*Source: PAHO/WHO United States-Mexico Border Office, unpublished 2013.*



# ■ Beyond the Chronic Care Model: ■ Macro Level Considerations

## POLICY IMPLICATIONS

**S**uccessful implementation of the CCM requires supportive policies and financing mechanisms. These macro-level factors are not considered in detail within the CCM itself but are addressed in its adaptation, the WHO ICCC Framework (see Figure 5) *1*. While conceptually linked to the CCM, the ICCC Framework reflects the international health care context and therefore places emphasis on different aspects of what constitutes good-quality CNCD care (32).

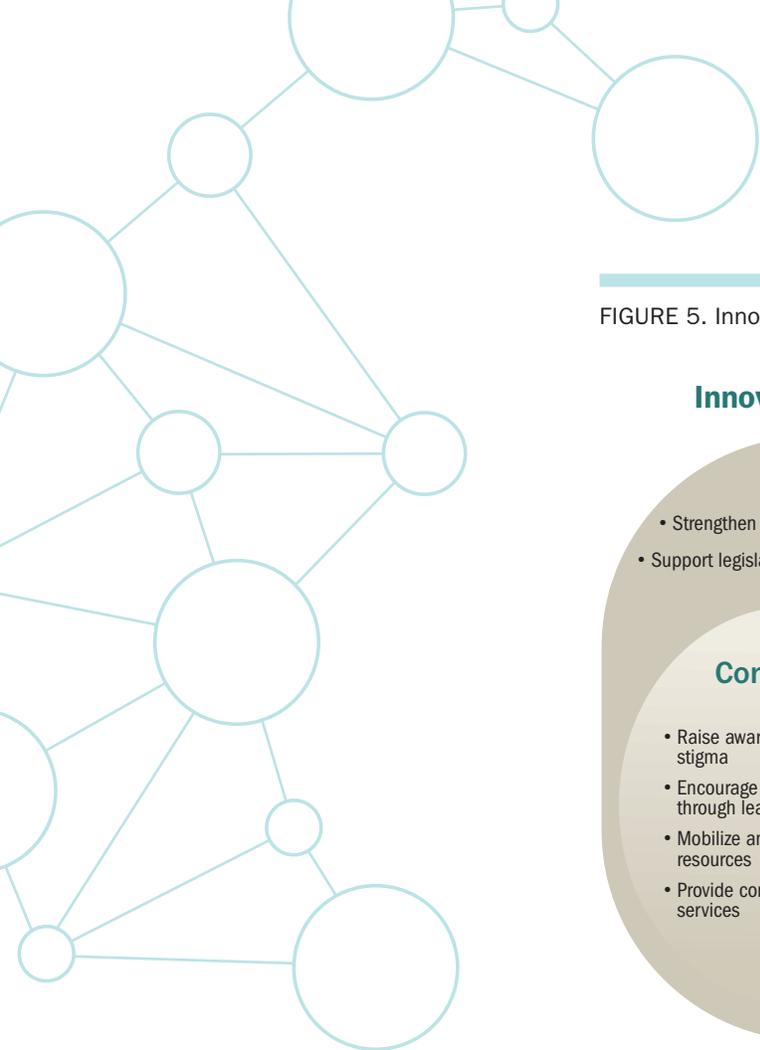
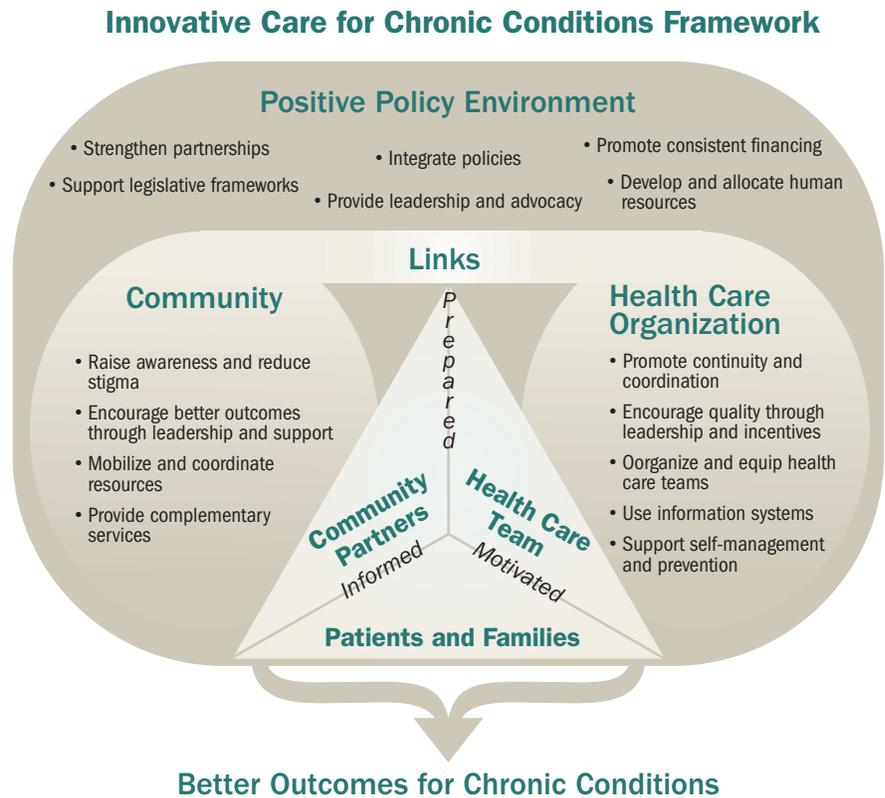


FIGURE 5. Innovative Care for Chronic Conditions Framework



A positive policy environment that supports integrated CNCD care is essential to reduce the burden of these long-term health problems. Financing, legislation, human resources, partnerships, and leadership and advocacy are examples of policy-level domains that influence the quality of integrated CNCD management.

Health ministers from the Region of the Americas, as part of the Governing Bodies of PAHO approved in recent years strategies and plans of actions focused on diabetes (124) and cervical cancer (125). Cardiovascular disease (126) was the subject of a broad consultation across the Region of the Americas.

## INTEGRATION OF SERVICES

To achieve the maximum impact, care for chronic conditions should be delivered at the PHC level (126). Therefore, elements essential for PHC are also beneficial for the delivery of high-quality care for chronic conditions. Essential elements of PHC include the following (127-128):

- Universal coverage and access
- Resources
- Comprehensive and integrated care
- Emphasis on promotion and prevention
- Appropriate care

- Family and community-based care
- Active participation mechanisms
- Legal and institutional framework
- Optimal organization and management
- Pro-equity policies and programs
- First contact
- Appropriate human resources
- Intersectoriality

People with chronic conditions need to receive patient-centered care throughout primary care. One of the principles of patient-centered care is to put people first, which means patient care needs to be managed holistically (i.e., considering the broader context, including all of the individual's health problems and needs) (129). NCD management does not require a vertical health service program. Although vertical or disease-specific programs have attracted a large amount of funding, they have been deemed ineffective based on various research studies (130). Existing health service delivery platforms such as adult health programs or women's health programs can be used to integrate services for primary prevention, screening and early detection, and treatment for NCDs. Integrating services also involves effective linkages and clear referral mechanisms between services, enabling holistic patient management rather than disease-specific care. However, if specific disease programs already exist, the overall health system can benefit from them. For example, part of the support that generates disease-specific programs can be used to strengthen the capacity of the primary care system (131).

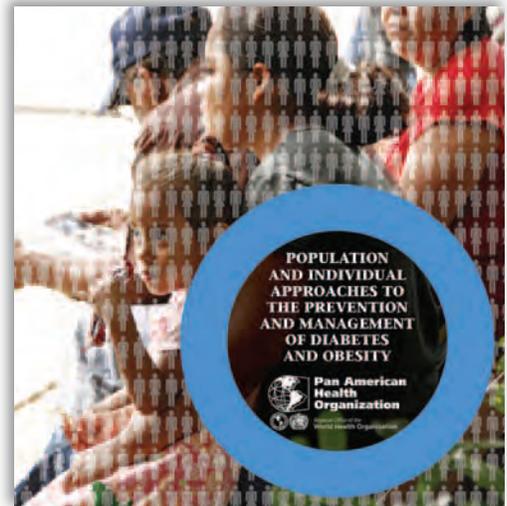
People visit health centers seeking care for a wide array of reasons, and these visits are opportunities for health providers to screen for major CNCDs such as hypertension, diabetes, obesity, and different types of cancers. In this way, CNCDs can be integrated into routine health service

## Population and Individual Approaches to the Prevention and Management of Diabetes and Obesity

The Population and Individual Approaches to the Prevention and Management of Diabetes and Obesity Resolution was approved by PAHO's 48th Directing Council in September 2008 in response to the epidemic of obesity and diabetes currently affecting the countries in the Region. Its main goal is to call on member states to prioritize the prevention of obesity and diabetes and their common risk factors by establishing and/or strengthening policies and programs, integrating them into public and private health systems, and working to ensure adequate allocation of resources to carry out such policies and programs. A consultation process was also conducted to define a list of priorities for the implementation of the resolution. The consultation included review of various national diabetes and other chronic disease programs, including those from Argentina, Cuba, and Paraguay, among others.

These programs were used as the framework for the list of priorities discussed during the workshop Diabetes in the Americas: Priorities for the Partner Forum to Fight Diabetes and Obesity in the Americas held in Montreal, Canada, October 20, 2009. The list of priorities is published to help member states prepare action plans to fight diabetes and obesity. It is recommended that program components be adapted to particular countries or organizations.

Source: Reference (124).



delivery. The most important aspect of this type of integrated care is the increased opportunity for follow-up with continuous quality care for persons who are newly diagnosed or living with an NCD. Integrated services are an efficient way to deliver care as the number of community health care providers at the primary level is often limited.

A patient centered or whole person approach means to provide care for all possible health risks associated with the individual who is consulting the health services. Patient visits at primary-level clinics may be the only opportunity to conduct CNCD screening and care, so it is important that these opportunities not be missed. Overall a great majority of the adult population requires some action related to CNCD and any acute event or illness needs to be seen in the context of the broader conditions or risks that the person may be exposed to.

Specialist care is often offered in secondary or tertiary settings isolated from primary care. Implementing specialist care at community level is believed to provide better access and flexibility of services. But shifting from hospital to primary care involves more than moving services into the community. A number of common features have been used with success to shift from hospital to community care including (132):

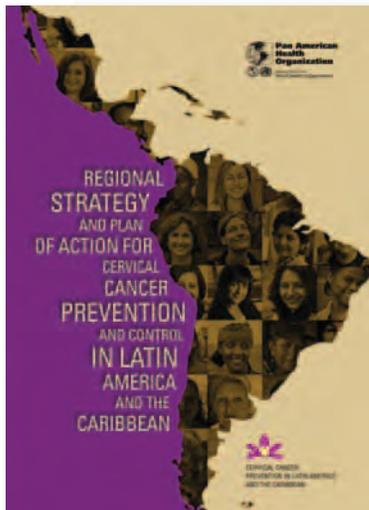
- Empowering people to take responsibility
- Focusing on changing professional behavior
- Training to support staff in new roles
- Increasing staff competencies
- Adequate investment in services
- Adequate timeframes in which to test services
- Realistic targets
- Involvement of all key stakeholders
- Whole systems approaches
- Providing care based on levels of need
- Not running (competing) services in parallel, and
- Not assuming that shifts will reduce costs

PHC-level care, which is seen as a “gatekeeper” for patient health, can play a coordinating role in the provision of other types of care by linking to secondary or specialized diagnostic and preventive services, and to community services (see Figure 6).

## Regional Strategy and Plan of Action for Cervical Cancer Prevention and Control in Latin America and the Caribbean

The Regional Strategy and Plan of Action for Cervical Cancer Prevention and Control in Latin America and the Caribbean aims to address the large burden of disease and limited impact of current screening programs in low-resource settings. The strategy describes cost-effective approaches available for comprehensive cervical cancer prevention and control, including a complete package of services (health education, screening, diagnosis, and treatment) and depending on affordability, sustainability, and country preparedness, HPV vaccination. An integrated approach for cervical cancer prevention is required across existing programs on adolescent health, sexual and reproductive health, immunization, and cervical cancer control. The aim is to fortify programs and determine if and how new technologies and methods, such as new screening techniques; behavioral, educational, and preventive programs; and HPV vaccines, can be used to improve the effectiveness of current programs .

*Source: Reference (125).*



# FINANCING

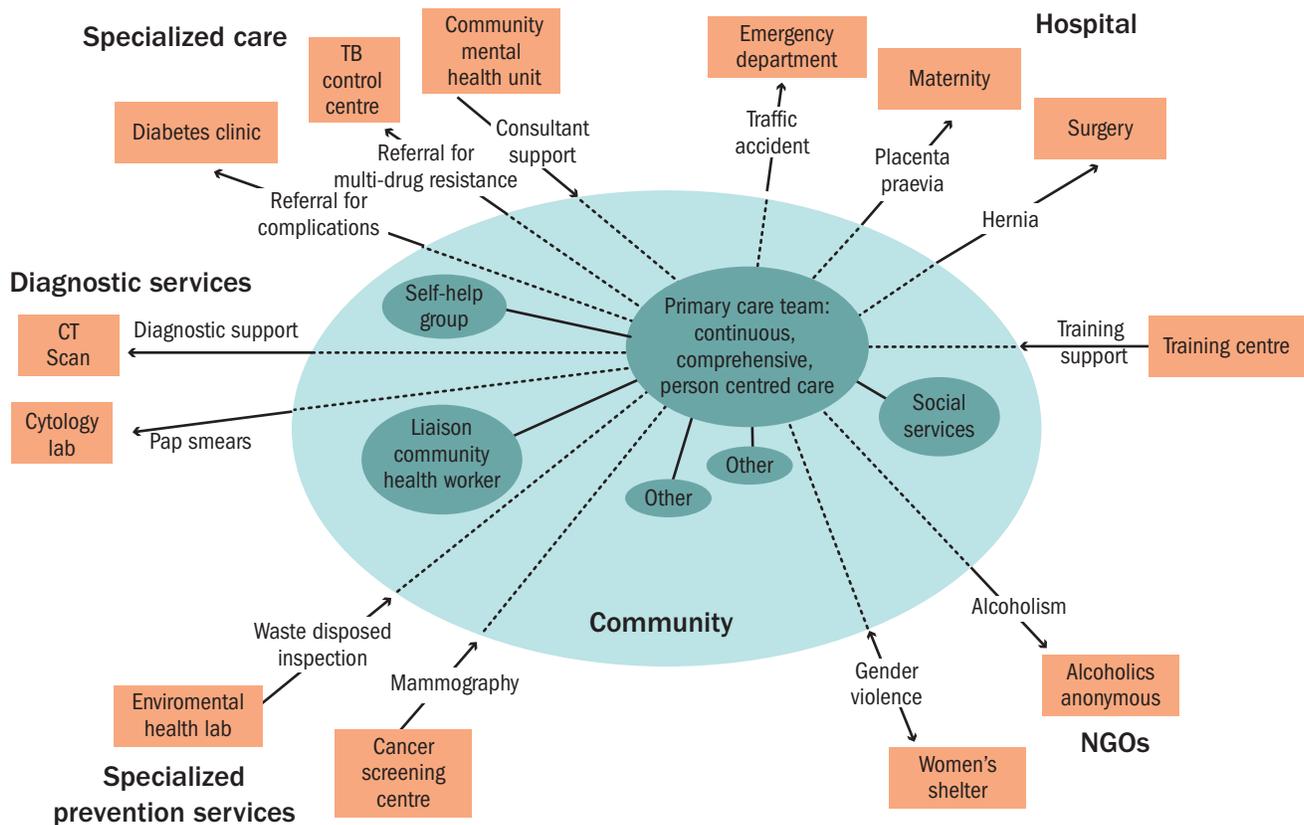
CNCDs are often detected at a late stage, resulting in high-cost treatment and care. As many countries are not able to absorb these costs, patients and their families often bear the cost of treatment. According to research, 39%–46% of all health expenditures are paid out-of-pocket (135-137); the poorer the country, the higher the proportion of direct payment. A health promotion approach reinforcing the prevention of major CNCDs and their risk factors is critical to avoid this high burden.

Two essential elements for improving quality of care and clinical results are universal coverage and

care that is free at the point of service (138). In the absence of these characteristics, patients may delay seeking care because of costs. Catastrophic health expenditure is a critical factor in impoverishing families (138). Universal coverage contributes tremendously to reducing inequities in health (140-141). As Dr. Margaret Chan, Director General of the World Organization (WHO) said “...universal [health care] coverage is the single most powerful social equalizer” (142).

Fee-for-service payment systems, common in some setting, are problematic for effective CDM for two important reasons. First, these payment systems typically do not compensate for the extra costs

FIGURE 6. Primary Care as A Hub Of Coordination: Networking within the Community Served and with Outside Partners



Source: Adapted from (133-134)



associated with more effective management, such as time spent negotiating treatment plans with patients or coordinating their care. Second, health workers who do a good job managing their patients lose the opportunity to make additional revenue generated by further illnesses and complications. Likewise, fee-for-service discourages the kind of collaborative teamwork that is needed for effective chronic illness care (143). Capitation, on the other hand, provides greater flexibility than fee-for-service payment, and could be more conducive to the implementation of the kind of innovation that is needed for CDM (144).

Regardless of the payment system, health workers must be compensated for key CDM functions. They must be remunerated for time and resources spent on chronic disease prevention (e.g., tobacco cessation or weight management services) and in counseling chronic disease patients on how to self-manage their conditions and prevent complications (31). Health workers should also be eligible for compensation for services they provide in patients' homes or communities.

Effective prevention and control of CNCDS require long-term investments in health infrastructure capable of providing preventive services, early diagnosis, and care. Further financing decisions based on principles of equity and effectiveness will help ensure the most beneficial allocation of scarce resources.

All financing components should be used as a means of encouraging the implementation of integrated health care strategies. These financing components include the following:

- Revenue collection (including source of funds);
- Pooling (accumulation of prepaid funds on behalf of some/all of the population);
- Purchasing (mechanisms and institutional arrangements for allocating resources to service

providers, including both implicit (e.g., budget allocations within integrated hierarchies) and explicit (e.g., purchaser-provider split, where a separate "purchasing agency" pays providers for what they produce).

The benefit package should allow for preventive interventions and cover appropriate management of acute symptoms and long-term care (including rehabilitation and palliative and hospice care). Home-based care should also be included.

A prepayment and risk-pooling approach, in which payments are made in advance of illness, can help ensure adequate health care access and coverage for all. The prepayment approach is considered a step toward universal coverage (138). Other measures, such as using revenue from taxes on tobacco and alcohol consumption, can generate additional revenue to dedicate to prevention, including discouraging these risk behaviors (8, 138).

## LEGISLATION

Legislation is a powerful tool that countries can use to reduce exposure to CNCDS risk factors, ensure patients' quality of care, address the social determinants of health, and uphold patients' human rights. For example, legislation that has proven effective includes laws that restrict tobacco and alcohol sales, and those that limit or ban tobacco advertising and smoking in public places. Laws that ensure access to care and voluntary treatment help protect human rights, along with regulatory frameworks that protect health care institutions and workers. Antidiscrimination laws protecting people with CNCDS in the realms of housing and employment are also effective. Legislation on palliative care can help ensure appropriate access to oral pain medication such as opiate analgesics, while protect-

ing the population from illicit use.

Recent reviews (146-147) indicate that legislation on obesity, diabetes, CVDs, and their risk factors has increased with the rising epidemic of these diseases in the Region. Specific regulations related to prevention and treatment of obesity are in place in Argentina, Brazil, Colombia, Costa Rica, and Mexico. In Argentina and Costa Rica, obesity is considered a priority condition. Colombia considers obesity and related CNCDS as a public health priority and has adopted legislation promoting intersectoral food safety and nutrition policies as well as physical activity. Brazil has several federal regulations for coordinated care of people with obesity within the public health system, and it is compulsory for private health insurance schemes to offer treatment for people with morbid obesity. In Argentina a specific laws on CVDs

requires a national CVD epidemiological and statistical system and regulates food labeling regarding saturated fat, excess salt, and cholesterol.

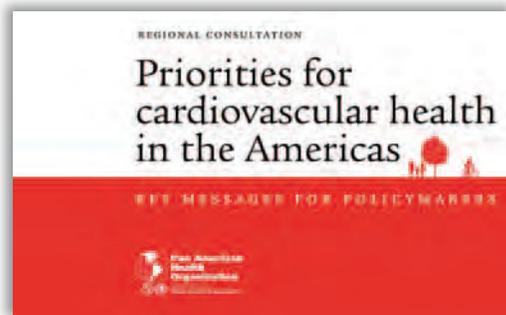
While diabetes-related legislation exists in all countries in the Region, the regulations vary in terms of their comprehensiveness. Ecuador, Mexico, Paraguay, and Uruguay have specific and comprehensive regulations. Ecuador also has a comprehensive legislative framework that guarantees universal diabetes protection, prevention, management, and control.

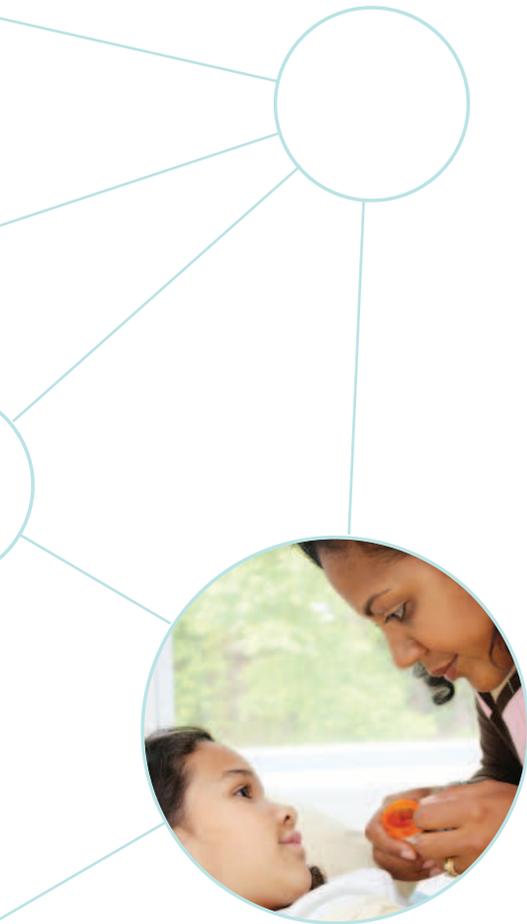
Various reviews have been conducted in the United States on policies and legislative changes that have contributed to healthier behaviors. These are summarized in the U.S. Centers for Disease Control and Prevention (CDC) Guide to Community Preventive Services (148), a free resource to help public health

## Priorities for Cardiovascular Health in the Americas

The PAHO document Regional consultation: priorities for cardiovascular health in the Americas: key messages for policymakers, which summarizes cardiovascular health priorities, is the result of a far-reaching consultation process focused on prevention at the population level, integrated risk and disease control, and health services organization. The priorities were grouped around the CNCDS Regional Strategy's four pillars of action: 1) public policy and advocacy, 2) surveillance, 3) health promotion and disease prevention, and 4) integrated control of chronic diseases and risk factors. These priorities are also consistent with PAHO's Health Agenda for the Americas and the WHO Action Plan for the CNCDS Global Strategy approved in 2008. This document presents a list of cardiovascular health priorities in the Region—based on the best available scientific evidence, and criteria for cost-effectiveness, social value, and equity—that would enable PAHO member states to prioritize activities for the prevention and control of CVD in their national health plans and galvanize implementation of the CNCDS Regional Strategy.

*Source: Reference (126).*





programmers select programs and policies to improve health and prevent disease in their communities. Topics include the full range of chronic diseases, including diabetes, CVDs, and cancer.

## HUMAN RESOURCES AND INFRASTRUCTURE

There is a worldwide shortage of health workers qualified to meet the diverse health needs of the general population. In addition, most of the current workforce has been trained to deal with acute illnesses rather than chronic problems, which require a different set of competencies and skills. More-

over, the traditional care model is physician-centered as opposed to multidisciplinary team approach advocated by the CCM.

Ideally, the health workforce should have the knowledge and skills defined by PHC-based health systems as core, essential elements (127). These core competencies include, among others, the ability to promote self-management; provide preventive, evidence-based, and coordinated curative care; involve family and community in the care process; establish and negotiate patient goals; provide care as part of a multidisciplinary team; manage clinical information; and participate in continuing medical education.

The need for a new set of workforce competencies is embedded in the CCMs described above. It is therefore critical to establish collaboration between universities and

TABLE 3. Core Competencies for Caring for Chronic Conditions, as Identified by WHO (2005)

### 1. Patient-centered care

- Interviewing and communicating effectively
- Assisting changes in health-related behaviors
- Supporting self-management
- Using a proactive approach

### 2. Partnering

- Partnering with patients
- Partnering with other providers
- Partnering with communities

### 3. Quality improvement

- Measuring care delivery and outcomes
- Learning and adapting to change
- Translating evidence into practice

### 4. Information and communication technology

- Designing and using patient registries
- Using computer technologies
- Communicating with partners

### 5. Public health perspective

- Providing population-based care
- Systems thinking
- Working across the care continuum
- Working in primary health care-led systems

Source: Reference (150).

other training institutions and health service organizations to ensure that the workforce receives appropriate training and continuous medical education in order to better meet the health needs of the population (127).

A 2005 review by WHO identified five competencies for delivering effective chronic care (see Table 3) (149-150). These competencies were chosen in part for their applicability to all health workers, regardless of discipline. They were not meant to supplant existing competencies, such as the practice of evidence-based and ethical care, but rather to underscore the need for new areas of expertise.

First, the health workforce needs to organize care around the patient (i.e., adopt a patient-centered approach). Within a patient-centered approach, disease prevention and management are seen as important, but do not take priority over the needs and expectations of people and communities. The central focus is on the person, within the context of his or her family, community, and culture.

Second, health workers need communication skills that enable them to collaborate with others. They need to not only partner with patients but also work closely with other providers and join with communities to improve outcomes for patients with chronic conditions. This competency requires strong communication skills, including the ability to negotiate, participate in shared decision-making, collectively solve problems, establish goals, implement actions, identify strengths and weaknesses, clarify roles and responsibilities, and evaluate progress. Learning may not occur only in the traditional way of an educational or knowledge based intervention but also in a modality called reciprocal learning. Reciprocal Learning in the context of the Chronic Care Model is a learning process that occurs between peers where each learns from sharing

with the other in an iterative process. Reciprocal learning has been related to the degree of implementation of the Chronic Care Model and suggested to be related to overall quality of care. (151)

Third, the workforce needs quality improvement skills to ensure that the safety and quality of patient care are continuously improved. In general, quality improvement requires health workers to have clearly defined goals and know which changes are most likely to lead to improvements, and how to evaluate their efforts.

## Jamaica: Innovating Financing Through the National Health Fund

The National Health Fund of Jamaica (“the Fund”) is an example of an innovative financing mechanism. It has enabled Jamaica to successfully manage the growing pressures of CNCDs, which comprise more than 60% of the country’s burden of disease. Resources for the Fund originate from a 20% national tobacco consumption tax (43% of Fund revenues); a 0.5% national payroll tax (35% of Fund revenues); and a government contribution (22% of Fund revenues). The Fund is designed to provide universally subsidized medicines to all eligible people with CNCDs. These benefits are available to all residents who have the required certification of their condition. Fund-subsidization of medications is not meant to replace coverage by private or public insurance schemes, which provide national pharmaceutical coverage for senior citizens, and often require modest out-of-pocket co-payments. The Fund also supports public education programs within the Ministry of Health, as well as private organizations that fall within the Ministry’s Health Protection and Promotion Strategy. *Source: Reference (141).*



Fourth, the workforce needs skills that help them monitor patients over time, such as the ability to use and sharing information through available technology. The value of this type of competency in terms of improving patient care has been recognized by several professional bodies that have recommended that the health workforce be capable of using information and communication systems.

Finally, standards for health workforce skills should be based not only on patient care but also on health workers' role in that care within the context of new models for health care delivery—including population-based care, multiple-level care, and the care continuum—and on the concept of “systems thinking” (the idea that health care is a series of systems embedded within other, broader systems).

Several strategic approaches can help optimize the ability of the health workforce to manage CNCDS in an integrated way. Health sectors must ensure that health workers have the right competencies, as described above, which requires changes in pre-service and in-service training curricula. At the operational level, health workers must be organized into multidisciplinary teams and have access to infrastructure and tools to help them practice good-quality CNCDS care. In addition, health workers' practice environment must be positive and supportive, to ensure a good rate of retention as well as the capacity and motivation to provide effective services. Finally, health workers should be efficiently distributed across the continuum of patients' chronic care needs, with most located in communities and PHC settings.

In addition to human resources, health units should be equipped with the appropriate material resources to provide care for people with chronic conditions. Health

units providing general health services should have the appropriate equipment, medicines, and educational material to provide curative and preventive services. Health units should have access to new technology, such as social media and digital communication networks in order to provide better care for the chronically ill. In addition, physical access to facilities by people with limited capacity and assisted transportation between different units should be available in health units providing primary and specialized care.

## PARTNERSHIPS

A single sector, organization, or group is unlikely to have sufficient resources to tackle the complex issues inherent in integrated management of CNCDS. Therefore, partnerships are established to achieve this shared goal. Partnerships can be formed within and between various government sectors (e.g., the Ministries of Health and Education) as well as NGOs, the private sector, and other entities.

Implementing CNCDS policies and programs requires the collaboration of different partners and stakeholders, including social services, health-related sectors such as agricultural, finance, public works, transportation, and recreation. Civil society organizations such as health professional associations, academic institutions, patient groups, and individuals affected by diseases also play a key role. Existing networks in the Region, such as CARMEN (Collaborative Action for Risk Factor Prevention & Effective Management for NCDs) and PANA (Physical Activity Network of the Americas), can help expand and sustain partnerships particularly with civil society (27).

## LEADERSHIP AND ADVOCACY

Changing health systems in the Region requires strong political commitment and advocacy. Leadership is required to advance policy and institutional changes, leverage and allocate resources and ensure financial protection, promote legislation and intersectoral action, and plan for long-term care. Rather than operating unilaterally, effective health leaders involve different stakeholders, such as health care professionals, patients, families, and community members, and incorporate their needs, preferences, and views in developing health strategies.

To be most effective, leaders need to consider how they can influence the health system at multiple levels. A complete system overhaul is not necessary to start, although the more components that can be addressed simultaneously, the greater the expected benefits. Models such as the CCM and the ICC Framework can help leaders organize the way they think about what needs to be done.

Leader inclusiveness encourages contributions from all health team members, despite their rank or status, to improve chronic care. Inputs from all team members with different points of view are important factors in redesigning the practice to achieve better outcomes. Input from support personnel such as receptionists and secretaries can complement contributions from clinical staff such as physicians and nurses, to create the right environment for quality improvement (152).

### Chile: Ensuring Financial Protection and Access to Good-quality Care for Advanced Cancer

Universal Access to Explicit Guaranties (Acceso Universal a Garantía Explícitas, AUGE) is a health system law in Chile that mandates coverage for priority programs, diseases, and conditions. According to the law, health care benefits for the specified diseases and conditions must be provided by both public and private health insurance plans. Explicit guarantees regulated by law include access to and quality of health care benefits; timeliness of health care benefits; and financial protection (through the regulation of out-of-pocket payments). Among other benefits provided by this legislation is extended access to care for advanced cancer. Prior to the enactment of this law, only users from the public health sector were covered for late-stage cancer, through the National Palliative Care and Patient Care Commission (Programa Nacional de Alivio del dolor por Cáncer y Cuidados Paliativos, PNACCP) established in 1995. Coverage for cancer pain relief and palliative care for both the public and private sectors was incorporated into AUGE in 2005. Incorporating advanced cancer palliative care and pain management into AUGE has given patients improved quality of life in their final days and helped promote death with dignity. This care is provided mainly within patients' homes rather than at hospitals or specialized cancer care centers, facilitating both cost savings for the health system and preferable conditions for patients, families, and caregivers.

*Source: Reference (145).*



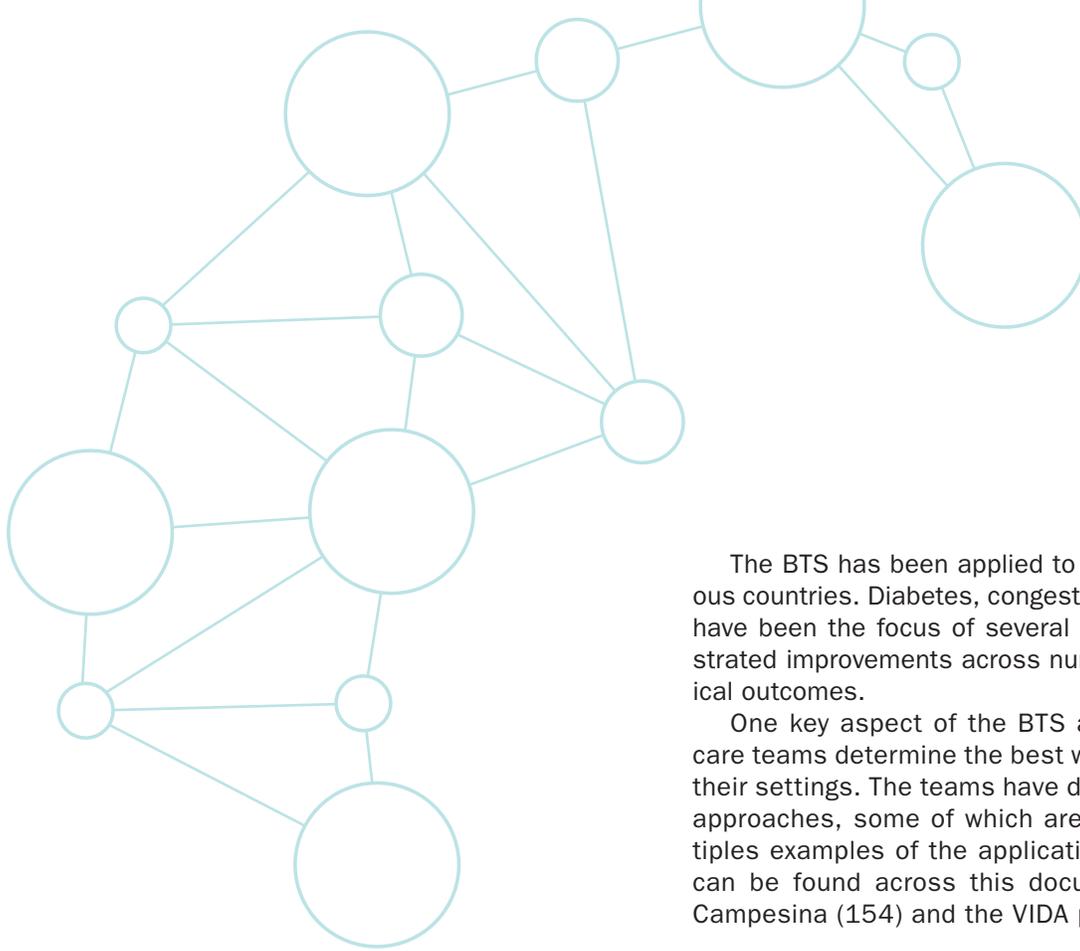
health  
system

groups

changes

## ■ A Method for Introducing Change ■

**W**hile the CCM and ICCF Framework provide information on how to organize care to improve outcomes, the BTS (Breakthrough Series) (see Figure 7) developed by the Institute for Healthcare Improvement (IHI) (Cambridge, MA, USA) (152) provides a tool for introducing and maintaining health system change. The BTS brings together groups of health care organizations that share a commitment to making major, rapid system changes to specific aspects of their organizations. About 20–40 organizations participate in a 6- to 13-month program involving three two-day learning sessions alternated with action periods. At the learning sessions, faculty present evidence-based interventions related to specific issues, and each participating organization works on its improvement plan, with faculty support. During the action periods, participants are linked to faculty via e-mail, monthly reports, and conference calls.



The BTS has been applied to a range of CNCDs in numerous countries. Diabetes, congestive heart failure, and asthma have been the focus of several BTS endeavors with demonstrated improvements across numerous operational and clinical outcomes.

One key aspect of the BTS approach is that the health care teams determine the best way to operationalize CDM in their settings. The teams have devised a range of innovative approaches, some of which are described in Table 4. Multiple examples of the application of the BTS methodology can be found across this document including the Clinica Campesina (154) and the VIDA project (48-49).

FIGURE 7. The Breakthrough Series

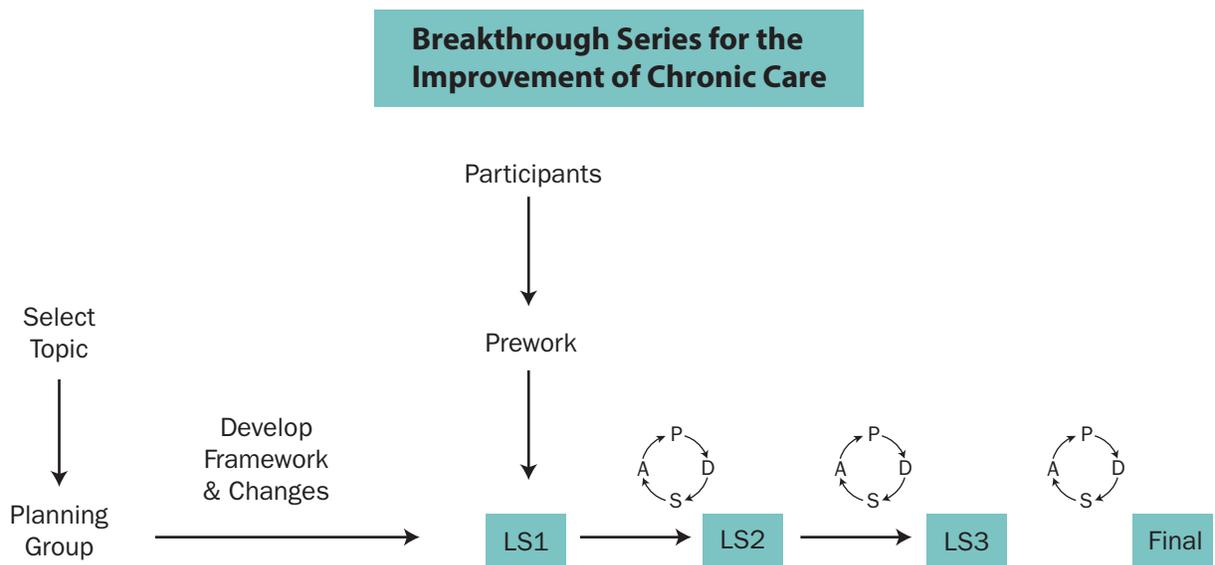


Table 4. Innovating Health Care using the BTS Approach

The health care innovations below were developed by health care teams using the BTS approach (29).

### CLINICAL INFORMATION SYSTEMS

Registries were used to track clinical measures and identify patients who needed education or increased case management. Particularly innovative strategies included making registries accessible to physicians via the Internet and linking registries to community-wide electronic medical records.

### DECISION SUPPORT

Guidelines were integrated into a chronic disease flow sheet, posted on the Internet, and displayed on posters in exam rooms to better incorporate them into daily practice. Clinical teams were provided with feedback on guideline compliance extracted from registry data. Specialist referral guidelines were implemented.

### DELIVERY SYSTEM DESIGN

Teams reviewed and readjusted their clinical roles. In some cases, they introduced health coaches for patients with more complex needs. Clinical teams also implemented group visits and planned follow-up visits for people with chronic diseases.

### SELF-MANAGEMENT SUPPORT

Self-management assessments and surveys were adapted; staff members were trained; toolkits (posters, calendars, action plans, Web sites and reading lists) were created and made available to health care teams; and peer support group meetings were held.

### COMMUNITY RESOURCES

Designated case managers referred patients to community resources, and staff participated in community boards, task forces, and health-related community initiatives.

### ORGANIZATIONAL SUPPORT

Health centers secured financial support for patient education and communicated with payers regarding the CCM. The medical director sent a monthly newsletter to health care workers.

Sources: Reference (29).

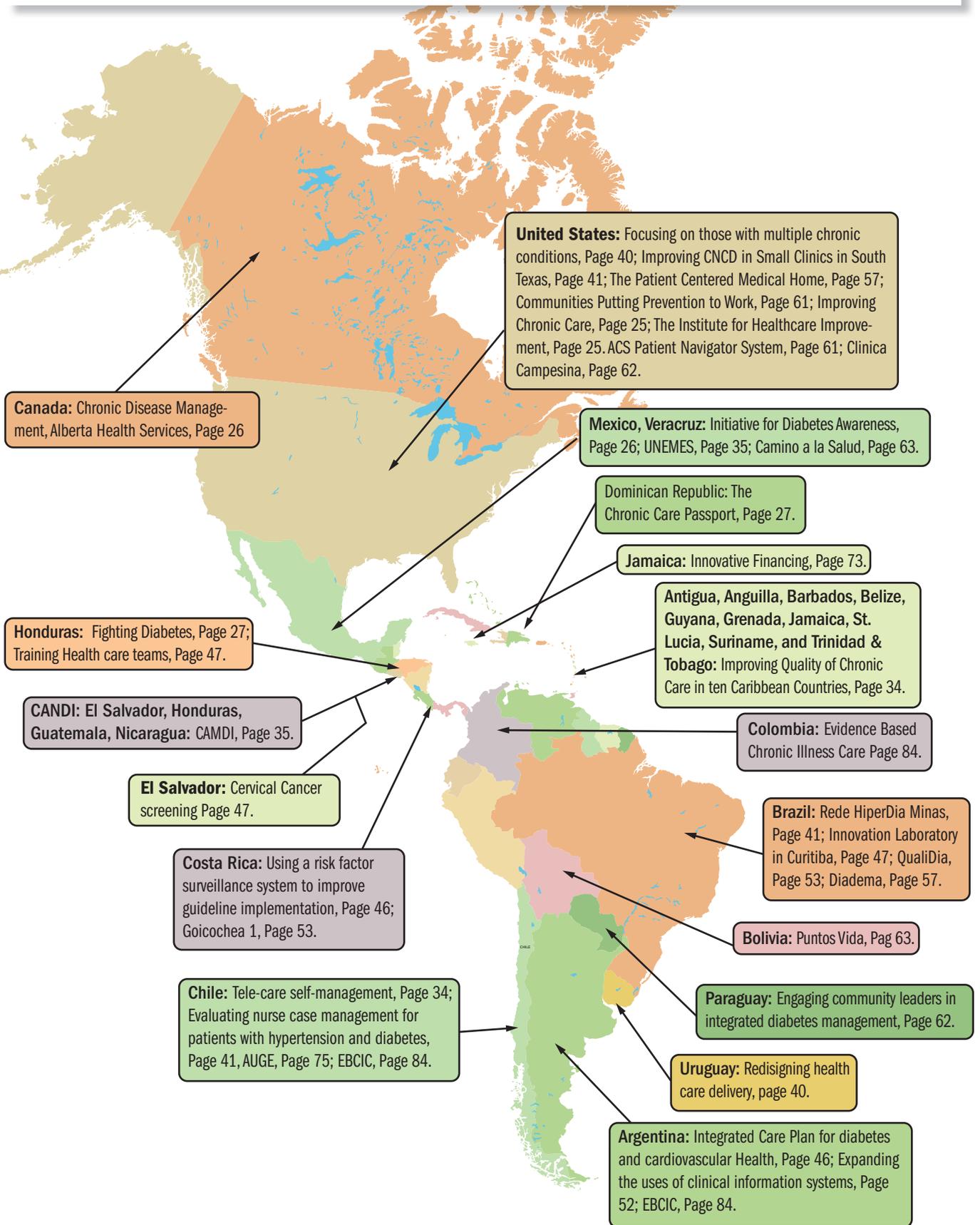




# Implementing and Improving CNCD Care in the Americas

As CNCDs spread, strengthening health systems' ability to provide preventive and treatment services has become an urgent priority for PAHO and its Member States. As part of the Strategy for the Integrated Prevention and Control of Chronic Disease, PAHO has worked to support its countries by increasing the technical capacity to provide good-quality chronic care and reduce the gaps between current needs, clinical recommendations, and existing care. PAHO's training and technical support has contributed to catalyze a variety of successful programs throughout the Region. The initiatives from PAHO member States summarized in this document were conducted using structured quality improvement techniques, assessment and measurement tools, and organized training.

# The Chronic Care Map: Experience Showcase

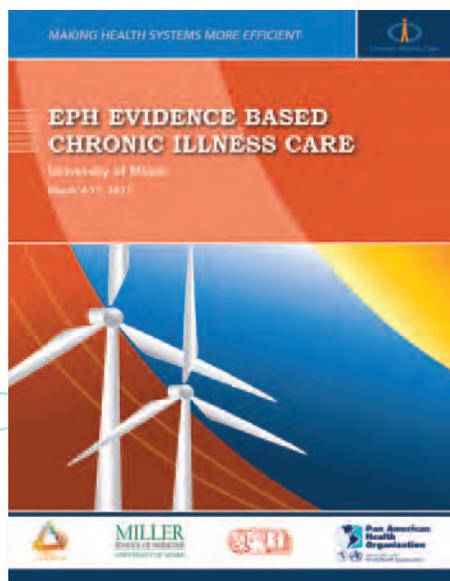




## The Imperative of Adapting Chronic Care to the Brazilian Program of Family Health

The health situation in Brazil at the beginning of the 21st century is characterized by a triple burden of disease; combining health problems caused by infectious diseases, external causes and chronic non-communicable conditions. National and international publications have shown the success of the Program of Family Health (PFH) in Brazil during the 20th century addressing the most pressing problems such as infectious diseases, nutritional problems and maternal and infant health. It is now imperative to transform the system to address the new epidemic of CNCD with appropriate approaches and tools. Major reviews of concepts and strategies related to chronic care and their application to the Brazilian health system are underway. The application of the Chronic Care Model, the adaptation of the Population Risk Stratification Pyramid, as well as models of disease management and shared care (among others) are some of the technical issues that are being addressed by Brazilian researchers to help with the transition of the successful PFH to the new era.

*Source: Reference (155).*



2009-2011  
United States

2012  
Colombia

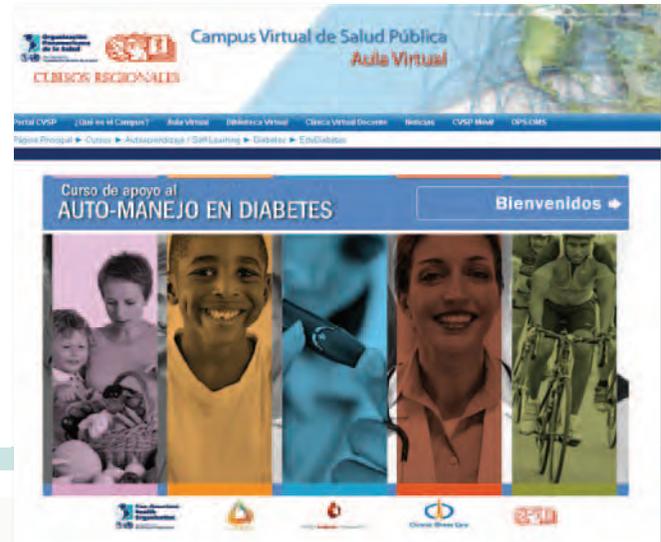
2012  
Argentina

2011  
Chile

## PAHO: Evidence Based Chronic Illness Care

The course Evidence Based Chronic Illness Care (EBCIC) was developed by PAHO and implemented in collaboration with the University of Miami in 2009 and 2011. The course was also subsequently implemented in Chile in 2011 and in Argentina and Colombia in 2012 in collaboration with PAHO country offices and Ministries of Health. As of January 2013, overall an approximate total of 250 public health officials from the region have taken the program. EBCIC introduces students to the Chronic Care Model and public health aspects of quality of health care improvement. Emphasis is placed on examples of public health interventions for the management of major chronic conditions such as diabetes, cardiovascular diseases, cancer and chronic obstructive pulmonary diseases and its application in different scenarios in especial in low resource settings and developing countries. Topics covered by EBCIC include components within the health care organization, health system design, decision support, clinical information system, self-management support and community resources and policies. This course provides elements to better understand the role of health policies, access to care, health disparities and health determinants in the quality of care for chronic conditions.

Source: Reference (156).



## PAHO: On-line Diabetes Self-management Education for Patients and Health Providers

On-line diabetes self-management education courses are available free of charge in the Virtual Campus for Public Health of the Pan American Health Organization in Spanish language. The Diabetes Self-management Education Program for health professionals is a self-learning course organized in five modules covering topics related to the essential knowledge of diabetes physiopathology, public health and epidemiology, education and social support. Students completing all exams with scores of 75% or more receive a certificate from the Virtual Campus.

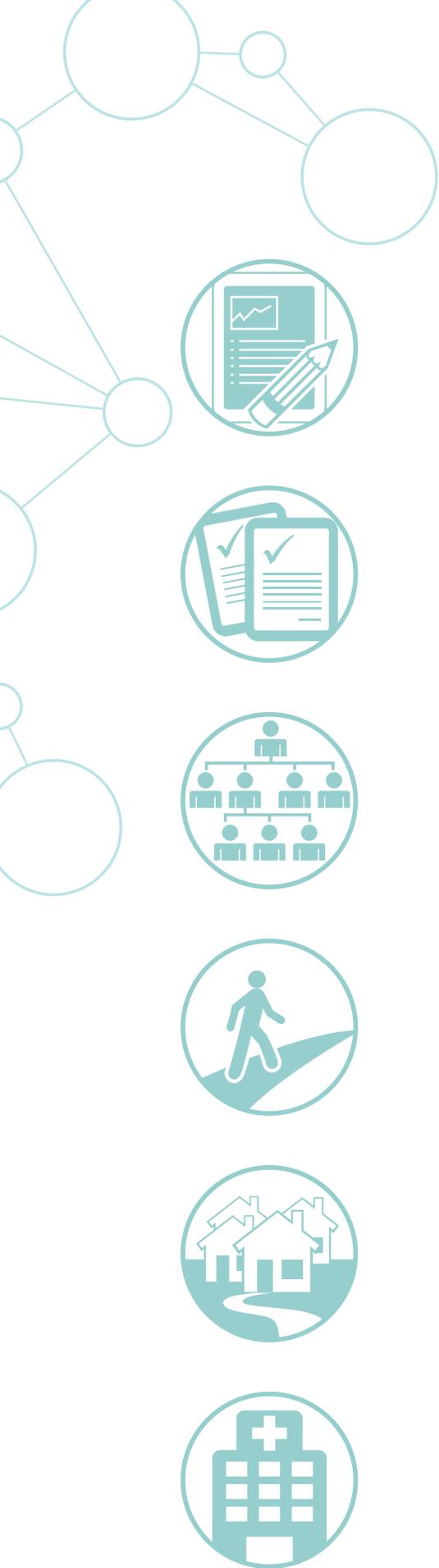
This course was initially implemented with success as a pilot in Chile, Costa Rica, Cuba and Mexico. As of January of 2013, more than 1,600 health professionals have registered for this course most of them have successfully completed the program. *Source: Reference (157).*

The On-line Education Program for People with Type 2 Diabetes was developed in coordination with the Institute Nutrition and of Technology of Aliments (Instituto de Nutrición y Tecnología de los Alimentos, INTA of Chile). This course is a self-learning program organized in four modules covering topics such as general knowledge of diabetes and its complications as well as day-to-day and especial situation self-management for people with type 2 diabetes. The course free of charge and it is evaluated by an on-line exam. A certificate is provided for those passing exams with scores of 75% or more. The effectiveness of this course was positively evaluated in a randomized controlled trial in Chile comparing on-line with face-to-face learning in 2011. *Source: Reference (158).*



## Conclusions

The Chronic Care Model should be implemented in its entirety since its components have synergistic effects, where the whole is greater than the sum of the parts. No single intervention component has emerged as the underlying driver of success. Rather, multidimensional intervention packages that incorporate several distinct features of CCM seem to be most effective. The ultimate outcome is a productive interaction between a well prepared health team and an activated receptive patient resulting in improved care. But as the main protagonist remains to be the patient, ensuring a patient centered care strategy seems to be the cornerstone of a successful implementation of the CCM. Patient-centered quality care, which is proactive, continuous and evidence based, can benefit all patients, regardless of the nature of the condition being communicable or noncommunicable. The target population for chronic care is a large and growing proportion of the adults with established, undiagnosed or high risk for CNCD. This population is also exposed to the risks of various communicable diseases. The application of the Chronic Care Model means organizing high quality integrated care based on the most advanced evidence, it means better care for all, not only for those with chronic conditions.



Policy reforms are the linchpin for actions. Universal access is the most important legislation leading to better outcomes and reducing disparities in chronic disease care. Commitment from the government to integrated CNCD care, and formal policies, legislation, and regulations is fundamental to success. Universal coverage and care that is free at the point of service are needed to be able to successfully implement preventive, population-based care for CNCDs. In addition, payment systems need to be aligned toward evidence based chronic illness care and quality improvement.

Any action taken in the field of chronic care should be predicated on a firm understanding of the health care and CNCD situation in the country or health system at various levels, including the local level. Steps include reviewing relevant policies and financing systems, available human resources, and the health care infrastructure, and estimating current and projected health care needs. Without accurate, updated information, policy-makers and planners cannot design efficient integrated CNCD care. While there are common challenges across countries, each health system has a unique context.

Clinical information systems are considered by many to be an essential component of effective CDM. As such, their introduction or upgrading is frequently recommended as the starting point for improving integrated CNCD care. In studies from high-income countries, specific health information technology components had a positive impact on chronic illness care. Components closely correlated with positive experimental results include connection to an electronic medical record system; the use of computerized

prompts; population management systems (including reports and feedback); specialized decision support systems; electronic scheduling systems; and personal health records systems. Clinical information systems should be integrated with existing health information systems as much as possible; therefore it is preferable to incorporate CNCD to existing information systems than create a new isolated one for this purpose.

Health providers should be permitted sufficient amount of time to carry the myriad of tasks required to provide high quality care. There are multiple ways to maximize the value of the limited time available for medical encounters in primary care. Medical encounters productivity may be enhanced by using the risk stratification pyramid, the use of noble means of communication to contact patients, as well as sharing responsibilities for certain tasks with other team members.

Self-management support is an important element of improved health outcomes. The key task for integrated CNCD management is to ensure that self-management support is put into practice using a range of specific strategies or approaches. All clinical encounters should include a self-management support component. In addition, group programs led by expert patients, health professionals, or community leaders should be integrated with the system of care.

Health care systems seem to be most effective when it prioritizes and it is organized around a defined population rather than an isolated single patient seeking care. The use of a population approach implies that health systems are invested in optimizing the overall health of their communities over the long term,

and that they provide proactive, participative, and preventive care to meet this aim. The use of a population approach also means that PHC teams assume full responsibility for the health of the served community, so the health service must be familiar with health risks and resources and act accordingly. In population management, case registries and information systems are of central importance. Health workers can use case registries to predict care needs, improve clinical management, and provide proactive, rather than reactive, clinical care. Furthermore chronic care should be complemented by strong health promotion strategies such as those promoting healthy eating and physical activity as well as the prevention of tobacco use and alcohol abuse.

Developing an extended group of partners and collaborators from different sectors, including the community and the private sector, may help strengthen the needed advocacy efforts to promote this level of health system change.

It is critical to integrate PHC-based chronic care into existing services and programs. Effective, high-quality care for chronic conditions needs to be based on PHC and comply with its essential core elements. Chronic care needs to be integrated with other existing health programs, such as maternal and child health. PHC clinics should be appropriately equipped to provide chronic care. Multidisciplinary teams as well as appropriate medical equipment and testing materials should be available to patients throughout the continuum of care. Physical access to the point of care, including transportation, should facilitate patient attendance as well as patient flow from PHC clinics to specialized care.

People with CNCs have diverse health care needs that frequently wax and wane over the course of the condition. Care for individual patients needs to be coordinated effectively. No single setting can meet all of the health care needs of CNC patients. Primary care has a central role to play as a coordination hub, but must be complemented by more specialized and intensive care settings, such as diagnostic labs, specialty care clinics, hospitals, and rehabilitation centers. IHSNs can improve accessibility to the system, reduce health care fragmentation, improve overall system efficiency, prevent the duplication of infrastructure and services, lower production costs, and better meet patients' needs and expectations.

It is important to introduce changes within the context of monitoring and evaluation. Desired outcomes should be identified and measured on an ongoing basis. This does not imply the implementation of stringent trials but rather the establishment of organized quality improvement methods for monitoring and evaluation of the results, as part of overall clinical care. The BTS and PDSA cycles described before are well-tested methodologies for these types of assessments.

An accurate diagnosis and an evidence-based treatment plan are the foundation of good clinical care. This requires that health workers be trained appropriately for the roles they perform, and that they have access to the necessary equipment, supplies, medications, and specialist support to implement evidence-based care. Guidelines and protocols are important but must be integrated with the health workers' decision-making process. Providing feedback and reminders to health workers has been shown to improve

health worker adherence to guidelines and clinical outcomes for a range of CNCs.

The need for multidisciplinary team care is highlighted by virtually all chronic care models. This is because patients benefit from a diverse set of skills and perspectives that cannot be held by any single cadre of health worker working in isolation. Involvement of or leadership from appropriately trained nurses or other specially trained health workers (e.g. physician assistants) in key functions such as assessment, counseling, treatment management, self-management support, and follow-up has been shown repeatedly to improve health worker adherence to guidelines, and patient satisfaction, clinical and health status, and use of health services. However, these complementary roles must be clearly defined, and access to regular supervision for complex cases provided. Other cadres of health workers such as pharmacists, dietitians, rehabilitation therapists, psychologists, and case managers may also contribute to multidisciplinary teams. In addition, lay health workers or expert patients can assume responsibility for nonclinical tasks, and share knowledge and experience with others who share a common illness experience.

The health workforce need to be trained to respond to core health conditions and have specific competencies defined by PHC-based health systems to enable better prevention and control of chronic diseases. Collaboration between academic and other types of training institutions and health service organizations will ensure that the workforce receives appropriate training and continuous medical education to better meet the health needs of the population in a sustainable manner.

# Recommendations

The conclusions noted above are based on a review of technical literature and published and unpublished reports on the implementation of the Chronic Care Model. Two categories are evident in this document, both equally valuable. First those interventions for the implementation of the Chronic Care Model that are supported by strong evidence; and second those that are implemented in the countries of the Region of the Americas, in particular those from developing countries. The following ten recommendations provide a roadmap for organizing and delivery high-quality care for chronic noncommunicable condition in the Americas.

- 1.** Implement the Chronic Care Model in its entirety.  
.....
- 2.** Ensure a patient centered approach.  
.....
- 3.** Create (or review existing) multisectoral policies for CNCD management including universal access to care, aligning payment systems to support best practice.  
.....
- 4.** Create or improve existing clinical information system including monitoring, evaluation and quality improvement strategies as integral parts of the health system.  
.....
- 5.** Introduce systematic patient self-management support.  
.....
- 6.** Orient care toward preventive and population care, reinforced by health promotion strategies and community participation.  
.....

- 7.** Change (or maintain) health system structures to better support CNCD management and control.
- 8.** Create PHC-led networks of care supporting continuity of care.
- 9.** Reorient health services creating a chronic care culture including evidence based proactive care and quality improvement strategies.
- 10.** Reconfigure health workers into multidisciplinary teams ensuring continuous training in CNCD management.

There is not a single prescription to build an efficient health system. Many other recommendations may be formulated based on a variety of further existing experiences addressing specific issues affecting health systems in the Region and globally. Other lists of recommendations have been published previously (e.g., the WHO report *Innovative Care for Chronic Conditions* (31); the IOM books *Crossing the Quality Chasm: a new health system for the 21<sup>st</sup> century* (159), and *A CEO checklist for high-value health care* (160); and Ham’s article on the *10 characteristics of high-performing chronic care systems* (161). Nonetheless, these actions are relevant to many health systems wishing to improve integrated CNCD care in the Region of the Americas. In all situations, decision-makers must contextualize the actions to the underlying unique circumstances. Concentrating initially on smaller geographical areas, rather than entire countries, is often a feasible approach.

The results of the case studies described in this report indicate integrated CNCD care is achievable, and scaling up is possible—even in low- and middle-income countries. With integrated care, the substantial burden of CNCDs can be reduced.

# List of Abbreviations

5A's	Assess, Advice, Agree, Assist, Arrange
A1c	Glycated hemoglobin
ACIC	Assessment of Chronic Illness Care
ACS	American Cancer Society
AGREE	Assessment of Guidelines for Research and Education
AIDS	Acquired Immune Deficiency Syndrome
ATAS	Technological Support for Self-Management of Chronic Diseases (from the Spanish Apoyo Tecnológico para el Automanejo de Condiciones Crónicas)
AUGE	Aceso Universal a Garantías Explicitas
BMI	Body mass index
BTS	Breakthrough Series
CAMDI	Central American Diabetes Initiative
CARMEN	Collaborative Action for Risk Factor Prevention & Effective Management for NCDs
CCM	Chronic Care Model
CDC	Centers for Disease Control and Prevention
CDEMS	Chronic Disease Electronic Management System
CDM	Chronic disease management
CDSMP	Chronic Disease Self-Management Program
CESFAM	Centro de Salud Familiar San Alberto Hurtado
CNCD	Chronic noncommunicable disease
COPD	Chronic obstructive pulmonary disease
CPPW	Communities Putting Prevention to Work
CVD	Cardiovascular disease
DC	District of Columbia
DHHS	Department of Health and Human Services
GDP	Gross domestic product
HIV	Human Immunodeficiency Virus
HPV	Human papilloma virus
ICCC	Innovative Care for Chronic Conditions Framework

ICIC	Improving Chronic Illness Care
IHI	Institute for Healthcare Improvement
IHSDN	Integrated Health Service Delivery Network
INC	Instituto Nacional CardioPulmonar
IOM	Institute of Medicine
MCC	Multiple chronic conditions
MIDAS	Integrated Model of Health Care (from the Spanish Modelo Integrado de Atención a la Salud)
NCD	Noncommunicable disease
NGO	Nongovernmental organization
PACIC	Patient Assessment of Chronic Illness Care
PNS	Patient Navigation System
PAHO	Pan American Health Organization
PARA	Physical Activity Network of the Americas
PCMH	Patient-Centered Medical Home
PDSA	Plan, Do, Study, Act
PEN	Package of Essential Noncommunicable Disease Interventions for Primary Health Care
PG	Practice Guideline
PHC	Primary Health Care
PNACCP	Programa Nacional de Alivio del dolor por Cáncer y Cuidados Paliativos
PNS	Patient Navigation System
PRONCEC	National Program for the Prevention and Control of Chronic Noncommunicable Diseases (from the Spanish Programa Nacional para la Prevención y el Control de las Enfermedades Crónicas no Trasmisibles)
TB	Tuberculosis
UN HIM	United Nations High-level Meeting
UNAP	National Unit of Primary Care (from the Spanish Unidad Nacional de Atención Primaria)
UNEME	Unit of Medical Specialties (from the Spanish Unidad de Especialidades Médicas)
VIDA	Veracruz Initiative for Diabetes Awareness
WDF	World Diabetes Foundation
WHO	World Health Organization

# References

1. Hart JT. Rule of halves: implications of increasing diagnosis and reducing dropout for future workload and prescribing costs in primary care. *Br J Gen Pract.* 1992;42(356):116–19.
2. World Health Organization. Impact of out-of-pocket payments for treatment of non-communicable diseases in developing countries: a review of literature. Discussion Paper No. 2. Geneva: WHO; 2011. Available at [www.who.int/health\\_financing/documents/dp\\_e\\_11\\_02-ncd\\_finburden.pdf](http://www.who.int/health_financing/documents/dp_e_11_02-ncd_finburden.pdf) . Accessed on 24 August 2012.
3. United Nations General Assembly. Sixty-sixth session. 16 September 2011. Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases. New York: UNGA; 2011. Available at [www.un.org/ga/search/view\\_doc.asp?symbol=A%2F66%2FL.1&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A%2F66%2FL.1&Lang=E) . Accessed on 24 May 2012.
4. World Conference on Social Determinants of Health. Rio Political Declaration on Social Determinants of Health. Rio de Janeiro, Brazil, 21 October 2011 [Internet]. Geneva: WHO; c2012. Available at <http://cmdss2011.org/site/wp-content/uploads/2011/10/Rio-Political-Declaration-on-SDH-20111021.pdf> . Accessed on 24 May 2012.
5. Tinetti ME, Fried TR, Boyd CM. Designing health care for the most common chronic condition—multimorbidity. *JAMA.* 2012;307(23):2493–4.
6. World Health Organization. Global Health Observatory (GHO) [Internet]. Geneva: WHO; c2012. Available at [www.who.int/gho/en/](http://www.who.int/gho/en/) Accessed on 31 May 2012.
7. Pan American Health Organization. Political declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases [Internet]. Washington: PAHO; c2011-2012. Available at [http://new.paho.org/hq/index.php?option=com\\_content&task=view&id=5267&Itemid=3805](http://new.paho.org/hq/index.php?option=com_content&task=view&id=5267&Itemid=3805) Accessed on 31 May 2012.
8. Bloom DE, Cafiero ET, Jané-Llopis E, Abrahams-Gessel S, Bloom LR, Fathima S, et al. The global economic burden of non-communicable diseases. Geneva: World Economic Forum; 2011. Available at [www3.weforum.org/docs/WEF\\_Harvard\\_HE\\_GlobalEconomicBurdenNonCommunicableDiseases\\_2011.pdf](http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf) Accessed on 24 May 2012.
9. Glassman A, Gaziano TA, Bouillon Buendia CP, Guanais de Aguiar FC. Confronting the chronic disease burden in Latin America and the Caribbean. *Health Affairs.* 2010;29(12):2142-8.
10. U.S. Department of Health and Human Services. National healthcare disparities report. Rockville, MD: DHHS Agency for Healthcare Research and Quality; 2003. Available at <http://archive.ahrq.gov/qual/nhdr03/nhdr03.htm> . Accessed on 20 February 2013.
11. Schoen C, Osborn R, Squires D, Doty M, Pierson R, Applebaum S. New 2011 survey of patients with complex care needs in eleven countries finds that care is often poorly coordinated. *Health Aff.* 2011;30(12):2437-48.
12. Becher EC, Chassin MR. Improving the quality of health care: who will lead? *Health Aff.* 2001;20(5):164-79.
13. Berwick DM, Hackbarth AD. Eliminating waste in US health care. *JAMA.*, 2012;307(14):1513-6.
14. Burroughs Peña M, Mendes Abdala CV, Legetic B, Silva LC, Orduñez P. Updated prevalence estimates for hypertension in Latin America and the Caribbean. In press.
15. Pan American Health Organization. Final report: Institutional response to diabetes and its complications (IRDC)—an evaluation of the quality of diabetes care. Washington: PAHO; 2004. Available at [www.paho.org/English/AD/DPC/NC/dia-irdc-final-rpt.pdf](http://www.paho.org/English/AD/DPC/NC/dia-irdc-final-rpt.pdf) . Accessed on 23 August 2012.
16. Mudaliar U, Kim WC, Kirk K, Rouse C, Narayan KM, Ali M. Are recommended standards for diabetes care met in Central and South America? A systematic review. *Diabetes Res Clin Pract.* 2013 Jan 30. pii: S0168-8227(13)00011-9. doi: 10.1016/j.diabres.2013.01.010. [Epub ahead of print]. Available at [http://ac.els-cdn.com/S0168822713000119/1-s2.0-S0168822713000119-main.pdf?\\_tid=0a987166-7c66-11e2-a8e7-00000aacb35d&acdnat=1361479028\\_9bf5c-0f1ea13f6aa36d68643b8750757](http://ac.els-cdn.com/S0168822713000119/1-s2.0-S0168822713000119-main.pdf?_tid=0a987166-7c66-11e2-a8e7-00000aacb35d&acdnat=1361479028_9bf5c-0f1ea13f6aa36d68643b8750757) . Accessed on 20 February 2013.
17. Lopez Stewart G, Tambascia M, Rosas Guzmán J, Etchegoyen F, Ortega Carrión J, Artemenko S. Control of type 2 diabetes mellitus among general practitioners in nine countries of Latin America. *Rev Panam Salud Publica.* 2007;22(1):12–20.
18. Saydah SH, Fradkin J, Cowie CC. Poor control of risk factors for vascular disease among adults with previously diagnosed diabetes. *JAMA.* 2004;291(3):335-42.

19. Díaz-Apodaca B, de Cosío FG, Canela-Soler J, Ruiz-Holguín R, Cerqueira MT. Quality of diabetes care: a cross-sectional study of adults of Hispanic origin across and along the United States-Mexico Border. *Rev Panam Salud Publica*. 2010;28(3):207-13.
20. Ministerio de Salud (CL). Encuesta Nacional de Salud 2009-2010. Santiago: MS; 2011. Available at [www.minsal.gob.cl/portal/url/item/bcb03d7bc28b64dfe040010165012d23.pdf](http://www.minsal.gob.cl/portal/url/item/bcb03d7bc28b64dfe040010165012d23.pdf) . Accessed on 23 August 2012.
21. Zavatini M, Obreli-Neto P, Cuman R. Estratégia saúde da família no tratamento de doenças crônico- degenerativas: avanços e desafios. *Rev Gaúcha Enferm*. 2010;31(4):647-54.
22. Capilheira M, Santos IS. Doenças crônicas não transmissíveis: desempenho no cuidado médico em atenção primária à saúde no sul do Brasil. *Cad Saude Publica*. 2011;27(6):1143-53.
23. American Cancer Society. *Global cancer Facts & Figures 2nd Edition*. Atlanta: American Cancer Society; 2011.
24. Pan American Health Organization. *A Review of Breast Cancer Care and Outcomes in Latin America*. Washington DC 2013
25. World Health Organization. *Preventing chronic disease: a vital investment*. Geneva: WHO; 2005. Available at [www.who.int/chp/chronic\\_disease\\_report/en/](http://www.who.int/chp/chronic_disease_report/en/) . Accessed on 24 May 24, 2012.
26. World Health Organization. *Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases, 2008-2013*. Geneva: WHO; 2008. Available at [www.who.int/nmh/Actionplan-PC-NCD-2008.pdf](http://www.who.int/nmh/Actionplan-PC-NCD-2008.pdf) . Accessed on 24 May 2012.
27. Pan American Health Organization. *Strategy for the Prevention and Control of Noncommunicable Diseases, 2012-2025*. Available at [http://new.paho.org/hq/index.php?option=com\\_docman&task=doc\\_download&gid=18607&Itemid=270&lang=en](http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=18607&Itemid=270&lang=en) . Accessed on 30 January 2013.
28. Wagner EH, Davis C, Schaefer J, Von Korff M, Austin B. A survey of leading chronic disease management programs: are they consistent with the literature? *Manag Care Q*. 1999;7(3):56-66.
29. Wagner E, Glasgow RE, Davis C, Bonomi AE, Provost L, McCulloch D, et al. Quality improvement in chronic illness care: a collaborative approach. *Jt Comm J Qual Improv*. 2001;27(2):63-80.
30. MacColl Center for Health Care Innovation. *About ICIC and our work* [Internet]. Seattle: MCHCI; c2008–2012. Available at [www.improvingchroniccare.org/index.php?p=About\\_ICIC\\_&Our\\_Work&s=6](http://www.improvingchroniccare.org/index.php?p=About_ICIC_&Our_Work&s=6) . Accessed on 24 May 2012.
31. World Health Organization. *Innovative care for chronic conditions: building blocks for action*. Geneva: WHO; 2002. Available at [www.who.int/chp/knowledge/publications/iccreport/en/](http://www.who.int/chp/knowledge/publications/iccreport/en/) . Accessed on 24 May 2012.
32. Epping-Jordan JE, Pruitt SD, Bengoa R, Wagner EH. Improving the quality of health care for chronic conditions. *Quality and Safety in Health Care*. 2004;13(4):299-305.
33. Feachem RG, Sekhri NK, White KL. Getting more for their dollar: a comparison of the NHS with California's Kaiser Permanente. *BMJ*. 2002;324(7330):135-41.
34. Scottish Government Health Directorates. *Partnership for care: Scotland's Health White Paper* [Internet]. Surrey: National Archives; 2008. Available at [www.scotland.gov.uk/Publications/2003/02/16476/18736](http://www.scotland.gov.uk/Publications/2003/02/16476/18736) . Accessed on 11 March 2008.
35. National Health Priority Action Council (AU). *National Chronic Disease Strategy*. Canberra: Australian Government Department of Health and Ageing; 2006. Available at [www.health.gov.au/internet/main/publishing.nsf/content/7E7E9140A3D3A3BC-CA257140007AB32B/\\$File/stratal3.pdf](http://www.health.gov.au/internet/main/publishing.nsf/content/7E7E9140A3D3A3BC-CA257140007AB32B/$File/stratal3.pdf) . Accessed on 20 February 2013.
36. Weingarten SR, Henning JM, Badamgarav E, Knight K, Hasselblad V, Gano A Jr, et al. Interventions used in disease management programmes for patients with chronic illness—which ones work? Meta-analysis of published reports. *BMJ*. 2002;325(7370):925.
37. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model, Part 2. *JAMA*., 2002;288(15):1909-14.
38. Tsai AC, Morton SC, Mangione CM, Keeler EB. A meta-analysis of interventions to improve care for chronic illness. *Am J Manag Care*. 2005;11(8):478-88.
39. Ouwens M, Wollersheim H, Hermens R, Hulscher M, Grol R. Integrated care programmes for chronically ill patients: a review of systematic reviews. *Int J Qual Health Care*. 2005;17(2):141-6.
40. Barceló A, Luciani S, Agurto I, Orduñez P, Tasca R, Sued O. *Improving chronic illness care through Integrated Health Service Delivery Networks*. Washington: Pan American Health Organization; 2012.
41. *Improving Chronic Illness Care. Assessment of Chronic Illness Care (ACIC)* . Available at [http://www.improvingchroniccare.org/index.php?p=ACIC\\_Survey&s=35](http://www.improvingchroniccare.org/index.php?p=ACIC_Survey&s=35) . Accessed on 31 January 2013.

42. Improving Chronic Illness Care. Patient Assessment of Chronic Illness Care (PACIC) Survey. Available at [http://www.improvingchroniccare.org/index.php?p=PACIC\\_Survey&s=36](http://www.improvingchroniccare.org/index.php?p=PACIC_Survey&s=36) . Accessed on 31 January 2013.
43. Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. *JAMA*. 2002;288(19):2469-75.
44. Michie S, Miles J, Weinman J. Patient-centeredness in chronic illness: what is it and does it matter? *Patient Educ Couns*. 2003;51(3):197-206.
45. Stewart MA. Effective physician–patient communication and health outcomes. *CMAJ*. 1995;152(9):1423-33.
46. Olivarius NF, Beck-Nielsen H, Andreasen AH, Hørder M, Pedersen PA. Randomised controlled trial of structured personal care of type 2 diabetes mellitus. *BMJ*. 2001;323(7319):970-5.
47. Delon S, Mackinnon B; Alberta Health CDM Advisory Committee. Alberta’s systems approach to chronic disease management and prevention utilizing the expanded chronic care model. *Healthc Q*. 2009;13:98-104.
48. Barceló A, Cafiero E, de Boer M, Escobar Mesa A, Garcia Lopez M, Jiménez RA, et al. Using collaborative learning to improve diabetes care and outcomes: the VIDA project. *Prim Care Diabetes*. 2010;4(3):145-53.
49. Barceló A, Cafiero E, de Boer M, Epping-Jordan J, Gordillo A, Meiners M, Perez Flores E. Veracruz Project for the Improvement of Diabetes Care (VIDA): final report. Washington: PAHO; 2010. Available at [http://new.paho.org/hq/index.php?option=com\\_docman&task=doc\\_view&gid=18698&Itemid=](http://new.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=18698&Itemid=) . Accessed on 30 January 2013.
50. Deakin TA, McShane CE, Cade JE, Williams R. Group based training for self-management strategies in people with type 2 diabetes mellitus. *Cochrane Database Syst Rev*. 2005;2:CD003417.
51. Glynn LG, Murphy AW, Smith SM, Schroeder K, Fahey T. Interventions used to improve control of blood pressure in patients with hypertension. *Cochrane Database of Systematic Reviews* 2010; 3:CD005182.
52. Bennett MI, Bagnall AM, Closs J. How effective are patient-based educational interventions in the management of cancer pain? Systematic review and meta-analysis. *PAIN* 2009;143: 192.
53. Goldstein MG, Whitlock EP, DePue J. Multiple health risk behavior interventions in primary care: summary of research evidence. *American Journal of Preventive Medicine*, 2004, 27(2 Suppl):61-79
54. Norris SL, Engelgau M, Narayan K. Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials. *Diabetes Care* 2001;24:561-87
55. ASMP/CDSMP Meta-Analysis Project Team. Sorting Through the Evidence for the Arthritis Self-Management Program and the Chronic Disease Self-Management Program. Centers for Disease Control and Prevention, 2011. Available at <http://www.cdc.gov/arthritis/docs/asmp-executive-summary.pdf> . Accessed on 1 February 2013.
56. National Primary Care Research & Development Center. Expert Patient Programme (EPP) National Evaluation. Available at <http://www.medicine.manchester.ac.uk/primarycare/npcrdc-archive/archive/ProjectDetail.cfm/ID/117.htm> . Accessed on 17 January 2013
57. Kennedy A, Reeves D, Bower P, Lee V, Middleton E, Richardson G, et al. The effectiveness and cost effectiveness of a national lay-led self care support programme for patients with long-term conditions: a pragmatic randomised controlled trial. *J Epidemiol Community Health* 2007;61:254–261.
58. Gibson PG, Powell H, Coughlan J, Wilson AJ, Abramson M, Haywood P, Bauman A, Hensley MJ, Walters EH. Self-management education and regular practitioner review for adults with asthma. *Cochrane Database of Systematic Reviews* 2002; 3:CD001117.
59. Jovicic A, Holroyd-Leduc JM, Straus SE. Effects of self-management intervention on health outcomes of patients with heart failure: a systematic review of randomized controlled trials. *BMC Cardiovascular Disorders* 2006;6:43
60. Renders CM, Valk GD, Griffin S, Wagner EH, van Eijk JThM, Assendelft WJJ. Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings. *Cochrane Database of Systematic Reviews* 2000;4:CD001481
61. Adams KG, Greiner AC, Corrigan JM, eds. Report of a summit. The 1st annual crossing the quality chasm summit: a focus on communities; Jan 6-7, 2004. Washington, DC: National Academies Press; 2004. Available at [http://locatorplus.gov/cgi-bin/Pwebrecon.cgi?DB=local&v1=1&ti=1,1&Search\\_Arg=101235455&Search\\_Code=0359&CNT=20&SID=1](http://locatorplus.gov/cgi-bin/Pwebrecon.cgi?DB=local&v1=1&ti=1,1&Search_Arg=101235455&Search_Code=0359&CNT=20&SID=1) . Accessed on 1 February 2013.
62. Lorig KR, Holman H. Self-management education: history, definition, outcomes, and mechanisms. *Ann Behav Med*. 2003;26(1):1-7.

63. Shojania KG, Ranji SR, McDonald KM, Grimshaw JM, Sundaram V, Rushakoff RJ, et al. Effects of quality improvement strategies for type 2 diabetes on glycemic control: a meta-regression analysis. *JAMA* 2006;296(4):427-40.
64. Whitlock EP, Orleans CT, Pender N, Allan J. Evaluating primary care behavioral counseling interventions: an evidence-based approach. *Am J Prev Med.* 2002;22(4):267-84.
65. Glasgow RE, Davis CL, Funnell MM, Beck A. Implementing practical interventions to support chronic illness self-management. *Jt Comm J Qual Saf.* 2003;29(11):563-74.
66. Heisler M. Building peer support programs to manage chronic disease: seven models for success. Oakland, CA: California Healthcare Foundation; 2006. Available at [www.chcf.org/publications/2006/12/building-peer-support-programs-to-manage-chronic-disease-seven-models-for-success](http://www.chcf.org/publications/2006/12/building-peer-support-programs-to-manage-chronic-disease-seven-models-for-success) . Accessed on 4 February 2013.
67. Stanford University School of Medicine. Chronic Disease Self-Management Program [Internet]. Palo Alto, CA: Stanford University; c2012. Available at <http://patienteducation.stanford.edu/programs/cdsmp.html> . Accessed on 24 May 2012.
68. National Primary Care Research & Development Center. Expert Patient Programme (EPP) National Evaluation. Available at <http://www.medicine.manchester.ac.uk/primarycare/npcrdc-archive/archive/ProjectDetail.cfm/ID/117.htm> . Accessed on 17 January 2013
69. Pan American Health Organization. Chronic Care Passport [Internet]. Washington: PAHO; c2012. Available at [http://new.paho.org/hq/index.php?option=com\\_content&view=article&id=7067%3Ael-pasaporte-de-cuidados-cronicos&catid=1339%3Ahsd0203a-cncc-integrated-management-home&Itemid=4233&lang=en](http://new.paho.org/hq/index.php?option=com_content&view=article&id=7067%3Ael-pasaporte-de-cuidados-cronicos&catid=1339%3Ahsd0203a-cncc-integrated-management-home&Itemid=4233&lang=en) . Accessed on 23 August 2012.
70. Pan American Health Organization. CARIDIAB—Guiding and supporting national quality improvement initiatives for diabetes in less well-served parts of the world: a proof-of-concept project in the Caribbean. Part of the Caribbean Chronic Care Collaborative (CCCC). Available at [http://new.paho.org/hq/index.php?option=com\\_content&view=article&id=1399%3Acaridiab%3A-caribbean-diabetes-project&catid=1415%3Ahsd0203b-cncc-integrated-management-content&Itemid=1&lang=en](http://new.paho.org/hq/index.php?option=com_content&view=article&id=1399%3Acaridiab%3A-caribbean-diabetes-project&catid=1415%3Ahsd0203b-cncc-integrated-management-content&Itemid=1&lang=en) . Accessed on 31 January 2013.
71. Lange I, Campos S, Urrutia M, Bustamante C, Alcayaga C, Tellez A et al. Efecto de un modelo de apoyo telefónico en el auto-manejo y control metabólico de la diabetes tipo 2, en un centro de atención primaria, Santiago, Chile. *Rev Med Chile* 2010;138:729-737.
72. Secretaria de Salud de México. Socios por la Prevención. UNEMES. Enfermedades Crónicas. Ciudad de México, 2008.
73. Jamtvedt G. Does telling people what they have been doing change what they do? A systematic review of the effects of audit and feedback. *Qual Saf Health Care* 2006;15:433–436.
74. Watts SA et al. Nurse practitioner-led multidisciplinary teams to improve chronic illness care: The unique strengths of nurse practitioners applied to shared medical appointments/group visits. *Journal of the American Academy of Nurse Practitioners* 2009; 21: 167–172 .
75. Shepperd S, McClaran J, Phillips CO, Lannin NA, Clemson LM, McCluskey A, Cameron ID, Barras SL. Discharge planning from hospital to home. *Cochrane Database of Systematic Reviews* 2010;1:CD000313.
76. Akbari A, Mayhew A, Al-Alawi MA, Grimshaw J, Winkens R, Glidewell E, Pritchard C, Thomas R, Fraser C. Interventions to improve outpatient referrals from primary care to secondary care. *Cochrane Database of Systematic Reviews* 2008; 4: CD005471.
77. Buckley BS, Byrne MC, Smith SM. Service organisation for the secondary prevention of ischaemic heart disease in primary care. *Cochrane Database of Systematic Reviews* 2010; 3:CD006772.
78. Elissen AMJ. Meta-analysis of the effectiveness of chronic care management for diabetes: investigating heterogeneity in outcomes. *Journal of Evaluation in Clinical Practice* 2012;ISSN:1365-2753.
79. Abegunde DO, Shengelia B, Luyten A, Cameron A, Celletti F, Nishtar S, et al. Can non-physician health-care workers assess and manage cardiovascular risk in primary care? *Bull World Health Organ.* 2007;85(6):432-40.
80. Sadur CN, Moline N, Costa M, Michalik D, Mendlowitz D, Roller S, et al. Diabetes management in a health maintenance organization. Efficacy of care management using cluster visits. *Diabetes Care.* 1999;22(12):2011-7.
81. Wagner EH. The role of patient care teams in chronic disease management. *BMJ.* 2000;320(7234):569-72.
82. Aubert RE, Herman WH, Waters J, Moore W, Sutton D, Peterson BL, et al. Nurse case management to improve glycemic control in diabetic patients in a health maintenance organization. *Ann Intern Med.* 1998;129(8):605-12.
83. Craig C, Eby D, Whittington J. Care Coordination Model: Better Care at Lower Cost for People with Multiple Health and Social Needs. IHI Innovation Series white paper. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2011.

84. Norris SL, Nichols PJ, Caspersen CJ, Glasgow RE, Engelgau MM, Jack L, et al. The effectiveness of disease and case management for people with diabetes. A systematic review. *Am J Prev Med* 2002;22(4):15–38.
85. Department of Health (UK). Supporting people with long term conditions: commissioning personalized care planning—a guide for commissioners. London: DoH; 2009. Available at [www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_093354](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_093354) . Accessed on 24 May 2012.
86. Scottish Government Health Directorates. Improving health and wellbeing of people with long term conditions in Scotland: a national action plan. Edinburgh: NHS; 2009. Available at [www.sehd.scot.nhs.uk/mels/CEL2009\\_23.pdf](http://www.sehd.scot.nhs.uk/mels/CEL2009_23.pdf) . Accessed on 23 August 2012.
87. U.S. Department of Health and Human Services. HHS initiative on multiple chronic conditions [Internet]. Washington: DHHS; c2012. Available at [www.hhs.gov/ash/initiatives/mcc](http://www.hhs.gov/ash/initiatives/mcc) . Accessed on 23 August 2012.
88. Bright TJ. Effect of Clinical Decision-Support Systems. A Systematic Review. *Ann Intern Med.* 2012;157:29-43.
89. Thomas LH, Cullum NA, McColl E, Rousseau N, Soutter J, Steen N. Guidelines in professions allied to medicine. *Cochrane Database of Systematic Reviews* 1999;1: CD000349.
90. Murthy L, Shepperd S, Clarke MJ, Garner SE, Lavis JN, Perrier L, Roberts NW, Straus SE. Interventions to improve the use of systematic reviews in decision-making by health system managers, policy makers and clinicians. *Cochrane Database of Systematic Reviews* 2012: 9:CD009401.
91. Smith SM, Allwright S, O'Dowd T. Effectiveness of shared care across the interface between primary and specialty care in chronic disease management. *Cochrane Database of Systematic Reviews* 2007; 3: CD004910.
92. Légaré F, Ratté S, Stacey D, Kryworuchko J, Gravel K, Graham ID, Turcotte S. Interventions for improving the adoption of shared decision making by healthcare professionals. *Cochrane Database of Systematic Reviews* 2010; 5: CD006732.
93. Souza NM, Sebaldt RJ, Mackay JA, Prorok JC, Weise-Kelly L, Navarro T et al. Computerized clinical decision support systems for primary preventive care: A decision-maker-researcher partnership systematic review of effects on process of care and patient outcomes. *Implementation Science* 2011;6:87.
94. Stacey D, Bennett CL, Barry MJ, Col NF, Eden KB, Holmes-Rovner M, Llewellyn-Thomas H, Lyddiatt A, Légaré F, Thomson R. Decision aids for people facing health treatment or screening decisions. *Cochrane Database of Systematic Reviews* 2011; 10: CD001431.
95. World Health Organization. WHO handbook for guideline development. ISBN 978 92 4 154844 1. Geneva, 2012. Available at [http://apps.who.int/iris/bitstream/10665/75146/1/9789241548441\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/75146/1/9789241548441_eng.pdf) . Accessed on 13 March 2013.
96. Improving Chronic Illness Care (ICIC): improving your practice manual, 2005. Available at [http://www.improvingchronic-care.org/downloads/improving\\_your\\_practice\\_manual\\_icic.doc](http://www.improvingchronic-care.org/downloads/improving_your_practice_manual_icic.doc) . Accessed on 20 February 2013.
97. Caja Costarricense del Seguro Social, Dirección de Desarrollo de Servicios de Salud, Subárea de Vigilancia Epidemiológica. Vigilancia de los factores de riesgo cardiovascular 2011. San José: CCSS; 2011.
98. Agurto I, Sandoval J, De La Rosa M, Guardado ME. Improving cervical cancer prevention in a developing country. *Int J Qual Health Care.* 2006;18(2):81-6.
99. Ministério da Saúde, Sistema Único de Saúde, Redes e Atenção Primária a Saúde (BR). Laboratório de inovação [Internet]. Brasília: MS-SUS; c2012. Available at <http://apsredes.org/> . Accessed on 11 February 2013.
100. Shekelle PG, Morton SC, Keeler EB. Costs and Benefits of Health Information Technology. Evidence Report/Technology Assessment No. 132. (Prepared by the Southern California Evidence-based Practice Center under Contract No. 290-02-0003.) AHRQ Publication No. 06-E006. Rockville, MD: Agency for Healthcare Research and Quality. April 2006.
101. Ivers N, Jamtvedt G, Flottorp S, Young JM, Odgaard-Jensen J, French SD, O'Brien MA, Johansen M, Grimshaw J, Oxman AD. Audit and feedback: effects on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews* 2012; 6:CD000259.
102. Shojania KG, Jennings A, Mayhew A, Ramsay CR, Eccles MP, Grimshaw J. The effects of on-screen, point of care computer reminders on processes and outcomes of care. *Cochrane Database of Systematic Reviews* 2009; 3: CD001096.
103. Metzger J. Using computerized registries in chronic disease care. Oakland, CA: California Healthcare Foundation; 2004. Available at [www.chcf.org/topics/view.cfm?itemID=21718](http://www.chcf.org/topics/view.cfm?itemID=21718) Accessed on 24 May 2012.
104. Chronic Disease Electronic Management System. The CDEMS User Network [Internet]. CDEMS; c2012. Available at [www.cdems.com/](http://www.cdems.com/) Accessed on 24 May 2012.

105. Insua JT. Integration of information technology (IT) for chronic diseases management in Latin America: 5 year experience, Hospital Universitario Austral (HUA), Argentina. *AMIA Annu Symp Proc* 2006;963.
106. Administración de la Comunidad Autónoma del País Vasco. País Vasco: transformando el Sistema de Salud 2009-12. D.L.:VI 878-2012. Servicio Central de Publicaciones del Gobierno Vasco, 2012. Available at [http://www.osakidetza.euskadi.net/r85-skprin01/es/contenidos/informacion/principios\\_programaticos/es\\_sanidad/adjuntos/transformando\\_sistema\\_salud.pdf](http://www.osakidetza.euskadi.net/r85-skprin01/es/contenidos/informacion/principios_programaticos/es_sanidad/adjuntos/transformando_sistema_salud.pdf) . Accessed on 18 January 2013.
107. De Bruin SR, Versnel N, Lemmens LC, Molema CC, Schellevis FG, Nijpels G, Baan CA. Comprehensive care programs for patients with multiple chronic conditions: A systematic literature review. *Health Policy* 2012;107(2-3):108-45.
108. Moullec G et al. Efficacy of interventions to improve adherence to inhaled corticosteroids in adult asthmatics: Impact of using components of the chronic care model. *Respiratory Medicine*, 2012;106: 1211-1225.
109. Smith SM, Soubhi H, Fortin M, Hudon C, O'Dowd T. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database of Systematic Reviews* 2012; 4: CD006560.
110. Petersen LA, Woodard LD, Urech T, Daw C, Sookanan S. Does pay-for-performance improve the quality of health care? *Annals of Internal Medicine* 2006;145:265-72.
111. Scott A, Sivey P, Ait Ouakrim D, Willenberg L, Naccarella L, Furler J, Young D. The effect of financial incentives on the quality of health care provided by primary care physicians. *Cochrane Database of Systematic Reviews* 2011; 9: CD008451.
112. Walsh JM, McDonald KM, Shojania KG, Sundaram V, Nayak S, Lewis R, Owens DK, Goldstein MK. Quality improvement strategies for hypertension management: a systematic review. *Medical Care* 2006, 44(7):646-57.
113. Institute of Medicine. Patient-Centered Primary Care Collaborative [Internet]. Washington: IOM; c2012. Available at [www.pcpcc.net/](http://www.pcpcc.net/). Accessed on 12 May 2012.
114. Pan American Health Organization. Linha de cuidado: hipertensão arterial e diabetes. Brasília: PAHO; 2010. Available at [http://bvsmis.saude.gov.br/bvs/publicacoes/linhas\\_cuidado\\_hipertensao\\_diabetes.pdf](http://bvsmis.saude.gov.br/bvs/publicacoes/linhas_cuidado_hipertensao_diabetes.pdf) . Accessed on 30 January 2013.
115. Wong CX, Carson KV, Smith BJ. Home care by outreach nursing for chronic obstructive pulmonary disease. *Cochrane Database of Systematic Reviews* 2012; 4: CD000994.
116. Weinrich SP, Boyd MD, Weinrich M, Greene F, Reynolds WA, Metlin C. Increasing prostate cancer screening in African American men with peer educator and client-navigator interventions. *J Cancer Educ.* 1998;13(1):213-219
117. Jandorf L, Gutierrez Y, Lopez J, Christie J, Itzkowitz SH. Use of a patient navigator to increase colorectal cancer screening in an urban neighborhood health clinic. *J Urban Health* 2005;82(2):216-224.
118. Robinson-White S, Conroy B, Slavish KH, Rosenzweig M. Patient navigation in breast cancer: a systematic review. *Cancer Nurs* 2010; 33(2):127-40.
119. Lewin SA, Dick J, Pond P, Zwarenstein M, Aja G, van Wyk B, Bosch-Capblanch X, Patrick M. Lay health workers in primary and community health care. *Cochrane Database of Systematic Reviews* 2005; 1: CD004015.
120. Lewis R, Hunt P, Carson D. Social enterprise and community based care. London: The King's Fund; 2006. Available at [www.kingsfund.org.uk/publications/social.html](http://www.kingsfund.org.uk/publications/social.html) . Accessed on 24 May 2012.
121. Kendall J, Knapp M. The third sector and welfare state modernization: inputs, activities and comparative performance. Civil Society Working Paper No. 14. London: London School of Economics and Political Science; 2000. Available at [http://eprints.lse.ac.uk/29055/1/CSWP\\_14.pdf](http://eprints.lse.ac.uk/29055/1/CSWP_14.pdf) . Accessed on 24 May 2012.
122. Freeman HP. Patient navigation: a community-based strategy to reduce cancer disparities. *J Urban Health.* 2006; 83(2):139-41.
123. Centers for Disease Control and Prevention (US). MAPPS interventions for Communities Putting Prevention to Work. Atlanta: CDC; 2010. Available at [http://www.cdc.gov/chronicdisease/recovery/PDF/MAPPS\\_Intervention\\_Table.pdf](http://www.cdc.gov/chronicdisease/recovery/PDF/MAPPS_Intervention_Table.pdf) . Accessed on 22 August 2012.
124. Pan American Health Organization. Population and individual approaches to the prevention and management of diabetes and obesity. Washington: PAHO; 2011. Available at [http://new.paho.org/hq/index.php?option=com\\_docman&task=doc\\_view&gid=15557&Itemid=](http://new.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=15557&Itemid=) . Accessed on 23 August 2012.
125. Pan American Health Organization. Regional Strategy and Plan of Action for Cervical Cancer Prevention and Control in Latin America and the Caribbean. Washington: PAHO; 2010. Available at [HTTP://NEW.PAHO.ORG/HQ/DMDOCUMENTS/2011/PAHO\\_CERVICAL\\_CANCER\\_STRATEGY\\_EN.PDF](http://NEW.PAHO.ORG/HQ/DMDOCUMENTS/2011/PAHO_CERVICAL_CANCER_STRATEGY_EN.PDF) . Accessed on 23 August 2012.

126. Ordúñez-García P, Campillo Artero C, editors. Regional consultation: priorities for cardiovascular health in the Americas. Key messages for policymakers. Washington: Pan American Health Organization; 2011. Available at [www.paho.org/priorities/pdf-en/book.pdf](http://www.paho.org/priorities/pdf-en/book.pdf) . Accessed on 23 August 2012.
127. Pan American Health Organization. Primary Health Care–Based Health Systems: Strategies for the Development of Primary Health Care Teams. Washington: PAHO; 2009. (Renewing Primary Health Care in the Americas No. 1). Available at <http://www2.paho.org/hq/dmdocuments/2010/PHC-Strategies-Development-PHC-Teams.pdf> . Accessed on 4 February 2013.
128. Pan American Health Organization. Renewing primary health care in the Americas: a position paper of the Pan American Health Organization / World Health Organization (PAHO/WHO). Washington: PAHO; 2007. Available at <http://apps.who.int/medicinedocs/en/m/abstract/Js19055en/> . Accessed on 4 February 2013.
129. World Health Organization. The world health report 2008: primary health care—now more than ever. Geneva: WHO; 2008. Available at [www.who.int/whr/2008/en/](http://www.who.int/whr/2008/en/) . Accessed on 23 August 2012.
130. De Maeseneer J, van Weel C, Egilman D, Mfenyana K, Kaufman A, Sewankambo N. Strengthening primary care: addressing the disparity between vertical and horizontal investment. *Br J Gen Pract.* 2008;58(546):3-4.
131. De Maeseneer J, van Weel C, Egilman D, Mfenyana K, Kaufman A, Sewankambo N, Flinkenflögel M. Funding for primary health care in developing countries. *BMJ* 2008;336(7643):518-9.
132. Signh D. Making the shift: key success factors. A rapid review of best practice in shifting hospital care into the community. Health Services Management Centre. University of Birmingham, NHS Institute for Innovation and Improvement. UK 2006. Available at <http://www.bhamlive2.bham.ac.uk/Documents/college-social-sciences/social-policy/HSMC/publications/2006/Making-the-Shift-Key-Success-Factors.pdf> . Accessed on 4 February 2013.
133. Wollast E, Mercenier P. Pour une régionalisation des soins. In: Groupe d'Etude pour une Réforme de la Médecine. Pour une politique de la santé. Brussels: Editions Vie Ouvrière/La Revue Nouvelle; 1971.
134. Criel B, De Brouwere V, Dugas S. Integration of vertical programmes in multi-function health services. Antwerp: ITG Press; 1997. (Studies in Health Services Organization and Policy No. 3). Available at <http://www.modirisk.be/modirisk/GeneralSite/InfServices/Downloads/shsop03.pdf> . Accessed on February 4th 2013.
135. Johns Hopkins University, Bloomberg School of Public Health. Non-communicable chronic diseases in Latin America and the Caribbean. Baltimore: JHU-BSPH; 2009. Available at [www.healthycaribbean.org/publications/documents/NCD-in-LAC-USAID.pdf](http://www.healthycaribbean.org/publications/documents/NCD-in-LAC-USAID.pdf) . Accessed on 23 August 2012.
136. Pan American Health Organization. Proposed Strategic Plan 2008–2012. Washington: PAHO; 2007. Available at [www.paho.org/french/gov/csp/od328-full-e.pdf](http://www.paho.org/french/gov/csp/od328-full-e.pdf) . Accessed on 24 August 2012.
137. Pan American Health Organization. Health in the Americas: regional outlook and country profiles. 2012 ed. Washington: PAHO; 2012. Available at [http://new.paho.org/saludenlasamericas/index.php?option=com\\_content&view=article&id=9&Itemid=14&lang=en](http://new.paho.org/saludenlasamericas/index.php?option=com_content&view=article&id=9&Itemid=14&lang=en) . Accessed on 4 February 2013.
138. World Health Organization. The world health report: health systems financing: the path to universal coverage. Geneva: WHO; 2010. Available at [http://whqlibdoc.who.int/whr/2010/9789241564021\\_eng.pdf](http://whqlibdoc.who.int/whr/2010/9789241564021_eng.pdf) Accessed on 31 January 2013
139. Xu K, Evans DB, Carrin G, Aguilar-Rivera AM, Musgrove P, Evans T. Protecting households from catastrophic health spending. *Health Aff.* 2007;26(4):972–83.
140. Paterson I, Judge K. Equality of access to healthcare. In: Mackenbach JP, Bakker M, editors. Reducing inequalities in health: a European perspective. London: Routledge, 2002.
141. Pan American Health Organization. Non-communicable diseases in the Americas: building a healthier future. Washington: PAHO; 2011. Available at [http://new.paho.org/hq/index.php?option=com\\_docman&task=doc\\_view&gid=14832&Itemid=](http://new.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=14832&Itemid=) . Accessed on 24 May 2012.
142. Pan American Sanitary Conference, Pan American Health Organization. —Opening Remarks by the Director-General of the World Health Organization at the 64th Session of the Who Regional Committee for the Americas. September 2012. Document CSP28/DIV/5. Available at [http://new.paho.org/hq/index.php?option=com\\_docman&task=doc\\_download&gid=19024&Itemid=270&lang=en](http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=19024&Itemid=270&lang=en) . Accessed on 31 January 2013
143. Thrall JH. Prevalence and costs of chronic disease in a health care system structured for treatment of acute illness. *Radiology* 2005;235(1):9-12.
144. Berenson RA, Horvath J. Confronting the barriers to chronic care management in Medicare. *Health Aff (Millwood)* 2003; Suppl Web Exclusives:W3-37-53.

145. Ministerio de Salud, Departamento de Enfermedades Crónicas no transmisibles [homepage on the Internet]. Santiago: MS; c2011-2012. Available at <http://redcronicas.minsal.gob.cl/> . Accessed on 22 May 2012.
146. Pan American Health Organization. Compilation of legislation for the English-speaking Caribbean countries and territories on prevention and control of obesity, diabetes and cardiovascular diseases. Washington: PAHO; 2010. Available at [http://new.paho.org/hq/index.php?option=com\\_docman&task=doc\\_download&gid=14133&Itemid=](http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=14133&Itemid=) . Accessed on 23 August 2012.
147. Organización Panamericana de la Salud Pan American Health Organization. Recopilación de normas sobre prevención y control de enfermedades crónicas en América Latina: obesidad, diabetes y enfermedades cardiovasculares. Washington: PAHO; 2009. Available at [http://new.paho.org/hq/dmdocuments/2010/normas\\_preencion\\_ecnt.pdf](http://new.paho.org/hq/dmdocuments/2010/normas_preencion_ecnt.pdf) . Accessed on 22 August 2012.
148. Centers for Disease Prevention and Control, Community Preventive Service Taskforce (US). Guide to Community Preventive Services [Internet]. Washington: CDC; c2012. Available at [www.thecommunityguide.org/index.html](http://www.thecommunityguide.org/index.html) . Accessed on 22 August 2012.
149. World Health Organization. Preparing a health care workforce for the 21st century: the challenge of chronic conditions. Geneva: WHO; 2005. Available at [www.who.int/chp/knowledge/publications/workforce\\_report/en/](http://www.who.int/chp/knowledge/publications/workforce_report/en/). Accessed on 23 August 2012.
150. Pruitt SD, Epping-Jordan JE. Preparing the 21st century global healthcare workforce. *BMJ*. 2005;330(7492):637-9.
151. Leykum LK, Palmer R, Lanham H, Jordan M, McDaniel RR, Noël PH, Parchman M. Reciprocal learning and chronic care model implementation in primary care: results from a new scale of learning in primary care. *BMC Health Serv Res*; 2011:11-44.
152. Bowers KW, Robertson M, Parchman ML. How Inclusive Leadership Can Help your Practice Adapt to Change. *Fam Pract Manag*. 2012;19(1):8-11.
153. Institute for Healthcare Improvement. The Breakthrough Series: IHI's collaborative model for achieving breakthrough improvement. Cambridge, MA: IHI; 2003. Available at [http://www.ihl.org/knowledge/\\_layouts/download.aspx?SourceURL=%2fknowledge%2fKnowledge+Center+Assets%2f364ac260-175b-498d-ae21-8670db1fbc92%2fIHIBreakthroughSerieswhitepaper2003.pdf](http://www.ihl.org/knowledge/_layouts/download.aspx?SourceURL=%2fknowledge%2fKnowledge+Center+Assets%2f364ac260-175b-498d-ae21-8670db1fbc92%2fIHIBreakthroughSerieswhitepaper2003.pdf) . Accessed on 4 February 2013.
154. Kaplan A. Curing the system: stories of change in chronic illness care. Washington: National Coalition on Health Care; 2002. Available at [www.improvingchroniccare.org/downloads/act\\_report\\_may\\_2002\\_curing\\_the\\_system\\_copy1.pdf](http://www.improvingchroniccare.org/downloads/act_report_may_2002_curing_the_system_copy1.pdf) . Accessed on 31 May 2012.
155. Vilaça E. O Cuidado das Condições Crônicas na Atenção Primária a Saúde: O Imperativo da Consolidação da Estratégia da Saúde da Família [Care for Chronic Conditions in Primary Health Care: The Imperative of the Consolidation of the Strategy of Family Health]. Pan American Health Organization, ISBN 978-85-7967-078-7. Brasilia, 2012. Available at [http://bvsmms.saude.gov.br/bvs/publicacoes/cuidado\\_condicoes\\_atencao\\_primaria\\_saude.pdf](http://bvsmms.saude.gov.br/bvs/publicacoes/cuidado_condicoes_atencao_primaria_saude.pdf) . Accessed on 20 February 2013.
156. Pan American Health Organization. Evidence Based Chronic Illness Care. Available at [http://www2.paho.org/hq/dmdocuments/2011/EVIDENCE%20BASED%20CIC-2011-FINAL\\_INTERNET.pdf](http://www2.paho.org/hq/dmdocuments/2011/EVIDENCE%20BASED%20CIC-2011-FINAL_INTERNET.pdf) . Accessed on 1 February 2013.
157. Pan American Health Organization. Diabetes Self-Management Education [Spanish]. Available at <http://cursos.campusvirtualsp.org/course/view.php?id=20> . Accessed on 1 February 2013.
158. Pan American Health Organization. Education Program for People with Type 2 Diabetes [Spanish]. Available at <http://cursos.campusvirtualsp.org/course/view.php?id=116> . Accessed on 1 February 2013.
159. Committee on Quality Health Care in America, Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington: National Academy Press; 2001. Available at [www.nap.edu/html/quality\\_chasm/report-brief.pdf](http://www.nap.edu/html/quality_chasm/report-brief.pdf) . Accessed on 23 August 2012.
160. Cosgrove D, Fisher M, Gabow P, Gottlieb G, Halvorson G, James B, et al. A CEO checklist for high-value health care. Washington: Institute of Medicine of the National Academies; 2012. Available at [www.iom.edu/~media/Files/Perspectives-Files/2012/Discussion-Papers/CEOHIGHVALUECHECKLIST.pdf](http://www.iom.edu/~media/Files/Perspectives-Files/2012/Discussion-Papers/CEOHIGHVALUECHECKLIST.pdf) Accessed on 23 August 2012.
161. Ham C. The ten characteristics of the high-performing chronic care system. *Health Econ Policy Law*. 2010;5(Pt 1):71-90.



# Annex 1: Contributors

The following individuals contributed with examples that are showcased along the document:

1. *Sandra Delon, Canada*
2. *Ilta Lange, Chile*
3. *Romeo Montoya, PAHO, Honduras*
4. *omiris Estepan, Dominican Republic*
5. *Anand Parekh, United States of America*
6. *Laura Solá, Uruguay*
7. *Ailton Cezario Alves Jr., Brazil*
8. *Michael Parchman, United States of America*
9. *Fernando Poblete, Chile*
10. *Sebastian Laspiur, Chile*
11. *Roy Wong, Costa Rica*
12. *Irene Agurto, Chile*
13. *Eliane Regina da Veiga Chomatas, Brazil*
14. *JT Insua, Chile*
15. *Rafael Bengoa, Spain*
16. *Micheline Marie Milward de Azevedo Meiners, Brazil*
17. *Norma Tuckler, Costa Rica*
18. *Laura Ramirez, Costa Rica*
19. *Aparecida Linhares Pimenta, Brazil*
20. *Ruben Palma, Honduras*
21. *Felicia Cañete, Paraguay*
22. *Dora Caballero, PAHO, Bolivia*
23. *Enrique Perez Flores, PAHO, EL Paso, Texas, United States of America*

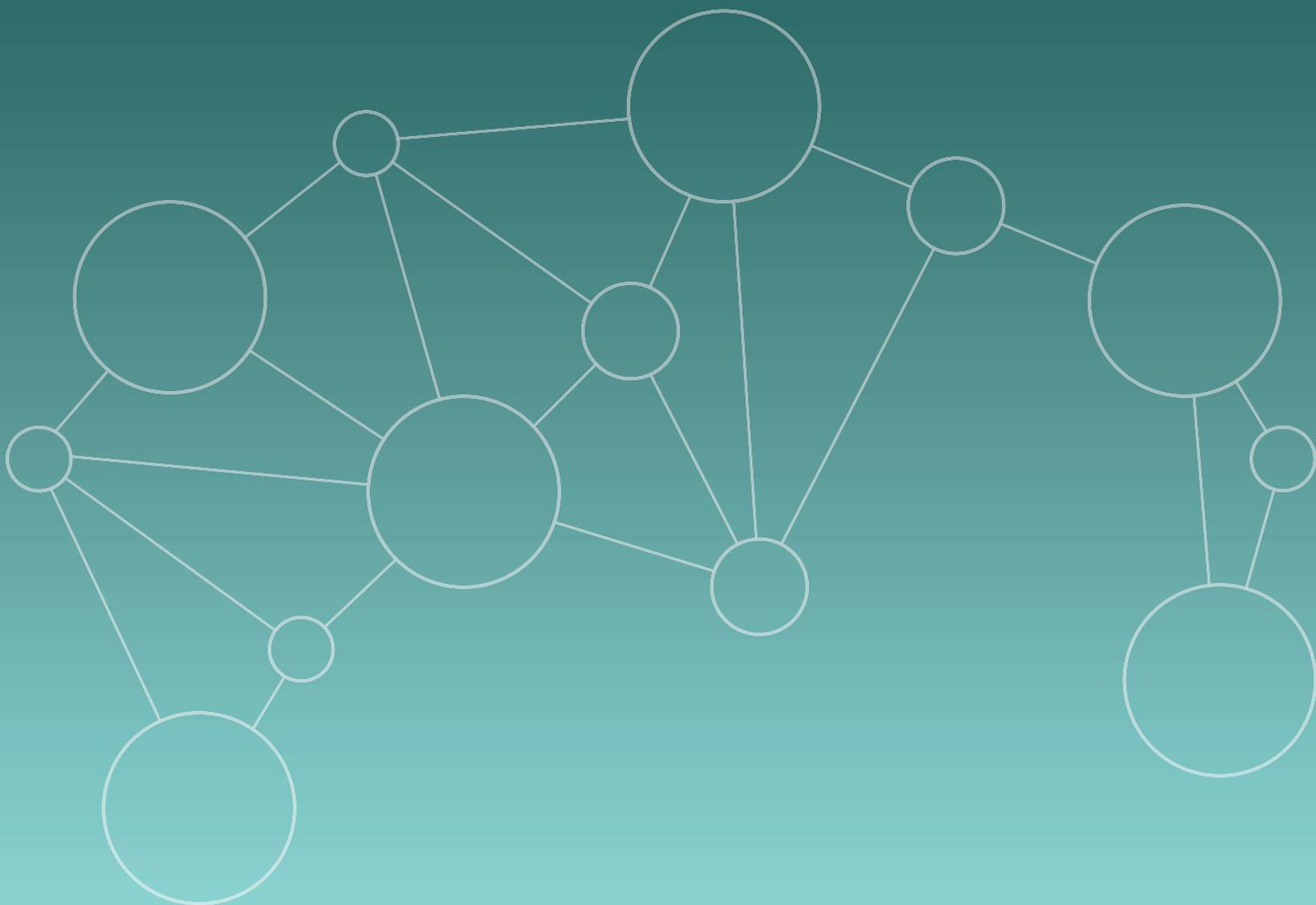
Participants in the working group Organizing and Delivering High-Quality Care for Chronic Non-Communicable Diseases in the Americas, Washington DC. December 13-14, 2012

1. *Michael Parchman, Seattle, USA*
2. *JoAnne Epping Jordan, Seattle, USA*
3. *Sandra Delon, Calgary, Canada*
4. *Maria Cristina Escobar, Chile*
5. *Tamu Davidson Sadler, Jamaica*
6. *Sebastian Laspiur, Argentina*
7. *Anan Parekh, USA*
8. *Rafael Bengoa, Spain*
9. *Lizbeth Rodriguez, Mexico*
10. *Anselm Hennis, Barbados*
11. *Micheline Meiners, Brazil*
12. *Frederico Guanais, Inter-American Development Bank (IDB), USA*

PAHO Secretariat

1. *Alberto Barceló (Meeting Coordinator)*
2. *James Hospedales*
3. *Silvana Luciani*
4. *Pedro Orduñez*
5. *Elisa Prieto*
6. *Renato Tasca*
7. *Tomo Kanda*
8. *Enrique Vega*





**Pan American  
Health  
Organization**



**World Health  
Organization**  
REGIONAL OFFICE FOR THE **Americas**

