

**Proyect: Improving the management of health services
for people with multiple chronic diseases in three
Latin American countries - Brazil, Colombia, and Uruguay**



PROPOSAL TO OPTIMIZE THE CARE MODEL FOR PEOPLE WITH CHRONIC DISEASES AND MULTIMORBIDITY IN URUGUAY

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PROPOSAL TO OPTIMIZE THE CARE MODEL FOR PEOPLE WITH CHRONIC DISEASES AND MULTIMORBIDITY IN URUGUAY



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Uruguay 2023



Content

Acronyms	5
Key Messages.....	6
Introduction.....	9
Goals	11
Methodology.....	13
Results and Main Contributions to the Country and the Region	19
Stratification of the Population with Chronic Disease in Uruguay	19
Care Models for Chronic Noncommunicable Diseases and Multimorbidity in Uruguay	22
Proposal for Optimization of the Care Model	26
Projection or Future Possibilities.....	41







Acronyms

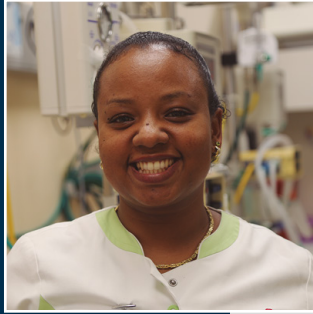
ACG-PM	Adjusted Clinical Groups - Predictor Modeling
SHSA	State Health Services Administration
TA	Technical Assistance
D.B.	Databases
ICD-10	International Classification of Diseases, Version 10.
DIGESA	General Directorate of Health
CD	Chronic Disease
NCDs	Chronic Noncommunicable Disease
COPD	Chronic Obstructive Pulmonary Disease
NRF	National Resource Fund
GP	General Practitioner
AHT	Arterial Hypertension
CMAI	Collective Medical Assistance Institutions
JA-CHRODIS	The EU joint action on chronic diseases and promoting healthy aging across the life cycle
JUNASA	National Board of Health
MPH	Ministry of Public Health
NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
WHO	World Health Organization
POPP	Partnership for Older People Projects
NIHS	National Integrated Health System
B.P.	Blood Pressure
TCA	Team Care Arrangement
ICT	Information and Communication Technology



Key Messages



- The stratification process of patients with Chronic Noncommunicable Diseases (NCDs) according to their health risk provides results that can be used for decision-making by managers of health services.
- Case management as a care strategy for complex multimorbid patients allows providers to focus on improving the patient's quality of life and safety by minimizing the risk of readmissions and drug interactions in polypharmacy. It also enables the release of resources that can be allocated to improving the quality of care.
- The health expenditure of patients with multimorbidity in Uruguay is significant. Patients with five or more of the selected pathologies represent 8.44% of the total. However, their care accounts for 42.07% of the total expenditure and 50.48% of the spending on medications. Patients with five or more diseases that had two or more hospitalizations during the previous year and are taking five or more different medications per month, represent 5.4% of the total number of patients. Still, they represent 83% of the total expenditure and 87.3% of the total medical spending.
- Those in charge of formulating health policies need to define a minimum set of basic data widely used in all health information systems—both in the public and private sectors—that record outpatient production, use of medicines, and referral procedures to generate periodic and reliable information aimed at guiding public health policies. Uruguay has an adequate platform for applying a patient-centered model of care. However, each component offers ample room for improvement, with strong implications for quality of care, patient safety, and efficiency in service provision. The models of care for the five selected highly



prevalent NCDs also present ample room for improvement concerning: the extension of specific components of the person-centered care model and in the search and institutional development of the convergence of care teams that systematically identify multimorbidity and apply joint care criteria and follow-up of these patients, who represent the highest individual risk of severe chronic disease and mortality and a demanding family and social burden due to the lack of comprehensive care.



- The optimization of care models is an effective strategy since it starts from a baseline in the care developments carried out by the country within the framework of the availability of existing resources and processes and proposes improvements in the gaps identified in relation to international models that have relevant experience in regarding the problems of multimorbidity worldwide.

[More information](#)





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Introduction

The importance of Chronic Disease (CD) in Uruguay has been widely analyzed for many years and in multiple studies and reports^{1, 2, 3}. Its impact on mortality and its high cost of care was decisive in creating various health promotion and primary and secondary prevention strategies, whose impact has begun to be perceived in the change in trends in some specific areas, such as cardiovascular disease⁴.

However, beyond measures to include specific programs and benefits for CD care and general organization guidelines for health services to satisfy the spontaneous demand generated by CD, there have not been many review initiatives of the care models for CD, especially about the multimorbidity problem, except for the development by the Ministry of Public Health (MPH) of the “Guide to Frailty in Older Adults: Practical Criteria and Research Instruments in The First Level of Care”⁵, an aspect of great clinical relevance about both CD and multimorbidity for human resources and providers of the National Integrated Health System (NIHS).

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- 1 Non-Communicable diseases prevention project, Report No: 40382 – UY, World Bank, July 31,2007
 - 2 Uruguay Health System Profile 2015, PAHO. Levcovitz E, Fernández Galeano M, Benia W, Anzalone P., Harispe E., coord. Health system profile. Monitoring and analysis of change processes. ISBN: 978-9974-8561-9-6
 - 3 <https://cardiosalud.org/wp-content/uploads/2019/06/Interpelaciones-y-respuestas-a-las-Enfermedades-No-Transmisibles-en-Uruguay.pdf>
 - 4 <https://cardiosalud.org/mortality-por-enfermedades-del-sistema-circulatorio-en-el-uruguay-2021/>
 - 5 <https://www.gub.uy/ministerio-salud-publica/comunicacion/publicaciones/guia-fragilidad-personas-adultas-mayores,06/10/2022>



This work was developed under the guidance and support of the General Directorate of Health (DIGESA, in Spanish) and the CD Program of the MPH. It was developed over a year in three phases focused on: i) presenting specific strategies for the stratification of populations according to their health risk; ii) analyzing the care models for the most prevalent CD and multimorbidity⁶ by comprehensive providers with various parameters of CD analysis, including multimorbidity and analyzing its economic impact in terms of proportion of institutional expenditure that their care generates⁷; and iii) presenting a proposal for the gradual development of a comprehensive care model for multimorbidity centered on the person, based on the analysis of the magnitude of the problem, the current stage of the care model, and current international experiences in care.

This document presents the work carried out in Uruguay, which culminates with the proposal of the Comprehensive Model of Care for Multimorbidity and includes the study's results. As such, we present the general and specific objectives, the methodology for each of the proposed phases, the results and main contributions to the country and the region, and finally, future projections or possibilities.

6 WB; ASA “Improving the Management of Health Care Services for Patients with Multiple Chronic Conditions in Three Latin American Countries” – URUGUAY: “Survey on the Model of Care for Non-Communicable Chronic Diseases and Multimorbidity in Uruguay: Results”; March 2023.

7 WB; ASA “Improving the Management of Health Care Services for Patients with Multiple Chronic Conditions in Three Latin American Countries” – URUGUAY: “Stratification of the population with Chronic Disease in Uruguay”; March 2023



Goals

General Objective

The general objective of the study was to formulate a stratification scheme for patients with Chronic Noncommunicable Diseases (NCDs) according to their health risk, which would allow the identification of multimorbid conditions and the proposal of a model to address multimorbidity based on international experience and the local possibilities of implementation in Uruguay.

Specific Objectives

1. To identify multimorbid patients with NCDs based on the MPH's institutional definition of the concept and stratify them according to their health risk.
2. To identify care models for chronic and multimorbid patients in healthcare providers of the National Integrated Health System (NIHS).
3. To formulate a proposal for a model to address and care for multimorbidity based on international experience and local implementation possibilities.



Photography: World Bank | Flickr



Methodology

To fulfill the objectives, three phases were carried out:

- i) Stratification of the population with CD in Uruguay;
- ii) Identification and evaluation of care models for NCDs and multimorbidity in Uruguay, and
- iii) Proposal for optimization of the care model.

Each of them is described below:

Stratification of the Population with Chronic Disease in Uruguay

For the first analysis, a dynamic descriptive model that utilizes Business Intelligence tools was used. It applied “What if” techniques that allowed progressive approaches to the conceptual and institutional definition of the chronic multimorbid patient. The model worked with 46 ICD-10 NCDs codes, excluding cancer and mental illness. Subsequently, a second phase of analysis was carried out, grouping ICD-10 codes related to five highly prevalent chronic conditions, whose care models were explored through a qualitative study.

For the grouping⁸ of patients in strata of care levels, the methodology proposed by Kaiser Permanente was used, expressed in the expanded

⁸ Cited in Osakidetza; July 2010, op. cit., page 17.

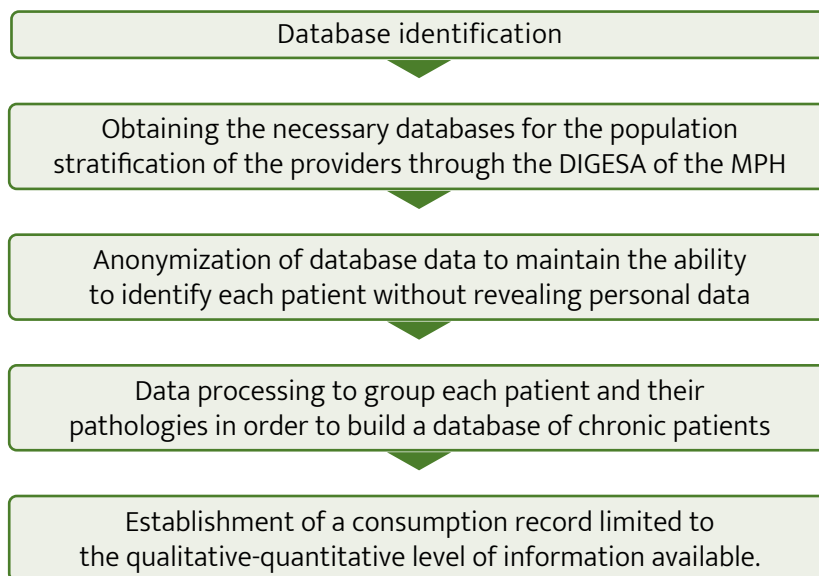


“Kaiser Pyramid”,⁹ which identifies four levels of medical intervention according to the level of complexity, as follows:

- **Level 0:** Healthy patients with or without risk factors.
- **Level 1:** Patients with up to 2 low-risk chronic diseases, with conditions in incipient stages.
- **Level 2:** Patients who present between 3 and 4 high-risk chronic diseases but of lower complexity.
- **Level 3:** Complex patients with the presence of more than 5 chronic diseases.

The databases were requested from 38 NIHS providers, having received a response from 20 of them, and a sequence of processes was applied to identify and stratify these patients according to the methodology described in the following figure:

Figure 1. Identification and stratification processes of patients with chronic diseases and multimorbidity. Uruguay 2023



[More information](#)

Source: The authors

⁹ Sources: “Strategy to face the challenge of chronicity in Euskadi.” Osakidetza July 2010. “Strategy for Care of Patients with Chronic Diseases in the Community of Madrid.” Ministry of Health of Madrid; 2016.



Models of Care for Noncommunicable Chronic Diseases and Multimorbidity in Uruguay

This phase was carried out through a descriptive and exploratory study from a qualitative methodological approach. The study uses primary data obtained from conducting a semi-structured interview with technical directors or Operational Managers of comprehensive providers, both public and private, of the NIHS who are aware of the day-to-day problems of patients and selected by the MPH, considering health coverage and geographic location type criteria. For the interviews, a proprietary questionnaire was developed by the World Bank team and reviewed and validated by the MPH's NCDs team.

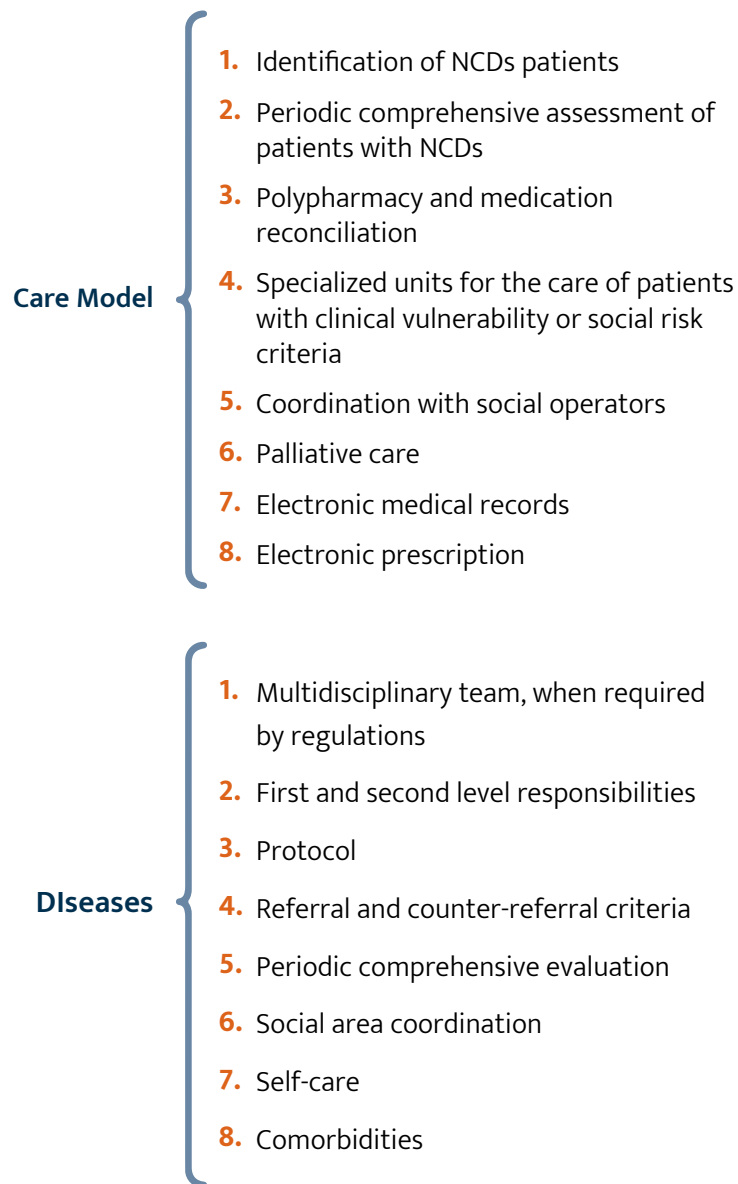
This focused on highly prevalent NCDs with a clinical course with a high worsening probability due to the presence of exacerbations and/or relapses, such as cardiovascular disease (CVD); arterial hypertension (AHT); diabetes; chronic obstructive pulmonary disease (COPD), and degenerative neurological disease. In these, a person-centered care model based on preventive activities and anticipation could stabilize the progression of the disease and/or delay complications and clinical deterioration. And, consequently, improve the patient's and their families' quality of life and reduce hospitalizations and polypharmacy with clear gains in the efficiency of the health system.

The interview scope included two different sections: an initial part focused on the existence of various characteristic elements necessary to facilitate assistance to the NCDs; and a second part exploring the care model for each of the 5 selected diseases. Additionally, a system was designed to evaluate the level of development of the NCDs care model, and the different diseases considered in the study. This system evaluates the most relevant components incorporated in the international experience and 8 evaluation aspects were established with three steps of advancement in each. (See criteria in Figure 2).

For the grouping of patients in strata of care levels, the methodology proposed by Kaiser Permanente was used, expressed in the expanded which identifies four levels of medical intervention according to the level of complexity.



Figure 2. Evaluation criteria for the care model and NCDs. Uruguay 2023



Source: The authors



Subsequently, and according to the score obtained (from 0 to 24 possible points), providers are classified into three levels:

- 1) developed (type A): 15 or more points;
- 2) basic (type B): from 10 to 14 points; and
- 3) incipient (type C): less than 10 points.

[More information](#)

Proposal for Optimization of the Care Model

The proposal to optimize the care model took the results of the previous stages of population stratification and the analysis of care models operating in the country as an analytical basis and advanced the proposal for the gradual development of a comprehensive care model for multimorbidity, also using current international experiences in addressing the same problem as essential input.

[More information](#)





Photography: World Bank | Flickr



Results and Main Contributions to the Country and the Region

The main results for each of the developed phases are described below.

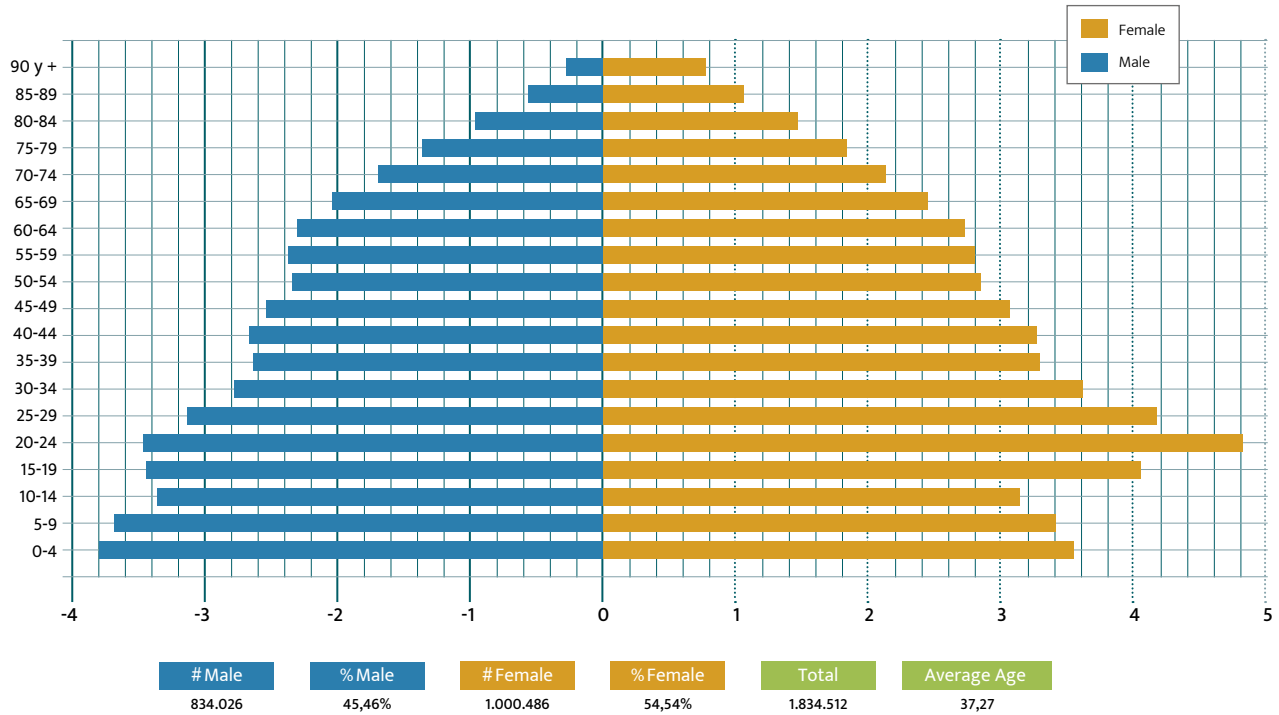
Stratification of the Population with Chronic Disease in Uruguay

The risk stratification of the population in charge of 20 public and private providing institutions was carried out on a population sample of 51.8% (1,834,512 people out of 3,543,025 of the total population, which is considered a representative sample size of the general population with a 99% confidence level; margin of error <0.07%), in which the diagnoses found in hospitalization events, outpatient consultations, and monthly medication consumption were analyzed.

A slight predominance of female beneficiaries was observed, especially of childbearing age (while the percentage of women in the general population is 51.51%, that of the sample beneficiary population is 54.54%). Regarding the distribution by age cohorts, as is expected to be found in a population benefiting from health coverage in the region, the cohorts corresponding to those under 14 years of age prevail with a detraction of the pyramid between 10 and 19 years of age in males and between 10 and 14 years in women. The average age of the beneficiaries of both sexes is 37.27 years. (See Figure 3)



Figure 3. Reference population pyramid Uruguay 2023



Source: The authors

Regarding the stratification of the population according to the established parameters, the following results were obtained using the Kaiser method: (See Figure 4)

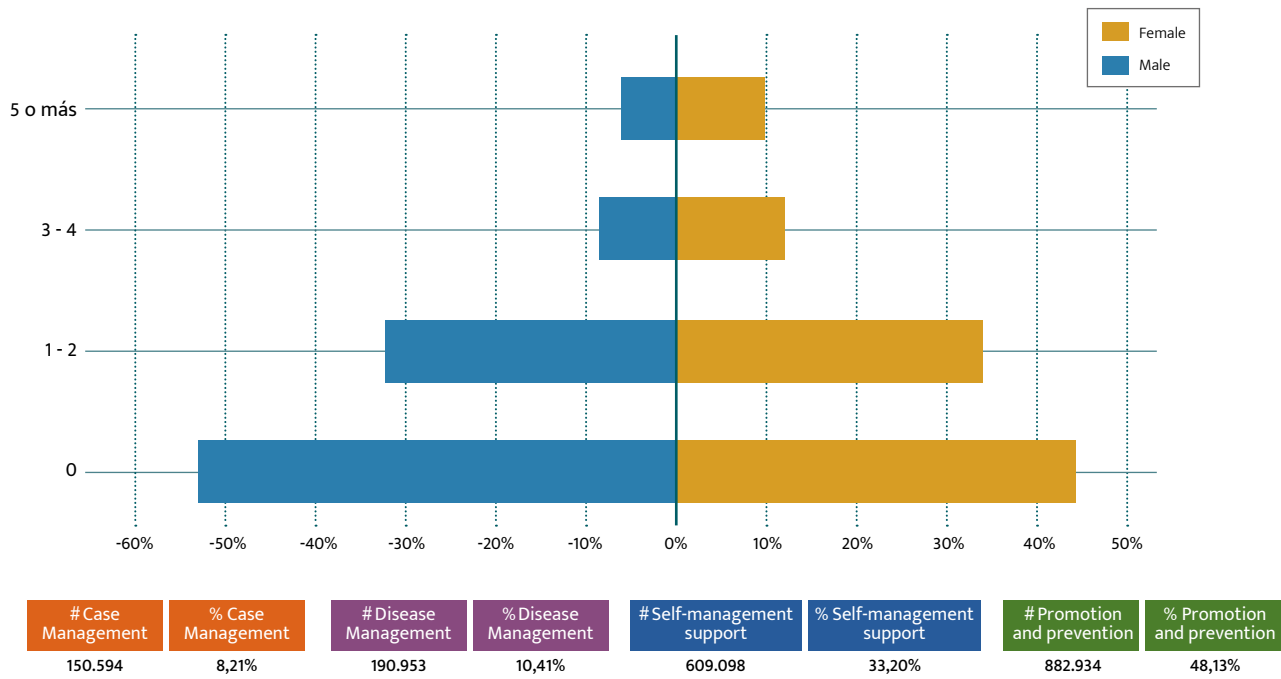
- **Level 3 with 150,594 people** (8.21% of the sample population) who present 5 or more selected coexisting pathologies,¹⁰ that would make up the stratum of the population to which case management should be carried out.
- **Level 2 with 190,953 people** (10.41% of the sample population) who present 3 or 4 selected coexisting pathologies and should be managed through disease management.

10 341,547 people (18.62% of the reference population) if more than 2 selected coexisting pathologies are considered.



- **Level 1 with 608,995 people** (33.2% of the sample population) presenting 1 or 2 more selected coexisting pathologies and should be addressed through Self-Management Support.
- **Level 0 with 882,859 people** who did not present NCDs (48.13% of the sample population), is the appropriate level for promoting health.

Figure 4. Kaiser pyramid of the reference population Uruguay 2023



Source: The authors

For the sole comparative purpose of the results obtained, the Kaiser Pyramid and the pyramid of the reference population of comprehensive health service providers were reproduced. In the pyramids presented, the general population that did not present NCDs is excluded from the total to make the percentages comparable.

A more significant proportion of highly complex patients was observed (16% of the sample versus 5% of the pyramid of the original Kaiser theoretical model), representing the stratification results of countries with mature care systems regarding Universal Health Coverage. It was also observed that a greater proportion of high-risk patients (20% of the sample, versus 15% of the theoretical model), making up among them comprised 36% of the sample, versus 20% of the theoretical model.



Economic Impact of CD Care

When analyzing the economic impact of CD care in the entire spectrum of care that institutions develop, it was found that it accounts for approximately 87% of institutional spending, but that the 8% stratum of more complex patients (multimorbid with 5 or more diseases) generates 41% of total institutional expenditure (See Table 1). This is of particular relevance, considering that today, in Uruguay, there is no differentiated care model for this type of patient, as seen in the following section.

Table 1. Expenditure summary by NCD management categories, simple NCD counting criteria (with 5 or +, 3 or 4, 1 or 2 and no NCD)

Kaiser Pyramid Groups	Reference Population		Expenditure by category in reference population		
	Patients	Total Cost	Expenses	Outpatient Consultations	Medicines
Case Management	8.21%	41.71%	16.32%	25.92%	50.50%
Disease Management	10.41%	23.21%	13.97%	18.30%	26.26%
Self-Management Support	33.22%	22.79%	36.69%	32.13%	17.86%
Promotion and Prevention	48.15%	12.29%	33.02%	23.65%	5.38%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

Source: The authors

Health expenditure on multimorbidity in Uruguay is high and has the following behavior: patients with 5 or more of the selected pathologies represent 8.44% of the registered patients, their care accounts for 42.07% of the total expenditure and 50.48% of expenditure on medications; those patients with more than two pathologies represent 18.79% of the total population looked after and their care accounts for 62.5% of the total expenditure and 76.69% of expenditure on medications in particular. Including additional inclusion criteria, for example, when considering patients with 2 or more hospitalizations during the previous year and taking 5 or more different medications during the month, the percentage of patients with 5 or more of the selected pathologies is reduced to 5.4% of the total number of patients with these characteristics, requiring 83%



of the total expenditure and 87.3% of the total spending on medications for this subset of patients.

The importance of having explicit and specific policies on the care model and of carrying out institutional monitoring of its application can be measured with greater elements, since this could increase the quality and safety of the patient with CD, significantly improving these standards. At the same time, it could contribute to the economic sustainability of the NIHS and its service-providing institutions, since it may be feasible to reduce the number of readmissions and optimize expenditure on medications, while reducing the risks of polypharmacy.

[More information](#)

87% of institutional spending, but that the 8% stratum of more complex patients (multimorbid with 5 or more diseases) generates 41% of total institutional expenditure.

Models of Care for Chronic Noncommunicable Diseases and Multimorbidity in Uruguay

From the analysis of the application and use by the institutions providing services of critical variables in CD care in 28 institutions, with a population representation of approximately 76% of the Uruguayan population, it is found that the eight basic elements to facilitate CD care described in the Methodology section are not systematically applied in all the institutions, even though there is a high level of consideration of the CD problem in all the institutions. Thus, out of an ideal score of 24 points, on average, the 28 institutions obtained 9.1 points, this score being considered as considered a basic institutional stage for CD care.

When evaluating the care of five prevalent CDs, under the existence and application level of the eight application variables of the care model, it was found that the score obtained was 9.28 out of 24, also in the basic stage of care, showing the wide range of possibilities for improvement. That is, the penetration of each of the components of the care model, endorsed by international literature as necessary for CD care, is dissimilar among providers, which means a high risk of problems of quality of care and patient safety and issues of productive efficiency in the organization of services.



The predominant care model continues to be monovalent, with low search, capture, and preferential care for multimorbid patients. However, even when applying the monovalent care model, there is ample room for improvement through the systemic introduction of a more comprehensive and focused care model on the person's needs.

Strengths of Care Models

The strengths found were the following::

- The technical departments have made important considerations of the relevance of the NCDs and their potential both to improve the population health level and to increase health system efficiency.
- Patients with NCDs, their comorbidities, drug interactions and problems of social vulnerability and disability that influence the progression of the disease can be identified through the providers' information systems.
- Some providers carry out relevant activities in NCDs management, such as comprehensive patient assessment, self-care promotion, and medication reconciliation, but most of them are informal, non-systematic, and do not have records of clinical history.
- There is a good level of interaction between the first and second levels, facilitating each other's work and offering a good disposition to solve patients' day-to-day problems. However, these are not supported by documented agreements.
- Approximately half of the providers have multidisciplinary teams for NCDs care. The degree of integration of the different health professionals who are part of these is highly variable, but generally, they are part of the same team.
- The deployment of palliative care is broad, and in many cases extensive, incorporating non-oncology patients.
- There is coordination between the clinical and social areas, and day-to-day operational functioning is good. However, documented agreements are lacking, and the referral and counter-referral systems are informal.
- There is a significant deployment of electronic medical records (EMR) and electronic prescriptions. These tools represent a facilitating element in care agility and a great opportunity to generate collaborative environments for care.



Areas for improvement

The areas of improvement identified were the following:

- The Technical Directorates lack a global vision of multimorbidity and the need to integrate care for complex patients to facilitate continuity of care and consequently to improve results and to reduce the consumption of health services.
- A collaborative work environment between the Technical Directorates and patient care professionals needs to be created to complement knowledge about the most appropriate strategies for their approach and their effectiveness in implementation.
- Agreement formalization and documentation between the first and second levels define commitments in patient follow-up according to complexity level, reference and counter-reference criteria, attention to comorbidities and their influence on the underlying disease, and relationship systems for attention to solving their problems on a daily basis.
- Need of NCDs management, in accordance with the available scientific evidence, documenting documents the ways of doing things in a written Protocol agreed upon by the multidisciplinary team, incorporating the responsibilities of the two levels of care mentioned in the previous point.
- Systematization of the comprehensive annual evaluation of the elements that, to a larger extent, condition the progression of the disease, including social assessment when in the clinician's opinion this is necessary, incorporating its specific record in the EMR.
- Methodology development to reconcile medications prescribed by different specialists to reduce drug interactions and polypharmacy as much as possible.
- Strengthening self-care by training patients and caregivers about the key elements of the disease, emphasizing their contribution to the stabilization of the disease through correct adherence to treatment and the practice of healthy lifestyles.
- Extension and uniformity of palliative care through minimum requirements for all providers and supervision of their degree of compliance.



- Preferential care for multimorbid and fragile patients that allows them to avoid or to anticipate their relapses to avoid continuous re-hospitalizations, with remote monitoring or follow-up systems that could represent an approach to the care model in the patient's household.
- Implementation of simple and consistent indicators that allow to know the effectiveness of innovations in care.

[More information](#)

Proposal for Optimization of the Care Model

The high development of the NIHS, the universal population coverage, the broad spectrum of benefit coverage, and the high financial protection, while providing an excellent platform for care of CD, show that the main problem is focused on the care model. This shows a slow migration from care based on the spontaneous demand of the disease to care focused on the needs of the person, supported by a systemic approach.

Under the current conditions, it is clear that it is necessary to work in multiple areas, since while Public Health must continue to apply population health policies of promotion and prevention to reduce risk factors and the consequent burden of future disease, at the institutional level it is important to begin organizing systematic activities related to:

- i)** early detection of risk.
- ii)** training patients in minimizing their risks (education);
- iii)** training in self-management support for those patients with initial degrees of illness;
- iv)** assembly of groups for disease management; and
- iv)** development of case management strategies.

In parallel, specific action protocols for the main prevalent CDs are required to guide professional work towards highly effective clinical practices and the development of action guides in multimorbidity. Both protocols and action guides can occur at the Ministerial or Institutional level with approval from the NIHS regulator and can be sanctioned as recommendations or as a regulatory obligation, depending on the policy decisions. Both instruments and the use of specific devices for the care



of CD and multimorbidity, can be monitored by the regulatory health authority by requiring specific information from service providers.

What is clear is that spontaneous demand care of CD is not effective for the patient or the health system. International experience indicates that regulation by the health authority on the subject accelerates the transformation of the care system from spontaneous demand to programmed, patient-centered care.

[More information](#)

The main problem is focused on the care model. This shows a slow migration from care based on the spontaneous demand of the disease to care focused on the needs of the person, supported by a systemic approach.

Problem

The proposed model seeks to provide a progressive solution to the main problems that patients with CD face, including:

- Difficulties in managing their disease, with problems adhering to treatment and lack of practicing more convenient lifestyles.
- Fragmentation of care in different actors of the health system acting individually, with important gaps in the continuity of care and oriented mainly to the disease without incorporating the needs perceived by the patient.
- Lack of convergence in health care and social support actions, developing care programs almost autonomously, and losing the opportunity for synergies.

At the same time, the model aims to solve the main triggers of patient destabilization, especially complex and/or fragile multimorbid patients:

- Sedentary lifestyle.
- Problems in medication reconciliation in polypharmacy.
- Inadequate adherence to treatment.
- Patient's lack of knowledge in their disease management.
- Lack of prevention of the triggers of clinical deterioration.
- Delays in intervention before the onset of clinical exacerbation.



Goals

The international experience includes a series of fundamental aspects that Uruguay can implement to optimize the care of patients with CD under the principles of comprehensive, person-centered care, focusing on quality and patient safety. These aspects apply to the different stages of identification of the types of care that CD requires in the Kaiser scheme.

The objectives (common to international strategies) taken for this proposal for a global approach to CD are the following:

- To improve the quality of life of people with multimorbidity, stabilizing the course of CD and delaying, if possible, the appearance of complications.
- To develop a more efficient person-centered care model based on prevention and early action during periods of clinical exacerbation, all aimed at reducing and avoiding hospital admissions and readmissions and emergency care, with a focus on quality of care and patient safety.
- To replace the care model that treats each disease individually with a care model focused on the patient's needs and the inevitably personalized balance of their combination of morbidities.
- To reconcile the medication prescribed for the care of various diseases, balancing polypharmacy, and reinforcing adherence to treatment.
- To improve management of complex fragile cases with high disease burden and high risk of destabilization through early care, almost daily in some cases.
- To involve professionals in the new care model through teamwork and the delegation of powers within it.

Essential Pillars of the Model

To this end, the fundamental pillars of this model, taken from the WHO recommendations, are:

- To involve professionals in the new care model through teamwork and the delegation of powers.
- To act to stabilize CD from its origin, especially cardiovascular risk, to delay and mitigate its progression as much as possible.



- To improve complex cases management by establishing specific strategies aimed at stabilizing the disease, avoiding cycles of decompensation, and delaying the appearance of complications, to try to reduce and prevent unnecessary acute hospital admissions, considering these as a failure of the care model.
- To involve the patient and, where possible, their family in preventive self-care and in developing healthy habits and lifestyles.

The proposed model's challenge focuses on starting the intervention not when the clinical exacerbation begins but in periods of stability, developing the actions that have proven useful in preventing relapses.

Five Elements of Model Success in Stable Patients

The proposed model's challenge focuses on starting the intervention not when the clinical exacerbation begins but in periods of stability, developing the actions that have proven useful in preventing relapses.

In this interest in intervening when the patient is stable, 5 elements of success are identified, which are common in international experiences:

1. Identification and stratification of the population to identify complex patients and predict care needs.
2. Creation of multidisciplinary groups to care for fragile patients that establish a coordinated care project personalized to their needs, with the creation of the figure of Care Coordinator/Case Manager, who acts as an intermediary in all the patient's needs in their interactions with the health system and is responsible for coordinating the personalized plan indicated in point 4 below.
3. Involvement of the patient in the management of their disease, taking the role of active health agent with the capacity to act to stabilize their disease and prevent the appearance of complications and relapses.
4. Individualized care plan, including social needs, aimed at achieving disease stability; anticipating potential problems; delaying the progression of the disease and the appearance of complications and preventing relapses.



5. Use information and communication technologies (ICT) to create interaction networks through non-face-to-face mechanisms, sharing the same EMR, remotely monitoring the patient's clinical status, and intervening early.

Main Transformations of the Model

The main transformations can be split into 3 sections, which set the future horizon on the topic, focusing on the patient, the care model, and the health system:

Future Patient



Active patient experts in managing their disease and practicing a healthy lifestyle:

- Know their illness and the factors that condition it.
- Wants to know all the possible therapeutic alternatives.
- Participates in decisions that affect their illness.
- Is actively involved in managing their illness (self-care).
- Is Interested in establishing a relationship of trust and commitment with their doctor.
- Is permanently connected through ICT to intervene in the management of their disease and is willing to network as another agent in the health system.

Future Care Model



Collaborative teams focused on prevention, and anticipation of patient needs, using new forms of non-face-to-face care:

- Multidisciplinary teams of professionals organized in collaborative groups that agree on ways of doing things and communicate with each other.
- Preventive activities and anticipation of destabilization cycles.
- Non-face-to-face actions and/or remote monitoring to stabilize the course of the disease.
- Promotion of healthy lifestyles using various interaction channels, including mental health support to promote acceptance and adaptation of lifestyle to conditions derived from CD.

Future Healthcare System



The aim is to develop a health system that rigorously evaluates health outcomes and encourages best practices:

- Collaborative work based on agreements and operations in care networks of integrated services within and between levels of care.
- Payment of benefits per capita to the dependent population promotes a care model centered on the person, which is preventive and proactive in managing the disease.
- Health evaluation systems based on robust internationally validated indicators.
- Decentralization of commitment and responsibility and clinical leadership (Clinical Management).

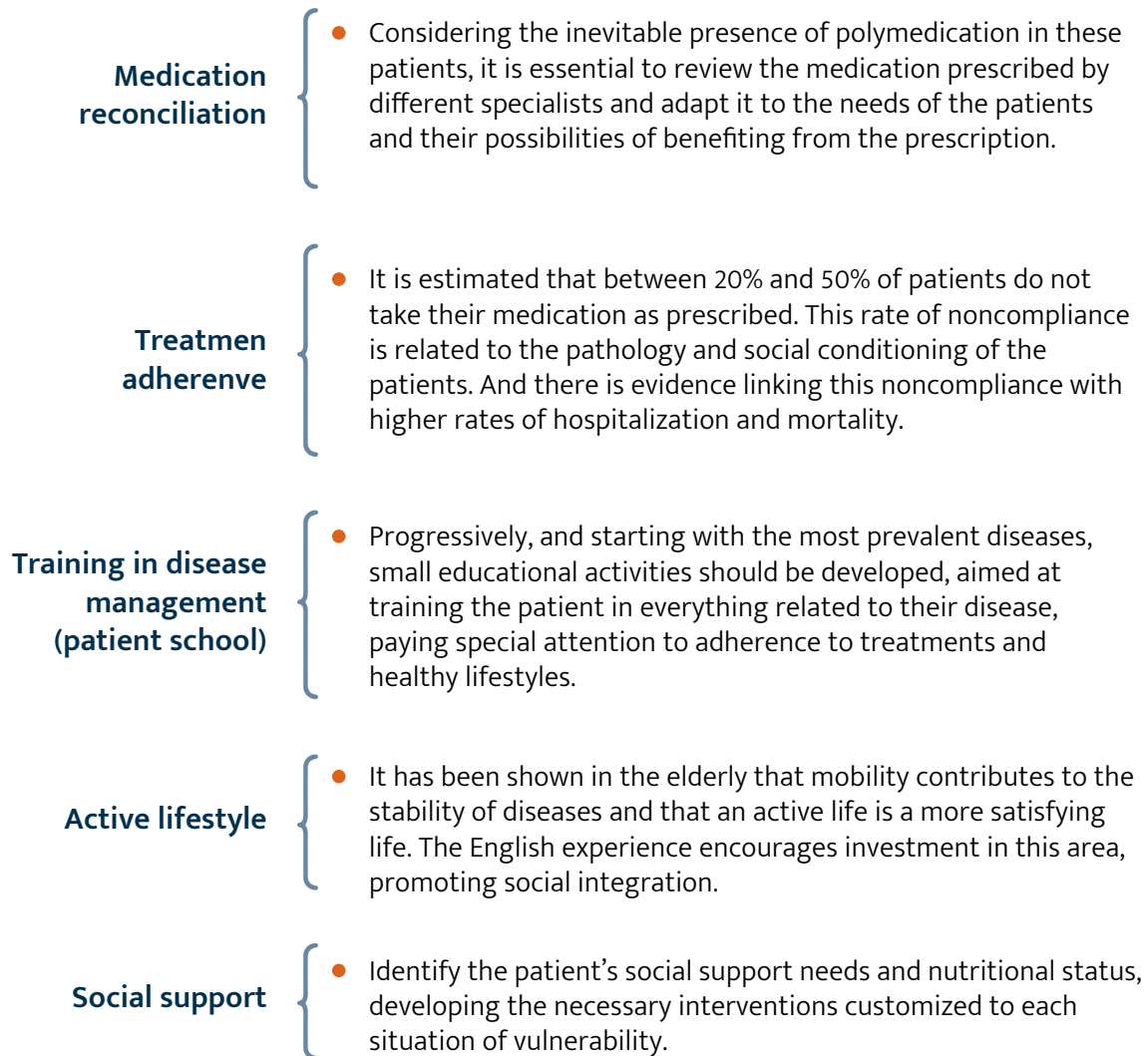
[More information](#)



Value contributions of the care model

The main contributions of this care model, which with a balanced combination decisively led to stabilizing the disease and reducing decompensations, can be summarized in the following points:

Figure 6. Value contributions of the future care model



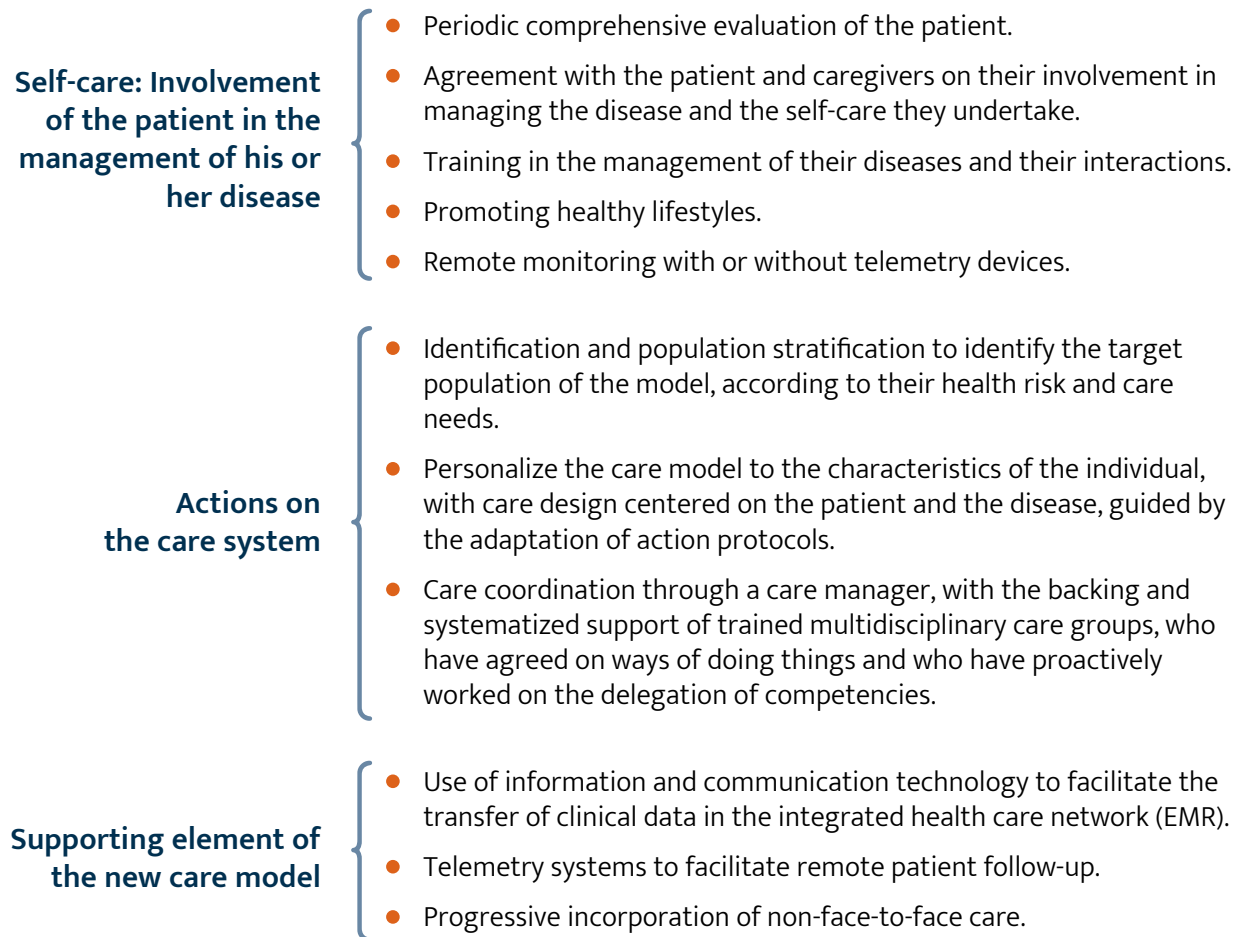
Source: The authors



Innovations in the healthcare system of the future

To achieve these objectives, the following main innovations are identified and grouped into actions on the patient, the care, and the support system (See Figure 7).

Figure 7. Innovations in the future healthcare system



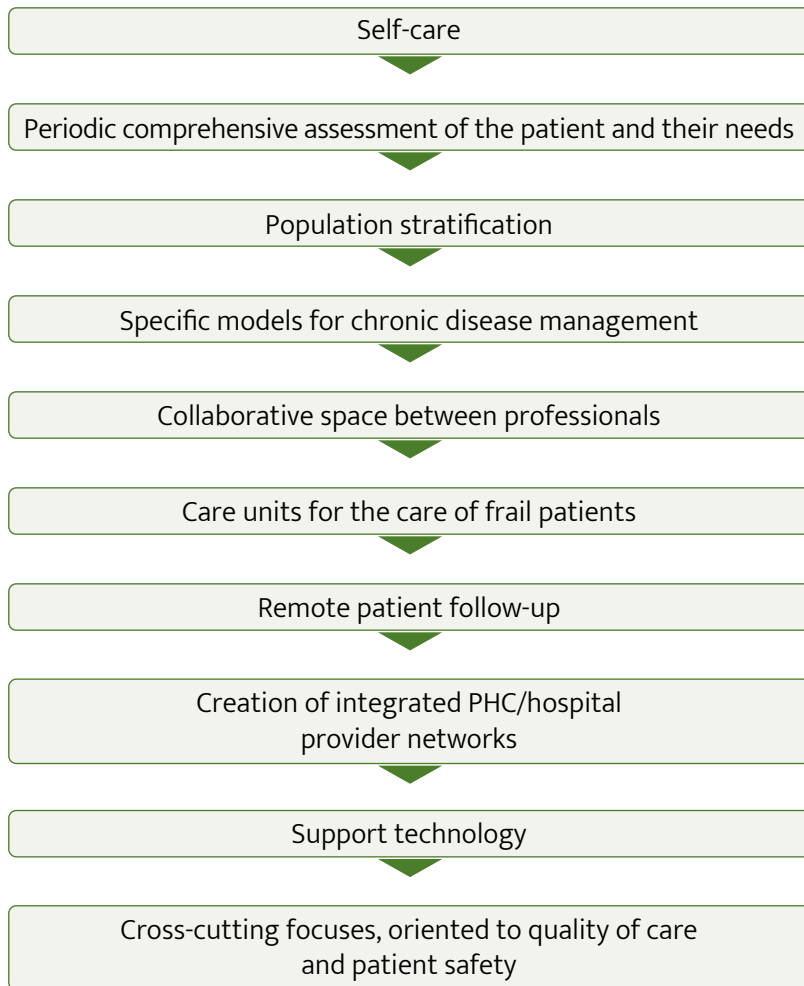
Source: The authors

Basic Elements of the Proposal

The main initiatives proposed below are described according to international experience to optimize the CD care model and move towards a comprehensive, patient-centered model of multimorbidity care.



Figure 8. Central elements of the proposal. Proposal to optimize the care model for people with chronic diseases and multimorbidity. Uruguay 2023



Source: The authors

Self care

The citizen's involvement with their health and the patient with their illness is probably the factor that has the greatest potential in improving the results of the health system and in achieving a healthier society with a lower burden of disease, with its implication in its economic sustainability. The promotion of healthy lifestyles and the commitment of citizens to its practice is the core element of the Health Plans. It is expected that an active citizen involved with their health will contribute essential elements to their care and, consequently, more years of life in good health and improvement of the macro indicators for evaluating society's level of health.



The active patient has greater guarantees of care and adherence to treatment, allowing, at the same time, opportunities to act on the conditions that destabilize their disease and to intensify treatment at the beginning of cycles of clinical destabilization. Consequently, it is possible to improve the disease's control parameters, provide greater stability, and lower the frequency and intensity of cycles of worsening and reduction in the use of health services.

The main activities recommended to ensure that the patient becomes empowered and active about their illness are:

- **Training in disease management:** development of Patient School. The stratification of patients with CD allows the identification of cohorts with common CD characteristics, but also, by applying successive filters, common socioeconomic aspects and, especially, everyday needs, on which the patient school can develop its activity.
- **Strengthen adherence to treatment:** dosage simplification, reminders, preparation of medication by pharmacists, etc.
- **Periodic non-face-to-face contacts** to reinforce involvement with your health..

Comprehensive Periodic Evaluation of the Patient and their Needs

Whenever possible, a periodic comprehensive evaluation using standardized assessment tools and a clinical interview should be performed. The assessment should preferably consider all current and previous information from other resources, such as clinical records and other medical evaluations. The complexity of conditions, including treatment burden, drug interactions, and disease patterns, should be evaluated.

The comprehensive assessment should identify key aspects to be used in any subsequent care planning steps, including patient empowerment

The promotion of healthy lifestyles and the commitment of citizens to its practice is the core element of the Health Plans. It is expected that an active citizen involved with their health will contribute essential elements to their care.



and resource allocation through the construction of an individualized plan. The care plan is reviewed and updated during subsequent periodic evaluations and shared among care providers, patients, and their families.

Population Stratification

Stratification systems make it possible to identify patients who are predicted to require a high level of care to initiate preventive activities to delay an unfavorable clinical course and the cataloging of the population served into homogeneous groups of patients about their multimorbidity and the intensity of care they require, and refinement with the application of successive filters makes it possible to identify other common characteristics in groups of patients, useful for adapting health services to these groups.

Thus, for example, the characterization of patients who are close or far from a facility makes it possible to define better frequencies of direct contact or telematic contacts for control; the characterization of specific situations of risk of vulnerability such as living alone makes it possible to program more frequent contacts preventively; and the identification of socioeconomic vulnerabilities makes it possible to adjust the support work with social assistance. The greater predictive capacity of needs makes it possible to improve care planning, including the training of the healthcare team, with an impact on the quality of care, both technical and as perceived by the patient and their family and their social environment.

Despite these potential benefits, implementing risk stratification and using its conclusions in care is complex and requires not only institutional decisions but also the early and participatory involvement of healthcare teams, especially physicians, to achieve adoption of the change in model towards a conception of population health while simultaneously providing care focused on the needs of the person.¹¹

11 Arce et al. *BMC Family Practice* 2014, 15:150 <http://www.biomedcentral.com/1471-2296/15/150>



Specific Models for Chronic Disease Management

Disease management is a process of optimizing the provision of care by coordinating resources across the entire health system throughout the disease's life cycle, based on scientific evidence, and aimed at improving quality and results at the lowest possible cost. It is oriented towards the disease from a comprehensive and global perspective, incorporating preventive and curative actions and involving all actors in the health system.

Its predominant objectives are prevention, clinical effectiveness, and efficiency. They usually incorporate evaluation elements through indicators of good results, prepared with the creation of groups of experts that design the care protocol for the most prevalent NCDs and with the most significant impact on the population, considering the interaction with other diseases and their treatments to channel best practices for patients with multimorbidity. Its level of development can be driven by the regulatory authority or the institutional level with supervision, guidance, or approval by the health auth.

Collaborative Spaces between Professionals

The creation of multidisciplinary teams is present in all CD care models and aims to integrate health care and facilitate continuity of care between the professionals who participate in care. They are usually composed of primary care doctors, specialist doctors, nurses, pharmacists, and social workers, eventually supported by physiotherapists, nutritionists, and trained administrative staff. Most international experiences hand over the leadership of these groups to the Primary Care doctor. In the case of Uruguay, it would probably be the role to be assumed by family doctors, trained in this new role.

Different tools facilitate rapport between the diversity of professionals, among them:

- Shared patient medical records, prior authorization from the patient, through which the concept of population EMR arises.
- Development of skills collaboratively: clinical sessions and face-to-face and non-face-to-face training activities.
- Agreements on how each person in the group acts through consensus are needed.



- Use of direct communication through face-to-face and non-face-to-face mechanisms.
- Implementation of specific strategies for managing various clinical problems for the best management of diseases.

Care Units for the Care of Fragile Patients

These are hospital units focused on the care of chronically fragile patients, especially those with high risk of hospitalization and high multimorbidity. They include a team made up of doctors (usually geriatricians or internists), nurses, pharmacists, and social workers who work closely in a collaborative environment with specialists and with a close interrelation with primary care. A critical role is that of liaison with primary health care, usually assigned to a nurse trained for this purpose to develop articulation with case managers (liaison nurse).

These teams analyze and manage all the patients' needs, including: i) patient training in the management of their disease; ii) medication reconciliation; iii) remote monitoring – telecare; and iv) social support. They balance different patient care modalities by combining hospitalization, in-person outpatient care, non-face-to-face action, and remote monitoring at the patient's home with telemetry systems.

Remote Patient Monitoring

These care models are used for changing clinical conditions in which frequent adjustments in treatment are necessary. The clinical conditions required to obtain benefits are: i) disease with exacerbation cycles in which mobility has a determining effect; ii) with treatments that avoid or reduce the intensity of cycles of clinical instability; and iii) diseases in which a periodic, sometimes daily, adjustment of medication can have a benefit in stabilizing the disease.

There are experiences in managing NCDs. In all of them, the patient responds daily or periodically to a questionnaire, and measures various variables such as pulse oximetry, blood glucose, blood pressure, or weight. Some algorithms early predict unstable situations, and thus, professionals contact the patient, and thus, professionals contact the patient. These

The creation of multidisciplinary teams is present in all CD care models and aims to integrate health care and facilitate continuity of care between the professionals who participate in care.



experiences enhance the patient's involvement in managing their disease and take advantage of the potential of rehabilitation to stabilize and improve the underlying situation of the disease.

Creation of Integrated Supplier Networks. Integration Primary/Hospital Care

These experiences are based on the creation of integrated networks of providers that provide all the health and social services that patients need. They integrate into a single healthcare network all professionals with the potential to add value to the patient including at least: primary care doctors, specialist doctors, nurses, pharmacists, social workers, nutritionists, and physiotherapists. These networks are highly oriented toward preventive actions and stabilizing the clinical course of the disease in the belief that it is the best strategy to avoid hospitalizations, which represent the most unfavorable and expensive care modality for the patient.

The main experience of integrated service networks is Kaiser Permanente, an integrated care consortium that operates as a health subsystem, in charge of underwriting and provisioning. It is a model of vertical integration based on integrated health service networks. Its operating principles are: population health approach, clinical leadership, integrated care, minimization of hospitalization, and optimization of medical time. Kaiser Permanente has been recognized as an organization with multiple disease prevention initiatives and is the world's most valued organization in this field. . It has also received several awards for leadership in digital health and in the creation of non-face-to-face interaction networks, training the patient as an active part of these networks.

Support Technology

These experiences have relevant technological support and significantly facilitate communication between all the agents involved. The main highlights are: i) unified EMR that integrates information from all levels of care; ii) patient telecare and telemonitoring systems; iii) electronic prescription; and iv) interaction systems that facilitate network operation.

These networks are highly oriented toward preventive actions and stabilizing the clinical course of the disease in the belief that it is the best strategy to avoid hospitalizations, which represent the most unfavorable and expensive care modality for the patient.



All these systems allow the interoperability of the different professionals who participate in patient care, facilitate care coordination and continuity of care, and facilitate the evaluation of results.

Transversal Focuses, oriented to the Quality of Care and Patient Safety

While all the points mentioned contribute to a higher-quality approach to care, quality aspects more related to patient safety may require specific approaches. These transversal work axes complement the previous axes to achieve highly effective patient-centered care.

As has been reiterated, patients with CD, especially multimorbid patients, are highly frequent patients at different levels of care. Due to these characteristics, errors in care are not uncommon and it is suggested that the risks can be minimized with specific approaches to some quality areas that are related to patient safety. Among them, without exhausting the possibilities, the following stand out: i) patient identification; ii) improvements in effective communication; iii) safety of high alert medications, especially in instances of transition of care; iv) prevention of falls; and v) incident management, under the focus of staff involvement in incident reporting, as a strategy for transforming the error in progress.

More information





Photography: DCStudio | Freepik



Projection

Future possibilities are seen in the short and medium term through the proposal's implementation to optimize the care model for people with CD and multimorbidity in the country, starting from the baseline raised by this study. This work made possible the identification of strengths and points of improvement for each of the current care models and the need to advance in the development of a comprehensive, person-centered model for addressing multimorbidity. Additionally, it is proposed that follow-up and monitoring indicators focused on quality and safety of care and results and impact on the population and the system be designed to achieve real-time adjustments and provide greater efficiency to the health system.

Regarding long-term projections, there are possibilities for evaluating the implementation of the care model, and regional collaborative work in favor of the care of people with multimorbidity in terms of sharing successful experiences and lessons learned regarding better health outcomes, quality of life of this population, and efficiency in the use of health system resources.





The importance of Chronic Disease (CD) in Uruguay has been reported and analyzed for many years and in multiple studies. Its impact on mortality and its high cost of care was a determining factor in the generation of various health promotion strategies, primary and secondary prevention, whose effect has begun to be perceived in the change in trend in some specific areas, such as cardiovascular disease.

However, beyond measures to include programs and benefits specific for the care of CD and the general organization guidelines of the health services to satisfy the spontaneous demand generated by the EC, there have not been many initiatives to review health care models.

CD and especially, to the problem of multimorbidity, as it exists in other countries facing a similar epidemiological situation. An important exception is the “Guide of frailty in older adults: practical criteria and instruments of investigations at the first level of care”, developed by the Ministry of Health Public of Uruguay (MSP) and made available to the System providers National Integrated Health.

The Technical Assistance accompanied by the World Bank and developed under the guidance and support from the General Directorate of Health and the Disease Program Chronicle of the MSP, is focused on beginning to fill that space. In the first phase, provided an analysis of the disease care models more prevalent chronic diseases and multimorbidity. In the second, he collected the specific strategies for the stratification of populations in charge of the comprehensive providers with various parameters of CE analysis, among them, multimorbidity and its economic impact in terms of proportion of expenditure institutional that their attention generates. In the third phase, progress is made in the proposal gradual development of a comprehensive model of care for multimorbidity, also using as essential input, current international experiences in attention to this problem.