



Artículo original

Risk Factors in Chronic Diseases – Control with an Active Epidemiological Surveillance System: one step further with the STEPwise model

Factores de riesgo en enfermedades crónicas. Control con un sistema activo de vigilancia epidemiológica: un paso más allá con el modelo STEPwise

Fatores de risco em doenças Crônicas. Controle com um Sistema de Vigilância Epidemiológica Ativa: Um passo adiante com o modelo STEPwise

Recibido: 12 | 09 | 2019

Aprobado: 23 | 10 | 2019

DOI: <https://doi.org/10.18270/rsb.v9i2.2791>

How to cite:

Rodríguez GT. Risk Factors in Chronic Diseases. Control with an Active Epidemiological Surveillance System: One step further with the STEPwise model. Rev. salud. bosque. 2019;9(2):4-17. DOI: <https://doi.org/10.18270/rsb.v9i2.2791>.

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Summary

It has long been known that chronic diseases are often the result of prolonged exposure to certain environmental, lifestyle or socio-economic factors. It is also recognized that chronic diseases can be prevented, detected and controlled; but the reality is that the disease profile in a developing country like Colombia demonstrates a large burden of chronic diseases, reflected in most of its communities. This problem is also the result of an erroneous public health approach, focusing on medical treatment for the later stages of the disease, living prevention to a secondary role.

At the individual level, a health system like Colombian's framework do not perform enough work and efforts for early detection and rapid actions to address modifiable risk factors. Individual and population-based measures against chronic disease risk factors are carried out sporadically for some people, but not as a preventive public policy.

Therefore, complimenting the need for activities on the determinants of population health, the purpose of this proposal is directed to the management and control of these deficiencies through the implementation of an active surveillance system. Using the World Health Organization step-by-step model as the conceptual framework, this specific surveillance system is established as a new strategy through which health data at the community level can be analyzed, expanded, and integrated into existing general public health surveillance and the infrastructure of the Colombian's health programs. As a result, this document intends to lay out the foundations for these new strategic tools to inform suitable planning with the adaptation of interventions; aiming at achieving optimal early detection and rapid intervention of risk factors. Closing these gaps should be another step towards reaching a preventive approach to address the enormous burden of chronic diseases for the Colombian population.

Keywords: chronic diseases, non-communicable diseases, epidemiological surveillance, risk factors, public health, active surveillance, WHO STEPwise model.

Resumen

Desde buen tiempo atrás, se es conocido que las enfermedades crónicas suelen ser consecuencia de una exposición prolongada a ciertos factores ambientales, de estilo de vida o socioeconómicos. Igualmente se reconoce que las enfermedades crónicas pueden prevenirse, detectarse y controlarse, la realidad es que el perfil de la enfermedad en Colombia demuestra una gran carga de enfermedades crónicas reflejadas en la mayoría de sus comunidades. Este problema es también el resultado de un enfoque de salud pública erróneo, centrado en el tratamiento médico para las últimas etapas de la enfermedad, dejando la prevención a un papel secundario.

A nivel individual, los marcos del sistema de salud colombiano no realizan el trabajo y los esfuerzos suficientes para la detección temprana y las acciones rápidas para abordar los factores de riesgo modificables. Las medidas individuales y poblacionales contra factores de riesgo de enfermedades crónicas, en realidad, se llevan a cabo esporádicamente para algunas personas, pero no como una política pública preventiva.

Por lo tanto, complementando la necesidad de actividades sobre los determinantes de la salud poblacional, el propósito de esta propuesta está dirigido al manejo y control de estas deficiencias mediante la implementación de un sistema de vigilancia activa. Teniendo el modelo paso a paso de la Organización Mundial de la Salud como marco conceptual, este sistema de vigilancia específico se establece como una nueva estrategia mediante la cual los datos de salud a nivel comunitario pueden analizarse, ampliarse e integrarse en la vigilancia de salud pública general existente y la infraestructura del programa de salud colombiano. Como resultado, este documento tiene la intención de establecer los fundamentos de estas nuevas herramientas estratégicas para informar la planificación territorial con la adaptación de las intervenciones, con el objetivo de lograr una detección temprana óptima y una rápida intervención de los factores de riesgo. Cerrar estas brechas debe ser otro paso hacia el logro de un enfoque preventivo como abordaje de la enorme carga de enfermedades crónicas para la población colombiana.

Palabras claves: enfermedades crónicas, enfermedades no transmisibles, vigilancia epidemiológica, factores de riesgo, salud pública, vigilancia activa, stepwise.

Resumo

Há muito tempo sabe-se que as doenças crônicas são geralmente o resultado de uma exposição prolongada a certos fatores ambientais, de estilo de vida ou socioeconômicos. Também se reconhece que as doenças crônicas podem ser prevenidas, detectadas e controladas, porém o perfil de doenças na Colômbia mostra uma grande carga de doenças crônicas refletida na maioria das comunidades. Esse fato reflete uma abordagem errada da saúde pública, focada no tratamento médico para as fases posteriores da doença, ficando a prevenção em um papel secundário.

No nível individual, as estruturas do sistema de saúde colombiano não fazem esforço suficiente para detectar precocemente as doenças e agir rapidamente para lidar com os fatores de risco modificáveis. Medidas individuais e populacionais contra fatores de risco para doenças crônicas são esporádica e parcialmente realizadas, mas não maciçamente como política pública preventiva.

Portanto, complementando a necessidade de atividades sobre os determinantes da saúde da população, o objetivo desta proposta é direcionar ao gerenciamento e controle dessas deficiências por meio da implementação de um sistema de vigilância ativo. O modelo de Passo a passo, proposto pela Organização Mundial da Saúde foi aplicado, trata-se de um sistema de vigilância específico, estabelecido como uma nova estratégia pela qual os dados de saúde no nível da comunidade podem ser analisados, ampliados e integrados à vigilância da saúde pública geral e infraestrutura existentes do programa de saúde colombiano. Este documento pretende estabelecer novas ferramentas estratégicas para informar o planejamento territorial adaptando intervenções para conseguir detectar precocemente o fator de risco e intervir-lo rapidamente. Preencher essas lacunas contribui para uma abordagem preventiva para enfrentar o enorme fardo de doenças crônicas da população colombiana.

Palavras-chave: doenças crônicas, doenças não transmissíveis, vigilância epidemiológica, fatores de risco, saúde pública, vigilância ativa, stepwise.

Introduction and Justification

The current burden caused by chronic diseases

Chronic diseases (CD) or non-communicable diseases (NCD), or pathologies other than those caused by infectious agents, include a long list of conditions such as diseases of the cardiovascular system, diabetes, chronic obstructive pulmonary disease (COPD), the mayor

forms of cancer, Alzheimer's disease, and kidney disease, among others (1). The main risk factors that cause these diseases are directly related to smoking, inappropriate diet, insufficient physical activity, excessive alcohol consumption, and inadequate interaction of some social determinants of health (2). Usually, these conditions develop over a long period of time, leading to a high burden, expressed in premature death, disability, or poor quality of life, with the subsequent social and economic cost to health systems (3). International

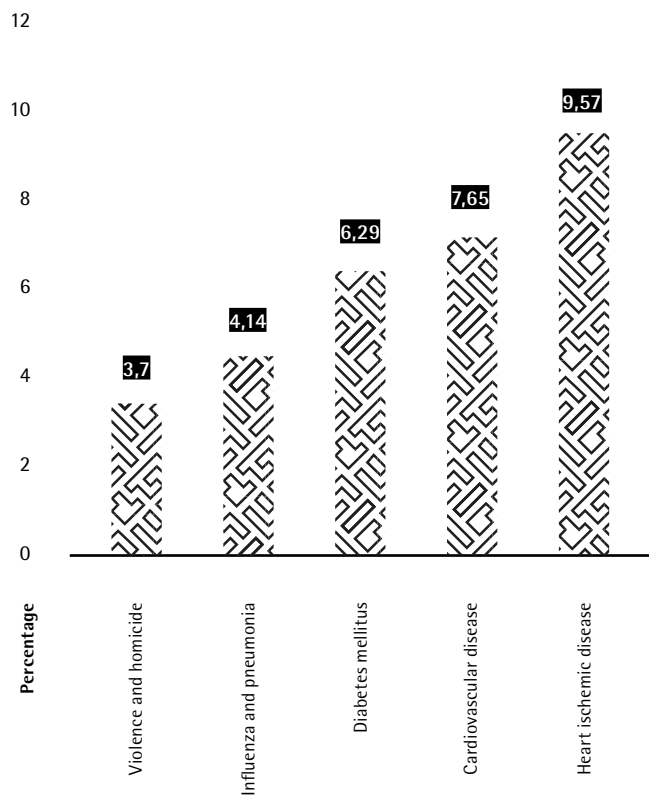
agencies such as the World Health Organization (WHO) have been warning about the gradual increase in CD, considering the problem as a current epidemic in both developed and developing countries (4,5).

In a country like Colombia, data from 2012 shows that 67% of all deaths, and 80% of all disease burden are due to CD, especially cardiovascular diseases, cancer, diabetes mellitus and COPD. This phenomenon is much higher than infectious diseases, responsible for 11% of all deaths, followed by violence-homicide in 17% and traffic accidents in 5.4% (6). Compared to countries in the region, in Colombia, the mortality rate from heart disease highly exceeds countries such as Peru, Chile, El Salvador and Ecuador (7). Consequently, countries with high prevalence of NCD as Colombia bear the economic consequences in term of loss of

productivity and constant drain of services (see also figures 1, 2, & 3)

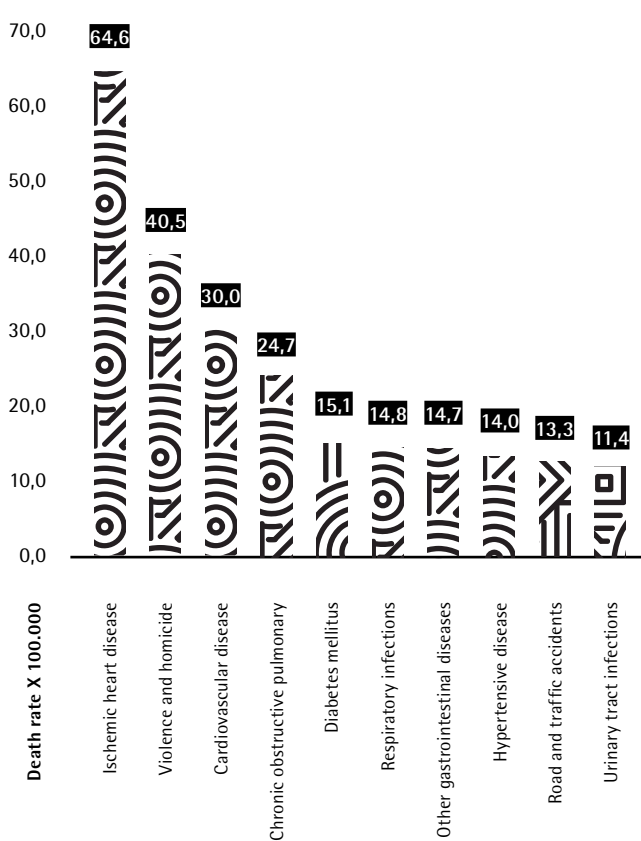
However, although chronic diseases such as diabetes and cardiovascular disease pose serious health risks, several studies have shown that these diseases can be controlled and prevented through modification of risk factors (8, 9). A diabetes prevention program established that modification of eating and exercise habits decreases the probability that individuals with impaired glucose tolerance will develop type 2 diabetes (10). Similarly, clear correlated evidence has been observed since one of the first cardiovascular-related research, the Framingham Heart Study. This study indicates that overweight, smoking, lack of exercise, and unhealthy eating habits are all related to the development of heart disease (11), and that the modification of these risk factors can reduce mortality rates from heart disease (12).

Fig. 1: Main Causes of Mortality in Latin America Et the Caribbean 2008



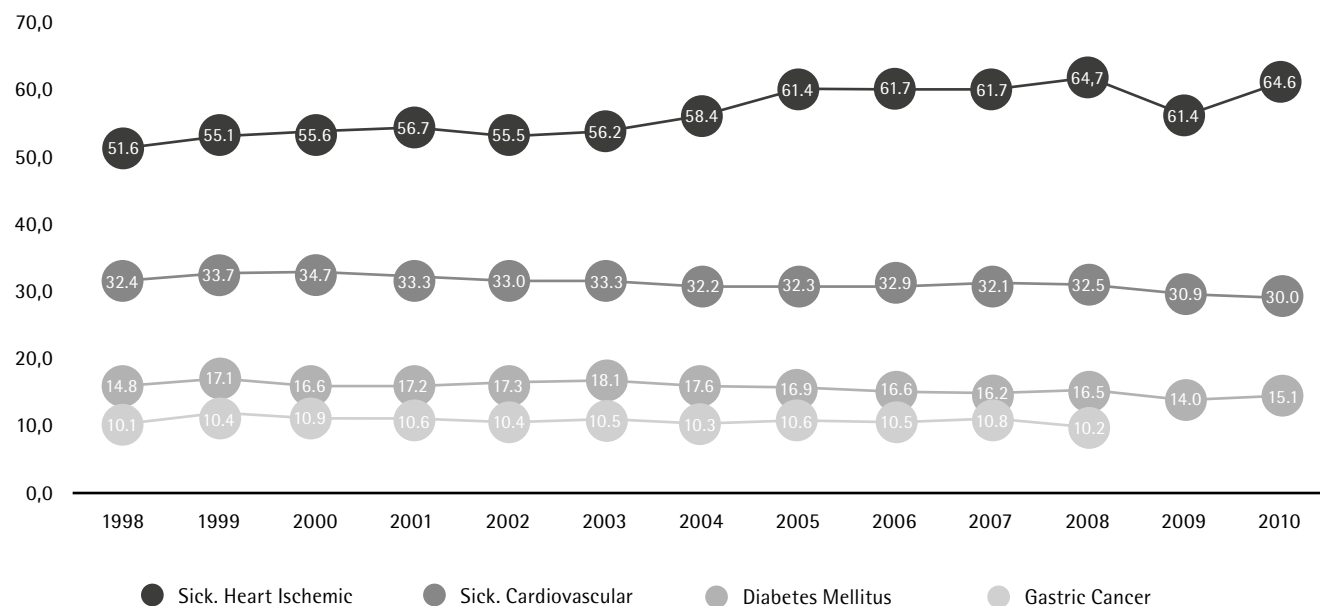
Source: Osorio MA et al. (2012). "Así Vamos en Salud". Annual Report, Chapter 4. Data retrieved from Regional Observatory for Health – PAHO 2012.

Fig. 2: Main Causes of Mortality in Colombia 2010



Source: Osorio MA et al. (2012). "Así Vamos en Salud". Annual Report, Chapter 4. Data extracted from Vital Statistics– DANE 2010.

Fig. 3: Chronic Disease Behavior and Main Causes of Mortality in Colombia



Source: Adapted from Osorio MA et al. "Así Vamos en Salud", Annual Report -2012, Chapter 4 Et Pulido A. "Así Vamos en Salud", Annual Report -2009. Data extracted from Vital Statistics- DANE 2010.

Current limitations of epidemiological surveillance systems for chronic diseases

In general, epidemiological surveillance systems are classified into two types: active or passive (13). *Active surveillance* is initiated by an agency, such as a Department or Ministry of Health, in which the agency regularly or periodically requests or seeks information or data from its various agencies or provider entities. Conversely, *passive surveillance* is initiated by the data source, often a medical center, clinical facility, laboratory, hospital, etc., rather than the agency (department or Ministry of health); in which, this provider routinely supplies data to the agency (14). In the health sector, most epidemiological surveillance systems worldwide are passive, because they are financially cheaper and easier to run (15).

The WHO defines epidemiological surveillance as "the permanent and systemic collection, location and analysis of data and information, added to the pertinent dissemination thereof, for those groups of individuals who need to be informed, so that based on this, timely actions can be taken". The Atlanta Center of Disease Prevention and Control (CDC) goes a step further and establishes the use of surveillance to

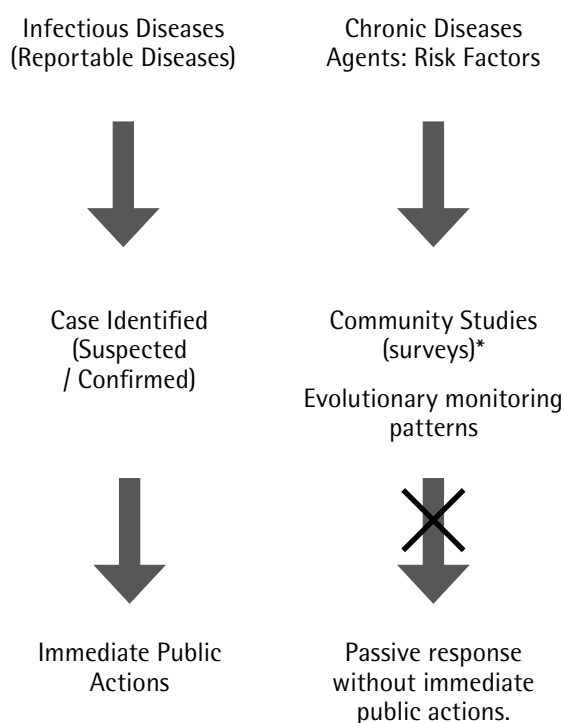
develop, implement and evaluate public health policies and actions (16). However, as we shall see below, these concepts of surveillance apply and function perfectly for *infectious diseases*, but to a much lesser stand for chronic or non-communicable diseases (NCD). In general, epidemiological surveillance systems for chronic diseases show the following flaws:

First, there is an inappropriate dissemination of findings and reporting from ongoing NCD surveillance systems. With marked discrepancy with infectious disease, currently, the goal of ongoing or long-term surveillance practices for NCD is monitor trends over time, and often do not provide an immediate public health response. By contrast, lethal infectious diseases are considered a national, regional or local threat, and therefore, a notifiable and mandatory reportable disease. Thus, cases of reportable infectious diseases are identified by a physician or practitioner or other health care provider according to standard case definitions. The case is then reported to the health local and provincial health authorities, prompting, usually, a public health action or response (17). In other words, unfortunately the long-standing outbreaks and coming epidemics from non-communicable diseases are observed and evaluated with different lenses, within a passive perspective

Second, the reportable disease concept is biased and data for NCD is incomplete and often they are not timely. The reportable disease concept implies for diseases in which timely information regarding individual cases is necessary for prevention and control. But clearly, timeliness is a priority attribute just for outbreak detection, mainly for infectious diseases. Moreover, a disease mandated as reportable includes: “one that it may be associated with severe illness and death, it may require specialized treatment available through public health, it has the potential to cause outbreaks and it can be prevented through interventions” (18). Thus, although CD meets all these criteria, unfortunately the concept is eminently biased for infectious diseases, with a passive response in order for CD, or differing the problem often for too late actions.

Third, the data collection is disease-centered and not patient-centered; that is, there is a multiplicity of categorical system centered on syndromes and diseases.

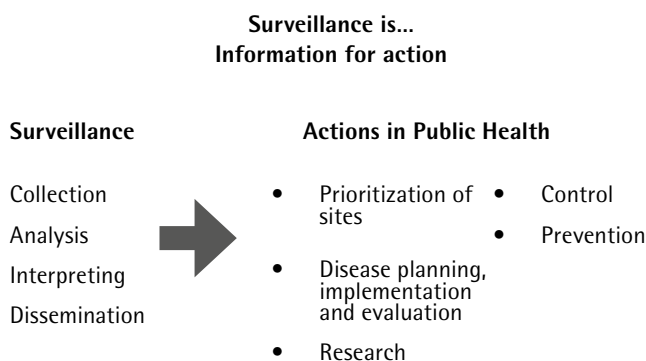
Fig. 4: Infectious Diseases vs. Chronic Diseases: Levels of Response and Actions in Public Health.



Examples of Surveillance Systems*
WHO – STEPwise Instruments for chronic diseases.
*ORRFSS – Ontario Rapid Risk Factor Surveillance System

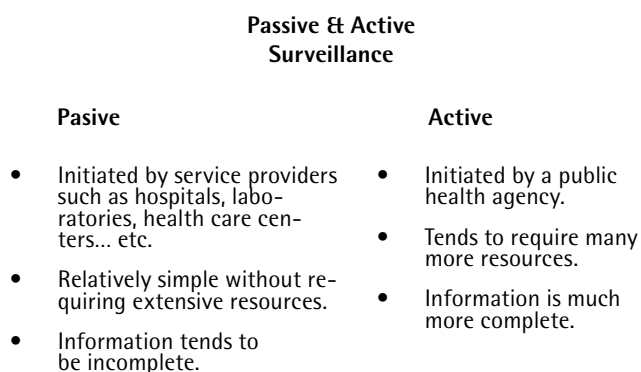
Countries around the world have a variety of surveillance systems that are not integrated and not linked, producing an extreme burden on reporting sources, lots of duplication, and lack of appropriate use of the data. Chaotic situation that is happening due to the ways in which different reporting systems have been set up independently; to the point that data volume and management has become complex and overwhelming. There is currently a trend, including developed and developing countries, to organize an epidemiological surveillance system for each disease or syndrome considered a threat to the population; emphasizing the current curative approach, and leaving health promotion and disease prevention, with their risk factors, in a secondary role (19). (see also figures 4, 5 & 6)

Fig. 5: Epidemiological surveillance systems. Applicability in infectious diseases with minimal use in chronic diseases.



Source. CDC Atlanta, 1992

Fig. 6: Differences between active and passive epidemiological surveillance systems*



*Adapted from McNabb, S. et al. (2016)

In this way, the immense burden represented by chronic diseases can be observed, added to the limiting developments of their surveillance system. It is evident that CD, and in particular their risk factors, require a different management than the current curative approach, based eminently on the disease. The first measure to address the problem must be through a *right preventive approach*; improving in the first instance the limitations of surveillance systems on risk factors, with the aim of achieving a timely detection and immediate intervention on them. Thus, the purpose of this Discussion Paper will have the following central objectives:

- Highlight the overwhelming burden of chronic disease at the global, regional and local levels,
- Document the current limitations of epidemiological surveillance systems for chronic diseases,
- Establish an essentially preventive approach to the management and control of chronic non-communicable diseases,
- Lay out the foundations for an active epidemiological surveillance system as a pressing and essential proposal in public health, oriented to the management and control of the risk factors for chronic diseases,
- Describe the World Health Organization's stepwise model as a theoretical framework for the assessment of chronic disease risk factors,
- Propose the transformation of the stepwise model as a passive reporting system into an active surveillance system, shifting the management and control of chronic disease risk factors,
- Propose an additional step to the stepwise model, adding an active surveillance system, based on risk levels, and using referral and counter-referral as a crucial strategy for the management of risk factors,
- Describe the operation of this new surveillance model for chronic diseases with their respective follow-up in a developing country like Colombia, along with response of public actions by the different actors responsible for the health and social security system,
- Establish a proposal for evaluating and monitoring the new epidemiological surveillance model,
- Describe the benefits and potential limitation of this new active epidemiological surveillance system

Methodology

As the relationship between modifiable risk factors and the onset and progression of these diseases has become increasingly clear, the model of the World Health Organization, commonly known as STEPwise (20), has been seen as a promising theoretical framework for early detection of modifiable risk factors, and therefore, behavioral change interventions. By conducting a survey (basic questionnaire) along with physical and biochemical measurements, the tool and its instruments focusses on obtaining core data on individual established risk factors that determine the major disease burden, as such: (see also figure 7)

- smoking (daily and occasional)
- insufficient physical activity
- unhealthy/poor diet (daily consumption of less than 5 servings of fruit and vegetables)
- raised blood pressure
- overweight and obesity
- raised cholesterol
- raised blood sugar

The framework had been used exclusively as a measurement tool for reporting patterns and trends over time at the community level with national or regional prevalence STEPS surveys, but not as an instrument for individualized behavioral change intervention, or individual referral for immediate public actions. Thus, based on this framework, this proposal aims to fulfil this gap by creating an active surveillance system, and tackling with a preventive approach chronic disease risk factors at the individual and community level. In other word, complementing the current experience with the stepwise model, this initiative brings or goes one step beyond the current concept and use.

Description of the conceptual framework

Currently the model is used for collective (community) study of risk factors through steps. That is, by means of a survey (basic questionnaire) together with taking physical, anthropometric and biochemical measurements, the instruments of the model focus on obtaining central data on established risk factors in peoples, which are the determinants of the disease burden for CD. *In other word, as it is so far with a passive perspective around*

CD surveillance, the model has been used exclusively as a tool to determine chronic disease patterns and trends at the community/population level over time, by using surveys and subsequent prevalence assessment,

at local, regional and even national levels (21). Several countries around the world have benefited from the stepwise model, highlighting two studies carried out in Colombia:

Figure 7. STEPwise model – Evaluative STEPS of risk factors in Chronic Diseases

Measures	Step 1 (Self-Report)	Step 2 (Physical)	Step 3 (Biochemical)
Core	Socio-economic and demographic variables, years of education, tobacco and alcohol use, physical inactivity, intake of fruit and vegetables.	Measure weight and height, waist circumference, blood pressure	Fasting blood sugar, total cholesterol
Expanded Core	Ethnicity, income, education, household indicators, dietary patterns.	Hip circumference, pulse rate	HDL-cholesterol, triglycerides
Optional (Examples)	Other health-related behaviors, mental health, disability, injury	Time walked, pedometer, skinfold thickness	Oral glucose tolerance test, urine examination

Source: World Health Organization (WHO – 2015). The STEPwise method of surveillance, available at: <http://www.who.int/chp/steps/es/>

- The first one is a local study, in 2011, in the city of Medellín, corroborating the critical load of the CD. With a basket of 3,138 participants, and a response rate of practically 100%, the study reported tobacco consumption of 18.3%, alcoholism of 64.5%, inappropriate diet in 81.6%, low level of physical activity in 80%, overweight and obesity in 46.7%, hypertension in 20.2%, diabetes in 7.6% and hypercholesterolemia in 57.7% of the participating population (22).
- The second is a 2010 regional study, in the provincial of Santander. Report which also corroborated the high prevalence of risk factors of CD in other national morbidities studies, showing that 75% of the population has at least one or two risk factors. As such, using a sample of the provincial adult population, the study revealed high tendency to physical inactivity (70.6%), diabetes (5.7%), hypercholesterolemia (37.5%), hypertension (19.5%), overweight or obesity (50.7%), tobacco use (8.2%), inappropriate alcohol consumption (25%) and inappropriate diet (94.9%) (23)

In this way, contrary to the current passive use, the present proposal intends to turn the stepwise model into an active epidemiological surveillance system with a preventive approach; adapting it, in the first instance, as an instrument for individual use (reinforcing in the

short term, the collective or community process), for early detection an immediate intervention for risk factors. That is, by adjusting the model and making use of a referral and counter-referral program, upon a time that risk factors in a patient have been evaluated and detected, immediate public health actions and responses will be carried out on them.

Primary Case Definition

The term ‘primary case definitions’ refers to the criteria in which participants in a surveillance system are organized in order to detect and select affected subjects or individuals whom are evaluated. By establishing criteria, a primary case definition becomes the main insight for clinical alertness, and therefore case findings, among stakeholder and potential sites where the surveillance system will be implemented (sentinel sites) (26).

As previously mentioned, the stepwise approach has a set of instruments, which provide a customized assessment of risk factors at three different levels or “steps”, including central, expanded, and optional measures. The step 1, is a questionnaire-based survey that evaluates each participant’s behavior and lifestyle (e.g. physical activity, diet type) along with socio-demographic risk factors. For the step 2, basic physical

measures are taken from each participant to detect related risk factors (e.g. weight, blood pressure). And similarly, during the step 3, basic laboratory criteria (biochemical measures, e.g. glycaemia, cholesterol) is established for the confirmation of risk factors (27).

Consequently, by using the stepwise parameters to be included on a primary case definition and adapting and turning this approach into a new active surveillance system, the method provides a practical way to classify each participant evaluated. As can be seen ahead, with the use of this method, the participants can be categorized into four main groups or *primary cases*, according to the level of risk given by the individual accumulation of these factors.

Results

As a discussion document and additional proposal for intervention in public health, which after the description of the theoretical conceptual framework, and based on the primary case definition, the organization and delivery of the new active surveillance for CD, will be as follows:

Implementation and Evaluation Process

Like a population-based surveillance system, all individuals between the ages of 16 and 70 are eligible to participate. However, the implementation in a social health system should be a gradual process. By using Colombia as a case study, the implementation process ought to go first through primary or pilot projects in different locations, in both contributory and subsidized schemes. Obviously, local and regional expansion requires the commitment of the regimen administrators (ARS y EPS) to their network of services and the other actors of the health security system, including the Ministry of Health, National Institute of Health, local and provincial health units and departments, among others. The establishment of pilot projects in different territorial entities is facilitated by the current infrastructure of the Colombian' service networks. Location sites or sentinel sites would correspond to the first-level service delivery networks, including community health centers, primary healthcare centers, and first-level hospitals or policlinics. In the same way, the development of the project would be in charge of the personnel currently working on these institutions and service networks; that is, health promoters, nurse assistants, chief nurses, nurse practitioners,

community-based health workers, family doctors, nutritionists, psychologists, etc.; adding to it all the logistics and administrative support for the project development (see descriptive graph of implementing the model at the Colombian's Health and Social Security System, figure 8)

Thus, before the start of any individual or group intervention, the data accumulated by the evaluative process (questionnaire or survey), along with anthropometric and biochemical measurements, will be used to categorize individual levels of risk, define case management and referral needs, according to the previously stipulated case definition. Then, at the zero-risk level (with none or minimal risk factors) the user (patient) will be motivated to continue with favorable lifestyles, being educated on aspects of doubt or significant potential risk. At level I risk (evaluated by the questionnaire or one of the physical or biochemical measurements), the individual is classified as low or moderate risk, for whom preventive and supportive measures are provided for the elimination or radical control of these factors. With level II risk (three risk factors evaluated by the mentioned measurements), the individual is classified in a high risk, for whom preventive and assisted measures are provided for the elimination and radical control. Finally, at level III risk (with four or more factors) the individual is classified in a high and complex risk, for whom preventive and intensive measures are provided, seeking maximum control and potential elimination of those factors (see also descriptive graph of operability, figure 9).

To evaluate the effect of the interventions on chronic disease factors, and therefore, the effectiveness of this surveillance system, independent cross-sectional surveys of randomly selected families and individuals (evaluative-A survey), and repeated surveys from the first-year longitudinal cohort will be conducted (evaluative-B survey). The general community progress, including for the first-year longitudinal cohort, should be evaluated, at least, every other year during the first decade. Likewise, following a formative evaluation approach, the same parameters will be carried out throughout a project development (28). This approach will ensure that programs, objectives, procedures, activities, materials and modifications will work as planned. In general, formative evaluation begin as soon as the idea for development, in this case a pilot project, is conceived (see graph for implementation process & evaluation, figure 10)

Analysis Plan & Logistics for Implementation

To be successful, this new active surveillance system needs to be integrated into a chronic care model for preventing and managing chronic disease, such as the Colombian' SGSS. Integration that must align with the structure, goals, and values of the regional and provincial health care system and the extent to which it supports efforts to improve chronic care. Therefore, the surveillance system for early detection of risk factors becomes a crucial, strategic and supportive tool to enhance and complement all components and management for a chronic disease care model development. Mentioning in detail the logistics, budget and other requirements for this project development lies beyond the scope of this initial proposal; but it needs to go into detail in a second phase, when decision-makers adopt this initiative to be incorporated in a chronic disease model. However, in summary, the main aspects for the development of this project will be:

Logistics refers to the needs required for the project implementation, such as personnel, equipment, and the computer software necessary to process the data, including data collection, data entry, plus editing and analyzing of the data. It is highly recommended that updated technology for public health will be used; for example, the use of geographic information system, such as the ArcGIS software, which in addition of geospatial analysis, it allows the mapping and location of primary cases (29).

Analysis and dissemination of this new surveillance data refers to the process of analyzing the data appropriately and disseminating them in a timely manner to those who need to know (see also figure 8). Because some of those who need to know include lay persons, policy makers and administrators, (people with little epidemiologic knowledge or background) the reports need to be simple and easy to understand. The data must be distributed in a regular and timely manner to all concerned parties so that control and prevention measures can be implemented immediately,

emphasizing the preventive benefits involved in this new surveillance system.

Budget and timeline imply the financial resources and timeliness that is based on the specifics of the action plan for each year and the general implementation process. It includes cost for personnel, equipment, supplies, and participants, having into consideration additional cost associated with it, and justifying each budget line.

Locations of the project or sentinel sites refers to the places where data are gathered from a limited number of sites, aiming to capture and convey individual information for all the cases in the target population. Specifically, for this proposal, it is having in mind a limited number of supportive stakeholders, such as local community health centers, health units, and medical offices interested in these pilot project.

Community resources refer to other linkages such as exercise programs, seniors' centers, patient education classes in community health centers, or home care agencies providing case managers.

Self-management support involves helping patients and their families acquire the skills to manage their illnesses, providing self-management tools such as blood pressure cuffs, glucometers, diets, and referrals to community resources.

Evaluation of this new surveillance systems involves final additional aspects that need to be considered before launching the program, following as mentioning above, a formative evaluation perspective. In other words, this proposal needs to keep in mind other important aspects in the short and long term, such as: potential future challenges of this type of surveillance (e.g. confidentiality issues); potential health policy implications (e.g. enhancing provision of chronic disease management and self-care); the usefulness and cost of the surveillance system (whether it is meeting its goals and cost-effectiveness); explicit attributes of the quality of the new surveillance system (internal and external validity: sensitivity, specificity, representativeness, timeliness, flexibility and acceptability)

Fig 8: Information Flow in an Active Epidemiological Surveillance System for Risk Factors in Chronic Diseases (CD) – Follow-Up and Response of Public Actions by the Colombian' Social and Health Security System

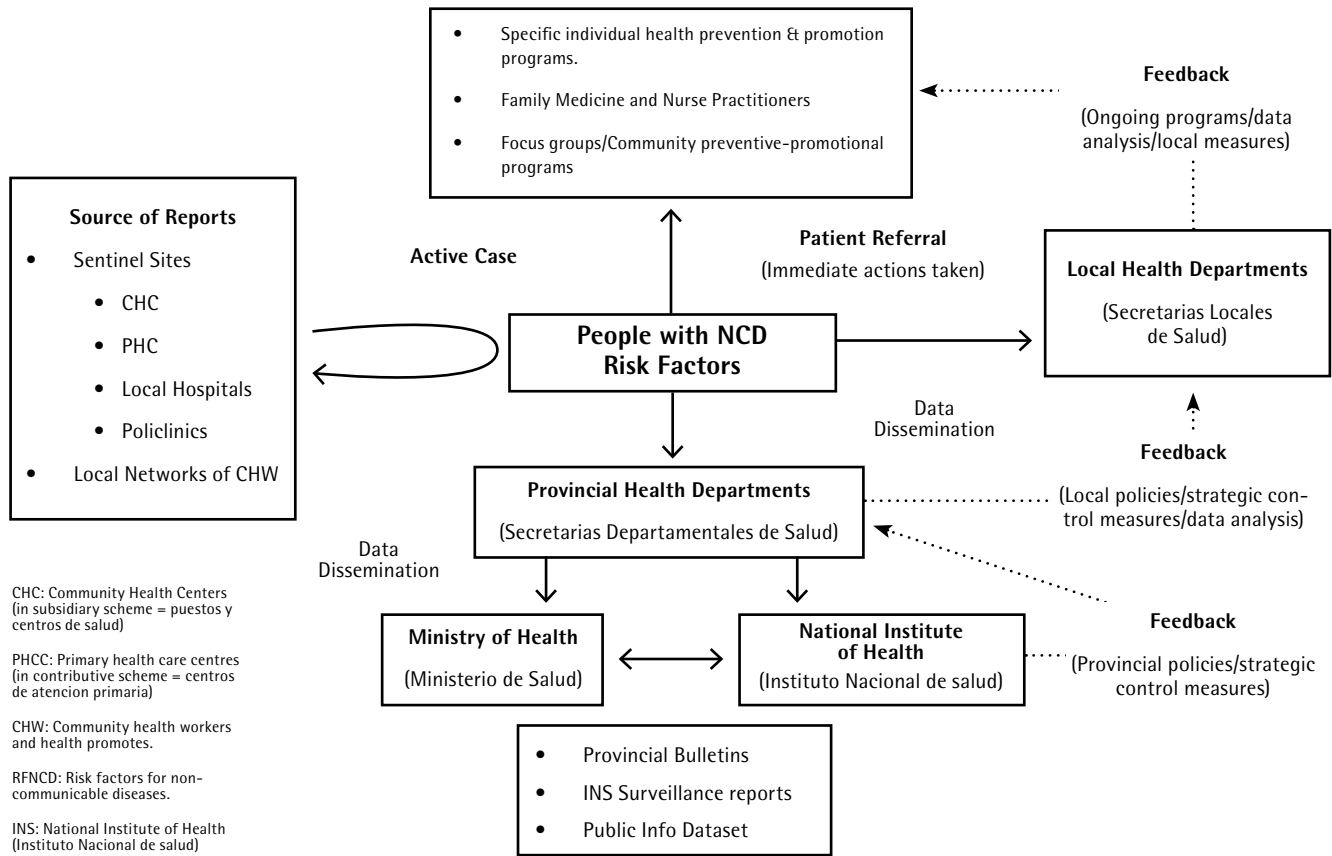


Fig 9: Level of risk according to case definitions & case management framework

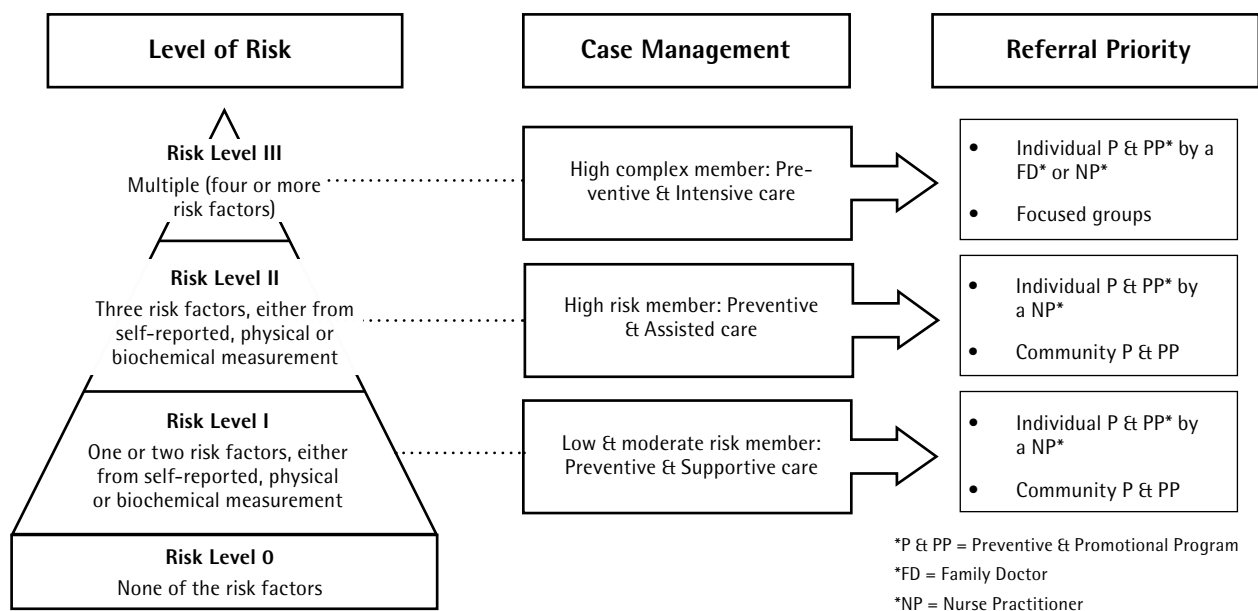
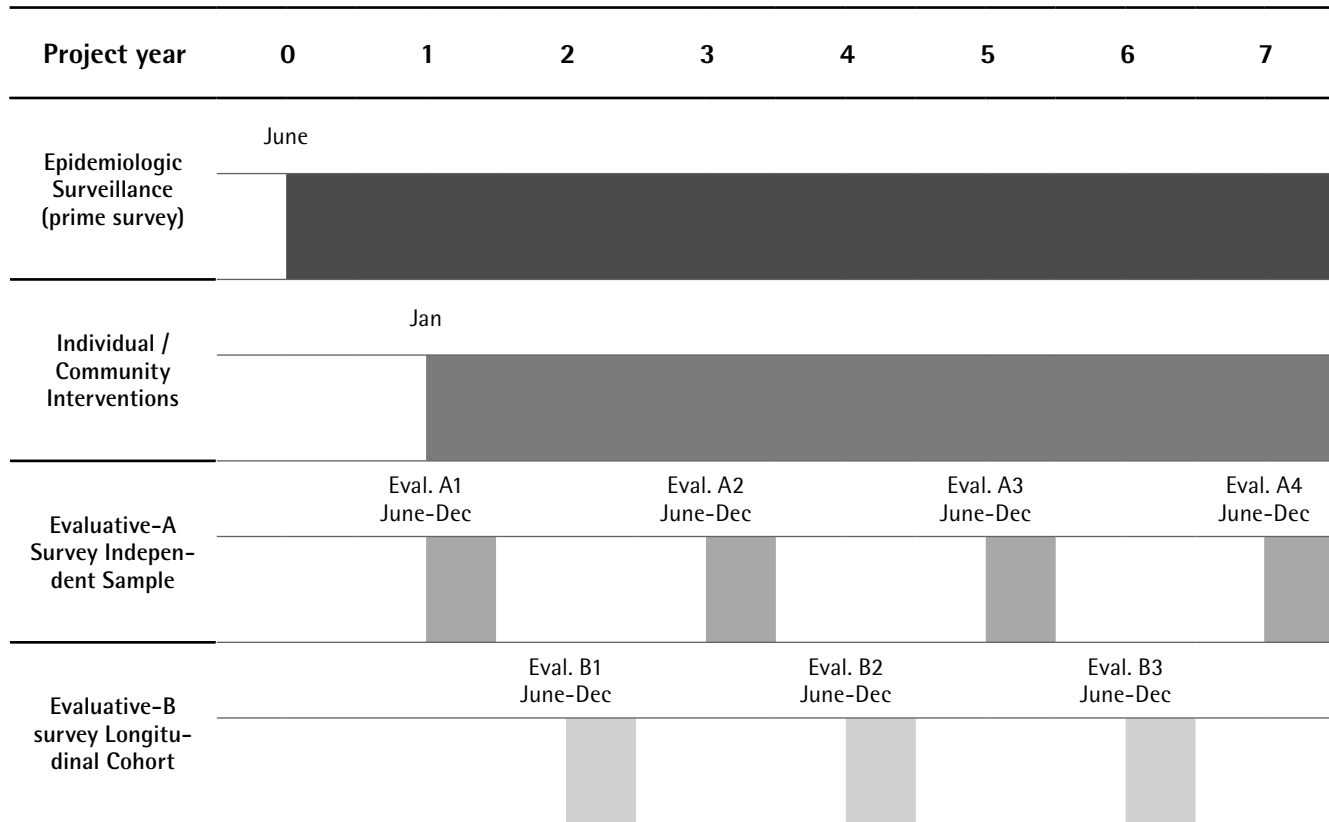


Fig 10. Pilot program design – Active Epidemiological Surveillance System for Chronic Diseases' Risk Factors during the first eight years.



Adapted from Fortmann Sp et al., Community intervention trials: reflection on the Stanford Five-City Project experience. American Journal of Epidemiology, Vol 142, N. 6, p. 579 (1995), The Johns Hopkins University of Hygiene and Public Health. Evaluative survey A1 to A4 (in yellow). Evaluative Survey B1 to B3 (in orange).

Discussion & Conclusions

Colombia, as a developing country, is currently undergoing typical demographic and epidemiological transitional periods, which is the direct result of social and economic changes from the Colombian population (30). For example, since 2009, nearly 6% of the Colombian population was over 65, a proportion that could reach 20% in 2040 if the current trend continues (31). Similarly, over the last two decades, Colombia has shown sustainable economic growth and increased urbanization with the corresponding population exposure to multiple risk factors. Changes that have led to dramatic modifications in lifestyles, levels of physical activity and behavior in general, resulting secondarily in the double burden of disease (infectious and chronic diseases) (32). However, similar to what is currently observed in developed countries, chronic diseases represent the predominant burden; a much

more overwhelming aspect for a country such as Colombia, where, in addition to the double burden, the huge phenomenon of violence is added (33).

In addition to the disease burden, the current limitations of surveillance systems must be taken into account; in which risk factors for CD (obesity, smoking, inappropriate diet) do not represent an “imminent” threat at the individual or collective level, thereby provoking a passive response. Basic models that intervene over the problem with public responses often are too late, or when the disease is in advanced stages. In this way, it is evident that a new approach must be on the agenda, aimed at the control and management of CD. Thus, based on the WHO stepwise approach, a new surveillance structure is proposed in this discussion paper, after which the active component, by modifying the risk factors for CD, is the predominant aspect. By classifying new levels of risk, in addition to the referral process according to the

individual needs, this proposal initiative is considered *one step further to the STEPwise method*; complementing, therefore the model.

Through their current health and social security system, a nation like Colombia has an entire infrastructure favorable to the implementation and dissemination of the new model, expecting a positive impact in the very short term. Under this path, as an enriching support for the discussion, and closing for this working document, some benefits and useful considerations with the establishment of this new active surveillance system are going to be stated, and some possible limitations will also be mentioned.

Making progress in the preventive and wellness model

The pillars of the preventive and wellness approach is originated in the Ottawa report from 1986, in a health promotion document known as *The Ottawa Chapter of Health Promotion* (34). This report establishes the need to transform the current disease-based curative model to a preventive model based on well-being (35). Despite the clarity of the model, almost 33 years later, most nations continue to base their health systems on a curative and disease model, resulting in part in the hazy burden of chronic disease (36). The transformation bases are summarized in the following graphic:

Curative and Disease Model	➔	Preventive and Wellness Model
<ul style="list-style-type: none"> • Prevention is not a priority 		<ul style="list-style-type: none"> • Prevention at all points of a continuum
<ul style="list-style-type: none"> • Based on a provider (usually a doctor) 		<ul style="list-style-type: none"> • Integrates an interdisciplinary team
<ul style="list-style-type: none"> • Disease-based 		<ul style="list-style-type: none"> • User-based (patient)
<ul style="list-style-type: none"> • Reactive, intervening in various states of the disease 		<ul style="list-style-type: none"> • Proactive, modifying risk factors
<ul style="list-style-type: none"> • Limits the role of users in management 		<ul style="list-style-type: none"> • Empowers the user to self-manage and integrates them into the multidisciplinary team

Thus, it is evident that the conformation of an active surveillance system, tending towards the early detection and timely action on the risk factors in chronic diseases, represents a basic tool of support for the development of the preventive and wellness approach.

Supporting action to close the social inequality gap

In an effort to better assess and modify social inequalities in health and their consequences on population well-being, the WHO Commission on Social Determinants, over its final report of 2008, *“closing the gap in a generation”* recommends the inclusion of additional information in routine data collection. The report (p.182) states that, in addition to the assessment of social determinants in health, surveillance of risk factors of chronic diseases (e.g. tobacco and alcohol consumption, physical activity, diet and nutrition, literacy and education levels, means of transport, among others), will represent one of the first steps in creating

policies and immediate actions to address and deal with social and health inequalities (36).

Potential limitations of the new surveillance system

One of the main limitations with this type of active system is the difficulty in guaranteeing the personal confidentiality of the information. Obtaining motivation and consent from the patient or user to assess personal risk conditions and characteristics is crucial for the proper development of the system. However, this must be accompanied by a total guarantee of the information confidentiality, an aspect that is potentially difficult to comply with, or that may cause mistrust for the user. Similar to mandatory reporting in communicable diseases (37), reports resulting from the analysis of information over CD should be oriented with the same guarantee of confidentiality, protecting names, addresses and individual information of users; aimed only at technical analysis or public response based on individual

or collective information, respecting and ensuring privacy in the first instance. The task of improving confidentiality should be achieved in the short and medium term through continuous education processes for the frontline technical staff in charge of data collection and gathering, as well as the professional staff in charge of monitoring and controlling. Likewise, accompanying the task, there must be the support of regional and national legislation that enforces compliance with rules (38). Obviously, the new process cannot run like a loose wheel. The operation of this new surveillance process requires its respective incorporation into a local, regional and national scheme for the provision of public health services, which in the case of Colombia represents the current general health and social security system (see also integration diagram, figure 8)

Another important limitation is originated in the apparent cost for the development of the system. Although pilot projects in a country like Colombia are expected to be part of the prevention and promotion programs established in the social security law (39), this implies a new cost of priority re-organizations that might serve as a limiting factor for their implementation. Obviously, in the medium-and-long-term the benefits will be much greater than any other cost. It is clear that in any health system, preventive actions over the final negative impacts on CD, such as productivity loss (healthy life years lost), premature death, and disproportionate financial spending on healthcare, so far outweigh medium-and-long-term huge costs (40).

Conflicto de intereses

Ninguno declarado por el autor.

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