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Road map for leadership and management in public health: a case study on noncommunicable diseases program managers' training in Rwanda

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Abstract

Ministries of Health (MoHs) and health organizations are compelled to work across sectors and build coalitions, strengthening health systems to abate the rise of noncommunicable diseases (NCDs). A critical element of NCD prevention and control involves significant and difficult changes in attitudes, policies and protective behavior at the population level. The population-level impact of NCD interventions depends on the strength of the health system that delivers them. In particular, low-resource settings are exploring efficiencies and linkages to existing systems or partnerships in ways that may alleviate redundancies and high delivery costs. These entail complex operational challenges, and can only be spearheaded by a competent and passionate workforce. There is a critical need to develop and strengthen the management and leadership skills of public health professionals so that they can take on the unique challenges of NCD prevention and control. An added component must include a shift from the traditional clinical approach to a community-based effort, focusing heavily on health education and community norm change. Strengthening the work-force capacity of program managers at MoHs and other implementing institutions is key to capturing, analyzing, advocating and communicating information and will, in turn, reinforce the scale-up of interventions fostering a robust health system. This paper summarizes the best practices and lessons learned from the NCD Program Managers short course conducted by the US Centers for Disease Control and Prevention (CDC) in December, 2016 in Rwanda.

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Keywords

Noncommunicable diseases; program managers; training; Rwanda; leadership; NCD workforce capacity

Introduction

Noncommunicable diseases (NCDs) are a rapidly growing public health priority in low-and middle-income countries (LMICs). Annually, 15 million lives worldwide are lost prematurely (between the ages of 30 and 69) due to NCDs. Over 85% of these premature deaths occur in LMICs and over 80% stem from four diseases: cardiovascular disease (including heart attacks and strokes), cancer, respiratory disease and diabetes (WHO 2017, 2018). These NCDs have now surpassed communicable diseases as the leading source of premature death and disability in developing countries (WHO 2018). NCDs are associated with high productivity losses and healthcare costs, and thus further burden developing economies with limited healthcare systems, and undermine social and economic development (Suhrcke et al. 2006; Adeyi, Smith, and Robles 2007). The high concentration of NCDs in low-income countries accelerates poverty and is described as the ‘social justice issue of our generation’ (Horton 2015). With the global epidemiological shift from infectious to chronic diseases, NCD-related initiatives are increasingly relevant to high-stake matters like global health security and international financial stability (Kostova et al. 2017).

The global community has recognized the burden and challenge of NCDs, resulting in the inclusion of NCDs in the 2015 Sustainable Development Goals (SDG). Heads of State and Governments committed to develop national responses to reduce premature mortality from NCDs by one-third through prevention and treatment and by promoting mental health and wellbeing (SDG 3, Target 3.4), by 2030 (United Nations 2015). Ministries of Health (MoH) and other health organizations are compelled to work across sectors and build coalitions to strengthen health systems and implement policies to abate the rise of NCDs. However, public health programs to prevent or control disease, injury, disability and death are becoming more complex than ever before, especially when it involves multistakeholder coalitions. In addition, a critical element of NCD prevention and control involves significant and difficult changes in attitudes, policies and behavior at the population level. The population-level impact of NCD interventions depends on the strength of the health system that delivers it, and low-resource settings in particular are exploring efficiencies and linkages to existing systems or partnerships in ways that may alleviate redundancies and added high delivery costs (Olsen et al. 2016). These entail complex operational challenges, and can only be spearheaded by a competent and passionate workforce. Therefore, there is a critical need to develop and strengthen the skills of these public health professionals so they can take on the unique challenges of NCD prevention and control (WHO 2016). The traditional clinical approach to NCDs would be strengthened by adding a shift to community-based efforts, focusing heavily on health education and community norm change. Absent a change (ie integrating health promotion into the traditional clinical approach), achieving an effective country-wide impact will be challenging.

A strong combination of management and leadership skills are required to tackle the NCD burden effectively. Strengthening the workforce capacity of program managers at MoHs and other implementing institutions' ability to capture, analyze, advocate and communicate information is key to making data-based decisions and will reinforce the scale-up of interventions, fostering a robust health system. Because most senior managers are physicians with a primarily clinical focus, public health benefits at the population level can be expanded through the involvement of multidisciplinary experts in health promotion, health education, statistics and applied economics, in order to have the appropriate in-house technical expertise for a well-rounded and effective approach. To enhance country expertise in NCD public health promotion, the US Centers for Disease Control and Prevention (CDC) collaboratively with the Rwanda Biomedical Center (RBC) conducted a NCD Program Managers short course in December 2016 for RBC colleagues, in Musanze, Rwanda. This article summarizes the best practices and lessons learned from this training initiative. Providing context for the initiative, we first summarize the NCD situation in Rwanda, current national NCD strategic plans, and the governance and implementation framework for the control and prevention of NCDs in Rwanda.

NCDs and NCD risk factors in Rwanda

Rwanda is a low-income country in East Africa with a population of 11.6 million in 2015, of whom 71% live in rural areas (World Bank 2017). After the 1994 genocide, which resulted in a collapsed and distrusted health system, the Rwandan national government turned around the situation by: championing health equity and a universal right to health; supporting investments in public health; improving the healthcare delivery system, access to healthcare and the quality of healthcare; reducing healthcare costs to the poorest members of the population (Hamblin 2014). The resulting decline in mortality is among the steepest recorded in the recent past anywhere in Africa (Evans 2014). In the last two decades, the Rwanda GDP has increased, growing at a rate of 8.1% annually from 2000; life expectancy has more than doubled (ie from 28 years in 1994 to 58 years in 2012); vaccination rates have risen higher than those registered in the US, with more than 97% of Rwandan infants vaccinated against 10 different diseases; child mortality has fallen by more than two-thirds; maternal mortality has declined by 60%; new HIV rates have fallen by 60%; AIDS-related mortality have fallen by 82% (some of the greatest declines in Africa) and HIV treatment is provided at no cost (Binagwaho et al. 2014; Naughton 2014). Nearly 45,000 community health workers are trained in health promotion as well as providing basic preventive interventions, diagnosis and treatment for infectious diseases (Binagwaho et al. 2012). These dramatic changes illustrate that with targeted resources, Rwanda has the ability to have a similar nationwide impact on NCDs, through a coordinated response across ministries and efficient allocation of resources.

Comprehensive insurance reform enacted in 2011 transformed Mutuelle de Santé, a community-based health insurance program, to a system of tiered premiums to make it more financially progressive and sustainable. However, most of these remarkable achievements have been in the infectious disease areas, and there has not yet been a concerted effort to focus on NCDs, which are responsible for 45% of death and are collectively the leading causes of death in Rwanda (WHO 2017). Moreover, the current focus on a hospital-based

and home-based primary and secondary prevention program needs to be shifted by designing a community-based health promotion and health education program to effectively achieve primary prevention. Community norm change in alcohol use, tobacco use, physical inactivity and obesity control can only be achieved through an intersectoral approach.

Though Rwanda has experienced enormous success against communicable disease, the country is becoming more urbanized and globalized, and key changes in demographic and health indicators have led to new challenges for NCDs. Harmful use of alcohol and tobacco, unhealthy diets, obesity and physical inactivity are emerging as major NCD risk factors. The percentages of current and heavy alcohol drinkers are 52% and 30.5% among men and 31.4% and 17.1% among women, respectively (RwandaMoH 2015b). Alcohol per capita (age 15+) consumption is 9.8 L of pure alcohol, which is 40% higher than the average consumption of 6.0 L in the WHO African region. Three in four deaths from liver cirrhosis, and one in three deaths from road traffic injuries are attributed to alcohol use (WHO 2014a, 2014b); and 19.1% of men and 7.1% of women are current tobacco smokers, currently below the African average (WHO 2015a). Both blood pressure and blood sugar are infrequently measured in Rwanda with only one in five Rwandans ever having had their blood pressure taken by a health care professional. Prevalence of elevated blood pressure when readings were taken was 15%; the prevalence rose to 40% among persons in the 55–64 age group (WHO 2014b). Also, 17.1% of Rwandans are overweight (Rwanda MoH 2015b; WHO 2014c). In 2010, 15.3% of Rwandan adults aged 18+ years had insufficient physical activity (WHO 2015b). Overall, 32,000 Rwandans are dying from NCDs each year with 66% of these deaths being premature with approximately 18% of 30-year-old-people in Rwanda will die before their 70th birthday from any of the leading four NCDs (WHO 2015b).

The economic and demographic trends in Rwanda present several challenges in the fight against NCD risk factors. Given the economic growth outlook in Rwanda combined with the increased presence of multinational tobacco companies; the pervasive alcohol retail sales and distribution system and the rapidly growing impact and influence of multinational beverage and fast-food sales, outlets and related product marketing, there is the potential for a significant increase in the tobacco and obesity epidemics along with associated disease and death. However, absent a multisectoral community-based intervention focusing on cardiovascular risk factors, NCDs are likely to continue to rise. Thus, there is a window of opportunity for an increasing emphasis on social, economic and educational policy in coordination with relevant ministries and health partners in Rwanda.

National NCD strategic frame and objectives

Rwanda's 2014 National Strategic Plan prioritized NCDs with the goal of reducing premature mortality from all NCDs and injuries by 80% in individuals younger than 40 years by 2020 (Bingawaho, Muhimpundu, and Buckman 2014). To achieve this target, the action plan emphasizes integrated health-service delivery platforms at community, health-center, district hospital and referral-center levels, as well as a shift from prioritizing specific diseases (Rwanda MoH 2015b). It envisions multi-sectoral action to mitigate indoor air pollution, and improve household, workplace and road safety as part of a global movement

for eradication of extreme poverty (Rwanda MoH 2015b). The three pillars of the action plan include improving: (a) access and quality of care through universal health coverage; (b) general knowledge about prevention of risk factors and early detection and (c) national and local response, multisectoral coordination and mobilization of resources and the monitoring and evaluation systems for prevention and control of NCDs (Rwanda MoH 2015b; WHO 2015c).

Governance and implementation framework for NCD control and prevention in Rwanda

The Ministry of Health (MoH) and RBC work closely in the planning and implementation of NCD programs in Rwanda. The MoH has the responsibility to oversee overall coordination; ensure strengthening of national capacity, leadership and governance; propel advocacy, resource mobilization and distribution and garner multisectoral action and partnerships to accelerate national response for prevention and control of NCDs. The NCDs Division in the RBC was established as an implementing entity for national NCD prevention and control activities. The division oversees the coordination of NCD-related interventions and is responsible for strengthening international cooperation (Rwanda MoH 2015a).

NCD initiatives are implemented through multilevel stakeholders and partnership engagement to go beyond a purely hospital and home-based system, where community interventions might actually be best achieved. Several ministries are also expected to assume complementary roles in NCD and risk factor control and prevention. The roles of each agency are illustrated in Table 1 (Rwanda MoH 2015b).

Training initiative: a four-day course to strengthen NCD management and leadership capacity

Strengthening program manager capacity is crucial to improving programmatic response to challenges and advancing best-practice approaches for effective NCD implementation. The RBC NCD Division is tasked with the day-to-day implementation, management, monitoring and evaluation of interventions related to NCD prevention and control. The division's foresight to demonstrate its commitment to respond to the challenge, given the current burden, was the driving force behind training NCD program managers. A total of 14 RBC NCD program managers participated, most of whom had a Master degree or higher and had previous professional experience in implementing programs in infectious disease (eg HIV/AIDS, TB and malaria).

Intended learning outcomes

The course, which was conducted in Musanze District in the Northern Province of Rwanda, piloted a systematic lesson plan developed for NCD program managers that aimed to increase their confidence to develop strategic priorities and advocate for resources that achieved defined objectives by the division. The course was guided by competencies in three principal domains, as shown in Figure 1: core functional competencies (Institute of Medicine 1994; CDC 2017); implementation competencies (Frieden 2014) and

competencies in comprehending intervention domains (Frieden 2010). The course curriculum was designed to strengthen program managers' skills in these competency areas, utilizing a holistic approach and in consideration of adult learning principles via interactive lectures, discussions, case studies and group work.

The course framework was based on the functional competency domains that describe the 10 essential public health activities recommended by the Core Public Health Functions Steering Committee. Building the course on the 10 essential components supports what public health professionals may already comprehend and practice, fostering critical thought on its application to NCDs. The implementation competencies domain asserts that organizations and coalitions need to address six key areas for successful and sustainable public health programs (Frieden 2014). The domain stresses the importance of: expanding the evidence base; identifying high-impact, evidence-based interventions; monitoring and evaluating in real-time; relying on multisectoral partnerships and coalitions; disseminating accurate and timely information to effect behavior change and building political commitment to leverage resources and support for implementation of interventions. Finally, a five-tier pyramid provides a framework to improve health with interventions impacting varying proportions of the public. In ascending order, the levels are interventions that make individuals' default decisions healthy; make clinical interventions ongoing to provide patient-centered care and promote health education and counseling. Interventions focusing on lower levels of the pyramid tend to be more effective because they reach broader segments of society and require less individual effort. Sustained and significant progress can be made through a confluence of both clinical and policy interventions (Frieden 2010).

The competencies outlined above underpin the formulation of seven specific intended learning outcomes. By the end of the course, the participants were expected to: (i) state the difference between public health and clinical strategies in addressing disease, disability and injury; (ii) distinguish individual-level interventions from population-level interventions; (iii) recognize global, regional and national data on NCD epidemiology related to Rwanda NCD concerns; (iv) strengthen skills in analysis and interpretation of NCD surveillance data and in program evaluation; (v) identify and prioritize local and national strengths, weaknesses, barriers and opportunities related to NCD issues; (vi) champion NCD prevention and control to the public sector, private sector, civil society and other stakeholders at the national, regional and local levels and (vii) implement the 'Train the Trainer' model for national and local capacity building in NCD control and prevention.

Characteristics of, and competencies for, managers and leaders are related by linking inputs to performance and identifying and allocating resources; however, leadership qualities require a further step to create enabling environments and support systems change rather than stewarding operational inputs (Kwamie 2015). While a single individual may play both roles, there are obvious overlapping attributes in distinguishing managerial skills from leadership skills. The intended learning outcomes outlined above addressed managerial competencies in: strategic thinking and problem solving; operations management; performance management and accountability within MoH governance; leadership; community assessment and engagement (Kwamie 2015). Leadership skills addressed fostered self-efficacy, thus, empowering trainees through their understanding of political and

regulatory environments; appreciation of policy tradeoffs implications; execution of stakeholder analysis and advocacy, and identification of opportunities for multisectoral engagements and challenges from industry interferences to thwart NCD prevention and control initiatives and policies.

A multidisciplinary team, including visiting experts from the US CDC and an independent public health consultant who previously led NCD activities in the state health departments of California and Hawaii, presented the materials. The CDC team collaborated with RBC to assess organizational capacity, training needs, knowledge gaps and intended learning outcomes. The course included both educational content as well as train-the-trainer methods, focusing on modes of effective training so that participants would be able to teach course content effectively to others at a later time.

Best practices

Theoretical underpinnings

There are several theoretical underpinnings that can inform the design, develop and delivery of the training initiative. Given the audience of the NCD program managers training and the course's main intended outcomes, the curriculum was informed by three theoretical constructs including Bloom's taxonomy of educational objectives (Bloom 1956; Bloom et al. 1956), Structure of Observed Learning Outcome (SOLO) taxonomy by Biggs and Collis (1982) and Light and Cox's (2001) Learning Gap framework. Table 2 proposes a mapping of the main intended learning outcomes to these theories.

At a modular level, the course based an effective teaching strategy and three broad goals—knowledge-based goals, skills-based goals and affective goals (ie values, attitudes, and interests) on Bloom's taxonomy of educational objectives (Bloom 1956). For example, the levels of expertise in the ascending order of complexities (o difficulties) in Bloom's taxonomy of 'knowledge based goals' are: knowledge, comprehension, application, analysis, synthesis and evaluation. Similarly, the taxonomy of skill-based goals, where the trainees' levels could be assessed against seven major action categories, listed from the simplest to the most complex behavior: perception, set, guided response, mechanism, complex overt response, adaptation and origination. The taxonomy under the 'affective goals' provides a useful framework for determining trainees' willingness to participate; interest in topic and issues; appreciation of the objectives and importance; ability to compare different values, and resolves conflicts between them to form an internally consistent system of values; adoption of a long-term value system that is pervasive, consistent and predictable (Bloom 1956). These frameworks are not only helpful in designing the training curriculum and delivery approach but also enable trainers to conduct real-time assessments of the trainees' knowledge, skills and affection levels.

SOLO also informed the curriculum design, which identifies knowledge contents as: (i) Prestructural, which constitute the trainee learning in terms of simply acquiring bits of unconnected information, which have no organization; (ii) Unistructural, where the students can make simple and obvious connections of the Prestructural phase information without grasping their significances; (iii) Multistructural, where the students are able to make a

number of connections, but without rigorous meta-connections between them; (iv) Relational, where the student is able to appreciate the significance of the parts in relation to the whole and (v) Extended abstract level, where the student is able to make connections not only within the given subject area, but also beyond it, able to generalize and transfer the principles and ideas underlying the specific instance (Biggs and Collis 1982).

In a similar vein, the training approach also embeds the threshold concept in the Light and Cox (2001) Learning Gap framework. They outlined several steps: (i) Recall—identify basic concepts, definitions, assumptions; (ii) Understanding—connecting the recall components; (iii) Ability—able to work through different examples; (iv) Wanting to—challenge and experiment different concepts with intuitive deviations of assumptions; (v) Doing—able to analyze case studies; (vi) Changing—synthesis of case studies, relaxing the assumptions, independent critical thinking and identifying model limitations. Finally, the training curriculum and delivery adopted an internationalization strategy that promotes greater global understanding, which is culturally inclusive and fair (eg Teichler 2004; De Vita and Case 2003), and that employs measures to increase perceived self-efficacy in future leaders (Hannah et al. 2008). Table 2 provides an example of how different theoretical frameworks align with the intended learning outcomes of the training and curriculum design and delivery.

While the curriculum was informed by three distinct theories, many other constructs and strategies could be applied including the Biggs' model. This model hinges on the theoretical framework of outcome-based curriculum, aligning three key areas: the intended learning outcomes; participants' conduct in their learning process and assessment and feedback mechanism (Biggs 2003, Biggs 1999; McMahan and Thakore 2006). At a more complex level, alignment requires a balance and synergy between trainers' goals and expectations, trainees' wants and needs which includes the curriculum, teaching methods, assessment and feedback methods, the psychological and social climate of the classroom and the institutions—each of these components needs to work toward the common goal—eg increasing participants' self-efficacy.

The 'scaffolding' teaching strategy that originated from Lev Vygotsky's sociocultural theory and his concept of the zone of proximal development (ZPD) is another effective teaching and training approach (Vygotsky 1978). In a 'scaffolding' strategy, the trainer provides scaffolds or supports to facilitate a trainee's ability to build on prior knowledge and internalize new information, and accomplish the tasks that he or she could otherwise not complete—thus helping the learner through the ZPD (Bransford, Brown, and Cocking 2000).

Adapt training

In consideration of an international audience, the standard training curriculum should be adapted to increase relevance, relatability and retention through the use of country-specific data and real-life examples and scenarios that increase its cultural appropriateness. To support execution, the training design included the following key components: guiding framework, modularized courses and facilitator instruction (Morical and Tsai 1992). Through a series of planning meetings, training facilitators worked together to: (a) verify

that the training framework is appropriate for the target audience (ie RBC NCD team); (b) tailor training curriculum modules based on their specific training needs. Identification of these needs was done through key informant interviews with relevant stakeholders; review of program documents; and independent investigation of the country context, including but not limited to demographics, health indicators, social-political factors and health infrastructure and systems. Regardless of the content changes made, the integrity of the training remained intact; (c) document facilitator roles and responsibilities, discuss communication strategies and practice content delivery.

Establish expectations early on

The course began with a large group discussion, and identifying and mapping participants' expectations to the agenda and anticipated outcomes. This was done to manage participants' expectations and ensure that needs were heard and addressed. Participants' expectations included strengthening capacity in: (a) program design, (b) implementation, (c) collecting and analyzing data, (d) using data to influence policy and decision making, (e) identify data points to mobilize resources, (f) determining best interventions for NCDs, (g) publishing data and (h) measuring impact in the community. With the participants' expectations aligned with the anticipated workshop outcomes, the course was meant to provide an overview of strategic approaches to NCD prevention and control that could be adopted and tailor to the country's needs, as opposed to an in-depth technical training.

Evaluate participants' learning and perceptions

At the end of each day, the participants were given an evaluation form to provide feedback on the knowledge and skills acquired; expectations around utilizing these skills in their current position and anticipated benefits/barriers; perceived self-efficacy as it relates to facilitating this type of training. After the course, participant data were compiled and analyzed, resulting in both quantitative and qualitative measures. Overall outcomes are summarized in Table 3.

Discussion: lessons learned

Based on the Rwandan experience, several 'lessons learned' were identified from the best practices and theoretical underpinnings informing NCD workforce capacity-building efforts:

- a.** The use of a standard training curriculum was a critical tool as it helped establish competency benchmarks for all program managers working in the NCD arena regardless of geographic location or sector. The curriculum continually reinforced the public health paradigm throughout the training, which is critical for countries that may benefit from a shift that would result in a greater health impact—shifting priority of individual-level clinical care to inclusion of population-based strategies. It also expedited the training development, planning and implementation process, which helped CDC rapidly respond to Rwanda's request for capacity building technical assistance.
- b.** Typically in low-resource settings, program managers may be pulled to work outside their subject matter expertise. Communicable and NCD etiology are

quite different, and it is important that those working in NCDs understand these unique nuances. By setting the stage on day 1 to close any gaps in NCD knowledge, a common level of understanding was established among the participants which is important as communicable and NCD etiology are quite different; distinctions that inform the roll out impactful programs and policies.

- c. It was important to contextualize the training framework by providing a specific disease approach that is relevant to the country. Having a topical area (eg cervical cancer) helped participants understand how the RBC could adopt, implement and monitor the intervention.
- d. Train-the-trainer content was presented in a condensed manner via a 1-h session at the end of each day and appeared particularly beneficial to the trainees because they regularly conduct trainings to district and clinic-level colleagues. While positively received, the condensed format might be more appropriate as a retraining session if precluded by a separate, more in-depth train-the-trainer course since many participants conveyed the desire for more time spent on these sessions.
- e. Active learning was encouraged throughout the course through interactive discussion and activities. The *New Times* article, *Globalizing the fight against noncommunicable disease* (Weisz 2016), printed the day before the course, was featured as a guided analysis activity, providing an example of how to communicate and advocate for NCDs. Through dissection and discussion of the article, a spontaneous action item for the team emerged—writing an RBC communication piece on the country’s NCD burden. Additionally, relevant topic areas were included (eg Rwandan road traffic injury issues and tobacco advertisements), personalizing the training module on communication, led to thoughtful and relevant discussions on the types dissemination tools and partnership engagement required to support effective interventions and policies. Furthermore, group exercises were incorporated to help participants practice problem-solving techniques and prevention strategies. For example, a lesson on developing policy briefs was influential as it encouraged active participation and resulted in an anticipated action item—developing country-driven fact sheets.
- f. Offering follow-up technical assistance can extend participants’ learning over time. For example, during the training, participants worked as a team to draft an outline of a policy brief. After the training concluded, the RBC NCD team continued to further develop the brief. Remote technical assistance was made available to the team, providing recommendations on research translation, communication and graphic design. The end result was a polished policy brief on the NCD burden in Rwanda that could be used to promote the need for their work and mobilize resources.

Conclusion

Though some may see the rise of NCDs as an inevitable consequence of age and economic development, the effects of avoidable and harmful behaviors like tobacco use, alcohol use,

physical inactivity and unhealthy diet hamper the improvements of the public's health and undermine the gains achieved by declines in infectious disease (Heymann et al. 2015). The enormous relevance of this to low-resource settings, including Rwanda, is that these behaviors are ever increasing and LMICs need to be wary of associated effects on their society and economy as a whole. Historically, NCD programs are significantly underresourced, understaffed and underfunded compared to infectious disease programs in LMICs because of the predominantly infectious disease burden. However, the increasing infrastructural overlap between infectious and chronic disease control initiatives can allow for efficient allocation of resources to accomplish disease reduction in both areas (Kostova et al. 2017). Thus, there is a need for targeted training of NCD program managers to empower them to overcome the inevitable, multifaceted challenges that accompany work in this field. As NCDs become the largest cause of preventive death and disability worldwide, NCD workforce training on community norm change and resourcing a major multiministry effort is critical, and possibly the only potentially viable solution.

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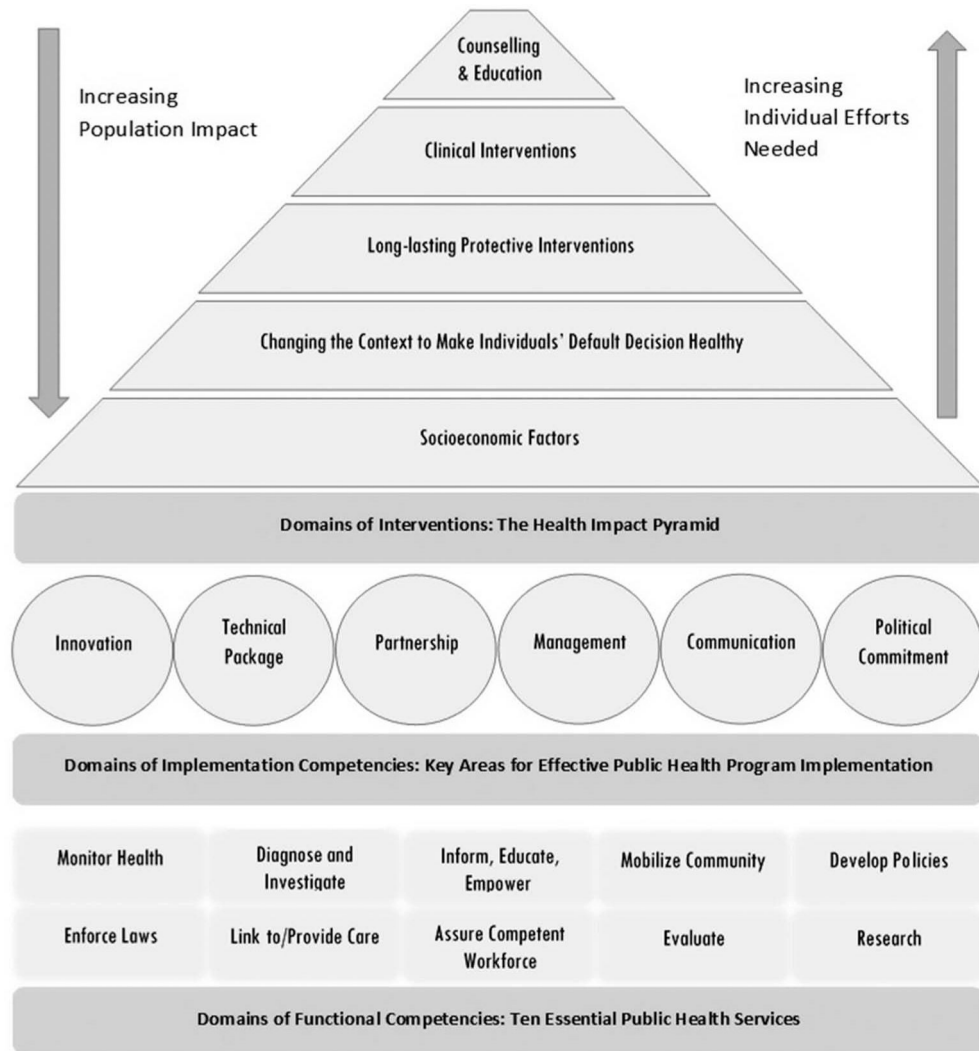


Figure 1. NCD prevention and control core competencies informing training framework.

Table 1.

Roles of Rwandan government agencies in the prevention and control of NCDs.

Ministries/Agencies	NCD-related roles
Ministry of Education	Integration of NCDs prevention and control in curricula and strengthening awareness campaign
Ministry of Local Government	Integration of NCDs prevention and control in decentralized entities' agenda and increase awareness to the population
Ministry of Natural Resources	Reinforcing policy and regulations for air pollution and other environmental factors
Ministry of Infrastructure	Reinforcing policy and regulations on preventions of injuries and accessible infrastructure for persons living with disability
Ministry of Gender and Family Promotion	Increasing awareness in families mainly on healthy diet, smoking, alcohol consumption and home-based violence
Ministry of Agriculture	Strengthening NCD and risk-factor conducive policy and regulations on growing crops
Ministry of Internal security	Enforcement of the implementation of NCD risk-factor-related policy, law and regulations
Ministry of Sport and Culture	Promoting the sport culture for awareness and prevention of NCDs
Ministry of Youth and Technology	Promoting awareness activities among the youth
Rwanda Standards Board	Reinforcing regulation and control of NCD and their risk-factors-related imported and local products

Source: Rwanda Ministry of Health, 2015. Noncommunicable Disease Policy. Kigali. March 2015.

Table 2
Potential of mapping intended learning outcomes with the theories of curriculum, teaching and learning

Main intended learning outcomes	Bloom's taxonomy	Solo taxonomy	Light and Cox's Learning Gap Framework	Constructively Aligned Teaching, Learning, Feedback and Assessment Activities (Embedding managerial and leadership attributes)
State the difference between public health and clinical strategies in addressing disease, disability and injury	Knowledge-based goals/Cognitive domain (Knowledge, comprehension)	Prestructural Unistructural Multistructural	Recall, Understanding, Ability	Introductory session <ul style="list-style-type: none"> • Introduction of trainees and trainers; exchange of professional profile and specializations • Building up a 'psychological contract' with the trainees clarifying expectations
Distinguish individual-level interventions from population-level interventions	Knowledge-based goals/Cognitive domain (Comprehension, Application, Analysis, Synthesis)	Multistructural Relational	Understanding, Ability	<ul style="list-style-type: none"> • Explaining the course outline and relating different module themes • Career and professional outlooks (incl. multidisciplinary context) • Discuss module ILOS and the way they will be achieved. • Generate candid discussion
Recognize global, regional and national data on NCD epidemiology related to Rwanda NCD concerns	Knowledge-based goals/Cognitive domain (Comprehension, Application, Analysis, Synthesis)	Relational	Understanding, Ability Wanting to	Lecture sessions <ul style="list-style-type: none"> • Setting up intended learning outcomes • Recap/relate previous sessions' topic • Lecture content delivery
Strengthen skills in analysis and interpretation of NCD surveillance data and in program evaluation	Skill-based goals/ Psychomotor domain	Relational Extended Abstract	Ability, Wanting to, Changing	<ul style="list-style-type: none"> • Eliciting student feedback in regular intervals • Video clips and initiate critical discussions • Review intended learning outcomes
Identify and prioritize local and national strengths, weaknesses, barriers and opportunities related to NCD issues	Skill-based goals; Affective goals	Extended Abstract	Understanding, Ability Wanting to, Changing	Tutorial, case study and policy brief sessions <ul style="list-style-type: none"> • Discuss other issues that enhance managerial and leadership skills • Review of exercises with active student participation • Practice analytical and policy brief write-ups
Champion NCD prevention and control to the public sector, private sector, civil society and other stakeholders at the national, regional and local levels	Skill-based goals, Affective goals	Extended Abstract	Wanting to, Changing	Critical discussions, assessment and formative feedback <ul style="list-style-type: none"> • Stimulate discussion based on video clips, newspaper articles, pictures, short commentary by experts—in the Rwanda context and well as cross-country context • Oral presentation of the policy briefs and analyses on case studies by the trainees • Support during analytical and policy brief write-ups, feedbacks afterward.
Implement the "Train the Trainer" model for national and local capacity building in NCD control and prevention	Skill-based, Knowledge-base and Affective goals	Multistructural Relational Extended Abstract	Understanding, Ability Wanting to, Changing	<ul style="list-style-type: none"> • Commit to follow-up activities by trainees and feedbacks and technical assistance by the trainers.

Table 3.

High-level summary of participants' assessment of course outcomes.

Theme	Outcomes
NCD Prevention & Control	<ul style="list-style-type: none"> • Course motivated and inspired the RBC NCD Division to broaden the scope of its NCD prevention and control work by including population-level activities and programs and implementing within the local context. • Participants were able to examine NCD risk factors in-depth and explore how to mobilize funds with multisectorial institutions. • Participants recognized the importance of including a prevention approach to NCDs and setting priorities.
Data Sources	<ul style="list-style-type: none"> • Participants gained a better understanding of NCD data sources for surveillance, including sources of data that CDC, World Bank and USA Center for Statistics use for setting specific indicators for NCDs surveillance. • Participants were able to grasp how the use of data can influence policy and planning.
Public Health Policy	<ul style="list-style-type: none"> • Participants gained practical knowledge on public health policy. • Participants practiced writing an effective policy brief.
Training	<ul style="list-style-type: none"> • Train-the-trainer modules were useful because they provided a foundation for types/styles of adult learning. This was particularly valuable because the division regularly conducts trainings to district and clinic level staff.