Citation: F. Ssengooba, SN Kiwanuka, E. Rutebemberwa, E. Ekirapa-Kiracho (2017), Universal Health Coverage in Uganda: Looking Back and Forward to Speed up the Progress. Makerere University, Kampala Uganda.

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Non-Communicable Diseases in Low-Income Countries: Implications for Universal Health Coverage

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Key Messages

- Non communicable diseases (NCDs) represent the largest cause of mortality among adults globally, with more than two-thirds of the disease burden in low-income countries.
- Health systems in low-income countries, including Uganda, are not able to provide the required preventive and curative services for NCDs. Service delivery has been hampered by several factors that include under-investment in finance, human and infrastructure as well as sub-optimal design of services for NCDs, with most of the health systems oriented towards providing curative care.
- Achieving universal health coverage (UHC) for NCD services will require increased investment. Mechanisms should be put in place to allow increased investment in the financial and human resources and the infrastructure required for delivering appropriate preventive and curative care for NCDs in resource-constrained settings.
- Achieving universal preventive care for NCDs requires developing a minimum package of NCD services and integrating this within

routine Ministry of Health (MOH) programmes for: 1) mass health education; 2) risk assessment; 3) initiation of non-pharmaceutical 'treatment' for people with risk factors; and 4) follow-up for early diagnosis and chronic care at different levels of health facilities.

- Successful delivery of preventive and curative care for NCDs requires multi-sectoral programmes, partnerships and collaborations.

Introduction

NCDs represent the largest cause of mortality among adults globally (1). According to the 2010 global burden of disease study, chronic NCDs accounted for 68 per cent of the global disease burden (2). Of increasing concern is the rapid upturn of NCDs in low-income countries (LICs) where they were previously low. The World Health Organisation (WHO) has prioritised four conditions that contribute the most to the global NCD burden: cardiovascular diseases (31.4 per cent), cancers (14.7 per cent), chronic respiratory diseases (7.2 per cent) and diabetes (2.7 per cent) (3). The World Health Organisation estimates that 106,400 people died of NCDs in Uganda in 2008 (4). More than half (51 per cent) of the NCD-related deaths were due to cardiovascular disease, 15 per cent from chronic respiratory disease and 12 per cent from cancers (4). The most recent countrywide NCD risk factor survey in Uganda revealed a 24 per cent prevalence of hypertension (5), 1.3 per cent prevalence of diabetes and 3 per cent prevalence of pre-diabetes (6). Other more localised studies, however, show that diabetes distribution is not homogeneous and that there is clustering of risk in some population sub-groups (7). In eastern Uganda, for instance, a diabetes prevalence of 7.4 per cent among people aged 35-60 years was reported (8). The national survey also showed that only 7 per cent of people with hypertension and 51 per cent of people with diabetes were aware of their status (5, 6).

The growing burden of NCDs in LICs is part of an epidemiologic shift from acute communicable conditions as the dominant causes of disease to chronic diseases, catalysed by the demographic, epidemiologic and nutritional transitions. At the population level, the increase in NCDs is attributed to systematic changes in age composition, lifestyles, economic activity and environmental exposures that increase behavioural risks. Individual risk is linked to genetic factors, obesity and the adoption of unhealthy behaviours and unhealthy diets. The key risk factors for NCDs include smoking, alcohol consumption, obesity and inadequate physical exercise. Estimates from

WHO have shown that the prevalence of smoking is relatively low among Ugandans (6 per cent) (4). Similarly, the national NCD survey indicated that over 90 per cent of Ugandans achieved sufficient physical activity (9, 10). Although this should be interpreted with caution since studies show that interview-based physical activity assessments have very low correlation with more objective physical activity measurement methods and tend to over-estimate actual activity levels in LICs (11). The estimated adult per-capita consumption of alcohol for Uganda was found to be 16.4 liters of alcohol per year, leading to Uganda being ranked as fifth in the world (12). A localised survey among people aged 35-60 in eastern Uganda also found the prevalence of obesity to be 18 per cent, with a wide disparity between women (25 per cent) and men (9.7 per cent).

The rising burden of NCDs in LICs has not been matched by increased capacity to provide services to people afflicted by or at risk of NCDs. The health systems in Uganda and similar countries are designed mainly to tackle acute and communicable conditions and seem unprepared for the emerging NCD surge. This unchecked rise in NCDs will not only have serious implications for the general health status of the population; it will drive up the cost of health care, making universal health coverage (UHC) harder to achieve. Achieving UHC for chronic non-communicable diseases requires a deeper analysis of the situation of NCDs in resource-constrained settings and an enhanced understanding of the critical gaps in current services so as to inform the selection of effective and affordable interventions. This chapter presents an analysis of the current status of NCDs as well as challenges in providing universal health care coverage for NCD services. Secondly, it highlights policy implications and proposes recommendations on priority interventions for advancing universal access to care for NCDs. We use cardiovascular disease and type 2 diabetes as tracer conditions of this analysis.

Management of NCDs

Primary prevention, it is argued, is more cost-effective than secondary care in fighting the NCD epidemic (13). In the paper entitled 'Prevention and control of NCDs: Priorities for investment', the World Health Organisation proposes 14 'best buys' for tackling the global NCD burden (14) (see Table 1 below). These interventions were selected on the basis of four criteria: i) health impact; ii) cost-effectiveness; iii) cultural acceptability; and IV) feasibility for scale, particularly in resource-constrained settings.

Table 1: Best buys for NCD control

Risk factor	Disease interventions
Tobacco use	Raise taxes on tobacco Protect people from tobacco smoke Warn about the dangers of tobacco Enforce bans on tobacco advertising
Harmful use of alcohol	Raise taxes on alcohol Restrict access to retailed alcohol Enforce bans on alcohol advertising
Unhealthy diet and physical inactivity	Reduce salt intake in food Replace transfat with polyunsaturated fat Promote public awareness about diet and physical activity (via mass media)
Cardiovascular disease (CVD) and diabetes	Provide counselling and multi-drug therapy (including blood sugar control for diabetes) for people with medium-high risk of developing heart attacks and strokes Treat heart attacks (myocardial infarction) with aspirin
Cancer	Hepatitis B immunisation beginning at birth Screening and treatment of pre-cancerous lesions to prevent cervical cancer

Source: *WHO, 2010 (14)*

Some of the interventions highlighted are already being implemented in Uganda, albeit to different extents. Evidence shows that increasing taxes on tobacco is one of the most effective ways to control tobacco use at population level. However, many LICs fail to reach the WHO-recommended threshold for tobacco taxation (i.e. 70). Public smoking has also been banned in the country. Advertisements for tobacco are required to have a health warning about the dangers of tobacco. Efforts to reduce alcohol intake have mainly included raising taxes as well as giving warnings about underage drinking and drink driving. Attempts to regulate the opening hours for bars have not been successful.

Tackling obesity would need changing population attitudes towards diet and physical activity. In a study in eastern Uganda that explored community

perceptions about diabetes risk, the findings show that obesity was associated with 'success' and 'wellness' while weight loss was stigmatised – partly as a backdrop to Uganda's history with HIV/AIDS, locally known as 'slim disease'. Adjustments in diet and physical activity were perceived as feasible, but requiring gradual change. For instance, change is perceived as 'sacrificing a good life' (15). Adoption of positive behaviours such as physical inactivity and healthy diets has so far received minimal attention. Although the heart and cancer institutes have been recently established, the interventions for addressing cardiovascular disease and cancers are also in their infancy. The capacity to deliver the interventions recommended for cardiovascular disease and cancer have probably been and will continue to be the main constraint on implementing these recommendations in Uganda until additional sources of funding are identified.

Three major programmatic gaps affect NCD control in Uganda: (1) The lack of a framework for risk factor prevention and assessment; (2) Low detection rates for people with early disease leading to late detection; and (2) Insufficient quality of care and retention in care for those with illness.

Policy environment for NCDs in Uganda

Incorporation of NCDs into national health policies and development plans by the governments is of paramount importance. The Programme for the Prevention and Control of NCDs in the Department of Community Health within the Ugandan MOH was established in 2006 primarily to coordinate NCD-related activities at national level. In addition, the Health Promotion Division of the MOH has the mandate of promoting healthy lifestyles at population level (16). The prevention and control of NCDs have been incorporated into the revised National Health Policy, the Health Sector Strategic Plan, the Uganda Health Sector Development Plan and the Uganda National Minimum Health Care Package. The Uganda Health Sector Development Plan for 2015-2020 states that enhanced programmes for the prevention and treatment of NCDs will be implemented with special focus on NCD prevention and control, capacity-building and NCD management (17). The NCD unit in the MOH has also developed the Uganda NCD Strategic Plan, the Uganda NCD Policy, the Uganda NCD Screening Guidelines and the Uganda NCD Desk Guide. At the time of preparing this book these documents were still in draft form awaiting piloting and scale-up. The Uganda Tobacco Control Act was passed by Parliament in 2015. Following

this, the Tobacco Control Policy and the National Tobacco Control Strategy have been drafted. Policies and guidelines on food and nutrition have been developed, such as the Uganda Food and Nutrition Strategy and Investment Bill, the Food and Nutrition Bill and the Uganda Food and Nutrition Policy. Guidelines on physical activity were being developed at the time this book went to press. However, the foundations for a revamped service delivery system lie not only in elucidating a clear policy but also in getting the policy implemented at all levels (18). The implementation of these policies has been constrained by the limited financial, human and infrastructure capacity across the country. This a fundamental constraint on the universal provision of NCD services in Uganda in the short to medium term.

Readiness of the health system to provide universal coverage for NCDs

Health systems in Uganda and similar LICs face a number of challenges in their ability to provide universal care for NCDs. With the WHO Health Systems Framework as a reference point (19), these challenges include, among others:

Human resources and service delivery: Because of the shortage of doctors, nurses and assistant clinicians (Clinical Officers) drive the bulk of service delivery in SSS. Most primary health care (PHC) workers and the PHC services they offer are oriented towards acute conditions. People with known or suspected NCDs are often referred to hospitals. Treatment of NCDs is variable and the quality sub-optimal. Chronic care is still largely provided at tertiary level even for some basic services like drug refills for diseases like hypertension and diabetes. Where basic services exist, they are often frequently interrupted by stock-outs of key supplies. Health facilities lack guidelines for the standardisation of care and integration of prevention into routine care. This has resulted in sub-optimal care for chronic patients. Control of blood pressure was also low, with less than 50 per cent of patients well controlled according to a systematic review in Africa (20). Studies in rural Uganda have also found poor levels of control, with only about 40 per cent of those on treatment achieving treatment targets overall (21).

Health financing: Like in most countries in the region, Uganda's health services are provided free or subsidised for the users through a state-owned health delivery network and external aid. Some settings charge a user fee, with special groups being exempted. Private health insurance is practised

in very few countries, such as South Africa and Botswana (22), although some countries have small, fragmented schemes. National health services are plagued by inadequate resources as most countries have not met the Abuja threshold of 15 per cent expenditure on health (23). As a result, the resources available for NCDs are generally limited across the continent, with more priority being given to infectious diseases. For example, in Uganda an estimate of only 0.01 per cent of the MOH budget is available for diabetes management (16).

Diagnostics, medicines and therapeutics: PHC facilities often lack point-of-care diagnostics, including basic tools like glucometers, glucose test strips, stethoscopes and blood pressure machines. Essential medicines for diabetes and hypertension are often not stocked at the lower facilities (24). Outpatient departments lack simple risk assessment tools like tape measures and weighing scales. There are no validated simple-to-use risk assessment guides to aid the identification of high-risk persons, yet mass screening is impractical.

Health information: There is also need to improve NCD data and surveillance. National risk factor surveys have become a key tool for countries to understand the burden of NCDs and their risk factors (7). This has been especially useful because of the often patchy and incomplete epidemiological and passive surveillance data on NCDs in LICs. Uganda is one of the African countries that conducted a national risk factor survey, using the WHO STEPS approach (5, 6).

Achieving UHC for NCDs

With the new public health challenge of rising non-communicable diseases amidst a high burden of communicable diseases, achieving universal health coverage for NCDs is an uphill but achievable task. Universal health care coverage for NCD's infers; (1) increasing the proportion of people receiving NCD services, (2) increasing the package of NCD services that are provided and (3) reducing the financial burden of accessing these services.

Increasing the proportion of people receiving NCD services including vulnerable populations and increasing the package provided requires the translation of proven cost effective measures to reach the at-risk populations at the lowest levels of interface with the health system. It also requires the active involvement of other sectors that have an influence on NCDs. For these measures to be effective, a major shift in the approach to service delivery

ought to happen, with the provision of quality chronic care receiving as much attention as provision of quality care for acute conditions.

Increasing population and service coverage for NCDs

Priority interventions to foster universal access to NCD services by increasing both population and service coverage can be classified in two broad categories: (1) Preventing new cases by addressing risk factors for NCDs; and (2) Improving care and outcomes for people with NCDs.

Addressing risk: Prevention as a route to achieving UHC for NCDs

Given that the NCD epidemic is still evolving in our context, we have an opportunity to arrest it from imploding by promoting widespread awareness about the risk factors at both population and primary care levels in a way that motivates people to act on behavioural drivers. To develop chronic lifestyle disease, individuals often undergo long pre-disease exposure to preventable risk factors (25). The lack of systematic prevention has been hindered by a) the absence of programmes to identify high-risk persons; b) the absence of context-relevant risk reduction programmes at individual and population levels; and c) lack of effective behaviour change messages and support. Achieving universal preventive care for NCDs, therefore, requires re-configuration of service delivery towards the integration of prevention with other routine services. Attention should be paid to four core areas:

1. Mass health education

Mass health education has the potential to awaken a critical mass of the population to the reality that chronic conditions are as important as acute diseases, that they are often lifelong, and that they have a strong link to lifestyles. Because behaviours that predispose one to NCD risk are deeply rooted in societal norms, awareness creation should emphasise cultural change regarding how society perceives wellness and risk behaviours. Messages should also not only provide strong justification for behaviour change but they should also provide contextually relevant suggestions on healthy lifestyle options, building on positive things that communities already do. At the population level, mass health education can be done through the media. Radio is fairly low-cost and has a high penetration in LICs. With the increasing penetration of mobile phones, telephone messages may also be considered. Although

health education messages are common in Ugandan media, those focusing on NCDs are rather limited.

2. Risk assessment as part of routine services

Owing to the impracticality of mass testing for some chronic illnesses, early diagnosis requires simple standardised algorithms for risk assessment to enable the identification of high-risk individuals. To be affordable, risk assessment should be integrated into the existing outpatient services. Comprehensive risk assessment for NCDs is currently absent in most public health facilities in Uganda.

3. Initiation of non-pharmaceutical 'treatment' for people assessed to have risk factors

Initiation of lifestyle interventions for people at higher risk will require the development of risk assessment tools, risk stratification and prescription of lifestyle interventions (exercise, diet, and healthy habits). These tools are largely lacking in Uganda. Current treatment guidelines do not adequately address lifestyle measures. It would also require simple contextually relevant health education materials that can be used to communicate to clients.

4. Follow-up support of people at higher risk to reinforce behaviour change

People with risk factors would also need a mechanism for follow-up to reinforce their healthy choices and assess progress towards risk reduction. Guidelines on the frequency, content and rigour of such follow-up are needed, given the potential impact of such added services on already overstretched clinics. Follow-up of high-risk patients is largely absent in Uganda; and moreover often facilities do not even have home addresses and contact information for their clients.

Improving access to quality care for NCDs

At the primary and secondary care health facilities, increasing access to universal care for NCDs requires re-organisation of services to enhance chronic care. Care is constrained by four main gaps: a) the lack of effective mechanisms for early diagnosis and early entry into care; b) the absence of contextualised and standardised algorithms for diagnosis and management; c) non availability and inadequacy of medicines; and d) low retention into care. This calls for a minimum package for diagnosis, initiation into care

and follow-up of people with chronic disease, tiered to different levels of health facilities. These procedures should be summarised in simple service delivery algorithms that the health workers can quickly refer to, specifying the flow of services at different levels and when to refer. These guidelines should be distributed and normalised into all primary care facilities. They should incorporate three main aspects of improved care: 1) Using simple risk assessment tools to identify high-risk individuals who are then screened for undetected disease; 2) Initiation and maintenance of care for people with disease; and 3) Empowering those enrolled and supporting self-care for them. One of the low-hanging fruits is for the primary care facilities to establish chronic care clinic days, especially for diabetes and hypertension and related medicines.

a) Effective mechanisms for early diagnosis and early entry into care

Simple easy-to-use diagnostic tests and equipment should be provided to facilities to allow early screening of patients with NCDs. Routine testing for NCDs even for high-risk individuals is currently absent in most health facilities in Uganda (26). Where this occurs it is highly driven by individual patients and in some cases personal physicians. While screening of those at risk is recommended, significant preparation for the leap in demand must precede any efforts at screening for NCDs and their risk factors. In health systems that lack essential care, identifying more people with disease is likely to exacerbate existing shortages (27), raising serious ethical questions about screening without the capacity to treat.

b) Quality care for NCDs

Once people with disease are identified, there is need to provide them with quality care. Quality care should involve not only medication, but should support the adoption of healthy lifestyles and adherence to medication. This has been successfully done with the management of HIV, which provides several lessons for NCD care *(see case study 1).*

Health facilities should be equipped with the relevant tools, drugs and human resources to enable them to offer the minimum NCD care package. Because the majority of health workers were trained in a predominantly acute care-based paradigm, there will be need to implement scaled in-service training to re-orient health workers to the integration of acute and chronic care. Likewise, there is need to strengthen pre-service training in chronic care for all health sciences trainees. Since NCDs have a strong link to lifestyles,

health education should be a key component of treatment. Health facilities should offer health education for stable patients and motivational counselling for new, non-adherent or non-improving patients – some of these sessions can be handled by empowered expert patients.

c) Increasing retention into care

Following the initiation of care, follow-up needs to be strengthened if patients are to achieve their treatment targets and improve their outcomes. Continuity of care should be ensured by establishing regular NCD clinics. Adherence to follow-up appointments, drugs and lifestyle modification plans should be tracked, so that patients who are not performing well receive additional support. Learning from HIV/AIDS programmes, care companions could be a key resource in home-based treatment support. Self-organisation of patients by forming peer support groups has also been demonstrated to be effective in HIV programmes. To support lifestyle change, patients need illustrated health education materials that relate to their food and physical activity environment, as well as motivational coaching. Peer groups also have a role in home visiting, tracing of patients lost to follow-up, and identification and referral of patients with danger signs (peer referral). Devices for self-monitoring could also be made accessible at community level through the peer groups. Many clinics that offer care for NCDs in Uganda do not have strong follow-up programmes; they tend to just wait for patients to come to the clinic. However, a few clinics use care companions and patient clubs to encourage retention in care for diabetic patients.

Case study 1: Lessons from HIV management

There are many lessons for NCD programmes to learn from HIV services. When HIV became a major public health challenge, health systems in sub-Saharan Africa were at the time unprepared to handle the sharp increase in morbidity that it brought. What followed were concerted efforts to re-orient the health system to accommodate the new service package for HIV. HIV care services required a chronic care configuration and they were structured along three main categories:

a) Prevention of new infections
b) Identification and treatment of infected persons
c) Provision of counselling and psychosocial support

For those living with the condition, prevention involved both population-level programmes (e.g. mass health education, condom distribution and screening outreach) and facility-level programmes (e.g. facility-based screening, ARV treatment, treatment of opportunistic infections and counselling). Screening was a vital aspect of the programme to enable the identification of undetected cases. Akin to NCDs, early treatment was essential to prevent complications. As soon as simple point-of-care tests were available, they were quickly rolled out for use at the lowest primary care levels, with sufficient controls to minimise false positive results. When ARVs became widely available, health facilities were quickly upgraded to be able to offer them. To be accredited as an ARV centre, a health facility has to undergo a readiness assessment, investments and service delivery upgrades. Facilities as low as health centre (HC) IIIs are now providing ARVs following the shifting to nurses of some essential treatment-related tasks. Alongside the treatment, there was substantial capacity-building in counselling and psychosocial support for people living with HIV/AIDS, making support services available to the lowest levels of care. Strong partnerships with civil society and the private sector were established. Many agencies and civil society organisations (CSOs) were established and assigned vital roles to prevent HIV spread. The Uganda AIDS Commission was established to coordinate all the actors from different government and non-governmental sectors. A multi-sectoral approach to HIV was established.

Ensuring health system resilience

The measures proposed above cannot be implemented while ignoring the challenges in which health facilities in LICs operate, including shortages of staff, diagnostic and monitoring equipment, and drugs. The challenge is how to build health systems that can balance both acute and chronic conditions, with sufficient quality, access and outcomes without 'crashing'. Effective integration of chronic care in cross-sectoral systems is a litmus test for the resilience of health systems in LICs (28).

How much can we add to an already overstretched service package and how do we position the add-ons so that they do not suffocate the system? An incremental approach that builds on existing services and focuses on integration rather than parallel services is crucial. Following the roll-out of the enhanced package, primary care facilities would need mentorship support from higher levels to facilitate the normalisation of the NCD package into the routine package. Alongside the enhanced care is the need for effective support functions: improved easy-to-use diagnostics to assess both risk factors and disease; and better supply chains to ensure the steady availability of drugs and supplies, especially since chronic diseases require lifelong treatment.

Reducing the financial burden of paying for services

The financial implications of achieving UHC for NCDs cannot be ignored, especially where LICs are grappling with a dual disease burden. The cost of inaction now could have tremendous financial implications several years from now. Since governments in many LICs are the main financiers of public health services, it is pertinent that governments take the lead in financing the basic package. Because chronic care is lifelong, costs related to care are also lifelong. Re-orientation of health systems requires innovative financing models for patients and the community to share costs with the health system (23). Increased use of insurance systems which include chronic care in their benefit packages can also reduce the financial burden of paying for treatment. There is also the potential for establishing earmarked taxes on products that contribute to the burden of NCDs so that special taxes collected on them are channelled directly to the improvement of NCD care.

Discussion

Universal access to NCD services by increasing both population and service coverage requires the active prevention of new cases by addressing the risk factors at population level and in primary service delivery. A key question that will be encountered while extending UHC for NCDs is whether to focus on population-level measures or the high-risk person. While population-level approaches are needed for disease control at the mass level, they offer little benefit to the high-risk individual and the person with undetected chronic disease (29, 30). Conversely, individual approaches would have maximal benefit for the individual but may not impact on population-level risk (29, 31). We suggest balancing both population and high-risk approaches. The widespread low levels of awareness about lifestyle diseases amidst the substantial prevalence of risk factors in LICs means that mass health education is necessary to create a shift in the general population's perception about NCDs. On the other hand, the high prevalence of undetected chronic conditions in the population suggests the need to strengthen secondary care. To increase awareness while ignoring secondary care would create future challenges as the demand for such services increases. 'Most-at-risk approaches' have been widely used in HIV prevention in Africa. This approach can, therefore, be considered with regard to extending NCD care to the most at-risk populations.

Attention must, however, be paid to the acute shortage of clinicians providing care in primary health care facilities. Some service delivery activities in the care for conditions like diabetes and hypertension can be shifted to non-physician health workers like nurses, particularly for patients who are stable. This includes basic follow-up assessments and drug refills. This approach has already been tested with HIV care and treatment services. There is a growing body of evidence that nurses can perform some clinical tasks as well as physicians, given adequate training and support (27, 32). Patients should also be empowered to undertake some of the routine service delivery tasks so that they become active participants in the care process. On clinic days, they should be able to assess and interpret their own BMI, blood pressure and blood sugar. Learning from HIV care, 'expert patients' come in handy in this respect, as do the patient clubs.

The factors that influence NCD risk (diet, physical activity, habits and self-care) cut across sectors. Therefore, achieving UHC for NCDs requires a cross-sectoral approach, partnership and collaboration. The food industry,

for example, needs to play a role by providing nutritional information on packed processed foods. In the education sector, health promotion activities regarding diet and physical activity should be institutionalised in schools through various curricular and co-curricular activities. School curricula should integrate directed teaching on diet, physical activities and self-care to mitigate NCD risk. It is through persistently building the aptitude of school children both at primary and secondary levels that we can build a generation that is physically active and health-conscious. Secondly, CSOs involved in delivery of public health interventions ought to be brought on board to integrate lifestyle education in their existing outreach platforms.

With the resource constraints that the health system and NCD programmes face, such programmes will require strong partnerships with other stakeholders to foster joint investment, external leverage of commitment and optimization of available resources. The substantial investments into HIV, malaria and TB for example provide an opportunity for re-tooling of their platforms to integrate NCDs. Donor agencies that support the region's health sector will also have to repurpose their investments to include NCDs as a tool for health systems strengthening. These partnerships could include CSOs involved in supporting chronic care (e.g. national NCD initiatives and associations, diabetes associations, stroke associations and CSOs involved in chronic care and rehabilitation), private sector businesses and agencies with a stake in NCD prevention and care (including private health care facilities, insurers and food processors) and other sectors, besides the health sector, that have a stake in NCD control.

Lastly, there is also need for countries to put in place measures for continuous surveillance to understand the changing nature of the distribution and determinants of NCD risk factors. Like HIV/AIDS, risk factor surveys that assess behavioural, anthropometric and biochemical markers should be implemented periodically. Because the distribution of NCDs is not uniform across different regions and socio-economic groups, these surveys should provide sufficient stratification or should be backed up by smaller focal surveys in higher prevalence regions to identify the most-at-risk population sub-groups.

Policy Implications and Recommendations

1. In Uganda the implementation of NCD-related policies have been constrained by the limited financial, human and infrastructure capacity of the country. Uganda needs to increase investment in NCDs so as to facilitate the implementation of policies that can enable universal access to the prevention, early diagnosis and appropriate management of NCDs. This investment should focus on:

    - Increasing government budget allocations for NCDs at all levels.
    - Increasing purchasing of the relevant diagnostic equipment and supplies required for the management of NCDs.
    - Heightened in-service and on-the-job training for the prevention and management of NCDs.

2. Achieving universal preventive care for NCDs requires re-configuration of service delivery towards the integration of NCD preventive services with other routine activities. Attention should be paid to four core areas: mass health education; risk assessment as part of routine services; initiation of non-pharmaceutical 'treatment' for people assessed to have risk factors; and follow-up of such people.

3. To increase the proportion of people receiving NCD services and the service packages offered at primary and secondary care health facilities, the MOH and its partners should develop a minimum package for diagnosis, initiation into care and follow-up of people with chronic disease, tiered to different levels of health facilities. These procedures should be summarised in simple service delivery algorithms so as to enhance their use by health workers.

4. To ensure continuity, special clinics for chronic care should be instituted in HC IIIs and above. Such clinics should also establish mechanisms for obtaining home the addresses and contact information of their clients so as to allow follow-up. Secondly, they should strengthen appointment systems as a means of improving regular attendance of clinics.

5. Successful delivery of preventive and curative care for NCDs requires multi-sectoral programmes, partnerships and collaborations.

6. Mechanisms should be put in place to enable patients and people at risk to contribute towards meeting the direct and indirect costs associated with care for patients with NCDs. This could include the use of health insurance schemes and other local collective financing mechanisms at health facility or community level.

7. Countries should periodically conduct risk factor surveys to understand the changing nature of the distribution and determinants of NCD risk factors.

References

1. Fezeu L, Minkoulou E, Balkau B, Kengne AP, Awah P, Unwin N, et al. Association between socioeconomic status and adiposity in urban Cameroon. Int J Epidemiol. 2006;35(1):105-11. Epub 2005 Oct 28.
2. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2012;380(9859):2095-128.
3. WHO. Noncommunicable Diseases Country Profiles 20112011b. Available from: http://www.who.int/nmh/publications/ncd_profiles_report.pdf.
4. WHO. Global status report on noncommunicable diseases 2010: Description of the global burden of NCDs, their risk factors and determinants 2011c. Available from: http://www.who.int/nmh/publications/ncd_report2010/en/.
5. Guwatudde D, Mutungi G, Wesonga R, Kajjura R, Kasule H, Muwonge J, et al. The Epidemiology of Hypertension in Uganda: Findings from the National Non-Communicable Diseases Risk Factor Survey. PLoS One. 2015;10(9):e0138991.
6. Bahendeka S, Wesonga R, Mutungi G, Muwonge J, Neema S, Guwatudde D. Prevalence and correlates of diabetes mellitus in Uganda: a population-based national survey. Trop Med Int Health. 2016;21(3):405-16.
7. Mayega RW, Kayima J, Mutyoba NJ, editors. A Rapid Assessment of Morbidity and Mortality due to Non-Communicable Diseases in Uganda: Ministry of Health, Uganda; 2011.

8. Mayega RW, Guwatudde D, Makumbi F, Nakwagala FN, Peterson S, Tomson G, et al. Diabetes and pre-diabetes among persons aged 35 to 60 years in eastern Uganda: prevalence and associated factors. PLoS One. 2013;8(8):e72554.
9. Guwatudde D, Kirunda BE, Wesonga R, Mutungi G, Kajjura R, Kasule H, et al. Physical Activity Levels Among Adults in Uganda: Findings From a Countrywide Cross-Sectional Survey. Journal of physical activity & health. 2016;13(9):938-45.
10. Wesonga R, Guwatudde D, Bahendeka SK, Mutungi G, Nabugoomu F, Muwonge J. Burden of cumulative risk factors associated with non-communicable diseases among adults in Uganda: evidence from a national baseline survey. International journal for equity in health. 2016;15(1):195.
11. Kirunda BE, Fadnes LT, Wamani H, Van den Broeck J, Tylleskär T. Population-based survey of overweight and obesity and the associated factors in peri-urban and rural Eastern Uganda. BMC public health. 2015;15:1168.
12. WHO. Global Status Report on Alcohol and Health2011f 02/04/2013:[16 p.]. Available from: http://www.who.int/substance_abuse/publications/global_alcohol_report/msbgsruprofiles.pdf
13. Probst-Hensch N, Tanner M, Kessler C, Burri C, Kunzli N. Prevention - a cost-effective way to fight the non-communicable disease epidemic: an academic perspective of the United Nations High-level NCD Meeting. Swiss medical weekly. 2011;141:w13266.
14. WHO. Package of Essential Noncommunicable (PEN) Disease Interventions for Primary Health Care in Low-Resource Settings2010b. Available from: http://whqlibdoc.who.int/publications/2010/9789241598996_eng.pdf
15. Mayega RW, Etajak S, Rutebemberwa E, Tomson G, Kiguli J. 'Change means sacrificing a good life': perceptions about severity of type 2 diabetes and preventive lifestyles among people afflicted or at high risk of type 2 diabetes in Iganga Uganda. BMC public health. 2014;14(1):864.
16. Schwartz JI, Guwatudde D, Nugent R, Kiiza CM. Looking at non-communicable diseases in Uganda through a local lens: an analysis using locally derived data. Global Health. 2014;10:77.

17. MOH. Health Sector Strategic Plan III 2010/11-2014/15. Kampala: Ministry of Health, Uganda; 2010a. Available from: http://www.health.go.ug/docs/HSSP_III_2010.pdf
18. Geneau R, Stuckler D, Stachenko S, McKee M, Ebrahim S, Basu S, et al. Raising the priority of preventing chronic diseases: a political process. Lancet. 2010;376(9753):1689-98.
19. WHO-WPRO. The WHO Health Systems Framework2007. Available from: http://www.wpro.who.int/health_services/health_systems_framework/en/.
20. Kayima J, Wanyenze RK, Katamba A, Leontsini E, Nuwaha F. Hypertension awareness, treatment and control in Africa: a systematic review. BMC cardiovascular disorders. 2013;13:54.
21. Kotwani P, Kwarisiima D, Clark TD, Kabami J, Geng EH, Jain V, et al. Epidemiology and awareness of hypertension in a rural Ugandan community: a cross-sectional study. BMC public health. 2013;13:1151.
22. Sekhri N, Savedoff W. Private health insurance: implications for developing countries. Bulletin of the World Health Organization. 2005;83(2):127-34.
23. WHO. World Health Statistics: Health Expenditure2009. Available from: http://www.who.int/whosis/whostat/EN_WHS09_Table7.pdf
24. Kengne A, Sobngwi E, Echouffo-Tcheugui J, JC; M. New insights on diabetes mellitus and obesity in Africa-Part 2: prevention, screening and economic burden. Heart 2013;99(15):1072-7.
25. Ambady R, Chamukuttan S. Early diagnosis and prevention of diabetes in developing countries. Rev Endocr Metab Disord. 2008;9(3):193-201. Epub 2008 Jul 7.
26. Mayega, Ekirapa EK, Kirunda BT, Tushemerirwe F, Kasujja FX, Etajak S, et al. WP3: Cross-lessons on the implementation of care — Uganda. [Exploratory study]. In press 2016.
27. Beaglehole R, Epping-Jordan J, Patel V, Chopra M, Ebrahim S, Kidd M, et al. Improving the prevention and management of chronic disease in low-income and middle-income countries: a priority for primary health care. Lancet. 2008;372(9642):940-9. doi: 10.1016/S0140-6736(08)61404-X.

28. Samb B, Desai N, Nishtar S, Mendis S, Bekedam H, Wright A, et al. Prevention and management of chronic disease: a litmus test for health-systems strengthening in low-income and middle-income countries. Lancet (London, England). 2010;376(9754):1785-97.
29. Rose G. Strategy of prevention: lessons from cardiovascular disease. British medical journal (Clinical research ed). 1981;282(6279):1847-51.
30. Waugh N, Scotland G, McNamee P, Gillett M, Brennan A, Goyder E, et al. Screening for type 2 diabetes: literature review and economic modelling. Health Technol Assess. 2007;11(17):iii-iv, ix-xi, 1-125.
31. Peters RJ. [Cardiovascular disease: big problems require big solutions]. Nederlands tijdschrift voor geneeskunde. 2013;157(20):A6047.
32. Abegunde DO, Shengelia B, Luyten A, Cameron A, Celletti F, Nishtar S, et al. Can non-physician health-care workers assess and manage cardiovascular risk in primary care? Bulletin of the World Health Organization. 2007;85(6):432-40.