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Enhancing nursing and midwifery capacity to contribute to the prevention, treatment and management of noncommunicable diseases

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Foreword

The global burden of noncommunicable diseases is already high and continues to grow in all regions of the world. Given this trend, it is important to scale up action to improve the education and practices of health workers. In most countries, nurses and midwives account for more than 50% of health-care providers, representing the largest group who can make significant contributions to prevent and treat noncommunicable diseases. As professionals, nurses and midwives have the expertise to build on the strengths of individuals and communities to improve health outcomes. This expertise is vital to address and manage the complex risks that contribute to the global burden of noncommunicable diseases.

This document discusses specific interventions in the areas of policy, advocacy, research and education and practice, and the roles that nurses and midwives play. The evidence outlined in this document provides an important reference point for policy-makers, researchers, educationists, nurses and midwives, and other health-care workers. It is anticipated the presented information will stimulate interest and action to enhance the capacity of these health workers to respond effectively to noncommunicable diseases.

Executive summary

The more than 19 million nurses and midwives in the world, the largest group of health-care providers, can make an important contribution to efforts to prevent, reduce and treat noncommunicable diseases (NCDs). Nurses and midwives play an important role as members of multidisciplinary and multiprofessional teams who tackle this global health concern. In recognition of their crucial role, two meetings focused on this issue in 2012. The WHO Global Forum for Government Nursing and Midwifery Officers (the Global Forum) focused on strengthening the role of nurses and midwifery in NCDs. The meeting of the International Confederation of Midwives, the International Council of Nurses and the World Health Organization (the Triad meeting) also focused on the contributions of nursing and midwifery in addressing NCDs. Both meetings produced statements supporting the need for changes in policy, research and education to better prepare nurses and midwives to tackle the NCDs epidemic. (http://www.who.int/hrh/nursing_midwifery/en/ and http://www.icn.ch/news/triad-meetings-2012/)

This document includes evidence-based examples of value-added nursing interventions to address NCDs and reduce the associated risk factors, i.e. tobacco use, harmful use of alcohol, physical inactivity and unhealthy diets. It also proposes how suggestions from the Global Forum and the Triad meeting might be implemented so that changes in education and clinical practice can strengthen nurses and midwives' capacity to help prevent, screen and detect NCDs, and then treat and rehabilitate those suffering such diseases.

Since many Member States have a shortage of nurses, an integrated approach that promotes synergies among existing manpower and functions of nursing is proposed to maximize, in the short and medium term, nurses' and midwives' contribution to reducing the burden of NCDs.

Central to the overall plan to build capacity is evidence-based clinical practice within the nursing and midwifery professions. Strategies need to take into account nursing and midwifery potential and expanded opportunities to address NCDs and risk factors within existing mandates and programmes. Member States, health-care organizations, professional organizations, including nursing and midwifery organizations and civil society partners are encouraged to consider these suggestions as they respond to the increase in NCDs worldwide. The strategies, built on recommendations from the Global Forum and Triad meeting, in the areas of policy and advocacy, research and education, when implemented, will strengthen knowledge transfer into clinical practice.

Introduction

In May 2010, the Member States of the United Nations approved UN Resolution 64/265 calling for a "High-level Meeting of the United Nations General Assembly on the Prevention and Control of Noncommunicable Diseases" (also known as the UN NCD Summit) in September 2011 *(1)*. As a result of the meeting, Member States acknowledged the global burden and threat of noncommunicable diseases (NCDs) and committed to taking action to address the NCDs epidemic to prevent millions of premature deaths, and reduce suffering and disability *(2)*. The important role of nurses and midwives, as professionals and as members of multidisciplinary teams, should be a key part of discussions on how Member States might pursue their commitment and how health systems might be strengthened should be a priority topic. Partnerships between nursing and midwifery groups and with other professional groups, government agencies, policy-makers and nongovernment organizations are essential in addressing NCDs.

The four types of NCDs identified by WHO as being responsible for the largest health burden are: cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. These four types of disease are responsible for 60% of deaths worldwide, and 80% of these deaths occur in low-income and middle-income countries (LMICs) *(3)*. 90% of people who die from NCDs in LMICs die before the age of 60 *(1)*. NCDs pose an ongoing threat to achieving the Millennium Development Goals of eradicating poverty and improving health outcomes. WHO estimates that unless action is taken to increase efforts to address NCDs, the cumulative economic losses to LMICs from the four types of NCDs will surpass US$ 7 trillion over the period 2011 to 2025 (averaging about US$ 500 billion per year). On the other hand, a commitment to scale up interventions to address NCDs would cost US$ 11.4 billion per year for all LMICs, or less than US$ 1 per person in low-income countries and up to $3 in high-income countries *(4)*. Strategies to prevent NCDs reduce costs throughout the health-care system and enhance productivity.

These diseases are largely preventable through evidence-based interventions that address four key risk factors: tobacco use, harmful use of alcohol, physical inactivity and unhealthy diets *(3)*. The risk factors overlap in many cases, and co-morbidities often create a double burden for the people affected, making it crucial that policies and programmes addressing NCDs and their risk factors be implemented horizontally and holistically throughout the health-care continuum.

There are many possible synergies between the WHO *Strategic Directions for Strengthening Nursing and Midwifery 2011–2015 (5)* and opportunities to enhance nursing and midwifery involvement in reducing the global burden of NCDs (see appendix 1). These synergies should be harnessed to address NCDs, despite the nursing and midwifery shortage *(6)*. According to the Nursing and Midwifery Programme at WHO, nurses and midwives:

… play a central role in health service delivery – promotion, prevention, treatment and rehabilitation – in areas of great health need, where they may be the only frontline providers of health, especially in remote areas … Since in most countries nurses and midwives form the bulk of the clinical health workforce, developing and strengthening human resources for health means recognizing that nursing and midwifery services play a vital role in improving health service delivery *(7)*.

Supporting nursing and midwifery education and research and promoting nursing and midwifery leadership in policy-making on NCDs and reducing risk factors are aligned with the strategies of the Nursing and Midwifery Programme at WHO and fit within WHO's five main strategic areas for nursing and midwifery, namely: strengthening health systems and services; developing and implementing nursing and midwifery policy and practice; addressing the education, training and career development of nursing and midwifery personnel; assisting in maximizing the management of the nursing and midwifery workforce to address NCDs; and creating partnerships within and between nursing and midwifery services, and other services *(7)*.

Similarly, some health professional organizations have already taken up NCDs education. The International Council of Nurses, for example, has launched a Nurse NCDs Initiative aimed at mobilizing the more than 19 million[1] nurses and midwives for NCDs prevention and care *(8)*.

[1] Based on the numbers of nursing and midwifery personnel reported by WHO from 2001 to 2009, available at the Global Health Observatory Data Repository http://apps.who.int/ghodata/ (retrieved in June 2011).

1

Role of nurses and midwives in the prevention, treatment and management of NCDs

Nurses and midwives can make important contributions as professionals and as part of multidisciplinary teams to address NCDs and reduce risk factors. Information presented in this document can stimulate discussion on maximizing the contributions of the largest group of health-care professionals, nurses and midwives, in responding to the epidemic of NCDs and the four identified risk factors for NCDs, namely tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol. Nurses and midwives, along with other members of the health-care team, must be directly engaged in reducing these risk factors. Nursing's holistic approach to the health of individuals and communities will not only prevent diseases, but promote health, building on the strengths and resources of individuals and communities.

In the face of the growing incidence of NCDs, especially in countries with limited resources, engaging all health-care professionals is vital. Nurses, as members of the health-care team, receive well-earned public trust and respect, and have access to all levels of the population, including the traditionally underserved, throughout the lifespan, and in a variety of settings. Most people worldwide will, at some point, interact with a nursing or midwifery professional. The more than 19 million nursing and midwifery personnel worldwide are the largest group of health-care professionals in most of the Member States and are indispensable for the success of NCDs interventions. Additionally, there is evidence that nurses want to be involved in the global effort to address NCDs *(9)* and evidence is growing about the positive impact of midwives' integrating the prevention and management of NCDs and risk factors into their practice *(10, 11)*.

Nurses and midwives, particularly in LMICs, have a horizontal approach to health care and public health, often providing services ranging from immunization to palliative care, and everything in between. Nursing and midwifery personnel are well positioned to provide interventions at the individual and community level, including providing crucial follow-up to behavioural interventions that aim to modify the key risk factors for NCDs and promote health. The horizontal approach to health care provided by nursing is particularly relevant given the nursing shortage *(6)*. An integrated approach that promotes synergies between existing nursing and midwifery human resources, in the short and the medium term, can expand their population reach while Member States and nursing organizations work to resolve the nursing shortage. This horizontal, primary-care approach was emphasized by Member States in their statements after the NCD Summit *(2)*.

Nurses and midwives are well placed to reduce risk factors associated with NCDs by implementing WHO's recommended "best buys" (that is, cost effective, feasible and with a low implementation cost) *(4)*, such as implementing policies on smoke-free environments and smoking cessation interventions, promoting physical activity, providing dietary education and guidance, and preventing and treating the harmful use of alcohol. Addressing NCDs through existing health-care programmes can also maximize reach. For example, including smoking cessation interventions as part of Directly Observed Treatment Short-course (DOTS) programmes for tuberculosis patients, integrating treatment for NCDs with HIV/AIDS care, and including diet and physical activity education in mother-and-child health and immunization clinics are ways to build synergies and maximize reach. Nurses and midwives in primary-care clinics have a particularly important role to play as noted below in the *Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Noncommunicable Diseases*:

> [M]aternal and child health is inextricably linked with noncommunicable diseases and their risk factors, specifically as prenatal malnutrition and low birth weight create a predisposition to obesity, high blood pressure, heart disease and diabetes later in life; and that pregnancy conditions, such as maternal obesity and gestational diabetes, are associated with similar risks in both the mother and her offspring … *(2)*

The *Political Declaration* highlights important measures to promote and support breastfeeding, prevent obesity and NCDs later in life, improve access to immunization and cancer screening, and scale up health education *(2)*. These are all areas where, traditionally, nurses and midwives have been profoundly involved. However, because of the urgent need to address the NCD epidemic, nursing and midwifery practice on NCDs must be expanded to reduce risk factors. WHO identified a well-prepared health workforce as essential to health-system change and to an effective response to NCDs, stating that health workers, "particularly those in remote and rural areas, must have appropriate skills and competencies through pre-service education and in-service training" *(3)*, together with sufficient funding and infrastructure to perform their tasks. WHO's recommendations on the health workforce supports the establishment of "strong leadership nationwide and integrating NCD treatment with all phases of health workforce development and management, and health workforce policies with national health strategies" *(3)*. WHO also recommends revising the curricula and providing continuing education to health workers *(3)*.

Recognizing the important contributions of nursing and midwifery practice for preventing, treating and managing NCDs, the 2012 WHO Global Forum for Government Chief Nursing and Midwifery Officers (Global Forum) focused on

evidence-based practice and NCDs *(12)*. The Global Forum issued a commitment to enhance nursing and midwifery practice, "working collectively and in our own countries to address NCDs evidence-based nursing and midwifery practices" *(12)* through policy and advocacy, research and education. The Global Forum participants support a strong commitment to evidence-based nursing and midwifery practice to "address NCDs and risk factors impact on individuals, families, communities, and society" *(13)* in support of WHO's global strategy on NCDs. The Global Forum emphasized that nursing and midwifery contributions would ensure that discussions on best-practices to address NCDs would maintain a "people centered primary care is crucial [approach], that prevention must be the cornerstone and that NCDs and risk factors need to be addressed throughout the lifespan" *(13)*. The Global Forum concluded that the need to emphasize NCDs and risk factors would require a "transformed curricula, standards of education and practice, in revised competency statements and in updated job descriptions and role definitions" *(13)*.

The fourth Triad meeting of the International Council of Nurses, WHO and the International Confederation of Midwives (Triad meeting), in May 2012 *(14),* strengthened the commitment of nurses and midwives to develop evidence-based practice to enhance their involvement in preventing, treating and managing NCDs and risk factors. The communiqué from the Triad meeting highlights the need to ensure nurses and midwives "have the necessary knowledge, skills and competencies and a scope of practice that allows them to effectively address NCDs" *(15)*.
This document proposes that strategies be implemented to enhance the evidence-based capacity of nurses and midwives to address the global burden of NCDs and risk factors in clinical practice. Three areas highlighted by the Global Forum as influencing practice include: policy and advocacy; research; education.

The following section presents examples of the scientific contributions of nurses and midwives to address NCDs and risk factors. Subsequent sections address how nursing and midwifery practice can be changed through policy and advocacy, research and education.

2

Scientific evidence supporting the role of nurses and midwives in adressing noncommunicable diseases and risk factors

This section provides selected examples of nursing and midwifery-led intervention research that builds scientific evidence for the role of nurses and midwives in addressing NCDs and risk factors. For several decades, nurses and midwives have contributed significantly to the understanding of health, including predictors and correlates of health-seeking behaviour and the cultural, social and emotional factors that impact on the effectiveness of interventions throughout the health-care continuum. Nursing and midwifery researchers have been involved in building evidence-based practice for preventing, screening/early detection and treating cancer, diabetes, and cardiovascular and chronic respiratory diseases. Nurses and midwives have developed evidence-based practice to reduce the four key identified risk factors for NCDs: tobacco use, harmful use of alcohol, physical inactivity and unhealthy diets. Nurse and midwife scientists have been active collaborators in multidisciplinary and multiprofessional research, developing the best strategies to improve evidence-based practice, from prevention to health systems changes that improve access to and quality of care provided throughout the life continuum. This section, however, highlights examples of nurse and midwife-led initiatives only.

The holistic approach of nurses and midwives to health care is often mirrored in nurse and midwife-led research. Interventions often target multiple behaviours and co-morbidities in order to improve overall health. For example, interventions addressing diet and physical activity in mother-and-child health settings are often linked. Therefore, nurses and midwives seem well positioned to assist Member States in implementing the "best buys" identified by WHO *(4)* to reduce the burden of NCDs at the population, community and individual levels. Tables 1 and 2 provide examples from nurse and midwife-led studies from the past decade that demonstrate the value-added and positive impact of nursing and midwifery interventions in addressing NCDs and risk factors. Several of the interventions described, if adopted, could lead to changes in health-care systems that would reduce costs and improve the quality of care provided at the primary, secondary and tertiary levels.

Midwives are well-positioned in their daily practice to provide health education, encourage healthy behaviours and ease access to primary and secondary prevention of NCDs. This could include regular cervical cancer screening and screening for early detection of breast cancer. Such activities fit within the essential competencies identified by the International Confederation of Midwives *(16)* and the call in the report *The State of the World's Midwifery, 2011. Delivering Health, Saving Lives (17)* for midwifery services to be integrated with the community and health system as part of the continuum of care.

English-language literature from the past decade on nursing-led intervention research programmes, including meta-analyses, was reviewed to select examples of nursing research contributions to addressing NCDs and reducing risk factors. The review took place from 1 August 2011 to 1 November 2011. Efforts were made to select recent examples from various countries in all of the NCD areas and to cover all the risk factors. These studies are listed in Tables 1 and 2. A comprehensive review of the extensive literature on nursing and midwifery interventions on NCDs and risk factors is beyond the scope of this document.

2a. Research led by nursing and midwifery to assess interventions that tackle NCD risk factors

Nurses and midwives worldwide have addressed NCD risk factors as part of their daily practice while engaging in health education in a variety of settings. Table 1 provides some examples of nursing-led research in the area of NCD risk-factor intervention.

While all identified risk factors need to be addressed to achieve maximum impact on curbing the growth of NCDs, special attention to tobacco control is warranted given the burden its use represents for global health *(18, 19)*. The health dangers of tobacco use are cross-cutting. It is a risk factor for all four NCDs that were the focus of the UN Summit, as well as a significant contributor to co-morbidity of other noncommunicable and communicable diseases worldwide, including HIV *(20)* and tuberculosis *(21)*. This necessitates multifaceted approaches to address the double burden of communicable and noncommunicable diseases. Promoting tobacco control policies to protect people from exposure to tobacco smoke, educating them about the harms of tobacco use, banning advertising and marketing, and raising taxes on tobacco products are identified by WHO as "best buys"; offering cessation intervention to tobacco users is identified as a "good buy" to address the global burden of NCDs *(3)*. These are policies supported by the WHO Framework Convention on Tobacco Control, the first UN public health treaty *(22)*.

There are numerous documents describing the positive impact nurses can have on the care of patients with one or more of the NCDs as, for example, the International Council of Nurses, *Delivering Quality, serving communities: Nurses Leading Chronic Care, May 2010.* There is particularly strong scientific evidence describing nurses' contribution to tobacco control *(23)* and growing evidence of their key role in reducing harmful use of alcohol *(24,25)*, the latter based on almost two decades of inquiry.

The body of research and policies on nursing involvement in tobacco control provides a model that can be adapted to ensure nurses are adequately prepared to address other risk factors for NCDs. A meta-analysis of 31 studies comparing a nursing intervention for smoking cessation with a control group receiving usual care concludes that nursing intervention is effective in improving abstinence for six months or longer (RR 1.28, *CI* = 1.18, 1.38) *(26)*. Smoking cessation not only prevents NCDs, it helps prevent recurrence and co-morbidities, and is, therefore, an intervention to be offered throughout the health care continuum *(27)*. The many examples of nursing-led research efforts include those aimed at reducing respiratory and cardiovascular diseases among children through tobacco and diet interventions *(28)*. Nurse-led studies have tested a variety of strategies to screen for high risk of harmful alcohol use and developed brief interventions that reduced alcohol consumption *(24)*. Similarly, there is a growing body of research examining the most effective nursing and midwifery interventions to promote a healthy diet and physical activity in the community and among groups of patients for whom unhealthy diets and physical inactivity pose a serious threat for developing co-morbidities and poor prognosis, as exemplified in Table 1.

Nursing and tobacco control have a legacy of interdisciplinary collaboration that exemplifies how nurses and midwives can be represented in policy-making. This collaboration also serves as a model for nursing involvement in reducing NCD risk factors. At the 1999 meeting of the International Council of Nurses in London, then Director-General of the WHO, Dr Gro Brundtland, said:

> In setting the future directions for global health policy, nursing and midwifery are key elements … Nurses have many opportunities to play a leadership role in combating the tobacco epidemic … Nurses throughout the world have access to the population at all levels of the health care system, and enjoy a high degree of public trust *(29)*.

Table 1. Reducing NCD risk factors: Tobacco use, harmful use of alcohol, physical inactivity and unhealthy diet: Examples of nursing research, 2000–2011

Study objectives	Target population	Design/intervention	Results
Risk factor: tobacco use			
Primary and secondary prevention of smoking among youths *(30)*.	19 studies.	15 studies on primary prevention (9 school-based, 4 community-based); 4 on secondary prevention/ cessation.	Interventions increased awareness of harms of smoking, increased the negative perception of smoking and boosted self-efficacy.
Nursing interventions for smoking cessation *(26)*.	31 studies; smokers in different settings and with different diagnosis.	Studies comparing a nursing intervention for smoking cessation with a control group/usual care.	Nursing intervention was effective in improving abstinence for 6 months or longer.
Smoking during pregnancy and postpartum *(31)*.	64 studies focused on women who smoked during pregnancy and postpartum.	10 studies tested interventions and 14 were preliminary intervention studies.	Significant improvement in the efficacy of interventions.
Impact of an integrated brief intervention to assist antenatal staff in addressing smoking among pregnant women *(32)*.	117 prenatal health professionals; 1024 pregnancy records; follow-up interviews at one month (n=58), 6 months (n=40) and 12 months (n=31) after intervention.	Pre-training and post-training staff surveys; retrospective audit of records; post-intervention interviews with pregnant women who smoked at baseline.	89% of staff reported integrating intervention at 12 months; quit rates were higher than community quit rates, but women tended to relapse after giving birth.
Midwifery intervention to help pregnant smokers quit: Community Action on Tobacco for Children's Health (CATCH) *(33)*.	79 underprivileged young pregnant women.	Pre-intervention survey, and 3-month and 12-month post intervention surveys of smoking status (self-report and carbon monoxide validation).	22.8% self-reported non-smokers at 3 months (20.3% biochemically validated); 16.5% smoke free at 12 months (12.7% biochemically validated).
Intensive advice to pregnant smokers and levels of stress *(34)*.	918 women who smoked at the start of prenatal care.	Randomized trial with 3 arms: 1 brief advice to stop smoking; assessment of willingness to change and self-help exercises; and 20-minute computer program X3 plus self-help exercises.	Intensive cessation advice did not significantly increase levels of stress.
Smoking cessation and patients with cancer *(35)*.	21 studies: 19 as primary intervention with follow-up.	17/19 studies focused on adults; 2/19 studies reported significant differences in smoking cessation between control and intervention groups.	High-intensity interventions were the most successful.
Reducing second-hand smoke *(36)*.	14 policy outcome studies.	5 studies on community readiness for smoke-free policies; 8 studies to reduce exposure to second-hand smoke.	The strength of legislation is directly related to better outcomes.

Table 1 (continued)

Study objectives	Target population	Design/intervention	Results
Health-care systems for tobacco control *(37)*.	38 studies.	Systems research included: 1) tobacco use identification; 2) education and training of nursing staff to deliver tobacco cessation interventions; 3) dedicated staff for tobacco dependence treatment in acute and chronic care settings; 4) institutional policies to support tobacco intervention.	Key system changes associated with increasing nursing intervention included electronic medical record information technology that has the potential to systematically support tobacco cessation interventions.
Policy and politics of tobacco control *(38)*.	50 studies.	Politics and policy studies included: (1) tobacco industry influence on policy; (2) tobacco industry responses to public health efforts; (3) tobacco industry targeting of marginalized groups; and (4) tobacco industry influence on science.	Nursing research on the politics of tobacco control that focuses on the role of the tobacco industry, has informed decision-makers and assists in the development of tobacco control policies.
Risk factor: harmful use of alcohol			
Feasibility of using the single alcohol screening question (SASQ) and to determine its effect on alcohol screening and intervention rates *(39)*.	126 patients.	Assessment before and after implementation of screening; intervention consisting of single-question screening and brief intervention.	Use of SASQ led to a significant increase in screening rates and intervention in alcohol misuse.
Effects of a 6-month therapeutic lifestyle modification (TLM) in subjects with metabolic syndrome (MetS) in Korea *(44)*.	447 high-risk drinkers, 12 months' data.	Controlled clinical trial with 6-month and 12-month follow-up; the intervention (screening and brief counselling) was part of routine primary care with system-based reminders.	Significantly larger changes in weekly alcohol intake, and in changes to safe drinking.
Impact of nurse-delivered brief interventions to reduce drinking among hazardous drinkers in Scotland *(41)*.	194 patients with facial trauma.	A randomized controlled trial of two brief interventions (nurse-led motivational intervention or leaflet on alcohol misuse) involving hazardous drinkers.	Significant reductions in alcohol consumption in the nurse intervention group at 12 months after the intervention.
Efficacy of trained nurses' intervention to screen for alcohol problems in hospitalized patients *(42)*.	1360 patients screened; 125 received the intervention; and 45 were referred to a counsellor.	Pre-post survey of changes at 6 months; one or two sessions of counselling.	Reduction of alcohol intake with counselling while hospitalized.
Screening strategy in clinical settings *(43)*.	315 pregnant women.	Randomized trial; intervention collected data about alcohol use during the year before pregnancy, and assessed actual consumption during the first trimester.	Screening led to significantly higher levels of identification of women with hazardous consumption during the year before pregnancy and with ongoing consumption problems.

Study objectives	Target population	Design/intervention	Results
Risk factors: unhealthy diet and physical inactivity [2]			
Effects of a 6-month therapeutic lifestyle modification (TLM) in subjects with metabolic syndrome (MetS) in Korea *(44)*.	52 women with MetS.	Randomized controlled trial; intervention included health screening, exercise, low-calorie diet, and health education and counselling for 6 months.	Significant improvement in metabolic levels of several MetS markers and inflammatory states.
Differences in self-efficacy for and barriers to healthy dietary intake between cardiac rehabilitation participants and non-participants after hospital discharge *(45)*.	51 adults previously diagnosed with an acute cardiac event.	Prospective longitudinal design.	Significantly greater self-efficacy and fewer barriers to healthy diet at the end of follow-up.
Predictive validity of three behavioural variables on changes in diet: commitment to health; confidence in ability to change dietary behaviours; and belief about the importance of changing dietary behaviours *(46)*.	499 manufacturing workers from multiple worksites.	A cross-sectional survey.	Commitment was the best predictor of dietary change.
Effectiveness of nutritional education or advice on physical function, emotional health, quality of life, nutritional indices, anthropometric indicators, mortality, service use and costs of care in people more than 65 years of age living at home *(47)*.	23 studies; 10 had intervention solely delivered by nurses.	Systematic review of randomized controlled trials.	Nutritional education or advice can positively affect physical function and diet, while complex interventions with nutritional education as a component can reduce depression in people more than 65 years of age who live at home.
Effectiveness of an 8-session health promotion programme (internet/ video-delivered) to increase physical activity and reduce dietary fat among low-income, culturally diverse students *(48)*.	103 students.	Quasi-experimental design.	Significant increase in exercise and reduction in dietary fat.
Effectiveness of the Heart and Soul Physical Activity Program in promoting physical activity among midlife women *(49)*.	42 women aged 35 to 65 years.	Randomized, repeated measures, nested design; health promotion intervention was church-based.	Significant improvement in physical activity, energy expenditure and cardio-respiratory fitness.
Cost–effectiveness of exercise on prescription with ongoing support in general practice in New Zealand *(50)*.	1089 women aged 40 to 74 years.	Prospective cost–effectiveness study as part of a randomized controlled trial; nurse-led intervention (brief advice, follow-up, "prescription" for exercise).	Significant improvements in physical activity at 12 and 24 months; intervention was cost–effective.

Table 1 (continued)

Study objectives	Target population	Design/intervention	Results
Effect of individual counselling on diet and physical activity from pregnancy to 6 months postpartum, or from birth to 6 months postpartum, on weight retention among Taiwanese women *(51)*.	189 women.	Randomized controlled trial. Two experimental groups (from pregnancy to 6 months postpartum and from birth to 6 months) and one comparison group.	Intervention was effective in reducing post-pregnancy weight retention.
Women's attitudes to and satisfaction with a weight-gain intervention programme during pregnancy *(52)*.	56 obese pregnant women.	Exploratory, descriptive study.	While the maximum ideal weight gain was not reached by more than half of the participants, most of them were satisfied with the programme and their weight gain, and stated they had changed their eating and exercise habits (71.4% of the women participated in aqua aerobics classes).

[2] Due to the significant number of intervention studies that focus on modifying both diet and level of physical activity, we combined nursing-led research addressing these two modifiable risk factors for NCDs.

2b. Nursing and midwifery interventions and NCDs: diabetes, cancer, cardiovascular and chronic respiratory diseases

Table 2 offers examples of extensive nursing research involving interventions in various aspects of NCD prevention, screening/early detection, treatment and palliative care, in different settings and countries.

Diabetes

Evidence-based nursing interventions in diabetes, exemplified in Table 2, help to achieve WHO's recommended cost-effective interventions for preventing and managing diabetes, including blood pressure and glycaemic control, and foot care *(3)*. In addition to intervention research, nursing organizations developed and implemented best-practice, evidence-based guidelines on caring for diabetics, from prevention to treatment. For example, the Registered Nurses' Association of Ontario in Canada developed and implemented the *Reducing Foot Complications for People with Diabetes Best Practice Guideline (53)*. An evaluation study of the guideline's implementation found there was a statistically significant improvement in nine out of 12 nurse indicators related to diabetes foot care *(54)*.

Cancer

In the area of cancer care, nurse-led research has guided interventions related to screening and early detection, treatment, survivorship/rehabilitation, and palliation/end-of-life care. Screening for cervical cancer has been recommended by WHO as one of the "best buys" to tackle the global burden of cancer and is one of the competencies recommended by the International Confederation of Midwives *(55)*. Findings from nursing research have resulted in identifying the factors that help or hinder the spread of knowledge about, and access to, screening among women in countries such as Zimbabwe *(56)* Turkey *(57)*, Hong Kong SAR *(58)* and the Philippines *(59)* as well as ethnic minorities in Australia *(60)* and the United States *(61)* to cite a few recent examples. Health promotion, including testing interventions to enhance cancer screening in underserved populations, is one of the strategic research priorities of the Oncology Nursing Society *(62)*. Co-occurring NCDs and risk factors complicate nursing intervention. For example, a study of cancer screening for women with diabetes in 12 states of the United States *(63)* found no difference in mammography rates, but the findings revealed that women with diabetes were less likely to have cervical cancer screenings, highlighting the importance of a holistic approach to addressing NCDs rather than a disease-focused approach. Research describing nursing interventions in various aspects of cancer care in different settings and in different countries contributes to efforts to achieve WHO's goal of cost-effective interventions to prevent and manage cancer *(3)*.

Managing symptoms, minimizing the consequences of cancer treatment, promoting health and quality of life among cancer survivors, and end-of-life issues continue to be research priorities in oncology nursing *(62)*. The social and cultural contexts of care within the family are often considered in nursing studies. More clearly identifying nurse-sensitive outcomes and translating evidence into clinical practice are also a focus of nursing research. This

range of topics and the impact of nursing care on outcomes are displayed in Table 2.

Cardiovascular disease

For decades, nurses have been developing and implementing interventions to improve treatment outcomes and reduce death from cardiovascular diseases. Related studies examined the promotion of smoking cessation *(64),* physical activity *(65)* and a proper diet among patients with an array of cardiovascular diseases *(66–68)*. Table 2 outlines research that evaluates nursing interventions to address cardiovascular diseases at all levels of health-care systems. The findings confirm that nurses can be valuable members of multidisciplinary teams working towards implementing WHO's recommended "best buys" for interventions to tackle cardiovascular diseases, including strategies to promote aspirin therapy to reduce the risk of acute myocardial infarction.

Respiratory diseases

Nurse-led research on individuals with chronic respiratory diseases has helped to identify strategies to manage symptoms and improve the quality of life among patients with chronic respiratory obstructive disease and asthma. This includes offering cost-effective interventions that minimize disability caused by respiratory diseases. Nurse-led research has also helped improve understanding of the factors associated with health-seeking behaviours, medication adherence and access to care for patients. These research efforts highlight a variety of complex approaches to promote symptom management and enhance quality of life *(69)*. Tobacco use is among the priorities for research into risk reduction even after a diagnosis of respiratory disease. Research is also needed on how to reduce complications in the critical-care setting and end-of-life models of care.

The examples provided in Table 2 show the wide range of nursing research that contributes to our understanding of NCDs and supports evidence-based clinical practice. Nursing and midwifery personnel are well-positioned to provide interventions at the individual and community levels, including crucial follow-up to behavioural interventions that aim to modify the key risk factors for NCDs and promote health.

Table 2: Examples of international nurse-led intervention research demonstrating significant improvements in the NCD scenario through the prevention, screening/early detection, treatment and management of diabetes, cancer, and cardiovascular and chronic respiratory diseases, 2000–2011

Study objective	Target population	Design/intervention	Results
NCD: diabetes			
Intervention to prevent diabetes through primary care in Thailand *(70)*.	160 people in the community with pre-diabetes.	Integrating health promotion (exercise, weight control) in the community with treatment centres.	Significantly higher scores for physical activity, weight control and blood pressure control in the intervention group.
Self-efficacy programme for persons with type 2 diabetes in Taiwan *(71)*.	145 people with type 2 diabetes.	Randomized controlled trial; intervention group received diabetes education together with a self-efficacy programme.	Significant improvement in self-care and fewer hospitalizations and visits to the emergency room among the intervention group
Effectiveness of a culturally tailored diabetes educational intervention on glycaemic control in ethnic minorities with type 2 diabetes *(72)*.	Ethnic minorities with type 2 diabetes: 12 studies with 1495 participants.	Meta-analysis of randomized controlled trials. Education interventions during one-on-one or group sessions.	Education interventions were effective in improving glycaemic control.
Effectiveness of a brief structured diabetes education programme based on the concept of self-efficacy in self-care and glycaemic control in Malaysia *(73)*.	164 participants with poorly controlled diabetes.	Single-blind study design; monthly interventions over 12 weeks addressing self-care practices for diet, physical activity, medication adherence, self-monitoring of blood glucose (SMBG) and measurement of glycated haemoglobin A1c (HbA1c).	Significant improvement in SMBG, physical activity, HbA1c, diabetes knowledge and medication adherence.

Table 2 - Diabetes (continued)

Study objective	Target population	Design/intervention	Results
Evolution of glycosylated haemoglobin and other parameters after nurses in Spain performed a control programme and follow-up *(74)*.	831 patients with poorly controlled type 2 diabetes in primary-care settings.	Nurse visits for diabetes education (baseline, 3 and 6 months, and after 6 months).	Significant improvement in glycosylated haemoglobin levels, lipoprotein cholesterol and blood pressure.
Utilization and clinical outcomes of a telephonic nursing disease management programme for elderly patients with diabetes in the United States *(75)*.	610 interventions and 610 matched controls for people more than 65 years of age.	Matched cohort study over 24 months; the telephone nursing intervention provided patient education, counselling and monitoring services.	Significantly lower rates of acute health-care service utilization, improved drug use compliance, improved glycaemic levels and an increase in eye exams.
Efficacy of a controlled nursing intervention focused on education and counselling to improve metabolic control of diabetes in Mexico *(76)*.	45 adults diagnosed with diabetes mellitus type 2 in ambulatory care.	Quasi-experimental design with repeated measures (baseline and 3, 6, 9 and 12 months) of a nursing education intervention.	Significant improvement in glycaemic level and self-care.
Effectiveness of a diabetes nurse clinic intervention in controlling glycaemia in Hong Kong *(77)*.	150 poor glycaemic-control older patients with diabetes (75 controls, 75 cases).	Quasi-experimental design with pre-tests and follow-up tests, with nurse follow-up as the intervention.	Significant improvement in the HbA1c and systolic blood pressure, and reduction in health-care utilization.
Effects of an educational programme for coping with problem situations as a nursing intervention in the diabetic patient in Korea *(78)*.	31 patients with diabetes.	Non-equivalent control group pretest–post-test design, with the intervention being an educational programme by nurses.	Significant differences between the intervention and control groups in self-efficacy, self-care behaviour, coping behaviour and in glycaemic control.
Impact of a health promotion programme on the knowledge of the type 2 diabetic population in Mexico *(79)*.	40 patients with diabetes.	Quasi-experimental study with baseline and post-intervention assessment and nursing education.	After the intervention, the percentage of patients with knowledge about diabetes increased from 10% to 72.5%.
Effectiveness of a nursing programme in preventing diabetic foot complications in Japan *(80)*.	88 patients with diabetes.	Implementation of a nurse intervention for diabetic foot care based on the International Working Group on the Diabetic Foot.	Significant improvement in the severity of complications from diabetic foot.
Clinical and psychosocial factors associated with achieving metabolic control treatment goals and improved quality of life *(81)*.	81 adolescents with type 1 diabetes.	Coping skills training for patients and family.	Significant improvement in HbA1c levels.
Effects of a parish nurse intervention programme on maternal health behaviours, glycaemic control and neonatal outcomes among Mexican American women with gestational diabetes *(82)*.	100 women with diabetes.	Randomized controlled trial. Intervention: usual care plus 1-hour education session.	Significantly improved self-reported health-promoting behaviours.

Study objective	Target population	Design/intervention	Results
NCD: cancer			
Effectiveness of interventions used to promote Pap test screening among ethnic minority women *(83)*.	18 studies.	Meta-analysis of randomized and non-randomized controlled trials.	Interventions were effective in improving Pap test use among ethnic minority women. Access enhancement was the most effective, followed by community education and individual counselling or letters.
Effectiveness of non-invasive interventions delivered by health-care professionals in improving symptoms, psychological functioning and quality of life in patients with lung cancer *(84)*.	9 studies on interventions for patients with lung cancer.	Meta-analysis of randomized or quasi-randomized clinical trials.	Positive results were found for nurse interventions to manage breathlessness, delay clinical deterioration and symptom distress, and improve emotional functioning. One trial assessed an exercise programme and found a beneficial effect on self-empowerment.
Cervical cancer messages that promote screening in South Africa *(85)*.	105 women in a low-resource area of South Africa.	Exploratory, contextual, quantitative door-to-door survey testing non-stigmatizing messages.	Positive association between non-stigmatizing messages and cervical screening.
Effect of a tailored telephone reminder call by community peer volunteers on mammography rates *(86)*.	3880 women aged 50 to 69 years who had not had a mammogram.	Randomized trial; control arm consisted of an invitation letter for mammography screening and an information leaflet; intervention arm added a tailored telephone call.	Higher rates of mammography on intervention.
Telephone intervention and its meeting the information needs of women with breast cancer *(87)*.	135 women with breast cancer.	Randomized trial; intervention arm received a telephone intervention and the control arm usual care.	Fewer physical problems in the intervention group at follow-up. Women in the intervention group reported having their information needs met at higher levels and used nurses more than using the media.
Effects of a comprehensive group rehabilitation programme on the range of motion of the shoulder joint, psychosocial adjustment and quality of life for early breast cancer patients in South Korea *(88)*.	55 women with breast cancer.	Randomized controlled trial; intervention was a rehabilitation programme (education, exercise, peer support) 3 times/week.	Significantly higher range of motion, psychosocial adjustment and quality of life.

Table 2 Cancer (continued)

Study objective	Target population	Design/intervention	Results
Effects of early-onset rehabilitation programme on shoulder mobility, functional status, lymphedema and the incidence of post-operative complications in patients who had had a modified radical mastectomy in Turkey *(89)*.	57 women with breast cancer.	Randomized controlled trial; intervention was a home exercise and rehabilitation programme.	Significant improvement in measurements of flexion, abduction and adduction movements of the shoulder joint, and functional capacity.
Effects of the 'Passport to Comfort' intervention on reducing barriers to pain and fatigue management for ambulatory care cancer patients *(90)*.	187 cancer patients with breast, lung, colon or prostate cancers with moderate to severe pain and/or fatigue.	Quasi-experimental, comparative study; intervention combined education and system changes to improve pain and fatigue management.	Significant improvements in pain and fatigue measures immediately after the intervention, and sustained over time.
Effectiveness of a nurse-led intervention on (1) disease-specific quality of life, including sexual, urinary and bowel outcomes, and cancer worry; (2) depression; (3) dyadic adjustment; and (4) general quality of life *(91)*.	99 patients and their partners.	Randomized controlled trial; nurse-driven, cancer care intervention (once-a-month meetings with a nurse).	Long-term improvements in quality-of-life outcomes related to sexual functioning and cancer worry.
Impact of a cognitive behavioural intervention to reduce symptom severity among patients diagnosed with solid tumors and undergoing a first course of chemotherapy, and to determine whether the intervention had an additive or interactive effect on symptom severity in the presence of supportive care medications *(92)*.	237 patients with cancer.	Randomized controlled trial; experimental group received cognitive behavioural intervention and control group received usual care.	Significantly lower symptom severity among patients who entered the trial with higher symptom severity.
Effectiveness of the PRO-SELF Pain Control Program in decreasing pain intensity scores, increasing appropriate analgesic prescriptions and increasing analgesic intake in oncology outpatients with pain from bone metastasis *(93)*.	174 patients with cancer.	Randomized clinical trial; PRO-SELF patients were seen by specially trained intervention nurses and received a psychoeducational intervention, were taught how to use a pillbox and were given written instructions on how to communicate with their physician about unrelieved pain plus follow-up calls and visits.	Significant decrease in pain intensity scores; increase in proper analgesic prescription.

Study objective	Target population	Design/intervention	Results
NCD: cardiovascular diseases			
Scoring algorithm for interventions in a chronic heart failure management programme – the Heart Failure Intervention Score in Australia *(94)*.	Chronic Heart Failure programmes: 48 (77%) completed the survey and 27 individual interventions were identified.	Prospective cross-sectional survey design.	This evidence-based quality improvement tool can be used to set heart failure intervention standards.
Effectiveness of home-based cardiac rehabilitation programmes compared with supervised centre-based cardiac rehabilitation on outcomes for patients with coronary heart disease *(95)*.	12 studies (1938 participants).	Randomized controlled trials comparing centre-based cardiac rehabilitation with home-based programmes, in adults with myocardial infarction, angina or heart failure, or who had undergone revascularization.	Home-based and centre-based cardiac rehabilitation were equally effective in improving the clinical and health-related quality of life outcomes in acute MI and revascularization patients, supporting the extension of home-based cardiac rehabilitation programmes.
Effectiveness of a more intensive and comprehensive educational, behavioural and pharmacologic intervention by a nurse practitioner, community health worker and physician team and a less intensive education and referral intervention *(96)*.	309 hypertensive urban African-American men.	Randomized clinical trial; intervention group perceived a more intensive comprehensive educational-behavioural-pharmacologic intervention; control group received a less intensive education and referral intervention.	Significant reductions in blood pressure/increased blood pressure control; significantly lower left ventricular hypertrophy in the more intensive intervention group.
Effectiveness of a transitional care intervention delivered by advanced practice nurses (APNs) to elders hospitalized with heart failure *(97)*.	239 patients hospitalized for heart failure and 65 years of age or older.	Randomized, controlled trial with follow-up through 52 weeks after discharge. The intervention was a nurse-directed discharge plan.	Intervention was significant in reducing and delaying readmission and death, and lowering health-care costs.
Effectiveness of an education, counselling and behavioural skill-building programme in knowledge of, attitudes to and beliefs about cardiovascular disease and adopting a healthy lifestyle in Jordan *(98)*.	160 people.	Non-equivalent, quasi-experimental design; intervention was a health promotion programme.	Significant improvement in knowledge and attitude related to cardiovascular disease.
Intervention tailored specifically for patients with acute coronary syndrome (ACS) and delivered one on one *(99)*.	3522 people with documented coronary heart disease.	Clinical randomized trial, 2-year follow-up. Intervention: education about ACS symptoms and actions required.	Intervention significantly improved aspirin-taking after onset of symptoms.
Brief behavioral intervention together with antidepressant therapy *(100)*.	101 clinically depressed patients with ischemic stroke.	Randomized controlled trial; intervention was a brief psychosocial and behavioural counselling session plus antidepressants versus usual care, including antidepressants.	Significantly lower depression in the short and long term (12 months after treatment).

Table 2 - cardiovascular diseases (continued)

Study objective	Target population	Design/intervention	Results
Impact of an outreach programme using trained lay health advisers in one community of underserved Latinos *(101)*.	256 participants.	Lay advisers were trained to teach 3 classes on healthy nutrition, physical activity and the maintenance of smoke-free environments.	Significant increases in scores from baseline to follow-up in overall lifestyle behaviours and nutrition, physical activity and smoke-free behaviour.
NCD: Chronic Respiratory Disease			
Inhaled corticosteroid (ICS) adherence and asthma control *(102)*.	139 patients with asthma.	Prospective, cluster-randomized and controlled effectiveness trial; intervention was to provide visually standardized, interpreted peak-flow graphs (CUE intervention) to patients and their clinicians on ICS adherence and asthma control.	Significantly less airway reactivity; fewer courses of oral steroids during winter and spring; fewer periods of worsening symptoms; fewer urgent care visits during winter; significant improvement in ICS adherence during winter months.
Effects of inspiratory muscle training with high-intensity inspiratory pressure loads on respiratory muscle performance and exertional dyspnea *(103)*.	27 patients with severe to very severe airflow obstruction and severely limited functional performance.	Randomized single-blind clinical trial; patients were assigned to receive inspiratory muscle training (IMT) or education.	Significant improvement in inspiratory muscle strength, respiratory muscle endurance and respiratory symptoms during daily activities and respiratory exertion.
Intervention through a nurse- led community care programme, the Network Collaborative Action Plan, and its impact on disease severity and patient satis-faction in Thailand *(104)*.	44 patients diagnosed with chronic obstructive lung disease (COPD), coronary heart disease (CHD) and chronic heart failure (CHF).	Quasi-experimental study, using historical controls; nurse-led intervention to promote coordination and continuity of care for patients with chronic illness.	Significantly lower scores on severity of disease measurements; significantly higher scores on satisfaction with community care than those in the control group.
Effects of a nurse-led intermediate care programme on patients who had been hospitalized with an acute exacerbation of chronic obstructive pulmonary disease (COPD) *(105)*.	122 patients with COPD.	Randomized controlled trial; intervention was a care package (pulmonary rehabilitation and self-management education), a written, personalized COPD action plan, monthly telephone calls and 3-monthly home visits by a specialist nurse for 2 years.	Significant reduction in the need for unscheduled primary-care consultations and a reduction in deaths due to COPD.

3

Suggested actions to enhance nursing and midwife capacity to respond to NCDs in practice

The May 2012 Global Forum for Government Chief Nursing and Midwifery Officers on strengthening the role of nursing and midwifery in NCDs (Global Forum) emphasized that changes in standards of practice, competency statements and job descriptions were necessary for nursing and midwives to enhance their contributions to global efforts to prevent, treat and manage NCDs and risk factors. The Triad Communiqué issued by the International Confederation of Midwives, the International Council of Nurses and WHO after the Fourth Triad meeting, also in May 2012, concurred with the Global Forum on the need for nursing and midwifery leadership and action.

It was agreed that in order to achieve changes in practice, increased efforts in the areas of policy, research and education

were needed. The actions suggested below in these three areas will assist Member States, as well as national and local nursing and midwifery organizations, in making further strides in implementing evidence-based practice related to NCDs and risk factors.

3a. Policy and advocacy

The Global Forum statement proposes that, in the area of policy and advocacy, efforts to change clinical practice should:

a. Advocate for the inclusion of NCDs in national health policies plans and strategies, as appropriate.

b. Integrate NCDs into national nursing and midwifery strategies/action plans to provide a framework for nursing and midwifery interventions addressing issues of policy, standards, research, education and practice, including establishing a pool of NCDs nurse and midwife experts.

c. Advocate for the inclusion of NCDs risk factors screening and evidence-based interventions to promote healthy lifestyles for all people throughout the lifespan and health care continuum.

d. Ensure the inclusion of nursing and midwifery stakeholders (e.g. regulators, associations, academics, etc.) in national health policy discussions related to NCDs in all levels in the health system.

e. Develop a strategy and programmes to reduce NCDs risks among nurses and midwives, promoting a healthy workforce and promoting positive role modelling *(13)*.

Nursing and midwifery leadership in policy and advocacy is imperative for changing practice and expanding nursing capacity to address NCDs to help prevent death and disease. Significant nursing leadership already exists among specialized organizations in the areas of diabetes, respiratory disease, cardiovascular disease and cancer, some specific to nursing and midwifery, some with chapters dedicated to nursing practice. However, these nursing leaders are underrepresented in the global movement to address NCDs.

Nursing and midwifery voices need to be heard and nursing and midwifery action needs to be seen, as the more than 19 million-strong group of health professionals will play a pivotal role in reducing the suffering and deaths from NCDs. Box 1 suggests activities that could support putting into practice the Forum Statement and strengthen nursing and midwifery capacity to address NCDs and risk factors through the promotion of leadership in policy.

Box 1: Activities to promote nursing and midwifery leadership in developing and implementing policy as it relates to NCDs and risk factors.

1. Review existing nursing and midwifery strategic action plans, competencies and standards of practice to ensure that NCDs and risk factors are included.
2. Ensure that nurse and midwifery experts representing nursing and midwifery organizations at the international, national and local levels are actively involved in interdisciplinary policy development and implementation to prevent and treat NCDs and risk factors.
3. Ensure that nursing and midwifery experts in NCDs participate in all committees and similar policy bodies that, after the UN Summit, will develop and implement Member States' policies to address NCDs.
4. Develop position statements, or endorse existing ones, on the role of nursing and midwifery in addressing NCDs. Promote the position statements through professional media among members and monitor their adoption.
5. Collaborate with other health-care professional groups, public health groups and tobacco control groups to strengthen the support for risk factor control at the local, provincial/state and national level.
6. Protect nursing and midwifery organizations against commercial interests that promote products and programmes that are detrimental to health and result in increased risk of NCDs.
7. Support strong legislative and regulatory measures to prevent NCDs and address risks for NCDs among young people.
8. Support the creation of programmes to encourage and support nursing and midwifery personnel to embrace health-enhancing behaviours, such as support for tobacco-use cessation and healthy lifestyles.
9. Actively support efforts to implement the WHO Framework Convention on Tobacco Control *(22)*.
10. Advocate for the rights of all people who use tobacco, have unhealthy diets, lack of physical activity and engage in harmful alcohol use to approach risk-reduction services that are evidence-based, accessible, effective and sustained.
11. Support the implementation of brief risk-reduction interventions at every encounter with patients, including adolescents and pregnant women, where nurses and midwives must at least assess tobacco use, alcohol use, physical activity and diet, and provide evidence-based advice for reducing risk factors for NCDs and refer patients to services as available.

A number of nursing and midwifery organizations have developed position statements (for example, the International Society of Nurses in Cancer Care Position Statement on Tobacco Control, http://www.isncc.org/resources/Position_Statements/Tobacco.aspx), model curricula and other resources that will be useful to Member States and other nursing and midwifery groups as they move the NCDs agenda forward. However, more needs to be done to ensure that NCDs and risk factors are featured prominently in nursing and midwifery organizations' agenda and that nursing and midwifery leadership provides ongoing support to its members so that nurses and midwives can be significant contributors to the policy process.

There is growing evidence that nurses and midwives are responding in an effective, collaborative and sustained manner to calls for greater involvement in policy making in relation *to* NCDs. However, it is essential that nurses, midwives and their organizations now take an even stronger leadership role in working with policy makers to promote the integration of evidence-based nursing practice in the reduction of risk factors. For example, the robust response of nursing leaders to tobacco control efforts can expand to other areas of NCD prevention and treatment. Table 3 suggests activities for nurses, midwives and their organizations to strengthen their positioning related to policies to prevent and treat NCDs.

The activities suggested in Table 3 are but a few examples of how nurses, midwives, and nursing and midwifery organizations can, without a significant burden on their budget, help establish a nursing and midwifery presence in policy-making for NCDs. However, additional efforts will be required to fully accomplish the leadership role of nursing and midwifery organizations as the global NCD agenda moves forward, especially collaboration among nursing organizations and among these organization and other health-care organizations.

Table 3: Examples of how nurses and midwives can be involved in policy-making to address NCDs at the individual and organizational level

At the **individual** level.	1. Engage policy-makers and express support for policies to promote the prevention, treatment and rehabilitation of NCDs. 2. Become involved with local NCDs advocacy groups or organizations, such as a local or national cancer association. 3. Create a committee where possible, at the workplace to enhance awareness among nurses and midwives about NCDs, risk factors and how to integrate addressing NCD risk factors with health promotion; for example, smoking cessation interventions in nursing practice.
At the **organizational** level.	1. Promote the assessment of tobacco use, alcohol use, diet and physical activity on all patient records as an indicator of quality nursing and midwifery care within institutions. 2. Initiate and participate, through nursing experts, in the interdisciplinary development, adoption and ongoing updates of clinical practice guidelines for tobacco use treatment, for addressing harmful use of alcohol, and for assisting with countering unhealthy diets and physical inactivity. 3. Advocate for public-health policies that result in reducing risk factors, such as taxing alcohol and tobacco, and restricting the marketing of tobacco products, alcohol and unhealthy foods. 4. Advocate for dedicated funds for NCD programmes and research, including a proportionate level for nursing and midwifery research. 5. Advocate for bans on smoking in all workplaces and public spaces, especially health-care facilities. 6. Identify nursing and midwifery champions/designated leaders in the NCD field within professional organizations who can be key resources for policy-makers and partners.

3b. Research

In the area of nursing and midwifery research priorities, the Global Forum statement emphasizes:

a. Prioritize support for nursing and midwifery research in NCDs, including efficacy and cost–effectiveness of interventions, and translate knowledge into evidence-based practice.

b. Work with partners to secure funding of research and innovative projects, including the use of technology, to address NCDs *(13)*.

While additional research is needed, nursing and midwifery research in several areas of NCD treatment and prevention is growing and has contributed significantly to preventing and treating NCDs. Nursing research on how to best address the complex and sophisticated care of people with NCDs in acute care is well established, but support is urgently needed for additional research, particularly on preventing risk factors, including innovative research that addresses multiple risk factors and co-morbidities in a holistic, horizontal approach. Several nursing organizations have suggested research priorities for NCDs and risk factors *(62,107,108)*.

Research, including translational research, will be a key component in ensuring that nursing and midwifery personnel are using evidence-based interventions in their daily practice when addressing NCDs. Given the reach of nurses and midwives throughout the health-care continuum, research on how to build synergies with existing programmes and services will further facilitate nursing and midwifery intervention in prevention, treatment and rehabilitation efforts for NCDs.

Further efforts are needed to support nursing and midwifery research in the field of NCDs and reducing risk factors. Such efforts must include expanding the scientific portfolios of funding agencies. Educating nurse and midwife scholars at the post-graduate level provides an opportunity to create a cadre of scientists and educators with a foundation in NCDs. Systematic efforts must be directed towards developing a critical mass of nursing and midwifery scientists and post-graduate educated nursing and midwifery clinicians with expertise and training in the sociocultural, political, psychological, behavioural and biological determinants of NCDs. As future faculty members in academic settings, these individuals will transmit an understanding of NCDs to the next generation of nursing and midwifery students, facilitating a change in culture towards NCDs being given the priority they warrant, proportionate to the death and disease burden they cause. Nursing and midwifery scholars must also continue to address translational research in order to improve the implementation of evidence-based methods in clinical nursing and midwifery practice. Increased nursing and midwifery presence in multidisciplinary networks would also benefit efforts to confront NCDs.

The suggested activities to implement the Forum Statement recommendations and strengthen nursing and midwifery capacity and evidence-based practice are summarized in Box 2.

Box 2: Activities to support nursing and midwifery research to address prevention, treatment and risk factors for NCFS

1. Advocate and support funding for research on the effectiveness of nursing and midwifery interventions in addressing NCDs and risk factors in a variety of settings with various populations.

2. Support an increase in funding for nursing and midwifery research on NCDs prevention, treatment and control, including the development and testing of best practices for incorporating NCDs prevention in standard nursing and midwifery care, and to investigate the most effective strategies for implementing prevention interventions among those most in need.

3. Channel resources to research that assesses and addresses tobacco use, the harmful use of alcohol, levels of physical activity and dietary patterns among nurses and midwives themselves, as these NCDs risk factors affect their health and their interaction with patients. Resources and research are needed to determine the best strategies to assist all health professionals, including those in training, with behaviour-change programmes throughout their careers.

4. Support the systematic collection of data on the education and practices of nurses and midwives as they pertain to NCDs and risk factors, evaluating the adequacy of their educational preparation and making changes, as appropriate, to ensure that the nursing and midwifery practitioners are prepared for playing their role in addressing NCDs.

5. Develop policies to ensure funding opportunities for nursing and midwifery scientists to evaluate the best systems and programmes for enhancing the role of nurses and midwives in confronting NCDs, including but not limited to promoting regional and international collaboration on a level befitting this epidemic.

With leadership from nursing and midwifery academia and professional organizations, nursing and midwifery scientists can fully contribute to developing new knowledge and evidence-based practice and policy. With appropriate levels of funding and educational preparation at the graduate level, as well as strong encouragement at the research-training level, nurses and midwives will be well-positioned to

address the research gaps and fulfil their potential to contribute to science-based solutions to counter the devastating impact of NCDs globally. Building on previous reviews of nursing research contributions to understanding NCDs and risk factors, Table 4 provides some examples of the types of additional nursing and midwifery research that are needed.

Table 4: Examples of research that needs to be supported to enhance nursing and midwifery capacity to address NCDs.

1. Expand settings for implementing interventions led by nursing and midwifery to address risk factors, such as paediatric primary care, TB clinics and home health care, since much of this care is coordinated by nursing and midwifery.
2. Evaluate strategies for best integrating NCDs risk assessment with current practice in areas such as community health, mother-and-child health, primary care and acute care, for example, so that targeted interventions can begin as early as possible.
3. Survey the prevalence of risky health behaviours – tobacco use for example – among nursing and midwifery personnel and students, as such behaviours may be barriers to interventions with patients. Evaluate best-model programmes to address tobacco-use cessation and other needs among nurses and midwives in clinical practice and among students.
4. Research best strategies to advance the knowledge and skills of nurses and midwives to address NCDs and risk factors through various curricula, including distance learning.

3c. Education

According to the Forum Statement *(13)* and the Triad Communiqué *(15)*, for nurses and midwives to fully reach their potential to contribute to global efforts to prevent, treat and manage NCDs and risk factors, education standards, competencies and, subsequently, the scope of practice, need to be revised. On education, the Forum statement suggests:

a. Work with education institutions and regulators to promote greater emphasis on NCDs in the nursing and midwifery curricula and to ensure faculty preparedness to facilitate competence in NCDs.

b. Work with WHO Nursing and Midwifery Collaborating Centres, national nurses' and midwives' associations and others to develop and disseminate NCDs information and tools to enhance the nurses and midwives' role in NCDs.

c. Promote health care workers' regular access to continuing education related to health promotion, NCDs prevention and care *(13)*.

Education about NCDs and risk factors could expand the capacity of nurses and midwives worldwide to address NCDs. Such learning could:

1) improve gaps in their knowledge of NCDs and risk factors that limit interventions in clinical practice.

2) remove barriers to increasing their involvement in NCDs prevention and treatment.

3) enhance knowledge transfer from research to clinical practice. Education efforts could utilize existing funded projects and networks that build nursing capacity, particularly those in the non-NCDs areas of tuberculosis, mother-and-child health and HIV/AIDS.

Member States could take advantage of WHO's Nursing and Midwifery Communities of Practice and Collaborating Centres by providing support to these forums and utilizing their expertise in educational outreach. Such collaboration would allow for education to further integrate NCDs prevention with evidence-based clinical nursing and midwifery practice throughout the health-care system. It would also promote technical assistance and networking in developing culture-sensitive, evidence-based nursing and midwifery practice.

Educational policies that prioritize the inclusion of NCDs and risk-factor content in nursing and midwifery curricula are essential. Data suggests the topic of tobacco control has only limited coverage in nursing schools worldwide *(109,110)*. Research also indicates that midwives receive limited information on how to address alcohol and tobacco use among pregnant women, but support efforts to enhance their education in these areas *(109,111,112)*. Limited education about tobacco is found in nursing and midwifery as well as other health-care professions *(110)*. There are many factors that limit the coverage of NCDs in the curricula for nursing and midwifery and other health professions. These include a lack of time to deal with NCDs in the curricula, competing content priorities, lack of trained faculty, lack of appropriate educational resources, lack of clinical training laboratories/settings, and lack of interest among administrators, educators and/or students. Strategies to address these inhibiting factors are listed in Table 5.

Box 3: Strategies to support efforts to expand nursing and midwifery education and ensure the integration of evidence-based findings with clinical practice

1. Support professional education opportunities (workshops, conferences and continuing education programmes) for nurses that address all aspects of NCDs, including the role of nurses and midwives.
2. Include risk factors relative to NCDs, as well as interventions by nurses and midwives to address them, in the agenda of scientific and educational nursing and midwifery programmes.
3. Actively promote the inclusion of specific information about NCDs prevention, health effects and treatment in all undergraduate/graduate nursing and midwifery curricula. The level of such information should be proportionate to the scientific evidence about the burden of NCDs in society and curricula should include both theory and clinical practice content.
4. Support the inclusion of NCDs content in the licensure examinations for professional nursing and midwifery; ensure that NCDs prevention, treatment and rehabilitation, as well as nursing and midwifery intervention to address risk factors, are adequately incorporated with basic, standardized nursing and midwifery practice.
5. Ensure continuing education opportunities exist to allow practising nursing and midwifery personnel to competently and confidently address NCDs risk factors, treatment and rehabilitation.
6. Set specific targets to increase the percentage of nurses and midwives who receive education on reducing risk factors for NCDs.

Table 5: Addressing the inhibitors to nursing and midwifery education on NCDs and risk factors

Inhibitor	Facilitators / strategies
Limited preparation of educators.	Ensure the faculty is prepared to teach content by having access to continuing educational programmes, train-the-trainer workshops, on-line programmes and resources.
Lack of curricular support.	Designate a faculty champion to ensure that NCDs are included in health promotion courses and integrated with the whole curriculum; examine strands in courses to ensure that core content is delivered; and provide opportunities in clinical settings to deliver interventions.
NCD risk factors not prioritized in the curriculum.	Include explicit risk-factor content in standards of nursing and midwifery education at all levels, and address these factors as indicators of quality nursing and midwifery education.
Student assignments.	Include NCDs risk factors as an option for a health promotion paper. Include the involvement of nursing and midwifery advocacy in NCDs treatment as an option for issues courses. Require NCDs risk-factor assessment and intervention to be part of all clinical write-ups.
Lack of NCDs content in pre-licensure and advanced examinations.	Enforce policies in nursing organizations that ensure that competency to address NCDs and risk factors is viewed as an outcome of basic and specialty nursing and midwifery education.
Limited expectation of NCDs treatment and prevention infrastructure for nursing and midwifery care in the health-care delivery system.	Institutionalize nursing care of NCDs and risk factors, such as tobacco-cessation interventions and education about a healthy diet, alcohol intake and physical activity, in the health-care system (inpatient and outpatient) as part of quality care; expose students to clinician role models in practice. Provide opportunities for collaboration with other health-care providers in training programmes.
Limited knowledge about the potential role of the nurse and midwife in preventing NCDs risk factors.	Provide for education on the critical role of nursing professionals in addressing NCDs; expand education on how to be involved in policy efforts in nursing and midwifery organizations, and as part of multidisciplinary teams that address NCDs and risk factors.

Note: Adapted from Sarna et al (2009) in Drug and Alcohol Review *(109)*.

Specific suggestions have been made on how to apply the strategies listed above. While there are many demands on curricula, failure to prepare nurses and midwives adequately to address the leading causes of premature illness, disability and death cannot be tolerated if the goal is to eradicate NCDs. Research indicates there are specific strategies to enhance teaching on tobacco control *(109)*. These strategies might be evaluated and adopted to address other risk factors for NCDs. Several model curricula exist, such as those on diabetes *(113)*, harmful use of alcohol *(24)* and tobacco use *(114)*, and these could be adapted to enhance nursing and midwifery education on NCDs. Few programmes on nursing and midwifery can create, in the short and mid-term, separate classes on NCDs and risk factors. Table 6 suggests how NCDs and risk factor content can be integrated with existing curricula.

Table 6: Suggestions for core content on NCDs and risk factors for basic and advanced nursing and midwifery education.

Topic	Content	Suggested placement
Trends in risk factors for NCDs.	Prevalence, differences by population. Also address risk factors and health behaviours among nursing professionals.	Health promotion, follow-up in specialty courses (e.g. maternity).
Burden of NCDs and their risk factors.	Health impact, including morbidity, mortality and cost, of different forms of tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity.	Health promotion, follow-up in related courses (e.g. medical surgery).
Nicotine addiction, alcohol dependence.	Emerging science of addiction, withdrawal symptoms and the phenomenon of relapse.	Pathophysiology, medical-surgical courses, and mental health or addiction subspecialty courses.
Evidence-based practice.	Most effective treatments, effectiveness of nurses in delivering interventions. Address myths and misperceptions of NCDs risk factors held by nursing students; adapted application of intervention for various subpopulations (e.g. youth, pregnant women, adults with co-morbid disease, psychiatric disease, ethnic groups).	Health promotion, all clinical courses.
Pharmacotherapy.	Mechanism of action and use of drug treatment for NCDs and side-effect management.	Pharmacology, medical-surgical and specialty courses (e.g. mental health).
Behaviour counselling towards behaviour change.	Health promotion and behaviour change theories; stress and coping. Social support and skill training, concepts of motivational interviewing, and other behaviour change interventions.	Health promotion courses, medical-surgical courses, related specialty courses (e.g. mental health).
Implementation of guidelines for risk factor education; prevention and treatment of NCDs.	Identify evidence-based practice guidelines. Address health-care system barriers, including insurance coverage. Address sociocultural and community factors.	Medical-surgical, maternal health and specialty courses, health-care systems, nursing and midwifery issues courses.
NCDs locally nationally and globally.	Awareness of policies addressing NCDs regionally and nationally, and in health-care organizations. Include legislation affecting NCDs. Include discussion of the WHO Framework Convention on Tobacco Control, and the role for nursing and midwifery advocacy as a model.	Nursing and midwifery issues, leadership and health promotion courses.

Note: Adapted from Sarna et al (2009) in Drug and Alcohol Review *(109)*.

3d.
Opportunities for educational outreach

Using information technology through the internet can provide low-cost access to evidence-based NCDs content and resources that can prepare nurses and midwives to help patients address their tobacco use, harmful use of alcohol, unhealthy diets and physical inactivity. Direct access to information through continuing educational programmes and conferences may be limited in some parts of the world. Access through the internet can be useful, especially if the content is delivered in the appropriate language and is culturally valid.

The use of internet-based resources for continuing nursing and midwifery education is a fast-growing field, with special appeal for nurses who have variable work schedules. It is also a cost-effective means of education and has been commended by nurses in practice where available. Increasing partnerships in telemedicine will further enhance the opportunities to educate nurses on NCDs. WHO provides several resources for e-learning: (http://www.who.int/healthacademy/courses/en/). Nurses and midwives must be involved at all levels in planning, developing, implementing and evaluating such learning or any new long-distance learning that aims to strengthen their capacity to address NCDs and risk factors.

4
Concluding remarks

Integrating the 19 million nursing and midwifery personnel with public health efforts to address NCDs is critical to promoting health and preventing and reducing NCDs. Expanding nurses' role in reducing the risk factors that contribute to these diseases, the associated disability and death will be essential. Activities suggested in this document could promote changes in clinical practice by developing and expanding policies and research as well as education, all of which would strengthen evidence-based nursing and midwifery.

Actions to enhance nursing and midwifery capacity to address NCDs through policy and advocacy, research and education are aligned with WHO's publications and recommendations to address the global burden of NCDs *(3)* and are linked with several Member States-approved WHO documents, notably Resolution *64.7 of the 64th World Health Assembly, and the WHO Strategic directions for strengthening nursing and midwifery services, 2011–2015 (5)* (see appendix 1). Given the challenges posed by the nursing shortage *(6),* the proposed synergies between existing programmes and practices will minimize the burden on Member States while capitalizing on investment to build health professionals' capacity to address NCDs.

This document provides examples of evidence-based nursing and midwifery interventions to reduce the four identified key risk factors (tobacco use, harmful use of alcohol, physical inactivity and unhealthy diet) as well as nursing and midwifery interventions to address NCDs (diabetes, cancer, and cardiovascular and chronic respiratory diseases) throughout the continuum of care. Based on the statements from the WHO Global Forum for Government Chief Nursing and Midwifery Officers, specific actions are suggested to enhance policy and advocacy, research and education in nursing and midwifery and NCDs.

Nurses, midwives and nursing and midwifery organizations support policies that promote a healthy and safe environment for the general public. This support can be enhanced by their involvement in developing and implementing policies and programmes that address NCDs. Evidence-based guidelines on risk factors, such as tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity, often encourage all health professionals, including nurses and midwives, to address these issues at every point of patient contact. Risk-reduction interventions should become an essential part of clinical practice at all levels and throughout the lifespan.

Appendix 1

Key result areas, with associated key focus, as proposed in the *WHO strategic directions for strengthening nursing and midwifery services, 2011–2015* document, with examples of activities that both assist in meeting the result area and address NCDs.

Key result area	Key focus	Example of NCD-related activity
1. Strengthening of health systems and services.	Contribution of nursing and midwifery to health system performance, service delivery universal coverage and health outcomes through the active engagement and leadership of nurses and midwives at every level of health policy/programme development and decision-making.	Involve the nursing and midwifery professions, through nursing experts, in developing, implementing and evaluating policies and strategies to ensure that nurses are prepared to engage in preventing and treating NCDs throughout the health-care continuum.
2. Nursing and midwifery policy and practice.	Comprehensive strategic planning for nursing and midwifery services, involving all relevant stakeholders in government, civil society, service delivery, education and professional organizations. Policies must consider local health needs, the current state of health services, the provider mix, available resources and production, and training capacity. They must focus on the regulation of practitioners, the standardization of educational programmes, support for nursing and midwifery, and the promotion of research within and outside the health sector to address significant gaps in policy development.	Include nursing and midwifery interventions to address NCDs in all strategic planning related to clinical practice and service; develop plans to ensure that addressing NCDs and risk factors is standardized nursing practice. Provide funding and support for implementing the capacity-building recommendations (education, research and leadership) included in this document.
3. Education, training and career development.	Continuous monitoring, evaluation and research to provide input for programmes covering pre-service, continuing and post-basic education and training, not only for nurses and midwives but also for other categories of health workers delivering a substantial share of nursing and midwifery-related services. A particular emphasis must be maintained on quality improvement and the mobilization of human, material and financial resources.	Monitor the progress of nursing and midwifery involvement in addressing NCDs by assessing curricular changes, continuing education and advanced nursing and midwifery education, and assessing quality indicators in practice. Conduct NCDs-focused research, including translational research that helps implement evidence-based practice in nursing and midwifery services. Create an electronic global repository of nursing and midwifery research and clinical programmes on NCDs and risk factors.
4. Nursing and midwifery workforce management.	Deployment of a nursing and midwifery workforce capable of consistently meeting established standards of care and the expectations of the public. Strategies can draw on evidence-based recommendations and technical support to enhance the skills mix, performance and mobility. National HRH [Human Resources for Health] plans must consider costs, cover nursing and midwifery personnel at every level, manage migration and remain consistent with approaches for internal and interprofessional task-sharing.	Develop the nursing and midwifery workforce by enhancing nursing and midwifery capacity in education and research, and promoting their leadership in policy development. Putting into practice evidence-based recommendations is imperative for workforce development.

Appendix 1 (continued)

Key result area	Key focus	Example of NCD-related activity
5. Partnership for nursing and midwifery services.	Encouraging governments to partner with other key stakeholders in the development of sound health systems, stewardship and governance. Multi-year work plans must be devised to guide SDNM [Strategic Directions for Nursing and Midwifery] implementation and monitoring. Supporting mechanisms should include formal/informal networks and communities of practice, utilizing electronic means of communication.	Utilize WHO's Communities of Practice and Collaborating Centres to help implement the recommendations to enhance the capacity of nursing and midwifery personnel to address NCDs. These mechanisms, which are already in place, need to include NCDs and risk factors in knowledge exchange, technical assistance and networking, so nurses and midwives globally can benefit from the existing networks.

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The global burden of noncommunicable diseases is already high and continues to grow in all regions of the world. Given this trend, it is important to scale up action to improve the education and practices of health workers. In most countries, nurses and midwives account for more than 50% of health-care providers, representing the largest group who can make significant contributions to prevent and treat noncommunicable diseases. As professionals, nurses and midwives have the expertise to build on the strengths of individuals and communities to improve health outcomes. This expertise is vital to address and manage the complex risks that contribute to the global burden of noncommunicable diseases.

This document discusses specific interventions in the areas of policy, advocacy, research and education and practice, and the roles that nurses and midwives play. The evidence outlined in this document provides an important reference point for policy-makers, researchers, educationists, nurses and midwives, and other health-care workers. It is anticipated the presented information will stimulate interest and action to enhance the capacity of these health workers to respond effectively to noncommunicable diseases.

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