

Beating non-communicable diseases in the community

The contribution of pharmacists

2019

Colophon

Copyright 2019 International Pharmaceutical Federation (FIP)
International Pharmaceutical Federation (FIP)
Andries Bickerweg 5
2517 JP The Hague
The Netherlands
www.fip.org

All rights reserved. No part of this publication may be stored in any retrieval system or transcribed by any form or means – electronic, mechanical, recording, or otherwise without citation of the source. FIP shall not be held liable for any damages incurred resulting from the use of any data and information from this report. All measures have been taken to ensure accuracy of the data and information presented in this report.

Authors:

FIP Working Group on the Role of Pharmacists in Non-Communicable Diseases

Chair: Isabel Jacinto (Portugal)
Chair 2015–2017: Isabelle Adenot (France)
Yetunde Oyeneyin (Nigeria)
Luna El Bizri (Lebanon)
Kristina Billberg (Sweden)
Deirdre Criddle (Australia)
Manjiri Gharat (India)
Michael D. Hogue (USA)
Layla Kishli (Lebanon)
Anna Laven (Germany)
Gonçalo Sousa Pinto (FIP)
Ying Zhou (China)

Editors:

Isabel Jacinto
Gonçalo Sousa Pinto

Assistant editors:

Mariana Gomes
Catarina Nobre
Ibrahim A. Rasoul

Recommended citation:

International Pharmaceutical Federation (FIP). Beating non-communicable diseases in the community — The contribution of pharmacists. The Hague, International Pharmaceutical Federation, 2019.

Cover image: © tai11 | Shutterstock.com

Table of contents

Executive summary	1
1 Introduction	4
1.1 An increasing threat to public health and a heavy economic burden for health systems	5
1.2 Prevention and screening	6
1.3 Pharmaceutical care	6
1.4 Therapy and disease management	7
1.5 Pharmacist training and workforce development	7
1.6 Essential and new technologies to support pharmaceutical care and NCDs	8
1.7 Main limitations and challenges	8
1.8 References	9
2 Evidence: Literature review on the impact of pharmacists' interventions	12
2.1 Prevention	12
2.1.1 References	13
2.2 Screening	14
2.2.1 Cardiovascular diseases	14
2.2.2 Diabetes	16
2.2.3 Asthma/chronic obstructive pulmonary disease	17
2.2.4 Cancer	17
2.2.5 References	18
2.3 Referral	19
2.3.1 Referral pathways	19
2.3.2 Interprofessional relationships	19
2.3.3 Transitions of care	20
2.3.4 Disease-focused referral pathways	20
2.3.5 Cardiovascular studies — focusing on outcome of referrals	20
2.3.6 Asthma studies — focusing on referral	21
2.3.7 References	21
2.4 Therapy and disease management	22
2.4.1 Diabetes	23
2.4.2 Cardiovascular disease	23
2.4.3 Asthma and COPD	23
2.4.4 Cancer	24
2.4.5 Improving adherence to medication	24
2.4.6 References	26
3 Global survey on the role of pharmacists in non-communicable diseases	29
3.1 Aims and objectives	29
3.2 Data collection methodology and tool	29
3.2.1 Design of the survey questionnaire	29
3.2.2 Study sample	29
3.2.3 Limitations	31

3.3 NCD prevention: the role of pharmacists	32
3.3.1 Involvement of pharmacists in NCD prevention programmes or activities.....	32
3.3.2 Country-specific information and resources on pharmacy-based NCD prevention activities	37
3.4 Screening or early detection of NCD patients	38
3.4.1 Involvement of pharmacists in NCD screening activities	38
3.4.2 Cardiovascular diseases: screening methods.....	40
3.4.3 Diabetes: screening methods.....	42
3.4.4 Asthma: screening methods	44
3.4.5 Chronic obstructive pulmonary disease: screening methods.....	45
3.4.6 Cancer: screening methods.....	46
3.4.7 Country-specific information and resources on pharmacy-based NCD screening activities.....	47
3.5 Referral of potential NCD patients.....	48
3.6 Pharmaceutical care and treatment follow-up of NCD patients.....	51
3.7 Access to patient health records	58
3.8 Training of the pharmacist workforce for roles related to NCDs.....	64
3.9 Limitations and barriers to community pharmacists' participation in NCD management	65
3.10 Use of supporting technologies.....	67
3.11 Professional policy on NCDs.....	67
3.12 Additional observations.....	69
3.13 References	71
4 Case studies	73
4.1 Australia.....	73
4.1.1 Legal framework	73
4.1.2 Prevention	73
4.1.3 Therapy and disease management	74
4.1.4 Training	75
4.1.5 Use of new technologies.....	75
4.1.6 Collaboration with other healthcare professionals	76
4.1.7 Main limitations and challenges	76
4.1.8 References:	76
4.2 China	77
4.2.1 Legal framework	77
4.2.2 Prevention, screening and referral	77
4.2.3 Therapy and disease management	77
4.2.4 Training	78
4.2.5 Use of new technologies.....	78
4.2.6 Collaboration with other healthcare professionals	78
4.2.7 Main limitations and challenges	78
4.2.8 References:	78
4.3 Finland.....	79
4.3.1 Legal framework	79
4.3.2 Prevention	79
4.3.3 Therapy and disease management	80
4.3.4 Training	81

4.3.5 Use of new technologies	81
4.3.6 Collaboration with other healthcare professionals	82
4.3.7 Main limitations and challenges	82
4.3.8 References	82
4.4 Germany.....	83
4.4.1 Legal Framework.....	83
4.4.2 Prevention	83
4.4.3 Therapy and disease management	84
4.4.4 Training.....	85
4.4.5 Use of new technologies.....	85
4.4.6 Collaboration with other healthcare professionals	86
4.4.7 Main limitations and challenges	86
4.4.8 References	87
4.5 India.....	87
4.5.1 Legal framework	87
4.5.2 Prevention	88
4.5.3 Therapy and disease management	88
4.5.4 Training.....	88
4.5.5 Use of new technologies.....	88
4.5.6 Collaboration with other healthcare professionals	88
4.5.7 Main limitations and challenges	88
4.5.8 References:	88
4.6 Lebanon	89
4.6.1 Legal framework	89
4.6.2 Prevention	89
4.6.3 Training.....	90
4.6.4 Therapy and disease management	90
4.6.5 Use of new technologies.....	90
4.6.6 Collaboration with other healthcare professionals	91
4.6.7 Main limitations and challenges	91
4.6.8 References:	91
4.7 Nigeria	92
4.7.1 Legal framework	92
4.7.2 Prevention	92
4.7.3 Therapy and disease management	93
4.7.4 Training.....	93
4.7.5 Use of new technologies.....	93
4.7.6 Collaboration with other healthcare professionals	93
4.7.7 Main limitations and challenges:	94
4.7.8 References	94
4.8 Portugal	95
4.8.1 Legal framework	95
4.8.2 Prevention	95
4.8.3 Therapy and disease management	98
4.8.4 Training.....	101
4.8.5 Use of new technologies.....	101
4.8.6 Collaboration with other healthcare professionals	102
4.8.7 Main limitations and challenges:	104

4.8.8 References:	104
4.9 South Africa	106
4.9.1 Legal framework	106
4.9.2 Prevention	107
4.9.3 Therapy and disease management	107
4.9.4 Training	108
4.9.5 Use of new technologies	108
4.9.6 Collaboration with other healthcare professionals	109
4.9.7 Main limitations and challenges	109
4.9.8 References	109
4.10 Sweden	110
4.10.1 Legal framework	110
4.10.2 Prevention	110
4.10.3 Therapy and disease management	112
4.10.4 Training	113
4.10.5 Use of new technologies	113
4.10.6 Collaboration with other healthcare professionals	113
4.10.7 Main limitations and challenges	113
4.10.8 References:	114
4.11 Switzerland	114
4.11.1 Legal framework	114
4.11.2 Prevention	115
4.11.3 Therapy and disease management	116
4.11.4 Training	116
4.11.5 Use of new technologies	116
4.11.6 Collaboration with other healthcare professionals	116
4.11.7 Main limitations and challenges	116
4.12 United States of America	116
4.12.1 Legal framework	116
4.12.2 Prevention	117
4.12.3 Therapy and disease management	117
4.12.4 Training	117
4.12.5 Use of new technologies	117
4.12.6 Collaboration with other healthcare professionals	118
4.12.7 Main limitations and challenges	118
4.12.8 References	118
4.13 Other national initiatives on NCDs	119
4.13.1 Denmark: Expansion of the new medicine service	119
4.13.2 Ireland: New medicine service improves adherence in people with chronic disease	119
4.13.3 Spain: Early screening of colorectal cancer	123
5 Conclusions and recommendations	126

Executive summary

According to the World Health Organization (WHO), more than 36 million people die annually from non-communicable diseases (NCDs), representing over 60% of deaths worldwide, 15 million of which occur before the age of 70 years.¹ Prevention and control of NCDs require interventions that are therapeutically cost-effective, affordable by the patient and/or health systems and feasible, based upon local resources. Interventions need to be framed within national policies and in line with NCD and risk-factor indicators. Chosen interventions should contribute to improving equity in health care in targeted populations and individuals, and improving health outcomes.² For the WHO, priority NCDs fall into four areas: cardiovascular diseases, diabetes, asthma/chronic obstructive pulmonary disease and cancer.²

The FIP Working Group on Non-communicable Diseases conducted a survey of all FIP member organisations and reviewed the main activities of pharmacists related to NCDs. Available literature and case studies complete the sources used to present the global overview of the role of pharmacists in NCDs.

This paper sets a basis of global evidence to advocate, nationally and internationally, for an expanded role for pharmacists in NCD management by compiling best practices and examples. It encourages pharmacists around the world to act upon NCDs, from prevention and screening activities, to patient referral when appropriate, and to pharmacist-led, patient-centred NCD management to improve outcomes and quality of life.

Through research, pharmacists have proven to be a valued asset in the global fight against NCDs, being able to perform relevant activities in the multidisciplinary healthcare team focused on prevention and early detection, and optimising and ensuring compliance with medicines therapy regimens.

In April 2018, the WHO held a global conference in Copenhagen called “Global dialogue on partnerships for sustainable financing of NCD prevention and control 2018”, in which FIP and this working group participated. Among the key messages included in the briefing documents for this conference, WHO states that:

- NCDs competencies and social accountability should be part of every health professional’s training curriculum.
- To reduce the NCDs burden, it is of utmost importance to strengthen healthcare systems using a holistic approach with a strong primary health care system as entry point, closely linked with health promotion, prevention, specialised care and rehabilitation. Remuneration of health professionals should reflect all the health services delivered, especially health promotion and prevention.
- The role of all actors along the healthcare delivery chain should be considered and emphasised, from preventive work and diagnosis to drug delivery and adherence monitoring. In this regard, pharmacies play an important role as a primary healthcare network, providing early screening and testing, advanced counselling and long-term chronic disease management (including key point-of-care measurement and drug management).
- Increased cooperation between the successive specialists (for example, physicians, nurses, pharmacists and social workers) involved in chronic disease management can be both beneficial for patients and cost effective.
- No innovation will matter if it cannot reach patients. Therefore, the private sector should also work with policymakers to ensure that new technologies and services are accessible and appropriately reimbursed, and that there are adequately trained professionals to use them.

Furthermore, in the report from the session “A vital investment: Scaling up health workforce for NCDs” of the above-mentioned conference, the agreed policy recommendations and innovative solutions included to “reimburse NCD-related care provided by pharmacists” and to “increase cooperation between doctors and pharmacists for NCD-related care.”³

Both the key messages and recommendations cited above are entirely supported by FIP and are in line with those expressed in this report.

To further illustrate the pressing need — clinical, humanistic and economic — to improve adherence to treatments, especially in the case of NCDs, a recent paper by the Organisation for Economic Cooperation and Development stated that “the adherence process begins with a patient and a prescribing clinician and a dispensing pharmacist who should all be supported by other health system stakeholders. Payers/system

designers can develop IT systems that facilitate optimal prescribing and patient-clinician communication or renewing prescriptions by patients. Educators have a role in equipping health professionals with skills in managing adherence such as person-centred communication, shared decision-making, and socio-cultural competencies. Professional bodies can issue guidelines on how to personalise medication plans and decision aids facilitating shared patient-provider decision-making. Industry can contribute with solutions such as, for example, simplified medication regimens or packaging. There is also a scope for multi-partner initiatives to **improve patients' health literacy**".⁴

NCDs pose one of the greatest emerging healthcare risks for humanity, demanding new answers and requiring innovative and creative solutions. Building on the key roles they already play as primary healthcare professionals in the community, pharmacists can provide focused interventions, specialised counselling and care coordination, improving patient engagement to achieve better outcomes in the global fight against NCDs.

The key messages of this report are:

A. Collaborative approaches to NCD management

1. Optimising health-related NCD outcomes requires collaborative care models, and reinforces the importance of multidisciplinary healthcare teams including pharmacists, physicians, nutritionists, nurses, physiotherapists and dentists, as well as patients and caregivers.
2. Community pharmacists remain universally one of the most accessible primary healthcare professionals, offering quick and qualified support to patient needs.
3. Pharmacists are embedded within communities, and can be used to improve the health outcomes of NCD patients.
4. Pharmacists use their expertise as a valuable part of the multidisciplinary healthcare team, adding **unique contributions to the clinical outcomes of medicines therapy and to patients' quality of life**.
5. Pharmacists working in the community and across care transitions can act as care coordinators assisting in the delivery of public health interventions.

B. Prevention, screening and referral

6. Pharmacists are ideally placed to be involved in tackling NCDs, especially in disease prevention, with key interventions in tobacco cessation, weight management and other NCD risk prevention, and promotion of healthier lifestyles.
7. Pharmacist-led screening programmes targeting high-risk individuals ensure appropriate resource management in healthcare systems through symptom assessment and point-of-care measurement (e.g., waist circumference, blood pressure, glycaemia, cholesterol) for adequate and timely referrals to doctors.
8. Access to pharmacist screening services in the community pharmacy setting may be limited in some countries based upon lack of clear remuneration models, or unnecessarily difficult public health laws and regulations limiting access to point-of-care testing devices in pharmacies. The elimination of such barriers is an important step towards ensuring optimal patient care.
9. It is important that pharmacists ensure that devices and point-of-care testing equipment used in the screening and monitoring of NCDs are of appropriate, regulated quality, deliver consistently accurate and reliable results and are regularly serviced, maintained and calibrated according to principles of quality control and local policies.

C. Better treatment outcomes

10. Pharmacists can encourage preventive measures, support adequate prescribing and improve **patients' adherence and safety of treatments**, both pharmacological and non-pharmacological.
11. Pharmacist-led medicines adherence needs to be prioritised, both in terms of treatment outcomes and the economic consequences of nonadherence, highlighting the need for pharmacists to consolidate their role in this area.
12. Community pharmacists play a key role in promoting the responsible use of medicines for NCDs, **adding value to patients' knowledge and ability to adequately manage their therapy autonomously** or with the support of caregivers.

13. Pharmacists have a crucial role in therapy management, including medication review, assisting with correct use of devices (inhalers, insulin administration and other devices for self-monitoring), disease management programmes (such as cardiovascular disease, asthma/COPD or diabetes).
 14. Patients can play a major role in managing their own health and preventing NCDs, and pharmacists can actively encourage patient and caregiver engagement and empowerment through education.
- D. Key barriers and challenges to the full utilisation of pharmacists in NCD care
15. In some countries, lack of adequate access to pharmacists due to severe pharmacist shortage is jeopardising the health of patients with NCDs, and government action is necessary to increase the supply of well-qualified pharmacists to ensure patients have access to pharmacist-provided patient care services for NCDs.
 16. Pharmacist interventions supported by evidence-based professional protocols contribute towards ensuring that care pathways are informed by results of screening assessments and tests.
 17. **Evidence is strong concerning the value of pharmacists' contribution to NCD prevention and management, and the quality use of medicines.** Adequate recognition and remuneration of such contributions by both public and private third-party payers could lead to the consolidation of these roles, including activities such as pharmaceutical care based on individual needs, identification and resolution of medication-related problems, safe and effective use of medicines, promotion of adherence to therapy, counselling on medicines, developing personalised pharmaceutical care plans and monitoring disease progression and treatment results.

References

1. World Health Organization. Noncommunicable diseases progress monitor 2017. Geneva: World Health Organization; 2017. Available from: <http://apps.who.int/iris/bitstream/handle/10665/258940/9789241513029-eng.pdf;jsessionid=84BDE82322A835F3344707A3F9185370?sequence=1> [Accessed 11 May 2018]
2. World Health Organization. Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020. Geneva: World Health Organization; 2013. Available from: http://apps.who.int/iris/bitstream/handle/10665/94384/9789241506236_eng.pdf;jsessionid=2B5A5A36001E0D27BB00503A7CE6FBA9?sequence=1. [Accessed 11 May 2018]
3. World Health Organization. Unpublished documents distributed to participants of the conference WHO Global Dialogue on Partnerships for Sustainable Financing of NCD Prevention and Control, Copenhagen, 9-11 April 2018. Available upon request from FIP. For further information: <https://www.who.int/conferences/global-ncd-conference/financing/en/>
4. Organisation for Economic Co-operation and Development (Khan, R. and Socha-Dietrich, K.). Investing in medication adherence improves health outcomes and health system efficiency. Adherence to medicines for diabetes, hypertension, and hyperlipidaemia. OECD Health Working Paper No. 105, June 2018. Available at: <https://doi.org/10.1787/18152015> [Accessed 18 January 2019]

1 Introduction

Non-communicable diseases (NCDs) such as cardiovascular diseases, cancer, chronic respiratory diseases and diabetes are conditions of long duration and slow progression, having the most significant impact on deaths worldwide.¹ Their devastating social, human, economic and public health impact is recognised as a global burden by all societies and economies. NCDs are driven by the effect of globalisation, rapid urbanisation, trade of health-harming products and population growth. According to the World Health Organization (WHO), more than 36 million people die annually from NCDs, representing more than 60% of deaths worldwide, with 15 million people dying before the age of 70 years. The burden of NCDs is estimated to be one in five people having more than one chronic condition in the western world.²

This situation is expected to worsen with ageing populations.² However, NCDs are not only prevalent in the western world. Their number is alarmingly large and growing disproportionately in low- and middle-income countries.² In the Eastern Mediterranean region, in 2012, NCDs claimed over 2.2 million lives and caused 57% of mortality; and 60% of people with chronic diseases die under the age of 70.³

Most premature deaths are linked to common risk factors such as tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol. Subsequently, the WHO developed its global action plan⁴ for the prevention and control of NCDs 2013–2020. This plan includes a global monitoring framework and nine voluntary NCD targets:

1. A 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases.
2. At least 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context.
3. A 10% relative reduction in prevalence of insufficient physical activity.
4. A 30% relative reduction in mean population intake of salt/sodium.
5. A 30% relative reduction in prevalence of current tobacco use in persons aged 15+ years.
6. A 25% relative reduction in the prevalence of raised blood pressure or a containment of the prevalence of raised blood pressure, according to national circumstances.
7. Halt the rise in diabetes and obesity.
8. At least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes.
9. An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCDs in both public and private facilities.

The exposure to NCDs and their complications could be reduced if affordable, evidence-based preventive actions were implemented efficiently, and therapy directed to a broader population. Measures include screening and early detection of diseases; education to promote individual behavioural change; re-evaluation of the access to medicine; evidence-based therapy; disease management to initiate and implement therapy; and fostering adherence to treatment.

In 2006, FIP issued a policy statement on the role of the pharmacist in the prevention and treatment of chronic diseases which already pointed towards the need to expand and consolidate the roles described above.⁵ More recently, FIP set up a working group with the goals of: collecting and analysing the available evidence for the **role and impact of pharmacists' interventions in the fight against NCDs**; providing an overview of existing national and regional policies around the fight against NCDs; assessing the pharmacists' added value in prevention, implementation of the therapeutic plan and supervision, and how they could be supported in this task by new technologies; and reviewing the continued relevance of existing FIP Statements on the effective utilisation of pharmacists and pharmaceutical care in the fight against NCDs and possibly suggesting an update or expansion of those statements. This reference paper is the outcome of that working group.

In April 2018, the WHO held a **global conference in Copenhagen called "Global dialogue on partnerships for sustainable financing of NCD prevention and control 2018"**, in which FIP and this working group participated. Among the key messages included in the briefing documents for this conference, WHO states that:

- Only through a strong healthcare system with well-trained and equipped health professionals can we increase the health of the population and fight the burden of NCDs. NCDs competencies and

social accountability should be part of every health professional's training curriculum. In this regard, it is important to improve the governance of education institutions and to develop regulatory mechanisms for accreditation and quality assurance as well as to ensure their consistent implementation.

- To reduce the NCD burden, it is of utmost importance to strengthen healthcare systems in a holistic approach with a strong primary healthcare system as entry point, closely linked with health promotion, prevention, specialised care and rehabilitation. The remuneration system of health professionals should reflect all these health services delivered, especially health promotion and prevention.
- The role of all actors along the healthcare delivery chain should be considered and emphasised, from preventive work and diagnosis to drug delivery and adherence monitoring. In this regard, pharmacies play an important role as a primary healthcare network, providing early screening and testing, advanced counselling and long-term chronic disease management (including key point-of-care measurement and drug management).
- Increased cooperation between the successive specialists (for example, physicians, nurses, pharmacists and social workers) involved in chronic disease management can be both beneficial for patients and cost effective.
- No innovation will matter if it cannot reach patients. Therefore, the private sector should also work with policymakers to ensure that new technologies and services are accessible and appropriately reimbursed, and that there are adequately trained professionals to use them.

Furthermore, in the report from the session “A vital investment: Scaling up health workforce for NCDs” of the above-mentioned conference, the agreed policy recommendations and innovative solutions included to “reimburse NCD-related care provided by pharmacists” and to “increase cooperation between doctors and pharmacists for NCD-related care.”⁶

Patients suffering from NCDs can experience changes or deterioration in their health condition across their lifetime. They may be treated as an inpatient or outpatient, with greater risk of medication-related problems occurring during transitions of care. In these situations, collaboration between healthcare professionals is fundamental to ensure continuity of care and to provide an agreed safe therapeutic plan. Health professionals, including physicians, nurses and pharmacists, are all important in ensuring safe transitions. Despite a rise in medication-related problems, pharmacists are under-utilised and inadequately remunerated for their role in delivering and improving health care.⁷

Several studies have outlined the benefits of pharmacists' role in the therapeutic management of patients with chronic diseases.⁸⁻¹⁰ Over the past years, community pharmacists have engaged in generating hard evidence of the benefits of such roles, thus expanding the profession's scope of practice.¹¹ Pharmacists can implement public health programmes, conduct preventive measures, screen and refer potential NCD patients, support prescribing and improve patients' adherence to a safe therapeutic plan including pharmacological and non-pharmacological therapy. In the context of NCDs, pharmacists could use their proven expertise and add new technologies to be a valuable part of the multidisciplinary healthcare team, thereby making a unique contribution to the clinical results of medicines therapy and consequently to patients' quality of life.

1.1 An increasing threat to public health and a heavy economic burden for health systems

Cardiovascular diseases are the most critical NCDs worldwide,¹² with diabetes as a major cardiovascular risk factor.¹³ Cardiovascular diseases impose medical, social and public health problems that increase the economic burden on patients, healthcare systems and national economies. Diabetes complications increase disability, reduce life expectancy and increase health costs. Research demonstrates that complications of diabetes could be reduced with improved diabetes control. Community pharmacists can play a vital role in this issue. They are among the most accessible, frequently visited and readily available healthcare professionals worldwide.¹⁴⁻¹⁶ Even if patients do not see their physicians, they will often talk to a pharmacist. The role of pharmacists has evolved from the supply of pharmaceutical products towards the provision of services and information, and particularly in improving the use of medicines.

Cardiovascular diseases such as atrial fibrillation, deep vein thrombosis and pulmonary embolism often require anticoagulation therapy.^{17,18} Polypharmacy is common in these patients, who may require cardiovascular and antidiabetic medicines in addition to anticoagulants, and all these medicines can interact and increase the risk of complications. For example, German patients older than 65 are prescribed more than five drugs per day on average,¹⁹ which contributes to poor adherence. Despite active pharmacotherapy treatment, only 28% of the patients with diabetes in Europe are well controlled in terms of their glycaemic values, and less than 25% of hypertensive patients have an optimal blood pressure.²⁰ Also, less than 50% of patients with atrial fibrillation using a vitamin K antagonist are within the therapeutic INR (International Normalised Ratio) ranges. Adherence was also found to be low among Middle Eastern populations: studies have estimated medication nonadherence rates for diabetes to be 68% or lower.^{21,22}

A modifiable risk factor for the development of NCDs is the patient's weight. Patients who are overweight or obese are at greatest risk of developing NCDs. For example, almost 90% of people with type 2 diabetes are also obese.²³ Moreover, cancer diagnoses associated with overweight or obesity make up for roughly 40% of all cancer diagnoses in the United States.²⁴ Obesity contributes to the development of cardiovascular disease (e.g., hypertension and coronary artery disease) as well as sleep apnoea and osteoarthritis.²⁵ Obesity is considered a global health challenge requiring a chronic disease management model. The WHO recommends that “obesity management covers a whole range of long-term strategies ranging from prevention, through weight maintenance and the management of obesity comorbidities (such as type 2 diabetes or hypertension), to weight loss”.²⁶

Chronic conditions might additionally lead to depression: the incidence is doubled in cardiac patients versus the general population²⁷ and increases to 15–20% after acute myocardial infarction.²⁸

1.2 Prevention and screening

Better public health and prevention policies or more effective and timely health care could prevent more than 1.2 million deaths per year.²⁹ For various reasons, such as the cost of care or geographic distance, individuals may infrequently seek a physician's advice except when experiencing acute conditions. Their reluctance creates a greater need for opportunistic screening technologies, including those conducted by community pharmacists that do not require advanced preparation (e.g., not requiring fasting for blood samples used to diagnose diabetes) or providing opportunities for “see and treat” interventions.

Pharmacy-based screening programmes use medical equipment for physiological measurements, questionnaires and risk assessment forms to determine participants' risk of the targeted disease. Participants' satisfaction with pharmacy-based screening is consistently high.³⁰ Access to pharmacist screening services in the community pharmacy setting may be limited in some countries based upon lack of clear remuneration models, or unnecessarily difficult public health laws and regulations limiting access to point-of-care testing devices in pharmacies. Such barriers must be removed to ensure optimal patient care.

In addition, pharmacists should ensure devices and point-of-care testing equipment used in the screening and monitoring of NCDs are of appropriate, regulated quality, deliver consistently accurate and reliable results and are regularly serviced, maintained and calibrated according to principles of quality control and local policies.

1.3 Pharmaceutical care

Pharmaceutical care is defined as “the pharmacists' contribution to the care of individuals to optimise medicines use and improve health outcomes”.³¹ It involves the process through which pharmacists collaborate with patients and other healthcare professionals to fulfil a therapeutic plan that will produce better clinical outcomes for patients. The three major steps in the patient care process are:³²

1. Assessment of the patient's medical problem,
2. Measures to identify and solve drug therapy problems, including care plan development, and
3. Follow-up evaluation.

In addition to dispensing of medicines, pharmacists can ensure that the medicines therapy is appropriately indicated, safe and effective, while providing counselling on the medication, solving medicines-related problems and raising the patient's awareness about adherence to improve clinical results and outcomes.

Although the extent of the involvement of pharmacists in patient care might vary according to the country in which they operate, community pharmacists are well positioned within healthcare systems, and may have an important role in, among others:

- Counselling on healthy life-style and self-management,
- Counselling on prevention, early detection and adherence of patients with obesity, blood pressure or blood glucose values out of the recommended targets,
- Supporting patients and caregivers to understand how to manage their medication, including medical devices, health related applications and monitoring systems,
- Fostering adherence in all phases (initiation, implementation and persistence),
- Managing addictions,
- Helping to Identify patients with depression,
- Reducing the risk of patients with thromboembolic disorders by improving adherence.

These roles are fully aligned with those described in the Joint FIP/WHO Guidelines on Good Pharmacy Practice: Standards for Quality of Pharmacy Services, from 2011, in which both WHO and FIP define GPP as “the practice of pharmacy that responds to the needs of the people who use the pharmacists’ services to provide optimal, evidence-based care”. These guidelines further state: “As health-care professionals, pharmacists play an important role in improving access to health care and in closing the gap between the potential benefit of medicines and the actual value realised and should be part of any comprehensive health system.”³³

1.4 Therapy and disease management

Many medicines used to treat NCDs require adherence support, frequent clinical monitoring and diagnostic testing, especially during initiation and in the first months of treatment. However, adherence support requires continuing care, as developing healthier habits can take up to one year in the real world.³⁴

In 2012, the IMS Institute for Healthcare Informatics estimated that USD 269 billion worldwide could be saved if adherence to medicines was improved.³⁵ Pharmacists can improve medication adherence and reduce health care costs.³⁶ Additionally, they can minimise access barriers to care, especially in developing countries, if treatments that have minimal requirements for testing and the lowest risk of harm are made available. Community pharmacists can offer better access to health care, support patients and caregivers to conduct adequate therapy and disease management and, thus, improve clinical outcomes.

To further illustrate the pressing need — clinical, humanistic and economic — to improve adherence to treatments, especially in the case of NCDs, a recent paper by the Organisation for Economic Cooperation and Development stated that “the adherence process begins with a patient and a prescribing clinician and a dispensing pharmacist who should all be supported by other health system stakeholders. Payers/system designers can develop IT systems that facilitate optimal prescribing and patient-clinician communication or renewing prescriptions by patients. Educators have a role in equipping health professionals with skills in managing adherence such as person-centred communication, shared decision-making, and socio-cultural competencies. Professional bodies can issue guidelines on how to personalise medication plans and decision aids facilitating shared patient-provider decision-making. Industry can contribute with solutions such as, for example, simplified medication regimens or packaging. There is also a scope for multi-partner initiatives to improve patients’ health literacy.”³⁷

1.5 Pharmacist training and workforce development

Pharmaceutical counselling includes leadership, clinical knowledge of the disease, pharmaceutical understanding of the therapy, communication skills that are culturally appropriate and a structured, professionalised consultation. Initial and continuous training should include:

- Knowledge of targets for early detection of NCDs, including risk factors such as cardiovascular risk, diabetes risk, etc.,
- Demonstrable competency after training in disease-specific topics, pharmacotherapy, medication therapy management, medicines-related problems, and communication skills,
- Training on adherence and behavioural change, including diet, nutrition, smoking cessation and exercise,
- Training in the use of devices and point-of-care testing,
- Responsibility for quality assurance of devices and point-of-care testing equipment,
- Ability to critically appraise the role of new devices and technological advances in identification, management and monitoring of NCDs,
- Intercultural competence development,
- Interprofessional practice.

1.6 Essential and new technologies to support pharmaceutical care and NCDs

In their global vision to promote action on NCDs, the WHO highlighted the need for sustainable healthcare financing and adequate and reliable procurement systems for basic health technologies³⁸ which includes, at least, a blood pressure measurement device, a weighing scale, height measuring equipment, blood sugar and blood cholesterol measurement devices with strips, and urine strips for albumin assay. Access to essential diagnosing and monitoring equipment reduces short- and long-term adverse effects from NCDs.³⁸

The WHO defines health technologies as “the application of organised knowledge and skills in the form of devices, medicines, vaccines, procedures and systems developed to solve a health problem and improve quality of life”.³⁹

As the pace of technological advances increases, there are opportunities for new product innovations in both diagnostics and delivery technologies. Due to the rapid development of medicine and pharmacy, healthcare professionals may lack knowledge and skills to be aware of the newest diagnostic or monitoring technologies. There is a role for both industry and educators to ensure pharmacists are adequately trained in critical appraisal and have the skills needed to evaluate emerging technologies and devices for their suitability in the screening and monitoring of NCDs.⁴⁰

Products that can automate tasks, thereby changing the need for education (e.g., automatic blood-pressure cuffs) or reducing the level of training required (e.g., single-purpose ultrasound devices) might be helpful.

Point-of-care testing and devices quality assurance

Community pharmacies and healthcare organisations providing point-of-care tests or using devices (e.g., for blood pressure monitoring) remain accountable for the quality of their services. This includes responsibility for maintaining a high standard of care, ensuring personnel are adequately trained in use and measurement and all equipment is regularly maintained and calibrated according to quality control protocols.

Delivery technologies are loosely defined as technologies that facilitate healthcare delivery but are neither diagnostic tools nor treatments. Examples of delivery technologies include health information systems, cold chain solutions, and mobile health technologies.⁴¹ e-Learning and webinars may also facilitate broader access to training; for example, e-learning tools have been designed to train individuals in breast cancer screening and promote ongoing quality assurance.⁴²

1.7 Main limitations and challenges

There are minimum requirements to implement NCD interventions in primary care in community pharmacies:

- Compensation models which provide remuneration to support pharmacist involvement,
- Workable policies that are driven by the regulatory authorities,

- Common infrastructure — space, medical devices, medical books etc.,
- Sufficient qualified workforce and enough time to take care of the multitude of patients,
- Knowledge of current guidelines in management and prevention of NCDs,
- Good communication and behavioural change skills,
- The will to innovate and differentiate services by pharmacists,
- Access to essential technologies to support NCD screening and management,
- A workforce which is capable and competent to utilise devices and technologies for screening and management of NCDs,
- Quality assurance programmes which ensure all devices meet acceptable standards,
- Interprofessional collaboration and confidence from physicians, nurses and specialists in laboratory medicine and other healthcare professionals. (Although we are not advocating this collaboration be physically co-located, there should be open communication dialogue with other healthcare professionals and access to the patients' records for all healthcare professionals involved with the treatment of a specific patient.)

Effective implementation of interventions by community pharmacies and pharmacists will require several barriers to be urgently addressed. Pharmacists should be adequately trained in NCD prevention and management. Also, existing healthcare service delivery models should be adapted to promote and allow pharmacists' interventions and make an effective use of pharmacists' knowledge and skills. Consideration must be given to financial models which ensure pharmacists are remunerated for providing pharmaceutical services to patients.

1.8 References

1. World Health Organization. Global Status Report on Noncommunicable Diseases 2010. Geneva: World Health Organization; 2011. Available from: http://www.who.int/nmh/publications/ncd_report_full_en.pdf. [Accessed 24 April 2018]
2. World Health Organization. Noncommunicable diseases progress monitor 2017. Geneva: World Health Organization; 2017. Available from: <http://apps.who.int/iris/bitstream/handle/10665/258940/9789241513029-eng.pdf;jsessionid=84BDE82322A835F3344707A3F9185370?sequence=1> [Accessed 24 April 2018]
3. World Health Organization, Eastern Mediterranean Regional Office. Burden of noncommunicable diseases in the Eastern Mediterranean Region. Cairo: World Health Organization EMRO; 2018. <http://www.emro.who.int/noncommunicable-diseases/publications/burden-of-noncommunicable-diseases-in-the-eastern-mediterranean-region.html>. [Accessed 20 May 2018]
4. World Health Organization. Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020. Geneva: World Health Organization; 2013. Available from: http://apps.who.int/iris/bitstream/handle/10665/94384/9789241506236_eng.pdf;jsessionid=2B5A5A36001E0D27BB00503A7CE6FBA9?sequence=1. [Accessed 25 April 2018]
5. International Pharmaceutical Federation. FIP Statement of Policy the role of the pharmacist in the prevention and treatment of chronic disease, approved by FIP Council, Brazil, 2006. Available from: https://www.fip.org/www/uploads/database_file.php?id=274&table_id=
6. World Health Organization. Unpublished documents distributed to participants of the conference WHO Global Dialogue on Partnerships for Sustainable Financing of NCD Prevention and Control, Copenhagen, 9-11 April 2018. Available upon request from FIP. For further information: <https://www.who.int/conferences/global-ncd-conference/financing/en/>
7. Mossialos E, Courtin E, Naci H, Benrimoj S, Bouvy M, Farris K, Noyce P, Sketris I. From retailers to health care providers: Transforming the role of community pharmacists in chronic disease management. *Health policy* 119 (2015) 628-639
8. Deters MA, Laven A, Castejon A, Doucette WR, Ev LS, Krass I, et al. Effective Interventions for Diabetes Patients by Community Pharmacists: A Meta-analysis of Pharmaceutical Care Components. *Ann Pharmacother*. 2018;52(2):198-211
9. Kharjul M, Braund R, Green J. The influence of pharmacist-led adherence support on glycaemic control in people with type 2 diabetes. *Int J Clin Pharm*. 2018

10. Tsuyuki R, Houle S, Charrois T, Kolber M, Rosenthal M, Lewanczuk R, et al. Randomized Trial of the Effect of Pharmacist Prescribing on Improving Blood Pressure in the Community: The Alberta Clinical Trial in Optimizing Hypertension (RxAction). *Circulation*. 2015; 132:93-100
11. Canadian Pharmacists Association. Pharmacists' Expanded Scope of Practice. Ottawa: Canadian Pharmacists Association; 2018. Available from: <https://www.pharmacists.ca/pharmacy-in-canada/scope-of-practice-canada/>. [Accessed 25 April 2018]
12. World Health Organization. Noncommunicable Diseases Country Profiles 2014. Geneva: World Health Organization; 2014. Available from: http://apps.who.int/iris/bitstream/handle/10665/128038/9789241507509_eng.pdf?sequence=1 [Accessed 25 April 2018]
13. Martin-Timon I, Sevillano-Collantes C, Segura-Galindo A, Canizo Gomez FJ. Type 2 diabetes and cardiovascular disease: Have all risk factors the same strength? *World J Diabetes*. 2014 Aug 15; 5(4): 444-470
14. Tsuyuki R.T., Beahm N.P., Okada H., Al Hamarneh Y.N. Pharmacists as accessible primary health care providers: Review of the evidence. *Can. Pharm. J*. 2018;151:4-5. Available from: doi: 10.1177/1715163517745517 [Accessed 25 January 2019]
15. International Pharmaceutical Federation — FIP (2015). *Global Trends Shaping Pharmacy — Regulatory Frameworks, Distribution of Medicines and Professional Services. 2013-2015*. The Hague, The Netherlands: International Pharmaceutical Federation.
16. International Pharmaceutical Federation — FIP (2017). *Pharmacy: A Global Overview — Workforce, medicines distribution, practice, regulation and remuneration. 2015-2017*. The Hague, The Netherlands: International Pharmaceutical Federation
17. Lip G, Hull R. Rationale and indications for indefinite anticoagulation in patients with venous thromboembolism. UpToDate [Internet]; 2017 Jan. Available from: <https://www.uptodate.com/contents/rationale-and-indications-for-indefinite-anticoagulation-in-patients-with-venous-thromboembolism> [Accessed 25 April 2018]
18. Heidbuchel H, Verhamme P, Alings M, Antz M, Diener HC, Hacke W, et al. Updated European Heart Rhythm Association Practical Guide on the use of non-vitamin K antagonist anticoagulants in patients with non-valvular atrial fibrillation. *Europace* (2015) 17, 1467–1507 doi:10.1093/europace/euv309
19. Cascorbi . Drug interactions—principles, examples and clinical consequences. *Dtsch Arztebl Int*. 2012; 109(33–34): 546–56.
20. World Health Organization and Sabaté, E (ed.). *Adherence to long-term therapies: evidence for action*. Geneva: World Health Organization; 2003. Available from: http://www.who.int/chp/knowledge/publications/adherence_full_report.pdf?ua=1. [Accessed 25 April 2018]
21. Cotté F et al. REACT-AF Study: anticoagulation treatment with VKA. *Clin Ther* 2014;36:1160–11682
22. Alsairafi ZK, Taylor KMG, Smith FJ, Alattar AT. Patients' management of type 2 diabetes in Middle Eastern countries: review of studies. Patient preference and adherence. 2016;10:1051-1062. doi:10.2147/PPA.S104335.
23. American Society for Metabolic and Bariatric Surgery. Type 2 Diabetes and Obesity: Twin Epidemics. Gainesville, FL: American Society for Metabolic and Bariatric Surgery; 2013. Available from: <https://asmbs.org/resources/weight-and-type-2-diabetes-after-bariatric-surgery-fact-sheet>. [Accessed 25 April 2018]
24. Centers for Disease Control and Prevention. Cancers Associated with Overweight and Obesity Make up 40 percent of Cancers Diagnosed in the United States. Atlanta, GA: Centers for Disease Control and Prevention; 2017. Available from: <https://www.cdc.gov/media/releases/2017/p1003-vs-cancer-obesity.html>. [Accessed 25 April 2018]
25. Khaodhiar L, McCowen KC, Blackburn GL. Obesity and its comorbid conditions. *Clin Cornerstone* 1999. 2(3): pp. 17-31
26. World Health Organization. *Obesity: Preventing and Managing the Global Epidemic*. Geneva: World Health Organization; 1999. Available from: http://apps.who.int/iris/bitstream/10665/42330/1/WHO_TRS_894.pdf?ua=1&ua=1 [Accessed 25 April 2018]
27. Egede LE. Major depression in individuals with chronic medical disorders: prevalence, correlates and association with health resource utilization, lost productivity and functional disability. *Gen Hosp Psychiatry*. 2007;29:409–416.

28. Lichtman JH, Bigger JT Jr, Blumenthal JA, et al. Depression and coronary heart disease: recommendations for screening, referral, and treatment: a science advisory from the American Heart Association Prevention Committee of the Council on Cardiovascular Nursing, Council on Clinical Cardiology, Council on Epidemiology and Prevention, and Interdisciplinary Council on Quality of Care and Outcomes Research: endorsed by the American Psychiatric Association. *Circulation*. 2008;118:1768–1775.
29. Organisation for Economic Co-operation and Development and European Commission. *Health at a Glance: Europe 2016: State of Health in the EU Cycle*. Paris: OECD Publishing; 2016. Available from: <http://www.oecd.org/health/health-at-a-glance-europe-23056088.htm> [Accessed 25 April 2018]
30. Melton B, Lai Z. Review of community pharmacy services: what is being performed, and where are the opportunities for improvement? *Integr Pharm Res Pract*. 2017; 6: 79–89
31. Allemann S, van Mil JW, Botermann L, Berger K, Griese N, Hersberger K. Pharmaceutical Care: the PCNE definition 2013. *Int. J. of Clin. Pharm*. 2014;544-55
32. Cipolle R, Strand L, Morley P. *Pharmaceutical Care Practice: The Clinician's Guide, Second Edition: The Clinician's Guide* McGraw-Hill Companies, Incorporated, 25 May 2004 – ISBN 0071362592
33. FIP/World Health Organization. *Good Pharmacy Practice. Joint FIP/WHO Guidelines on GPP: Standards for Quality of Pharmacy Practice*. The Hague and Geneva: FIP and WHO; 2011. Available from: https://fip.org/www/uploads/database_file.php?id=331&table_id= [Accessed 18 January 2019]
34. Lally P, van Jaarsfeld C, Potts H, Wardle J. How are habits formed: Modelling habit formation in the real world. *European Journal of Social Psychology* 2010; 6:998-1009
35. Aitken M, Gorokhovich L. Advancing the Responsible Use of Medicines: Applying Levers for Change. *SSRN Electronic Journal*; 2012. Available at <http://dx.doi.org/10.2139/ssrn.2222541>. [Accessed 25 April 2018].
36. Pringle J et al. The Pennsylvania Project: Pharmacist intervention improved medication adherence and reduced health care costs. *Health Affairs* 2014; 1444-52
37. Organisation for Economic Co-operation and Development (Khan, R. and Socha-Dietrich, K.). Investing in medication adherence improves health outcomes and health system efficiency. Adherence to medicines for diabetes, hypertension, and hyperlipidaemia. OECD Health Working Paper No. 105, June 2018. Available at: <https://doi.org/10.1787/18152015> [Accessed 18 January 2019]
38. World Health Organization. Global NCD target: Improve access to technologies and medicines to treat NCDs. Available from: <https://www.who.int/beat-ncds/take-action/policy-brief-improve-medicine-access.pdf?ua=1> [Accessed 25 January 2019]
39. World Health Organization. Health technologies. World Health Assembly. WHA60.29. Available from: www.who.int/healthsystems/WHA60_29.pdf, p. 106. [Accessed 25 April 2018]
40. Kehrler, J.P, and James D.E. The Role of Pharmacists and Pharmacy Education in Point-of-Care Testing *Am J Pharm Education* 2016; 80 (8) 1-7
41. Nundy, S and Han, E. *New Technology Needs for Noncommunicable Diseases in Developing Countries: a landscaping study*. Results for Development Institute, Washington, 2012. Available from: <https://www.r4d.org/wp-content/uploads/R4D-RD-for-NCDs-final.pdf> [Accessed 25 January 2019]
42. Garra G. *Imaging Communications and Education Technology for Global Health*. Abstract. National Cancer Institute—Cancer Detection and Diagnostics Technologies for Global Health, August 22-23, 2011: 29. NIH Campus, Rockville, Maryland.

2 Evidence: Literature review on the impact of pharmacists' interventions

2.1 Prevention

Prevention consists of activities to stop people from getting diseases or to stop a disease from progressing. For example, health promotion initiatives foster healthy living, delay the onset of disease, and offer strategies to manage diseases and related complications so that their progress is slowed or interrupted.¹

According to the WHO's Global Action Plan for the Prevention and Control of NCDs 2013–2020, the World Health Assembly has endorsed cost-effective interventions proven to prevent or delay most premature NCD deaths. Countries are encouraged to adopt such measures, aimed at the prevention and treatment of NCDs, and to raise awareness about them. Several countries have already adopted public health strategies and policies to prevent NCDs through physical activity. For example, fitness programmes and campaigns encourage people to exercise for 30 minutes a day.¹

The WHO identifies four main risk factors for NCDs — tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity — and four priority NCDs: cardiovascular diseases, diabetes, cancer and chronic respiratory diseases.²

Due to their proximity, pharmacies are at the heart of communities, promoting access to high quality pharmacy services and improving health outcomes for patients. Also, the community pharmacy network provides many opportunities for public health and disease prevention activities. For example, in several countries, pharmacists educate smokers about the benefits of quitting and support them in giving up tobacco use.^{3,4}

In the United States, the National Center for Chronic Disease Prevention and Health Promotion (CDC) also recognised that **“the role of the pharmacist has expanded beyond just dispensing medications and is evolving into active participation in chronic disease management as a part of team-based care”**.⁵ The CDC issued guidance on **“Partnering with pharmacists in the prevention and control of chronic diseases”**, which provides a description and evidence of the role of the pharmacist in team-based health care, as well as an overview of **pharmacists' scope of practice policies at the federal and state levels and a description of how chronic diseases are addressed in community pharmacies**.⁹

Pharmacists specifically have a unique opportunity to influence health outcomes associated with heart disease and stroke. Community pharmacists can help by proactively identifying the needs and disease risk factors of their patients, and taking action to influence healthy behaviours and offering patient care services, such as promotion of lifestyle modifications and self-management.⁶

Also in the United States, the Asheville Project, based on educational interventions by healthcare providers, helps patients with diabetes to make the behavioural changes needed to improve glycaemic control.⁷ Another study indicates that patients with hypertension and/or dyslipidaemia, who were receiving education and long-term medication therapy management services through pharmacies, achieved significant clinical improvements that were sustained for as long as six years, a significant increase in the appropriate use of and adherence to cardiovascular medicines, and a decrease in cardiovascular events and related medical costs.⁸

In a study of pharmacist-led risk factor control for secondary prevention after ischaemic stroke, substantially greater improvements were seen in patients whose care was managed by a pharmacist to attain systolic blood pressure control and desirable blood levels of low-density lipoprotein (LDL) cholesterol, than those managed by a nurse, because pharmacists were empowered to initiate and titrate medicines to attain guideline-recommended targets.⁹

In Spain, a comparative study of health education and drug therapy monitoring interventions in patients with cardiovascular risk factors demonstrated that community pharmacies can have an effective contribution in enhancing the cardiovascular health of patients, through health education campaigns and drug therapy monitoring services. The latter is more effective than the former in improving the values of systolic blood pressure, heart rate, weight, body mass index, basal glucose, total cholesterol, waist circumference and waist-height index. With regards to triglycerides levels, waist-hip index, diastolic blood pressure, improvement of

pharmacotherapeutic compliance and smoking cessation, drug therapy monitoring and health education initiatives were equally effective in improving these parameters.¹⁰

Limited knowledge and awareness of cardiovascular diseases (CVD) and their risk factors among the public in Penang, Malaysia, was revealed in a study, and the majority of respondents expressed favourable opinions concerning the role of community pharmacists in identifying and preventing CVD risk factors in the community.¹¹

A study among Lebanese pharmacists showed that they are more aware of their role in hypertension detection and prevention rather than hypertension management.¹² This study flags competency gaps and opportunities for professional development and exploring new roles for pharmacists, but also that their role in hypertension and detection is well rooted among Lebanese pharmacists. In Nigeria, educational interventions were targeted at practising community pharmacists to improve their knowledge about several public health issues and expand their role in this area. A study concluded that developing incentives for public health services could increase community pharmacists' engagement in health education and disease prevention activities.¹³

Notwithstanding the above, a survey, also in Nigeria, about pharmacists' participation in health promotion activities in two cities indicated a 90% participation among respondents, irrespective of whether financial incentives or remunerations were paid for performing these activities or not. Community pharmacists offered free consultation services at various identified pharmacy outlets, making them readily accessible and well placed for achieving wider coverage among the public. Active participation of community pharmacists in health promotion may serve as a needed link in the sustained global push towards allowing increased access to essential medicines in developing communities and wider health coverage.¹⁴

The guidelines from the Pneumology Society for French-speaking countries (Société de Pneumologie de Langue Française) state that the preventive measures after an exacerbation of chronic obstructive pulmonary disease are very important. These measures include pulmonary rehabilitation with control of cardiovascular comorbidities, therapeutic education intended for patient self-management and pneumococcal vaccination.¹⁵ These roles may be offered by pharmacists in the community setting.

In a consumer study conducted in Germany, pharmacists were identified as the preferred provider in 29 of the 31 preventive care services listed in the study questionnaire. Pharmacists provide several disease prevention services, and there is a great interest in pharmacy-based preventive care counselling in the Bavarian population.¹⁶

The Swiss Pharmacists Association (pharmaSuisse) achieved an in-depth reform of the profession with measures such as a system of remuneration based on pharmaceutical cognitive services, a quality care programme, health promotion programmes, innovative services of managed care, generics substitution, and others.¹⁷

2.1.1 References

- Centers for Disease Control and Prevention (CDC). NCD Prevention and Control. Atlanta (GA): CDC; 2013. 29p. Available from: https://www.cdc.gov/globalhealth/healthprotection/fetp/training_modules/3/prevention-and-control_fg_final_09262013v2.pdf [Accessed 4 June 2018]
- World Health Organization (WHO). The Global Action Plan for the Prevention and Control of NCDs 2013–2020. Geneva (Switzerland): WHO; 2013. 91p. Available from: http://africahealthforum.afro.who.int/IMG/pdf/global_action_plan_for_the_prevention_and_control_of_ncds_2013-2020.pdf [Accessed 4 June 2018]
- International Pharmaceutical Federation. Establishing tobacco-free communities: A practical guide for pharmacists. The Hague: International Pharmaceutical Federation; 2015. Available from: <https://fip.org/files/fip/publications/2015-12-Establishing-tobacco-free-communities.pdf> [Accessed 4 June 2018]
- Pharmaceutical Group of the European Union. Community pharmacy, a public health hub: Annual Report. Brussels (Belgium): PGEU; 2016. 24p. Available from: <https://pgeu.eu/en/component/attachments/attachments.html?id=4293&task=download> [Accessed 4 June 2018]
- Morrison CM, Glover D, Gilchrist SM, Casey MO, Lanza A, Lane RI, et al. A Program Guide for Public Health: Partnering with Pharmacists in the Prevention and Control of Chronic Diseases. Atlanta (GA): Centers for

- Disease Control and Prevention (CDC); 2012 Aug. 18p. Available from: https://www.cdc.gov/dhdsp/programs/spha/docs/pharmacist_guide.pdf [Accessed 4 June 2018]
6. Centers for Disease Control and Prevention (CDC). *Using the Pharmacists' Patient Care Process to Manage High Blood Pressure: A Resource Guide for Pharmacists*. Atlanta (GA): CDC, U.S. Department of Health and Human Services; 2016. 20p. Available from: <https://www.cdc.gov/dhdsp/pubs/docs/pharmacist-resource-guide.pdf> [Accessed 4 June 2018]
 7. Cranor CW, Bunting BA, Chrustensen DB. The Asheville Project: Long-Term Clinical and Economic Outcomes of a Community Pharmacy Diabetes Care Program. *J Am Pharm Assoc (Wash)*. 2003 March-April;43(2):173-184.
 8. Bunting BA, Smith BH, Sutherland SE, Susan E. et al. The Asheville Project: Clinical and economic outcomes of a community-based long-term medication therapy management program for hypertension and dyslipidemia. *J Am Pharm Assoc* (2003). 2008 Jan-Feb; 48(1):23–31. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/18192127> [Accessed 4 June 2018]
 9. McAlister FA, Majumdar SR, Padwal RS, Fradette M, Thompson A, Buck B et al. Case management for blood pressure and lipid level control after minor stroke: PREVENTION randomized controlled trial. *CMAJ*. 2014 May 13; 186(8):577-84. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/24733770> [Accessed 4 June 2018]
 10. Martínez PB, Jiménez EG, Martínez FM. Comparación de las intervenciones de educación sanitaria y de seguimiento farmacoterapéutico en pacientes con factores de riesgo cardiovascular que acuden a una farmacia comunitaria (Estudio FISFTES-PM). *Aten Primaria*. 2015 March; 47(3):141-148.
 11. Sarriff A, Amin AM, Mostafa H. Public Knowledge and Awareness of Cardiovascular Diseases and the Expected Role of Community Pharmacists in the Prevention and Management of Cardiovascular Diseases in Penang, Malaysia. *CMU Journal of Natural Sciences*. 2014 January;13(3):355-369.
 12. Zreik R. *The Role of Pharmacists in the Detection, Management and Prevention of Hypertension in Lebanese Community Pharmacies*: Master thesis. Lithuania: Lithuanian University of Health Sciences, Medical Academy, Faculty of Pharmacy, Department of Clinical Pharmacy;2017.
 13. Offu O, Anetoh M, Okonta M, Ekwunife O. Engaging Nigerian community pharmacists in public health programs: assessment of their knowledge, attitude and practice in Enugu metropolis. *J Pharm Policy Pract*. 2015 Nov 9; 8:27.
 14. Brian OO, Henry NC. *Community Pharmacists and Health Promotion Activities in the 21st Century: Maximizing the Expanded Roles for Universal Health Coverage and Population Health Optimization*. *MOJ Public Health*. 2017 Sept 25; 6(3): 00174.
 15. Jouneau S, Dres M, Guerder A, Bele N, Bellocq A, Bernady A, et al. Management of acute exacerbations of chronic obstructive pulmonary disease (COPD). *Rev Mal Respir*. 2017 Apr; 34(4):282-322.
 16. Schmiedel K, Schlager H, Dörje F. Preventive counselling for public health in pharmacies in South Germany. *Int J Clin Pharm*. 2013 Feb; 35(1):138-144. DOI: 10.1007/s11096-012-9722-3.
 17. Guignard E, Bugnon O. *Pharmaceutical Care in Community Pharmacies: Practice and Research in Switzerland*. *Ann Pharmacother*. 2016 Feb 1; 40: 512-517.

2.2 Screening

There are several studies and publications on the role of community pharmacists in screening patients for various NCDs. Although most of them are small, open and uncontrolled studies, they all show the feasibility of using pharmacies and the skills of pharmacists to screen these highly costly conditions in the community setting. The challenge is that the performance of practice-based research by community pharmacists differs considerably between countries. In addition, to communicate and share information in a secure way with physicians can also be an obstacle in several countries. Notwithstanding this, the results of the mentioned studies suggest that, if there is a screening intervention at the community pharmacy level, there is prompt referral of suspected cases to a general practitioner (GP) or specialist, increased disease awareness and higher patient willingness to initiate and adhere to treatment. These studies also indicated that community pharmacist interventions were associated with higher diagnosis rates and with a more efficient use of GP visits, namely by avoiding unnecessary referrals. The sections below offer a literature review of studies of screening interventions for NCDs at community pharmacies for the four major NCD groups.

2.2.1 Cardiovascular diseases

In a French study performed at 130 pharmacies in the Nord-Pas de Calais region, 200 individuals in good health and with no treatment for cardiovascular (CV) conditions or CV risk factors were enrolled. In total, 107 subjects completed the screening. Criteria for CV risk were of two types: type 1 included risk of CV death higher than 5% within 10 years, arterial hypertension, increased blood glucose values and hypercholesterolemia; type 2 included age, waist circumference and heredity. Participants registered as having CV risk had at least one type-

1 risk factor, or two type-2 risk factors. Results showed that 50% of the participants had CV risk (48% of the women and 57% of the men). The average age was 50 and, in relation to type-1 factors, 23% had arterial hypertension, 5% had increased blood glucose levels and 17% had hypercholesterolemia. As such, 50% of people in good health were in risk of CV disease and could be referred to a physician for further evaluation. The study concluded that the screening of CV risk factors at community pharmacies gave results comparable to those observed in epidemiological studies, which indicates the validity of the results.¹

Hypercholesterolaemia (HC) is one of the main factors of cardiovascular risk. An Argentinian study determined the strength of association of HC between parents and children. The methodology used was observational, analytic, and cross-sectional. **Blood cholesterol levels were assessed in children between ≥6 and <12 years of age, and in their biological parents.** The study results suggest a strong association and a high predictive power of HC of parents for HC in their children. As such, the author proposes that HC in parents can be used as an effective indicator for the exploration of HC in their children. Considering the number of regular visits to a pharmacy of HC patients to obtain cholesterol-lowering medicines, the evidence supports the development of **a professional service by pharmacists to screen HC in the patients' children and appropriate referral to a GP or specialist when necessary.**²

In an Australian study, the objective was to assess the suitability of community pharmacies as CV disease risk profile screening centres, and to evaluate whether pharmacists can play an important role in detecting, educating and referring screened individuals at high risk of CV disease. The study was performed at 14 Australian community pharmacies, which performed opportunistic cardiovascular disease risk profiling for members of the public aged above 30 years old with no existing CV diseases. All major CV risk factors were measured. Exercise habits, existing conditions and therapy, and family history were also assessed. The results were used to calculate each subject's 10-year risk of developing CV events, based on Framingham Risk Equations (New Zealand tables). Each subject's knowledge of CV risk factors was assessed using a multiple-choice questionnaire. Written educational materials and verbal counselling were provided. Referral to a doctor for further assessment was recommended as appropriate. The screened individuals were followed up via a mailed out questionnaire. A random sample of individuals at elevated risk was telephoned to assess for outcomes of the screening and referral process. The main outcome measure was the risk of developing CV disease and knowledge of CV risk factors. The results showed that there was a statistically significant improvement in the knowledge of CV disease risk factors at follow-up. Almost half of the contacted high-risk subjects reported lifestyle changes or started medicine therapy following retesting by their GP. The study concluded that a pharmacy-based CV disease risk profile screening and education programme has the potential to identify and refer many undiagnosed individuals at high risk of CV events and help contain the burden of heart disease.³

In 2017, the results of a study designed to assess feasibility of implementing a pharmacy-based CV risk screening service in a referral community pharmacy in Iran were published. The study included 287 subjects aged between 30 and 75 years without previous diagnosis of CV disease or diabetes. Measurement of all major CV risk factors, exercise habits, medical conditions, medications, and family history were investigated. High-risk individuals were given a clinical summary sheet signed by a clinical pharmacist and were encouraged to follow up with their physician. Subjects were contacted one month after the recruitment period and their adherence to the follow-up recommendation was recorded. Data analysed showed that 146 patients were referred due to at least one abnormal laboratory test. Approximately half of the individuals who received a follow-up recommendation had made an appointment with their physician. This study reinforced the expectation that a screening programme by community pharmacies has the potential to identify and refer patients with elevated CV risk factors.⁴

A study carried out in 35 community pharmacies in Lebanon evaluated the involvement of pharmacists in the detection, management and prevention of hypertension. The study used a structured questionnaire with 69 questions for data collection. Data concerning detection of hypertension, lifestyle modification and treatment were collected over two months. Results were divided into three sections: detection of hypertension, lifestyle modifications and medication adherence. This study showed that community pharmacists are more aware about their role in hypertension detection and prevention than in hypertension management. The author considered that this was due to the fact that pharmacists in Lebanon lack the authority to prescribe antihypertensive medicines, which limits their role in hypertension management.⁵

Atrial fibrillation is the most common arrhythmia and increases the risk of stroke five times, with research showing atrial fibrillation is responsible for up to 20 per cent of all strokes.⁶ An Australian study of the

feasibility and cost-effectiveness of stroke prevention through community screening for atrial fibrillation using iPhone electrocardiogram in pharmacies concluded that “community screening in pharmacies is a feasible and cost-effective strategy to identify a sizeable cohort with newly identified atrial fibrillation, at sufficient risk to require oral anticoagulants for stroke prevention. High overall stroke risk, relatively low oral anticoagulant prescription, and poor knowledge of diagnosed atrial fibrillation sufferers highlight the need for community-based screening and education.”⁷

In Ireland, a pilot to detect hypertension and atrial fibrillation in the community was carried out in 2018 in 68 community pharmacies, in a study promoted by the Irish Pharmacy Union. More than 1,100 people were checked over a two-month period. The aim was to identify those people aged 50 years and over who were at risk of hypertension or atrial fibrillation or both. As a result of the pilot:

- An irregular pulse (possible atrial fibrillation) was detected in 5.5% of participants who were checked,
- 27% of participants were identified with high blood pressure (possible hypertension),
- Both an irregular pulse (possible atrial fibrillation) and high blood pressure (possible hypertension) were noted in 2% of participants, and
- 26% of all participants checked were referred to their GP.

Overall, 83% of participants were happy with the information they were given by the pharmacist who undertook the health check and 91% said they were more aware of blood pressure and atrial fibrillation as a result of taking part in the pilot.

The pilot demonstrated that, by carrying out a standardised population health check for hypertension and atrial fibrillation in the community pharmacy, community pharmacists can deliver an extremely positive benefit to participants in terms of prevention, detection and initial management of suspected hypertension and atrial fibrillation.⁸

2.2.2 Diabetes

An article by the National Association of Pharmacies of Portugal published the results of a campaign it launched on World Diabetes Day 2015. The campaign targeted adults aged over 18 years, without diabetes and non-pregnant. Subjects were encouraged by the pharmacist to complete the Findrisk test at the pharmacy, to adopt healthy lifestyles and to consult with their physician when the test score was high or very high. The Findrisk test was integrated in the pharmacy software and the score was calculated automatically. A total of 295 pharmacies participated in the campaign and recruited a total of 7,007 adults (an average of 31 adults per pharmacy): 66.0% were female; the mean age was 60 years; 66.6% had a body mass index over 25kg/m²; 51.2% were physically active; 85.6% ate fruits and vegetables daily. With regards to waist circumference, 81.3% of the women and 70.1% of the men were classified in the highest categories; 51.9% were taking medicines for high blood pressure; 12% had high blood glucose at least once and 43.0% had a family history of diabetes (type 1 or 2). Overall, the study concluded that 24.0% of the subjects were at high or very high risk of developing type 2 diabetes within the following 10 years. Patients were encouraged to seek further specialised medical care for their condition. The findings suggest that community pharmacists may play an important role in the early detection of patients at high risk of developing type 2 diabetes.⁹

The Pharmacy Diabetes Care Programme, an Australian initiative reported in 2005, was designed to investigate a disease state management model for people with type 2 diabetes. The model consists of two components: a screening service and a diabetes medication assistance service. The specific aim of the screening programme was to investigate the capacity of community pharmacies to identify and refer people at risk of type 2 diabetes to their GP. The critical elements of the service included patient education, support and monitoring to facilitate self-management in those with established disease. For those at risk, the focus was on education and referral. Thirty community pharmacies were recruited across four states and 1,286 people were screened. The screening service delivered through the pharmacy utilised two screening protocol variants: sequential screening and a tick test only. Both protocols used a tick test risk assessment to determine if risk factors for type 2 diabetes were present. In the sequential screening protocol, any person with at least one risk factor was also offered a fingerpick test for capillary blood glucose in the pharmacy. Patients whose blood glucose levels were higher than a predefined level were referred to their GP. In the tick test only protocol, no fingerpick testing was performed in the pharmacy and if the patient had at least one risk factor for type 2 diabetes they qualified for a referral to the GP. In conclusion, the sequential screening method was significantly more

efficient and cost-effective than the tick test only method and could be successfully implemented in community pharmacies resulting in fewer unnecessary referrals to the GPs, while resulting in a higher rate of diagnosis. Consumers were very satisfied with, and strongly approved of, the diabetes screening in community pharmacy.¹⁰

2.2.3 Asthma/chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality across the world and is responsible for a disproportionate use of health care resources. It is a progressive condition that is largely caused or worsened by smoking. Identification of early stage COPD provides an opportunity for interventions which prevent its progression, such as smoking cessation support. Although there are a number of robust studies that have demonstrated the role that pharmacists can play to identify and prevent disease progression, adoption of such services is currently limited.

Australian researchers have investigated the use of community pharmacists in identifying patients at risk of poor asthma control and the factors that contribute to this situation. Ninety-six community pharmacists with **specialised asthma management training enrolled 570 patients aged ≥18 years who had been diagnosed with asthma** and who were considered at risk of poor asthma control, and conducted a comprehensive asthma assessment. Asthma history was discussed, and lung function and inhaler technique were also assessed by the pharmacist. Results showed that community pharmacists were able to identify patients with asthma at risk of suboptimal control, and factors that contributed to this were elicited. This group that was identified by community pharmacists may not have been visible or accessible to other healthcare professionals. Therefore, there exists an opportunity within pharmacies to target poorly controlled asthma and provide timely and tailored interventions.¹¹

2.2.4 Cancer

Spain follows the 2003 recommendations of the Council of the European Union, which say that member states should develop screening programmes for breast cancer, cervical cancer, and colorectal cancer. In the specific case of colorectal cancer, in general, the basis for performing screening tests are:

- Target population: women and men between 50 and 69 years of age,
- Screening test: occult blood in stool, and
- Exploration interval: two years.

At present, all Spain's autonomous communities have a screening programme for colorectal cancer although community pharmacies participate only in Catalonia, Murcia and the Balearic Islands. The objective of including community pharmacies is to encourage participation by making the test more accessible for the population (closeness, flexible hours, no need for a prior appointment, and presence of a health professional).

Patient stool samples can be delivered to the pharmacy and are then sent to a laboratory for analysis. In some regions, samples may also be delivered to primary health care centres. If no evidence of blood in faeces is found, the test is considered negative and subjects are invited to repeat it after two years. If a specific amount of haemoglobin is found in at least one of the two samples, a confirmatory test (colonoscopy) will be performed.¹²

A related programme exists also in Switzerland, where the Swiss Pharmacists Association (pharmaSuisse) launched in 2016 a low-threshold colorectal cancer screening through community pharmacies. The screening involved the completion of a questionnaire at the pharmacy. Based on the questionnaire, the pharmacists evaluated the risk factors together with the patient that were exclusion criteria for the stool test screening. Depending on the risk factors identified through the questionnaire, the patient was directly sent to a GP or to a gastroenterologist with a letter explaining the purpose of the patient visit. All other participants received a stool test and an explanation of how to conduct it at home.

The results of the stool test are provided to the pharmacist, who informs the patient. In case of a positive result, the pharmacist refers the patient to his or her GP or gastroenterologist for further investigation (usually colonoscopy). When the test result is negative, the pharmacist provides advice to reduce colon cancer risk.

This service is offered all year long by around 550 pharmacies (out of 1,800 Swiss pharmacies), while 200 to 250 additional pharmacies offer this service during the biennial campaign.

In 2016, for the first campaign a total of 771 community participated and completed an online course about the disease, the test and its outcome and about the design of the campaign. During the six-week campaign, more than 23,000 people were screened at the pharmacy based on the questionnaire. Three per cent had risk factors and were sent to a doctor. The others received a stool test, and 97% of them performed it and sent it to the laboratory. From the 21,701 tests analysed, 93% were negative, which is in accordance with other published results. The 7% of persons with positive stool tests were sent to physicians and gastroenterologists for colonoscopy. Considering an estimate that two-thirds of the subjects adhere to the recommendations and get a colonoscopy test, it has been estimated that thanks to the campaign, 58 (33–114) cases of colon cancer were diagnosed and 364 (283–429) cases of advanced adenoma were detected.

In summary, from the more than 23,000 people taking part in the campaign, about 2,270 were invited to undergo additional medical examinations: 760 because of their risk factors, and 1,510 because of the positive stool tests. According to published literature, 5% of those with positive stool tests do effectively have colon cancer and 31% suffer from advanced adenoma.

The economic impact of this screening service was also addressed: for each case of detected colon cancer or advanced adenoma, the screening costs are approximately USD 5,000. About 16–19% of advanced adenomas would develop into a cancer within 10 years. As such, the price of the screening and early intervention would be between USD 13,000 and 31,000 per patient, compared with a cost of at least USD 115,000 for one colon cancer treatment. Therefore, the service is clearly cost-effective. Almost 600 pharmacies have implemented the service on a permanent basis now, and the campaign was launched again in March 2018.¹³

A screening programme in Australia, called BowelScreen Australia, is an initiative launched in 2010 in collaboration with the Pharmacy Guild of Australia to provide greater access to bowel cancer screening. Patients are encouraged to talk to their GPs or community pharmacists about the programme. The initiative aims to use community pharmacists to raise awareness about colorectal cancer screening, and to facilitate access to a screening test that can be obtained at the pharmacy and performed at home and sent by post for analysis. The user-friendly tests come with full instructions and a dedicated customer helpline, as well as a reminder service.¹⁴

2.2.5 References

1. Fondation Cœur et Artères. Bilan Préliminaire de l'Etude Pilote portant sur le Dépistage du Risque Cardiovasculaire dans le Pharmacies du Nord – Pas de Calais. Internal report shared by the authors; 2014. 16p.
2. Robledo JA, Siccardi LJ, Gallindo LM, Bangdiwala SI. Parental hypercholesterolemia and family medical history as predictors of hypercholesterolemia in their children. *Arch Argent Pediatr* 2019;117(1):41-47
3. Peterson GM, Fitzmaurice KD, Kruup H, Jackson SL, Rasiah RL. Cardiovascular risk screening program in Australian community pharmacies. *Pharm World Sci.* 2010 Jun;32(3):373-80. <https://www.ncbi.nlm.nih.gov/pubmed/20217476> [Accessed 15 May 2018]
4. Zahra JR, Negar H, Amir S, Sheyda N, Kazem H, Mohammad R, et al. A community pharmacy-based cardiovascular risk screening service implemented in Iran: *Pharmacy Practice* 2017 Apr-Jun;15(2):919. <https://doi.org/10.18549/PharmPract.2017.02.919> [Accessed 15 May 2018]
5. Zreik R. The role of pharmacists in the detection, management and prevention of hypertension in Lebanese Community Pharmacies. (Master Thesis). Lithuanian University of Health Sciences, Medical Academy Faculty of Pharmacy, Department of Clinical Pharmacy; 2017. <https://repository.lsmuni.lt/handle/1/33765> [Accessed 15 May 2018]
6. Checking the Arrhythmia Tick [Internet]. Canberra: Pharmacy Guild of Australia; 20 October 2016. Available from: <https://www.guild.org.au/newsevents/blog/2016/10/20/checking-the-arrhythmia-tick> [Accessed 15 May 2018]
7. Lowres N, Neubeck L, Salkeld G, Krass I, McLachlan AJ, Redfern J, et al. Feasibility and cost-effectiveness of stroke prevention through community screening for atrial fibrillation using iPhone ECG in pharmacies. The SEARCH-AF study. *Thromb Haemost.* 2014 Jun;111(6):1167-76. Available from: <https://www.thieme-connect.de/DOI/DOI?10.1160/TH14-03-0231> [Accessed 15 May 2018]

8. Irish Pharmacy Union (Sinead McCool and Pamela Logan). IPU pilot to detect hypertension and atrial fibrillation in the community 2018 report. Dublin: Irish Pharmacy Union; December 2018. Available from: <https://ipu.ie/wp-content/uploads/2014/11/IPU-Pilot-to-Detect-Hypertension-and-Atrial-Fibrillation-Report-2018.pdf> [Accessed 28 December 2018]
9. Jacinto I, Horta R, Santos Rita, Cary M, Guerreiro JP, Torre C, et al. November, World Diabetes month Campaign in Portuguese Pharmacies (Poster). The FIP World Congress of Pharmacy and Pharmaceutical Sciences, Buenos Aires, Argentina. (28 August–1 September 2016). Available from: <https://www.fip.org/abstracts?page=abstracts&action=item&item=17197> [Accessed 15 May 2018]
10. Krass I, et al. Pharmacy DiabetesCare Program. The University of Sydney, Faculty of Pharmacy; April 2005. 163 p. <http://6cpa.com.au/wp-content/uploads/Pharmacy-Diabetes-Care-Program-final-report.pdf> [Accessed 15 May 2018]
11. Armour CL, LeMay K, Saini B, Reddel HK, Bosnic-Anticevich SZ, Smith LD. Using the Community Pharmacy to Identify Patients at Risk of Poor Asthma Control and Factors which Contribute to this Poor Control. *Journal of Asthma*. 2011 Sep 26;48(9): 914-922. <https://www.tandfonline.com/doi/abs/10.3109/02770903.2011.615431>. [Accessed 15 May 2018]
12. Salas D. Situación actual de los programas de cribado de cáncer colorrectal en España. Indicadores de resultados. Oral presentation at the 20th Annual Meeting of the Network of Cancer Screening Programmes (Red de Programas de Cribado de Cáncer). Zaragoza, 17-19 May 2017. Available at: http://www.cribadocancer.com/images/archivos/LolaSalas_8.pdf [Accessed 15 May 2018]
13. Vaucher F and Ruggli M. No to colon cancer - a campaign in the Swiss pharmacies. Oral presentation at the 77th FIP World Congress of Pharmacy and Pharmaceutical Sciences, Seoul, Republic of Korea, 10-14 September 2017. Available at: https://www.fip.org/files/abstracts/2017PSWC/E9/E9-Fabian-Vaucher2_No_to_colon_cancer.pdf [Accessed 15 May 2018]
14. Bowel Cancer Australia. Bowel cancer screening [Internet]. Sydney: Bowel Cancer Australia; 2017. Available from: <https://www.bowelcanceraustralia.org/screening> [Accessed 15 May 2018]

2.3 Referral

As pharmacists look to increase their value to patient care by applying their knowledge and skills in the prevention and management of NCDs, the importance of carefully considered and developed referral pathways is paramount. A review of the literature provides insights into how this aspect of pharmacists' role in NCDs is being approached, both in terms of disease states of NCDs and also in the context of the countries where programmes or projects have been undertaken. The global approach to incorporating referral in NCD management can be seen in the various case studies included in this report. NCD-related projects or programmes focused on screening usually describe referral pathways. However, the outcomes of referrals to healthcare providers is not always clear and deserves considerable attention as pharmacists look to demonstrate and improve their value in the fight against NCDs.

2.3.1 Referral pathways

Where pharmacists take a lead role in screening and managing NCDs, the most usual pathway described pharmacists referring a patient who is considered “at risk” to a prescriber, or medical practitioner.¹⁻¹² However, some referrals which resulted from screening or healthcare programmes also involved pharmacists' referral to other healthcare providers (dentists, podiatrists, diabetes educators).

2.3.2 Interprofessional relationships

There was significant discussion in the literature focused on the relationship between pharmacists and physicians — and, again, context was important in developing different models in different countries in order to establish the best model of cooperation. An increasing number of studies examined the collaborative relationship between pharmacists and GPs where medication management is a focal point for shared care and responsibility.¹³⁻¹⁶

Pharmacists remain a highly trained, under-utilised resource in primary health care in most western countries.¹ A qualitative study investigated pharmacists' and general practitioners' views on barriers to

interprofessional collaboration in the German healthcare system. Despite significant evidence of the positive effect of community pharmacists on health care, interprofessional collaboration of pharmacists and GPs is very often limited.¹ The authors conclude that future physician and pharmacist training curricula should focus on comprehensive pharmacist-physician interaction at early stages within both professional educations and careers. Developing and fostering a culture of continued professional exchange and appreciation is one major challenge of future policy and research.¹

In several other studies (Nigeria, Germany, Croatia, India and Portugal), collaboration made on mutual respect and appreciation was successful. The basis of this success was considered due to a mutual understanding of the clear roles of both healthcare professionals. The acceptance of the integration of pharmacists in the medical interventions and decision-making is crucial to the success of this collaboration. In some countries, **pharmacists' capacity to provide services beyond their** described dispensing roles is limited. (e.g., in Lebanon pharmacists are prohibited by law to prescribe or change any medicines). Lack of remuneration is also a significant disincentive to more active roles in NCD screening and referral (e.g., in Nigeria community pharmacists perform primary healthcare roles without official acknowledgment).

2.3.3 Transitions of care

Projects focused on improving medication management following hospital discharge featured in several country case studies. Although not specifically targeted at NCDs, these studies are important, informing models of collaborative care beyond the traditional pharmacist-prescriber roles. These studies show that adherence to medication regimens after discharge is one of the major concerns, and the establishment of a **collaborative care model increases patients' adherence after discharge. The importance of collaboration with primary care providers (and referral for longitudinal care) is emphasised here.**¹⁻⁶

A study of 240 chronic disease patients being discharged from hospital in Germany showed how the intervention of a clinical pharmacist, providing counselling to hospital doctors, simplified cardiovascular and antidiabetic medicines at discharge. Medication regimens in the intervention group (counselled by a clinical pharmacist) were significantly less complex than in the comparison group. Interestingly, complexity of the regimens in the intervention group increased to values similar to those in the comparison group six weeks after discharge unless reasons for the simplification were clearly identified to the primary care providers in the discharge letter.¹³

2.3.4 Disease-focused referral pathways

There are several examples of studies where pharmacist involvement in NCDs has resulted in improved care, and outcomes which show the benefit of pharmacist involvement in NCDs for asthma, hypertension, dyslipidaemia, heart failure, smoking cessation and stroke prevention. Unfortunately, there is a paucity of studies focused on rates of referral as an outcome, or indeed the outcome of referrals provided to healthcare professionals. **Researchers will need to focus on the value proposition of pharmacists' roles in NCDs.**

Measures addressing qualitative issues informing which models of care with referral as an outcome, and quantitative outcomes, including rates of referral and results of these, as well as the cost-effectiveness of **pharmacists' role in NCDs will be important to inform pharmacists' ongoing value in this area.** Research focused on community pharmacists' role in referral for cardiovascular and asthma pathways is highlighted here.

2.3.5 Cardiovascular studies — focusing on outcome of referrals

An Australian study of 1,000 patients screened for atrial fibrillation used an iPhone electrocardiogram (iECG) with referral to a medical specialist. Some **1.5% of screened patients were identified as having “unknown atrial fibrillation”.** The authors determined that the incremental cost-effectiveness ratio of extending iECG screening into the community, based on 55% warfarin prescription adherence, would be AUD 5,988 per quality adjusted life year gained and AUD 30,481 for preventing one stroke.¹⁷

In a subsequent Canadian study involving 30 community pharmacies, high-risk patients were screened for stroke, offered lifestyle advice and counselling, and referral for confirmatory testing to a physician if they

were found to have “actionable atrial fibrillation”. The screening programme was well received, and 2.5% of those screened were deemed to have “actionable atrial fibrillation”. However, only a quarter of the patients identified with “actionable atrial fibrillation” had followed up with their primary care physician after six weeks, and only 17% of those with “actionable atrial fibrillation” had been started on oral anticoagulation therapy.¹⁸

2.3.6 Asthma studies — focusing on referral

An Australian study researched the impact of pharmacist-initiated GP referral of patients with suboptimal asthma management. Thirty-five pharmacies completed a randomised controlled study involving the provision of educational material and GP referral (intervention group) and usual care (control group) for patients with potentially suboptimal management of their asthma (identified by higher use of asthma reliever medication in the preceding six months). The intervention group (n=706) showed significantly better asthma control and quality of life compared with the control patients (n=427) $P<0.01$ and $P<0.05$, respectively, demonstrating how community pharmacists are ideally placed to identify patients with suboptimal asthma management and refer such patients for a review by their GP. This type of collaborative intervention can significantly improve self-reported asthma control.¹²

As pharmacists move to increase their value in the fight against NCDs, there must be a greater focus in the design of referral pathways to ensure those at risk are not lost to follow up. New models routinely incorporate referral for patients who are at risk or in need of urgent medical care — our review showed the need to ensure follow up from referral is clearly identified and an integral component of every NCD model of pharmaceutical care. These care programmes will help improve control of NCDs and lead to better clinical outcomes for our patients.

Finally, we should acknowledge the important role patients can play in ensuring a successful referral pathway in this collaborative care model. This will ensure our expanded roles are accepted, not only by our colleagues who share our passion for improved pharmaceutical care, but also our patients. By educating our patients on the value of greater pharmacist involvement, we can improve patient outcomes and make a real difference in the fight against NCDs.

2.3.7 References

1. Löffler C, Koudmani C, Böhmer F, Paschka SD, Höck J, Drewelow E et al Perceptions of interprofessional collaboration of general practitioners and community pharmacists - a qualitative study. *BMC Health Serv Res.* 2017;17(1):224.
2. Irons, BK, Meyerrose, G, Laguardia, S Hazel, and Seiffer, CF. A collaborative cardiologist-pharmacist care model to improve hypertension management in patients with or at high risk for cardiovascular disease *Pharm Pract (Granada)*. 2012;10(1):25-32.
3. Krass, I Armour, C Taylor, S. Mitchell, B Brilliant, M Stewart, K et al. Pharmacy Diabetes program 2015, University of Sydney, Australia. <http://6cpa.com.au/wp-content/uploads/Pharmacy-Diabetes-Care-Program-final-report.pdf>. [Accessed 11 May 2018]
4. Watkins, K Bourdin, A Trevenen, M Murray, K Kendall, P Schneider, C et al Opportunities to develop the professional role of community pharmacists in the care of patients with asthma: a cross-sectional study *NPJ Prim Care Respir Med.* 2016;24:26:16082.
5. Leppee, M Culig, J Mandic, K and Eric, M 3Ps – Pharmacist, Physician and Patient: Proposal for Joint Cooperation to Increase Adherence to Medication *West Indian Med J.* 2014 Dec; 63(7): 744–751
6. Porwal, M Singh, L Kumar, A, Rastogi, V Maheshwari, K et al A newly developed assessment tool on collaborative role of doctor–pharmacist in patient medication management *Family Medicine & Primary Care Review* 2016; 18, 1: 44–48
7. Mackenzie, W Petersen, GM Tenni, P Bindoff, IK and Stafford, A DOCUMENT: a system for classifying drug-related problems in community pharmacy *Int J Clin Pharm.* 2012 Feb;34(1):43-52
8. Centers for Disease Control and Prevention Creating Community-Clinical Linkages Between Community Pharmacists and Physicians. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2017.
9. Oparah, AC and Arigbe-Osula, EM Evaluation of Community Pharmacists' Involvement in Primary Health Care *Trop* 2002; 1 (2)67-74

10. Peterson GM, Fitzmaurice KD, Kruup H, Jackson SL, and Rasiah RL. Cardiovascular risk screening program in Australian community pharmacies. *Pharm World Sci*. 2010;32(3):373-80.
11. McNamara K, O'Reilly S, Dunbar J, Bailey M, George J, Peterson G, et al. A pilot study evaluating multiple risk factor interventions by community pharmacists to prevent cardiovascular disease: the PAART CVD Pilot Project. *Annals of Pharmacotherapy* 2012;46:183-91
12. Bereznicki B, Peterson G, Jackson S, Walters H, Fitzmaurice K, Gee P. Pharmacist initiated general practitioner referral of patients with suboptimal asthma management. *Pharm World and Science* 2008;30(6):869-75.
13. Stange, D, Kriston L, von-Wolff A, Baehr M and Dartsch D. Reducing Cardiovascular Medication Complexity in a German University Hospital: Effects of a Structured Pharmaceutical Management Intervention on Adherence *J Manag Care Pharm*. 2013;19(5):396-407.
14. **Oparah, AC Famakinde, AJ and Adebayo** Outcomes of pharmacists' interventions in the collaborative care of patients with diabetes *Pharmacy Education* 2009;9:18-22
15. Condinho, M, Sá, J Eliseu, A Figueiredo, IV and Sinogas, Clinical Impact of a Pharmaceutical Care Programme Developed in a Family Health Unit: Results of a Pharmacist-Physician Collaboration in the Treatment of Hypertensive Patients *Rev Port Farmacoter* 2016;8:164-171
16. Zreik, R The role of the pharmacist in detection, management and prevention of hypertension in Lebanese community pharmacies *Lithuanian University of Health Sciences Masters Thesis* Accessed 20th May 2018 <https://repository.lsmuni.lt/handle/1/33765> [Accessed 11 May 2018]
17. Lowres N, Neubeck L, Salkeld G et al Feasibility and cost-effectiveness of stroke prevention through community screening for atrial fibrillation using iPhone ECG in pharmacies. The SEARCH-AF study. *Thromb Haemost*. 2014 Jun;111(6):1167-76. Available from: <https://www.thieme-connect.de/DOI/DOI?10.1160/TH14-03-0231> [Accessed 11 May 2018]
18. Sandhu RK, Dolovich L, Deif B et al. High prevalence of modifiable stroke risk factors identified in a pharmacy-based screening programme. *Open Heart* 2016;3(2).

2.4 Therapy and disease management

The management of established cases of disease and their treatment through medicines, i.e., pharmaceutical care, is a core process of health care, and is particularly relevant for NCD patients. This is a critical role to ensure the responsible use of medicines, achieve optimal clinical outcomes, guarantee patient safety and improve the efficiency of healthcare systems.

The consolidation of the role of pharmacists in optimising the use of medicines in NCDs requires clear political commitment, engagement by pharmacists themselves, and the collaboration of all healthcare professionals (physicians, nurses, specialists in laboratory medicine and pharmacists). Pharmacists around the world are increasingly shifting their practice towards patient-focused services to improve the use of medicines and **improve patients' quality of life through pharmaceutical care** — an effective and cost-effective professional service.¹ However, large discrepancies and imbalances still exist between countries in terms of the availability of such services, and especially between developed and developing countries. In several developed countries or regions, like Australia, Canada, USA and Western Europe, regulatory architectures for pharmacy and pharmacists are well established, defining such professional roles and authority, and there are programmes launched by governments or universities to promote pharmaceutical care in NCDs.

In fact, in the USA (and particularly in the states of California, North Carolina, Oregon, Tennessee and Washington), governments have provided pharmacists with limited authority to independently prescribe certain medicines for NCDs as part of a chronic disease management programme, and all but two of the 50 states allow pharmacists to adjust drug therapies for NCDs under collaborative practice agreement with the physician.² Similar regulatory developments are taking place in other countries too, such as Australia and the UK. Recently, the Philippines also enacted new national legislation giving broader authority to pharmacists in both communicable diseases and NCDs.

These legal and regulatory changes have occurred due to mounting evidence of the benefits of pharmacist involvement in NCD therapy selection and management. In the USA, sentinel work in NCD management was conducted in Ashville, North Carolina, nearly two decades ago establishing firmly that pharmacists involved

in the management of diabetes improved patient outcomes and reduced overall health care costs.³ This study was replicated through coordination of the American Pharmacists Association Foundation in the areas of hyperlipidaemia, hypertension, and depression management in the ensuing years, confirming the valuable role of pharmacists on the multidisciplinary healthcare team.⁴⁻⁸ In every case, pharmacists were able to positively improve patient-specific laboratory measures (e.g., blood lipids, blood pressure), increase medication adherence, and reduce overall healthcare costs even where medicines costs increased. In fact, the U.S. Centers for Disease Control and Prevention have issued several official documents strongly supporting **the pharmacist's role in NCDs based upon the evidence from these studies and several others.**⁹⁻¹¹ These articles are often referenced as the catalyst for much of the ensuing work published globally, particularly related to both diabetes and cardiovascular disease management by pharmacists.

2.4.1 Diabetes

In addition to those sentinel studies, a meta-analysis evaluating effective interventions for diabetes patients by community pharmacists was conducted by German researchers looking at 11 studies published on the subject in either English or German between January 2000 and April 2016. All were randomised controlled trials with interventions provided by community pharmacists for patients with diabetes. The meta-analysis suggests that community pharmacist-led interventions which were patient-centred and interdisciplinary in nature resulted in significantly improved glycaemic control in patients with type 1 and type 2 diabetes. Key aspects of the services of these studies where a difference was shown included sending feedback to the physician, setting of patient-specific goals, reviewing medicines, and assessing the patients' existing health beliefs and medication knowledge.¹²

2.4.2 Cardiovascular disease

Cardiovascular disease is by far the single largest cause of morbidity and mortality globally.¹³ It is thus not surprising that an overwhelming body of evidence from many countries (too numerous to fully discuss here) has evaluated pharmacist interventions in both hospital and community settings in the management of cardiovascular disease. In addition to the previously cited American studies, the Australian Community Pharmacy Agreement Research and Development Programme examined key cardiovascular findings of interventions provided in community pharmacies in that country through a series of studies. Key findings include: reductions in both systolic and diastolic blood pressure over time; improved adherence to medication therapy; and cardiovascular risk reduction (10-year calculated risk). Across the Australian studies, pharmacists and physicians were encouraged to collaborate.¹⁴

In Spain, researchers compared a traditional health education approach to a drug therapy monitoring intervention by community pharmacists in patients with cardiovascular risk factors. The researchers found that the differences in reduction percentages were statistically greater in the drug therapy monitoring intervention group for systolic blood pressure, heart rate, weight, BMI, fasting glucose, total cholesterol, waist measurement, and waist-to-height ratio. This study further emphasises that community pharmacies can have a positive impact on the cardiovascular health of patients.¹⁵

2.4.3 Asthma and COPD

COPD is one of the primary causes of morbidity and mortality in the European Union, and the third largest cause of death globally, according to the WHO, with over three million lives lost in 2016.^{13,16} A team of researchers from the UK, Germany, Ireland, Netherlands, and Greece estimated the economic burden in Europe alone to be over EUR 25.1 billion. Central to the rising costs, morbidity and mortality, the researchers determined that lack of communication among the various healthcare providers was the primary commonality through all care pathways.¹⁶

In Australia, the Pharmacy Asthma Care Programme 2006 was conducted at the University of Sydney. Community pharmacists' interventions consisted of patient assessment, education, support and monitoring to facilitate self-management in patients at risk of poorly controlled asthma compared with usual care.¹⁷ The result shows that interventions provided by pharmacists led to an evident improvement in asthma control, patient inhaler technique and asthma action plan decision. Besides, the Home Medicines Review (HMR) programme in Australia has also received governmental funding since 1995. The first step is to identify a

patient needing HMR, referral and provision of clinical patient data to pharmacists. Then pharmacists will set up a patient interview at home about medication and counselling. Pharmacists then finish reviewing and writing a report with findings and recommendations.

A Pharmacy Asthma Management Service (PAMS), a trial coordinated across four academic research centres in Australia in 2009, focused on self-management education, inhaler technique interventions, spirometry trials, interprofessional models of care, and regional trials addressing the particular needs of rural communities.¹⁸ Thirty-two pharmacists involved in the PAMS were approached and agreed to provide feedback on the service in a qualitative assessment of this service. In general, the pharmacists engaged with both the service and research components, and also embraced their roles as innovators in the trial of a new service.¹⁹

2.4.4 Cancer

Cancer of all types is of tremendous concern globally. Trachea, bronchus and lung cancer specifically has grown from the ninth leading cause of death globally in 2000 to the sixth leading cause of death in 2016.¹³ Pharmacotherapy for treatment of cancer is often complex, with many medication-related adverse events. In fact, the cancer treatment frequently results in the prescribing of additional therapy to manage the untoward effects, including medicines on both a short- and long-term basis for gastrointestinal, dermatological, neurological, psychological, and endocrinological adverse effects. Pharmacists are well positioned through their education and training to assist in the management of acute chemotherapy as well as the long-term effects of chemotherapy. For example, one study conducted in Lebanon utilised pharmacist-led enhanced electronic chemotherapy drug and dose monitoring in the hospital setting. The intervention focused heavily on the use of multidisciplinary healthcare teams which included pharmacists, with the researchers determining that the electronic interventions coupled with the pharmacist inclusion on the team led to optimised pharmacotherapy and improved patient care.²⁰

A 2014 manuscript from the USA articulates how collaborative practice agreements between physicians and pharmacists improves care for patients with hematopoietic stem cell transplant recipients — often among the most seriously ill patients.²¹

Another study conducted in Malaysia in 2013–14 evaluated the impact of regular pharmacist-led educational interventions in patients undergoing cancer chemotherapy. The study showed statistically significant improvement in quality of life, perceived physical health and social relationships, and decreases in patient anxiety among other findings.²²

German researchers reviewed all English language papers between 1980 and 2007 to examine drug-related problems in systemic cancer therapy and identified the specific contributions of pharmacists to minimise treatment-associated risks. The authors observed that **“pharmacists have enhanced efforts to assure quality and safety in systemic cancer therapy in partnership with other healthcare providers”**. They then concluded **that pharmaceutical care by pharmacists for cancer patients should be “integrated into disease management programmes in order to ensure broad implementation”**.²³

Because of the complexity of cancer chemotherapy, the USA-based Board of Pharmacy Specialties (www.bps.org) offers a globally recognised specialty credential in oncology through examination, although there is also a role for non-board certified pharmacists to play. In fact, the Canadian province of Nova Scotia has created guidelines for outpatient cancer care by community pharmacists, setting a clearer expectation of the important role that community pharmacists play in the management of patients undergoing cancer treatment.²⁴

2.4.5 Improving adherence to medication

Beyond NCD-specific interventions for conditions such as cardiovascular disease, diabetes, respiratory diseases and cancer, the literature is replete with studies demonstrating the positive effects of **pharmacists’** interventions on NCDs, related to adherence to medicines therapy. Medicines are often credited as the most cost-effective and reasonable intervention for modifying the course of NCDs; yet even when medicines are affordable and easily accessible to patients, those patients who should be taking the medicines are often not taking them as prescribed. Other patients may be taking too many medicines (polypharmacy), which leads to

additional problems beyond the NCD being treated. A study in Hong Kong revealed that pharmacists were able to reduce mortality in patients taking five or more drugs using a simple telephone intervention.²⁵ Studies in the UK, Spain, Australia, China, Portugal, Sweden, Nigeria, United States, India, Germany, and Japan^{26–35} utilising various specific methods of pharmacist intervention to improve adherence have all shown improved laboratory-specific measures, improved quality of life, and reduced overall healthcare expenditure despite the increased utilisation of pharmacotherapy resulting from improved adherence. Most recently, there has been experimentation within the USA to remunerate pharmacists and pharmacies for improving adherence, including through utilisation of quality of care measures at the national level by payers.³⁶

In other nations such as Argentina, Germany, Israel, Japan, South Africa, Republic of Korea, Thailand and UK, a similar situation to that of Australia, Canada and the USA is seen relative to NCDs, with pharmacists involved to some degree in more extensive counselling on chronic disease. In some cases, pharmacists may be involved in point-of-care testing as part of monitoring NCDs, and even working collaboratively with physicians to ensure effective drug therapy. However, further innovation and practice-based research in community pharmacy is welcome to improve access and evidence related to these services. Again, despite the evidence supporting the important role of the pharmacist in NCD management in terms of both improved outcomes and cost avoidance, in no country does our review find widespread acceptance of this emerging role for pharmacists in the healthcare system in a way that is financially sustainable in the community pharmacy setting. As of January 2015, the USA Centers for Medicare & Medicaid Services reimburse qualified providers for Chronic Care Management (CCM) services for Medicare (insurance for the elderly) patients with two or more chronic health conditions. According to the American Pharmacists Association, pharmacists can participate in CCM as clinical staff within a medical facility with their services being billed incident to and by a qualified provider (typically, a physician).³⁷ This is a step in the right direction in payment, yet is still a great distance from policies which enable patients in local communities to receive the beneficial NCD management services of the community pharmacist.

Compared with the systematic and regulated programme or intervention plan in a few developed and developing countries referenced above, the situation in the majority of countries is not that good. Patients equally in need of NCD management are denied access to critical pharmacist-provided NCD management services due to a host of factors. For example, in most countries pharmacists in the community are still seen more as shopkeepers or medicines dispensers than as healthcare professionals.^{38,39} Even in countries such as England, Scotland and Wales, where community pharmacist roles have expanded tremendously, there is continued room for improvement.⁴⁰ The global public misperception of the education and abilities of the pharmacist is a significant barrier, and resources should be devoted to raising public awareness of the valuable public health asset represented in local community pharmacists. Even in the most developed countries, **payment policies do not provide for government coverage of pharmacists' NCD management services** directly in most cases, particularly pharmacists who are based in local community pharmacies and who are in the best position to access patients in need. In addition, particularly in developing countries, there are shortages of well-trained pharmacists in the community setting capable of providing advanced NCD management services.

However, the situation is moving in the right direction. For example, the Indian Pharmaceutical Association consistently advocates for the healthcare role of pharmacists and conducts training programmes for pharmacists to develop their role in the management of diabetes and other NCDs. To control NCDs, central government in association with state government has come up with an ambitious programme called NPCDCS (National Programme for Prevention & Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke). The programme is about to systematically respond to the rising burden of NCDs.⁴¹ In China, the legislation of Pharmacist Law started on 15 January 2017 and the country is developing better opportunities for pharmacists to be more involved in NCD management. Additionally, the Philippines most recent law changes certainly have also elevated the responsibilities of pharmacists in the health system. Thus, progress is being made, although not as rapidly as is needed to curtail the effects of a growing number of poorly controlled NCDs.

Notwithstanding the evidence supporting the reductions in healthcare costs and improvement in patient outcomes discussed here, even in the United States there are challenges as the USA government and private insurance companies have not consistently remunerated pharmacists for these services. The situation in Great Britain has been somewhat better because of the National Health Service (NHS) structure, but even there pharmacists have challenges being consistently paid for a full range of NCD management services as is evidenced by the NHS's own website.⁴²

In Europe, a cross-sectional questionnaire-based survey of community pharmacies, using a modified version of the Behavioural Pharmaceutical Care Scale (BPCS) was conducted in late 2012 and early 2013 within 16 European countries and compared with an earlier assessment conducted in 2006. The study demonstrates a slight evolution in self-reported provision of pharmaceutical care by community pharmacists across Europe, as measured by the BPCS. Yet, the slow progress over time suggests a range of barriers that are preventing pharmacists from moving beyond traditional roles.⁴³ As a result, the implementation of these cost-saving, life-saving interventions has been inconsistent and sporadic even in the countries often heralded as leading the way with pharmacist involvement in NCDs. Further significant achievements in public health through effective NCD management are unlikely to take place unless and until payers revise payment models to include pharmacist care for NCDs.

It is our conclusion that no country or region has yet achieved an optimal and satisfactory approach to the use of pharmacists in NCD management. Perhaps the UK is leading the way with payment reforms. In developing countries, the situation seems particularly difficult. People literally are dying from NCDs every day and pharmacists are poised to help. Pharmacy organisations across the globe, including FIP, continue to advocate strongly on behalf of patients and pharmacists to ensure access to and coverage for pharmacist-provided NCD management and prevention services.

2.4.6 References

1. International Pharmaceutical Federation — FIP (2017). Pharmacy: A Global Overview — Workforce, medicines distribution, practice, regulation and remuneration. 2015-2017. The Hague, The Netherlands: International Pharmaceutical Federation. Available from: https://fip.org/files/fip/publications/2017-09-Pharmacy_at_a_Glance-2015-2017.pdf [Accessed 22 June 2018]
2. Pharmacists State-wide Protocols and Prescriptive Authority. National Alliance of State Pharmacy Associations. [Internet] Available from: <https://naspa.us/resource/swp/>. [Accessed 22 June 2018]
3. Cranor CW, Bunting BA, Christensen DB. The Asheville Project: long-term clinical and economic outcomes of a community pharmacy diabetes care program. *J Am Pharm Assoc (Wash)*. 2003 Mar-Apr;43(2): 173-84
4. Bunting BA, Cranor CW. The Asheville Project: long-term clinical, humanistic, and economic outcomes of a community-based medication therapy management project for asthma. *Journal of American Pharmacists Association* 2006; 46(2), 133-47.
5. Finley PR, Bluml BM, Bunting BA, Kiser SN. Clinical and economic outcomes of a pilot project examining pharmacist-focused collaborative care treatment for depression. *J Am Pharm Assoc*. 2011; 51(1):40-9.
6. Watson LL, Bluml Bm. Integrating pharmacists into diverse diabetes care teams: implementation tactics from Project IMPACT: Diabetes. *J Am Pharm Assoc*. 2014; 54(5):538-41.
7. Bluml BM, Watson LL, Skelton JB, Manolakis PG, Brock KA. Improving outcomes for diverse populations disproportionately affected by diabetes: final results from Project IMPACT: diabetes, *J Am Pharm Assoc*. 2014; 54(5):477-85.
8. Fer T, Bluml MB, Ellis WM. Diabetes ten city challenge: final economic and clinical results. *J Am Pharm Assoc*. 2009; 49(3):383-91.
9. Centers for Disease Control and Prevention. Using the Pharmacists' Patient Care Process to Manage High Blood Pressure: A Resource Guide for Pharmacists. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2016. Available from: <https://www.cdc.gov/dhdsppubs/docs/pharmacist-resource-guide.pdf> [Accessed 22 June 2018]
10. Centers for Disease Control and Prevention. Methods and Resources for Engaging Pharmacy Partners. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2016. Available from: <https://www.cdc.gov/dhdsppubs/docs/engaging-pharmacy-partners-guide.pdf> [Accessed 22 June 2018]
11. Centers for Disease Control and Prevention. A Program Guide For Public Health-Partnering with Pharmacists in the Prevention and Control of Chronic Diseases. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2012. Available from: https://www.cdc.gov/dhdspprograms/spha/docs/pharmacist_guide.pdf [Accessed 22 June 2018]
12. Deters MA, Laven A, Castejon A, Doucette WR, Ev LS, Krass I, et al. Effective Interventions for Diabetes Patients by Community Pharmacists: A Meta-analysis of Pharmaceutical Care Components. *Ann Pharmacother*. 2018 Feb;52(2):198-211. doi: 10.1177/1060028017733272. Epub 2017 Sep 26.
13. World Health Organization. Top 10 causes of death webpage. WHO website. Available from <http://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>. [Accessed 22 June 2018]
14. George J, McNamara K, Stewart K. The roles of community pharmacists in cardiovascular disease prevention and management. *Australas Med J*. 2011; 4(5): 266-72.
15. Bofí P, García E and Martínez F. Comparación de las intervenciones de educación sanitaria y de seguimiento farmacoterapéutico en pacientes con factores de riesgo cardiovascular que acuden a una farmacia comunitaria (Estudio FISFTES-PM). *Aten Primaria*. 2015; 47(3):141---148. Available at <http://dx.doi.org/10.1016/j.aprim.2014.04.012>. [Accessed 22 June 2018]

16. Kayyali R, Odeh B, Frerichs I, Davies N, Perantoni E, D'arcy S, et al. COPD care delivery pathways in five European Union countries: mapping and health care professionals' perceptions. *Int J Chron Obstruct Pulmon Dis*. 2016 Nov 14;11:2831-2838. eCollection 2016.
17. Armour C, Bosnic-Anticevich S, Brillant M, Burton D, Emmerton L, Krass I, et al. Pharmacy Asthma Care Program (PACP) improves outcomes for patients in the community. *Thorax*, 2007 Jun;62(6):496-502.
18. Saini, B., Krass, I., Smith, L., Bosnic-Anticevich, S., & Armour, C. Role of community pharmacists in asthma – Australian research highlighting pathways for future primary care models. *The Australasian Medical Journal*, 2011. 4(4), 190–200. Available from: <http://doi.org/10.4066/AMJ.2011790> [Accessed 22 June 2018]
19. Emmerton LM, Smith L, Lemay KS, Krass I, Saini B, Bosnic-anticevich SZ, et al. Experiences of Community Pharmacists Involved in the Delivery of a Specialist Asthma Service in Australia, 2012. *BMC Health Serv Res*. 2012; 12:164. Doi 10.1186/1472-6963-12-164.
20. Muhammad Tahir Aziz & al.; Effects of multidisciplinary teams and an integrated follow-up electronic system on clinical pharmacist interventions in a cancer hospital; *International Journal of Clinical Pharmacy*; December 2017, Volume 39, Issue 6, pp 1175–1184.
21. Merten JA, Shapiro JF, Gulbis AM, Rao KV, Bubalo, J, Lanum S, et al. Utilization of collaborative practice agreements between physicians and pharmacists as a mechanism to increase capacity to care for hematopoietic stem cell transplant recipients. *Biol Blood Marrow Transplant*. 2013; 19(4): 509-18.
22. Periasamy U, Sidik SM, Rampal L, Fadhilah SI, Akhtari-Zavare M, Mahmud R. Effect of chemotherapy counseling by pharmacists on quality of life and psychological outcomes of oncology patients in Malaysia: a randomized control trial. *Health Qual Lif Outcomes*. 2017; 15:104. Doi 10.1186/sf2955-017-0680-2.
23. Jaehde U, Liekweg A, Simons S, Westfeld M. Minimising treatment-associated risks in systemic cancer therapy. *Pharm World Sci*. 2008; 30(2): 161-8.
24. Broadfield L, Shaheen P, Rogez M, Jamieson K, McCallum M. Guidelines for outpatient cancer care by community pharmacists. *Can Pharm J (Ott)*. 2017; 150(1): 24-31. Doi: 10.1177/1715173516680009.
25. We JY, Leung WY, Chang S, Lee B. et al. Effectiveness of telephone counselling by a pharmacist in reducing mortality in patients receiving polypharmacy: randomised controlled trial *BMJ*. 2006; 333(7596): 522. Epub 2006 Aug 17.
26. Boyd M, Wells K. The new medicine service: supporting patients with their medicines. *Pharmaceutical Care Network of Europe*. 2012 May. Available from: http://www.pcne.org/upload/ms2012/Boyd_Wells%20PCNE%20MedRev%202012.pdf. [Accessed 22 June 2018]
27. Leikola S. Outcomes of clinical medication reviews in Australia and the United States. *Pharmaceutical Care Network of Europe*. 2012 May. Available from : <http://www.pcne.org/upload/ms2012/Leikola%20PCNE%20MedRev%202012.pdf>. [Accessed 22 June 2018]
28. Gastellurrutia MA. The Spanish approach to cognitive services: medication review with follow-up (MRF-up). *Pharmaceutical Care Network of Europe*. 2011 October. Available from: <http://www.pcne.org/upload/ms2011d/Presentations/Gastellurrutia%20pres.pdf>. [Accessed 22 June 2018]
29. Lourenco, Luis. Implementation of a pharmaceutical care service in community pharmacy: evaluation of 1 year of activity [Abstract on Internet]. 2016 FIP Congress, Buenos Aires, Argentina. Available from: <https://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=17039https://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=17039>. [Accessed 22 June 2018]
30. Montgomery AT, Kalvemark-Sporrong S, Henning M, Tully MP, Kettis-Linblad A. Implementation of a pharmaceutical care service: prescriptionists', pharmacists' and doctors' views. *Pharm World Sci*. 2007; 29(6): 593-602.
31. Oparah AC, Adje DU, Enato EF. Outcomes of pharmaceutical care intervention to hypertensive patients in a Nigerian community pharmacy. *Int J Pharm Pract [Internet]*. 2010 Feb 10. Available from: <https://doi.org/10.1211/ijpp.14.2.0005>. [Accessed 22 June 2018]
32. Tumkur A, Muragundi PM, Shetty R, Naik A. Pharmaceutical care: need of the hour in India. *J Young Pharm*. 2012; 4(4): 282-6. Doi: 10.4103/0975-1483.104374.
33. Greibing C, Kossler K, Freyer J, Hijter L, Buchal P, Schiek S, et al. The status of the performance of medication reviews in German community pharmacies and assessment of the practical performance. *Int J Clin Pharm*. 2016; 38(6): 1425-35. Doi: 10.1007/s11096-016-0381-7.
34. Lihara N, Tsukamoto T, Morita S, Miyoshi C, Takabatake K. Beliefs of chronically ill Japanese patients that lead to intentional non-adherence to medication. 2004. *J Clin Pharm and Ther*. [Internet]. Available from: <https://doi.org/10.1111/j.1365-2710.2004.00580.x> [Accessed 22 June 2018]
35. Tasaka Y, Yasunaga D, Taneka M, Taneka A, et al. Economic and safety benefits of pharmaceutical interventions by community and hospital pharmacists in Japan. *Int J clin Pharm*. 2016; 38:321-9. Doi: 10.1007/s11096-015-0245-6.
36. Lin A. 5 top ways to get paid for helping patients with med adherence. *Drug Topics*. [Internet] 2016 Feb 10. Available from: <http://www.drugtopics.com/community-practice/5-top-ways-get-paid-helping-patients-med-adherence>. [Accessed 22 June 2018]
37. Chronic Care Management. *American Pharmacists Association*. [Internet] Washington, DC. Available from: <https://pharmacist.com/chronic-care-management>. [Accessed 22 June 2018]

38. Minard LV, Deal H, Harrison ME, Toombs K, Neville H, Mead A. Pharmacists' perceptions of the barriers and facilitators to the implementation of clinical pharmacy key performance indicators. *PLoS One*. [Internet] 2016 April 4; 11(4): e0152903. doi: 10.1371/journal.pone.0152903.
39. Saw PS, Nissen LM, Freeman C, Wong PS, Mak V. Health care consumers' perspectives on pharmacist integration into private general practitioner clinics in Malaysia: a qualitative study. *Patient Preference Adherence*. 2015; 9:467-77. doi: 10.2147/PPA.S73953.
40. Hindi AM, Schafheutle EI, Jacobs S. Patient and public perspectives of community pharmacies in the United Kingdom: a systematic review. *Health Expect*. 2018 Apr; 21(2): 409-28. doi: 10.1111/hex.12639.
41. Manoj K Pati, Bhanuprakash, Praveen Aivalli, Maya Annie Elias, Mune Gowda, and NS Prashanth. Training manual for pharmacists and lab technicians on NCD management [Internet]. Institute of Public Health, Bangalore. 2014 May 9 [cited 2018 June 19]. Available from: <http://www.iphindia.org/wp-content/uploads/2015/04/Pharmacists-Training-Manual.pdf> [Accessed 22 June 2018]
42. National Health System. NHS pharmacy services explained [Internet]. UK: NHS; November 2015. Available from: <https://www.nhs.uk/NHSEngland/AboutNHSservices/pharmacists/Pages/pharmacistsandchemists.aspx> [Accessed 22 June 2018]
43. Costa FA, Scullin C, Al-Taani G, et al. Provision of pharmaceutical care by community pharmacists across Europe: Is it developing and spreading? *J Eval Clin Pract*. 2017;23:1336–1347.

3 Global survey on the role of pharmacists in non-communicable diseases

3.1 Aims and objectives

To gain a better understanding of the role of pharmacists in non-communicable diseases (NCDs), FIP has collaborated with its member organisations by conducting a global survey-based study. The survey aimed to obtain an overview of the roles that pharmacists currently play in the prevention and screening of NCDs, the referral of patients to physicians and the management or pharmaceutical care of patients being treated for NCDs. The diseases considered in this study were cardiovascular diseases, diabetes, asthma/COPD and cancer, as these are the NCDs that have been identified by the World Health Organization to be of highest priority.

In addition, the study investigated the level of access of pharmacists to patients' health records, the use of technologies to support pharmacists' roles, the development of competencies for the provision of professional services related to NCDs, and the existence of barriers or limitations to an expanded role of pharmacists in NCD management.

3.2 Data collection methodology and tool

This study was based on data collected from FIP member organisations through the FIP "Global survey on the role of pharmacists in non-communicable diseases", conducted between November 2017 and February 2018. The invitation to participate and the survey questionnaire were sent to FIP member organisations by email and reinforced through the monthly FIP newsletter *The Global Picture*.

3.2.1 Design of the survey questionnaire

The survey was conducted using the online survey platform QuestionPro, and was also distributed as Microsoft Word editable form via email to facilitate data collection.

The survey was conducted in three languages (English, French and Spanish).

3.2.2 Study sample

The survey questionnaire was sent to all FIP member organisations (140). Because the survey aimed to collect country-level information, organisations from the same country or territory were invited to merge efforts and provide a joint response. As such, the theoretical maximum sample size would be 102, representing the number of countries and territories with FIP member organisations. Responses were received from 70 countries and territories — a significant proportion (69%) of the target.

Table 1 indicates the responses that were received from each WHO region, and the population covered by the study. It is relevant to highlight the difference in the proportions of the study sample for each region in terms of number of responses and population accounted for.

Table 1. Sample distribution per WHO region and population covered by the study

WHO Region ⁱ	All countries and territories	Countries and territories with FIP member orgs.	Countries and territories responding	Response rate per region	Share of sample (total responses)	Total population ⁱⁱ	Population represented in FIP	Population covered by study	Percentage of population represented in FIP	Share of total study population
	n	n	n	%	%	n (million)	n (million)	n (million)	%	%
AFRO	49	25	14	56%	20%	1,066.04	873.04	580.28	66.5%	10.3%
EMRO	22	10	6	60%	8.6%	681.88	515.26	329.50	63.9%	5.8%
EURO	55	36	29	80.6%	41.4%	921.42	795.59	694.91	87.3%	12.3%
PAHO	38	13	10	76.9%	14.3%	1,002.26	761.45	712.05	93.5%	12.6%
SEARO	10	6	3	50%	4.3%	1,942.97	1,887.06	1,632.48	86.5%	28.9%
WPRO	33	12	8	66.7%	11.4%	1,933.90	1,858.28	1,701.32	91.6%	30.1%
Total	207	102	70	69%	100%	7,548.48	6,690.69	5,650.5	84.5%	100%

Respondents accounted for 75% of the world's population (7,548.48 million, according to United Nations 2017 data). The findings of this study therefore explain the role that pharmacists play in NCDs in countries and territories representing three-quarters of the world's population. Moreover, the population covered by this study (5,650.5 million) represents 84.5% of the total population of the countries and territories represented in FIP.

In terms of the number of respondents, the response rate was 69% of all the countries and territories where FIP has member organisations. For a full list of respondents per region, see Table 2.

Table 2. List of respondents per WHO region

AFRO	EMRO	France	Slovenia	SEARO
Benin	Afghanistan	Germany	Spain	India
Cabo Verde	Iran	Great Britain ⁱⁱⁱ	Sweden	Indonesia
Cameroon	Jordan	Hungary	Switzerland	Nepal
Ethiopia	Lebanon	Iceland	Turkey	WPRO
Ghana	Oman	Ireland	PAHO	Australia
Kenya	Pakistan	Israel	Argentina	China
Mali	EURO	Italy	Brazil	China Taiwan
Mauritius	Albania	Macedonia	Canada	Fiji
Nigeria	Armenia	Malta	Colombia	Japan
Rwanda	Austria	Montenegro	Costa Rica	New Zealand
Sierra Leone	Belgium	Netherlands	Ecuador	Philippines
South Africa	Croatia	Norway	Panama	Singapore
Tanzania	Czech Republic	Portugal	Paraguay	
Zimbabwe	Denmark	Romania	Uruguay	
	Finland	Russian Federation	USA	

ⁱ AFRO: African region; EMRO: Eastern Mediterranean region; EURO: European region; PAHO: Pan-American region; SEARO: Southeast Asian region; WPRO: Western Pacific region.

ⁱⁱ Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, available at <https://esa.un.org/unpd/wpp/>.

ⁱⁱⁱ It should be noted that the responses received from the Royal Pharmaceutical Society correspond to England, Scotland and Wales, but not Northern Ireland. For that reason, the respondent is referred to as Great Britain, and not United Kingdom throughout this report.

As for the sample's distribution per income level of responding countries and territories, the largest proportion (43%) of responses was received from high-income countries and territories. However, in terms of the population covered by the study, the largest proportion corresponds to lower-middle-income countries (39%). Low-income countries are the least represented in the survey in terms of population or number of respondents. For a detailed description of the sample's distribution per income levels, see Table 2. For a full list of respondents per income level, see Table 3.

Table 2. Distribution of survey respondents according to the World Bank classification of economies

World Bank income level	All countries and territories n	Countries and territories with FIP member orgs. n	Countries and territories responding n	Response rate per income level %	Share of sample (total responses) %	Total population ^{iv} n (million)	Population represented in FIP n (million)	Population covered by study n (million)	Percentage of population represented in FIP %	Share of total study population %
Low income	31	16	9	56.3%	12.9%	677.01	497.90	293.12	58.9%	5.2%
Lower-middle income	53	24	11	45.8%	15.7%	3,056.84	2,744.23	2,211.76	80.6%	39.1%
Upper-middle income	54	26	20	76.9%	28.6%	2,623.57	2,337.87	2,144.96	91.7%	38.0%
High income	69	36	30	83.3%	42.9%	1,191.06	1,110.69	1,000.71	90.1%	17.7%
Total	207	102	70	68.6%	100.0%	7,548.48	6,690.69	5,650.5	84.5%	100.0%

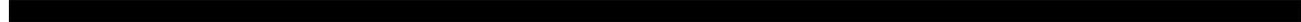
Table 3. List of respondents per World Bank income category

Low income	India	Ecuador	Austria	Japan
Afghanistan	Indonesia	Fiji	Belgium	Malta
Benin	Jordan	Iran	Canada	Netherlands
Ethiopia	Kenya	Lebanon	China Taiwan	New Zealand
Mali	Nigeria	Macedonia	Czech Republic	Norway
Nepal	Pakistan	Mauritius	Denmark	Oman
Rwanda	Philippines	Montenegro	Finland	Portugal
Sierra Leone	Upper-middle income	Panama	France	Singapore
Tanzania	Albania	Paraguay	Germany	Slovenia
Zimbabwe	Argentina	Romania	Great Britain	Spain
Lower-middle income	Brazil	Russian Federation	Hungary	Sweden
Armenia	China	South Africa	Iceland	Switzerland
Cabo Verde	Colombia	Turkey	Ireland	Uruguay
Cameroon	Costa Rica	High income	Israel	USA
Ghana	Croatia	Australia	Italy	

3.2.3 Limitations

Not all respondents completed the full questionnaire. As such, for each question, responses were collated and average results are indicated.

^{iv} Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, available at <https://esa.un.org/unpd/wpp/>.



It should be taken into account that the questions may have been misinterpreted by the respondents — especially if the questionnaire was not in their native language. This may have resulted in some questions being completed inaccurately.

If any inaccurate information was provided by any of the respondents, it may have had an effect on the accuracy of the results and their statistical analysis. As such, care should be taken when interpreting the findings.

It should be noted that the complexity and diversity of health systems and the existing practice models around the world may have made it difficult for some organisations to reflect their local reality and activities through the options available in the questionnaires.

This is especially relevant for countries with internal diversity in terms of governance and pharmacy practice (i.e., where the implementation of public health programmes and/or professional services may vary for each province/state/region, such as in federal countries). In such cases, FIP member organisations were asked to respond after considering the situation that covers or affects the majority of the population in the country. Nevertheless, such responses should be considered carefully, as they might provide a simplified view of the national situation of those countries.

3.3 NCD prevention: the role of pharmacists

The first part of the survey dealt with the role that pharmacists play in the prevention of NCDs. Particularly, we asked what NCDs and risk factors are targeted and what activities and services are in place to assist healthy individuals to adopt healthier lifestyles.

3.3.1 Involvement of pharmacists in NCD prevention programmes or activities.

The survey asked whether community pharmacists are commonly involved in NCD prevention programmes or activities. Although the adverb “commonly” was not defined in terms of the percentage of community pharmacists that are involved in such activities, the question was intended to investigate whether such services are part of routine community pharmacy practice for a majority of pharmacists and sustained over time. Results are presented in Figure 1 and

Figure 2 .

Figure 1. Community pharmacists’ involvement in NCD prevention per WHO region (n=70)

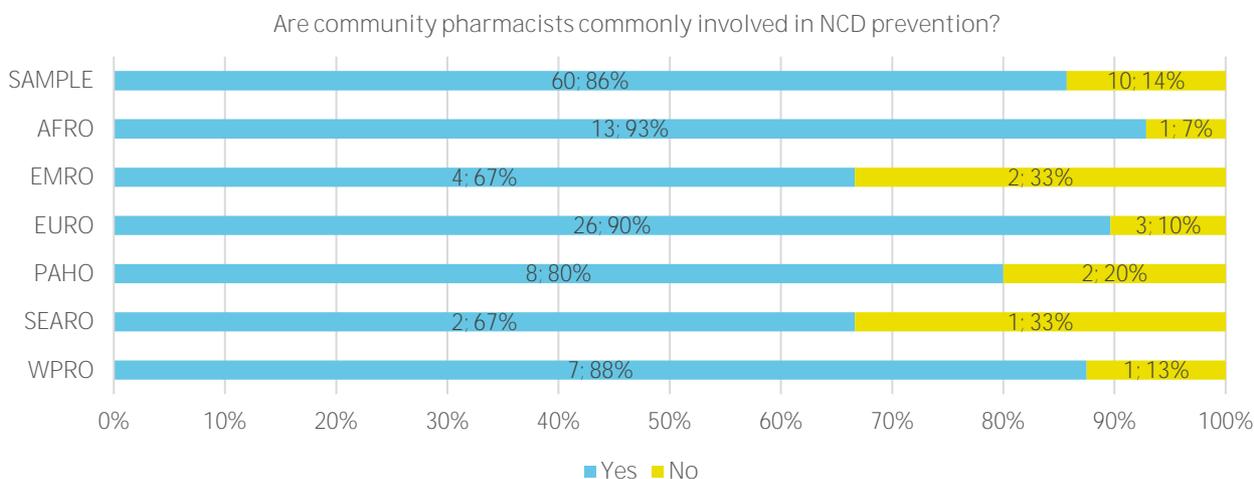
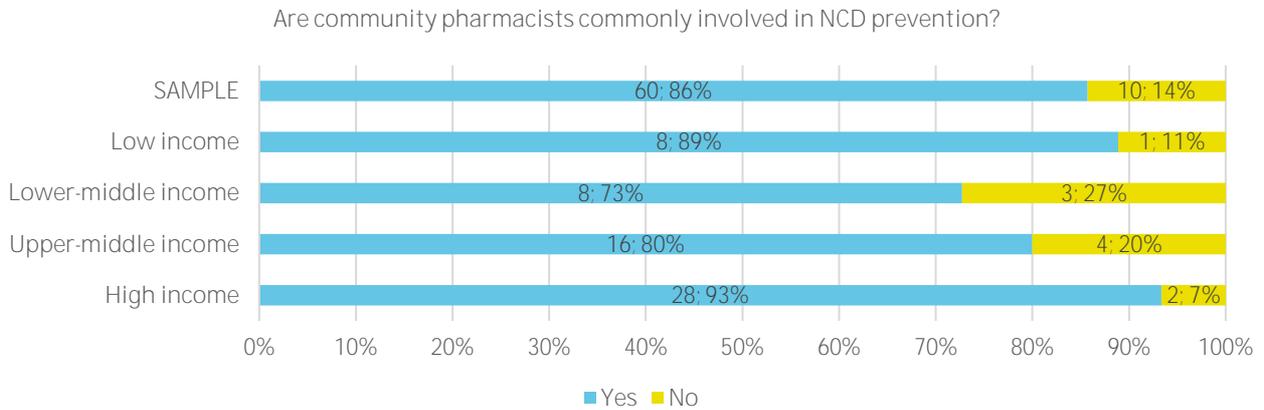


Figure 2. Community pharmacists' involvement in NCD prevention per income level (n=70)



NCD prevention activities are part of the routine practice of community pharmacists in a large majority of countries and territories (60 respondents; 86%). The role of the pharmacist as a prevention counsellor does not seem to be related to a country's income level. However, there is a variation across WHO regions and income levels, with the EMRO and SEARO regions reporting the lowest rates of involvement.

Forty-three respondents gave details about the disease prevention areas in which pharmacists are active. With an involvement rate of 95%, diabetes is the disease in which pharmacists are most commonly taking part in prevention activities. In four of six WHO regions, this rate even goes up to 100%. Cardiovascular diseases follow with a participation rate of 88%. Asthma/COPD and cancer are the diseases with the least frequent participation of pharmacists in preventive activities (see Figure 3, page 34 for details).

Preventive activities include the provision of information and advice as well as educational materials to individual patients, participating in or organising community outreach activities outside the pharmacy, and collaborating with other healthcare professionals (see Figure 3. Involvement of community pharmacists in NCD prevention, per disease and WHO region (n=43)

Table 4 for details of the frequency of each type of activity in the study sample).

In addition to these activities, Spain reported that pharmacists participate in research studies for the development of new professional services related to NCD prevention, and Zimbabwe indicated that pharmacists carry out public campaigns on radio and television during pharmacy week aimed at NCD prevention.

Figure 3. Involvement of community pharmacists in NCD prevention, per disease and WHO region (n=43)

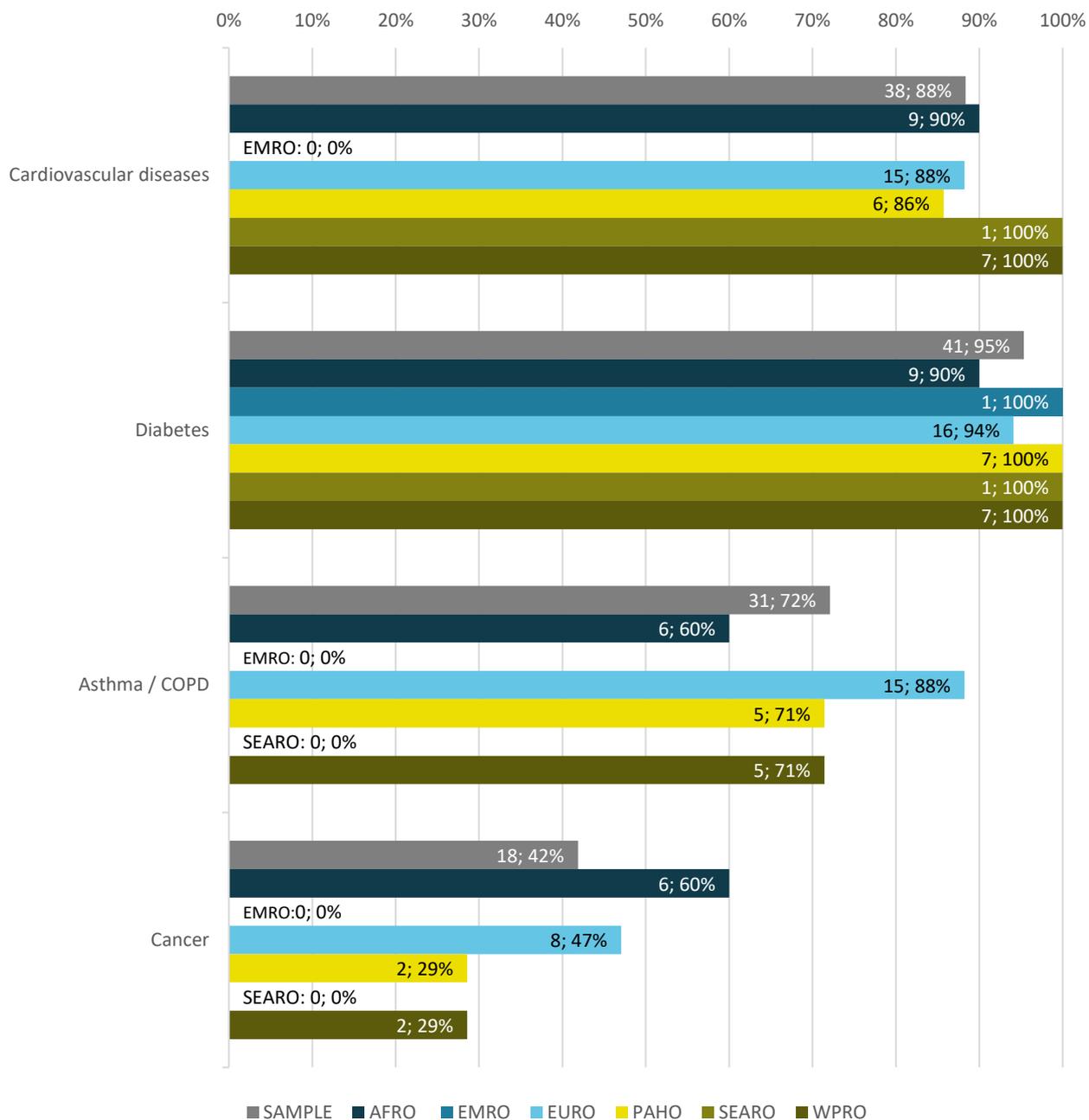


Table 4. Types of NCD prevention activities commonly carried out by community pharmacists

Service/activity	Number of countries and territories	% of respondents with NCD prevention activities (n=60)	% of the study sample (n=70)	Countries where the service or activity is available.
Providing information and advice to individual patients (e.g. face-to-face consultation, by phone, SMS, etc.)	54	90%	77.1%	Albania, Argentina, Armenia, Australia, Austria, Benin, Brazil, Cabo Verde, Cameroon, Canada, China Taiwan, Costa Rica, Croatia, Czech Republic, Denmark, Ethiopia, Fiji, Finland, France, Germany, Ghana, Great Britain, Hungary, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Lebanon, Mali, Malta, Nepal, Netherlands, Nigeria, Oman, Paraguay, Philippines, Portugal, Romania, Russian Federation, Rwanda, Sierra Leone, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, Uruguay, USA, Zimbabwe.
Providing educational materials (leaflets, websites, posts on social networks, etc.)	44	73.3%	62.9%	Argentina, Armenia, Austria, Belgium, Brazil, Cabo Verde, Cameroon, Canada, China, China Taiwan, Costa Rica, Croatia, Czech Republic, Denmark, Finland, France, Germany, Ghana, Great Britain, Hungary, Indonesia, Ireland, Italy, Japan, Mali, Malta, Netherlands, Nigeria, Norway, Oman, Paraguay, Philippines, Portugal, Romania, Russian Federation, Rwanda, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, USA.
Participating in multi-disciplinary activities	38	63.3%	54.3%	Albania, Argentina, Austria, Brazil, Cameroon, Canada, Costa Rica, Croatia, Czech Republic, Fiji, Finland, France, Ghana, Hungary, Indonesia, Iran, Ireland, Israel, Japan, Lebanon, Mali, Malta, Mauritius, Netherlands, Nigeria, Oman, Philippines, Portugal, Rwanda, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, USA, Zimbabwe
Organising activities outside the pharmacy (workshops, seminars, etc.)	35	58.3%	50%	Albania, Argentina, Austria, Brazil, Cameroon, Canada, China Taiwan, Czech Republic, Ethiopia, Fiji, Finland, France, Ghana, Hungary, Indonesia, Ireland, Japan, Mali, Mauritius, Netherlands, Nigeria, Oman, Paraguay, Philippines, Portugal, Rwanda, Sierra Leone, Singapore, Slovenia, South Africa, Spain, Sweden, Tanzania, USA, Zimbabwe

The data above point to a consolidated role of community pharmacists in health education and the promotion of healthy lifestyles that may prevent the onset of NCDs, through advice to individual patients combined with educational materials. These activities, together with the collaboration with other healthcare professionals and the organisation of community outreach events, represent a significant role of pharmacists as part of the primary care efforts to keep populations healthy.

In particular, pharmacists tackled a number of the major risk factors for several NCDs, as can be seen in Figure 4 and Table 5.

Figure 4. Community pharmacists’ involvement in targeting specific NCD risk factors (n=60)

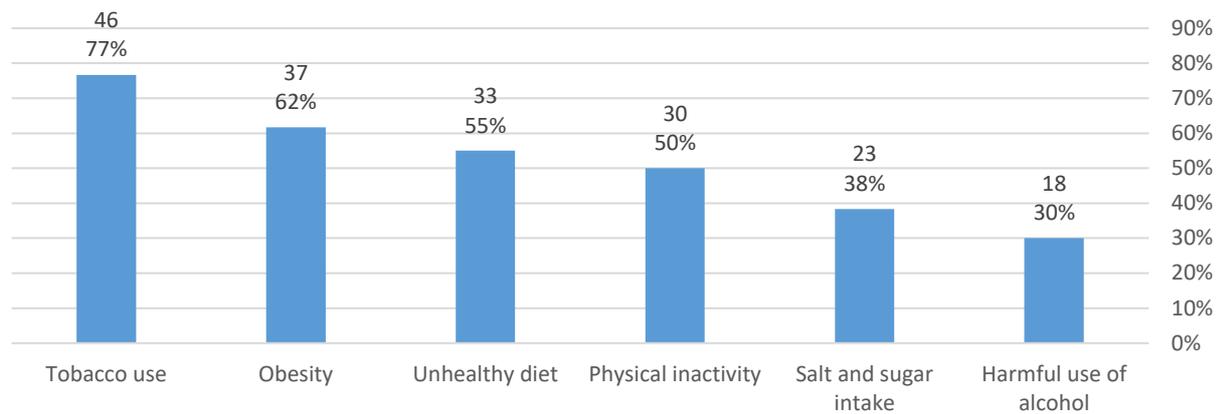


Table 5. Community pharmacists’ involvement in targeting specific NCD risk factors (n=60)

Risk factor	Countries and territories where services or activities are available.
Tobacco use	Argentina, Armenia, Australia, Austria, Belgium, Brazil, Canada, China Taiwan, Costa Rica , Croatia, Czech Republic, Denmark, Ethiopia, Fiji, Finland, France, Germany, Great Britain , Hungary, Iran, Ireland, Israel, Italy, Japan, Lebanon, Mali, Malta, Mauritius, Nepal, Netherlands, Nigeria, Norway, Paraguay, Philippines, Portugal, Romania, Rwanda, Singapore , Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, USA, Zimbabwe
Obesity	Albania, Argentina, Armenia, Austria, Brazil, Cameroon, China, China Taiwan, Costa Rica , Croatia, Czech Republic, Ethiopia, Fiji, Ghana, Great Britain , Hungary, Indonesia, Ireland, Italy, Lebanon, Malta, Nepal, Netherlands, Nigeria, Paraguay, Philippines, Portugal, Rwanda, Singapore , Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, USA
Unhealthy diet	Albania, Argentina, Australia, Brazil, Cameroon, China, Costa Rica, Croatia, Czech Republic, Ethiopia, France, Germany, Ghana, Great Britain, Hungary, Indonesia, Ireland, Italy, Malta, Nepal, Nigeria, Paraguay, Portugal, Rwanda, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, USA
Physical inactivity	Albania, Argentina, Brazil, Cameroon, Costa Rica, Croatia, Czech Republic, Ethiopia, Finland, Germany, Ghana, Great Britain, Hungary, Ireland, Italy, Malta, Nepal, Nigeria, Paraguay, Philippines, Portugal, Rwanda, Singapore, Slovenia, Spain, Sweden, Switzerland, Tanzania, Turkey, USA
Salt and sugar intake	Albania, Brazil, Cameroon, Costa Rica, Croatia, Czech Republic, France, Hungary, Indonesia, Ireland, Malta, Nepal, Nigeria, Panama, Portugal, Rwanda, Singapore, Slovenia, South Africa, Spain, Sweden, Tanzania, USA
Harmful use of alcohol	Argentina, Belgium, Brazil, China Taiwan, Czech Republic, Ethiopia, Great Britain, Malta, Nepal, Nigeria, Rwanda, Singapore, Slovenia, Spain, Sweden, Tanzania, USA, Zimbabwe

Addressing tobacco use and offering smoking cessation support is part of community pharmacists’ scope of practice in 80% of the countries and territories that reported having a role in NCD prevention. This is particularly important, because tobacco use is a significant risk factor for all NCDs considered in this survey.

In 2015, FIP published the document “Establishing tobacco-free communities — A practical guide for pharmacists”, which provides an overview of different tobacco cessation activities that pharmacists are involved in across the world. According to this report, “the burden of tobacco use on the health of people and on the healthcare system is evident in countries all around the world. As healthcare costs rise and healthcare workers worldwide become more burdened, it is important to recognise how pharmacists and their unique skills and knowledge may contribute to the mutual goal of better health for all.”¹

This applies to smoking cessation services by pharmacists, as it does to other activities supporting patients’ self-care through the adoption of healthy habits and lifestyles. Pharmacists play a role in NCD prevention through activities targeting dietary options, such as obesity prevention, unhealthy diets, salt and sugar intake or the harmful use of alcohol, as well as physical inactivity.

3.3.2 Country-specific information and resources on pharmacy-based NCD prevention activities

Table 6 offers examples of activities and resources related to the engagement of pharmacists in NCD prevention in a number of countries.

Table 6. Country-specific information and online resources about pharmacists' engagement in NCD prevention activities

Country or territory	Description	Link
Argentina	Programme ' <i>Farmacéuticos por la calidad de Vida</i> ' (Pharmacists for Quality of Life), since 2007	https://bit.ly/2UetYnY
Brazil	Advanced Pharmaceutical Service Programme	https://bit.ly/2Ty7ji6
	Smoking cessation programme	https://bit.ly/2HDNeWb
	Weight loss programme	https://bit.ly/2TU4ODQ
	Regional Pharmacy Council of São Paulo (Arterial hypertension)	https://bit.ly/2OpNIOv
	Support to Arterial Hypertension Control	https://bit.ly/2JDdzFK
	Cost-Effectiveness analysis of a pharmaceutical care programme for systemic arterial hypertension care in the Brazilian Public Health System	https://bit.ly/2UTEbnd
Canada	Pharmacy smoking cessation programme (Ontario, Canada)	https://bit.ly/2Wm2hXU https://bit.ly/2JDW7kx
China	Pharmacists' role in public health activities	https://bit.ly/2FD8ckP
China Taiwan	Taiwan Tobacco Control Annual Report 2016	https://bit.ly/2FAOTd4
Ecuador	Campaign for hypertensive and diabetic patients	https://bit.ly/2Fy6GA6
Fiji	Information about NCD prevention by the Ministry of Health of Fiji	https://bit.ly/2Ooj7CM
Finland	There are several NCD prevention programmes by community pharmacies focusing on asthma, diabetes, and cardiovascular diseases	NA
France	French Chamber of Pharmacists	https://bit.ly/2j1q398
Germany	Health services provided by pharmacies, including NCD prevention services	https://bit.ly/2TXrQ4T
	Scientific Institute for Prevention in Health Care of the Bavarian State Pharmacists' Chamber	https://bit.ly/2Cxecuz
Great Britain	The pharmacy contract for England can be accessed on the PSNC website	https://bit.ly/2YhNkYN
	Many of the public health campaigns and services available through community pharmacy in Wales can be found on the CPW website	https://bit.ly/2TthbJX
	Public health Wales website also highlights many of the areas discussed	https://bit.ly/2UcKZPx
Hungary	May measurement month	https://bit.ly/2TyrhcG
	Know your pulse campaign	https://bit.ly/2HSyTo0
	Metabolic Syndrome Programme	https://bit.ly/2Wg54Su
Indonesia	"Pharmacists as Agents of Change" campaign	https://bit.ly/2JD7CIX
Israel	By the new legislation all pharmacies are mandated to give advice and consultation on lifestyle and anything that can affect or prevent NCDs. This would include all risk factors.	NA
Italy	Federfarma's health promotion campaigns	https://bit.ly/2YmNzSj
Japan	Japan Pharmaceutical Association's "Health Support Pharmacies" Programme	https://bit.ly/2HEqkOn

Country or territory	Description	Link
Mauritius	NCD prevention activities of the Ministry of Health of Mauritius	https://bit.ly/2HQpttj
Montenegro	The Pharmaceutical Chamber of Montenegro has organised a project on asthma, as well as training activities focused on the role of pharmacists in smoking cessation.	NA
Nepal	Pharmacists increasingly participate in campaigns for World Diabetes Day and others.	NA
Netherlands	Royal Dutch Pharmacists' Association, Better care for the prevention of fall incidents and diabetes	https://bit.ly/2JSfV3R
	Ministry of Health: Diabetes until 2025. Prevention and care in conjunction	https://bit.ly/2WgTcj0
	Ministry of Health: Factsheet Exercise programme for the prevention of cardiovascular diseases	https://bit.ly/2OosQsE
	Alphega Pharmacies: Prevention and Advice	https://bit.ly/2TsEFip
	Inventory of diabetes interventions in the field of prevention and care	https://bit.ly/2Ftid3T
Nigeria	Community pharmacists as a group traditionally observe WHO days specifically for all NCDs, using the opportunity of the day to carry out awareness activities on prevention of the diseases.	NA
Rwanda	Rwanda Community Pharmacists Union: International Conference on NCDs	https://bit.ly/2TUsn7u
South Africa	GoSmokeFree pharmacy programme	https://bit.ly/2HDnx8h
	Pharma Dynamics and Heart and Stroke Foundation — Cooking from the Heart initiative	https://bit.ly/1LLgUKr https://bit.ly/2HYhwm7
	Accu Chek — Diabetes Portion Plate placemat	https://bit.ly/2OnDpfJ
Switzerland	Health advice	https://bit.ly/2Wtlp5p
	Smoking cessation	https://bit.ly/2WkN8Gf
Turkey	Chamber of Pharmacists — NCD prevention and risk assessment resources	https://bit.ly/2TwDzSE
USA	APhA resources for diabetes prevention and care	https://bit.ly/2FBBbGR
	APhA Pharmacy-Based Cardiovascular Disease Risk Management	https://bit.ly/2YmPjuP
	Skin cancer prevention	https://bit.ly/2YIH4z7
	Centers for Disease Control and Prevention — Pharmacy resources for cardiovascular disease prevention	https://bit.ly/2CD5JWK
Zimbabwe	The Pharmaceutical Society of Zimbabwe has organised joint symposia with the medical profession on hypertension, cancer, psychiatric disorders and drug abuse.	NA

3.4 Screening or early detection of NCD patients

3.4.1 Involvement of pharmacists in NCD screening activities.

Community pharmacies may provide increased access to an array of point-of-care tests and screening procedures that could contribute to increasing the early detection of NCDs and other diseases, thus allowing for **patients'** appropriate referral to other healthcare professionals, or the adoption of corrective self-care measures to reduce the risks of developing or aggravating an existing NCD.

As Figure 5 and Figure 6 illustrate, community pharmacists are commonly involved in the screening or early detection of NCDs to some extent in a majority of countries and territories (56 respondents; 80%). This is an overall figure that includes a variety of scenarios, from just performing a limited number of screening tests (such as blood pressure measurement) to offering a wide array of point-of-care tests and assessments for various NCDs. Notwithstanding these differences, these results highlight the role that community pharmacies

play in the triage of patients that may require further observation and diagnosis by another healthcare professional. This role is consistent with a definition of community pharmacies as a gateway to health care systems. Referring only patients who require disease management to other care settings contributes to the efficiency of the system, and avoids a collapse of other primary or secondary care facilities as patients can be screened in the community, at their local pharmacy.

Figure 5. Community pharmacists' involvement in NCD screening/early detection, per WHO region (n=70)

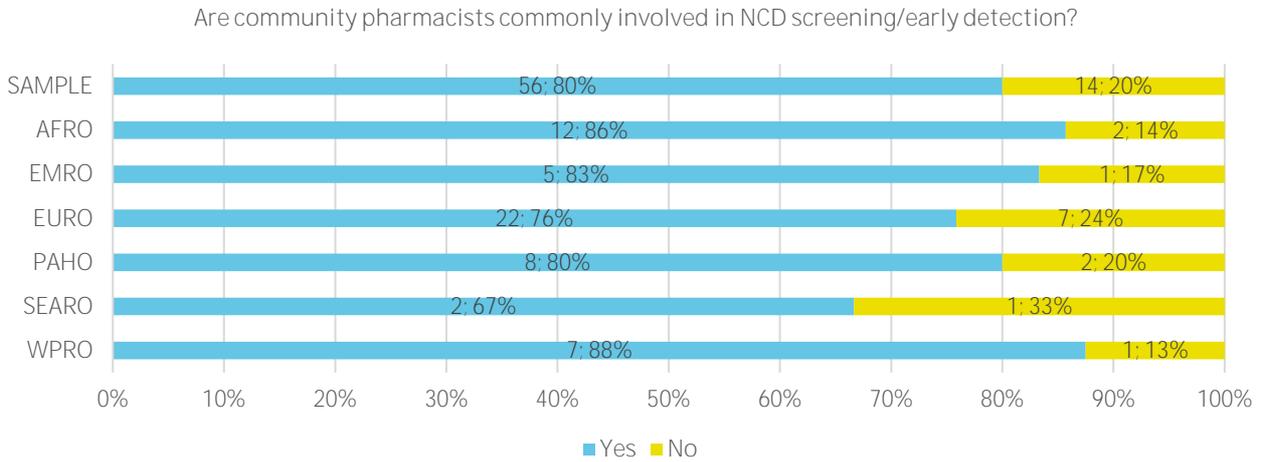
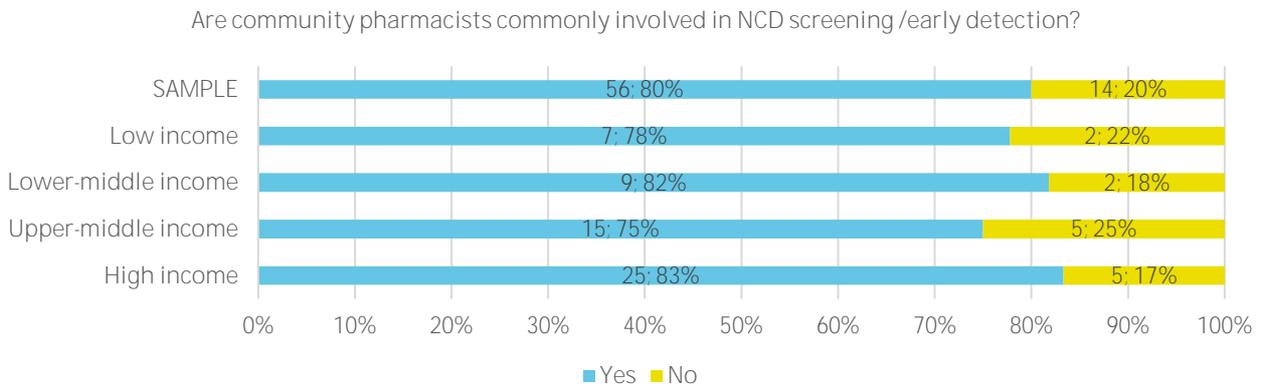


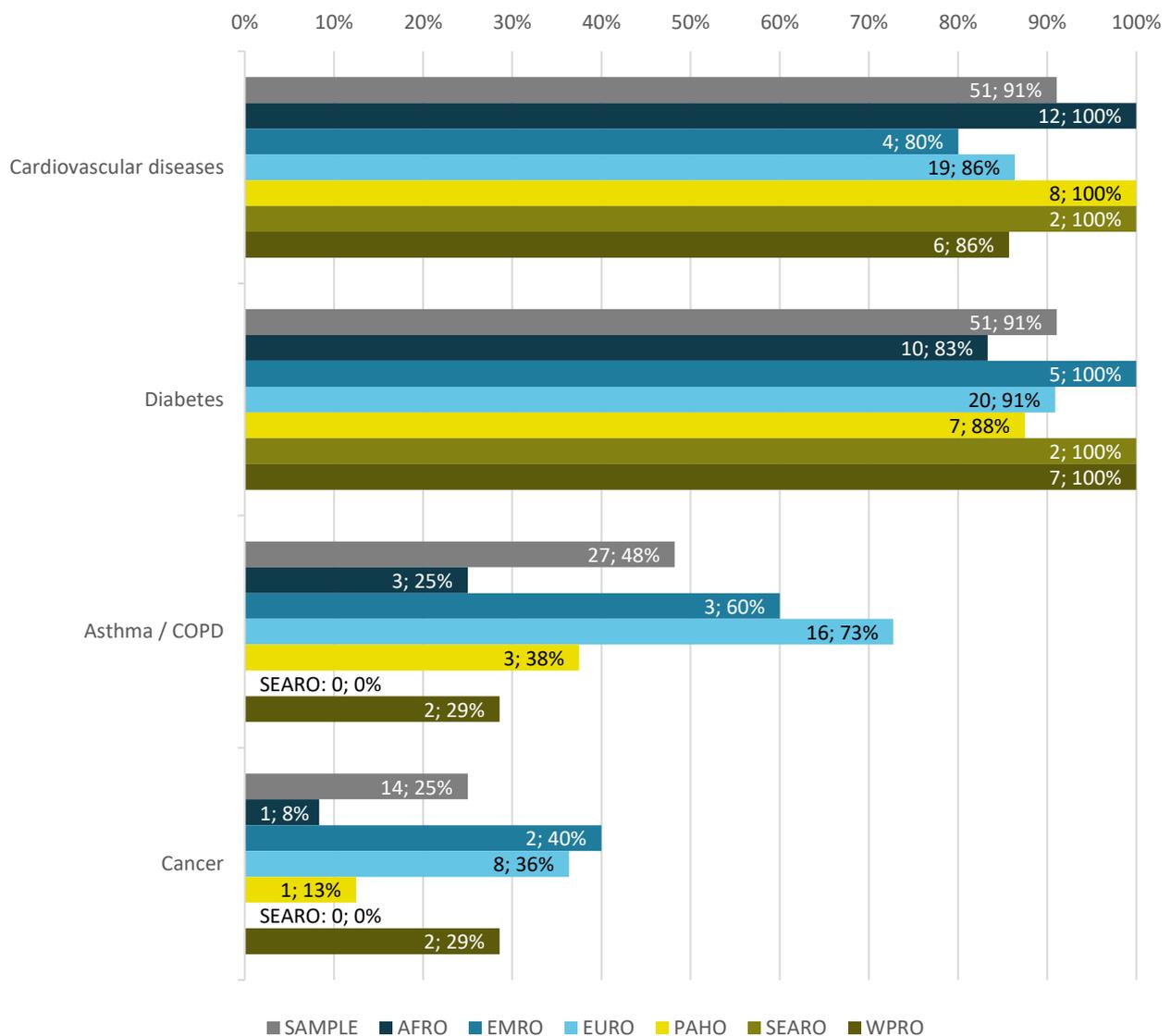
Figure 6. Community pharmacists' involvement in NCD screening/early detection, per income level (n=70)



As Figure 6 suggests, NCD screening services are most widely available in high-income countries (83%). However, this indicator does not vary in line with the income level of countries, and it does not present expressively lower rates for the lower income levels, which could be explained by the fact that some screening tests do not require costly equipment or resources, among other factors.

Looking at the 56 respondents who reported that pharmacists play a role in NCD screening and early detection, Figure 7 offers a breakdown of this role per disease area and WHO region. Cardiovascular diseases and diabetes are the areas with the highest implementation rates for screening tests, at a considerable distance from asthma/COPD and cancer. The two latter areas frequently require more advanced equipment or protocols, but interesting results are being observed in several countries, as can be seen in the following sections.

Figure 7. Involvement of community pharmacists in NCD screening/early detection, per disease and WHO region (n=56)



3.4.2 Cardiovascular diseases: screening methods

A variety of methods can be used by community pharmacists to identify patients at risk of having or developing a cardiovascular condition, namely by measuring blood pressure, body weight and body mass index, or blood cholesterol and/or triglyceride levels.

Figure 8 offers an overview of the availability of various screening methods for cardiovascular diseases per WHO region. As the chart indicates, the measurement of blood pressure is the most commonly used screening method among the 51 countries and territories that reported that pharmacies play an active role in the screening of this type of conditions in the community. Blood pressure measurement is typically followed by an interpretation of the measurements by pharmacists and the appropriate advice in terms of dietary and other habits, or the referral to the patient’s general practitioner, when appropriate.

Point-of-care tests involving the determination of biochemical parameters in the patient’s blood are less frequently part of the scope of practice of community pharmacists. However, tests such as total blood cholesterol can be found in 58% of the responding countries in the European region, and 50% in the region of the Americas.

Figure 8. Screening methods used by community pharmacies for cardiovascular diseases, per WHO region (n=51)

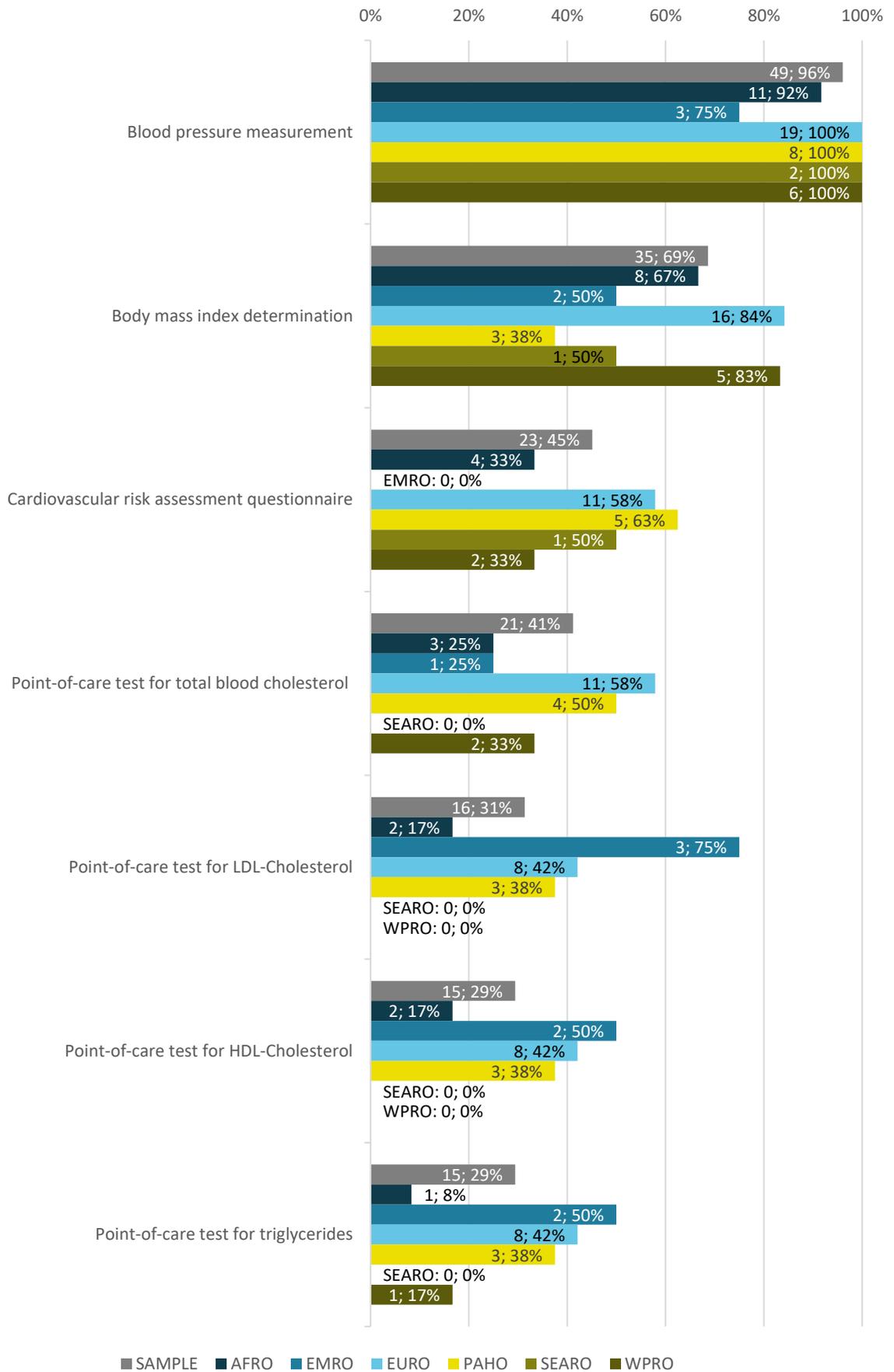


Table 7. Screening methods used by community pharmacies for cardiovascular diseases

Method	Number of countries and territories	% of respondents with screening activities (n=51)	% of the study sample (n=70)	Countries and territories where the method is employed.
Blood pressure measurement	49	96%	70%	Albania, Argentina, Armenia, Australia, Austria, Benin, Brazil, Cabo Verde, Cameroon, Canada, China, China Taiwan, Costa Rica, Croatia, Czech Republic, Ecuador, Fiji, Finland, France, Germany, Ghana, Great Britain, Hungary, Indonesia, Ireland, Israel, Jordan, Lebanon, Mali, Malta, Mauritius, Nepal, Netherlands, Nigeria, Pakistan, Panama, Philippines, Portugal, Romania, Sierra Leone, Singapore, South Africa, Spain, Sweden, Tanzania, Turkey, Uruguay, USA, Zimbabwe
Body mass index determination	35	69%	50%	Albania, Australia, Austria, Brazil, Cameroon, China, China Taiwan, Croatia, Czech Republic, Ecuador, Fiji, France, Germany, Ghana, Great Britain, Hungary, Ireland, Israel, Lebanon, Malta, Mauritius, Nepal, Netherlands, Nigeria, Pakistan, Portugal, Sierra Leone, Singapore, South Africa, Spain, Sweden, Tanzania, Turkey, Uruguay, Zimbabwe
Cardiovascular risk assessment questionnaire (smoking habits, physical activity, diet, etc.)	23	45%	33%	Australia, Brazil, Cameroon, Canada, Croatia, Czech Republic, Ecuador, France, Great Britain, Hungary, Indonesia, Ireland, Israel, Mauritius, Netherlands, Nigeria, Panama, Portugal, Singapore, Spain, Sweden, Tanzania, USA
Point-of-care test for total blood cholesterol	21	41%	30%	Austria, Brazil, China, Costa Rica, Croatia, Ecuador, Fiji, Germany, Hungary, Ireland, Israel, Lebanon, Malta, Netherlands, Nigeria, Portugal, South Africa, Spain, Sweden, Tanzania, USA
Point-of-care test for LDL-cholesterol	16	31%	23%	Brazil, Costa Rica, Croatia, Germany, Hungary, Iran, Ireland, Israel, Lebanon, Nigeria, Pakistan, Portugal, Spain, Sweden, Tanzania, USA
Point-of-care test for HDL-cholesterol	15	29%	21%	Brazil, Costa Rica, Croatia, Germany, Hungary, Ireland, Israel, Lebanon, Nigeria, Pakistan, Portugal, Spain, Sweden, Tanzania, USA
Point-of-care test for triglycerides	15	29%	21%	Brazil, China, Costa Rica, Croatia, Germany, Hungary, Ireland, Israel, Lebanon, Nigeria, Pakistan, Portugal, Spain, Sweden, USA

In addition to the methods mentioned above, Portugal reported using waist measurement as part of the screening strategy for cardiovascular disease risk, and Rwanda reported that community pharmacists assist patients in using blood pressure measurement machines for self-monitoring.

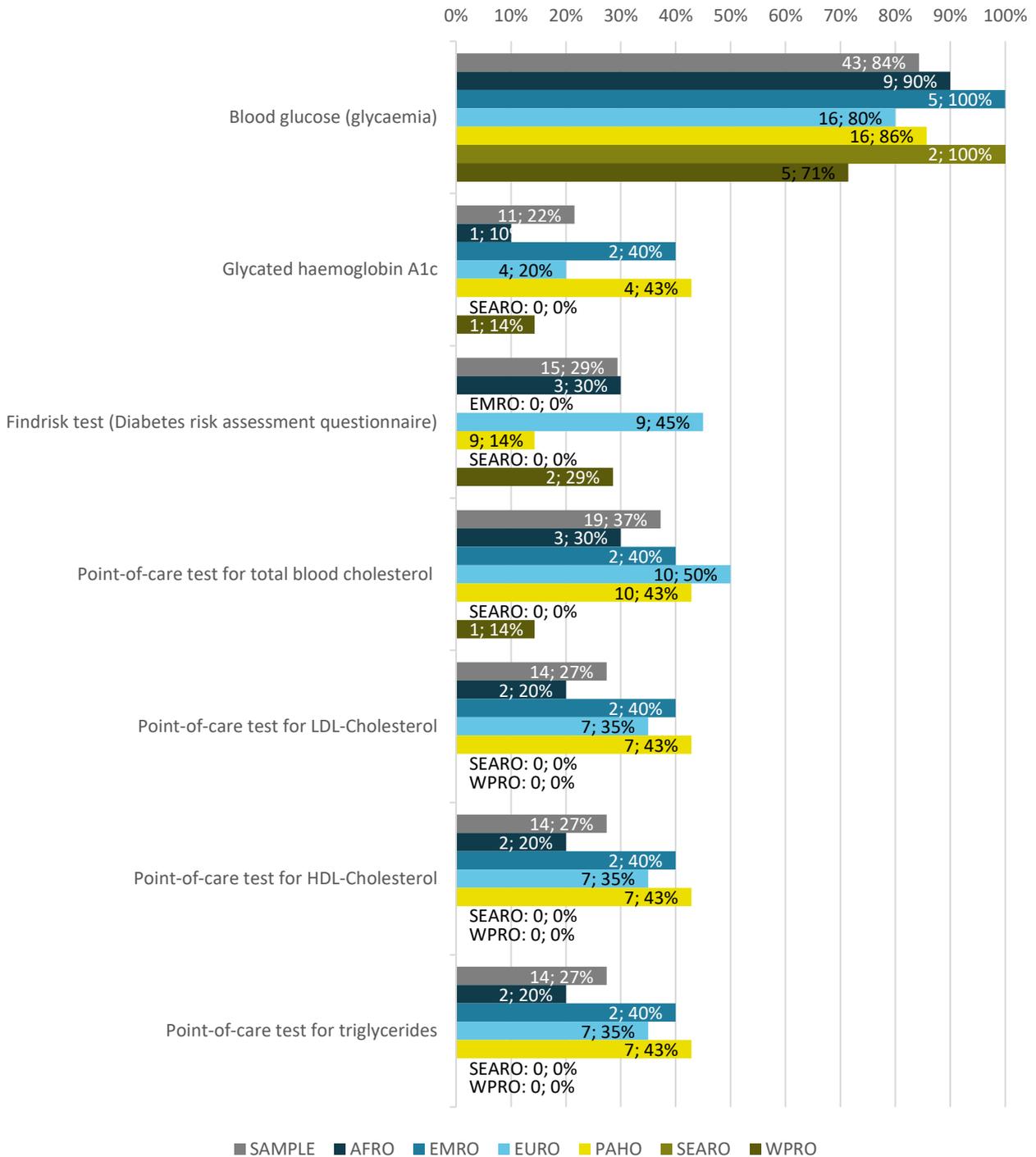
3.4.3 Diabetes: screening methods

The survey asked about the performance of several point-of-care tests for screening potential diabetic patients in the community. In particular, the following tests were surveyed: blood glucose (glycaemia), glycated haemoglobin A1c, Findrisk test (diabetes risk assessment questionnaire), total blood cholesterol, LDL-cholesterol, HDL-cholesterol, and triglycerides. Although some of these tests are used in the screening of both diabetes and cardiovascular diseases, they were included in both sections of the survey in order to frame responses within screening strategies for each of the two diseases. Figure 9 provides an overview of the availability of various screening methods for diabetes per WHO region.

In addition to these methods, the Canadian Pharmacists Association reported using the Canrisk test and monitoring of patient self-monitoring of blood glucose. The Canrisk test was developed by the Public Health Agency of Canada (PHAC), which adapted the Findrisk test, originally developed in Finland as part of its national diabetes prevention programme. The PHAC convened a group of clinical and academic experts to modify the questionnaire so it would more accurately reflect known diabetes risk factors applicable to Canadians; this included adding new questions on ethnicity, education and gestational diabetes.^v

^v For further information, see <https://www.pharmacists.ca/education-practice-resources/patient-care/diabetes-practice-tools-and-resources/canrisk-tools/>.

Figure 9. Screening methods used by community pharmacies for diabetes, per WHO region (n=51)



For the screening of diabetes, although the determination of blood glucose levels is extensively performed by community pharmacies (43 respondents; 84%), other point-of-care tests are not as widely available. Such tests, when combined, may provide a more accurate screening and a better understanding of a patient’s status in order to better inform the pharmacist’s counselling and referral to other healthcare professionals. Although they can be found in pharmacies of the European and Eastern Mediterranean regions to some extent, they are generally absent from pharmacy practice in the Southeast Asian and the Western Pacific regions (See Table 8 for details).

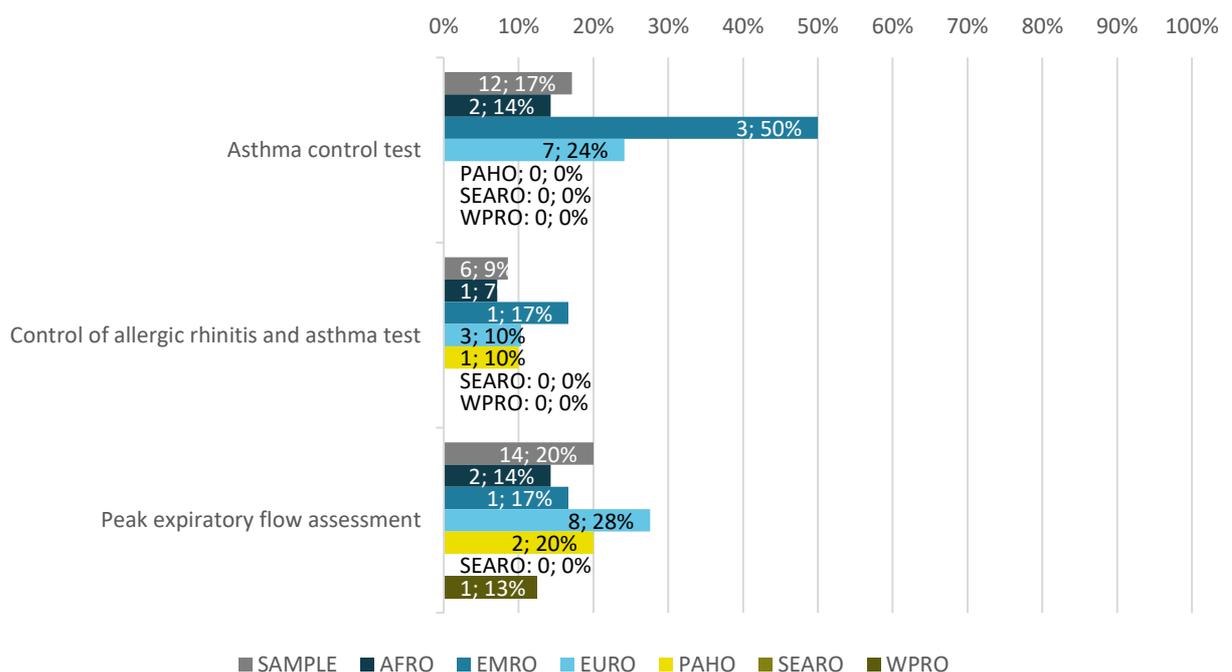
Table 8. Screening methods used by community pharmacies for diabetes

Method	Number of countries and territories	% of respondents with screening activities (n=51)	% of the study sample (n=70)	Countries and territories where the method is employed
Blood glucose (glycaemia)	43	84.3%	61.4%	Albania, Armenia, Australia, Austria, Brazil, Cabo Verde, Cameroon, China, China Taiwan, Costa Rica, Croatia, Czech Republic, Ecuador, Fiji, France, Germany, Ghana, Hungary, Indonesia, Iran, Ireland, Israel, Jordan, Lebanon, Malta, Mauritius, Nepal, Netherlands, Nigeria, Oman, Pakistan, Panama, Philippines, Portugal, Romania, Sierra Leone, South Africa, Spain, Sweden, Tanzania, Uruguay, USA, Zimbabwe
Glycated haemoglobin A1c	11	21.6%	15.7%	Australia, Brazil, Mauritius, Oman, Pakistan, Panama, Portugal, Romania, Spain, Sweden, USA
Findrisk test (diabetes risk assessment questionnaire)	15	29.4%	21.4%	Australia, Austria, Belgium, Canada, Finland, Germany, Hungary, Mauritius, Nigeria, Portugal, Singapore, Spain, Sweden, Tanzania, Turkey
Point-of-care test for total blood cholesterol	19	37.2%	27.1%	Austria, Brazil, Costa Rica, Croatia, Fiji, Germany, Hungary, Ireland, Lebanon, Malta, Netherlands, Nigeria, Oman, Portugal, South Africa, Spain, Sweden, Tanzania, USA.
Point-of-care test for LDL-cholesterol	14	27.4%	20%	Brazil, Costa Rica, Croatia, Germany, Hungary, Ireland, Lebanon, Nigeria, Oman, Portugal, Spain, Sweden, Tanzania, USA
Point-of-care test for HDL-cholesterol	14	27.4%	20%	Brazil, Costa Rica, Croatia, Germany, Hungary, Ireland, Lebanon, Nigeria, Oman, Portugal, Spain, Sweden, Tanzania, USA
Point-of-care test for triglycerides	14	27.4%	20%	Brazil, Costa Rica, Croatia, Germany, Hungary, Ireland, Lebanon, Nigeria, Oman, Portugal, Spain, Sweden, Tanzania, USA

3.4.4 Asthma: screening methods

For the screening of asthma patients, the survey investigated the extent of implementation of the three methods by community pharmacies: the asthma control test, the control of allergic rhinitis and asthma test and the peak expiratory flow assessment (peak flow metre). Results are presented in Figure 10.

Figure 10. Screening methods used by community pharmacies for asthma, per WHO region (n=27)



As Figure 11 illustrates, the screening method most commonly used for asthma in community pharmacies is the assessment of the peak expiratory flow using a peak flow metre, which is used in one fifth of the countries and territories where pharmacies play a role in asthma screening. Table 9 offers the list of respondents where the different methods are used. In addition to these methods, the Chinese Pharmaceutical Association reported that a simple pulmonary function test is used by community pharmacies in the country, but no further details were provided.

Table 9. Screening methods used by community pharmacies for asthma

Method	Number of countries and territories	% of respondents with screening activities (n=27)	% of the study sample (n=70)	Countries and territories where the method is employed
Asthma control test	12	44.4%	17.1%	Belgium, Croatia, Finland, Iran, Netherlands, Nigeria, Oman, Pakistan, Portugal, Sweden, Tanzania, Turkey
Control of allergic rhinitis and asthma test	6	22.2%	8.6%	Panama, Portugal, Sweden, Tanzania
Peak expiratory flow assessment (peak flow metre)	14	51.8%	20%	Australia, Austria, Brazil, Croatia, France, Germany, Hungary, Oman, Portugal, South Africa, Sweden, Tanzania, Turkey, USA

3.4.5 Chronic obstructive pulmonary disease: screening methods

For the screening of COPD, three types of screening methods were explored via the survey: the COPD assessment test, the dyspnoea assessment test (through mMRC [Modified Medical Research Council] Dyspnoea Scale) and the spirometry test. COPD screening by community pharmacies is not yet widely implemented, but a group of 13 countries (as listed on Table 10) has introduced spirometry tests for this purpose. Finland reported that, although COPD is not yet widely implemented in pharmacy practice, some pharmacies use microspirometry testing on theme days such as World COPD Day (21 November, <http://goldcopd.org/world-copd-day>) to raise awareness of the importance of screening for this disease.

Figure 11. Screening methods used by community pharmacies for COPD, per WHO region (n=27)

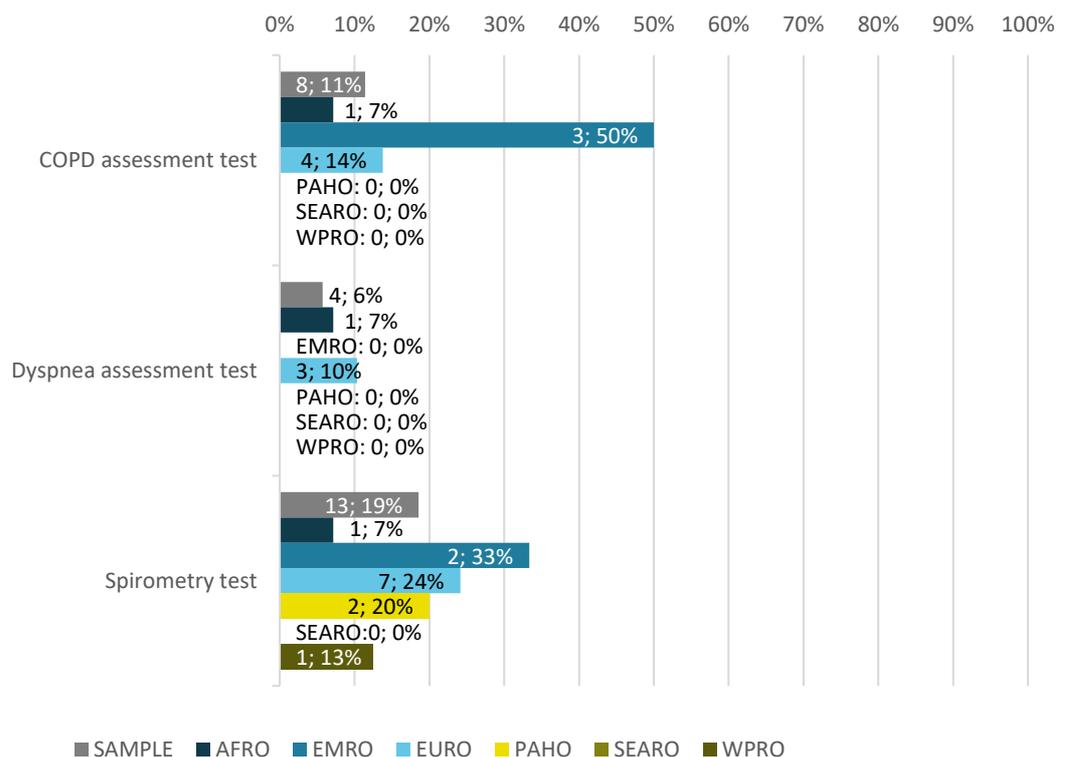


Table 10. Screening methods used by community pharmacies for COPD

Method	Number of countries and territories	% of respondents with screening activities (n=27)	% of the study sample (n=70)	Countries and territories where the method is employed
COPD assessment test	8	29.6%	11.4%	France, Hungary, Iran, Netherlands, Oman, Pakistan, Spain, Tanzania
Dyspnoea assessment test (through mMRC [Modified Medical Research Council] Dyspnoea Scale)	4	14.8%	5.7%	Hungary, Portugal, Sweden, Tanzania
Spirometry test	13	48.1%	18.6%	Australia, Austria, France, Hungary, Oman, Pakistan, Panama, Portugal, Romania, Spain, Sweden, Tanzania, USA

3.4.6 Cancer: screening methods

Due to the pathophysiology of cancer and the complexity of screening and diagnosing different types of tumours, the role of community pharmacies is quite limited in this area. However, interesting projects have been implemented in a few countries, generally in collaboration with health authorities and other health professionals, to raise public awareness and screen for some types of cancer and identify cancer patients as early as possible, by referring potential cases to the appropriate specialist for further exploration. The survey investigated the participation of community pharmacies in screening for colorectal cancer by collecting stool samples for analysis by a collaborating medical or clinical laboratory, and the scanning of suspicious skin moles for referral to a dermatologist. Results are presented in Figure 12 and Table 11.

Figure 12. Screening methods used by community pharmacies for cancer, per WHO region (n=14)

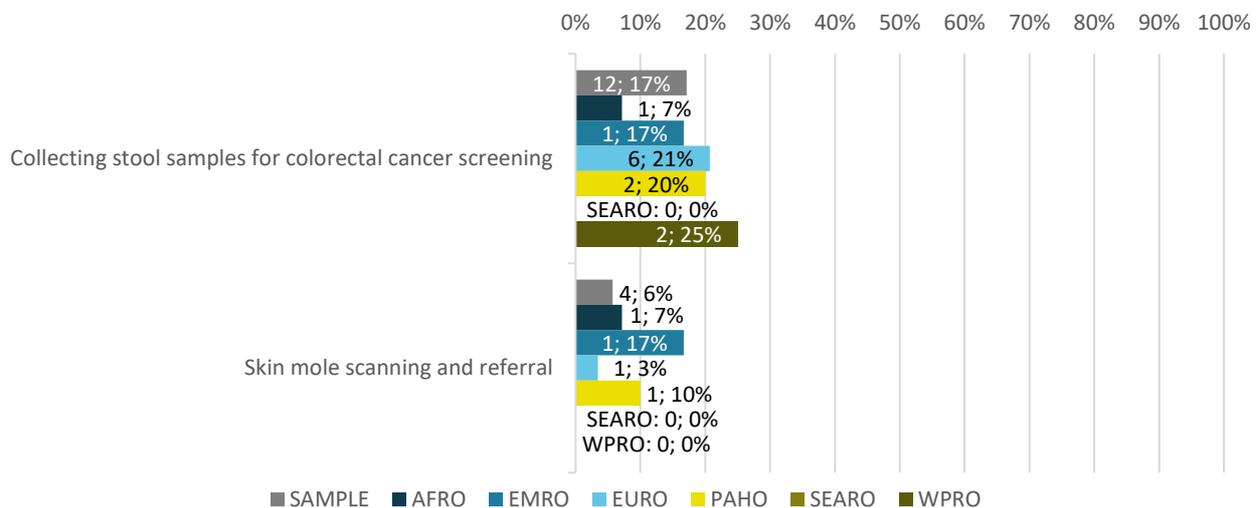


Table 11. Screening methods used by community pharmacies for cancer

Method	Number of countries and territories	% of respondents with screening activities (n=14)	% of the study sample (n=70)	Countries and territories where the method is employed
Collecting stool samples for analysis (occult blood) for colorectal cancer screening	12	85.7%	17.1%	Australia, Belgium, China, Italy, Pakistan, Panama, Portugal, Spain, Sweden, Switzerland, Tanzania, USA
Skin mole scanning and referral	4	28.6%	5.7%	Pakistan, Sweden, Tanzania, USA

3.4.7 Country-specific information and resources on pharmacy-based NCD screening activities

Table 12 offers examples of activities and resources related to the engagement of pharmacists in NCD screening in a number of countries.

Table 12. Country-specific information and online resources about pharmacists' engagement in NCD screening activities

Country or territory	Description	Links
Australia	Bowel Cancer Australia — screening	https://bit.ly/2c3jJz1
	6 th Community Pharmacy Agreement — Pharmacy Diabetes Screening Trial	https://bit.ly/2uEkvrS
Brazil	Advanced Pharmaceutical Services Programme: Up to date with hypertension programme	https://bit.ly/2TQaDWh
	Up to date with cholesterol programme	https://bit.ly/2JVLLwA
	Up to date with diabetes programme	https://bit.ly/2YICMCI
	Pharmacists' interventions on clinical asthma outcomes: a systematic review	https://bit.ly/2JXWwOX
Canada	Canadian Pharmacists Association, diabetes practice tools and resources	https://bit.ly/2OTgpbW
Fiji	Blood pressure checks and blood glucose testing is commonly available at all pharmacies. Some pharmacies have introduced cholesterol screening. There are no formally run NCD screening tests, hence there are no flyer or online resources available. All pharmacies run these programmes on their own.	NA
Germany	Federal Union of German Pharmacists Associations, Physiochemical investigations — performance of blood tests	https://bit.ly/2FNSswm
	Pharmacy-based blood glucose measurement report	https://bit.ly/2WGLynb
Great Britain	The Pharmaceutical Services Negotiating Committee service database includes examples of screening services for hypertension, atrial fibrillation, bowel and lung cancer, asthma, COPD and other conditions	https://bit.ly/2DALif0
Nepal	Community pharmacists are generally not involved in screening tests but can carry them out if they are personally skilled to do so.	NA
Netherlands	Royal Dutch Pharmacists Association: Blood sugar value is measured during Diabetes Days in November	https://bit.ly/2FPtxbZ
Norway	Information about various screening services by Boots pharmacies for hypertension, diabetes, bowel cancer, melanoma, and other conditions	https://bit.ly/2OCT4fX
Philippines	Information about point-of-care tests offered by Generika Pharmacies	https://bit.ly/2JTiySp
Switzerland	pharmaSuisse: Colon cancer screening	https://bit.ly/2CQihdg https://bit.ly/2WAx3MJ

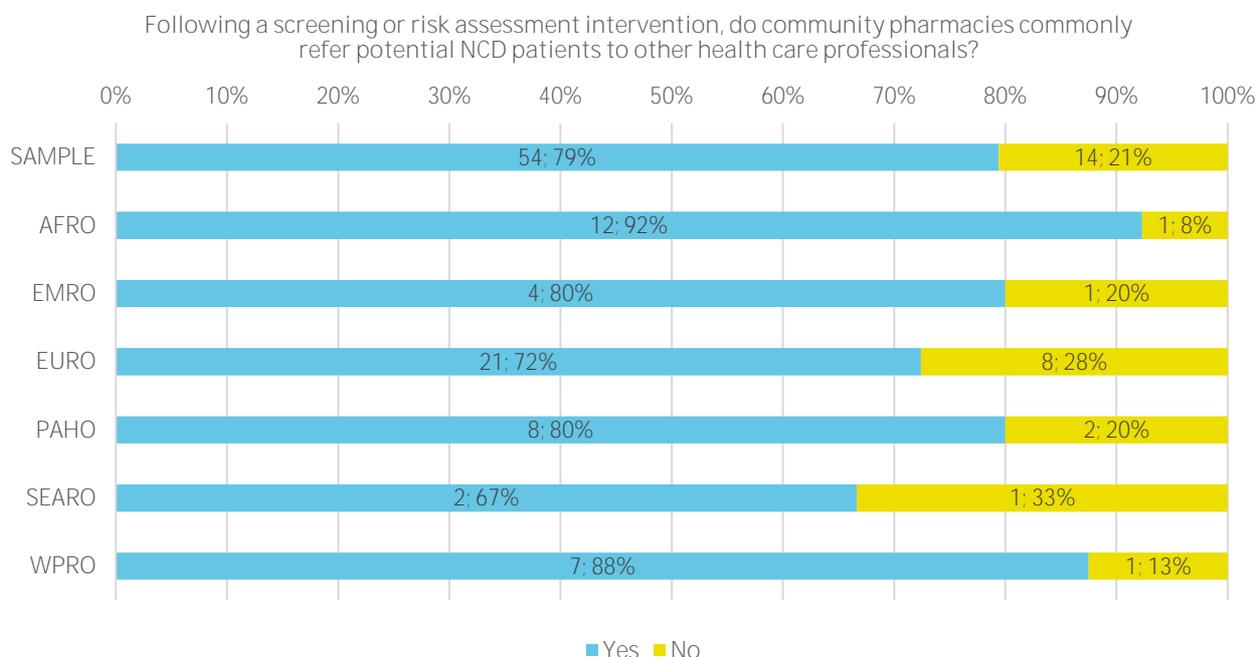
Country or territory	Description	Links
	Point-of-care tests for disease screening	https://bit.ly/2uFsKUp
	Diabetes screening and care	https://bit.ly/2Uaszj5
Turkey	Asthma, COPD and diabetes screening information	https://bit.ly/2JWOUvR
USA	Screening activities APhA Foundation – Diabetes and other chronic diseases	https://bit.ly/2I5ixZj https://bit.ly/2TNOVC7 https://bit.ly/2uFsVz3
Zimbabwe	This is a voluntary service provision by many, but not all pharmacies. No documentation is available.	NA

3.5 Referral of potential NCD patients

Our survey explored the extent to which community pharmacists are involved in referring potential NCD patients to other healthcare professionals for further observation and diagnosis, especially following the performance of a screening test, as indicated in the previous section. Through screening and referral of potential patients, pharmacies consolidate their role in patient triage and as a gateway to the health system.

Figure 13 provides an overview of the extent to which this referral takes place in the various WHO regions.

Figure 13. Community pharmacists’ involvement in NCD patient referral, per WHO region (n=68)



Out of 68 respondents, nearly four fifths (54 respondents; 79%) indicated that referral of potential NCD patients is part of standard community pharmacy practice. The referral can be done in a variety of ways to different extents depending on the the signs and symptoms of the disease, as shown below.

As Figure 14 illustrates, diabetes and cardiovascular diseases are the conditions where referrals following screening tests are most common (87% and 83% of the countries and territories where pharmacists have a role in NCD patient referral, respectively).

Figure 14. Community pharmacists' involvement in NCD patient referral, per disease and WHO region (n=54)

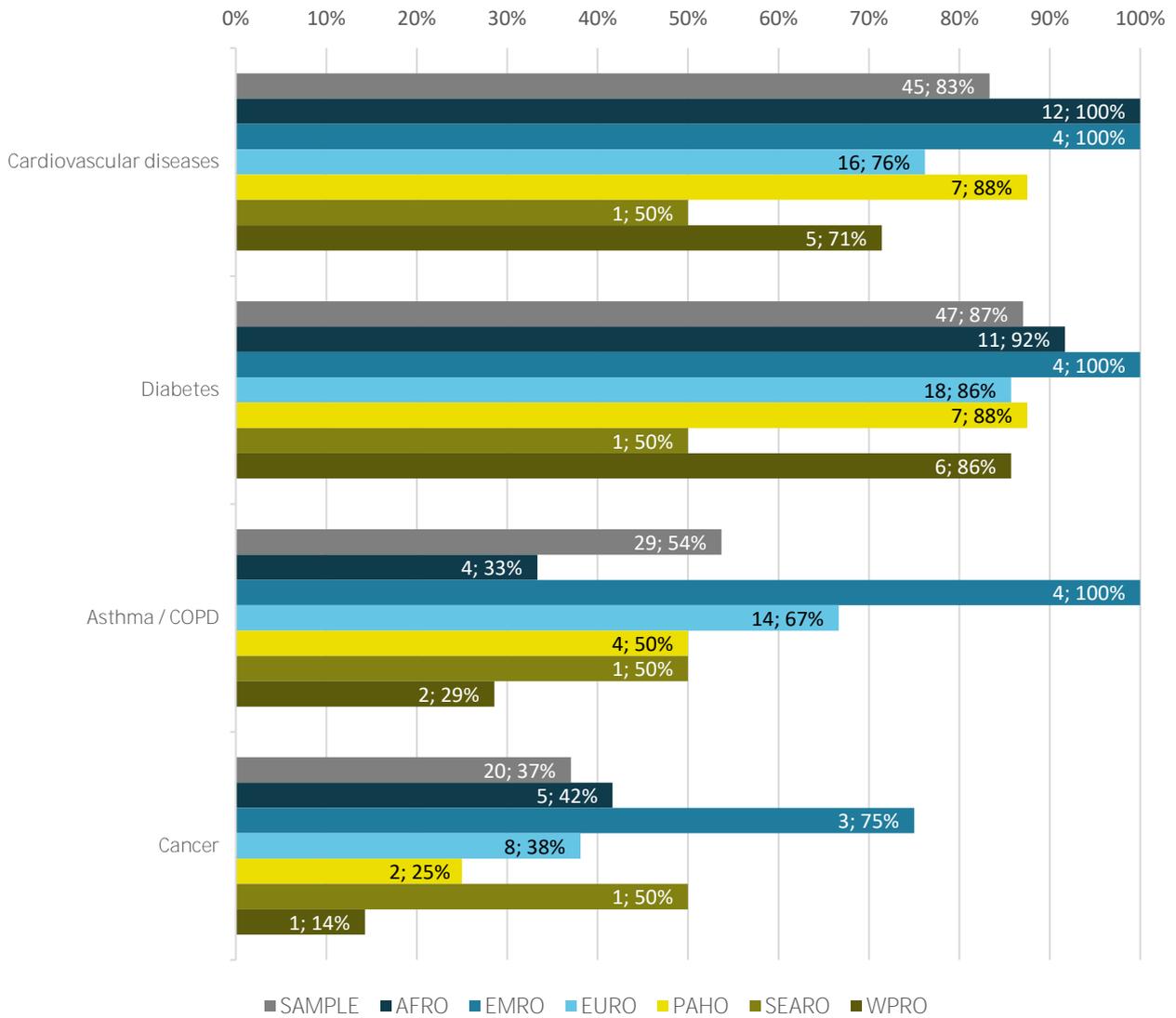
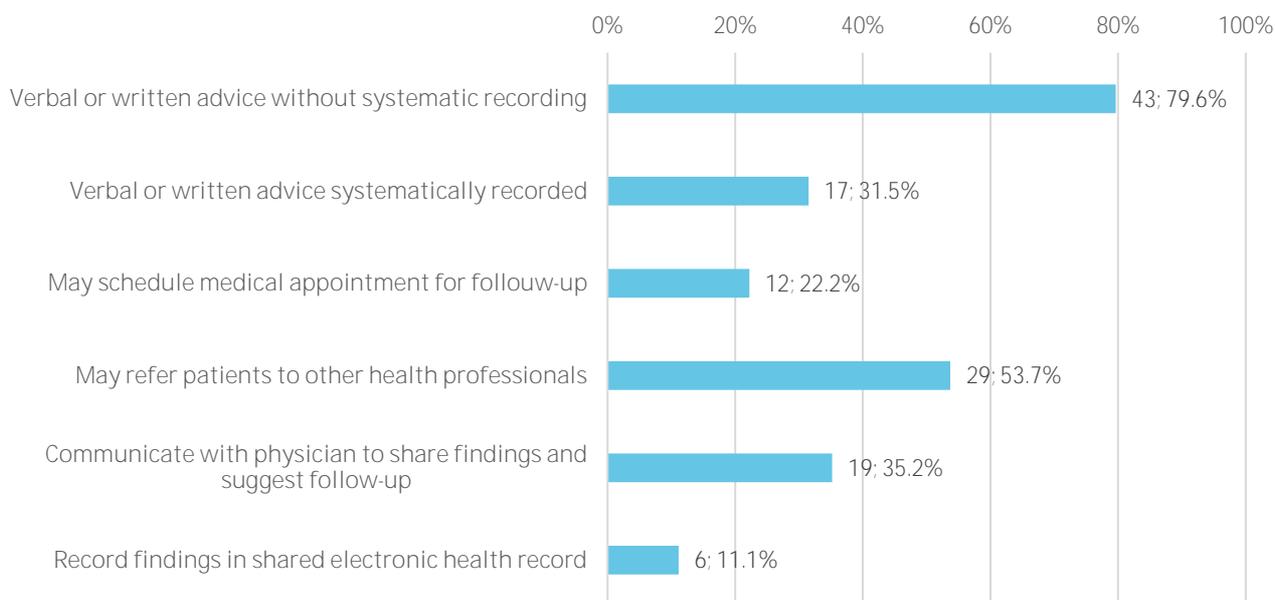


Figure 15. Methods commonly used by community pharmacists to refer potential NCD patients to other healthcare professionals or care settings (n=54)



As shown in Figure 15, most commonly (43 respondents; 79.6%) the act of referral of a patient to their doctor following a screening test or risk assessment is done informally, i.e., using oral or written advice but without registering the referral in a record, and particularly one that can be monitored by the health system administration or other health professionals. In other words, it is a form of referral that cannot be traced in terms of effectiveness or patient compliance. As such, even though it is part of standard pharmacy practice in nearly four-fifths of the countries in this subset of the study sample, it remains “invisible” to the health system and offers no guarantee that a patient who needs to be followed up and possibly treated actually receives further care.

A systematic recording of pharmacists’ referrals only exists in 17 countries and territories (31.5%). It should be noted that, although the two models (systematic recording and no systematic recording) would appear to be mutually exclusive, nine respondents (Argentina, Australia, Austria, Brazil, Cameroon, South Africa, Sweden, Tanzania and USA) actually reported that both models coexist — and for a few respondents even combined with other models, as can be seen below. This could be due to, for example, an assessment by the pharmacist of the severity or urgency of the situation, leading to opting for one or the other model, or to the existence of multiple health systems in the country, or to other factors not captured by this study.

In certain cases, pharmacists refer patients to other healthcare professionals (such as nurses, dietitians, podologists or others), who may appropriately assist the patient in modifying lifestyles and reducing NCD risk factors, or managing certain signs or symptoms.

The most effective interventions in terms of patient care through interdisciplinary collaboration include the pharmacist communicating directly with the patient’s physician to discuss the screening findings and suggest follow-up (35%), scheduling a medical appointment directly at the pharmacy to ensure that the patient is followed-up (22%) and, finally, to record the findings of the screening in a shared electronic patient record (present in six countries; 11%). This latter scenario not only allows the pharmacist to select the appropriate screening tests for each particular patient in line with their health record, but it also harnesses the value of screening tests performed at the pharmacy, by including them in the record that can be used across the health system.

In addition to these modes of referral, Finland reported that if a patient requests a pharmacy to ask for the renewal of an asthma medicines prescription, the pharmacist may ask the patient to complete the Asthma Control Test. The result is sent to the physician, who may then evaluate whether to renew the prescription or ask the patient to make an appointment.

See Table 13 for a list of countries and territories where the different referral models are in place.

Table 13. Referral models used by community pharmacies for potential NCD patients

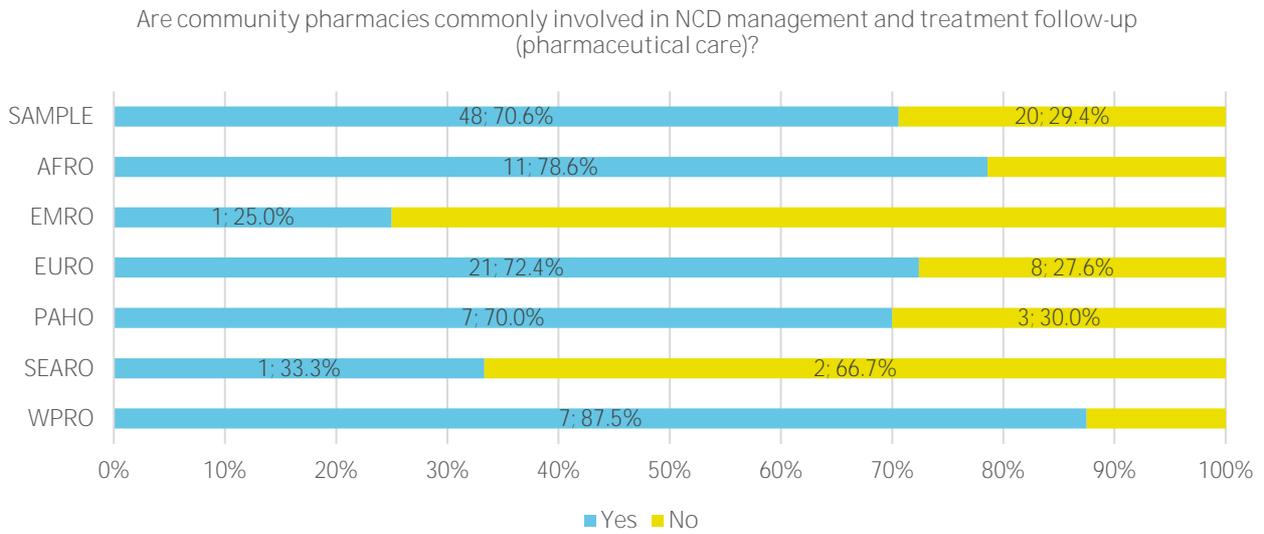
Model	Countries and territories where the model is employed
Pharmacists provide verbal or written advice to patients to see their doctor, but no records of this intervention are documented	Albania, Argentina, Armenia, Australia, Austria, Belgium, Benin, Brazil, Cabo Verde, Cameroon, Canada, China, China Taiwan, Costa Rica, Croatia, Czech Republic, Ecuador, Fiji, Finland, France, Germany, Ghana, Hungary, Indonesia, Ireland, Japan, Jordan, Lebanon, Mali, Malta, Nepal, Netherlands, Nigeria, Philippines, Romania, Sierra Leone, Singapore, South Africa, Sweden, Tanzania, Uruguay, USA, Zimbabwe
Pharmacists provide verbal or written advice to patients to see their doctor, and this intervention is systematically documented	Argentina, Australia, Austria, Brazil, Cameroon, Great Britain, Mauritius, Pakistan, Portugal, Rwanda, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, USA
Pharmacists may schedule a medical appointment for the patient for further diagnosis and follow-up	China Taiwan, Croatia, Jordan, Malta, Mauritius, Nepal, Nigeria, Panama, Portugal, Sierra Leone, Sweden, Switzerland
Pharmacists may refer patients to other healthcare professionals (nurses, dietitians, podologists, etc.)	Albania, Australia, Benin, Brazil, Cameroon, Canada, Costa Rica, Czech Republic, France, Great Britain, Indonesia, Ireland, Israel, Lebanon, Mali, Malta, Mauritius, Nepal, Nigeria, Oman, Panama, Philippines, Portugal, Sierra Leone, South Africa, Spain, Tanzania, USA, Zimbabwe
Pharmacists communicate with the patient's physician to share the screening findings and suggest follow-up visit	Albania, Australia, Benin, Canada, China Taiwan, Croatia, France, Malta, Nigeria, Pakistan, Panama, Portugal, Sierra Leone, South Africa, Spain, Sweden, Tanzania, Turkey, USA
Pharmacists may record the findings of the screening in a shared electronic patient health record	Brazil, Croatia, Portugal, Sweden, Tanzania, USA

3.6 Pharmaceutical care and treatment follow-up of NCD patients

The fourth role of community pharmacists that the survey investigated was the management of patients and their long-term treatments (pharmaceutical care), aiming at improving treatment outcomes, promoting adherence, minimising medicines-related problems and encouraging healthy lifestyles for patients with any of the targeted NCDs. Disease management and pharmaceutical care are professional services by pharmacists, designed to improve the health of people living with a long-term disease and to reduce associated costs from avoidable complications by assisting patients in monitoring and controlling their condition and improving their use of medicines.

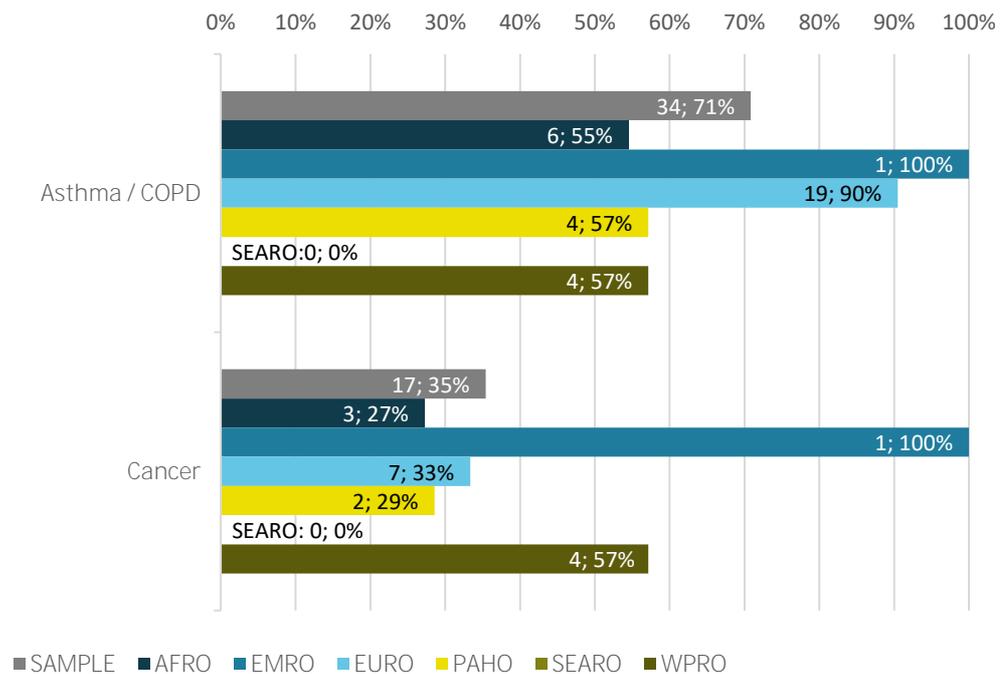
Figure 16 describes the extent of implementation of these services in relation to NCDs across the various WHO regions. As the Figure illustrates there are important differences among the regions: although the sample's average and four of the six WHO regions surpass the 70% implementation line, these services are less widely available in the Eastern Mediterranean and Southeast Asian regions (25% and 33% of the regions' respondents, respectively). Notwithstanding the above, these rates correspond to the implementation of advanced services of disease management and medicines optimisation. Several countries that indicated that pharmacists do not commonly provide such services reported the performance of other specific services that contribute to improve the use of medicines and lead to an adequate management of disease — see below for details.

Figure 16. Community pharmacists' involvement in NCD management and treatment follow-up, per WHO region (n=68)



Looking at the 68 respondents who reported that pharmacists play a role in NCD management and treatment follow-up, Figure 17 offers a breakdown of these roles per disease area and WHO region. As shown, diabetes and cardiovascular diseases are the conditions in which pharmacists most commonly have a role in promoting the best possible use of medicines, including the promotion of adherence, and in monitoring the disease state between medical appointments. This is in line with the findings of the previous sections, particularly in terms of screening and referral. The role of community pharmacists in managing respiratory NCDs and assisting patients, for example, to use inhalation devices correctly is also widely present (34 respondents; 71%), reaching an implementation rate of over 90% in the Eastern Mediterranean and European regions. In cancer, this role is less widely implemented in the community pharmacy setting, but it is present in over one third of responding countries and territories.

Figure 17. Involvement of community pharmacists in NCD management and treatment follow-up, per disease and WHO region (n=68)



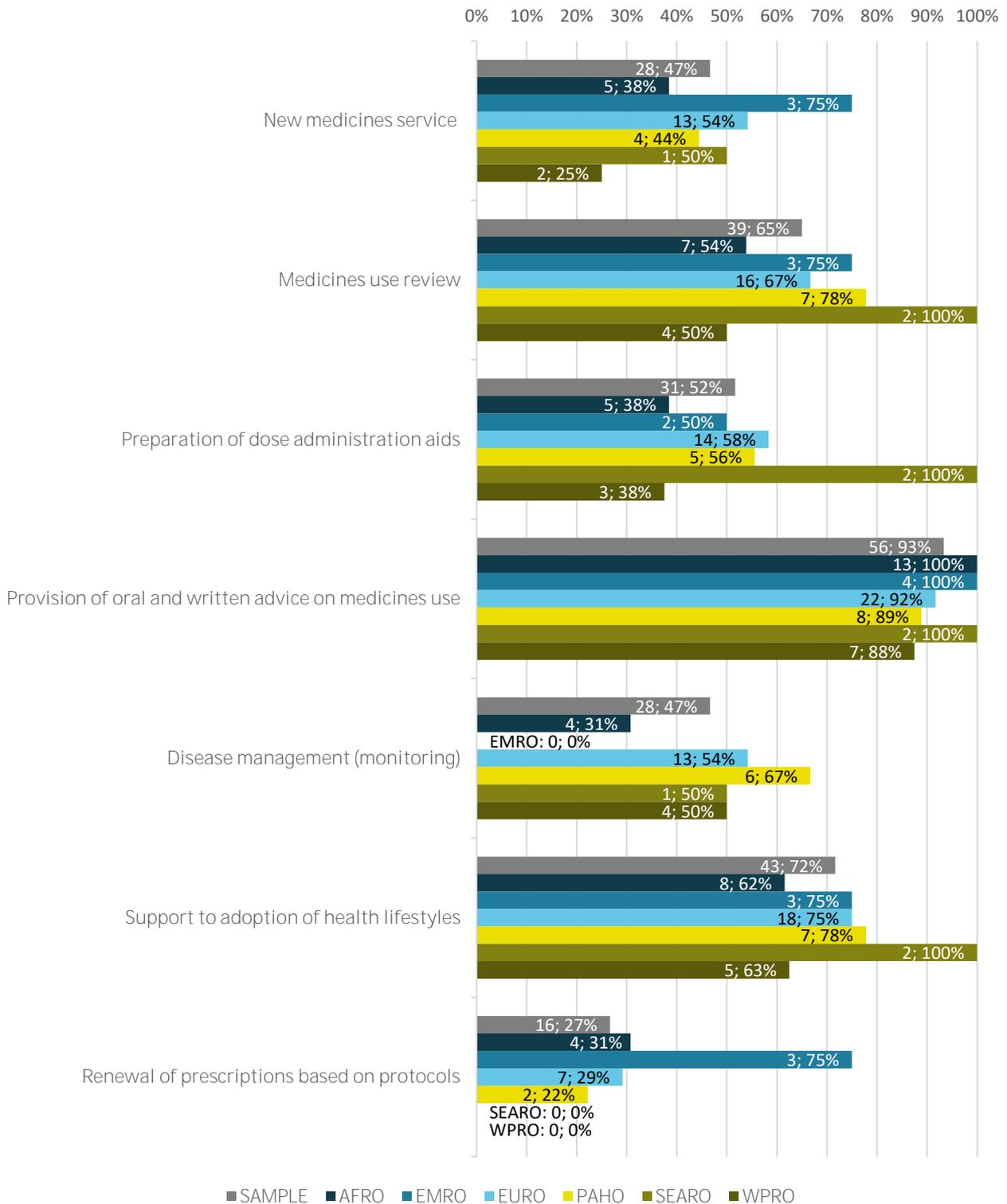
The survey then explored how this role in disease management and pharmaceutical care in NCDs is performed, i.e., which professional services and activities are commonly offered by community pharmacists in the subset of 60 countries and territories that reported NCD management and pharmaceutical care activities by community pharmacist. Results are presented in Figure 18 and Table 14.

The provision of oral and written advice on medicines use is part of standard community pharmacy practice in nearly all (56 out of 60) respondents in this group. More advanced services of medicines use optimisation, such as the new medicine service or the medicines use review, are present in a smaller but still important part of those countries (47% and 65%, respectively).

The new medicine service is defined as a professional service by pharmacists to provide support for people with long-term conditions who are prescribed a new medicine, to help to improve the use of the medicine and adherence, especially in the critical phase of initiating the new treatment. Conversely, the medicines use review (also known as medication therapy management) is a service through which patients can discuss their medicines with a pharmacist in a private consultation. It aims to collect patient-specific information, provide a review of all medicines to detect any redundancies or interactions, give additional information on medicines indication and use, discuss side effects and negative results, identify and find solutions for medication-related problems, and negotiate strategies to improve patient adherence and achieve optimal outcomes. Both services are especially valuable for long-term, often polymedicated patients.

Another useful strategy to simplify the administration of solid oral dose medicines (tablets and capsules) and improve adherence is the preparation of dose administration aids. The service usually consists of repackaging medicines into labelled compartments according to times of administration. The service may be complemented by technological aids that remind patients when to take medicines. This service is offered by pharmacies in more than half (52%) of the countries and territories in this group.

Figure 18. Services and activities by community pharmacies for NCD management and treatment optimisation (n=60)



To keep NCD patients as healthy as possible, it is important to closely monitor their disease status, and to support them in making lifestyle changes that may contribute to keeping their condition under control. Disease monitoring services are present in 47% of the respondents in this subset of the study sample.

Finally, the renewal of prescriptions based on protocols is a service that facilitates access to medicines to patients on long-term treatments with the same medicines. Following a standardised assessment of a patient’s disease state, the pharmacist is authorised to renew a prescription a certain number of times before

the patient is required to see their doctor again. This service not only is valued by patients, but it also contributes to the efficiency of health systems by reducing GP visits for the renewal of prescriptions. This service is less widely available (16 countries; 27%).

Table 14. Services and activities by community pharmacies for NCD management and treatment optimisation

Service/activity	Number of countries and territories	% of respondents with NCD management activities (n=60)	% of survey sample (n=70)	Countries where the service/activity is available.
New medicines service	28	47%	40%	Afghanistan, Argentina, Belgium, Benin, Brazil, Cameroon, China Taiwan, Costa Rica, Croatia, Czech Republic, Denmark, Fiji, Great Britain, Hungary, Jordan, Lebanon, Malta, Nepal, Netherlands, Norway, Romania, Slovenia, South Africa, Sweden, Switzerland, Tanzania, USA, Zimbabwe
Medicines use review	39	65%	56%	Afghanistan, Australia, Benin, Brazil, Cameroon, Canada, China Taiwan, Costa Rica, Croatia, Czech Republic, Ecuador, Finland, France, Great Britain, Hungary, Indonesia, Israel, Kenya, Lebanon, Malta, Nepal, Netherlands, New Zealand, Nigeria, Pakistan, Panama, Paraguay, Portugal, Romania, Rwanda, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, USA
Preparation of dose administration aids	31	52%	44%	Afghanistan, Australia, Belgium, Brazil, Cameroon, Canada, China Taiwan, Costa Rica, Croatia, Czech Republic, Denmark, France, Great Britain, Hungary, Indonesia, Ireland, Mali, Malta, Nepal, Netherlands, New Zealand, Nigeria, Pakistan, Paraguay, Portugal, Slovenia, South Africa, Spain, Sweden, Tanzania, USA
Provision of oral and written advice on medicines use	56	93%	80%	Afghanistan, Albania, Argentina, Armenia, Australia, Belgium, Benin, Brazil, Cabo Verde, Cameroon, Canada, China Taiwan, Colombia, Costa Rica, Croatia, Czech Republic, Denmark, Ethiopia, Fiji, Finland, France, Germany, Ghana, Great Britain, Hungary, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kenya, Lebanon, Mali, Malta, Mauritius, Nepal, Netherlands, New Zealand, Nigeria, Pakistan, Panama, Paraguay, Philippines, Portugal, Rwanda, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, USA, Zimbabwe
Disease management (monitoring)	28	47%	40%	Australia, Belgium, Brazil, Cameroon, Canada, China Taiwan, Costa Rica, Croatia, Czech Republic, Ethiopia, France, Great Britain, Hungary, Indonesia, Malta, New Zealand, Nigeria, Panama, Paraguay, Portugal, Romania, Singapore, Slovenia, South Africa, Spain, Sweden, Turkey, USA
Support to adoption of healthy lifestyles	43	72%	61%	Albania, Argentina, Australia, Brazil, Cabo Verde, Cameroon, Canada, China, China Taiwan, Costa Rica, Croatia, Czech Republic, Ecuador, Ethiopia, Finland, France, Germany, Ghana, Great Britain, Hungary, Indonesia, Ireland, Italy, Jordan, Lebanon, Malta, Nepal, New Zealand, Nigeria, Pakistan, Paraguay, Portugal, Romania, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, USA, Zimbabwe
Renewal of prescriptions based on protocols	16	27%	23%	Afghanistan, Benin, Canada, Czech Republic, France, Lebanon, Malta, Mauritius, Netherlands, Pakistan, Slovenia, Spain, Sweden, Tanzania, USA, Zimbabwe

Table 15 offers examples of activities and resources related to the engagement of pharmacists in NCD management and pharmaceutical care in a number of countries.

Table 15. Country-specific information and online resources about pharmacists' engagement in NCD management and pharmaceutical care activities

Country or territory	Description	Links
Australia	Pharmacy Guild of Australia — 6 th Community Pharmacy Agreement Resources for medicines adherence programmes and medicines management programmes	https://bit.ly/2YDbljr
Brazil	Effect of a pharmaceutical care programme on quality of life and satisfaction with pharmacy services in patients with type 2 diabetes mellitus	https://bit.ly/2K5p894
	Pharmaceutical care for hypertensive patients provided within the Family Health Strategy in Goiânia, Goiás, Brazil	https://bit.ly/2U8r12t
	Pharmaceutical care for patients with persistent asthma: assessment of treatment compliance and use of inhaled medications	https://bit.ly/2YFrBtT
Canada	Canadian Pharmacists Association: pharmacists' scope of practice in Canada	https://bit.ly/2nayW1P
	Ministry of Health and Long-term Care of Ontario — MedsCheck programme for Ontarians living with diabetes	https://bit.ly/2FOrHbg
France	In France, in 2013, an agreement between the Social Security System and Unions of Community Pharmacists recognised the value of pharmaceutical interviews for medicines use optimisation. The first target group were patients treated with vitamin K antagonists (the pharmacist monitors the international normalised ratio to adjust the medicine dose); secondly a new service was introduced for patients treated with inhaled corticosteroids (for asthma). Pharmacists are remunerated for the provision of each service.	NA
Germany	Federal Union of German Associations of Pharmacists — Guidelines and care support resources for pharmacists	https://bit.ly/2mVEEZr
Great Britain	Royal Pharmaceutical Society's community pharmacy hub	https://bit.ly/2V5Fhfz
Portugal	The National Association of Pharmacies reported a service to assist patients treated with inhaled corticosteroids for asthma to make an adequate use of the device.	NA
Spain	The Spanish General Pharmaceutical Council reported the existence of a medicines reconciliation service upon hospital discharge.	NA
Switzerland	Project Siscare-DT2 for improving treatment adherence in patients with diabetes	https://bit.ly/2TPeXVF
	TopPharm Pharmacies: Supervision programme for high blood pressure	https://bit.ly/2Up6WLS

3.7 Access to patient health records

An electronic health record (EHR) enables the standardised collection of patients’ health data and may allow to share these with the various health professionals that provide care to the patient. Throughout their lives, individuals are treated by a wide array of general practitioners and medical specialists, nurses, pharmacists and other health professionals in a variety of care settings. By accessing the data that are relevant for their scope of care, healthcare professionals might approach patients in a better informed manner, which would improve patient safety and quality of care. In addition to accessing patient information, the possibility of recording the interventions and data generated by each health professional and to make this record available to the whole healthcare team enhances collaborative practice for the benefit of the patient and the system. By reducing redundancy of interventions and minimising errors, shared electronic health records also contribute to savings for patients and healthcare systems and, with that, to their sustainability. This is particularly relevant for patients with long-term conditions, as NCDs typically are.

The survey investigated the existence of an EHR in the respondent countries and territories. Results are presented in Figure 19 (overall), Figure 20 (per WHO region) and Figure 21 (per income level). Within the study sample, these systems exist in 47 countries and territories (69%), with the Western Pacific and European regions leading with implementation rates of 88% and 86%, respectively. As shown in Figure 21, the availability of EHR systems increases in line with the economic capacity of national economies.

Figure 19. Availability of electronic health records (n=68)

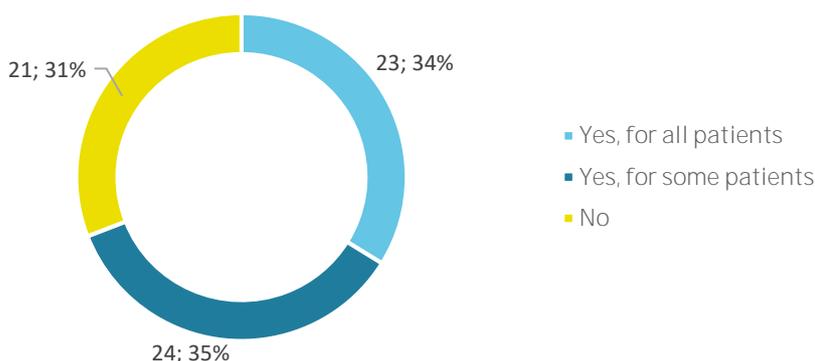


Figure 20. Availability of electronic health records, per WHO region (n=68)

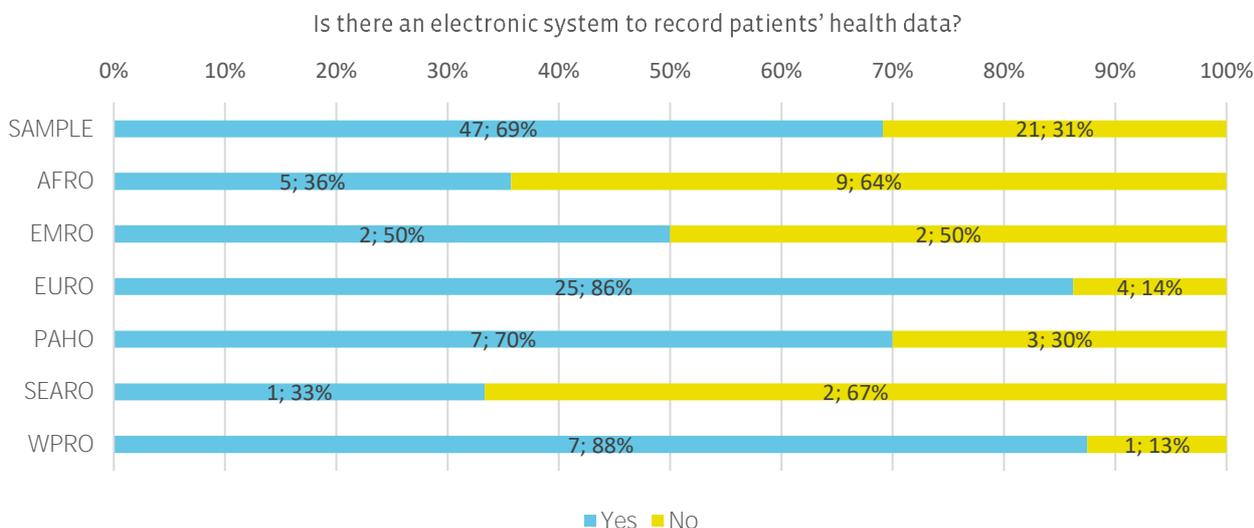


Figure 21. Availability of electronic health records, per income level (n=68)

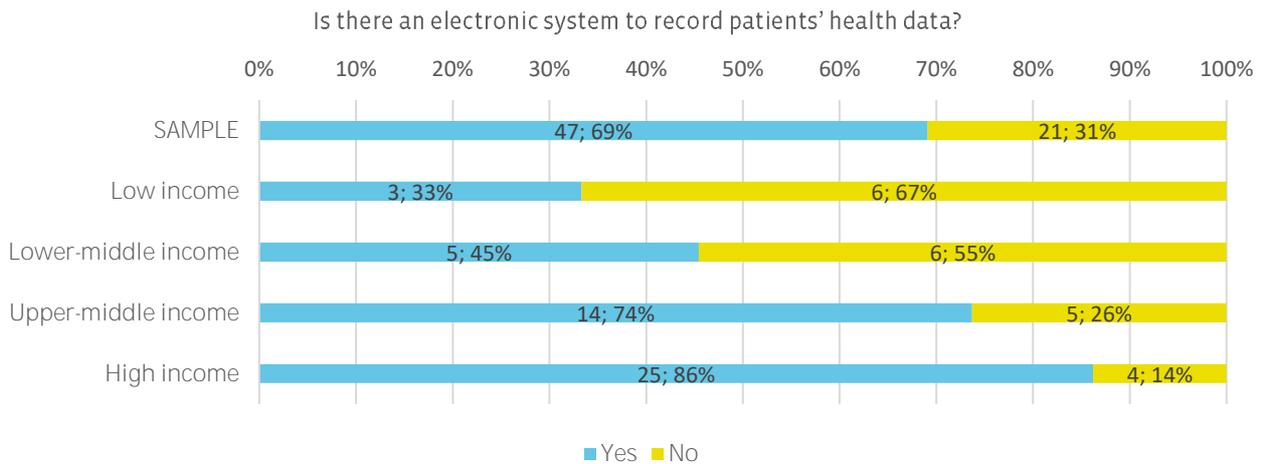


Table 16 indicates, for each of the countries and territories in the study sample, where EHRs are available and whether record keeping is mandatory or not, and for how long records must be kept.

Table 16. Characteristics of patient health records per country or territory (n=70)

Country or territory	Is there an EHR?	Is record keeping mandatory or optional?	For how long must records be kept?
Afghanistan	No		
Albania	Yes, for some patients	Mandatory	As long as community pharmacies have a contract within the reimbursement system
Argentina	No		
Armenia	Yes, for some patients		
Australia	Yes, for all patients	Optional	
Austria	Yes, for all patients	Optional	
Belgium	Yes, for all patients	Mandatory	Ten years
Benin	No		
Brazil	Yes, for some patients	Optional	It varies for each institution.
Cabo Verde	No		
Cameroon	No		
Canada	Yes, for some patients	Optional	It varies by province in Canada and some provinces have no record requirements other than computer prescription records/patient profiles.
China	Yes, for some patients	Mandatory	For outpatients: 15 years; for inpatients: 30 years
China Taiwan	Yes, for all patients	Mandatory	At least three months. The PharmCloud system is provided by the National Health Insurance. Pharmacists can access a patient's medication record in other institutions in the previous three months. But by law, a prescription of narcotics should be kept for five years and others three years in a pharmacy. National Health Insurance and many institutes keep the record for a long time because most are electronic.
Colombia	Yes, for some patients	Optional	
Costa Rica	Yes, for some patients	Optional	Three years

Country or territory	Is there an EHR?	Is record keeping mandatory or optional?	For how long must records be kept?
Croatia	Yes, for some patients	Optional	
Czech Republic	Yes, for all patients	Mandatory	
Denmark	Yes, for all patients	Mandatory	
Ecuador	Yes, for some patients	Optional	Ten years
Ethiopia	Yes, for all patients	Mandatory	Minimum of five years, discarded 10 years after retrieving the information in electronic form
Fiji	Yes, for some patients	Optional	There is no legal binding to it, so electronic records are kept indefinitely or at least for the lifespan of the individual.
Finland	Yes, for all patients	Mandatory	Twelve years after the patient has died
France	Yes, for all patients	Optional	The patient allows the pharmacist to create his/her pharmaceutical record, the pharmacist has an obligation to feed the "Dossier Pharmaceutique" (Pharmaceutical Record). The storage durations are: EMR: 10 years; medicinal products: four months; biological medicinal products: three years; vaccines: 21 years.
Germany	No		
Ghana	No	Optional	
Great Britain	Yes, for all patients		
Hungary	Yes, for all patients	Mandatory	It depends on the type of the medical information.
Iceland	Yes, for all patients	Mandatory	Not defined
India	No		
Indonesia	Yes, for some patients	Mandatory	Five years for inpatients and 10 years for inpatient with other treatment [sic]
Iran	No information		
Ireland	No		
Israel	Yes, for all patients	Mandatory	Seven years
Italy	Yes, for all patients	Optional	Records must be kept in the Patient Health Archive (Fascicolo Sanitario Elettronico) for an indefinite period.
Japan	Yes, for some patients	Optional	Three years from last written date
Jordan	Yes, for some patients		
Kenya	Yes, for some patients	Optional	
Lebanon	No		
Macedonia	No		
Mali	No		
Malta	Yes, for some patients	Mandatory	
Mauritius	No	Mandatory	Ten years
Montenegro	Yes, for all patients		
Nepal	No		
Netherlands	Yes, for all patients	Mandatory	Fifteen years or as long as necessary to provide care
New Zealand	Yes, for some patients	Mandatory	
Nigeria	No	Optional	Five years
Norway	Yes, for all patients	Mandatory	Ten years

Country or territory	Is there an EHR?	Is record keeping mandatory or optional?	For how long must records be kept?
Oman	No information		
Pakistan	Yes, for some patients	Mandatory	Ten years
Panama	No	Optional	Not defined
Paraguay	Yes, for some patients	Mandatory	Five years
Philippines	No	Mandatory	Two years
Portugal	Yes, for some patients	Optional	The software for the majority of Portuguese pharmacies can keep records indefinitely.
Romania	Yes, for all patients	Mandatory	Five years
Russian Federation	Yes, for some patients	Optional	From five to 25 years, depending on the type of information
Rwanda	Yes, for some patients	Mandatory	
Sierra Leone	No	Optional	
Singapore	Yes, for all patients	Mandatory	Two years
Slovenia	Yes, for all patients	Mandatory	A few years
South Africa	Yes, for some patients	Mandatory	Five years
Spain	Yes, for all patients		
Sweden	Yes, for all patients	Optional	
Switzerland	No		
Tanzania	No	Mandatory	Throughout the life of the patient
Turkey	Yes, for all patients	Mandatory	
Uruguay	No		
USA	Yes, for some patients	Optional	It varies
Zimbabwe	Yes, for some patients	Mandatory	Five years for prescription preparations

Among those countries and territories having an EHR system, the survey asked about the level of access of community pharmacists to such records. Out of 47 countries having the systems in place, 45 mentioned the level of access. Results are presented in Figure 22 and Table 17.

Figure 22. Level of access (reading rights) of community pharmacists to the EHR (n=45)

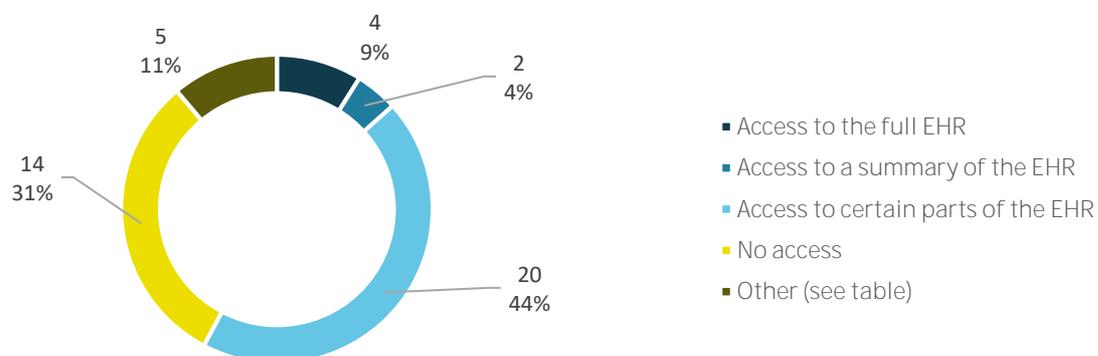


Table 17. Particular cases concerning access to the EHR by community pharmacists

Country or territory	Description
Canada	It varies greatly by province. Many provinces have no access to an electronic health record.
Italy	The pharmaceutical dossier is currently being implemented, where community pharmacists will have access to the patient's medicines record. A ministerial decree is still expected with the details of its specific implementation that probably will concern medication history both for prescription and non-prescription medicines.
Jordan	The patient's health record is only available in the institutional (governmental) sector
Rwanda	Data can be accessed upon request.
South Africa	The pharmacist can only see patient records recorded in the specific pharmacy or pharmacy group.
Observations by respondents included under "Access to certain parts of the EHR"	
Albania	Pharmacists have access only to the records according to electronic prescriptions, based on the reimbursement system, for every patient they encounter. The use of electronic prescriptions from the reimbursement system is a new practice, accessed by only some regions in Albania.
China Taiwan	Pharmacists have writing rights in the prescription medicines record.
Finland	Access only to the prescription record
France	In France, the medicines record is not merged with the Electronic Medical Record (EMR). Hence, both health records coexist, one for medical practitioners and the other for pharmacists.
Hungary	Pharmacist have access rights to the medical history only.
Montenegro	Pharmacists can only see a therapy record of medicines that are prescribed.
USA	These rights are limited and not widespread.

As for those countries and territories where community pharmacies do have reading access to a part or the full content of the EHR (22 respondents), the survey investigated the possibility of pharmacists registering their interventions and disease screening findings in the EHR. See Figure 23, Figure 24 and Table 18 for details.

Figure 23. Level of access (writing rights) of community pharmacists to the EHR (n=22)

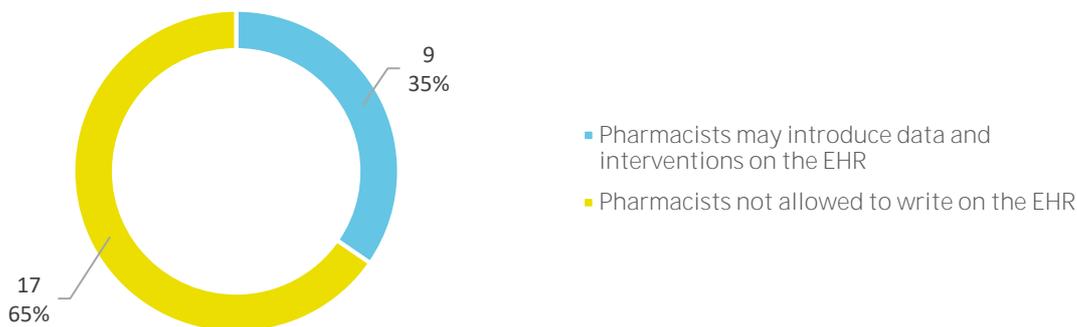


Figure 24. Combined reading and writing access by community pharmacists to the EHR (n=22)

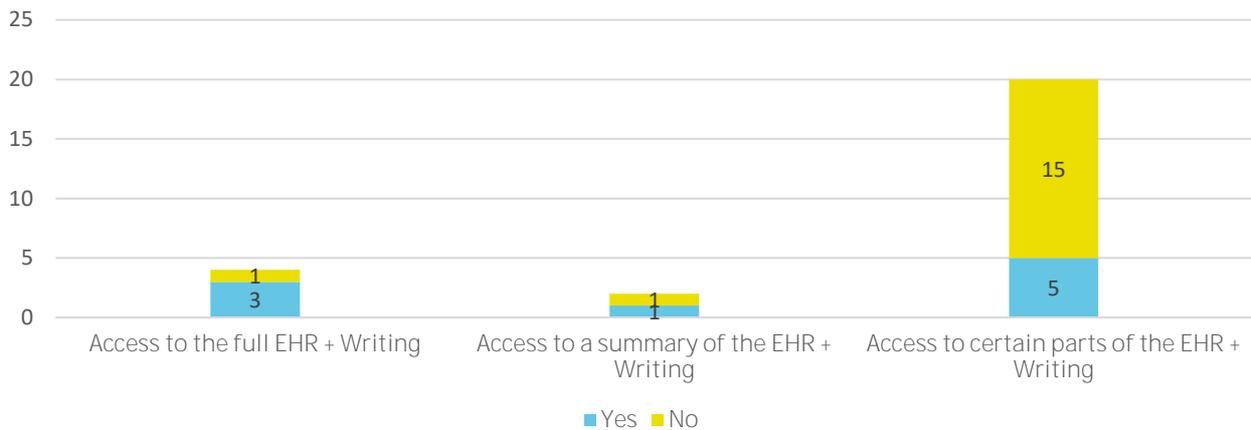


Table 18. Access (reading and writing) by community pharmacists to the EHR per country (n=47)

Level of access	Reading access only	Reading and writing access
Access to the full EHR	Singapore	Brazil, Netherlands, Sweden
Access to a summary of the EHR	Great Britain	Japan
Access to certain parts of the EHR	Albania, Austria, China Taiwan, Croatia, Czech Republic, Denmark, Finland, Hungary, Israel, Malta, Montenegro, New Zealand, Portugal, Turkey, USA	Australia, Belgium, Costa Rica, Ecuador, France
Other (see Table 17)	Canada, Italy, Jordan, Rwanda, South Africa	
No information about the level of access to the EHR by pharmacists	Pakistan, Slovenia	
No access to the EHR	Armenia, China, Colombia, Ethiopia, Fiji, Finland, Iceland, Indonesia, Kenya, Norway, Paraguay, Romania, Russian Federation, Spain, Zimbabwe	

Among countries and territories that have EHRs, such records may contain different types of patient data that may be accessible to different health professionals and patients themselves. Table 19 offers an overview of the countries that include each type of content in the EHR.

Table 19. Types of patient information recorded in the EHR (n=47)

Type of patient information	Number of countries and territories	% of respondents with EHRs	Countries where the information is part of the EHR
Administrative data (demographic, registration, admissions, discharge, and transfer data)	29	62%	Albania, Austria, China, Colombia, Costa Rica, Czech Republic, Denmark, Ethiopia, Fiji, Finland, France, Great Britain, Hungary, Iceland, Indonesia, Italy, Kenya, Netherlands, New Zealand, Norway, Pakistan, Paraguay, Portugal, Romania, Russian Federation, Rwanda, Singapore, Turkey, USA
Health and disease data	28	60%	Albania, Austria, Brazil, China, Colombia, Costa Rica, Croatia, Denmark, Ethiopia, Fiji, Finland, France, Hungary, Iceland, Indonesia, Italy, Kenya, Netherlands, New Zealand, Norway, Pakistan, Paraguay, Portugal, Russian Federation, Rwanda, Singapore, Sweden, USA

Type of patient information	Number of countries and territories	% of respondents with EHRs	Countries where the information is part of the EHR
Allergies/intolerances	27	57%	Brazil, China, China Taiwan, Costa Rica, Ecuador, Ethiopia, Fiji, Finland, France, Great Britain, Hungary, Iceland, Indonesia, Italy, Japan, Kenya, Netherlands, New Zealand, Norway, Pakistan, Paraguay, Portugal, Russian Federation, Rwanda, Singapore, South Africa, USA
Prescription medication history	36	77%	Australia, Austria, Belgium, Brazil, China, China Taiwan, Costa Rica, Croatia, Denmark, Ecuador, Ethiopia, Fiji, Finland, France, Great Britain, Hungary, Iceland, Indonesia, Israel, Japan, Kenya, Malta, Montenegro, Netherlands, New Zealand, Norway, Pakistan, Paraguay, Portugal, Russian Federation, Rwanda, Singapore, Slovenia, South Africa, Turkey, USA
Non-prescription medication history	16	34%	Belgium, Brazil, China, Costa Rica, Ethiopia, France, Japan, Kenya, New Zealand, Norway, Pakistan, Portugal, Russian Federation, Rwanda, South Africa, USA
Laboratory results	25	53%	Australia, Austria, Brazil, China Taiwan, Costa Rica, Denmark, Ethiopia, Fiji, Finland, France, Hungary, Iceland, Indonesia, Italy, Kenya, Netherlands, New Zealand, Norway, Pakistan, Paraguay, Portugal, Russian Federation, Rwanda, Singapore, USA
No information about EHR content	5		Armenia, Canada, Jordan, Spain, Zimbabwe

In addition, the following observations were made by some respondents:

- Canada indicated that the contents of the EHR vary by province, and some provinces have no EHRs at all. Overall, there is very limited access by few pharmacists.
- Finland remarked that the contents of the EHR are generally not available to community pharmacies, except for the prescription record.
- Israel indicated that, with a new law recently introduced, more information will be shared with pharmacists.
- Portugal reported that, in addition to all patient information types indicated, pharmacy services are also recorded in an EHR.
- South Africa reported that only the information recorded in the community pharmacy or within a group of pharmacies is available.
- Zimbabwe reported that data entry in patients' health records is manual. Electronic data records are available in some hospitals but are not accessible by pharmacists.

3.8 Training of the pharmacist workforce for roles related to NCDs

Delivering the services described in the previous sections requires that the pharmacist workforce develops the appropriate competence — knowledge, skills, attitudes and behaviours — through education and training. The survey investigated the extent to which pharmacists receive formal training to provide such services in any of the disease areas covered, and at what stage of their competence development.

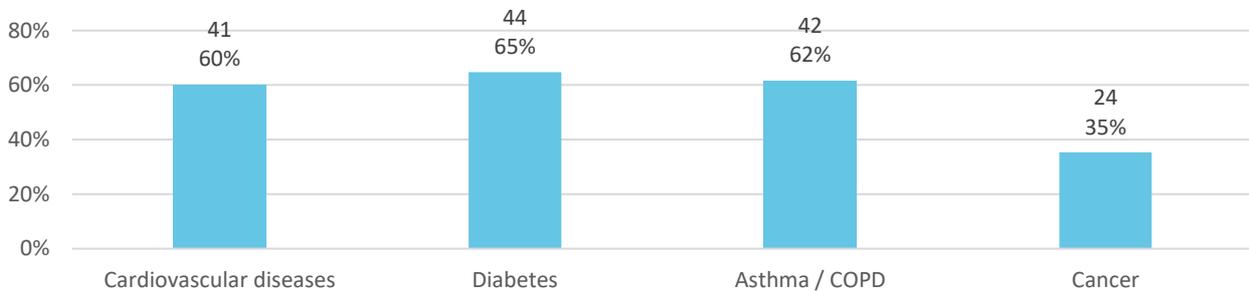
Out of 68 respondents, 48 (71%) indicated that pharmacists receive formal training in pharmaceutical care specifically focused on NCDs (cardiovascular diseases; diabetes; asthma/COPD and/or cancer). The fact that in nearly one out of five countries pharmacists do not receive formal training in this area is of concern and points to an area of need in terms of workforce development.

The survey explored at what stage (undergraduate and/or postgraduate) pharmacists receive formal training related to NCD management, and also whether such training was mandatory or not. However, a problem in the questionnaire design generated ambiguity in the interpretation of these questions, and their answers could not be analysed unequivocally. As such, these two questions were excluded from this report.

As can be seen in Figure 25, training in pharmaceutical care for cardiovascular diseases, diabetes and asthma/COPD exists in approximately 60–65% of the sample of 68 respondents (which include the 20 countries

without formal training in NCD care). Cancer, however, is much less present in pharmacists' training (35% of respondents). Expanding training in cancer care is paramount if pharmacists are to provide greater support to cancer patients in the community setting to make the best possible use of medicines.

Figure 25. Disease areas in which pharmacists receive specific formal training in terms of pharmaceutical care (n=68)



3.9 Limitations and barriers to community pharmacists' participation in NCD management

The previous sections of this report suggest that community pharmacists play a variety of important roles in NCD care and management, including prevention, screening, referral, disease management and treatment optimisation. The expansion and consolidation of these roles is critical to improve the efficiency and sustainability of health systems. For that reason, the survey investigated the limitations or barriers that community pharmacists and organisations perceive that restrict their participation in NCD management strategies. Sixty-five respondents provided details about the main barriers and limitations. Aggregated results are presented in Figure 26.

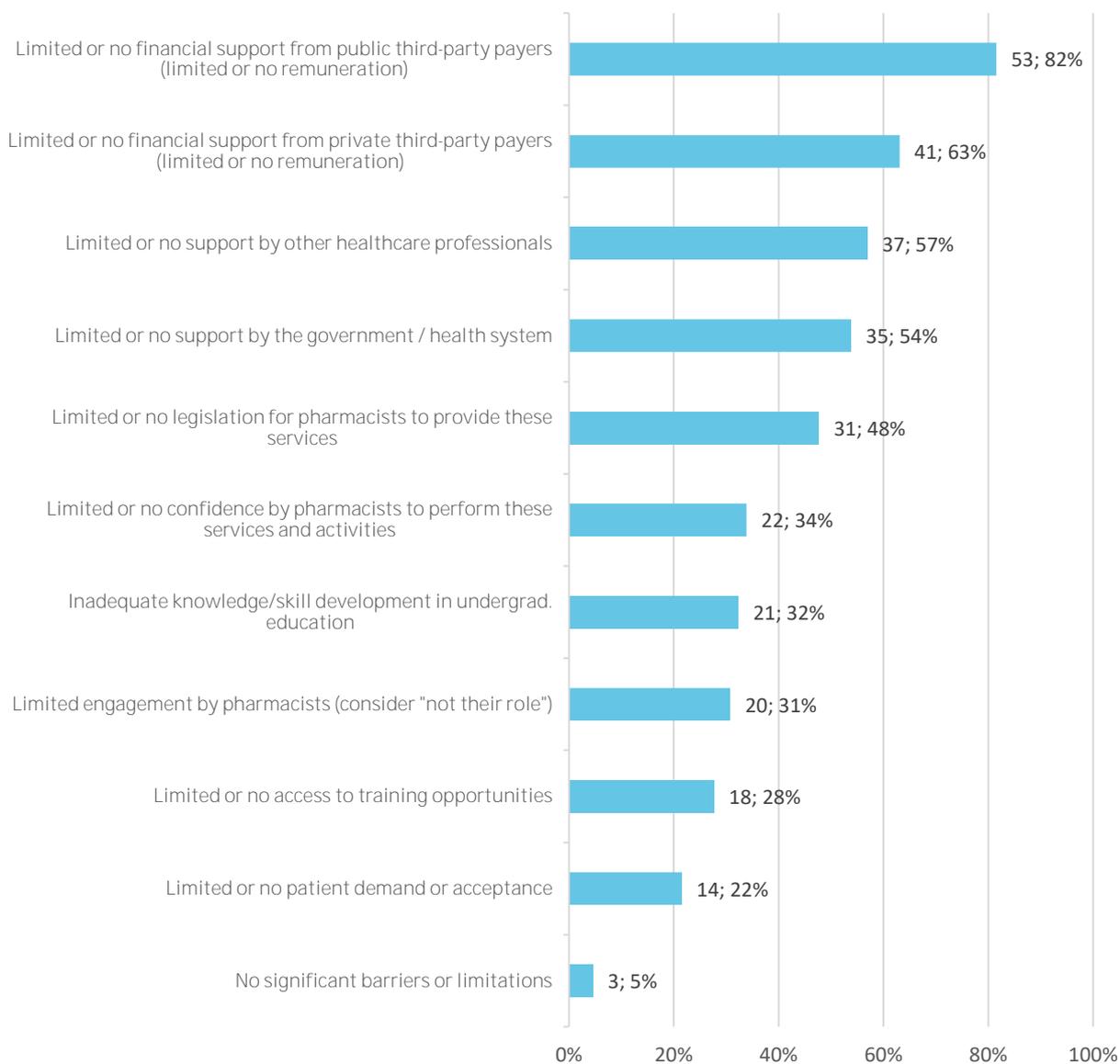
As Figure 26 suggests, the most important barrier to the expansion of pharmacists' services in NCD management is the lack of appropriate financial support or remuneration from public health systems (53 respondents: 82%) or private third-party payers (63%). Not only do interventions by community pharmacists require time, expert knowledge and skills, but they also generate savings for health systems. As such, it seems reasonable that, in order to increase the expansion and sustainability of these services over time, they should be appropriately remunerated by third-party payers.

The following most common limitations or barriers were the lack of acceptance and support by other health care professionals and by health authorities (57% and 54%, respectively). The promotion of collaborative practices in healthcare teams taking care of the same patient is critical to achieve optimal outcomes. The **generation and sharing of evidence of the value of pharmacists' interventions with other health professions and policy-makers** is important to gain their recognition and support.

Data suggest that limitations related to **pharmacists' knowledge, skills or self-confidence** to deliver these services are not among the most important, which would suggest that pharmacists feel sufficiently prepared to adopt such roles. In addition, lack of patient demand was the least commonly reported limitation, which suggests that patients do recognise value in such interventions.

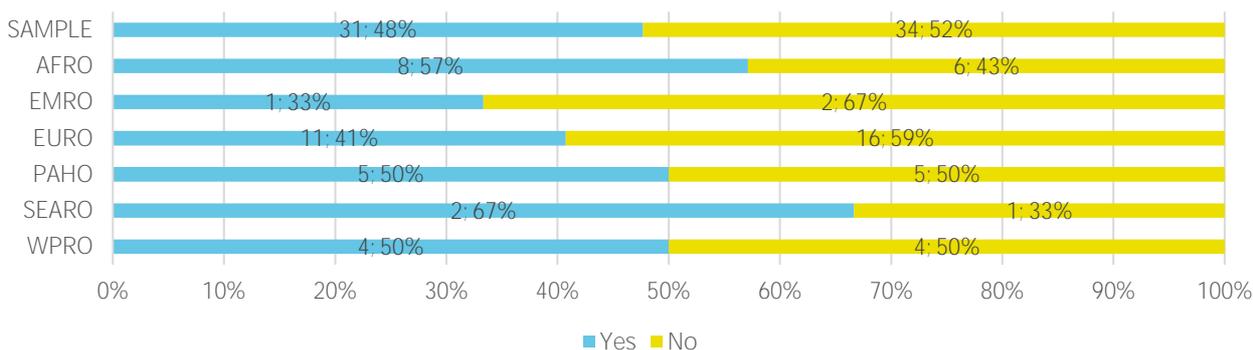
Three countries (Great Britain, Mauritius and Rwanda) reported no significant barriers or limitations to the participation of community pharmacists in NCD strategies.

Figure 26. Limitations or barriers to the participation of community pharmacists in NCD strategies (n=65)



With regards to the existence of limited or no legal provisions allowing pharmacists to provide these services, the analysis per WHO region suggests that such limitations are most common in the Southeast Asian (67%) and African (57%) regions, and not so significant in the Eastern Mediterranean (33%) and European (41%) regions. See Figure 27 for details.

Figure 27. Existence of limited or no legal provisions allowing pharmacists to participate in NCD strategies (n=65)



3.10 Use of supporting technologies

When asked about the existence of any specific technologies available to community pharmacists to support their roles related to NCDs (including prevention, screening, referral and disease management/treatment follow-up), such as computer systems, devices, mobile applications, text messaging systems, smart technologies, etc., a 62% majority of respondents indicated that such technologies are not available, as illustrated in Figure 28. See Table 20 for details of the technologies available.

Figure 28. Existence of technologies to support community pharmacists in NCD-related roles (n=65)

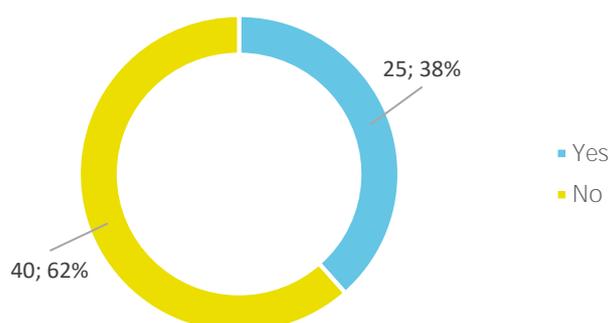


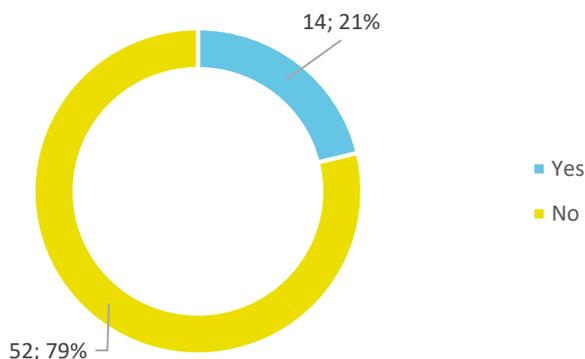
Table 20. Technologies available to support community pharmacists in NCD-related roles

Country or territory	Types of technologies available	Links
Australia	GuildCare electronic recording and reporting	https://bit.ly/2Vc7xNt
Belgium	Shared Pharmaceutical Records	https://bit.ly/2FFMP1Z
Brazil	There is a computer system created by Federal Pharmacy Council of Brazil called “Registre” — Pharmaceutical Services Record. There are other computer systems created by private organisations like the Brazilian Association of Pharmacies	https://bit.ly/2TNVDb9
France	Secure messaging service networks which are restricted to healthcare professionals, i.e., medical practitioners (GPs, specialists), nurses, pharmacists, etc. Software to support dispensing.	https://bit.ly/2UayAwb
Spain	Tools are being developed by the provincial colleges of pharmacists and the General Pharmaceutical Council to facilitate the clinical roles of pharmacists (adherence, pharmacotherapeutic follow-up, reconciliation at discharge, etc.).	https://bit.ly/2dgbTkQ https://bit.ly/2JSSbfB

3.11 Professional policy on NCDs

The survey finally asked about the existence of policy statements or position papers about the role of pharmacists on NCDs by the responding organisations. Nearly 80% of respondents indicated that no such advocacy tools have been developed yet (see Figure 29 for overall figures and Table 21 for details). This indicates the importance of FIP leading the way and developing an international statement that can support national organisations in advocating for an expanded role for pharmacists in this area.

Figure 29. Existence of specific statements/position papers by FIP member organisations on the role of community pharmacists in NCDs (n=66)



When considered per disease area, policy statements on the role of pharmacists in diabetes management are the most common (13 respondents; 20%), with cardiovascular diseases and asthma/COPD following with 11 countries or territories each (Figure 30).

Figure 30. Existence of specific statements/position papers by FIP member organisations on the role of community pharmacists in NCDs, per disease area (n=66)

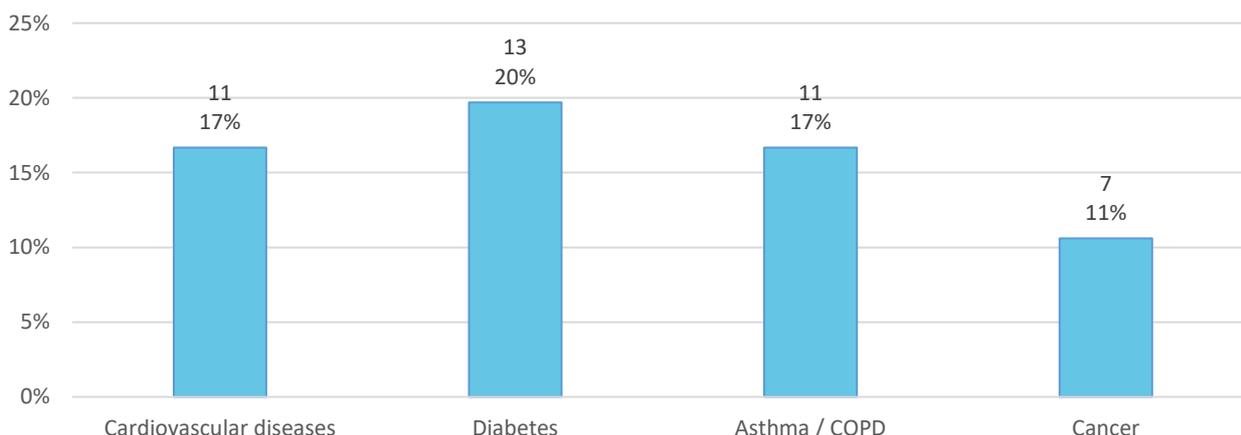


Table 21. Policy statements or position papers on the role of pharmacists in NCDs

Country or territory	Details of policy
Australia	https://bit.ly/2pF7yu4
Canada	https://bit.ly/2CQqTAC
Germany	https://bit.ly/2WCPn8
Great Britain	RPS Policy on Improving Care for People with Long Term Conditions https://bit.ly/2WK48Gn
Russian Federation	Moscow Pharmaceutical Society made a number of articles, monographs and oral presentations (not available online) on different levels and platforms (including parliament) concerning NCDs and the role of pharmacists in such diseases, but no position papers have been prepared.
Slovenia	Chamber of Pharmacy of Slovenia: www.lek-zbor.si
South Africa	The Pharmaceutical Society of South Africa accepts FIP specific statement/policy papers for the country.
USA	https://bit.ly/2CD5JWK Visit https://bit.ly/1MU052C for the American Pharmacists' Association's policy and practice related resources
Zimbabwe	The Pharmaceutical Society subscribes to FIP statements on the roles of pharmacists, but these are not always implemented or easy to enforce, unless they are subject to legislation.

3.12 Additional observations

Table 22. Additional comments or observations by respondents

Country or territory	Observations
Afghanistan	Pharmacists are not engaged in NCD prevention activities in Afghanistan
Albania	The Drugs and Pharmaceutical Service Legislation in Albania includes some services offered in community pharmacies, like blood pressure measurement, blood glucose evaluation and body mass index determination. These services are offered in community pharmacies for everyone that requires them, but they are not referring to any regulation or electronic system that obliges pharmacists to keep records or to follow up these patients. In case these records are kept by some community pharmacists, they do not report these records to any institution, so this is why we cannot have access to this information and to our knowledge, there are not specific electronic systems recording these information used in our country.
Brazil	In Brazil, the role of pharmacists in the prevention, screening, patient referral or treatment follow-up of NCD patients is a relatively recent movement. It started at the universities and is advancing through public and private pharmacies and hospitals. Our organisation, the Brazilian Federal Council of Pharmacy, has a general statement related to professional rules in pharmaceutical services, not a specific position on these issues.
Cameroon	One of the major challenges of NCD prevention to date is a better involvement of community pharmacists in these issues. This requires increased training, access to information through patient records, the establishment of a pharmaceutical record and increased collaboration with other health professionals.
Canada	<p>The Conference Board of Canada recently performed a study on behalf of the Canadian Pharmacists Association that is relevant to this study: https://bit.ly/2WCGPOn</p> <p>Document highlights:</p> <p>The scope of pharmacy services has expanded in many Canadian jurisdictions in recent years, with each province and territory taking a different approach to optimise these changes for better health and value.</p> <p>This report showcases a modelling study that estimates the health and economic impact of three services currently delivered within a community pharmacy setting that have the potential to be expanded: smoking cessation, advanced medication review and management for cardiovascular disease, and pneumococcal vaccination.</p> <p>Over the 20-year forecast period, the estimated economic value of expanding these services ranges from CAD 2.5 billion to CAD 25.7 billion. We also expect a large return on investment for all three services over the medium and long terms.</p>
Colombia	The participation of pharmacists in community pharmacies in Colombia is very low, and when they do participate, they mostly take on a commercial role and do not implement pharmaceutical care services.
Ecuador	Pharmacists stay in community pharmacies only for a few hours per week because there is no legal obligation to be there full time. Unless the law changes, pharmacists' role in relation to NCDs will remain weak.
Ethiopia	Basically, pharmacists are free to be engaged in health promotion and disease prevention in the country. In addition, they have also full rights in medicine compounding and dispensing. Screening and follow-up are restricted to physicians/clinicians.
Fiji	Pharmacists in Fiji can play a major role in NCD prevention and management. However, due to the lack of governmental commitment, there have not been any policies relating to this. Nevertheless, pharmacists have been carrying out (by whatever means necessary) screening of potential diabetes cases and cardiovascular disease cases and have referred patients to physicians for further assessment.
Finland	The role of pharmacists and community pharmacies should be enhanced in this work, for the benefit of the patients and society.
India	It is all just beginning in India. The Indian Pharmaceutical Association is trying to advocate this role as much possible. We just started training for cancer in one state (Maharashtra) through collaboration with the Indian Cancer Society. We have approached the Health Ministry to include pharmacists in national health programme for NCDs, in the same way as for the National Tuberculosis programme.
Indonesia	The Indonesian Pharmacist Association has a CPD programme on NCDs and recertification exam using OSCE methods. Topics of NCDs commonly appear on the exam materials. The association, in collaboration with the director of pharmacy services, Ministry of Health, has a programme called "Gema Cermat" to educate pharmacists on many topics, especially diabetes and hypertension (Indonesia's first and second top prevalent diseases). The association has also a programme called "DAGUSIBU" for community pharmacists on drug usage, storage, disposal etc.

Country or territory	Observations
Israel	We are in the process of endorsing a law that requires the pharmacist to counsel. Much will change as time goes on. At present, due to lack of payment, the move is slow but there are signs of a change and our association is to make a study programme to encourage Managed Care Organisations to see the advantage of the pharmacist's counselling.
Italy	Our Study Centre is now working on a position paper on NCDs.
Japan	Pharmacists, doctors, and patients should fully understand the necessity of various involvement with NCD and take measures against them.
Kenya	Pharmacists can offer services with a little bit of guidance and training on a common strategy to promote health in the prevention and management of NCDs. The pharmaceutical society needs to make it a norm for them to do this.
Mauritius	<p>Major activities of the NCD & Health Promotion Unit:</p> <ol style="list-style-type: none"> 1. Screening at worksites and in the community: <ul style="list-style-type: none"> (a) NCDs — diabetes, hypertension, obesity and vision. (b) Breast and cervical cancer for married/sexually active women aged 30 to 60 years 2. Screening — School Health Programme for Secondary Schools Students of Form III and Lower VI of Secondary Schools 3. Screening — School Health Programme for Tertiary Level students of Industrial Vocational Training Board (IVTB) and of tertiary level. 4. Empowerment programmes: <ul style="list-style-type: none"> (a) Training of community leaders (b) Training of housewives on Nutrition & Healthy Lifestyle. (c) Training to cope with emerging diseases like Chikungunya and Dengue. 5. Physical Activity: Coordinating physical activity (yoga, aerobics, physical exercise) for women, senior citizens and the public at large. 6. Organise talks on NCD and risk factors: NCD encourage people to attend talks on NCDs, physical exercise, cooking demonstration, smoking, alcohol, lifestyle management. 7. Social mobilisation and community participation: <ul style="list-style-type: none"> (a) Establish local health committees. (b) Organise regular meetings with the community leaders. (c) Enlist participation of the community. 8. Research works: conduct surveys / studies at national level.
Montenegro	We tried to do something about asthma and we asked to do something about smoking cessation, but our Health Care Law does not support any activities in pharmacy except the "classic" type of pharmaceutical activities (dispensing medicines and compounding in laboratory of pharmacy).
Nepal	Nepal's national health policy (1991) had previously focused on factors like reduction of maternal mortality, infant mortality etc. Back then, the majority of deaths was due to communicable diseases and easily preventable ones like diarrhoea, cholera, viral fever, etc. Life expectancy was also quite low. After implementation of the health policy, there was remarkable progress in these indicators. The current health policy (2015) has focused on those diseases plus, NCDs as well. But the history of pharmacy profession is quite new here and it has not been mentioned much in the health policy. People are recently only understanding the role of pharmacists in the health sector. So there is an increasing momentum to provide such roles to pharmacists as well and it has been starting with employing the hospital pharmacy directives. The number of pharmacists has also significantly increased in recent years and the community pharmacy sector is also showing signs of a paradigm shift in the coming decade.
New Zealand	Significant opportunity prevented by current regulation and lack of funding.
Nigeria	Aside from traditional herbal healers, community pharmacists remain the main gateway to care in Nigeria. A lot of lives have been saved through interventions made by community pharmacists through screening services and health promotion campaigns. The Pharmaceutical Society of Nigeria is currently working on policy and strategy documents that will direct pharmacy practice in terms interventions services in relation to varying disease conditions which are expected to be guiding references for pharmacy practice.
Pakistan	We believe that NCD prevention campaigns will play a vital role in Pakistan. Most people are unaware of prevention tips and techniques. Pharmacists are highly concerned and motivated to work in this area but we have limited resources and inadequate training. We are willing to attend training on the prevention of NCDs and how to raise awareness and counsel the community regarding NCDs.

Country or territory	Observations
Panama	The pharmacist is important in the compliance of patients' therapy since they are expert professionals in medicines. The patient has more confidence towards the pharmacist, to make any query. The pharmacist must always be part of the health team.
Philippines	The Philippine Pharmacists Association has created a group to lead in NCD prevention and treatment, particularly, on medicines adherence. The group is currently formulating a position paper and participating in competency building activities such as the Asthma Educators' Workshop .
Rwanda	The role of the pharmacist is evolving. Pharmacists are to play a role in the prevention, screening, patient referral and treatment follow-up, however different training programmes are necessary to get adequate skills and knowledge necessary.
Sierra Leone	Our pharmacists do play a role in NCDs in the country. This has largely not been coordinated and recorded. We would endeavour to do more in this vein in the future.
Slovenia	Community pharmacists are not involved in health promotion programmes.
Switzerland	Related with the national NCD-strategy (see https://bit.ly/2CKEh9u) and the Postulat Humbel (see https://bit.ly/2nEAl0c) there is a lot ongoing in Switzerland. We are planning to start a project in the field of chronic care management in 2018/2019 and we will also develop a post-graduate/continuous professional development course in relation with this project. We are also planning to introduce a self-management programme for chronic patients in pharmacies (project will probably start in 2019). Also concerning patient health records there are a lot of activities ongoing in Switzerland (see https://bit.ly/2UoFKq). A national ePatient Dossier does not exist yet, but this will change during the next years. The pharmacist is an important player in all these activities.
Uruguay	In all cases, when we speak of pharmacists' activities in community pharmacy, this does not imply necessarily the intervention of a pharmacist, but rather the intervention of all the employees of the pharmacy. In our country, the presence of pharmacists in community pharmacies is very low.
USA	The authority varies by state. Some are authorised at population level, some via collaborative practice agreements, and some do not need specific authority. All pharmacies at a minimum are serving as a public information site. Others are serving as a facilitator and/or partner in screening activities. Many are now doing disease management programmes and our provider status legislation will help address the access and coverage issues for these services.
Zimbabwe	Pharmacists carry out public campaigns and use television to educate the public on NCDs. Pharmacists Against Drug Abuse is part of the Pharmaceutical Society of Zimbabwe activities programme to educate the public on drug abuse; mental health has been covered in joint symposium with medical practitioners. The whole programme is often hampered by lack of financial rewards when monitoring and screening of NCDs is done.

3.13 References

1. International Pharmaceutical Federation (FIP). Establishing tobacco-free communities: A practical guide for pharmacists. [Online].; 2015. Available from: <http://fip.org/files/fip/publications/2015-12-Establishing-tobacco-free-communities.pdf>. [Accessed 18 May 2018]
2. Weidenmayer K, Summers R, Mackie C, Gous A, Everard M. Developing pharmacy practice: a focus on patient care. [Online].; 2006. Available from: <https://www.fip.org/files/fip/publications/DevelopingPharmacyPractice/DevelopingPharmacyPracticeEN.pdf>. [Accessed 18 May 2018]
3. Makowsky M, Guirguis L, Hughes C, Sadoski C, Yuksel N. Factors influencing pharmacists' adoption of prescribing: Qualitative application of the diffusion of innovations theory. *Implementation Science*. 2013; 8 p. 109.
4. Bernsten C, Garipey Y, Lutz E, Reid P, Schneider P. Developing new economic models for payment for services by pharmacists: The report of the working group. *International Pharmacy Journal*. 2009; 25(2): p. 30-45.
5. World Health Organization. What is universal health coverage? [Online].; 2014 [cited 2015 Jun 1]. Available from: http://www.who.int/features/qa/universal_health_coverage/en/.
6. Mossialos E, Courtin E, Naci H, Benrimoj S, Bouvy M, Farris K, et al. From "retailers" to health care providers: Transforming the role of community pharmacists in chronic disease management. *Health Policy*. 2015 May; 119(5): p. 628-39.
7. Akaho E, MacLaughlin E, Takeuchi Y. Comparison of prescription reimbursement methodologies in Japan and the United States. *Journal of the American Pharmacist Association*. 2003; 42(4): p. 519-26.
8. Bernsten C, Anderson K, Garipey Y, Simoens S. A comparative analysis of remuneration models for pharmaceutical professional services. *Health Policy*. 2010; 95(1): p. 1-9.

9. Davidova J, Praznovcova L, Lundborg C. Pricing and reimbursement of pharmaceuticals in the Czech Republic and Sweden. *Pharmacy World & Science*. 2008; 30(1): p. 57-64.
10. Eichler H. Pharmacoeconomics and the "4th hurdle" Drug reimbursement policies in Central and Eastern Europe. *International Journal of Clinical Pharmacology & Therapeutics*. 2013; 41(1): p. 1-2.
11. Board of Governors of the Federal Reserve System (US). Foreign exchange rates-G.5A. Economic research and data. [Online].; 2015 [cited 2015 Jun 1. Available from: <http://www.federalreserve.gov/releases/g5a/> [Accessed 18 May 2018]
12. The World Bank. Country and Lending Groups. [Online].; 2015 [cited 2015 Jun 1. Available from: <http://data.worldbank.org/about/country-and-lending-groups>. [Accessed 18 May 2018]
PriceWaterhouse Coopers. Review of community Pharmacy in Ireland. 2007. Dublin: Pricewaterhouse Coopers 2009.
13. Harjula I, Kostianen E, Vidgren M. Advice from community Pharmacies saves hundreds of millions of Euros. 2010. Poster presented to the FIP annual congress in Lisbon.
14. Gouveia M, Machado F, Mendes Z. Free but Valuable: The Economic Significance of Service Provided by Portuguese Pharmacies. *Value in Health*. 2009; 12(7): p. A248.

4 Case studies

4.1 Australia

4.1.1 Legal framework

In Australia there are over 5,450 community pharmacies offering a highly skilled network of primary healthcare professionals providing quality advice and services.

Community pharmacies are well distributed and in accessible locations, often operating over extended hours seven days a week in urban, rural and remote areas.

There has been a shift in Australian primary care from fragmented care towards patient-centred and multidisciplinary care.¹ Australia has followed the international lead in exploring the role of the practice pharmacist, defined as “a pharmacist who delivers professional services from or within a general practice medical centre with a coordinated, collaborative and integrated approach with an overall goal to improve the quality use of medicines of the practice population”.¹

Currently workforce issues are being robustly debated. General practitioner shortages in rural and remote areas have highlighted potential extended roles for pharmacists to improve the fight against NCDs.²

There is a strong belief that collaborative medication management between the GP and the pharmacist could reduce costs to the health system from adverse drug events and sub-optimal adherence to medication regimens. Funding models need to be further investigated to ensure cost-effectiveness of flexible models of care.¹

Pharmacy organisations have highlighted the benefits of increasing the role of pharmacists in chronic disease management, especially in underserved communities where the breadth of locations in which pharmacist’s work could contribute to improved health outcomes. Despite significant activity in pharmacist-led pilot projects in chronic disease, these have not translated into sustainable care models at community pharmacies, in contrast to international models in countries such as the USA, Canada and the UK.²

4.1.2 Prevention

4.1.2.1 Screening for cardiovascular diseases (CVD-screening)

A CVD risk profiling of patients >30 years without diagnosed heart disease was conducted in 14 rural community pharmacies. A total of 644 subjects were screened and 73% of those who were considered at increased risk were advised to consult their doctor.

The advice provided also had behavioural benefits, with 191 participants (55%) reporting one or more lifestyle changes; 31.8% reported increased exercise, 16.4% weight loss, 29.8% improved diet and 3.6% had quit smoking.³

4.1.2.2 Cardiovascular risk reduction

In order to reduce cardiovascular risk, pharmacists from 10 pharmacies received training in CVD risk factor management and how to facilitate patient lifestyle modification.

There were 70 patients aged 50–74 years, without diabetes or cardiovascular disease, taking medicines for blood pressure or cholesterol. Pharmacists provided assessment, recommendations and targets for risk reduction over five monthly sessions.^{4,5}

Relative risk reduction (RRR) for CVD onset over the next five years was 24% ($p < 0.001$). Reasons for that were reductions in mean systolic blood pressure (7 mmHg), diastolic blood pressure (5 mmHg), total HDL cholesterol ratio (-0.2), waist circumference (-2 cm in males, -0.7 cm in females) and other risk factors. Several key health

behaviours improved, including diet quality and physical activity levels. The prevalence of non-adherence to cardiovascular medication regimens dropped by 16 percentage points to 22%.

4.1.3 Therapy and disease management

4.1.3.1 Diabetes

The Pharmacy Diabetes Care Programme, a 2006 pilot project led by Krass *et al*,⁶ was developed through the University of Sydney. Patients received an ongoing cycle of assessment, management and review during four visits at regular intervals over six months compared with usual care.

The services included blood glucose monitoring, education, adherence assessment and reminders, and checks for complications related to diabetes.

The intervention group showed significantly greater improvements in glycaemic control, a mean reduction in HbA1C of -0.97% (95%CI: -0.8, -1.14) compared with -0.27% (95% CI: -0.15, -0.39) in the control group.⁶

4.1.3.2 Asthma

The Pharmacy Asthma Care Programme 2006, was conducted at the University of Sydney by Carol Armour. **Community pharmacists' interventions consisted of patient assessment**, education, support and monitoring to facilitate self-management in patients at risk of poorly controlled asthma compared with usual care.⁷ Results were the following:

- The proportion of patients with asthma, classified as severe, declined significantly from 87.9% to 52.7% ($p < 0.001$); the control group remained unchanged (71.2% to 67.9%).
- The proportion of patients with a correct inhaler technique increased from 24.3% at baseline to 72.9% at the final visit ($p < 0.001$) in the intervention group.
- The proportion of patients with an asthma action plan increased from 23.1% at the beginning to 63.5% at the final visit in the intervention group ($p < 0.001$) versus 36.6% of the control group at the end of the study.

4.1.3.3 Hypertension

Community pharmacists were enabled to improve patient adherence and/or persistence to antihypertensive medications. The multifaceted intervention consisted of: home blood pressure monitoring; training of self-monitoring of blood pressure; motivational interviewing; medication review; and prescription refill reminders via SMS, phone or mail at baseline, after three and after six months.

The intervention was tested in a randomised controlled trial with the objective to improve blood pressure control ($n=207$).⁸ The adherence to drug therapy improved in the intervention group compared with usual care and systolic blood pressure was significantly reduced (-10mmHg) in the intervention group.

4.1.3.4 Future pilot projects

Against a backdrop of a review and reform agenda in Australia, there has been significant interest in the Pharmacist Chronic Disease Management Pilot, which will give eligible patients the freedom to visit their local pharmacy when monitoring and managing their chronic illnesses in collaboration with their usual general practitioner. Working under a care plan developed by the GP, pharmacists will provide regular monitoring, dose refinement, earlier intervention and prompt referral back to the GP when necessary.

The programme is aimed at easing the current burden on doctors, with more than half of all visits to GPs currently involving the management of at least one chronic condition.

The programme had an 18-month pilot in three locations within a state of Australia, with 30 patients enrolled at each site. Through this programme, GPs will assess eligible patients and develop a care plan in relation to the management of one or more of the agreed chronic conditions. Pharmacist interventions will target conditions such as asthma, hypertension and hypercholesterolaemia, as well as patients on anticoagulation treatment.⁹

4.1.4 Training

4.1.4.1 Cultural awareness for Aboriginal and Torres Strait Islander patients

Aboriginal and Torres Strait Islander people generally have significantly poorer health than other Australians and typically die at much younger ages.¹⁰ About 80% of the mortality gap between Indigenous and other Australians aged 35–74 years is due to chronic diseases.¹⁰

Pharmacists can assist with screening and risk stratification through use of a cardiovascular risk tool, developed for use in a specific region and adapted for this specific population.¹¹

People with high levels of chronic disease often need to access a large number of health professionals and may have to access medicine services from a variety of providers including doctors, nurses, and Aboriginal health workers.¹² Pharmacists can play an important role in assisting patients to access the care they require, encouraging registration and utilisation of electronic health records.¹²

Cultural awareness training for community pharmacies/pharmacists to engage Aboriginal and Torres Strait Islander patients has been strongly advocated.¹² A culturally safe pharmacy may include welcoming signs or symbols reflecting the local culture, health resources specifically written for Aboriginal and Torres Strait Islander people and a private area to discuss medicines or employment of Aboriginal and Torres Strait people within the pharmacy.¹²

4.1.4.2 Diabetes care projects and services

Diabetes care projects and services are intended to increase the awareness of the targets for diabetes for blood sugar levels, cholesterol (HDL and LDL specifically), blood pressure, glycated haemoglobin, body mass index, waist circumference, exercise, and diet. However, this awareness needs to be tailored for certain risk groups — especially the elderly, with regards to blood pressure and blood sugar levels.

4.1.4.3 Asthma projects

A high population prevalence of asthma (10.2%) in Australia underpins its listing as a national health priority area. Despite significant national efforts to improve asthma management, several areas remain of concern. These include inappropriate medicines use, lack of self-management skills and lack of access to timely and comprehensive care.¹³

4.1.5 Use of new technologies

In Australia a “personally controlled electronic health record” will be introduced in 2018/2019, and which patients can opt into. There is an opportunity for pharmacy advocacy to lead this initiative. Reminder systems such as SMS for CVD, diabetes and asthma are in place. A reminder system for prescriptions is already in operation.¹⁴

An Australian randomised controlled trial of a computer-generated photo-ageing service (demonstrating the detrimental effects on facial physical appearance of smoking) in addition to standard smoking cessation advice from a pharmacist was effective in stopping young people (mean age 24 years) smoking compared with control using co-validated measures (13.8% n=22/80 vs 1.3% n=11/80) at six months.¹⁴

4.1.5.1 Text messages to reduce cardiovascular risk factors

A study was conducted to examine the effect of a lifestyle-focused semipersonalised support programme delivered by mobile phone text message on cardiovascular risk factors. Patients in the intervention group (n=352) received four text messages per week for six months in addition to usual care. The text messages provided advice, motivational reminders and support to change lifestyle behaviours. Patients in the control group (n=358) received usual care. The messages for individual participants were selected from a bank of messages according to baseline characteristics (e.g., smoking) and delivered via an automated computerised message management system. After six months, LDL-C, BMI, smoking rates and systolic BP were significantly lower in the intervention group, with significant increases in physical activity. Patients reported the text messages to be useful (91%), easy to understand (97%), and appropriate in frequency (86%).¹⁵

4.1.6 Collaboration with other healthcare professionals

4.1.6.1 “Quit for new life”, Australia

In 2015, Health Stats in New South Wales (NSW) reported 45% of NSW Aboriginal women smoked during pregnancy, compared with 7.4% of non-Aboriginal women. A voucher system provided free nicotine replacement therapy to Aboriginal women and their household members who smoke, redeemable through community pharmacies across NSW. This project is a collaboration between community pharmacies and local health district authorities and was scheduled to end in 2017/2018.

4.1.7 Main limitations and challenges

The 2015 FIP report “Sustainability of pharmacy services: Advancing global health”¹⁶ revealed a common concern among pharmacy associations worldwide over the long-term financial viability of community pharmacy owing to successive price and margin cuts. Although Australia has pioneered many service-focused models of care, including those aimed at fighting NCDs, these are yet to evolve into sustainable models, supported by government and embraced by other healthcare professionals.

4.1.8 References:

1. Freeman, C Rigby, D, Aloizos, J and Williams, A. The practice pharmacist: a natural fit in the general practice team *Aust Prescr* 2016;39:211-45 Dec 2016
2. Duckett, S., Bredon, P. and Ginnivan, L. Access all areas: new solutions for GP shortages in rural Australia [online]. Grattan Institute, 2013. Available from <https://grattan.edu.au/report/access-all-areas-new-solutions-for-gp-shortages-in-rural-australia/> [Accessed 9 July 2018]
3. Peterson GM, Fitzmaurice KD, Kruup H, Jackson SL, Rasiah RL. Cardiovascular risk screening program in Australian community pharmacies. *Pharm World Sci*. 2010;32(3):373-80.
4. Mc Namara KP, George J, O'Reilly SL, et al. Engaging community pharmacists in the primary prevention of cardiovascular disease: protocol for the Pharmacist Assessment of Adherence, Risk and Treatment in Cardiovascular Disease (PAART CVD) pilot study. 2010. Available from: <https://doi.org/10.1186/1472-6963-10-264>. [Accessed 9 July 2018]
5. Emerson L., Krass I. A Collaborative, Interdisciplinary Evidence Based Approach to Reducing Coronary Heart Disease in Rural Areas. Pharmacy Guild of Australia: Canberra, Australia: 2006
6. Krass I, Armour C, Mitchell B, Brilliant M, Dienaar R, Hughes J et al. The Pharmacy Diabetes Care Program: assessment of a community pharmacy diabetes service model in Australia. The University of Sydney, Faculty of Pharmacy, 2005. Available from: <http://6cpa.com.au/wp-content/uploads/Pharmacy-Diabetes-Care-Program-final-report.pdf>. [Accessed 9 July 2018]
7. Armour C, Bosnic-Anticevich S, Brilliant M, Burton D, Emmerton L, Krass I, Saini B, Smith L, Stewart K. Pharmacy Asthma Care Program (PACP) improves outcomes for patients in the community. *Thorax*. 2007 Jun;62(6):496-502. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/17251316> [Accessed 9 July 2018]
8. Lau R, Stewart K, McNamara KP, Jackson S, Hughes JD, Peterson GM, et al. Evaluation of a community pharmacy-based intervention for improving patient adherence to antihypertensives: a randomised controlled trial. *BMC Health Serv Res*. 2010;10:34. Available from: <https://doi.org/10.1186/1472-6963-10-34>. [Accessed 9 July 2018]
9. State Government of Victoria. Pharmacist Chronic Disease Management Pilot [Internet]. Melbourne: State Government of Victoria, 2017 July 17. Available from <http://www.vic.gov.au/news/pharmacist-chronic-disease-management-pilot.html> [Accessed 9 July 2018]
10. Australian Institute of Health and Welfare. Contribution of chronic disease to the gap in adult mortality between Aboriginal and Torres Strait Islander and other Australians [Internet]. Canberra ACT: Australian Institute of Health and Welfare, 2011. Available from: <https://www.aihw.gov.au/reports/indigenous-australians/contribution-of-chronic-disease-to-the-gap-in-mort/contents/table-of-contents> [Accessed 9 July 2018]
11. National Vascular Disease Prevention Alliance. Australian Absolute Cardiovascular Risk Calculator [Internet]. National Vascular Disease Prevention Alliance, 2012. Available from: <http://www.cvdcheck.org.au>. [Accessed 9 July 2018]
12. Swain, L. Guide to providing pharmacy services to Aboriginal and Torres Strait Islander people [Internet]. Canberra ACT: Pharmaceutical Society of Australia, 2014. Available from: <http://www.psa.org.au/wp-content/uploads/guide-to-providing-pharmacy-services-to-aboriginal-and-torres-strait-islander-people-2014.pdf> [Accessed 9 July 2018]
13. Saini, B Krass, I Smith, L Bosonic-Anticevich, S and Armour, C. Role of community pharmacists in asthma – Australian research highlighting pathways for future primary care models. *Australas Med J*. 2011; 4(4): 190–200.
14. Burford O, Jiwa M, Carter O et al. Internet-based photoaging within Australian pharmacies to promote smoking cessation: randomized controlled trial. *J Med Internet Res* 2013;15: e64.

15. Chow CK, Redfern J, Hillis GS, Thakkar J, Santo K, Hackett ML et al. Effect of Lifestyle-Focused Text Messaging on Risk Factor Modification in Patients With Coronary Heart Disease: A Randomized Clinical Trial. *JAMA*. 2015;314(12):1255-1263. Available from <https://www.ncbi.nlm.nih.gov/pubmed/26393848>. [Accessed 9 July 2018]
16. International Pharmaceutical Federation (FIP). Sustainability of pharmacy services: Advancing global health. The Hague: International Pharmaceutical Federation, 2015.

4.2 China

4.2.1 Legal framework

Pharmacy is a relatively new profession in China. Until recently, there was no law regulating the pharmacy profession. However, the new **Pharmacist Law of the People's Republic of China** came into force on 15 January 2017 and the country is now in the process of building a better environment for pharmacists. The law mainly focuses on the following seven points:

1. Establishment of China's pharmacist management system;
2. Defining who the "Pharmacist Law" will apply to;
3. Determining the conditions and methods of access to a pharmacist;
4. Stipulating the scope of practice and business of pharmacists, their rights and obligations;
5. Regulating pharmacists' competence assessment and training requirements;
6. Stipulating the legal responsibility of pharmacists; and
7. Combining the management experience of physicians and nurses.

Currently, most pharmacists in China practise in hospitals at all levels. Many staff members in community healthcare centres are not higher-education-trained professionals and just receive short-term training before entering into practice. Only a few of them are professional community pharmacists. However, with the development and reform of the healthcare system, a dramatic number of community healthcare institutions has emerged and the importance of community pharmacists has been recognised. The promotion of pharmaceutical services to guarantee the safe use of medicines and improve clinical effect is of great significance.

4.2.2 Prevention, screening and referral

Presently, there seem to be few projects focusing on disease prevention, screening or referral in the community setting by pharmacists, and there are not many initiatives in which Chinese pharmacists have participated. Due to the large population of China, the number of pharmacists available in the country is far from being sufficient. However, pharmacists in China are trying to take advantage of the mass media to propagate prevention advice for some chronic diseases.

4.2.3 Therapy and disease management

4.2.3.1 Diabetes

A total of 164 patients with confirmed type 2 diabetes mellitus were selected from a community in Hangzhou and were randomly assigned to an intervention group (n=82) or a control group (n=82). Patients in the intervention group received pharmaceutical care for six months under the guidance of community pharmacists, while those in the control group did not. Fasting blood glucose, postprandial 2h blood glucose, glycated haemoglobin (HbA1c), medication adherence, the incidence of adverse drug events and patient satisfaction were compared before and after the pharmaceutical care intervention between the two groups. Comparing the values with those before intervention, fasting blood glucose, postprandial 2h blood glucose, HbA1c, and the incidence of adverse drug events significantly decreased after intervention in intervention group ($P < 0.05$), while medicines adherence and patient satisfaction significantly increased.¹

4.2.3.2 Asthma

Research conducted by Tongji Hospital in Shanghai² divided 122 patients into observation and control groups to determine adherence rates. The adherence rates in the observation group were 36.7%, 62.30% and 59.06%

before the intervention, four weeks after the intervention and six months after the intervention, respectively. The corresponding results in the control group were 39.34%, 42.62% and 29.51%. The adherence rates at four weeks six months after the intervention differ significantly between the two groups.

4.2.3.3 Cancer

In 2013, a project was carried out in the Jiangsu Province³ enrolling 354 patients with cancer pain. Hospital pharmacists trained community and village doctors on the treatment of cancer pain so they could promote pharmacy services to cancer patients and their families between January and December 2013. Hospital pharmacists offered patient consultations and telephone follow-up, and provided pharmacy services to patients with cancer pain and their families in community outpatient clinics. A questionnaire survey was conducted among patients before and after receiving the pharmacy service to assess the pain treatment understanding, pain treatment outcomes, adverse reactions to medicines and the level of satisfaction of patients and their families.

Researchers concluded that patients' knowledge about their treatment increased from 45% before the intervention to 92% afterwards. From January to December 2013, there were 138 outpatients with tumours in the hospital, of whom 136 received the three-step analgesic treatment: 55% of patients experienced complete remission of the pain, and 34% expressed that they had experienced partial remission. Ninety-five percent of the patients were satisfied with the service.

4.2.4 Training

The education of pharmacists in China has not been totally separated from other pharmaceutical sciences. The curriculum consists of chemistry, biology, physiology and pharmacotherapy. A relative paucity of clinical practice may be a drawback for pharmacist training in China.

4.2.5 Use of new technologies

Due to the large number of patients and relative shortage of pharmacists in China, some patients cannot achieve good pharmaceutical care. To solve the problem, an oncological hospital in Beijing has set up a clinical pharmacy with a big data centre to establish a new mode pharmaceutical service, with the help of mathematical models and intelligent management. It can monitor, analyse and assess the safety, effectiveness and economy of medicines. The introduction of this new system promotes considerably the pharmaceutical service.

4.2.6 Collaboration with other healthcare professionals

The collaboration between pharmacists and other healthcare professionals is now mainly confined to top-ranking hospitals in developed cities. When coming across problems about adverse drug reactions, combinations of medicines, or dosing decisions, physicians invite pharmacists to participate in the consultation. Pharmacists will put into practice skills and information regarding the population pharmacokinetic models to help resolve problems.

4.2.7 Main limitations and challenges

The currently available pharmacists cannot cope with the needs of China's large population. Also, as mentioned before, there has not been a formal law on pharmacists, which represents an important limitation in terms of their scope of practice. In addition, the general public does not know much about pharmacists and prefer to trust physicians to solve their problems on medicines rather than turning to pharmacists.

4.2.8 References:

1. Chen Z. Effects of community -based pharmaceutical care on type 2 diabetes mellitus. Zhejiang Medical Education, Dec. 2013, 12(06):46-48+60. Available from: <https://bit.ly/2L29h79>. [Accessed 9 July 2018]
2. Huang B. Influence of pharmaceutical care intervention on medication compliance of patients with asthma. Chin Hosp Pharm J, Mar 2009, 29(05):413+418. Available from: <https://bit.ly/2u7InEn>. [Accessed 9 July 2018]
3. Huang H, Song K, Huang L, Zhang X. Discussion on pharmaceutical care for cancer pain patients in community. China Prac Med, Mar 2014, 9(07):188. Available from: <https://bit.ly/2NEptgr> [Accessed 9 July 2018]

4.3 Finland

4.3.1 Legal framework

The medicines act in Finland states that pharmacies may offer services aimed at improving health and well-being and preventing diseases, as long as they do not increase the unnecessary use of medicines or disturb the dispensing of medicines or medicine counselling. So there are no legal requirements for pharmacies for health promotion, but they are allowed to be involved in it.

Despite the lack of legal requirements, Finnish pharmacies have been involved in public health and disease management programmes for over two decades. Health promotion campaigns and initiatives by pharmacies have been conducted systematically and are now an essential part of pharmacies' functions. Pharmacies are in a unique position to raise awareness of these issues among the population, because pharmacy is by far the most frequently used health care service in Finland.

For local interprofessional cooperation there are obligations for both pharmacies and physicians:

- The Ministry of Social Affairs and Health requires that the prescriber pursue co-operation with local pharmacists in order to realise counselling about medicines and safe, effective and economic medicines treatment.
- The Finnish Medicines Agency rules that the prescriber and the pharmacists must co-operate to ensure consistent and extensive information about medicines to the patient.

The medicines policy and other related documents also emphasise that multidisciplinary cooperation and agreeing on joint policies and goals regionally and locally are prerequisites for securing systematic and sustained operations.

4.3.2 Prevention

There are three disease management programmes ongoing in Finnish pharmacies: the asthma programme since 1997, the diabetes programme since 2001 and the heart programme since 2005. All of these programmes are widespread across Finland and nearly 95% of pharmacies are taking part in them. These programmes for pharmacies were created as part of national health programmes, in order to meet the needs of global and national health policies and public health priorities. Their goal is to enhance pharmacists' involvement in patient care in order to get better outcomes from medicine therapies, in prevention of chronic diseases and their exacerbations, and in detecting those patients at high risk.

In all of these pharmacy programmes, counselling is used to ensure the success of pharmacotherapy. At the same time, the patient is encouraged to make lifestyle changes that improve the control of the disease and functional capacity, such as increasing physical exercise and quitting smoking.

Pharmacies take part in national campaigns, such as raising awareness about blood pressure on brain health, quit-smoking campaigns or raising awareness of diabetes risk. Pharmacy customers are offered minor interventions on a campaign basis or a regular basis: for example measuring blood pressure, testing lung capacity of smokers with microspirometers, asking asthma patients to take an asthma control test before sending their prescription for renewal, or encouraging those with apparent metabolic syndrome to complete a diabetes risk test.

On top of these three public health programmes, about a third of pharmacies are involved in promoting physical activity. The "Liikkujan Apteekki" ("Pharmacy physical activity") programme has been run by the "Fit for life" programme, the Organisation for Respiratory Health in Finland, the Association of Finnish Pharmacies and the Regional Sports Federations since 2009. Its aim is to incorporate discussion about the importance of physical activity into medicines counselling of patients with a chronic disease, whenever it seems suitable. In this concept pharmacies share information about local activities and know where to refer patients who need guidance on how to start exercising safely and in a sustainable manner. The target group for pharmacy activities are those whose physical activity level is too low for managing their chronic disease. The goal is to include pharmacies as part of the regional physical activity and wellbeing care chain.

4.3.3 Therapy and disease management

4.3.3.1 Asthma, COPD and atopic diseases

The goal of the asthma programme for pharmacies is to promote successful treatment of asthma and chronic obstructive pulmonary disease (COPD) with counselling available at pharmacies. The programme also takes into consideration the fact that a good treatment of other atopic diseases is a prerequisite for good control of asthma.

Pharmacy's tasks in the asthma programme related to medicines counselling include:

- Counselling related to the pharmacotherapy and the motivation for the correct use of medicines;
- Revisions and precisions of the basic characteristics of asthma medicines, in particular the difference between medicines treating the disease and those treating the symptoms;
- Guidance on using inhaled medicines and on the devices used;
- Recognising exacerbation periods of the disease and revising the self-care principles;
- Following the implementation of pharmacotherapy, recognising possible problems and solving them together with the patient and the doctor;
- Recognising patients in need of more efficient treatment and referring them to doctor or nurse; and
- Giving guidance in self-care, and taking the disease and regular medication into account when selecting a suitable self-care (OTC) medicine.

Pharmacy's tasks related to motivating lifestyle changes include:

- Encouragement to quit smoking;
- Highlighting the significance of physical activity in the treatment of respiratory disease and the maintenance of functional capability; and
- Supporting lifestyle changes and sharing information about local activities.

4.3.3.2 Diabetes

The main purpose of the diabetes programme for pharmacies is to contribute to the treatment success and the prevention of diabetes and its comorbid conditions. Detecting customers at high diabetes risk (using the diabetes risk test) and monitoring the overall medicines use are part of the pharmacy programme.

Pharmacy's tasks in the prevention and treatment of diabetes related to medicine counselling include:

- Supporting the diabetic patient's self-care, counselling related to the medicines and pharmacotherapy, and motivation for the correct use of medicines and treatment follow-up;
- Monitoring the implementation of the pharmacotherapy, recognising possible problems and solving them together with the doctor and the patient;
- Referring to a nurse or a doctor, if necessary;
- Screening for any overlapping medicines or medicine interactions;
- Guidance in financially sensible methods for acquiring the medicines; and
- Taking diabetes and regular medication into account when selecting a suitable self-care (OTC) medicine.

Pharmacy's tasks related to motivating lifestyle changes include:

- Discussing the significance of a healthy diet, weight control and physical activity in the prevention and treatment of diabetes;
- Encouragement to quit smoking;
- Supporting lifestyle changes, among others by sharing information about local activities and operations, and by using material suitable for the topic; and
- Recognising at-risk patients and referring them for treatment.

4.3.3.3 Cardiovascular diseases

The goal of the heart programme for pharmacies is the successful treatment of cardiovascular diseases and promoting cardiovascular health together with other health care operators and organisations.

Pharmacy's tasks in the prevention and treatment of cardiovascular diseases related to medicine counselling include:

- Counselling related to the medicines and pharmacotherapy and motivation for the correct use of medicines and follow-up of the treatment;
- Following the implementation of the pharmacotherapy, recognising possible problems and solving them together with the doctor and the patient;
- Referring to a nurse or a doctor, if necessary;
- Screening for any overlapping medicines or medicine interactions;
- Guidance in financially sensible methods for acquiring the medicines and
- Taking the disease and regular medication into account when selecting a suitable self-care (OTC) medicine.

Pharmacy's tasks related to motivating lifestyle changes include:

- Encouragement to quit smoking;
- Discussing the significance of a healthy diet, weight control and physical activity in the prevention and treatment of cardiovascular diseases;
- Supporting lifestyle changes, among others by sharing information about local activities and operations, and by using material suitable for the topic; and
- Recognising patients at high risk of developing cardiovascular diseases and referring them to treatment.

4.3.4 Training

In each of the above disease management programmes, pharmacies are requested to nominate one or two contact persons who are pharmacists. So there is a nationwide network of about 1,500 public health oriented professionals in Finnish pharmacies. The Association of Finnish Pharmacies keeps a record of all these contact persons and shares information with them on a regular basis about education possibilities, national campaigns, new materials, tools for counselling, etc.

These contact persons are offered one day's training about the aims of the disease management programmes. Their tasks include learning about the disease and the current care guidelines, and maintaining the competence and training of other pharmacists in-house. They serve as a link between pharmacy and other local healthcare professionals and patient organisations.

The Finnish Pharmaceutical Learning Centre offers suitable courses for contact persons in each disease management programme.

4.3.5 Use of new technologies

Digital technology is evolving rapidly, but so far it has not been widely used in pharmacies to support those with chronic diseases in the management of their condition. New digital technologies are currently tested to promote healthy lifestyles among those with a high risk of diabetes in a multicentre Stop Diabetes project. Pharmacies in three regions in Finland are taking part in this project (<https://bit.ly/2FVwqbf>). Those with a high diabetes risk are provided with "StopDia" web apps, which help them to make healthier choices in their daily lives. **Pharmacies' role is to detect those at high risk using an online diabetes Risk test, and refer them to join the study and for subsequent interventions.**

Mobile technology has also been piloted to support change management in allergic rhinitis and asthma multimorbidity, but these apps have not reached a wider population yet.

4.3.6 Collaboration with other healthcare professionals

The pharmacy disease management programmes are strongly directed at local interprofessional cooperation between pharmacies, other healthcare providers and patient organisations. Cooperation helps to ensure common practices and guidance throughout the patient's care chain.

There are goals for cooperation included in each of these programmes. The pharmacy's tasks in co-operation include:

- Agreeing about local operational methods, together with other healthcare providers and patient organisations;
- Participating in disease-prevention activities with other local operators; and
- Sharing information about suitable patient organisations and ensuring the availability of related materials.

In the early years of these disease management programmes, it was discovered that the frequent cooperation between pharmacies and other healthcare professionals increased. New local activities and action models have been set up and joint education for pharmacists and other health professionals has become more common.

Pharmacies have been recognised as a significant additional resource in tackling public health risks and chronic diseases. In stakeholders' view, when implementing a national disease management programme, networking of experts with primary care doctors and nurses as well with pharmacists is the key for effective implementation.

4.3.7 Main limitations and challenges

Regular surveys among pharmacy contact persons indicate that the key challenges in the local implementation of disease management programmes in community pharmacies are lack of cooperation with other healthcare providers and lack of time.

Furthermore, pharmacists wish for more public visibility of community pharmacists' involvement in the national public health programmes, in order to create awareness of availability of their specialised services. Contact persons who have responded to the surveys have perceived that the goals of the national public health programmes would be best achieved by promoting multidisciplinary collaboration, and increasing training, public awareness and support from the management to assure implementation.

One limitation in implementing the disease management programmes in pharmacies may be that counselling in pharmacies still seems to be more medicinal product-driven and less advisory concerning lifestyle changes such as smoking cessation and physical exercise. Furthermore, results of surveys among contact persons in pharmacies are limited to their views and opinions.

The key elements for involving pharmacies successfully in the national health programmes are that:

- Pharmacies have resources for implementing health programmes (qualified staff, economical possibilities etc.);
- There is a representative body coordinating the pharmacy programme;
- The programme is planned with all the relevant stakeholders (physicians included) and supported by influential bodies (Ministry of Health, etc.);
- Local interprofessional co-operation is encouraged; and
- Continuous (preferably interprofessional) education is organised and available on a regular basis.

4.3.8 References

1. Alakoski A, Dormischian T, Koskinen K, Saarikallio E, Teinilä T, Airaksinen A, Peura S. Community pharmacists' involvement in the National Development Programme for the Prevention and Care of Diabetes (DEHKO) (in Finnish, abstract in English). *Dosis* 3/2011, s.111-121.
2. Bousquet J et al. ARIA Phase 4 (2018): Change management in allergic rhinitis and asthma multimorbidity using mobile technology. *J Allergy Clin Immunol*. 2018 Sep 28. pii: S0091-6749(18)31359-9.

3. Hahtela T, Valovirta E, Kauppi P, Tommila E, Saarinen K, von Hertzen L, Mäkelä MJ, The Finnish Allergy Programme Group. The Finnish Allergy Programme 2008-2018 – scientific rationale and practical implementation. *Asia Pac Allergy*. 2012 Oct; 2(4): 275–279.
4. Heikkilä JH, Parkkamäki S, Salimäki J, Westermarck S, Pohjanoksa-Mäntylä M, Community pharmacists' knowledge of COPD, and practises and perceptions of medication counseling of COPD patients, *Int J COPD*, 2018, 13: 2065-2074
5. Kleme J, Himberg K, Vanhanen J, Pohjanoksa-Mäntylä M, Backas L, Airaksinen M, Peura S. A review of the research on the National Heart Programme in Finnish community pharmacies – how well the programme's goals have been met? (in Finnish, abstract in English). *Dosis 3/2011, s.125-139*.
6. Kurko T, Salimäki J, Airaksinen M, Silén S-M, Pietilä K. The development and importance of Finnish community pharmacies' involvement in smoking cessation in 1985-2011 (in Finnish, abstract in English). *Dosis 3/2011, s.125-139*.
7. Mononen A, Niskanen A, Nummi S, Nyqvist L, Kurko T, Peura S, Salimäki J. Implementation of the National Asthma Programme in Finnish community pharmacies (in Finnish, abstract in English). *Dosis 3/2011, s.100-112*.

4.4 Germany

4.4.1 Legal Framework

Germany has about 80 million inhabitants, with 70 million covered by statutory health insurance, five million covered by private insurance and another five million insured via state aid. Health insurance is mandatory in Germany. Prices for prescription medicines are regulated and are identical all over the country. German pharmacies are regulated by the German Pharmacies Act that specifies the responsibility of community pharmacists as “the proper supply of medicinal products to the population”.

One individual holding a German licence to practise as a pharmacist can own up to four community pharmacies (a main pharmacy and three branches) and requires a permit from authorities to operate them. Pharmacy chains are forbidden in Germany, as is third-party ownership. The country has about 20,000 community pharmacies, and there are about 24 community pharmacies per 100,000 population and 384 hospital pharmacies in total.

In hospital pharmacies, pharmacists must inform physicians on pharmaceuticals, especially with regards to purposeful and economical pharmaceutical therapy. This also applies to outpatient pharmaceutical care.

The Federal Union of German Associations of Pharmacists (ABDA) is the umbrella organisation of 17 chambers and 17 associations of pharmacists and the professional representation of about 60,000 German pharmacists.

The Federal Chamber of Pharmacists supports pharmacists to provide pharmaceutical services such as prevention or medication management through guidelines and work aids. These guidelines reflect the current state of science and technology and should be read as a recommendation to support a consistent quality of service delivery. Additional services, which are carried out in the pharmacy, are not standard services, for which the pharmacies are remunerated by the statutory health insurance. German legislation (Social Insurance Code, Book 5, SGB V) in its current version does not allow for an extended role for community pharmacists.

4.4.2 Prevention

German community pharmacies are often organised in cooperatives with a joint marketing system. On official days, such as World Diabetes Day, World Osteoporosis Day and World AIDS Day, the cooperatives organise numerous health actions that are conducted in pharmacies, for instance using the FIND-RISK test for diabetes prevention, conducting ultrasound densitometry bone tests or advising on how to prevent HIV infections, or testing for atrial fibrillation. Some action days are also organised country wide by ABDA, supporting the participating pharmacies with campaign materials and information packages.

Many pharmacies in Germany offer screening and related advice in the areas of blood pressure measurement and body mass index determination, LDL, HDL, total blood cholesterol, triglycerides and glucose. If necessary, patients are referred to the treating physician after the consultation. Pharmacies might also offer nutritional advice and assistance with smoking cessation. All services are offered on a self-pay basis.

The Bavarian Chamber of Pharmacists founded the Scientific Institute for Prevention in Health Care (WIPIG) in July 2007. The intention was to promote the idea of prevention in society and politics and to develop new prevention concepts. For this, the Institute creates various action packages, information materials, training and publications for pharmacists. Furthermore, the possibilities of the public pharmacy in the field of prevention and health promotion are explored.

4.4.3 Therapy and disease management

Every patient who regularly receives more than three prescription medicines is entitled to a medication plan. This plan is identical nationwide and is issued by the attending general practitioner in paper form. If the patient buys non-prescription medicines from a pharmacy, the pharmacist can update the medication plan (also by hand), if necessary, from his or her perspective.

For every prescription, the prescribed drugs are checked for interactions using pharmacy software. Contraindications are resolved together with the prescribing physician. Extended offers are medication analysis and medication management, which are described in the respective guidelines of the Federal Chamber of Pharmacists.¹ The medication analysis evaluates manifest and potential drug-related problems, develops possible solutions to these problems, and establishes an agreement with the patient and the attending physician. For medication management, this activity is carried out continuously. The goals are to minimise drug risks and increase the effectiveness of drug therapy.

4.4.3.1 Discrepancies on medication plans detected in German community pharmacies

Participants in a medication safety course evaluated medication plans from their patients during the performance of medication reviews in community pharmacies. Discrepancies were defined as additional or missing medicines, deviations in dosage and medicine names for prescription medicines, and missing or additional non-prescription medicines. Eighty percent of the patients had their medication plan written only by the general practitioner, thus it revealed discrepancies in the medicines used by the patients. Community pharmacists offering medication reviews have an essential position to use the medication plan as a central link between patients and their prescribers, and therefore improve patient safety. Deviations from the plan were observed frequently with antihypertensives (31.4%), analgesics (11.3%) and antidepressants/hypnotics as well as lipid-lowering medicines (6.7%). A total of 433 non-prescription medicines were not listed, mainly analgesics, mineral supplements and laxatives.²

4.4.3.2 WestGem project: Selection of eligible patients for medicines use review

In the WestGem project the acceptance of the prescribing general practitioner to implement pharmaceutical recommendations was measured, factors influencing physicians' acceptance were explored and evidence-based criteria for the selection of patients eligible for medicines use reviews were identified. The first step in patient selection could be the number of medicines in use and medicines reconciliation. Longitudinal patient care should be preferred over single medicine reviews. The project was well accepted by physicians.³

4.4.3.3 ATHINA: Medicines safety in community pharmacies

ATHINA is a medicines safety project in German community pharmacies that is endorsed by four chambers of pharmacists in Germany. It consists of a brown bag analysis and consultation on drug-related problems. From 2012 to 2015, 241 pharmacists documented 912 medicines reviews with an average of 10.8±3.6 medicines. In 75.7% of cases, the pharmacists could document a solution for the drug-related problem. The project is ongoing.⁴

Traditionally, German pharmacies also offer various services such as home delivery, night-time and emergency services and individual compounding (individually prepared parenteral solutions, cytostatic preparations, methadone preparations and standard formulations).

4.4.3.4 5 GLICEMIA 2.0

WIPIG and the Friedrich-Alexander-University Erlangen-Nürnberg developed a structured programme with a focus on secondary and tertiary prevention in type 2 diabetic patients by pharmacists, i.e., trying to detect the disease early and prevent it from getting worse; and trying to improve the quality of life of patients and to reduce the symptoms. The benefits and feasibility of the intervention are evaluated in GLICEMIA 2.0, a randomised, controlled trial. In this study, the impact of the intensive pharmaceutical care on the glycaemic

control is of particular importance. The structure and content of GLICEMIA 2.0 is based on the concept of GLICEMIA (2012–2014), a lifestyle intervention programme with focus on primary prevention of type 2 diabetes.⁵ The first results are expected in 2019.

4.4.4 Training

The education of pharmacists in Germany consists mostly of pharmaceutical chemistry, technology and biology with an amount of just 5% of clinical pharmacy that was added to the curriculum in 2001. Even though the education is based on natural sciences, and continuing pharmaceutical education is not mandatory, the majority of German pharmacists attend postgraduate training to learn how to provide good consultations as a community pharmacist or a hospital pharmacist. There are specialisation courses run by the chambers of pharmacists on the following topics that include NCDs: community pharmacy, nutrition, prevention and health promotion, oncological pharmacy and geriatric pharmacy.

The chambers of pharmacists and some universities offer specific courses on medicines therapy management, and some of them (e.g. ATHINA, ARMIN, PHARMADHERE) are or will be scientifically evaluated. Some hospitals started to employ pharmacists in the wards additionally to the traditional hospital pharmacist role.

4.4.4.1 Training certificate for pharmacists

The pharmacy chambers offer nationwide a variety of courses with a certificate on the following topics: asthma, diabetes, cardiovascular disease, cancer, interactions, medication analysis and management, palliative care, and medication management in the hospital for pharmacists on the ward.

4.4.4.2 ApoAMTS

In German, a pharmacy is an “Apotheke”, the abbreviation being “Apo”. Safe drug treatment is abbreviated to AMTS. Owners of ApoAMTS pharmacies and their associates undergo a curricular training as an AMTS-manager. In particular, contents are the implementation of medication management in chronic diseases such as diabetes, asthma, COPD, hypertension, heart failure and numerous other indications. The initiative is currently being carried out in only one federal state (Westfalen-Lippe). From 2012 to 2018, more than 1,000 pharmacists received their certificates. They counted for approximately 400 pharmacies and conducted 5,000 medication analyses. The main problem that arose was non-adherence, explicitly implementing the therapy into everyday life. Quality indicators were identified as follows: Documentation system, standard operating procedure or quality-management guidelines, additional qualification of the pharmacists, fixed appointments with patients, the disclosure of results to patients, and hand-over a final medication plan to patients.⁶

4.4.4.3 PharmAdhere study

Pharmacists who engage in pharmaceutical care need skills to optimise responsible medicines use and improve adherence. A blended-learning programme for community pharmacists that focused on conducting consultations in chronic diseases was developed and evaluated. It consisted of e-learning, face-to-face training and objective structured clinical examinations that were designed to conduct short interventions for either emergency, initiation, implementation of therapy or early detection of frequent chronic diseases such as hypertension, diabetes, depression or conditions that require anticoagulation.

Every consultation was conducted in a maximum of 10 minutes. The sums of the analytical checklist points and the number of correctly answered questions after the e-learning increased significantly ($p < 0.01$). **Participants’ self-evaluation** revealed a major increase in competency after the face-to-face training and their feedback was positive. By combining the methods described above with effective feedback methods, the PharmAdhere study showed that sustainable pharmaceutical care can be delivered in real-time situations.⁷

4.4.5 Use of new technologies

The federally standardised medication plan was introduced in October 2016. It serves primarily to inform polymedicated patients. After a transition phase until January 2019, the medication plan on paper will be replaced by information on the electronic health record.

According to German law, the electronic health record will be introduced by 2021. This will include the possibility of e-prescriptions. At present, pharmacies are prohibited from dispensing prescription drugs if the

patient was not seen by his doctor other than on the internet. The planned amendment is intended to advance tele-medicine further.

In 2011, the Falsified Medicines Directive was published by the European Commission and shall be implemented until 2019. The German initiative to prevent falsified medicines from entering the legal supply chain is called “securPharm”. It is sponsored by all major players in the pharmaceutical distribution chain in Germany, including pharmacists.

The updated “Apothekenfinder” (“Find your pharmacy”) app of the Federal Chamber of Pharmacists offers the location-specific search of German pharmacies during the day, in the evening and on weekends and public holidays (for emergency service).

4.4.6 Collaboration with other healthcare professionals

Interprofessional collaboration is common in hospitals in order to assess the best pharmaceutical treatment for patients or to detect adverse reactions to medicines. In communities, collaboration mainly happens following mistakes that might have occurred when physicians prescribe.

The profession prepares for digitalisation and more collaboration with other healthcare professionals. In January 2018, the German Society for Interprofessional Collaboration in the Health Sector was founded by two pharmacists and a GP. It aims to support the development of tools for interprofessional collaboration.

4.4.6.1 ARMIN project

The ARMIN project (Arzneimittelinitiative in Sachsen und Thüringen) was carried out over four years until the end of 2018 by the statutory health insurance associations of Saxony and Thuringia, the Saxon and Thuringian Pharmacists' Associations and the payer AOK PLUS. The goal of the project was to increase the quality of the drug supply by improving the safety of drug therapies and adherence to treatment, while at the same time reducing health expenditure through close collaboration between physicians and pharmacists. The implementation of appropriate modules in the primary software of both healthcare professionals is required to make the system work. The main focus is on better care for multimorbid AOK PLUS patients with polymedication. In this project, the electronic medication plan had already been implemented. The main points of ARMIN were:

- An active substance regulation, which promotes the prescription of active substances instead of specific products;
- A drug-related medication catalogue setting out the means of choice for care-related indications; and
- A medication management system that repeatedly analyses the total medication of an insured person, including self-medication.

The project has not been evaluated yet. Further project details can be found (in German) at www.arzneimittelinitiative.de.⁸

4.4.7 Main limitations and challenges

In their policy paper for “Pharmacy in 2030”, German pharmacists formulated their vision of the role of the pharmacist for the healthcare system of the future.

Pharmacists have launched initiatives to improve counselling in the pharmacy and to expand cognitive services, such as medicines reconciliation or medicines use management. However, there is no reimbursement for these pharmacy services yet.

The major challenge in Germany is the increasing number of elderly, multimorbid patients and at the same time the reduced number of healthcare professionals, especially general practitioners, in rural areas.

Another issue is the delivery of prescription medicines to German patients through the internet from non-German pharmacies, with German payers covering this service. This is a problem because medicines need to

be sold at a fixed price by German pharmacies but might be sold for less in other countries, meaning that German pharmacists are not allowed to compete in their own country.

4.4.8 References

1. Federal Union of German Associations of Pharmacists. Leitlinien und Arbeitshilfen. <https://www.abda.de/themen/apotheke/qualitaetssicherung0/leitlinien/leitlinien0/> [Accessed 24 January 2019]. German.
2. Waltering I, Schwalbe O, Hempel G. Discrepancies on Medication Plans detected in German Community Pharmacies. *Journal of evaluation in Clinical Practice*, Volume 21, Issue 5, October 2015, Pages 886–892
3. Rose O, Mennemann H, John C, Lautenschläger M, Mertens-Keller D, Richling K, et al. Priority Setting and Influential Factors on Acceptance of Pharmaceutical Recommendations in Collaborative Medication Reviews in an Ambulatory Care Setting - Analysis of a Cluster Randomized Controlled Trial (WestGem-Study). *PLoS One*. 2016 Jun 2;11(6):e0156304. doi: 10.1371/journal.pone.0156304. eCollection 2016. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27253380> [Accessed 9 July 2018]
4. Seidling HM, Send AF, Bittmann J, Renner K, Dewald B, Lange D, et al. Medication review in German community pharmacies - Post-hoc analysis of documented drug-related problems and subsequent interventions in the ATHINA-project. *Res Social Adm Pharm*. 2016 Oct 24. pii: S1551-7411(16)30206
5. Schmiedel, K., et al., Effects of the lifestyle intervention program GLICEMIA in people at risk for type 2 diabetes: a cluster-randomized controlled trial. *Diabetes care*, 2015. 38(5): p. 937-939.
6. Waltering I, Scheppe 2, Kurth V, Jaehde U, Hempel G. Development of quality-indicators for medication reviews Type 2 a. PCNE Symposium 2018, Fuengirola, Spain; Poster.
7. Laven A, Deters M, Rose O, Smaranda A, Schwender H, Waltering I, et al. Efficient pharmaceutical care interventions to enhance drug adherence – How to train community pharmacists (PharmAdhere Study). *Int J Clin Pharm* (2018) 40: 1317.
8. Kassenärztliche Vereinigung Sachsen. <https://www.arzneimittelinitiative.de/it-umsetzung/it-vertragsschnittstelle/> [Accessed 24 January 2019]. German.

4.5 India

4.5.1 Legal framework

The role of community pharmacists in India is slowly evolving. Currently pharmacists are seen more as shop traders than as healthcare professionals.

There are approximately 700,000 pharmacies in the country and the presence of pharmacists is required by law. However, in many pharmacies, especially in certain parts of the country, there isn't always a pharmacist on duty.

The level of education of large number of community pharmacists is a Diploma in Pharmacy, which is a two-year programme.

The sale of medicines is the main activity and patient care services or the concept of pharmaceutical care are not yet established. Pharmacy Practice Regulations 2015 (PPR 2015), released by the Pharmacy Council of India, have laid the foundation for the healthcare role of the pharmacist. However, the level of implementation is very low. If these regulations are implemented, they will help in developing the patient counsellor role of the pharmacist. But it may take a very long time.

The Indian Pharmaceutical Association (IPA) and some other organisations consistently advocate for the healthcare role of the pharmacist.

The IPA is also advocating for the role of pharmacists in the National Health Programme for NCDs and is in discussion with the Government of India about the same. India, being the diabetes capital of the world, needs efforts to control this epidemic. Pharmacists can play a role in early detection, awareness, treatment monitoring and adherence. The IPA will be soon start the training of community pharmacists for cancer awareness and referral.

Conducted training programmes for pharmacists by the IPA and various State Pharmacy Councils, in order to develop their role in the management of diabetes and other NCDs, are one example of the work in this field.

4.5.2 Prevention

Some pharmacists do clinical measurements such as blood pressure measurement and blood glucose measurement and help in early detection of these conditions. The IPA has an annual National Pharmacy Week (NPW). In 2016, the theme of the NPW was “Pharmacists for healthy India: Role of pharmacist in diabetes management”. The NPW was conducted by the IPA, pharmacy colleges, pharmacists and pharmacy councils all over India to create awareness about the theme.

4.5.3 Therapy and disease management

Pharmacy’s role in therapy and disease management is still evolving. Only a handful of pharmacists have started doing blood glucose measurements, distributing leaflets, counselling on medication adherence and diet.

4.5.4 Training

Through the pharmacy curriculum, depending on the level of education (diploma, degree or doctorate) budding pharmacists do learn about NCDs, point-of-care tests and clinical measurements.

The State Pharmacy Councils, Indian Pharmaceutical Association and some other organisations conduct training programmes for practising pharmacists to educate them about their role in the management of diabetes. Pharmaceutical companies also sometimes conduct such training.

4.5.5 Use of new technologies

Use of new technologies continues to evolve.

4.5.6 Collaboration with other healthcare professionals

No collaborative healthcare models have been developed yet.

4.5.7 Main limitations and challenges

There are several barriers and challenges to establish the role of pharmacists in healthcare in India. Until now neither pharmacists, nor Government, nor consumers/patients have realised the key position of pharmacists in health care. In recent times, engaging pharmacists in the National Tuberculosis Control Programme was an IPA-led initiative with support of other stakeholders which was successful and reached a national scale. This public-private partnership showed the unutilised potential of pharmacists in public health.

There is wide scope to create a favourable ecosystem to improve community pharmacy practice in the country. Improvement in pharmacy education, strong enforcement of existing laws, raising consumer awareness about the role of pharmacists and rigorous continuing professional development programmes are some of the measures needed. Good Pharmacy Practice needs to be implemented as a mandatory requirement.

PPR 2015 have not yet been implemented in their true sense.

4.5.8 References:

- National Pharmacy Week 2016, http://www.ipapharma.org/html/NPW_2016.html
- Pharmacists at the Frontlines: A Novel Approach at Combating TB, The DOTS TB Pharmacist Project, Publication by Indian Pharmaceutical Association, December 2017. Available from: <http://www.ipapharma.org/pdf/IPA%20Pharmacists%20at%20the%20Frontlines%20%20A%20Novel%20Approach%20at%20Combating%20TB%20Report%20Insidewww.pdf>
- Pharmacy Practice Regulations 2015: Published by Pharmacy Council of India, January 2015. Available from: <http://www.pci.nic.in/pdf/Pharmacy%20Practice%20Regulations.pdf>
- Patient Counselling Course for pharmacists: <http://dic.mspsindia.org/Pages/PCCNote.aspx>

4.6 Lebanon

4.6.1 Legal framework

Between 1997 and 2007, the Lebanese Ministry of Public Health (MOPH) established a National NCD Programme (NCDP). The MOPH was able to launch several periodic awareness and prevention campaigns, and to gather stakeholders around drafts of national control plans for cancer and cardiovascular-metabolic diseases.

The NCDP was replaced after 2007 by a number of disease-specific “national committees” with members nominated by ministerial decree.

The MOPH has been providing medicines at no cost to patients with cancer and other serious diseases since 1989. The MOPH also provides essential medicines for chronic diseases, including diabetes, hypertension, heart disease and osteoarticular conditions, through a network of nearly 200 accredited primary healthcare (PHC) centres across the national territory.

The MOPH continues to support a National Tobacco Programme by appointing a full-time staff member to run daily activities.

The Lebanese NCD Prevention and Control Plan (NCD-PCP) 2016–2020¹ was launched in January 2016. It sets out five Lebanese Strategic Objectives (LSOs):

1. Cooperation with the non-health sectors
2. Primary NCD prevention as public health policy
3. Preventive activities at all levels of health care, and not just at the primary care level
4. The promotion of quality NCD research
5. Development of surveillance systems able to monitor trends in NCDs and their risk factors and the impact of prevention and control interventions

Unfortunately, this plan relies on PHC physicians working under the MOPH and on other healthcare providers, except pharmacists.

The only role for community pharmacists during different MOPH campaigns has been to display posters distributed by the ministry about the specific campaigns, such as the breast cancer campaign or the smoking cessation campaign.

The MOPH deals with raising awareness among the public through different campaigns such as:

- National Campaign for the Prevention of Obesity and Kidney Diseases (2017); awareness materials included a flyer and a booklet on how to prevent obesity and kidney diseases, what to eat and not eat, etc.
- Tobacco Programme, World No Tobacco Day (31 May 2017)
- National Campaign for Cardiovascular Disease Prevention (2016); awareness materials included a flyer on how to prevent cardiovascular diseases
- National Breast Cancer Day

4.6.2 Prevention

Even though the MOPH did not include pharmacists in their action plans, pharmacists continue to play a role in the prevention of NCDs in two different ways (see below).

4.6.2.1 Activities by private community pharmacies

The major problem in community pharmacy is that services offered by pharmacists are free of charge and not reimbursed. For this reason, pharmacists cannot give their full time to the awareness and prevention of NCDs.

Nevertheless, they are offering different services in the pharmacy, such as:

- Reading laboratory results and advising patients on what to do
- Helping patients to use their inhalers, and to inject their insulin
- Injecting subcutaneous medicines for multiple sclerosis patients (demonstration of injection technique)
- Monitoring cardiac patients by measuring arterial pressure
- Monitoring diabetic patients through medicines and health management

4.6.2.2 Activities by pharmaceutical companies

Campaigns sponsored by pharmaceutical companies were:

- Diabetes campaigns: Awareness day held in community pharmacies to measure, free of charge, postprandial blood glucose levels, with distribution of flyers and brochures to patients. Repeat for one week, then refer to physician.
- Heart disease campaigns: Awareness day held in community pharmacies to measure, free of charge, blood pressure and refer to physician patients with abnormal levels.

4.6.3 Training

The Lebanese Order of Pharmacists (OPL) deals with the education of pharmacists. Under the umbrella of continuing education, the OPL offers live sessions about NCDs. The latest courses included:

- The Lebanese Society of Medical Oncology's 14th National Forum, which included a session for pharmacists (April 1, 2017)
- Diabetes (2017)
- Asthma (2017)
- Cardiovascular diseases (2017)
- Hyperlipidaemia and hypertension (2017)
- The American University of Beirut Medical Centre's Breast Cancer Conference (February 2018)

4.6.4 Therapy and disease management

Recently, Lebanese law obliged hospitals to integrate clinical pharmacists as members of their healthcare staff. Their number is relative to the hospital's number of beds. This step will give pharmacists a greater involvement in patient management both during their hospital stay and just before discharge, since those pharmacists are responsible for guiding patients in their therapies when they will be at home.

4.6.5 Use of new technologies

The OPL is taking steps towards the application of new technologies to assist both pharmacists and patients in the management of medicinal therapy. Indeed, the announcement of the "Lebanese Advanced Patient Profile" (LAPP) was made during the opening of OPL's 25th Annual Pharmacy Congress on 17 November 2017.

The LAPP online platform offers access to patients' information required by community and hospital pharmacists to help them better follow up their patients through the provision of medication therapy management services at a later stage.

The Medication Safety Online Platform will be used by community and hospital pharmacists so they can enhance their key role in the practice of medication safety.

At the same time, the MOPH is also considering the e-health record in order to follow the newest technologies to meet needs of both patients and healthcare providers.

The MOPH announced that it will start to apply the 2D Data Matrix^{2,3} on pharmaceutical products, given the importance of this project for the development of the health system, by tracing medicines and combating counterfeiting in order to ensure the safe provision of medicines to patients. The pilot phase started in January 2018 on the information system through a mechanism that consists of tracking the medicine from manufacturing to storage, distribution and provision to patients. During 2018, there was a pilot phase and participation in this e-record was not mandatory for pharmacists but rather an invitation.

4.6.6 Collaboration with other healthcare professionals

Unfortunately, physicians are not cooperating in the health sector with pharmacists. They consider them as only medicines dispensers and refuse sometimes their interventions in dosage corrections or any other interventions.

A study⁴ conducted in Lebanon to assess patients' attitudes towards community pharmacists' role showed that:

- Public perception and attitude toward community pharmacists in Lebanon is poor despite highly qualified pharmacists.
- The MOPH, along with the OLP, should educate pharmacists about working on the different issues patients complain about, in order to play a more important role in society and become the number one trusted healthcare professional.
- In hospitals the collaboration between physicians and pharmacist is better but has the potential to be much improved.

4.6.6.1 Chronic Care Centre

The Chronic Care Centre is a medico-social institution specialising in the treatment and follow-up of childhood chronic diseases: thalassemia and type 1 diabetes. It offers educational sessions to help patients meet, learn and correct misconceptions about diabetes. There is a pharmacist at this centre.

4.6.7 Main limitations and challenges

The MOPH must make some progress in involving pharmacists in its health programmes. It must also highlight the importance of the role of pharmacists in the healthcare sector, especially because they are in constant contact with patients.

The OPL must play an important role in promoting pharmacists as a cornerstone of healthcare management.

4.6.8 References:

1. Ministry of Public Health, Republic of Lebanon. Non-communicable diseases: Prevention and control plan (NCD-PCP) Lebanon 2016-2020 [Internet]. Beirut: Ministry of Public Health, 2018. Available from: <https://www.moph.gov.lb/en/view/3691/non-communicable-diseases-prevention-and-control-plan-ncd-pcp-lebanon-2016-2020>. [Accessed 10 July 2018]
2. Ministry of Public Health, Republic of Lebanon. Announcement Regarding the Implementation of 2D Data Matrix Barcode on Pharmaceutical Products [Internet]. Beirut: Ministry of Public Health, 4 December 2017. Available from: https://moph.gov.lb/en/DynamicPages/view_page/15109/29/announcement-regarding-the-implementation-of-2d-data-matrix-barcode-on-pharmaceutical-products. [Accessed 10 July 2018]
3. Mrad, LA. Track & Trace Solutions for pharmaceuticals using 2D barcode [Internet]. Beirut: Ministry of Public Health, 6 June 2016. Available from: https://www.moph.gov.lb/DynamicPages/download_file/3021. [Accessed 10 July 2018]
4. Iskandar K, Hallit S, Bou Raad E, Droubi F, Layoun N, Salameh P. Community pharmacy in Lebanon: A societal perspective. *Pharmacy Practice* 2017 Apr-Jun; 15(2):893. Available from: <https://doi.org/10.18549/PharmPract.2017.02.893>. [Accessed 10 July 2018]

4.7 Nigeria

4.7.1 Legal framework

The Pharmacists Council of Nigeria (PCN) regulates and controls the practice of pharmacy in all its ramifications in the country. This includes enforcing the tenets of the code of ethics. All these are under the PCN decree No. 91 of 1992.

The PCN Bill of Nigeria 2016 submitted to the legislative body for passage into law (still a work in progress) only stipulates that all ethical drugs can only be dispensed and sold by pharmacists and that a pharmacist cannot dispense dangerous drugs, except under a prescription issued by a licensed medical practitioner. The Bill is silent on whether a prescription medicine can be sold or dispensed without a prescription from the patient. It is also silent on what specific pharmaceutical care should be given when managing diseases. What this then implies is that refills of chronic medicines can and do take place without an actual prescription from the patient and so limits proper patient tracking by the community pharmacist unless special initiatives are set up to do so.

The Association of Community Pharmacists of Nigeria (ACPN) is a technical arm of the Pharmaceutical Society of Nigeria and it is an association of all pharmacists practising in the community setting.

In Nigeria, the Consumer Protection Council and the Nigerian Medical Association (NMA) have begun a process for the formulation of an acceptable guide to regulate interactions between patients and healthcare personnel in the country. The proposed guide — to be known as “**Patients’ Bill of Rights**” — will identify rights and privileges in a patient-care giver relationship for the protection of consumers. This Bill is driven by the NMA and so is geared towards regulating the doctor-patient care relationship. No similar Bill is being sponsored for pharmaceutical care.

4.7.2 Prevention

In Nigeria, NCDs account for 24% of deaths according to WHO data from 2014.¹ Hypertension is the most common cardiovascular disease in Nigeria with prevalence rates of about 23.9% for both sexes in 2015.² The prevalence of diabetes (measured as the percentage of the population with fasting glucose ≥ 7.0 mmol/L) was estimated at 6.2% in 2014.³

Chronic respiratory diseases (CRDs) affecting both children and adults are common in Nigeria. There are no data on the national prevalence of CRDs. These conditions are rarely diagnosed (apart from asthma), as experts in this field are scarce in the country.

The prevalence of cancer is on the increase and this problem is further compounded by the lack of integration of routine screening into the primary healthcare system. The majority of cancers in Nigeria are diagnosed at a very late stage and there are few centres offering radiotherapy and other oncology services.

The NCD desk in the Ministry of Health (MOH) rolled out a National Strategic Plan of Action on NCDs (NSPAN)⁴ in 2015, aimed at promoting steps for preventing NCDs. Nigeria has, however, been faced with some major barriers to tackling NCDs. These include: inadequate funding of NCD related programmes and activities; poor legislation and enforcement of laws linked to the prevention and control of NCDs; and a weak health system.

To support the NSPAN, the Government signed into law the National Tobacco Control Bill in 2015 and the National Nutrition Guideline on Prevention and Control of NCDs.

The strategic plan recognises the role that all stakeholders must play, including healthcare practitioners, but does not specify the activities required of community pharmacists in NCD prevention. The plan identifies the usual risk factors for NCDs and promotes their control, e.g., tobacco use, excessive alcohol consumption, physical inactivity and an unhealthy diet, and sets aside funds to mark the various world health days on diseases.

4.7.3 Therapy and disease management

Almost all current medicines in the treatment of hypertension and diabetes — like calcium channel blockers and angiotensin II receptor blockers for hypertension (often in combination with a diuretic), and biguanides and sulphonylureas — are used, although there is a growing usage of DPP4 inhibitors and other innovative medicines by practitioners in the country. There are, however, limited therapies for cancer and respiratory diseases.

Since affordability is a major challenge in Nigeria with less than 5% of the population covered by the National Health Insurance Scheme, out-of-pocket expenditure for health care is high and there is, therefore, an equally high tendency for patients and even physicians to choose non-innovative/cheaper generics.

Pharmacists are, therefore, sometimes pressured by patients to switch prescriptions to either cheaper generics or to other therapies. The latter happens less frequently when innovative therapies have been prescribed or specified by the physician; instead, the patient is counselled to return to the doctor for a switch in therapy when it is impossible to fill the prescription. When the pharmacist is able to convince the patient to purchase a newly prescribed medicine, there is usually a higher risk of drop-off by these patients when they cannot afford subsequent refills of the prescription, as community pharmacists have limited powers to switch prescriptions for chronic medicines.

4.7.4 Training

There is no specific training given to community pharmacists beyond undergraduate teaching. Part of the Bachelor of Pharmacy curriculum, however, includes some courses in clinical pharmacy, which aims to address various diseases that could be encountered in the clinical setting.

Community pharmacists rely on the basic knowledge acquired at pharmacy school, self-paced further education and update courses from pharmaceutical companies to keep abreast of recent trends in the management of diseases, including NCDs. They are, however, almost exclusively refillers of prescriptions.

4.7.5 Use of new technologies

As stated above, generally, the training of a pharmacist in Nigeria does not often include the use of routine diagnostic tools at the BPharm level. With the introduction of the Doctor of Pharmacy programme in some schools and developments in pharmacy education, community pharmacists have acquired knowledge on how to use diagnostic tools. This is, however, still at suboptimal levels and so there is no standardisation of the pharmaceutical care on NCDs provided by community pharmacists, with every community pharmacist trying to innovate when given the opportunity.

There are some key pharmacies in Nigeria which are thought to be at the forefront of pharmaceutical care practice in the country. They are considered high end, catering to the more informed middle to upper class patients who are more demanding of better care. Services provided by these pharmacy chains include but are not limited to asthma support services, body mass index determination, blood glucose tests, blood cholesterol tests, heart health checks, etc. These are offered to patients free of charge or for a nominal fee.

In addition, many community pharmacies work closely with laboratories which use basic to semi-advanced methods of conducting these tests. Again, multinational corporations are involved in upskilling the knowledge and capacity of pharmacists and laboratories by providing grants to purchase medical and diagnostic devices and training them on usage of these tools.

4.7.6 Collaboration with other healthcare professionals

The physician-to-patient ratio in Nigeria varies depending on who is being quoted but, according to the NMA, the ratio is about 1:4,000 patients. What this means is that there is a certain lack of optimal care given to patients at the physician level and the onus lies on pharmacists to bridge the gap.

There have been talks of some community pharmacies (through the ACPN) having a GP referral network where patients can be referred to based on symptoms described, but this has not yet been conceptualised.

Some community pharmacies have tried to differentiate themselves by offering further care to patients but there is no regulation structuring how this is to be done in Nigeria.

There is a new development for community pharmacy practice in Nigeria with the advent of the Community Pharmacy Action (COPA) initiative. This is an initiative by the ACPN to promote excellence and best practice in pharmaceutical care with a view to grading facilities in line with prescribed standards.

The COPA Centre brand will be given to any community pharmacy that has been graded by the committee using standards designed and agreed upon by the PCN and the ACPN, and with technical support from the Howard University Global Initiative of Nigeria. There will be three categories of COPA Centres, with level 3 being the highest score for a centre with the most services, which includes in-store preparations of extemporaneous preparations.

The pilot started with three pharmacies in Lagos. Results are being assessed and will be presented to the ACPN's general assembly for phased roll out across Nigeria

There are, however, no parameters specific to pharmaceutical care of diseases beyond ensuring that the pharmacist stocks the latest medicines in good conditions.

There is also no Government policy supporting this, so there are no consequences of not being COPA-graded. It is only wished that ACPN members will strive to improve their community practice because the benefits of the branding will come with some form of public awareness for patients to look out for COPA-branded vs non-branded establishments.

4.7.7 Main limitations and challenges;

Apart from the barriers and challenges discussed above, others include:

- Lack of knowledge on current trends in management and prevention of NCDs;
- Lack of will to innovate/differentiate services by the community pharmacist;
- Lack of focus and workable policies on pharmaceutical care driven by the regulatory authorities;
- Lack of manpower to handle patient influx;
- Limited time to take care of the multitude of patients; and
- Lack of infrastructure — space, medical devices, medical books etc.

4.7.8 References

1. World Health Organization. Noncommunicable Diseases (NCD) Country Profiles – Nigeria [Internet]. Geneva: World Health Organization, 2014. Available from: http://www.who.int/nmh/countries/nga_en.pdf?ua=1 [Accessed 12 July 2018]
2. World Health Organization. Global Health Observatory, Raised blood pressure (SBP \geq 140 OR DBP \geq 90), age-standardized (%), Estimates by country [Internet]. Geneva: World Health Organization, 2017. Available from: <http://apps.who.int/gho/data/view.main.2464ESTSTANDARD?lang=en>. [Accessed 12 July 2018]
3. World Health Organization. Global Health Observatory, Raised fasting blood glucose (\geq 7.0 mmol/L or on medication)(age-standardized), Estimates by country [Internet]. Geneva: World Health Organization, 2017. Available from: <http://apps.who.int/gho/data/node.main.NCDRGLUCA?lang=en> [Accessed 12 July 2018]
4. Ministry of Health, Government of Nigeria. National Strategic Plan of Action on NCDs (NSPAN) [Internet]. Abuja: MoH Nigeria, 2015. Available from: <https://www.medbox.org/nigeria-national-strategic-plan-of-action-on-prevention-and-control-of-non-communicable-diseases/download.pdf>. [Accessed 12 July 2018]

4.8 Portugal

4.8.1 Legal framework

In 2007, Portuguese law extended the scope of **services provided by pharmacies**, reinforcing pharmacists' involvement in public health. Several services were included, such as information campaigns, health education programmes, screening activities, pharmaceutical care programmes, provision of first aid, domiciliary/home support, medicines and vaccines administration.¹

In April 2018, the services that can be provided by pharmacies were again updated through Governmental Decree Portaria no. 97/2018, of 9 April. The new regulation defined pharmaceutical services and health and wellbeing services in community pharmacies, and added new activities such as nutrition consultation, nursing care, point-of-care tests for detection of HIV, hepatitis B and hepatitis C, automated dose dispensing, adherence and therapeutic management.²

The Portuguese government and health authorities are developing NCD policies, strategies and action plans in different areas: cardiovascular diseases, cancer, chronic respiratory diseases, diabetes, obesity, tobacco and, more recently, for diet and salt consumption. Although these activities are not specific for pharmacists, they can be involved and also can develop strategies aligned with these objectives.³

Portuguese pharmacies are pursuing more engagement with the government, healthcare units and other health professionals to develop activities that can benefit from pharmacists' expertise.

In January 2017, the National Association of Pharmacies (ANF) signed a memorandum with USF-AN (Association of Family Health Units) aiming to define a framework for joint primary care activities involving pharmacists, family doctors (general practitioners) and nurses, to improve the health status of the population. The aims of the agreement include multidisciplinary cooperation among health professionals and increased integration of community pharmacies within the primary care network for better health outcomes.

The scope includes health literacy, quaternary prevention (review of medical prescriptions to identify patients at risk of over-prescription), disease prevention (diabetes, obesity), health promotion and self-care (management of chronic therapy, diabetes).

In February 2017, the Ministries of Health and Finance signed an agreement with the ANF for the implementation of a new framework for the intervention of pharmacies in the scope of the national health policy and strengthening of the Portuguese National Health System.

The agreement foresees the intervention of pharmacies in public health services and experimental programmes in areas such as diabetes, flu vaccination, rational use of medicines particularly in adherence, and management of therapies. Public health interventions provided by pharmacies must be cost-effective. For this reason, it also foresees a contractual framework for the provision and funding for services based on the results of a trial period and the effectiveness, quality and economic evaluation of pharmacies' health interventions. One of the first projects to be tested was the dispensing of antiretroviral medicines by community pharmacies, started in December 2016. Other therapeutic areas, such as some oncology medicines, can be involved based on the patients' **interests and health priorities**. **The evaluation of pharmacies' interventions** will be determined within the scope of the health technology assessment process currently in place in Portugal. Through a protocol to be defined by the national health authorities, pharmacies will contribute to the evaluation of health technologies, providing a network of evidence in real context, namely in the scope of safety and effectiveness.

In March 2017, the ANF and the Portuguese Nurses Society signed a memorandum of cooperation to aim to study how some nursing care services could be available in Portuguese pharmacies. This professional healthcare collaboration aims to promote integration of nursing care in pharmacies, assessing the proper regulation needed and public trust in those interventions. It also aims to evaluate how the network pharmacies can help to disseminate nursing care across the country.

4.8.2 Prevention

Pharmacy interventions in prevention include:

- Assessment of the patient situation, based on symptoms and point-of-care measurements (BMI, blood pressure, glycaemia, cholesterol);
- Healthy lifestyle recommendations; and
- Professional interventions based on protocols, depending on the results of point-of-care tests, and referral to a physician when required.

4.8.2.1 Portuguese prevention campaign in November 2015: World Diabetes Month

The Portuguese campaign against diabetes is an example of an effective prevention and early detection programme of **patient information through community pharmacists**. The pharmacists' role consisted in encouraging people to complete the Findrisk test (International Diabetes Federation) at the pharmacy, promoting healthy lifestyles and recommending a visit to the physician when the score results were above 15 points. The Findrisk test was integrated into the pharmacy software and results were automatically calculated. A total of 295 pharmacies participated in the campaign, with 225 sending data to the ANF. They recruited a total of 7,007 adults, corresponding to an average of 31 adults per pharmacy. Of these, 24.0% had high or very high risk of developing type 2 diabetes within the next 10 years and were referred to a physician.⁴

4.8.2.2 Know your heart values: Health campaign in Portuguese community pharmacies

A “heart values” pharmaceutical intervention was conducted nationwide for six days in May 2010. It consisted of identifying target patients, measuring body-mass index, waist circumference, blood pressure and total cholesterol, calculating cardiovascular risk (SCORE method — Systematic Coronary Risk Evaluation: 10-year risk of fatal cardiovascular disease) and referral to physicians of all patients with measurements above the target values. The results and added-value of the initiative are:

- 1,380 pharmacies participated (50.4% of the ANF's members) with 412 sharing data with the ANF;
- 12,930 individuals were offered point-of-care measurements in 412 pharmacies;
- 44.9% of participant patients had a high risk of developing a fatal cardiovascular event within the next 10 years;
- A high proportion of patients under medication for hypertension and hyperlipidaemia with blood pressure and total cholesterol were above target values (140/90mmHg and 190mg/dl); and
- A high percentage of patients with blood pressure (37.6%) and total cholesterol (65.4%) above reference values had no pharmacological therapy.⁵

4.8.2.3 Smoking cessation national campaign: Portuguese pharmacies help smokers quit

Pharmacists' intervention in a smoking cessation campaign consisted of identifying patients who wanted to stop smoking, monitoring carbon monoxide and addiction levels, and developing a quit plan with all the information and support to maintain the smoking cessation status over time, with relevance to the provision of non-prescription medicines, whenever required. Individuals aged 18 and above who decided to quit smoking between May and September 2006 were invited to participate and pharmacies shared data with the ANF until November 2006. The results of the initiative are the following:

- 1,202 smokers expressed willingness to quit smoking and were offered a smoking cessation service in 162 pharmacies;
- The average age was 41 years (CI 95%: 40.6–42.1);
- The average time between date of initial approach and quit day was four days;
- The percentage of smokers who remained non-smokers at three months was 69.3% (CI 95%: 64.3%–74.2%); and
- The success rate was 19.1%.⁶

4.8.2.4 Pharmacists' Interventions in cardiovascular disease awareness and assessment

Community pharmacies in Portugal implemented a service that provided sustained interventions aimed at preventing CVDs, ensuring timely identification of people at risk or undiagnosed, and monitoring and promoting adherence to therapy.

The campaign, in May 2016, aimed to raise awareness on cardiovascular risk factors, with attention to modifiable risk factors (such as dyslipidaemia, hypertension, obesity and smoking), to identify individuals at increased risk, and to institute measures for effective control.

Participants were asked about their lifestyle and personal and family history of CVDs. To calculate SCORE (Systematic Coronary Risk Evaluation), participants had their physiological, biochemical and anthropometric parameters measured. Based on the information gathered, the pharmacist provided personalised counselling to each participant.

The results and added-value of the initiative are:

- 1,268 individuals were evaluated;
- 12.0% (n=154) were smokers;
- 48.0% (n=602) and 45.0% (n=564) of the participants had, respectively, total cholesterol and systolic blood pressure values above the reference values;
- 73.0% had an increased body mass index.
- For individuals aged 40 to 65 years old (n=634) the SCORE value revealed a moderate risk for CVD in 59.0% (n=367) of patients, a high risk in 4.0% (n=25) and a very high risk in 12.4% (n=77); and
- 102 participants were referred to the Nutrition Service and 27 participants to the Pharmaceutical Consultation Service.⁷

4.8.2.5 The role of community pharmacists in chronic obstructive pulmonary disease patients' education: Awareness campaign and spirometry tests

As part of the COPD Awareness Month, in November 2014, an awareness campaign on the disease was developed in a group of 82 Portuguese community pharmacies. The campaign sought to increase awareness of COPD symptoms, increase understanding that COPD is a serious but preventable and treatable disease, and to encourage people at risk to get a spirometry test and talk to their doctor. To address the symptoms and select individuals to perform spirometry tests conducted by cardiopneumologists in a scheduled day at the pharmacy, pharmacists applied the "Could it be COPD?" questionnaire, developed by the Global Initiative for Chronic Obstructive Lung Disease.

The main results are:

- 1,177 spirometry tests were performed in 118 pharmacies, for two months (November and December 2014);
- 58.9% (n=417) of the participants for which data were available (n=708), were active smokers; and
- 36.1% (n=421) of the participants were referred to physicians.

Follow-up consultations were carried out in the following years 2014 and 2015, with 207 patients enrolled in a medication management service (pharmaceutical care consultation), whereby practical information about inhalation techniques was provided.⁸

4.8.2.6 Screening and control of chronic obstructive pulmonary disease in community pharmacies

The pharmacists' intervention in a COPD screening and control initiative consisted of applying the questionnaire of the Global Initiative for Chronic Obstructive Lung Disease (GOLD) at the pharmacy. The pharmacist provided pharmaceutical care, regarding proper, effective and safe use of medicines, disease management and monitoring adherence to therapy. The pharmacist intervention model included evaluation of lifestyle, tobacco use and comorbidities. The pharmacist applied the questionnaire of Modified Medical Research Council Dyspnoea Scale (mMRC) to assess the degree of disease control required by patients.

The main results are as follows:

Early detection

- 832 questionnaires adapted for GOLD were performed in 81 pharmacies, during almost two years (July 2015 until June 2017);
- 43% (n=361) of the participants had three or more risk factors; and
- 33.3% (n=277) of the participants were referred to a physician and to other pharmacy services.

Pharmaceutical care

- 393 patients with COPD were evaluated for disease control in 73 pharmacies, during almost two years (July 2015 until June 2017);
- 77.9% (n=306) had mMRC scores greater than zero;
- 387 patients did a respiratory function test and 29.3% had FEV1/FVC<0.70;
- 43.8% of the participants were referred to a physician and to other pharmacy services; and
- Inhaler technique was evaluated in 200 patients, and 31.0% (n=62) of them were not using devices correctly.⁹

4.8.3 Therapy and disease management

Pharmacy interventions in therapy and disease management include:

- Assessment of patients, based on point-of-care measurements;
- Therapy management, including counselling on the correct use of inhaler technique, insulin administration and devices for self-monitoring; and
- Disease management programmes (cardiovascular diseases, asthma and chronic obstructive pulmonary disease and diabetes).

These interventions can be complemented with the administration of medicines (e.g., injections) or using other professionals such as dietitians (an important approach for diseases such as diabetes and cardiovascular disease).

4.8.3.1 Implementation of pharmaceutical care service in community pharmacies: Evaluation of one year of activity

Pharmacists' interventions were focused on patients receiving drug therapy for one or more of the following diseases: hypertension, diabetes, dyslipidaemia, asthma or chronic obstructive pulmonary disease. This study analysed and evaluated several outcomes, such as adherence, blood pressure, glycaemia, total cholesterol, triglycerides, drug-related problems, pharmacist interventions and patient satisfaction.

The main results are listed below:

- 125 patients were integrated in the pharmaceutical care service and 351 appointments were made which corresponds on average to 2.81 ± 0.5 visits per user;
- Patients declared on average 3.21 ± 1.03 diseases, including hypertension (118), dyslipidaemias (106), diabetes (81), COPD (7) and asthma (3).
- The percentage of patients "non-adherent to therapy" were: asthma, 56%; dyslipidaemia, 30%; hypertension 25%; diabetes, 25%; other diseases, 21%.¹⁰

4.8.3.2 Dispensing new medicines in community pharmacy: results from a telephone follow-up pilot testing

In a practice-based study of a pharmaceutical intervention conducted for two months (November and December 2014) in a community pharmacy in Lisbon, Portugal, patients were recruited when they presented a prescription that included a new medicine or a new therapy. The patient was later contacted by telephone to conduct a follow-up.

In order to empower the pharmacy team with the necessary skills to ensure good dispensing practices, including the provision of verbal and written information associated with each medicine, a training activity was run one month prior to the beginning of study.

The use of SIFARMA software was promoted to support professional intervention, patient registration and follow-up information. The main results are below:

- 61 out of the 84 initially identified patients were enrolled;
- 100 medicines were dispensed;
- 91 telephone contacts were made, on average eight days after dispensing;
- 96% of the patients reported being adherent but were not able to describe their regimen spontaneously;
- 55% reported improvement of their symptoms;
- 43% reported not feeling improvements;
- 15% reported new symptoms;
- 20% reported having doubts after starting to use the medicine; and
- Telephone follow-up proved to be a useful procedure in monitoring patients, promoting adherence, fulfilling additional information needs, helping overcoming difficulties and solving situations related to the safety of medicines.¹¹

4.8.3.3 Evaluation of allergic rhinitis and asthma control in a Portuguese community pharmacy setting

Pharmacists can do early detection and identify patients with uncontrolled allergic rhinitis and asthma (ARA), which is an important first step to change patients' knowledge about their disease, and promote the improvement of ARA outcomes.

A study was conducted in the pharmacies of the Portuguese county of Covilhã. Participants were invited to respond to a questionnaire that included the Control of Allergic Rhinitis and Asthma Test (CARAT) if they were aged between 18 and 70 years and presented a prescription for an ARA medicine. The CARAT is a validated tool that assesses control of ARA with disease control scores that range from 0 (worst) to 30 (best) points.

Among the 224 participants, the median CARAT score was 19 (mean = 17.8±5.1), and 87% of participants had a score below 25, indicating non-controlled disease.

Female participants, elderly, and those with less school education responded with scores that demonstrated significantly less disease control.¹²

4.8.3.4 Inhaler technique in older patients with COPD: Pharmacists' interventions

A pharmacy-based intervention for patients with chronic obstructive pulmonary disease (COPD) showed that Portuguese pharmacists can effectively improve inhalation techniques.

The pharmacist intervention model includes:

- Verbal instructions on inhaler technique at first prescription and at each refill;
- Evaluation of patient inhaler technique at least twice a year, based on a checklist tailored according to each device available;
- Identification and correction of errors in inhaler technique using practical explanations, placebo inhalers and leaflets;
- Practical demonstration with placebo inhalers performed by trained pharmacists to correct the observed errors;
- SMS refill reminders and/or requests for evaluation of inhaler technique; and
- Instructions and education on inhaler technique for caregivers.

The results of the interventions were as follows:

- 344 patients were enrolled in 57 pharmacies;

- More than 80% of the patients used Spiriva HandiHalers, and about 10% were using Spiriva Handihalers or Spiriva Respimat for the first time (incident users). Mean time since COPD diagnosis until patients' entrance in the programme was 8.6 years;
- At enrolment, the most frequent error observed was not breathing out completely, for both devices;
- For the patients who completed all three scheduled visits (n=198), the correct-steps score had significantly increased (74.5% to 94.6% for Spiriva HandiHaler and 71.9% to 96.2% for Spiriva Respimat ($p<0.0001$);
- Not repeating the nebulisation was the most frequent error for both devices;
- The final score of the inhalation technique performance was significantly higher at three months and at five months after recruitment ($p<0.0001$); and
- The scores reached at five months were $\geq 95\%$ and may represent the achievement of the correct performance following a structured intervention in pharmacies.^{13,14}

4.8.3.5 National medicines review campaign in the elderly population: Portuguese pharmacies check the brown bag

A “brown bag” campaign aimed to contribute to the proper, effective and safe use of medicines in elderly patients and to raise awareness among pharmacists of the principles of medication therapy management. Patients were invited to bring all their medicines and to schedule an appointment for a medicines review (brown bag). The results and added-value of the intervention were as follows:

- 1,487 pharmacies participated in the campaign, of which 507 (33.6%) shared data with the ANF, for about 5,008 patients;
- The study sample included 39,504 medicines, mostly prescription-only medicines (92.3%);
- The average number of medicines per patient was 7.3 and 25% of patients were on 10 or more medicines, results similar to those found in previous studies;
- The medicines review unveiled problems in 46.8% of patients, mainly in the subset on 10 or more medicines; and
- The main problems identified were poor adherence (22.1%), self-administration problems (21.6%), possible adverse drug events (13.2%), non-intended therapeutic duplication (11.6%) and expired medicines (7.3%).

Pharmacists referred 933 patients (21.3%) to physicians for further evaluation. The number of medicines is a predictor for medicines-related problems ($p<0.0001$).¹⁵

4.8.3.6 Diabetes management programme

People with diabetes were selected by pharmacists if they were taking at least one antidiabetic medicine and had frequent high blood glucose values. Pharmacists reviewed medicines therapy and measured capillary blood glucose values, blood pressure, total cholesterol and body mass index for each patient at scheduled appointments at the pharmacy. The evaluation of the pharmacist's intervention was based on the identification of drug-related problems in the pharmacy, drug-related problems reported to physicians and point-of-care measurements. The main results are as follows:

- 342 patients were included in the study;
- Drug-related problems were identified in 74% of the patients, 63% were reported to the physician;
- Most frequent drug-related problems were non-effectiveness of therapeutic regimens (78.5%) and need for (additional) medicines therapy (18.1%);
- The physician initiated or adjusted medicines therapy in 58% of reported situations;
- Results after six months indicate a significant effect of the intervention: a decrease of 13.5 mg/dl in fasting blood glucose ($p<0.0001$), 34.0 mg/dl in post-prandial blood glucose ($p<0.0001$), 7.99 mg/dl in total cholesterol ($p=0.0021$), 3.39 mmHg in systolic blood pressure ($p<0.0001$), 1.45 mmHg in diastolic blood pressure ($p=0.0001$) and 0.7% in HbA1c ($p=0.0428$); and
- The proportion of initially non-controlled diabetic patients who reached target values after three and six months was 21%.¹⁶

4.8.4 Training

The Post-Graduate School in Health and Management (EPGSG) of the ANF offers a training programme for pharmacists on pharmacotherapy, drug-related problems, communication skills, medication therapy management and disease-specific topics. The objective is to provide skills on these areas to support pharmacists in the provision of pharmacy services.

4.8.5 Use of new technologies

4.8.5.1 Safety in dispensing and medicines' use

A project aimed to contribute to the proper, effective and safe use of medicines and to promote adherence in patients. Reinforcing pharmacists' role in improving adherence and promoting the responsible use of medicines, health products, medical devices and dietary supplements) consolidates the role of pharmacies as gatekeepers for medicines safety and facilitates patients' therapy management. It provides the improvement of pharmacies' value proposition and customer engagement.

The project includes several channels to provide dosage information to the patient (such as labels, coupons, emails and apps). Scheduling SMS text messages as reminders about adherence promotion and refill is also used.¹⁷

4.8.5.2 Mobile applications of Portuguese pharmacists

The application "Farmácias Portuguesas" (Portuguese Pharmacies) offers pharmacy-related services and features for the personal management of some health data, including:

- a) A tool for planning a medicine dosage schedule for the user and/or his/her family members, with features for reminding users of medicine taking times, controlling the frequency of dosage intakes, the amount of medicine taken and the time of the next intake;
- b) Information about medicines and their effective use.
- c) A register of the user's point-of-care measurements, such as body mass index, waist measurement, blood pressure, and cholesterol, triglyceride and glycaemia values. Those parameters are associated with an alarm when the value entered is out of the standard range. The results of the monitoring tests done at the pharmacy can be transmitted automatically by the pharmacy software to the user's mobile phone app.

With this app, users can also find the nearest open pharmacy or a specific service all over the country in a fast and convenient way. The app can also be used to facilitate the purchase of health products or non-prescription medicines and to manage therapeutic plans.^{18,19}

4.8.5.3 Portuguese community pharmacist intervention in adherence programme

An example of an adherence programme is the "Pharmacy-delivered diabetes support programme for JANUVIA/JANUMET patients" through a partnership of Alliance Healthcare, MSD and the ANF. This programme began in October 2016. The duration is 12 months per patient from enrolment. The programme includes three face-to-face pharmacist interventions and 20 scheduled SMS text messages per patient. The pharmacists' face-to-face interventions are remunerated by MSD.

The face-to-face consultations with a pharmacist include counselling, dispensing, offering written information in the form of leaflets, answering questions regarding the proper, effective and safe use of medicines, disease management and the importance of adherence. These are followed by scheduled SMS text message reminders about doses, next face-to-face visit and prescription refills.

Preliminary results indicate that 558 pharmacies are participating and 4,712 patients have been recruited.¹⁷

4.8.6 Collaboration with other healthcare professionals

4.8.6.1 Pharmacists and physicians

4.8.6.1.1 USFarmácia — Collaborative model

Pharmacists, physicians and nurses signed professional protocols supporting common objectives and shared interventions using IT systems. There are several interventions on the USFarmácia collaborative model, such as measurements of parameters, prescription requests, requests for medical appointments and adherence improvement programmes.

These protocols target patients with cardiovascular diseases (cardiovascular risk, hypertension and dyslipidaemia).

The main aim is to contribute to the improvement of patient's health outcomes through the cooperation of all health professionals to ensure care is as seamless as possible. This can be both beneficial for patients and cost-effective.¹⁷

4.8.6.1.2 Diabetes campaign — Calouste Gulbenkian Foundation, **campaign “No to diabetes”**

The “No to diabetes” campaign is an example of an effective prevention and early detection programme, with patient information provided through community pharmacists.

The pharmacists' role consists in encouraging people to complete the Findrisk test (International Diabetes Federation) at the pharmacy and promoting healthy lifestyles. The Findrisk test was integrated into the pharmacy software and the result was automatically calculated. The risk score calculated in the pharmacy software is communicated to the Patient Health Data Platform. The higher risks prompt a contact with the family doctor to make an appointment. There is a collaboration with pharmacists and physicians through technological integration with the pharmacy software (Sifarma), the Patient Health Data Platform and the Primary Care software.

From 14 November 2017 to 1 May 2018, 383 pharmacies from 64 counties invited more than 8,000 non-diabetic people to determine their risk of getting diabetes within the next 10 years (Findrisk). From the resulting 2,007 medical appointments, it was possible to diagnose 190 patients who did not know they had diabetes.¹⁷

4.8.6.1.3 Therapeutic information exchange

A pilot project on therapeutic information exchange started on 10 July 2017, in Viana do Castelo. The project intends to reinforce the interaction between pharmacists and prescribing physicians, creating a unique communication channel between health units. The goal is to promote the correct, effective and safe use of medicines. The communication between pharmacies and primary care centres, or pharmacies and hospital care is through computer systems. A list of predefined therapeutic notes is included in the informatics system and pharmacists can select a note and send it to the prescribing physician. After that the physician will give feedback (useful/not useful) about the therapeutic note sent.¹⁷

Sixty pharmacies were invited to take part in the pilot. In the first four-month of evaluation, 23 pharmacies sent a total of 259 notes (34 pharmacists); 226 notes (87%) were related to non-dispensed medicines and 33 (13%) related to dispensed medicines.

All notes correspond to 205 prescriptions written by 118 different doctors. A total of 33% of pharmacies had a response from the doctor, and 39% were considered useful. **The most frequent note (n=83) was “already had the medicine at home”**. A severe interaction was reported in 12 notes. With the positive feedback on the first phase, improvements were suggested for next stages to reinforce the collaboration of pharmacists and doctors centred on patients. The expansion of the project is being phased in and in March 2018 it was launched in another district of Portugal, Bragança.²⁰

4.8.6.1.4 Clinical impact of a pharmaceutical care programme developed in a Portuguese family health unit: Results of a pharmacist-physician collaboration in the treatment of hypertensive patients

A study was based on evaluating the impact of the pharmacist-physician collaboration on blood pressure levels in patients with hypertension.

The main results were as follows:

- A total of 17 patients with hypertension were enrolled in the pharmaceutical care programme;
- The mean age was 68.50±3.26 years;
- On average, each patient used 6.06±0.93 medicinal products; and
- 13 patients had uncontrolled blood-pressure.

Compared with baseline, the pharmacy intervention contributed to reduce the systolic and diastolic blood pressure by 28.85±5.90 mmHg ($p<0.0005$) and 11.23±2.75 mmHg ($p<0.005$), respectively.

Compared with the control group, the improvements were 18.63±6.44 mmHg ($p=0.011$) in systolic blood pressure and 9.03±2.63 mmHg ($p<0.005$) in diastolic blood pressure.²¹

4.8.6.2 Pharmacists and other professionals: Nurses and nutritionists

4.8.6.2.1 The contribution of community pharmacies to diabetes control: A multidisciplinary approach

A network of 400 independent pharmacies in Portugal (branded “Farmácias Holon”) developed a pharmacy concept that focuses on the development and delivery of multidisciplinary services for chronic disease patients, among them patients with diabetes.

The intervention consists of identifying people at risk and referring them to educational sessions and/or individual screenings, as well as providing pharmacotherapy follow-up. For the early identification of people at risk of developing diabetes, the Finnish Type 2 Diabetes Risk Assessment Form was adapted. Therapeutic follow-up of people with diabetes was carried out within the context of pharmaceutical consultations. Together with the patient and in accordance with the clinical objectives established by the physician, goals were defined and a follow-up plan was drawn up. Strategies were defined for approaching people with diabetes involving a multidisciplinary healthcare team of nurses, podiatrists and nutritionists, who also developed the educational sessions. The main results are as follows:

- A total of 851 participants attended 34 educational sessions organised by pharmacies from January 2016 to June 2017;
- From September 2016 until July 2017, 116 pharmaceutical consultations occurred for 106 patients with type 2 diabetes. Patients reported having an average of 4.9 health problems ($SD=1.9$) and taking an average of 9.2 medicines ($SD=3.4$). One patient reported taking 19 different medicines on a daily basis;
- The most prevalent intervention following consultations was adherence promotion (75.0%; $n=87$), followed by counselling on the correct use of medicines (72.4%; $n=84$) and healthy eating counselling (70.7%; $n=82$);
- The most common referrals were for the nutrition and diabetic foot services (29.3%; $n=34$); and
- In the same period, nurses conducted 3,649 diabetic foot consultations, and nutritionists provided advice and follow-up to more than 180 people who specifically sought the nutrition service for diabetes control.²²

4.8.6.2.2 Diabetic foot service in community pharmacies: A multidisciplinary approach

Diabetic foot is one of the most serious complications of diabetes. There are many advantages of community pharmacists treating diabetic foot, since they are easily accessible by the public. Professionals working in this field must have specific training, and work in a multidisciplinary approach.

The diabetic foot service is performed exclusively for patients with diabetes, and it is provided by nurses. The service includes the following steps: anamnesis; evaluation; onychotomy and skin hydration; self-monitoring education; and referral to relevant health care services.

The main results are listed below:

- From January 2016 to February 2017, a total of 1,225 participants integrated the diabetic foot service at a community pharmacy; and
- A total of 1,213 participants enrolled, 28.5% (n=346) had some risk of ulceration and amputation.²³

4.8.7 Main limitations and challenges:

Pharmacies represent a resource that is underused by health systems. Facing the enormous challenges related to the expansion of NCDs, countries cannot afford to waste pharmacists' knowledge and expertise.

The large societal coalition needed to tackle NCDs cannot afford to leave pharmacists and pharmacies outside coordinated efforts towards better prevention, early detection and proper treatment.

The integration of pharmacies in healthcare systems is limited and most of the time is only seen as an interface to deliver medicines.

Providing access to health, promoting linkage to care and ensuring continuity of care are key roles that Portuguese pharmacies can offer to the health system.

Portuguese pharmacies are committed to these roles and proactively seeking to implement new activities that demonstrate value for patients and improved health outcomes. Based on agreements with the government, healthcare units and health professionals, pharmacists are available to design new interventions and subject them to external scrutiny to assess the health gains achieved.

Based on the value generated, the health system may establish new frameworks and cooperation schemes, aligning incentives, remuneration and health gains.

4.8.8 References:

1. Portuguese Government, Governmental Decree (Portaria) 1429/2007, 2 November 2007.
2. Portuguese Government, Governmental Decree (Portaria) 97/2018, 9 April 2018.
3. World Health Organization (WHO). National NCD Targets for Portugal 2017. Available from: <https://extranet.who.int/ncdccc/documents/Db?lang=en> [Accessed 12 July 2018]
4. Jacinto IP, Horta R, Santos R, Cary M, Guerreiro J, Torre C, et al. "November, World Diabetes Month" Campaign in Portuguese pharmacies. International Pharmaceutical Federation (FIP) Congress in Buenos Aires. 2016 Aug 30. Available from: <https://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=17197>. [Accessed 12 July 2018]
5. Santos R, Ganhoto T, Mendes Z, Santos C, Costa S. Know your heart values: health campaign in Portuguese Pharmacies. International Pharmaceutical Federation (FIP) Annual Congress in Hyderabad. 2011 Sept. Available from: <http://www.europeanpharmacistsforum.com/know-your-heart-values> [Accessed 12 July 2018]
6. Santos R, Costa, S, Mendes Z, Crisóstomo S, Pádua FD, Almeida MM, et al. Smoking Cessation National Campaign: Portuguese pharmacies help smokers quit. International Pharmaceutical Federation (FIP) Congress in Basel. 2008 Sept 3. Available from: <https://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=2548> [Accessed 12 July 2018]
7. Rosa M. et al. Pharmacists' Interventions in Cardiovascular Disease Awareness and Assessment. PSWC. 2017 May 21-24.
8. Mendes M, Mendes MJ et al. The Role of Community Pharmacists in Chronic Obstructive Pulmonary Disease (COPD) Patients' Education: Awareness campaign and spirometry tests. International Pharmaceutical Federation (FIP) Congress in Düsseldorf. 2015 Sep 30.
9. Soares P, Pinto AL, Maximiano AS, Rosa M, Paulino E. O contributo da farmácia comunitária para o rastreio e controlo da Doença Pulmonar Obstrutiva Crónica. 33º Congresso de Pneumologia SPP. 2017.
10. Lourenço L, Reis L, Ramos AL, Silva A, Almeida D, Tabora C. Implementation of pharmaceutical care service in community pharmacy: evaluation of 1 year of activity. International Pharmaceutical Federation (FIP) Congress in Buenos Aires. 2016. Available from: <https://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=17039>. [Accessed 12 July 2018]

11. Lourenço L, Reis Lúcia, Ramos AL, Silva A, Almeida D, Taborda C. Dispensing New Medicines in Community Pharmacy: results from a telephone follow-up pilot testing. International Pharmaceutical Federation (FIP) 2016. Available from: <https://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=17038> [Accessed 12 July 2018]
12. Lourenço O, Calado S, Sá-Sousa A, Fonseca J. Evaluation of Allergic Rhinitis and Asthma Control in a Portuguese Community Pharmacy Setting. *JMCP*. 2014 May; 20(5):513-22. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/24761823> [Accessed 12 July 2018]
13. Madeira A, Costa S, Torre C, Santos C, Santos D, Ferreira P. Inhaler technique in older patients with COPD: Pharmacists' intervention in Portugal. International Pharmaceutical Federation (FIP) Congress in Bangkok. 2014 Sep 5. Available from: <http://www.fip.org/?page=abstracts&action=generatePdf&item=10658> [Accessed 12 July 2018]
14. Torre C, Guerreiro JP, Madeira A, Miranda A, Lopes F, Mendes Z. Pharmacy-Based Intervention in COPD Patients – Portuguese Pharmacists can effectively improve inhalation technique! World Congress of Pharmacy and Pharmaceutical Sciences 2013 Jan. Available from: https://www.researchgate.net/publication/319352137_Pharmacy-based_intervention_in_COPD_patients_Portuguese_pharmacists_can_effectively_improve_inhalation_technique
15. Horta MR, Costa S, Inácio S, Mendes Z. National Medication Review Campaign in the Elderly Population: Portuguese pharmacies unveil the brown bag. International Pharmaceutical Federation (FIP) Congress in Basel. 2008. Available from: <http://www.fip.org/?page=abstracts&action=generatePdf&item=2550> [Accessed 12 July 2018]
16. Martins A, Horta MR, Costa S, Miranda A, Ferreira AP, Crisóstomo S, et al. Evaluating the Portuguese Pharmacy-Based Diabetes Management Program. Where do we stand now? International Pharmaceutical Federation (FIP) 2008. Available from: <http://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=2551> [Accessed 12 July 2018]
17. Internal data of the National Association of Pharmacies (ANF)
18. Pharmaceutical Group of European Union (PGEU). eHealth Solutions in European Community Pharmacies: Annex. 2016 Nov. p31.
19. Pinto J, Teixeira F, Palmela I, Garcia L, Botelho M, Castro M et al. Farmácias Portuguesas App: Increasing customer's engagement with the pharmacy. International Pharmaceutical Federation (FIP) in Buenos Aires. 2016. Available from: <https://www.fip.org/www/index.php?page=abstracts&action=generatePdf&item=17040> [Accessed 12 July 2018]
20. Miranda I, Jacinto I, Horta R, Salvador A, Guerreiro J, Romano S, Costa S. Therapeutic notes (TN) – a tool for reinforcing interaction between Portuguese pharmacists and doctors. International Pharmaceutical Federation (FIP) 2018. Available from: <https://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=21310> [Accessed 14 December 2018]
21. Condiño M, Sá J, Eliseu A, Figueiredo IV, Sinogas C. Clinical Impact of a Pharmaceutical Care Programme Developed in a Family Health Unit: Results of a Pharmacist-Physician Collaboration in the Treatment of Hypertensive Patients. *Rev Port Farmacoter*. 2016 July; 8:164-171. Available from: <https://www.researchgate.net/publication/308566537> [Accessed 12 July 2018]
22. Paulino E, Rosa M, Pinto AL, Maximiano AS, Teixeira ML, Soares P et al. The contribution of community pharmacies to Diabetes control: a multidisciplinary approach. International Pharmaceutical Federation (FIP) Congress in Seoul. 2017 Sept 11. Available from: <https://www.fip.org/abstracts?page=abstracts&action=generatePdf&item=19449> [Accessed 12 July 2018]
23. Pinto AL, Monteiro L, Carvalho T, Moreira M, Parrinha P, Soares P, et al. Serviço do Pé Diabético em farmácias comunitárias: um contributo multidisciplinar. XIII Congresso Português da Diabetes. *Rev Port Diabetes*. 2017; 12(1) Suppl:42. Available from: http://www2.spd.pt:8080/wp-content/uploads/2017/03/rpd_marco2017_suplemento.pdf [Accessed 12 July 2018]

Additional bibliography

- Costa F, Silvestre L, Periquito C, Carneiro C, Oliveira P, Fernandes AI, et al. Drug-Related Problems Identified in a Sample of Portuguese Institutionalised Elderly Patients and Pharmacists' Interventions to Improve Safety and Effectiveness of Medicines. *Drugs – Real World Outcomes* [Internet]. 2016 Mar 8; 3(1): 89-97. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4819488/> [Accessed 12 July 2018]
- Costa FA, Teixeira I, Duarte-Ramos F, Proença L, Pedro AR, Frutado C, et al. Effects of economic recession on elderly patients' perceptions of access to health care and medicines in Portugal. *IJCP*. 2016 feb; 39(1):104-112. Available from: <http://link.springer.com/article/10.1007/s11096-016-0405-3> [Accessed 12 July 2018]
- Gregório J, Russo G, Lapão L. Pharmaceutical services cost analysis using time-driven activity-based costing: A contribution to improve community pharmacies' management. *Res Social Adm Pharm*. 2015 Aug; 12(3):475-485. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/26365300> [Accessed 12 July 2018]

- Costa FA, Pedro AR, Teixeira I, Bragança F, da Silva JA, Cabrita J. Primary non-adherence in Portugal: findings and implications. *IJCP*. 2015 Aug ;37(4) :626-635. Available from : <https://www.ncbi.nlm.nih.gov/pubmed/25832675> [Accessed 12 July 2018]
- Nunes F, Anderson JE, Martins LMPatient reactions to community pharmacies' roles: evidence from the Portuguese market. *Health Expectations*. 2015 Dec;18(6):2853-64; Available from: <http://onlinelibrary.wiley.com/doi/10.1111/hex.12269/pdf> [Accessed 12 July 2018]
- Horta MR, Costa S, Mendes Z. A Nationwide Diabetes Campaign: Portuguese pharmacies identify uncontrolled diabetic patients. *Rev Port Diabetes*. 2009; 4(4):180-190. Available from: <http://www.revportdiabetes.com/wp-content/uploads/2017/10/RPD-Vol-4-n%C2%BA-4-Dezembro-2009-Revista-Internacional-p%C3%A1gs-180-190.pdf> [Accessed 12 July 2018]
- Mendes M, Soares P, Maximiano S, Rosa M, Paulino E. O Contributo das farmácias comunitárias para o controlo da Diabetes. 13º Congresso Português de Diabetes. 2017 Mar 10-12.
- Teixeira M, Paulino E, Pinto AL, Rosa M, Marques V, Noronha M. O Contributo da Farmácia Comunitária na Educação para a Saúde da Pessoa com Diabetes. XII Congresso da Diabetes. 2016.
- Esteves A. et al. Avaliação do risco cardiovascular em utentes das Farmácias Holon: uma abordagem multidisciplinar. Congresso da Nutrição e Alimentação. 2016.

4.9 South Africa

4.9.1 Legal framework

A number of statutes, regulations and guidelines determine the role that pharmacists and other healthcare professionals play in non-communicable diseases (NCDs) in South Africa. Pharmacists' role is determined by their scope of practice, which is found in regulations¹ published in terms of the Pharmacy Act, 53 of 1974.

The following services or actions shall for purposes of the Act be regarded to be services or actions pertaining to the scope of practice of a pharmacist:²

- Actions specially pertaining to the profession of a pharmacist as prescribed in regulation 3;³
- The formulation of any medicine for the purposes of registration as a medicine;
- The distribution of any medicine or scheduled substance;
- The repackaging of medicines;
- The initiation and conducting of pharmaceutical research and development; and
- The promotion of public health.

The actions specially pertaining to the profession of a pharmacist include the provision of pharmaceutical care. While this is important in the supply of all medicines, it can certainly limit the complications of NCDs if pharmacists ensure that patients understand their conditions and their medicines, and if pharmacists monitor patient adherence to both lifestyle modification and therapeutic regimens.

Over the years, the services that pharmacists can offer in the promotion of public health have been developed and the services, conditions which relate to them and the fees that may be charged have evolved and been published in two sets of rules, published in terms of the Pharmacy Act. They are the “Rules relating to good pharmacy practice” (GPP rules),⁴ which are minimum standards, and the “Rules relating to the services for which a pharmacist may levy a fee and guidelines for levying such a fee or fees” (fee rules).⁵

4.9.1.1 Political and National Department of Health commitment to combat NCDs

The Minister of Health, Dr Aaron Motsoaledi, in the introduction to the National Department of Health's Strategic Plan 2014/15–2018/19,⁶ stated: “The NCDs have been found to be on the increase in South Africa. These NCDs disproportionately affect poor people living in urban settings, and are driving the rising demand for chronic disease care. Studies have predicted that the burden of disease related to NCDs will increase substantially in South Africa over the next decade, if measures are not taken to combat the trend.”

Measures that have been taken include the re-engineering of primary healthcare services in order to facilitate South Africa's move towards universal healthcare coverage by preparing the healthcare system for the introduction of national health insurance (NHI). Discussions are currently under way to determine the optimal utilisation of pharmacists' knowledge and skills in the NHI environment.

4.9.2 Prevention

In South Africa, health promotion services are offered in terms of current health policy, epidemiological information and current legislative requirements.

There are two ways in which pharmacists can participate in prevention of NCDs. The first is incumbent on all healthcare professionals — dissemination of information and participating in health awareness campaigns to assist people to understand the risk factors for NCDs, useful lifestyle modification and the importance of early diagnosis and treatment. The South African health calendar includes many NCDs, including cardiovascular diseases, cancer, respiratory diseases and diabetes. Various individual aspects of health maintenance are also included, e.g. smoking cessation and healthy lifestyles.

Some pharmacists work with the Centre of Diabetes and Endocrinology in creating diabetes awareness during the month of November, which is marked annually as Diabetes Month. They also support the Cancer Association of South Africa in several cancer awareness initiatives during the year, including skin, cervical, childhood and breast cancer.

The second way is both preventive and useful for disease management — screening tests are assisting in counselling, therapeutic intervention, referral and early detection of disease. The GPP rules⁴ prescribe minimum standards for the provision of screening services for NCDs in community pharmacies, such as blood pressure monitoring, performance of peak flow test, blood cholesterol and/or triglyceride monitoring and glucose monitoring. For each service, minimum standards regarding the physical facility, equipment, procedures to perform test, interpretation of results, documentation and record keeping, confidentiality and waste disposal are addressed.

In addition, the maximum fee that pharmacists may charge for each service is found in the fee rules.⁵

4.9.3 Therapy and disease management

Pharmacists provide support to patients by not only dispensing medicines but also by reinforcing information given to them by the medical practitioner or nurse who diagnosed their disease. Few patients immediately understand their diagnosis, so pharmacists must educate them on the importance of the diagnosis, therapy and disease management. They are required to teach patients about their medicines and medication regimens, and correct use of devices such as asthma inhalers, and insulin injection techniques. The use and significance of self-monitoring devices, such as blood pressure monitors, glucometers and peak flow meters, must also be explained.

On subsequent interactions with patients, the pharmacist must evaluate the patient during collection of repeat medicines. Monitoring tests are useful in terms of adherence, therapeutic outcomes and overall well-being.

4.9.3.1 Primary care drug therapy

A postgraduate qualification in primary care drug therapy (PCDT) provides pharmacists with additional knowledge and skills to holistically review and assist a patient with therapy and disease management (see below). It may be registered as an additional qualification with the South African Pharmacy Council. In South Africa, pharmacists are not authorised prescribers, but PCDT pharmacists can apply to the National Department of Health for a permit authorising them to prescribe and dispense medicines to patients under specified circumstances.^{7,8} Protocols for specified conditions included in the Standard Treatment Guidelines and Essential Medicines List for Primary Health Level of Care⁹ must be followed.

Patients consult with the PCDT pharmacist in the private clinic area of the pharmacy. The PCDT pharmacist will take a patient history, record the main complaints and then perform diagnostic tests and/or physical examinations on the patient to determine the origin of the complaint. If needed, PCDT pharmacists may request blood tests or refer to other healthcare providers if the health concern is outside their scope of practice. Patients are requested to return to the PCDT pharmacist for follow-up evaluations.

4.9.4 Training

4.9.4.1 BPharm degree

Pharmacists graduate from universities with a four-year Bachelor of Pharmacy degree. The qualification requires graduates to demonstrate the philosophy and principles of pharmaceutical care in terms of optimising therapeutic outcomes for a specific patient. It is also crucial that pharmacists can apply a pharmaceutical care management approach in collaboration with other healthcare professionals and the patient. Rational medicines use is facilitated by applying pharmaceutical care, medicines utilisation reviews and the principles of pharmacoeconomics. Pharmacists are trained to contribute to public health. As part of a broader healthcare team, pharmacists inform the public on health care and lifestyle, in health promotion, disease prevention, disease management and medicines usage, in addition to enabling the recognition and management of risk factors.

4.9.4.2 PCDT qualification

The PCDT post-graduate qualification is a two-year programme consisting of three components. During the first year, pharmacists must complete two theoretical and knowledge-based modules. The first module focuses on screening tests, patient history taking, consultation approach and the physical examination of the body. The second module focuses on different diseases, and their causes, signs, symptoms and treatment. Part of the course content looks at NCDs such as chronic lower respiratory conditions, cardiovascular diseases and diabetes mellitus. In the second year of the programme, pharmacists develop their skills by attending a workshop where all the techniques are demonstrated. They are also required to shadow a qualified PCDT pharmacist or primary healthcare nurse and document 200 case studies observing the healthcare professional. The candidates will then attempt an objective structured clinical examination (OSCE) on both years' content.

4.9.4.3 Other courses

Several institutions provide additional courses for pharmacists which support the fight against NCDs, for example:

- The Centre of Diabetes and Endocrinology offers a five-day advanced course in diabetes care which is open to all healthcare professionals;
- Pharmacists may also enrol at the National Asthma Education Programme for a certificate in asthma care. This is a six-month distance learning course including a two-day revision workshop; and
- Pharmacists can enrol for a smoking cessation course in order to offer a service and support to patients who want to quit smoking.

4.9.5 Use of new technologies

New technologies are generally underutilised in South Africa, but there are indications that this is changing. The full potential, however, remains unexplored.

Health technology assessment, including the economic implications, has been identified as a critical part of preparation for NHI.

Even old technologies have not been widely available, e.g., many public sector pharmacists have no access to appropriate technology for dispensing, while private sector community pharmacists have generally had better access to technology, including text and WhatsApp messaging to remind patients of the need for refills and repeat prescriptions.

Self-monitoring devices have generally been made available in the private sector, with medical schemes contributing to the cost.

With the advent of smart phones and tablets, and their wide distribution, several mobile apps have been developed that have proved extremely successful. In particular, the National Department of Health has developed a number of useful apps that give healthcare professionals easy access to important information.

From an NCD point of view, the PHC Clinical Guide is important for pharmacists because it gives a user-friendly format of the Standard Treatment Guidelines and Essential Medicines List for PHC, as well as calculators for body mass index and cardiovascular event risk. In addition, it includes a useful paediatric dosage calculator and a list of resources for referral. It is also interactive inasmuch as adverse drug events may be reported.

4.9.6 Collaboration with other healthcare professionals

Many community pharmacies employ nurses to run a clinic in the pharmacy. This has been an excellent collaboration.

There is no formal requirement for collaboration between pharmacists and other healthcare professionals, beyond the requirement that there is appropriate co-operation. Collaboration has, however, generally been on an ad hoc or ad lib basis.

This is likely to change, however, because a risk-based capitation model has been proposed as the NHI remuneration to a multidisciplinary team for services.

4.9.7 Main limitations and challenges

South African community pharmacists operate in a relatively hostile business environment. Despite publication of the maximum dispensing fee for pharmacists in Regulations Relating to a Transparent Pricing System for Medicines and Scheduled Substances,¹⁰ many third-party payers reimburse pharmacists at a level that is very low, which threatens the sustainability of many pharmacies. Similarly, although the Pharmacy Council's fee rules⁵ provide for payment for many of the services discussed above, many third-party payers have been slow to include these pharmacy services in their benefits. This has disadvantages both for the pharmacist and the patient.

Despite a critical shortage of pharmacists, the public sector has insufficient funding for pharmacist posts. Many pharmacy owners work long hours because they are unable to afford to pay an additional pharmacist, but there is also a shortage of locum pharmacists.

As a result of the financial difficulties and the shortage of pharmacists, many pharmacists are weary and dispirited. Motivation of pharmacists to take on more commitments is therefore the greatest challenge faced when wanting to expand NCD services.

There has been little or no effort from any interested party to encourage healthcare professionals to work in closer collaboration with each other, as opposed to a multidisciplinary practice. This would surely be in the **patient's best interest**.

There have been many initiatives to curb and control NCDs in the past but there is a lack of evidence of the outcomes. For example, there is a tax on alcohol, but no evidence that the tax has decreased consumption. There are also warnings on alcohol and cigarette packages, but their success at discouraging use has not been evaluated or published. South Africa is about to institute a sugar tax in an effort to manage obesity due to consumption of sugary beverages, but there is doubt that this will have a long-term effect on purchases as consumers become accustomed to the increased price.

There needs to be a concerted effort to educate patients about the benefits of providing all relevant information to the pharmacist, including the use of natural and other remedies. The credibility of the pharmacist as a conveyer of information and advice must also be strengthened in this era where consumers' access to digital media sometimes influences their judgement, resulting in reluctance to accept professional advice.

4.9.8 References

1. GNR.1158 of 20 November 2000: Regulation relating to the practice of pharmacy
2. Regulation 4, GNR.1158 of 20 November 2000: Regulation relating to the practice of pharmacy
3. Regulation 3, GNR.1158 of 20 November 2000: Regulation relating to the practice of pharmacy
4. BN 129 of 2004: Rules relating to Good Pharmacy Practice, as amended
5. GN 432 of 6 June 2017: South African Pharmacy Council: Rules relating to the services for which a pharmacist may levy a fee and guidelines for levying such a fee or fees, as amended

6. National Department of Health, Strategic Plan 2014/15 – 2018/19. Available from <https://www.health-e.org.za/wp-content/uploads/2014/08/SA-DoH-Strategic-Plan-2014-to-2019.pdf> [Accesses 13 July 2018]
7. Section 22A(15), Medicines and Related Substances Act, 101 of 1965, as amended.
8. Application form and guidelines for PCDT pharmacists. Available at <C:\Users\User\Downloads\permits-2015-pcdt-application-form-and-guidelines-for-section-22a15-permits.pdf> <http://www.health.gov.za/index.php/affordable-medicines> [Accesses 13 July 2018]
9. Standard Treatment Guidelines and Essential Medicines List for Primary Health Level of Care. Available from: <http://www.kznhealth.gov.za/pharmacy/edlphc2014a.pdf> [Accesses 13 July 2018]
10. GNR.1102 of 11 November 2005: Regulations relating to a transparent pricing system for medicines and scheduled substances

4.10 Sweden

4.10.1 Legal framework

Swedish pharmacies were nationalised in 1970. Nearly 40 years later, in 2009, the monopoly was deregulated. The new private pharmacy companies try to profile themselves by offering different health services but as the government is not reimbursing this, the services are not utilised by patients as much as would be preferred and the unique knowledge pharmacists have about pharmaceuticals is not used in an optimal way in Sweden.

The former government, as well as the present one, put a lot of focus on how to improve and optimise the use of medicines. Misuse leads to a high cost for society as well as suffering for patients. A National Pharmaceutical Strategy has been initiated which involves the major stakeholders.¹ The Swedish Pharmacist Association (SPA) is represented in both the expert group as well as the high decision group.

The Ministry of Health and Social Affairs has posted several strategies, including one on how to prevent and treat chronic diseases.² In cooperation with the Swedish Association of Local Authorities and Regions, an agreement was set up in 2016 on how to improve the treatment outcome in patients with NCDs.³ In addition, the National Board of Health and Welfare publishes data from open comparisons on the health care of patients with selected chronic diseases.⁴

The SPA took part in reference groups in two inquiries initiated by the Government, namely :

- An inquiry into the pharmacy market.⁵ The emphasis has been on bringing about safe, efficient and equal supply of medicines and a pharmacy market notable for good availability and level of service. In accordance with the terms of reference, there has been a special focus on measures aimed at enhancing quality and patient safety in the pharmacy market. One suggestion, among several, is that the responsibilities of the community pharmacist will be further clarified and, in addition, that the Dental and Pharmaceutical Benefits Agency, a central government agency, will evaluate a potential pharmaceutical service in a pilot study.
- How to strengthen the efficacy of the primary care.⁶ The inquiry chose the name Coordinated development for good quality, local health care and one suggestion is a profession-neutral healthcare guarantee and amended time limits for medical assessments. This has also been introduced in the county of Stockholm.

The SPA's presence in both these inquiries, and the possibility to influence, gave the association a great opportunity to have an impact on the outcome. Furthermore, it will position community pharmacists, as well as clinical pharmacists, as experts to be included in healthcare teams to improve medicines use, which benefits the most important stakeholder, the patient.

4.10.2 Prevention

“Check my medicines” is an extremely successful project with the aim of empowering the elderly to take charge of their own medicines, and to improve the use of medicines among the elderly in Sweden. The project and long-term cooperation have evolved from an “individual interest” to a “common interest” in Sweden, and can nowadays be considered as a “people’s movement”. It started in late autumn 2009 and is still running — and can today be considered as the most successful pharmacy-patient project ever in Sweden. By spreading knowledge and creating a national dialogue and debate, “Check my medicines” wants to contribute to changes

which will improve the elderly's use of medicines and their health. The project is a long-term cooperation with Apoteket (the state-owned chain of community pharmacies), and the two main organisations for retired people in Sweden — PRO and SPF Seniorerna.

The project has many different goals, for example, reducing to a large extent the medicines considered as “inappropriate prescriptions for the elderly” (identified by the National Board of Health and Welfare). As such the project has been able to reduce these medicines from 33% among the elderly (80 years and above) to 15.5% in just a few years — leading to a more empowered, active and healthy elderly patient population in Sweden. The project has been active in working for a law that entitles the elderly to at least one medicines utilisation review annually. The project also publishes prescribing patterns for the elderly for each municipality/community and county council in Sweden and puts pressure on communities to improve the quality of care for the elderly with respect to prescribed medicines. Pharmacists at pharmacies are highly active in the project, identifying inappropriate medicines, developing a dialogue with patients at the pharmacy, empowering them in health literacy, and teaching at local and regional events about the elderly and their medicines — thus positioning both the pharmacist and the pharmacy as the medicines expert.

“Check my medicines” has developed a new website, where lots of statistics, advice, articles, and news about the elderly and medicines are presented. Evidence-based advice for doctors/GPs on how to prescribe medicines — and what to prescribe — for the elderly is also available on the website, as well as evaluation charts in order to identify drug-related problems. The website also contains two different interactive educational programmes for the elderly, called “Elderly & medicines” — the first interactive educational tools for the elderly worldwide. The elderly are constantly empowered about medicines and the elderly by pharmacies and pharmacists.

Some 800,000 elderly people have been educated and informed in study circles about medicines and the elderly, via national and regional campaigns, via brochures and keynote presentations, and via dialogues with their pharmacists etc. and about what they should expect from their medical treatment. They have been **empowered to ask “tough” questions** of their doctors/GPs etc. And the results are very encouraging. Yearly, regional conferences are arranged for the elderly, where pharmacists educate and empower this patient group.

Several seminars have been arranged at local, regional and national levels, and this shows clearly how it is possible to educate and empower patients to become their own ambassadors for their own sake. The project has also received additional funding from the Swedish Government, due to its success in empowering the elderly, and due to the good results in reducing the amount of inappropriate medicines for the elderly.

The project has been nominated for several prestigious medical awards in Sweden, and in 2012 received the Award of Honour for best innovation in medicine.

The project has:

- Increased health literacy among the elderly such that they understand specific health information better; understand their disease/condition and its implications better; understand how changes in lifestyle could impact on their health; have got to know their rights within health care; and have improved their medical therapy.
- Increased patient control such that they can monitor their treatment progress; feel less anxious about their health condition; feel more responsible for the management of their disease; be more aware and understand the effect of different medicines; learn how to avoid falls that can result from medical treatment; and learn how to improve medicines taking.
- Improved patient participation such that they are better prepared for consultations with health professionals and can meaningfully engage in discussions regarding their own health; are able to define treatment plans in partnership with healthcare staff (concordance); are able to attract healthcare professionals' attention to issues they consider important; and can get involved in a person-centred dialogue within the healthcare system as well as at the pharmacy.
- Resulted in better medical therapy and outcomes for the elderly, such that during the past years more than 200,000 patients, aged 80 years and above, have got a better medical treatment with less inappropriate medicines prescribed (evidence based), thanks to the project and by using the competence and skills from the pharmacist. Looking at patients aged 65+, analysis is being

performed, but the project estimates that between 700,000 and 800,000 elderly people in Sweden now have better medical treatment because of fewer inappropriate medicines being prescribed.

The project clearly demonstrates that, in a rapidly evolving health care system with increased demands for results and personalised care, the pharmacist is a critical partner in the provision of care. The skill set of the pharmacist provides a unique opportunity to deliver optimal medicines utilisation for the elderly, improving therapy and outcomes, and managing acute and chronic diseases as well as many other roles that are beyond an outdated view that limits pharmacy practice to the distribution of medicines.

For the pharmacy, **“Check my medicines”** has:

- Developed the concept of pharmaceutical care at Swedish pharmacies;
- Highlighted the competence and skills of pharmacists;
- Positioned the pharmacist as the medicines expert; and
- Positioned pharmacy as the “gateway to care”, and strengthened the relationship between pharmacists and patients.

“Check my medicines” shows clearly that the pharmacist is uniquely positioned to provide pharmaceutical care through appropriate medicines therapy management. The results demonstrate that pharmacists — by being able to reduce the number of inappropriate medicines, contributing to a more appropriate therapy for the elderly and empowering patients’ health literacy — are vital participants in the multidisciplinary healthcare team. By focusing on the elderly and their medicines, and improving both the medical therapy as well as the outcome, **“Check my medicines”** has positioned the pharmacist as a partner for a life in health, as well as positioning the pharmacy as the gateway to care.

Although the role of the pharmacist on the healthcare team for optimal management of medicines for the elderly has been highly appreciated, the positive impact on wellness, clinical outcomes, and overall healthcare costs through a full scope of practice highlights the significant contribution pharmacists make in the ever-changing healthcare system.

“Check my medicines” is today an established benchmark (for pharmacy and patients) when it comes to discussing and improving medical treatment for the elderly. The project has received great attention in Scandinavia, China, Argentina,⁷ Spain, UK, USA, India and in many other countries as well as at the WHO Ageing Centre in Japan.

4.10.3 Therapy and disease management

The number of clinical pharmacists has increased in the past years and, so far, they are mainly employed at hospitals and to some extent at health centres. Several studies have been performed showing that, as a result of pharmacist employment, there has been great improvement in the correct use of medicines and positive health economic outcomes.⁸

Attempts have been made to evaluate pharmacy-based cognitive services directly or indirectly aiming at improving adherence, but no studies so far have focused on clinical outcomes or cost-effectiveness. Consequently, no adherence-promoting cognitive services are currently publicly reimbursed.

In 2013 the government gave a directive to the Medical Products Agency to investigate the feasibility of performing structured counselling on medicines usage at pharmacies.⁹ The purpose of such counselling was to improve patients’ knowledge about their treatment, support adherence and avoid misuse of medicines. Patients who had been prescribed medicines for asthma or COPD were included in the study. Thirty-six pharmacies participated, 196 patients were enrolled and made the first visit, and 169 patients participated in the follow up visit. In general, the patients were very positive about the interaction with pharmacists and nine out of 10 would consider using counselling regarding medicines use in the future. Seven out of 10 thought that the GP would benefit from the information collected at the visit.

In summary the study showed that it is feasible to perform structured counselling at pharmacies. The shortcoming, however, is that no clinical data (efficacy) were recorded and that no physicians were included. Thus, the study cannot show any outcome on health improvement.

In an ongoing project in Stockholm County, patients initiated on statin therapy are offered to sign-up for a short, adherence-promoting intervention when collecting their first prescription in a community pharmacy belonging to one of the major retail pharmacy chains (Apoteket AB).¹⁰ Since it is known that the largest drop in refill rate takes place as early as within the first months of initiation, this intervention focuses on informing patients about the importance of adherence to statin therapy and removing barriers to adherence within one to three months of the first prescription being filled. Pharmacy involvement includes approaching patients in the pharmacy, inviting them to take part and, if they agree, registering them for the intervention. The pharmacies also receive the patients for a follow-up visit after the intervention is finalised. The intervention itself is provided by a team of nurses trained in life-style coaching, and is largely managed from a call-centre via a decision support system scheduling all contacts, storing patient-provided feedback as well as all notes made during contacts.

The different pharmacy chains offer different kind of services like blood pressure and blood sugar measurements, stop smoking, birth mark control, etc, but the outcome of these services is not documented or published, or communicated to the responsible GP.

4.10.4 Training

In Sweden there are two levels of pharmaceutical professions: prescriptionist, BSc (Pharm), a three-year university education, and pharmacist, MSc (Pharm), a five-year university education. The registration is granted by the National Board of Health and Welfare and it is noteworthy that both prescriptionists and pharmacists have the same authorities. Swedish pharmacists have the authority neither to prescribe medicines nor to vaccinate. Both university educations have been updated and emphasise knowledge in pharmacotherapy to a higher degree. As a pharmacist there is a possibility, after graduation, to take a one-year post-educational course in clinical pharmacy, which is very popular. Clinical pharmacists are much appreciated by both doctors and nurses in hospital care.

From a legal point of view, at pharmacies, the prescriptionist/pharmacist is responsible to check that the prescription is legal and appropriate and must ensure that the patient is well informed of how to take the medicine. However, work other than dispensing medicines is not documented. Communication with physicians only occurs to correct mistakes. Continuous education in pharmaceutical sciences for community prescriptionists/pharmacists is not regulated and there is certainly room for improvement. At the moment, it is the responsibility of both employers and employees.

4.10.5 Use of new technologies

e-Health (digitalisation) is prioritised both politically as well as with health care. In Sweden 98% of all prescriptions are electronic and stored in a registry handled by the Swedish eHealth Agency. A decision has been taken to allow the registry to be used for research. To incorporate the medicines module in the hospital chart with the registry is an ongoing project so that both physicians and pharmacists have the same information about a **patient's actual treatment**. Today, using separate sources of information is a major cause of medicines problems. Most of the patient adherence programmes are developed by the pharmaceutical industry. The interaction between industry and pharmacies is limited and could be improved. Several companies also develop apps for patients to register health data and these could be used for sharing medical information, register adherence, etc.

4.10.6 Collaboration with other healthcare professionals

In hospitals the perception of pharmacists is gradually improving both among nurses and physicians. However, for the pharmacist to be regarded as an obvious team member there is still a lot of work to do. In community pharmacies there is no history of cooperation with other professions and thus there is a lot of ignorance regarding the capacity and possible contribution of the pharmacy profession. On the initiative of two members of the Swedish Medical Association, the Swedish Pharmacist Association has just started a project and a couple of meetings have taken place. A workshop is planned to discuss medicine and **pharmacy's** respective roles and responsibilities. Also, nurses' associations are interested to meet up and discuss how to cooperate.

4.10.7 Main limitations and challenges

The pharmacy chains have a retail focus and little interest in the core value of pharmaceutical care because of low profitability. The government is reluctant to use more tax money to reimburse pharmacist services at the

pharmacies without health economic data from studies and employers are not willing to invest like they have in the UK (new medicine service) and Norway (Medisinstart).

Pharmacists are still not acknowledged as the health professional with the utmost knowledge of pharmaceuticals. Patients still refer to doctors if they have questions about their treatment. Pharmacy in Sweden must strengthen its trademark.

4.10.8 References:

1. Medical Products Agency. Action Plan 2017 National Pharmaceutical Strategy (Internet). 1 July 2017. Available from: <https://lakemedelsverket.se/upload/om-lakemedelsverket/NLS/Action-Plan-2017%E2%80%93National-Pharmaceutical-Strategy.pdf> [Accessed 13 July 2018]
2. Government Offices. Nationell strategi för att förebygga och behandla kroniska sjukdomar (Internet). 2014-17. Available from: https://plus.rjl.se/info_files/infosida41151/Nationell_strategi_for_att_forebygga_och_behandla_kroniska_sjukdomar.pdf [Accessed 13 July 2018]
3. Ministry of Health and Social Affairs. Insatser för att förbättra vården för personer med kroniska sjukdomar mm. (internet). 2017. Available from: <https://www.regeringen.se/4af67e/contentassets/ef10e08f07ba4ec089fc796db109f487/overenskom-melse-insatser-for-att-forbatta-varden-for-personer-med-kroniska-sjukdomar.pdf> [Accessed 13 July 2018]
4. National Board of Health and Welfare. Hälsa- och Sjukvård vid kroniska sjukdomar. Öppna jämförelser. (Internet). 2015. Available from: <https://www.socialstyrelsen.se/Lists/Artikelkatalog/Attachments/19930/2015-12-1.pdf> [Accessed 13 July 2018]
5. Ministry of Health and Social Affairs. English summary-nya apoteksmarknadsutredningen. (Internet). 2017. Available from: https://www.regeringen.se/494699/contentassets/898886b519fa4630b9b576de75d5cbf9/english_summary-nya_apoteksmarknadsutredningen.pdf [Accessed 13 July 2018]
6. Ministry of Health and Social Affairs. God och nära vård. Gemensam färdplan och målbild. (Internet). 2017. Available from: https://www.regeringen.se/49c297/contentassets/bbb35df88be240b08c5134090fe48b43/delbetanken-de-av-utredningen-samordnad-utveckling-for-god-och-nara-var-d-sou-2017_53.pdf [Accessed 13 July 2018]
7. Confederación Farmacéutica Argentina. La farmacia en Suecia: Lo que le sucedió a Gulli Johansson [Internet]. Correo Farmacéutico, Nov 2016, pp 14-17. Available from: <http://www.cofa.org.ar/wp-content/uploads/2016/11/Correo-173-web.pdf> [Accessed 13 July 2018]
8. Gillespie U, Alasaad A, Henrohn D, Garmo H, Hammarlund-Udenaes M, Toss H. A comprehensive pharmacist intervention to reduce morbidity in patients 80 years or older; a randomized controlled trial. Arch Intern Med. 2009 May 11;169(9):894-900.
9. Medical Product Agency. Slutrapport Strukturade läkemedelssamtal.(Internet). 11 December 2014. Available from: <https://lakemedelsverket.se/upload/om-lakemedelsverket/rapporter/Strukturade-lakemedelssamtal-slutrapport-20141211.pdf> [Accessed 13 July 2018]
10. Frisk P, Holtendal C, Bastholm-Rahmer P, Källemark-Sporrong S. Competence, competition and collaboration: Perceived challenges among Swedish community pharmacists engaging in pharmaceutical services research. (Submitted)

4.11 Switzerland

4.11.1 Legal framework

Swiss pharmacies offer different services in the field of NCDs.^{vi} The Swiss case study focuses on the colon cancer screening service in Swiss pharmacies, because this is one of the most successful and broadly offered services.

^{vi} See pharmaSuisse's position paper about this topic at: <http://www.pharmasuisse.org/de/1699/NCD-Strategie.htm>

Law on medical professions (SR 811.11; MedBG): The 2015 revised MedBG defines the education goals for medical professions, including pharmacists. Educational institutions are required to incorporate these goals into their curricula. One specific education goal for pharmacists, among others, is (Art. 9 lit. f MedBG): [Pharmacists must] contribute to health promotion and disease prevention, as well as acquire the necessary competencies, including in the field of vaccination.

The federal law of health insurance (SR 832.10; KVG) and the respective ordinance (SR 832.112.31; KLV) regulate the services that are paid for by health insurances. This includes also the services of pharmacists (Art. 4a Par. 1 KLV). The insurances can also cover additional cost-cutting services through a collective agreement in favour of a group of insured persons (Art. 4a Par. 2 KLV). These services must align with the role intended for pharmacists in Art. 25 Par. 2 lit. h KVG and therefore be connected to the dispensing of medicines prescribed by medical doctors.

Services by pharmacists in the field of prevention or chronic care are not yet included in the national agreement between all insurances and pharmacies. However, some health insurances cover specific services delivered in pharmacies to the individuals insured by them.

Next to these regulations different national strategies describe the **pharmacists' scope of practice**:

- In its answer of 2016 to the postulate Humbel (Positioning of pharmacies in primary care), the Swiss government defines the role of pharmacists in primary care mainly in two areas: low-threshold access to health care and the increased use of their pharmaceutical competences to increase the quality of medicinal therapy. In the area of low-threshold access to health care, pharmacists have an important function as a centre for observation, advice and coordination in the field of prevention. This aspect is incorporated and implemented in various national strategies of the government, e.g., in the NCD-strategy of the Federal Office for Public Health (FOPH; the equivalent of the Swiss Ministry of Health). In the long run, the Swiss government wants to lay the focus on an increased use of the pharmaceutical expertise in models of interdisciplinary collaboration at the level of the individual patient to secure and increase the quality of medicinal therapy (interdisciplinary chronic disease management programmes). PharmaSuisse supports the conclusions of the report of the Swiss government (see media release of pharmaSuisse 26 October 2016; <https://bit.ly/2leAuVH>)
- **There is no “prevention law” existing in Switzerland. Instead, the Swiss government adopted in April 2016 a “National strategy for the prevention of non-communicable diseases” (NCD strategy).** This strategy aims, for example, to strengthen preventive action for people with enhanced risks and chronic conditions in the healthcare system to prevent or delay the emergence of disease and make life easier for those affected. The health path developed in the context of the NCD strategy shows a possible role for pharmacists as a low-threshold access for persons in various life stages. The possibilities for a stronger inclusion of pharmacies in prevention range from the involvement in prevention campaigns over the conduction of risk-assessments to health consultations (among others, smoking cessation) as well as the coordination of patients and the involved service providers.
- For the prevention of cancer there is a dedicated strategy, the “National strategy against cancer” (NSK). Easy access for all people living in Switzerland to early detection of colon cancer is one of the goals of this strategy. PharmaSuisse is part of a committee that coordinates the activities necessary to reach this goal.

4.11.2 Prevention

Since 2016, Swiss pharmacists have offered colon cancer prevention services in community pharmacies. A first campaign of pharmaSuisse in 2016 was implemented with 770 pharmacies taking part. A second campaign was organised in 2018 and involved more than 800 pharmacies. Many pharmacies offered the service not only during the campaign, but also throughout the year. Together with the customer, the pharmacist fills out a questionnaire to assess **the personal risk for colon cancer (“risk check”)**. Patients with higher risk are referred by the pharmacist to their GP or medical specialist. Patients with no risk or low risk receive a stool test for occult blood (OC Sensor) and instructions on how to collect the sample. The patient takes the sample at home and sends it directly to the laboratory in a dedicated envelope. The results from the laboratory are sent back to the pharmacy and the pharmacist communicates them to the patient. If the result is positive, the patient is referred for further examination (colonoscopy) to a physician or specialist.

With the refresher campaign in 2018, those who received a test in the pharmacy during 2016 were invited to take it again after two years (as directed in guidelines).

Customers pay for the service out of their own pockets (usually around CHF 30). One health insurance (CSS) pays for the service for its customers who have a supplementary insurance contract.

4.11.3 Therapy and disease management

A chronic care management programme (myCare) is under preparation and testing. This programme will include myCare Start (the equivalent of a new medicine service), myCare Support (a patient support programme) and myCare Safety (medicines risk management). Pilot projects are expected to start in 2019.

4.11.4 Training

To be able to offer the colon cancer screening service in the pharmacy, pharmacists need to have undertaken online training developed by pharmaSuisse. In addition, participating pharmacists will be provided with specific tools, so that they can educate and share relevant information with the rest of the pharmacy team (e.g., pharmacy technicians).

4.11.5 Use of new technologies

Another requirement for offering the colon cancer screening service in the pharmacy is the use of an online platform. Through this platform, pharmacists can electronically fill out the risk assessment with the patients and thus save all patient data. Test results from the laboratory are sent to the pharmacy through this platform. The platform also allows the pharmacist to administer their clients and facilitate reminders of patients to take the test two years after the initial test.

4.11.6 Collaboration with other healthcare professionals

The colon cancer detection programme needs close collaboration between pharmacists, physicians and specialists. Only with this close collaboration can patient follow-up be ensured. Nevertheless, this collaboration and follow-up remain one of the main challenges. During the 2016 campaign, when patients with a positive test result were referred to a physician, the pharmacist often did not receive the results from the medical examination. In some cases, those patients did not undergo a colonoscopy. This was solved by medical doctors who have been involved in the project since the beginning and who contacted medical colleagues who may not have followed-up a positive test with a colonoscopy.

4.11.7 Main limitations and challenges

Limitations and challenges to expand pharmacists' roles in NCDs include:

- Remuneration of these services in the pharmacy;
- Interprofessional collaboration with other healthcare professionals, especially the clarification of the roles of the different healthcare providers and
- Cost-intensive development of technical supporting tools (e.g., IT platform).

4.12 United States of America

4.12.1 Legal framework

The role of the community pharmacist in the United States is, as in most of the world, undergoing a period of transformational change. Unlike many parts of the world, however, the practice of pharmacy is not governed nationally. Rather, each of the 50 state governments, the District of Columbia, and the territories of Guam, Puerto Rico and the American Virgin Islands independently set the laws and regulations by which pharmacists may practise within their states or territories. Pharmacists who wish to practise across state lines must take the examination, meet the requirements for licensure, and become licensed in each individual state in which they wish to practise. Because of this, the practice authority of the pharmacist varies widely across the United States.

Despite these variations, pharmacists do have control and responsibility for the nation's medicines supply in large measure. Physician dispensing in the U.S. is relatively limited. There are approximately 22,000 independently owned¹ community pharmacies in the U.S., and over 40,000 corporate chain² community pharmacies. Corporate owned chain community pharmacies may be stand-alone pharmacies, or may be pharmacies operating within a grocery store or a mass merchandising store (e.g. Wal-Mart). According to the U.S. Bureau of Labor and Statistics,³ there are just over 312,000 pharmacists practising in the United States, with anticipated job growth of about 6% until 2026.

4.12.2 Prevention

NCD prevention activities by pharmacists are fairly well documented. Many state-based insurance programmes and private insurance programmes will pay pharmacists on a fee-for-service basis to provide smoking cessation counselling to patients. Additionally, pharmacists who practise within recognised diabetes education practices (there is a national process for recognition) are frequently involved with prevention activities emphasising diet and exercise as a part of diabetes education. Additionally, Medicare (the national insurance programme for the elderly and disabled) provides for beneficiaries to receive an annual wellness visit with the primary care provider. A growing number of pharmacists practising in team-based care are now providing the wellness visit as a core contribution to the team, leading to new revenue streams for the practice employing the pharmacist. Despite these opportunities, there is clearly an even greater role for the pharmacist in NCD prevention.

4.12.3 Therapy and disease management

The U.S. has been involved extensively in pharmacist-run disease management and therapy management. From independently run, appointment-based clinics located within community pharmacies to community pharmacists co-locating with physicians and community pharmacists running referral-based clinics, the literature is replete with descriptive papers (see literature review chapter for sentinel papers). Pharmacists have had the greatest documented success in the area of diabetes and hypertension management, with additional strong activity in cardiovascular care more generally. Although community pharmacy-based anticoagulation clinics are not commonplace in the U.S., pharmacists are most frequently associated with such clinics in the ambulatory care setting. Community-based pharmacists are also now conducting asthma clinics, depression clinics and **movement disorder clinics, as well as men's health and women's health clinics**. Whatever the NCD, chances are good that somewhere in the U.S. there is a community pharmacist offering a special clinic to provide service to the patient population.

Notwithstanding this, as previously stated the most robust and common pharmacist-run disease management occurs with patients who have diabetes and hypertension. In fact, pharmacists have been so successful in these areas that the US Centers for Disease Control and Prevention has issued several documents encouraging pharmacists to be more involved. **These include** "Using the pharmacists' patient care process to manage high blood pressure: A resource guide for pharmacists",⁴ "Methods and resources for engaging pharmacy partners",⁵ and "Partnering with pharmacists in the prevention and control of chronic diseases".⁶

4.12.4 Training

The Doctor of Pharmacy (Pharm.D.) degree is the entry-level, single degree offered in the U.S. for individuals who wish to practise pharmacy. The Accreditation Council for Pharmacy Education (ACPE) is the national accrediting body which sets the standards for pharmacy education in the U.S. ACPE accreditation is by its own account "**public recognition that a professional degree programme leading to the Doctor of Pharmacy degree is judged to meet established qualifications and education standards through initial and subsequent periodic evaluations**".⁷ As of 2018, there are 142 schools and colleges of pharmacy which are either accredited, or in some phase of pre-accreditation status. The Pharm.D. degree is designed to prepare students to provide direct patient care, including medication therapy management and disease management, as a part of the robust, comprehensive standards of the ACPE.⁸

4.12.5 Use of new technologies

The use of technology in pharmacy practice, especially in the community setting, is highly variable. Increasingly the rapid growth of smart phone-based applications (apps), digital and home-based monitoring devices, and more technology savvy consumers have driven an increase in the use of technologies for

everything from measuring and monitoring heart rate, blood pressure, body weight, and many other parameters. Electronic prescribing is now commonplace in the U.S., with only a small portion of prescription orders being hand-written. Pharmacists and consumers partner together in the use of technology to improve adherence and compliance with prescribed therapies. However, pharmacists in the community setting are challenged by a general lack of access to patient electronic medical records. In fact, patients themselves often do not have access to their own records. Related to dispensing, the U.S. is somewhat unique in that most prescription medicines are bulk packaged in quantities of 100, 500 or 1,000 units, rather than unit-dose packaged as in other parts of the world. The result is that the dispensing process itself is often slow, and frequently pharmacists find themselves engaged in tasks which could easily be taken care of by pharmacy technicians or by using automated technology.

4.12.6 Collaboration with other healthcare professionals

In the U.S., the education of pharmacists, physicians, nurses, and other healthcare practitioners is rapidly evolving to incorporate interprofessional education (IPE) as a central component of the respective academic degrees. This evolution was driven by important publications of the Institute of Medicine, including:

- Measuring the impact of IPE on collaborative practice and patient outcomes;⁹ and
- Interprofessional education for collaboration: Learning how to improve health from interprofessional models across the continuum of education to practice — workshop summary.¹⁰ In addition, a robust Interprofessional Education Collaborative (IPEC)¹¹ has been well established in the U.S. and has issued several reports, held several consensus conferences, and conducted a host of faculty and practitioner training programmes since 2013.

4.12.7 Main limitations and challenges

In the United States, one of the most difficult challenges for pharmacists is receiving payment for non-dispensing patient care services. Because the business model of community pharmacy has for many years been carved away from the rest of healthcare services and paid for by pharmacy benefit management companies almost exclusively on the pharmaceutical product, and because the reimbursement scheme in the U.S. has been focused on paying pharmacies instead of pharmacists, it has been difficult for the U.S. government and other payers to incorporate the professional services of pharmacists into their systems of remuneration. Accelerating in the 1990s, research on the impact that pharmacists' non-dispensing services have on patient care has firmly shown the cost-savings pharmacists make on the non-drug portions of healthcare spending. As a result, there is now a move afoot in the United States to get the U.S. Congress¹² and state legislatures¹³ to pass new laws formally recognising pharmacists as healthcare providers under the laws and regulations allowing payment in the same manner as other healthcare providers.

4.12.8 References

1. National Community Pharmacy Association. Independent pharmacy today [Internet]. Alexandria, VA: NCPA, 2018. Available from: <http://www.ncpanet.org/home/independent-pharmacy-today> [Accessed 15 July 2018]
2. National Association of Chain Drug Stores, 2018. Available from: <https://www.nacds.org>. [Accessed 15 July 2018]
3. Bureau of Labor Statistics. Occupational Outlook Handbook: Pharmacists [Internet]. Washington DC: United States Department of Labor, 2018. Available from: <https://www.bls.gov/ooh/healthcare/pharmacists.htm>. [Accessed 15 July 2018]
4. Centers for Disease Control and Prevention. Using the Pharmacists' Patient Care Process to Manage High Blood Pressure: A Resource Guide for Pharmacists. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2016. Available from: <https://www.cdc.gov/dhdsp/pubs/docs/pharmacist-resource-guide.pdf>. [Accessed 15 July 2018]
5. Centers for Disease Control and Prevention. Methods and Resources for Engaging Pharmacy Partners. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2016. Available from: <https://www.cdc.gov/dhdsp/pubs/docs/engaging-pharmacy-partners-guide.pdf> [Accessed 15 July 2018]
6. Morrison CM, Glover D, Gilchrist SM, Casey MO, Lanza A, Lane RI, et al. A Program Guide for Public Health: Partnering with Pharmacists in the Prevention and Control of Chronic Diseases. Atlanta (GA):

- Centers for Disease Control and Prevention (CDC); 2012. Available from: https://www.cdc.gov/dhbsp/programs/spha/docs/pharmacist_guide.pdf [Accessed 15 July 2018]
7. Accreditation Council for Pharmacy Education. PharmD Program Accreditation [Internet]. Chicago, IL: ACPE, 2018. Available from: <https://www.acpe-accredit.org/pharmd-program-accreditation/>. [Accessed 15 July 2018]
 8. Accreditation Council for Pharmacy Education. Accredited programs by status [Internet]. Chicago, IL: ACPE, 2018. Available from: <https://www.acpe-accredit.org/accredited-programs-by-status>. [Accessed 15 July 2018]
 9. National Academies of Science, Engineering and Medicine. Measuring the Impact of Interprofessional Education (IPE) on Collaborative Practice and Patient Outcomes. 2015. Available from: <http://nationalacademies.org/hmd/reports/2015/impact-of-ipe.aspx>. [Accessed 15 July 2018]
 10. Institute of Medicine. Interprofessional Education for Collaboration: Learning How to Improve Health from Interprofessional Models Across the Continuum of Education to Practice: Workshop Summary. 2013. Washington, DC: The National Academies Press. <https://doi.org/10.17226/13486>.
 11. Interprofessional Education Collaborative website. Available from: <https://www.ipecollaborative.org/about-ipec.html>. [Accessed 15 July 2018]
 12. American Pharmacists' Association. Pharmacists provide care website, 2015. Available from: <http://www.pharmacistsprovidecare.com>. [Accessed 15 July 2018]
 13. National Alliance of State Pharmacy Associations website. Available from: <https://naspa.us>. [Accessed 15 July 2018]

4.13 Other national initiatives on NCDs

4.13.1 Denmark: Expansion of the new medicine service

Since January 2016, pharmacies in Denmark have been required to offer a new medicine service to patients. This service is an offer for patients who, within the previous six months, have been newly diagnosed with a chronic disease and prescribed a medicine for it. The service is a consultation about the new medicine between a pharmacist and the patient.

In Denmark a chronic disease is defined as a disease which is long-lasting and persistent. Therefore, the new medicine service in Denmark is slightly different from the same service in Ireland or England, where the service is only offered to patients with a specific chronic disease.

In a customer satisfaction survey, 95% of the respondents stated that they were, overall, satisfied or very satisfied with the service. Many patients commented that the new medicine service made them feel more secure about taking their medicine and provided them with knowledge about side effects.

An adherence service was introduced by Danish pharmacies in April 2018. This service is a short, private consultation between a pharmacist and a patient who has been taking medicine for a chronic disease for more than 12 months and experiences problems with adherence. This service is an expansion of the new medicine service.

The purpose of the service is better medical adherence for patients by giving them more knowledge about their medicine — safe, effective and rational use — and teaching them better habits. The focus is on identifying reasons for non-adherence and finding effective solutions. This will, in the long term, empower patients and increase the effect of their medicines treatment.

Non-adherent patients are entitled to one adherence service consultation a year. This makes it possible for the **pharmacists to follow the patients' future** adherence and medicines treatment. This is not a possibility with the new medicine service, where patients are only entitled to one consultation per chronic disease.

4.13.2 Ireland: New medicine service improves adherence in people with chronic disease

The concept for a new medicine service (NMS) in Ireland is based on evidence from research that problems with newly prescribed medicines appeared rapidly, were widespread and that a significant proportion of patients on long-term medication quickly become non-adherent. Work by Barber *et al*¹ has shown that patients

who started a new medicine for a chronic condition experienced considerable problems. About one third did not take their new medicine as prescribed, almost half of these deliberately so. The incidence of non-adherence was greater with new rather than with existing medicines. Patients frequently encountered problems and had substantial unmet needs for information and support. Although some problems were resolved, many were not and new ones were reported. This rapid emergence of non-adherence and the related plethora of problems are probably caused by two main factors: lack of appropriate communication with prescribers and at the time when the medicine is dispensed, **and patients' problems with the medicine only emerging once that medicine has been taken.**

Hence, a pharmacist-led intervention, the NMS, was devised. The NMS is a structured pharmacist-led intervention, delivered within the community pharmacy setting, consisting of advice and support on medicine-taking for a newly prescribed medicine for a specific chronic disease state (asthma, COPD, type 2 diabetes, hypertension, antiplatelet/anticoagulant therapy, statin therapy and chronic pain), delivered within two weeks of commencing the medicine. The NMS was first commissioned in England by the National Health Service (NHS) in October 2011. A 2016 review of this service² has shown that community pharmacists have carried out 3.59 million NMS consultations since the scheme was introduced in 2011 to the end of August 2016, resulting in a 10% improvement in adherence. In the long term, the authors of the research suggest that GBP 517.6m cash savings to the NHS could be made, and 179,500 quality-adjusted life years will be gained from the NMS.

In 2017, due to the benefits seen in the English NMS, both to patients and to the overall health system, the Irish Pharmacy Union (IPU), with the benefit of an educational grant from Pfizer Healthcare Ireland, decided to run an Irish NMS pilot to assess if similar benefits would be seen in the Irish context.

The aims of the IPU NMS pilot were to:

- Explore the operation of the NMS, in particular the complexity and nature of resulting consultations in terms of patient engagement, age range, advice-giving and support; and
- Determine acceptability to stakeholders, reasons for success or lack of success and feasibility within the service delivery environment.

The study outcomes were to:

- Assess the impact of the NMS pilot on patient adherence through measurement of a number of adherence measures;
- Identify barriers to and enablers of the success of this pilot and any future roll out of the NMS;
- Determine the feasibility of implementation of the NMS in the practice environment; and
- Assess stakeholder acceptability of the NMS.

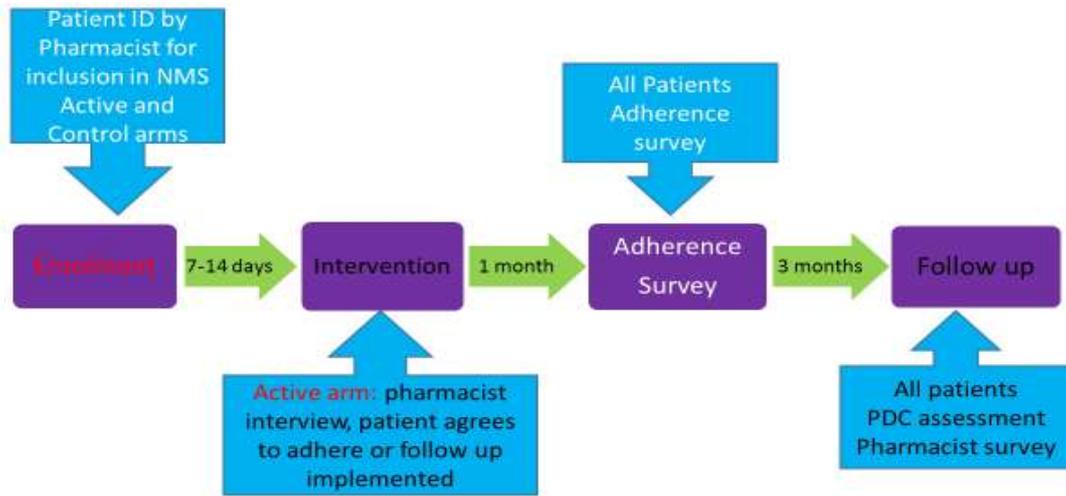
The pilot design was based on capturing quantitative data on adherence via the Proportion of Days Covered (PDC) values and a patient adherence score, along with qualitative feedback collected via a survey of participating pharmacists. The pilot received ethics approval from the National University of Ireland Galway and was registered as a Clinical Trial (ISRCTN12674490).

The NMS pilot consisted of two arms, an intervention and control arm. Once pharmacists enrolled patients onto the pilot via an online data collection tool, this tool randomly allocated patients to the control or intervention arm.

Those patients allocated to the NMS intervention arm had a total of three interventions during the NMS pilot, as outlined in Figure 31 and described here:

- A structured interview about their new medicine was carried out with the pharmacist within seven to 14 days after the first dispensing;
- The pharmacist undertook the patient adherence questionnaire with the patient to assess adherence four weeks after the first dispensing of the new medicine; and
- The pharmacist carried out a proportion of days covered (PDC) assessment of the new medicine, using the **patient's** medication record (PMR) from the dispensary computer system three months after the first dispensing of the new medicine.

Figure 31: NMS pilot process

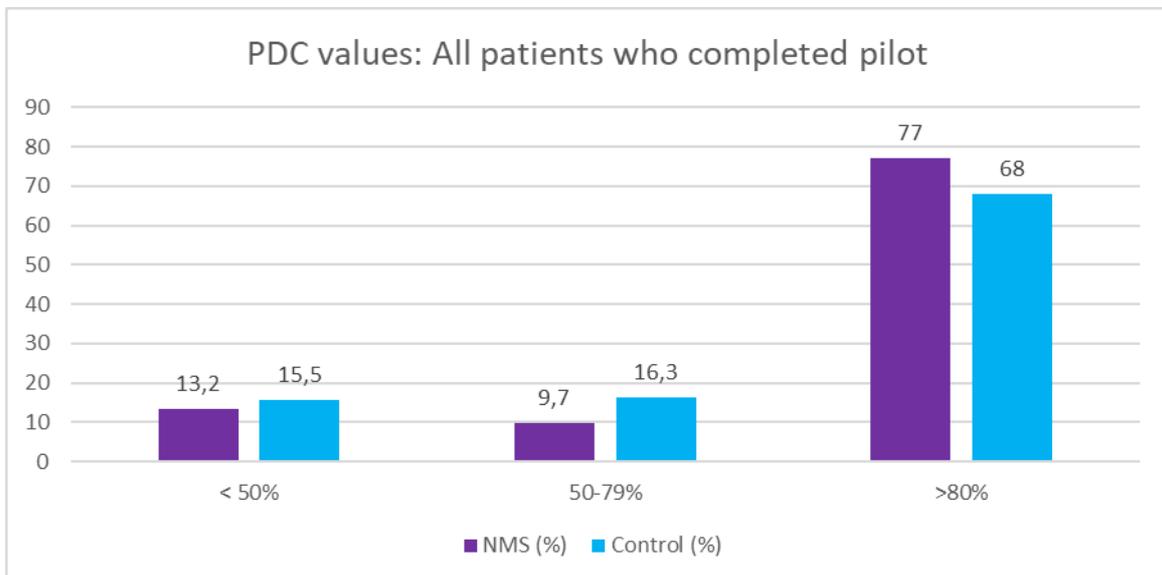


Those patients allocated to the control arm had a total of two interventions during the NMS pilot:

- The pharmacist undertook the patient adherence questionnaire with the patient to assess adherence four weeks after the first dispensing of the new medicine; and
- The pharmacist carried out a PDC assessment of the new medicine, using the PMR from the dispensary computer system three months after the first dispensing of the new medicine.

The results obtained³ demonstrated that both the aims and outcomes of the IPU NMS pilot were met. Patient adherence, as defined as PDC value of 80% or greater, was 9% higher in the intervention (NMS) arm compared with the control arm (Figure 32). This compares favourably with the results of the English NMS review, which showed an improvement in adherence of 10%. The increase in PDC indicates that this pharmacist-led intervention, the NMS interview undertaken within the community pharmacy, has a positive effect on patients' adherence and their medicines-taking.

Figure 32. PDC values at three months for all patients who completed the NMS pilot



Hypertension and type 2 diabetes were the most frequently occurring conditions in both arms (Figure 33) and medicines affecting the renin-angiotensin system, calcium channel blockers and antidiabetic medicines were the most frequently occurring medicine classes in both arms (Figure 34). Patients were evenly matched in both arms regarding age, gender and inclusion conditions.

Figure 33. Inclusion presenting conditions

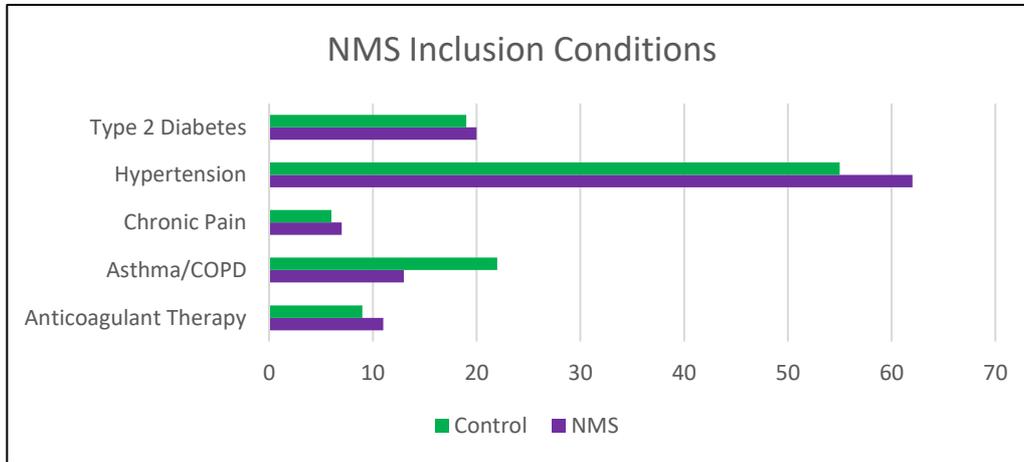
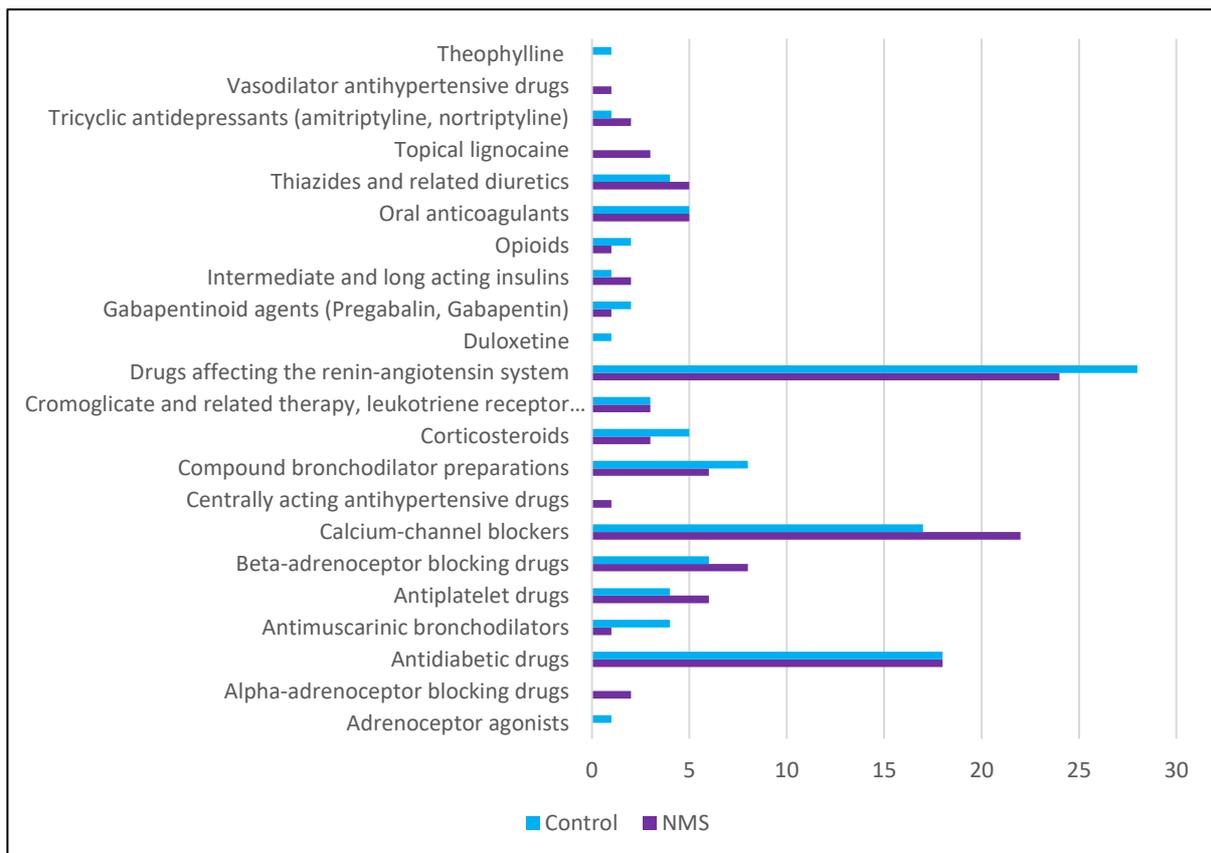


Figure 34. NMS medicine classes



Data were collected for 150 NMS intervention interviews. Table 23 shows that, for the majority of patients (101), no further advice was required. However, 39 patients did require further information and advice from the pharmacist and 10 patients were referred back to their GP. This suggests that almost a third of patients who were prescribed a new medicine and undertook the interview with the pharmacist required some form of intervention by the pharmacist.

Table 23. Matters Identified by the pharmacist during the NMS intervention

No further advice needed as patient reports using the medicine as prescribed	101
Further advice needed	39
Referred to GP	10

Among patients who had concerns, the majority reported side effects to the new medicine, followed by uncertainty as to whether the new medicine was working, with issues around use and information on the new medicine also occurring. Regarding advice and actions taken by the pharmacist in response to patient concerns expressed during the NMS interview, the main action was provision of information on how the drug worked, followed by information on how to take or use the new medicine. This information may have already been provided in previous counselling sessions with the pharmacist and also at the time of prescribing, but it reiterates the fact that patients often do not fully understand or engage with the information provided at the initial prescribing and dispensing stage.

The NMS interview resulted in 12 patients (8%) who undertook the NMS being referred back to their GP. Looking at the PDC values and GP referral figures in combination further demonstrates that the pharmacist-led NMS intervention potentially had a positive effect on a total of 85% of all patients in the intervention arm; 77% of patients achieved a PDC of 80% or greater and 8% were referred back to their GP.

This information indicated that the NMS highlighted issues with the new medicine which, if left unresolved, could result in negative implications for the patient and the health service such as poor adherence, poor patient outcomes, risk of adverse drug reactions and future cost implications.

References

1. Barber, N., et al., Patients' problems with new medication for chronic conditions. *Quality & Safety in Health Care*, 2004. 13 (3): p. 172-175.
2. Elliott RA, Boyd MJ, Salema N-E, et al. Supporting adherence for people starting a new medication for a long-term condition through community pharmacies: a pragmatic randomised controlled trial of the New Medicine Service. *BMJ Qual Saf* 2016;25:747–758.
3. IPU New Medicine Service (NMS) Pilot 2017 Report. Available from: <https://ipu.ie/wp-content/uploads/2017/12/IPU-NMS-Pilot-2017-Report-Copy.pdf>. [Accessed 15 July 2018]

4.13.3 Spain: Early screening of colorectal cancer

In Spain, the recommendations of the Council of the European Union of 2003 are followed, where it is recommended that member states develop screening programmes for breast cancer, cervical cancer and colorectal cancer.

In the specific case of colorectal cancer, in general, the basis for performing screening tests are:

- Target population: women and men between 50 and 69 years of age;
- Screening test: occult blood in stool; and
- Exploration interval: two years.

At present, in Spain, all autonomous communities have a colorectal cancer screening programme² although community pharmacies participate only in Catalonia, the Murcia and the Balearic Islands.

The objective of including community pharmacies is to encourage participation by making the test more accessible for the population (proximity, flexible hours, no need for a prior appointment, and presence of a health professional).

The methodology and procedure to be followed is, in a generalised way, as follows:

1. The Regional Ministry of Health of the autonomous community sends a letter of invitation to people in the identified target population group.
2. If the invitation is accepted, the subject is referred to his or her nearest pharmacy participating in the programme.
3. Upon presentation of the letter of invitation, the pharmacist will deliver the kit for sample collection and provide information to the user about the correct collection and delivery of the sample, as well as information (oral and written) about the possible results of the test, their meaning and subsequent steps to follow.

There are different screening kits available, but all are immunochemical tests capable of detecting human haemoglobin in faeces.

The sampling is usually done on two different days, and the sample kept in a refrigerator until delivery.

The sample is taken immediately after the stool is made. It is recommended to defecate on toilet paper either in the toilet or in the bidet and then take the sample by probing the stool at several different points.

Samples can be delivered to the pharmacy itself, which then sends them to the laboratory for analysis or, depending on the autonomous community, to a primary health centre.

The results will be sent by letter or communicated by telephone to the subject. If no evidence of blood in faeces has been found, the test is considered negative and subjects would be invited to repeat it after two years.

If a specific amount of haemoglobin is found in at least one of the two samples, a confirmatory test (colonoscopy) will be performed.

As a concrete example of the activity developed by community pharmacies in the screening of colorectal cancer, detailed information on the service in Murcia is given below.

The programme of the Ministry of Health of the Region of Murcia is called “Farmacolón” and involves 421 pharmacies out of the 567 existing throughout the region.

Participating pharmacies, in addition to collaborating in the manner described above, will record the following information:

- The patient who collects the kit for taking the sample;
- The date of collection of the kit; and
- The pharmacy that delivers the kit.

The latest available data (from 2014 for general data on invitations sent and tests carried out, and from 2016 for specific data on pharmacies) are as follows:

- Persons invited to take the test: 41,756
- People who performed the test: 22,813
- Participation rate: 54.8%
- Persons with valid tests: 22,143
- People with invalid tests: 964
- People with positive test: 2,105
- Positive rate of 9.5%
- People who delivered the sample at a pharmacy vs a health centre: 20,732 vs 7,439
- Percentage of positive tests detected by pharmacies vs health centres: 8.4% vs 10.2%
- Pharmacy user profile: men 45%; women 55%

- Tests delivered by pharmacies vs health centres (initial screening): 9,593 vs 6,057
- Tests delivered by pharmacies vs health centres (follow-up screening): 12,428 vs 1,661
- Undelivered samples, pharmacies vs health centres (initial screening): 781 vs 187
- Undelivered samples, pharmacies vs health centres (follow-up screening): 441 vs 67
- Poorly collected samples, pharmacies vs health centres (initial screening): 183 vs 178
- Poorly collected samples, pharmacies vs health centres (follow-up screening): 296 vs 78
- Invalid samples, pharmacies vs health centres (initial screening): 45 vs 19
- Invalid samples, pharmacies vs health centres (follow-up screening): 22 vs 6

References

1. Consejo General de Colegios Oficiales de Farmacéuticos. Portalfarma – Salud Pública, Campañas [Internet]. Madrid: CGCOF, 2018. Available from: <http://www.portalfarma.com/Profesionales/campanaspf/Paginas/indicea.aspx>. [Accessed 15 July 2018]
2. Salas D. Situación actual de los programas de cribado de cáncer colorrectal en España. Indicadores de resultados. Oral presentation at the 20th Annual Meeting of the Network of Cancer Screening Programmes (Red de Programas de Cribado de Cáncer). Zaragoza, 17-19 May 2017. Available at: http://www.cribadocancer.com/images/archivos/LolaSalas_8.pdf. [Accessed 15 July 2018]

5 Conclusions and recommendations

Governments, health systems, professional organisations, public and private healthcare providers and society in general are all co-responsible for NCDs prevention and control. It is essential to develop strategies that address some of the major root causes, namely, unhealthy lifestyles and the need to consistently change health-related behaviours and self-care. Effective, feasible interventions that are based on national realities and policies are needed for the prevention and control of NCDs. These interventions should have an impact on health equity and outcomes. They should combine population-wide policies and individual activities. Interventions should be patient-centred and take place at the primary care level. Health systems should ensure and encourage a focus on universal coverage.

Community pharmacies are generally private-sector entities. Nevertheless, they provide an essential public service, delivering value in terms of public health and generating consistent contributions to health gains and economic savings for health systems. Although it is important to have enough specialised health professionals, it is also critical to improve and optimise management and use of existing resources such as pharmacists, and to align their work with that of other healthcare professionals. In addition, professional organisations need to establish competency frameworks that support workforce development.

NCDs create new health challenges and need new healthcare responses: pharmacists and pharmacies are already committed to the future of health systems and pharmacists have a major role in primary care.

Pharmacists:

- Are underutilised human resources. They are highly qualified healthcare professionals, widely available across territories and highly trusted by patients. They are essential for harnessing the full potential of the primary healthcare network of community pharmacies;
- Have regular interactions with patients, even with those who do not see their physicians. These interactions can be used to improve the prevention of NCDs, access to care, the responsible use of medicines and adherence to treatments;
- Provide early screening and point-of-care testing, specialised counselling and long-term disease management;
- Are easily accessible, because pharmacies have long opening times and ensure safe and high-quality primary care services; and
- Could play a bigger role in NCDs, improving health outcomes by reinforcing health system coalition while facing NCD challenges.

NCDs represent an opportunity to strengthen pharmacists' commitment to citizens and patients, namely towards sustainable and better use of health resources.

Therefore, in light of the findings contained in this report, FIP recommends that FIP Member Organisations and all national and local associations of pharmacists:

- Use the evidence and case studies in this report to showcase the effectiveness of pharmacists in prevention and control of NCDs;
- Collaborate with other health professions' associations in developing joint strategies and methods for implementing closer working relationships and multidisciplinary efforts, including pharmacists and other healthcare professionals (physicians, nurses, nutritionists, specialists in laboratory medicine, etc.);
- Develop competency frameworks that support appropriate pharmacist workforce development and promote the achievement of an adequate level of competence related to NCDs at all career stages;
- Engage with healthcare providers, health programmes, patient organisations, managed care organisations and payers or insurers to include pharmacists' roles in prevention, control and management of chronic diseases, including safe and effective use of medicines, as valued initiatives covered by financing or reimbursement schemes;

- Develop strategies aimed at incorporating pharmacists in health programmes dealing with the prevention and management of NCDs, while ensuring that pharmacists are compensated for these services;
- Engage with health authorities to include pharmaceutical expertise in public health efforts and pharmacies as a valuable healthcare network; and
- Look forward to multidisciplinary cooperation with other health professionals, and increasing integration of community pharmacies within the primary care network.

NCDs pose one of the greatest emerging healthcare risks for humanity, demanding new answers and requiring innovative and creative solutions. Building on the key roles they already play as primary healthcare professionals in the community, pharmacists can provide focused interventions, specialised counselling and care coordination, improving patient engagement to achieve better outcomes in the global fight against NCDs.

International
Pharmaceutical
Federation

Fédération
Internationale
Pharmaceutique

Andries Bickerweg 5
2517 JP The Hague
The Netherlands

-
T +31 (0)70 302 19 70
F +31 (0)70 302 19 99
fip@fip.org

-
www.fip.org

| Beating NCDs 04/2019.