Assessing health system preparedness for multiple chronic conditions

Methods and findings report

Contents

About this report

This report describes the methods and main findings from The Economist Intelligence Unit's assessment of health system preparedness for multiple chronic conditions (MCC) in 25 countries across the globe. The research programme consists of an Index of Health System Preparedness, which measures how ready healthcare systems are for the challenge of MCC and identifies opportunities for health systems to improve their management of MCC. This report describes the methods used to build the index and discusses the key findings.

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Project overview

Project objectives

There has been significant progress towards reducing mortality and increasing life expectancy around the world.[1] Yet although health systems have improved globally, and more and more people are living longer, they are doing so with the effects of functional health loss and disability.[2] Many countries struggle to care for people who are living with the effects of MCC. This further disadvantages a large section of the population already suffering worse health outcomes than people who do not have MCC.[3,4] People with MCC also cost the health service more and are increasingly complex to manage. It is a challenge for health systems that are made up of services organised around specialist clinics for treating singular conditions to then cope with several conditions in one person.[5] With the advent of covid-19, the impact of MCC has become even more paramount, given evidence to suggest people with underlying comorbidities have an increasingly rapid and severe progression of the virus.[6]

The Economist Intelligence Unit has created a comparative framework that identifies countries' ability to respond to the MCC challenge. This framework aims to comprehensively capture the level of policy maturity and the capabilities of health systems to respond to MCC across 25 different geographies. The results form an index—a tool that will enable individual countries to assess their achievements and learn from others as they look to improve their performance.

As well as discussing the results of the index by country, this report also explores some best practices in selected countries, through interviews with experts. The case studies help provide examples of implementing MCC initiatives, whereas the index measures aspirations from governments, rather than their effectiveness in practice or the quality of the implementation of programmes or objectives.

Terminology and definitions

There is interchangeable terminology across the scientific and policy literature to describe people with MCC. By nature, MCC are complex combinations of diseases, with the combinations varying across individuals.

Establishing a standardised definition for people who have more than one chronic condition is important to enable accurate prevalence estimates and permit reliable comparisons of prevalence, both over time and between countries and regions.[5,7] A standard definition also facilitates the provision of consistent information to people with MCC and helps services to identify and provide the right support to these people. There is as yet no universally accepted standardised definition of MCC.

A chronic condition has been defined as a condition that lasts a year or more and requires ongoing medical attention and/or limits activities of daily living.[7] Both physical and mental conditions can be chronic. Examples include dementia, depression and arthritis, as well as developmental disabilities.[7]

The terminology used for one person experiencing more than one chronic condition at a time is more varied. Some of the most commonly used terms include "multi-morbidity", "MCC", "comorbidity" and "polychronicity".[8] This variation reflects the lack of a standard definition.

In this report, we use the term "MCC" to describe people who are living with more than one concurrent chronic disease diagnosis.[8] A key defining factor of using this term to describe a patient's status, unlike with the commonly used term, "comorbidity", is that it does not place emphasis on any one of the co·existent conditions: it is unambiguous, has been used in both academic and non·academic settings, and incorporates physical and mental health disorders.[7,8]

The Index

Index methods

The Index of Health System Preparedness for MCC seeks to answer the following question: how well prepared are healthcare systems to manage the growing prevalence of people with MCC? This report describes the methods used to build the index and includes a discussion of the main findings.

The index explores the issue of health system preparedness through five broad domains: *guidelines and policy to support MCC; health system infrastructure to support MCC; patient-centricity, training and research; clinical information systems/ digital transformation; and planning, prevention and risk management*. The first domain focuses on levers that are mostly in the hands of policymakers. The second domain looks at whether health systems have the infrastructure to manage MCC, which includes financing systems, staffing, approach to care and patient advocacy. The third domain seeks to understand whether healthcare systems are appropriately training the healthcare workforce to effectively manage people with MCC, and the fourth investigates whether healthcare systems have the appropriate information technology systems to collect, organise and manage information about patients with MCC. The final domain aims to find out if countries have appropriate surveillance systems to collect data on and appropriately assess the risk of MCC among their population, and whether they take steps to prevent them. The five domains are broken down into 20 subdomains and 38 indicators. Scores are weighted and normalised, so that the final score for each country ranges from 0 to 100, with 100 being the highest possible score, representing complete

alignment with best practice (as measured by the index). The countries are arranged into preparedness groups according to their scores; dark green for "most prepared", light green for "fairly prepared", yellow for "less prepared" and red for "not very prepared". Countries are listed in alphabetical order within each preparedness group rather than placing them in a leaderboard.

The design of the index was driven by the creation of a theoretical framework based on a collection of indicators that measure elements of health system preparedness for MCC that are inherently desirable. Therefore, it is possible to take standalone domains and indicators to help drive specific discussions and offer value beyond the overall score for each country. In addition to the index, we have also collected data on ten background indicators to support correlation analysis. These indicators provide context but are not computed in the index scores; they include indicators of healthcare spend, health outcomes and risk factors for MCC.

The index was built following a literature review and expert panel meeting. The 25 countries within the index cover four geographical regions (the Americas, East Asia and the Pacific, Europe and Central Asia, and the Middle East and Africa), three World Bank income groups (lower-middle income, upper-middle income and high income) and differing proportions of population older than 65 years (less than 10%, 10-15%, 15-20% or more than 20%). (See Appendix 1 for a detailed description of the indicators and scoring guidelines.)

Notes on interpretation

We describe here five potential cautions on interpreting the Index of Health System Preparedness for multiple chronic conditions:

1. Qualitative and quantitative indicators used in the index to measure the availability and strength of primary care services favour countries that have a robust primary care system, which is more likely to be publically funded. Some countries in the index, such as China, Turkey and Ukraine, are still in the early stages of developing a primary care system that mirrors those of western, developed healthcare systems. The limitation of this approach is that the patients in these countries may be receiving healthcare for conditions that might normally be dealt with in primary care from other healthcare providers—perhaps secondary care or private doctors and funded out-of-pocket.

2. Many of the qualitative indicators used in the index are based on the exploration of national policies and plans, which should be interpreted as aspirations from governments, rather than as a measure of effectiveness or quality of the implementation of programmes or objectives.

3. Research for this project was carried out in the first half of 2020 and considered the best evidence available at the time on matters relating to health system preparedness for MCC. Local country contributors were used to improve the penetration of the local healthcare system. This is a landscape that is undergoing continuous change, and so the situation in some countries may since have moved on.

4. For quantitative indicators, the index relies on the best available data. Databases from different organisations are updated with differing frequencies. Therefore, there may be some lags in the situation depicted by certain indicators as regards the situation on the ground.

5. The study offers a simplified view of the complex landscape of MCC preparedness based on indicators deemed the most representative across selected topics. Selection was informed by an examination of the literature and consultations with experts, but is limited in scope. Consequently, some areas of health system preparedness may not have been addressed.

Index findings

Figure 1 presents a snapshot of how the index groups countries within each domain of the index as well as colour coding each country according to the preparedness group within which they sit. These groupings are based on the assessment of national policy documents, comparative studies, published academic papers and publically available datasets. We list in the references some of the key sources for data collection or validation that cover multiple countries. Both figures 1 and 2 colour code countries according to how well prepared they are: dark green for "most prepared", light green for "fairly prepared", yellow for "less prepared" and red for "not very prepared".

The findings are discussed in two parts. Firstly, in terms of key takeaways that all health systems should be thinking about to provide good quality healthcare to people with MCC. Secondly, the index showed that no individual health system has all the answers, but lessons or examples were gleaned from how different health systems are preparing. Thus, the second part of the discussion delves into the findings at a country level.

Figure 1: Country scores by domain

OVERALL SCORE	1 GUIDLINES AND POLICY TO SUPPORT MCC	2 HEALTH SYSTEM INFRASTRUCTURE TO SUPPORT MCC	3 PATIENT-CENTRICITY, TRAINING AND RESEARCH	4 CLINICAL INFORMATION SYSTEMS/DIGITAL TRANSFORMATION	5 PLANNING, PREVENTION AND RISK MANAGEMENT
Australia	Australia	Australia	Australia	Australia	Australia
Brazil	Brazil	Brazil	Brazil	Brazil	Brazil
Canada	Canada	Canada	Canada	Canada	Canada
Chile	Chile	Chile	Chile	Chile	Chile
China	China	China	China	China	China
Croatia	Croatia	Croatia	Croatia	Croatia	Croatia
Denmark	Denmark	Denmark	Denmark	Denmark	Denmark
France	France	France	France	France	France
Germany	Germany	Germany	Germany	Germany	Germany
Indonesia	Indonesia	Indonesia	Indonesia	Indonesia	Indonesia
Israel	Israel	Israel	Israel	Israel	Israel
Italy	Italy	Italy	Italy	Italy	Italy
Japan	Japan	Japan	Japan	Japan	Japan
Mexico	Mexico	Mexico	Mexico	Mexico	Mexico
Netherlands	Netherlands	Netherlands	Netherlands	Netherlands	Netherlands
Peru	Peru	Peru	Peru	Peru	Peru
Russia	Russia	Russia	Russia	Russia	Russia
Saudi Arabia	Saudi Arabia	Saudi Arabia	Saudi Arabia	Saudi Arabia	Saudi Arabia
South Africa	South Africa	South Africa	South Africa	South Africa	South Africa
Spain	Spain	Spain	Spain	Spain	Spain
Thailand	Thailand	Thailand	Thailand	Thailand	Thailand
Turkey	Turkey	Turkey	Turkey	Turkey	Turkey
United Kingdom	United Kingdom	United Kingdom	United Kingdom	United Kingdom	United Kingdom
Ukraine	Ukraine	Ukraine	Ukraine	Ukraine	Ukraine
United States	United States	United States	United States	United States	United States

■ PREPARED   ■ FAIRLY PREPARED   ■ LESS PREPARED   ■ NOT VERY PREPARED

Key takeaways

MCC data collection, prevalence and incidence estimates

- Prevalence, incidence and mortality data are essential to healthcare systems when planning for the future burden of diseases. It was not possible to include prevalence of MCC in the index owing to the lack of a standardised definition for MCC and therefore lack of consistent reporting of prevalence. Countries include various age bands when calculating prevalence of MCC and some include different combinations of chronic conditions. For example, in Canada, reported MCC prevalence ranges from 55% to 39% for people aged 60-79, owing to the inclusion of differing ranges of conditions in the calculations. Similarly, in the UK, reported MCC prevalence ranges between 30% and 81%—in this instance, the former considers only eight chronic conditions for people aged 18 and above, whereas 185 conditions for people aged 50 and above were considered in the latter.[9] The methods for assessing MCC prevalence need to be standardised in order to yield comparable global epidemiological data.

- Research into MCC is dominated by a predominance of studies in Western countries, especially the US.[10] Scientific papers that research MCC are predominantly published in journals devoted to neuropsychiatry and neurosciences, which reflects the importance of mental health as a significant comorbidity of physical health conditions such as cardiovascular disease, cancer and other chronic disorders.[10]

Figure 2: The correlation between overall score and guidelines and policies to support MCC
Correlation (X, Y) 0.87
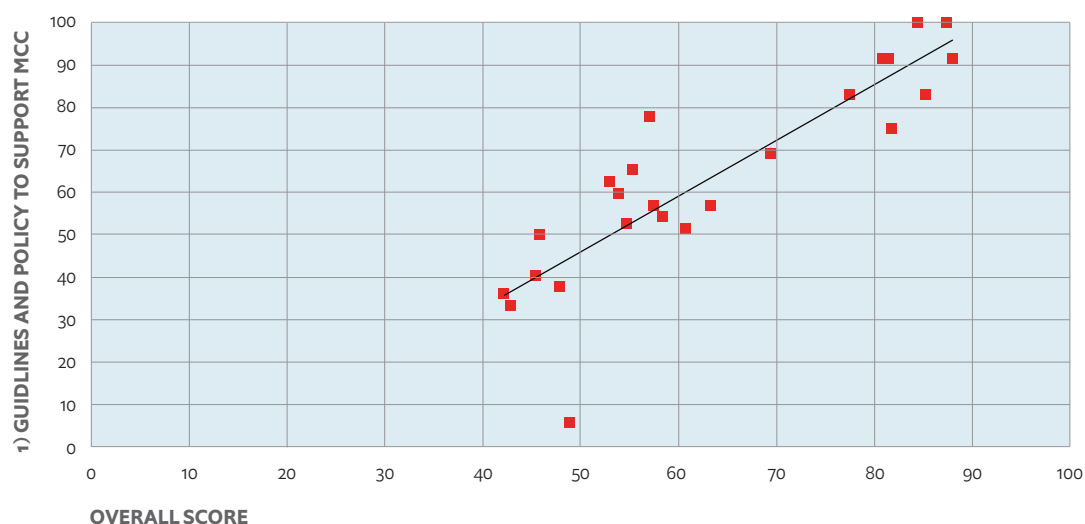
Source: The Economist Intelligence Unit

National strategies, guidelines and policies for MCC are rare, and in many countries do not exist.

- Figure 2 shows the positive correlation between country scores in domain 1, *guidelines and policy to support MCC*, and the overall score. This basically means that countries are more prepared for MCC if they have guidelines and policies for MCC. While all countries assessed had at least one evidence-based guideline for select chronic conditions that mentioned managing common comorbidities, only six countries have a national guideline specifically on MCC care. On the whole, however, MCCs are not given exclusive attention in guidelines and policies. The trouble with single disease guidelines, which focus on one organ or one disease, is that they can inadvertently drive polypharmacy (the concurrent use of multiple medications) and problems with medication compliance for patients when advice for one disease conflicts the other.

- For all of the European countries in the index, the Eurozone crisis is likely to have had an effect on the organisation of healthcare and the top-down drivers that affect things such as policies and guidelines.[11] A ripple effect of the Eurozone crisis was a project piloted in EU member states called the European Collaboration for Healthcare Optimisation, or ECHO. The aim of this project was to highlight unwarranted variation in healthcare delivery that cannot be explained by illness, medical evidence or patient preference. This kind of deep dive into a health system can provide new perspectives on national performances and lead to enquiries about why these variations have occurred. The Eurozone crisis, then, has ultimately encouraged EU member states to reduce variation in healthcare practice. This may have had an influence on the guidelines and system reorganisation that has boosted the health system preparedness scores for countries

Figure 3: Correlation between the health system infrastructure domain and overall index score
Correlation (X, Y) 0.95
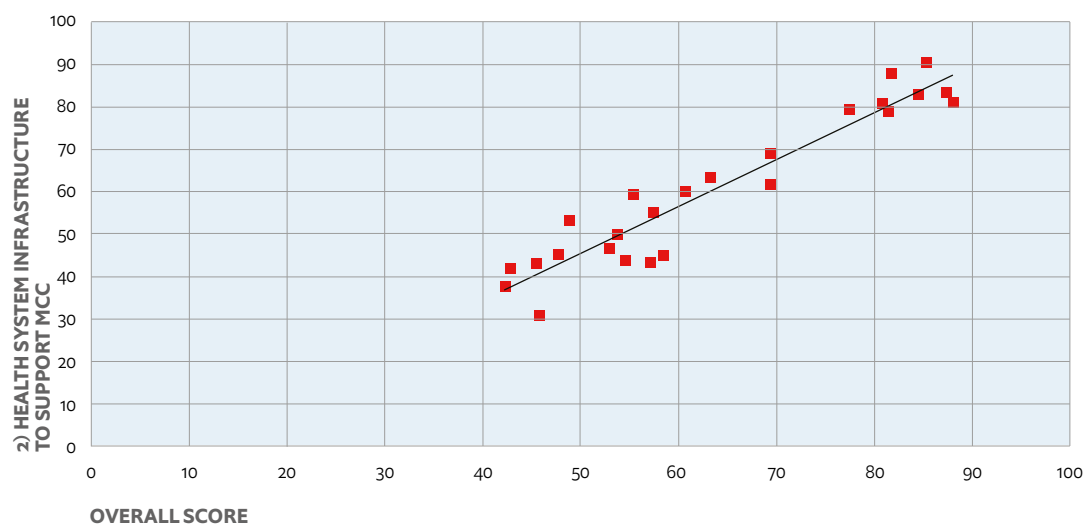
Source: The Economist Intelligence Unit

covered in the ECHO project, such as Denmark, England and Spain.[12]

- Developing evidence-based clinical practice guidelines is a time-consuming and resource-intensive process. It involves systematically reviewing all available evidence on the clinical issue in question, and doing so using a multi-professional review team, as well as members of the public and patients.[13] This means that developed healthcare systems, such as those that, on the whole, exist in high-income countries, are more likely to develop their own clinical guidelines. The index scores reflect this, with the developed healthcare systems of France, Germany, the Netherlands, Spain, the UK and the US all having an MCC guideline. The index also found a positive correlation, albeit a weak one, between countries that spend the most on healthcare and those that have a guideline and/or policy on MCC.

- Most clinical practice guidelines from internationally respected guideline development agencies such as the National Institute for Health and Care Excellence (NICE) in the UK and the Australian National Health and Medical Research Council, are freely available and accessible online to all. Some countries use and adapt clinical guidelines that were developed by other countries and/or professional societies.[13] On the whole, countries using professional guidelines not produced by their own governments were not given points for doing so, unless these guidelines were explicitly adopted as national policy. There was one exception to this scoring system: Germany uses clinical guidelines from professional societies but also takes steps to systematise how these guidelines are used in clinical practice. It does this using an independent health technology assessment organisation called the Institute for Quality and Efficiency in Health Care

(IQWIG).[14] IQWIG is a resource for healthcare professionals that lists the guidelines that are recommended for specific conditions. In this way, the care provision delivered in the German health system is standardised.

Of all five domains, health system infrastructure had the strongest correlation with the overall score

- *Health system infrastructure*, which is a composite indicator comprising of how much a country spends on healthcare, and the availability of healthcare professionals such as general practitioners (GPs) and community health workers, as well as pharmacy services and patient advocacy groups (detailed indicator descriptions can be found in the Appendix), has the strongest influence on determining how prepared a country is for MCC. Figure 3 demonstrates this correlation.

- All countries in the "prepared" category have public healthcare systems, apart from the US. Healthcare systems with universal healthcare coverage are more efficient, integrated, person-centred and actively take steps to inform and encourage people to stay healthy and prevent illness. Integrated care, which is person-centred and encourages people to self·manage, includes many elements we determined to be key to managing MCC.[15]

- Effective chronic disease management programmes are highly dependent on well·functioning national health systems.[16] Perhaps not surprisingly, factors that limit a country's capacity to implement strategies to manage chronic conditions relate to the way health systems are designed and function. There is a lack of understanding that significant attention to health systems is part of an active response to chronic diseases.[17] Efforts to scale up interventions

for managing common chronic diseases too often focus on one disease and its causes; they are fragmented in their approach and vertical in their health system penetration. Instead, the approach should include a strengthening of health systems to deliver a comprehensive range of services.

- The Innovative Care for Chronic Conditions Framework, which is adapted from the Chronic Care Model, lays out the building blocks needed to organise healthcare systems in low-and middle-income countries so that they are prepared to cope with chronic conditions.[18] Although there is some evidence that the Chronic Care Model has been adopted in the US, the UK, Canada, the Netherlands and Australia, the adapted framework is not used as a credible alternative in low-and middle-income countries. This is probably because the Chronic Care Model requires a level of capacity and resourcing that is not feasible for many such countries.[17]

High income countries do better overall, but there are some exceptions

- In all but Saudi Arabia and Israel it appears that health systems in high income countries do better in terms of preparedness for managing patients with MCC. This is most likely due to chronic conditions being an area of focus in developed, high income countries for much longer than in developing ones.[19]

- Primary care in lower middle income countries is focused on episodic care and in many cases is poorly situated to deliver access to the affordable prevention, diagnosis and treatment services that many chronic diseases require. More low-cost investment is needed to elevate primary care as the main platform for responding to chronic diseases in the health systems of low-income nations.[19]

- On a positive note, some countries (such as Brazil) demonstrate a growing appreciation for recycled models of primary care, focusing on community-directed interventions and the increasing use of community health workers. This community outreach approach to primary care allows expansive coverage and is proving to be cost-effective.[17]

- Low and middle income countries are often more likely to suffer from increasing prevalence of chronic diseases. This is because adults who have grown up in deprived communities are more prone to functional decline caused by chronic diseases at younger ages. Failing to respond to this shift in disease profile will mean higher health and welfare expenditure for countries, and this may reduce national productivity and competitiveness.[19] The worsening financial constraints that most health systems are under, partly a result of changing patient demographics, might just be the incentive that drives healthcare policymakers to consider chronicity in primary care models.[17]

Generalist healthcare professionals are key for managing both the treatment and the co-ordination of care for people with MCC.

- The nature of the healthcare workforce in each country is key to care management. As measured within the *health system infrastructure* domain, this included the number of generalists, skilled health workers, pharmacists, mental health doctors and mental health nurses. When speaking to MCC experts as part of this project, most mentioned the importance of a "generalist", who could be either a nurse or a doctor. A generalist is a professional who can apply their medical skills across a range of conditions—the opposite of a specialist. In

some countries, generalists may also be healthcare assistants and community health workers.

- More and more evidence suggests that an increase in lower-cost community health workers can increase the coverage and quality of care. These kinds of staffing solutions have worked well in the context of HIV/AIDS and have been effective in compensating for overburdened health systems, especially in rural settings.[19] These strategies may also prove useful in the context of non-communicable diseases (NCDs).

- Nurses are the largest part of the professional health workforce, and they are trained to take on various roles in healthcare. Because of this, both the scale and range of skills required to tackle MCC exist within nursing. Nurses are often the first point of contact, and in some countries the only point of contact, for people who are unwell.[20]

- Community pharmacists can also provide generalist healthcare services. Their role in the management of MCC is especially important owing to the high number of drugs required for treating people with several different chronic conditions. Pharmacists can visit people at home, provide advice on managing chronic diseases, prevent adverse drug reactions, promote medication adherence and help reduce hospital admissions, while also strengthening integrated primary care delivery (see case study 1).[21,22] Seventeen countries covered in the index have designed policies that equip community pharmacists with expanded community responsibilities. Twelve countries in the index provided both a policy that evidences expanded roles of community pharmacies and a training programme to equip them for such a role. A further five countries had policies but no evidence of training programmes.

Care co-ordination is paramount, but not necessarily the norm

- The *patient-centricity, training and research domain* is also positively correlated with overall score. Within this domain the index measures the average duration of primary care visits in a country as a proxy for whether primary care is equipped to manage patients with MCC. This is because people with MCC will require a longer consultation to give healthcare providers the time to treat and co-ordinate care, so as to make sure that patients receive support for each condition. Only six countries (Canada, Chile, France, Peru, Russia and the US) had primary care visits lasting 15 minutes or more. In the case of Canada, France and the US, these are all high-income countries with developed healthcare systems. In Chile and Peru, consultation lengths are a little longer, but they are not of high quality. In Russia, the results are based on data from Moscow,[23] thus consultations may not be 15 minutes or more in all of Russia.

- Average consultation length is also something that the World Health Organisation (WHO) determines is a quality indicator of safe and cost-effective use of drugs. For patients with MCC, there is trial evidence that longer consultations lead to an improved quality of life and encourage patients to be more independent.[24]

- A majority of countries have made efforts to train and employ healthcare professionals whose role it is to co-ordinate the care of people with MCC. This is slightly different to the work of a generalist, although it is possible for a generalist to also perform a care co-ordination role. For example, in the UK it is possible for a clinical nurse specialist to play a dual role as a generalist and care co-ordinator. However, it was not possible

to find evidence of such professionals in seven countries: Croatia, Denmark, Indonesia, Peru, Saudi Arabia, Turkey and the Ukraine.

- Although both the health and social care systems of just over half of the countries in the index are co-ordinated by the same ministry, this does not tell us much about the extent to which the health and social care systems are co-ordinated. Integrating care across silos is difficult, even in countries where primary care, community care and social services all operate under one national body.[25]

Electronic medical record (EMR) systems are a key facilitator for the care co-ordination of MCC

- There is a convincing body of evidence that EMR systems promote the co-ordination of care and improve quality and safety of patient care.[26,27] For an EMR system to have been successfully implemented, countries have usually received a commitment from the funders of the local healthcare system, which might be a mixture of governments, national insurance schemes or third parties, to meet the costs of IT solutions.[28]

- For MCC, EMR systems are especially critical, as they can alert healthcare professionals to adverse drug reactions and provide decision support algorithms, which also help to improve the efficiency of clinicians' time and resource use. Our index measured whether a country's EMR system incorporates a pharmacy information system for monitoring adverse drug reactions, data which the WHO collects routinely.

- Some countries have an EMR system but do not score a point in this sub-domain, because the system only exists within large organisations, in cities or specific regions, and/or does not expand to national levels.

Patient advocacy groups play a critical role in self-care of MCCs, but rarely exist

- Three countries—Australia, Spain and the US—have advocacy groups for MCC. All but three—Indonesia, Saudi Arabia and Ukraine—have advocacy groups for individual chronic conditions such as heart disease, diabetes or hypertension. Patient advocacy groups offer both patient and caregiver education and support for a range of specific conditions. Their mission is to help people who have been affected by a disease, as well as to educate and/or help the families and carers of the patient. Patient advocacy groups also help to raise public awareness of a disease, the risk factors involved and treatment options, as well as promoting research to help improve treatments available.[29]

- The transition from disease-focused to patient-centred models of care, where patients, families and carers are part of the decision-making process, is slow. Just over a third of the countries studied emphasise within their guidelines and/or policy for MCC care the importance of self-care. Self-care is a term used to include all the actions taken by people to recognise, treat and manage their own health. Self-care might include health promotion, disease prevention, providing care to dependent people, and seeking hospital and specialist care when relevant. Community health workers who visit people with MCC in their own homes can help to promote self-care.[3]

Discussion of findings by country

In terms of having a healthcare system that is prepared for MCC, **Australia, Canada, France, Germany Spain, the UK and the US** lead the way, in the process demonstrating several inspirational approaches to patient-centred care.

Australia is the highest ranked country in East Asia and the Pacific. In particular, Australia does well in the *clinical information systems and digital transformation* domain, *health system infrastructure* and *patient centricity, training and research*. Australia recognises that the appropriate use of

> **Most prepared: Australia, Canada, France, Germany, Spain, UK and the US**

digital technology and telehealth can enable people to take control over their health and support person-centred care and self-management.[31] A likely boost to Australia's digital achievements was the improvement of fixed wireless and satellite access through the National Broadband Network in 2009.[32]

Australia has also taken several steps to make sure that the care of patients with MCC is integrated. A patient advocacy group exists, bringing together many different advocacy groups for single chronic conditions. Described as an "alliance", this was mainly formed based on the fact that chronic diseases share many of the same risk factors, supporting the idea of tackling these together in an integrated manner through integrated risk-assessment programmes and guideline development activities.[33] The Australian National Strategic Framework for Chronic Conditions mentions that increased access to a range of services and self-management support is essential

to encourage people to self-manage their conditions. Australia also does a thorough job of case-management, using patient navigators. In some parts of Australia, patient navigators are a free service for people with diabetes and/or heart disease, heart failure or long-term lung conditions such as emphysema, chronic bronchitis and asthma.[34]

Canada is also doing better than most, despite the existence of some regional disparities in the way that healthcare is organised. The healthcare system (Medicare) is not a completely national healthcare service; rather, each territory has its own health department and health insurance plan, so the population in each region is covered slightly differently. However, despite territorial variations, healthcare is accessed based on need, not the ability to pay.[35]

The healthcare system in Canada does several things well, but worth particular attention is the PRISMA model for integrated care, which was developed in Quebec. PRISMA is a French acronym for the Programme of Research to Integrate the Services for the Maintenance of Autonomy. It was established to address lack of continuity of care for older people with chronic conditions, aiming to evaluate the impact of integrated service delivery. A special feature of this approach is the co-ordination and case-management approach. Most case managers are social workers or nurses, but members of other professions such as occupational therapists can equally take on the role.[36] Case managers have a responsibility to develop care plans that incorporate all the professional services between primary and secondary care. PRISMA works as a co-ordination model, and it depends on the ability of local providers to give up a little of their own autonomy. As with the Spanish model, PRISMA requires the engagement and will of the healthcare providers. All ten provinces in Canada are now implementing features of the PRISMA model to some degree.

In **France**, major concerns about the lack of co-ordination and continuity of care within the health sector arose in the mid-1990s. This prompted a series of initiatives. These included a strategy for addressing chronic disease, including reinforcing prevention and patient education, making sure that medical tasks were shared between doctors and nurses, and developing new ways of delivering care. In France, clinical guidelines are very inclusive of the care of people with MCC. There is both a guideline and policy on MCC care. In 2009 the Hospital, Patients, Health and Territories Act set out a series of measures to boost the quality of care for people with chronic disease. These included specific attention to integrated care, making sure that there were contractual agreements between professionals and regulations pertaining to multidisciplinary and multi-professional healthcare centres.

The French health system organises the delivery of healthcare into something known as a provider network. These networks aim to improve co-ordinated care for people with complex needs and measure their success across four domains: care pathways, co-ordination, efficiency and satisfaction, and cost-effectiveness. There are more than 1,000 of these networks in France, some of which are specific to certain population groups, such as older people. These networks can be accessed directly or through GPs, are free of charge and are regulated by the Ministry of Health. France also finances the health system in a way that promotes integrated care, further complimented by pay-for-performance mechanisms.[37]

France also has increased healthcare spending compared to most EU countries, at 11.5% of GDP, which is above the EU average of 9.6% of GDP spent on health.[38] The share of out-of-pocket spending is low, as over three-quarters of health expenditure is publicly funded, and complimentary health insurance pays an important role in this.[39] Unregulated direct out-of-pocket charges for health care in a country often constitute a major barrier to accessing necessary healthcare and can cause problems related to financial protection.[40]

France only really falls short on its clinical information systems, which have run into a few problems relating to patient confidentiality, leaving hospitals a little reluctant to implement EMR systems. However, in 2011 the Ministry of Social Affairs and Health re-launched its EMR project with a primary aim of making all healthcare vendors EMR compatible.[41]

In **Spain**, the public health system, the Sistema Nacional de Salud (SNS) is funded almost entirely from general taxation. This means that public healthcare, aside from pharmaceuticals, is free at the point of use for all residents who have a social security card. Because of public spending cuts in 2012-14, the government has made several efforts to reduce debt, including publishing an atlas to highlight unwarranted variation in healthcare delivery. This initiative may have played a role in encouraging the country's healthcare system to improve its integrated care strategies.[42]

Although the SNS is comprised of 17 regional health ministries, the Ministry of Health, Social Services and Equality is responsible for certain strategic areas at a national level. One of these areas is the use of a method used to stratify the health of the population, called Adjusted Morbidity Groups (AMG). This method was initially developed in Catalonia and is now used in most Spanish regions. Use of the AMG system helps to group populations according to their health status, which provides health authorities with valuable information about how to plan services and resource use. The AMG tool has allowed better identification of the number of people with chronic diseases of

different complexity levels.[43] This kind of model is particularly relevant for addressing patients with MCC from both a system-wide perspective and a clinical approach. Patients can be easily identified and targeted for case-management programmes.[43]

Spain scores highly on the guidelines and policy to support MCC domain, as it has both a policy and guideline on the care of people with MCC. In Spain, on June 27th 2012, the Ministry of Health, Social Services and Equality published an action plan for tackling MCC in six key areas: health promotion, prevention of health conditions and chronic activity limitations, continuity of care services, reorientation of health care services, health equity and equal treatment, and research and innovation.[31] Furthermore, a guideline for chronic conditions care exists, the "Approach to Comorbidity and Multiple Pathology", which was published in in 2015 by GuíaSalud—the repository of clinical care standards guidelines for the SNS—and the health ministry.[44]

Spain has a comprehensive EMR system which was developed with the aim to integrate the EMR systems of all autonomous communities. It is still in development however and currently operates in 15 Spanish regions to varying degrees.[45] The system also includes electronic prescriptions, which shows the prescribing physicians the active ingredients of drugs, and also the cost. Since 2006 all the regional ministries and regional health services have been working together on the development of the online healthcare programme in Spain.[46] The EMR system used in Spain are marked as key to the success of the AMG method for identifying people with MCC, and so are likely to continue to improve.[43]

Germany, which has a good primary care system, falls short on *clinical information systems/digital transformation*. A strong role is played by self-governing bodies, which shape political decisions, complicating

attempts to reform the health system in the interests of efficiency. There is also a strong segregation between primary care, hospital care and specialist care, which has led to a lack of continuity and co-ordination, and, consequently, negative consequences for quality and efficiency of care. Germany is not doing as well as other European countries in its efforts to shift service provision away from inpatient care to outpatient care.[38] There is also limited state control over the health system, which means that clinical guidelines are not produced by the a single national body.

The **UK** does a good job in the *guidelines and policy to support MCC* domain. The UK has an internationally respected guideline body, the National Institute for Health and Care Excellence (NICE), which includes specific guidelines for multi-morbidity. The multi-morbidity guidelines have a strong emphasis on the empowerment of patients in clinical decision-making, allowing patients to have control over their care. This approach should not be limited to just multi-morbid patients; it should be something that everyone in need of healthcare should experience, as is mentioned in the guideline. The key difference in terms of the approach outlined in this guideline, and something that all countries should adopt, comes through addressing existing disease and treatment burden in conjunction with establishing future goals, values and priorities of the patient. This will require a different approach to clinical consultations—one that is longer in length, to incorporate all the nuances across all conditions.[5]

For people with MCC, functional impairment and disability associated with chronic physical health problems can greatly increase the risk of depression. Depression is also a risk factor in the development of a range of physical illnesses, including cardiovascular disease.[47] It is important, then, that guidelines are nuanced enough

to address both physical and mental health comorbidities. NICE pays special attention to this too, evidenced in their development of a specific guideline addressing the management of depression in adults aged 18 years and older who also have a chronic physical health problem.[47] Although NICE guidelines technically only hold authority in England, their publications are seen as providing high-quality evidence worldwide.

As is the case with France, the UK falls short in terms of the digitisation of its health system. For the UK National Health Service (NHS), digitisation began well in 2002, when the UK government launched a National Programme for Information Technology, the NHS Care Records Service. This had the intention of delivering an electronic records system across the UK. However, there were problems using it, and the UK experienced the same issues France faced in addressing patient confidentiality, as well as costs becoming a lot higher than was expected. As a result, the system was closed down in 2011.[48] Although EMR systems exist in the UK—in some NHS trusts they are comprehensive—they do not operate consistently across different regions of the UK.[49]

In the **US**, the healthcare system focuses on volume of care rather than value and the appropriate goals of care.[11] Despite being categorised as "prepared" the US has a fairly inconsistent set of scores across all five domains in the index. The US does well in *patient-centricity, training and research* as well as *health system infrastructure.* In terms of the former, the US is a research powerhouse. In terms of the latter, despite scoring highly, regional disparities and inequitable access in the US healthcare system still exist. Notwithstanding the Affordable Care Act of 2010 establishing a shared responsibility between the government, employers and individuals for ensuring that all Americans have access to affordable health insurance, health coverage remains fragmented. There are some steps in the right direction, including moving away from specialist-driven care to a health system built around primary care and the introduction of accountable care organisations, a network of providers that are responsible for certain catchment areas.[50] There is evidence that the US is trying to make a difference for people with MCC. For example, as part of Department of Health and Human Services' Initiative on Multiple Chronic Conditions, they have launched a set of Education and Training materials for healthcare professionals on managing patients with MCC, and there is a high volume of research into the care of patients with MCC.[51] There is also both a guideline and a policy for managing people with MCC.

The US scores less well on clinical information systems. The Health Information Technology for Economic and Clinical Health Act (HITECH) was signed into law in 2009, giving health providers the incentive to adopt EMR systems. However, this process has been slow, owing to a mixture of issues similar to those experienced by the UK—namely cost, patient confidentiality and interoperability.[49]

Italy, sits in the "prepared" group in terms of its clinical information systems. According to the WHO, Italy's EMR system offers the ability to share digital data between health professionals in other health services, as well as allowing individuals to access their own health-related data and specify which health-related data from their EMR can

Fairly prepared: Italy, Japan and the Netherlands

be shared. In addition, Italy is investing in training more nurses to deal with the issues arising from population ageing.[52]

There is an emphasis on a primary care approach in Italy, with GPs acting as care co-ordinators. Furthermore, financial incentives are being provided for GPs to follow certain group practice approaches, involving multi-disciplinary care. Some regions have introduced chronic disease management programmes, focusing on conditions such as diabetes, chronic heart failure and respiratory diseases.[52]

Japan is the only non-European country in the "fairly prepared" group and the second country (along with Australia) in the East Asia and the Pacific region that is doing reasonably well. Japan is in the top ten for all domains apart from *clinical information systems/digital transformation*. Although Japan adopted a policy for eHealth in 2014 and the use of EMR generally increased between 2008 and 2014, there are disparities in EMR adoption on both a regional and an individual facility level. Hospitals in larger cities are more likely to adopt EMR systems than clinics or primary care facilities and hospitals in smaller towns.[53]

Another concern in Japan is a lack of primary care doctors. The Japan Primary Care Association (JPCA) was established in 2010 as the certifying body for primary care physicians. As it is relatively new, the JPCA will need a little more time to have an effect on the number of primary care physicians practicing in the country. A further factor supportive of MCC care is the development of an independent third-party initiative, "board-certified GPs". A certification board will assess GPs on competencies such as person-centred care, comprehensive care, integrated care, community orientation and inter-professional working.[54]

The Netherlands, does particularly well in *patient centricity, training and research*. The Netherlands has a large body of research into MCC, with only Denmark exceeding it on the number of publications per one million inhabitants. The Netherlands also offers training for healthcare professionals on MCC care in all medical schools, as well as in nursing qualifications. The long-term care system was reformed in 2015 to contain costs but also to make care more patient-centred. District nurses play a key role in integrating different aspects of care and support.[55] The primary care system is also strong, with primary care professionals usually working in multidisciplinary teams. Community pharmacists work alongside GPs in their catchment areas, with nurse practitioners having the skills to prescribe medicines, taking some of the workload burden off the GPs.

Overall, there have been significant efforts to shift care from secondary care to primary care, mainly for chronic diseases and simple low-risk treatments.[55] There are also several pilot projects that concentrate on integrated care for chronic diseases and care for people with multi-morbidities, shifting the responsibility of care to lower levels.[55] The Netherlands falls into the same bucket as the UK and France when it comes to digitisation of the health system, and scores poorly on this domain owing to sparse coverage of EMR systems.

Among the Latin American countries covered in this index—Brazil, Chile, Mexico and Peru (the latter two which will be discussed in the "not very prepared" group)—there is a common problem: they all suffer when it comes to providing comprehensive, integrated care, partly due to the split between public and private healthcare. This fragmentation typifies Latin American healthcare systems, and, despite some regional improvements in health indicators, there are inequalities in health status, alongside inequitable access to and use of health services. Some improvements can be seen in **Brazil** and **Chile**, which both introduced health reforms to support the integration of healthcare delivery, the former in 2001 and the latter in 1989.[56] This may have some bearing on the fact that Chile and Brazil are slightly more prepared for MCC than Mexico.

Chile scores well in the *patient centricity, training and research* domain, as it has the most academic research on MCC compared with Brazil. Brazil and Chile both employ healthcare professionals capable of coordination tasks, although they differ slightly in their exact job descriptions. **Brazil** is the only Latin American country covered in the index that does not have an electronic medical record system. Owing to the characteristics of health systems in Latin America, there is a lack of legislation at the country level on the use of EMR systems, a lack of consensus between different state and private players, and a limited number of professionals trained to work in medical informatics.[57] Despite the implementation of integrated healthcare systems in the region, the impact of these are largely unknown, as data on actual use of health services are unexplored.[58]

China is a few steps ahead of Indonesia and Thailand in the East Asia and the Pacific group. China is making progress, not only in terms of the general delivery of healthcare,

but also specifically regarding MCC, a fairly impressive feat, given that the country's policymakers and health authorities have the world's largest population to consider. There are some great examples of regional healthcare incentives that, although they did not end up improving China's grouping in the index—the country's size means that regional examples do not count—are worth mentioning in terms of aspirations for the future. For example, in September 2017 the Ministry of Health launched a new

Less prepared: Brazil, Chile, China, Croatia, Denmark, Russia, Saudi Arabia, South Africa and Ukraine

approach to people-centred, integrated care called the Louhu Model, piloted in the Louhu district of the southeastern city of Shenzhen. This model was launched as a response to the problems faced by the existing healthcare system, including the lack of integrated healthcare to address the growing population of people with MCC. A key issue in China is the ongoing lack of trust in the primary care system, and, therefore, the reliance on hospital care for even minor ailments. (This does not bode well for the treatment of MCC, which requires a strong general practice foundation.) The Louhu Model recommends primary healthcare as the first point of contact for care, as well as endorsing multidisciplinary teams and eHealth, among other factors.[59]

Countering its deficiencies in health infrastructure, China falls in the "prepared" group in the *clinical information systems/ digital transformation* domain. According to the WHO, China has an eHealth policy and an electronic medical record system that includes a pharmacy information system capable of highlighting adverse

drug reactions. That said, despite almost 90% of hospitals using electronic medical records, the accessibility and quality of the data could be improved. This is mainly due to incompatibility between different hospital systems. Health authorities are yet to agree on how to improve hospital information systems.[60] China also does not score well in the *guidelines and policy to support MCC* domain. This is because China has not yet developed guidelines or policies related to integrated care or MCC. Although guidelines exist for chronic conditions such as hypertension, diabetes, heart failure, stroke, and Chronic Obstructive Pulmonary Disease which mention comorbidities in care management, they do not go as far to include prompts on self-care or including family members in the care plan.

Croatia is the only county that does not have any operational plans on healthy living, according to the WHO; such plans are key to reducing the risk factors for MCC. Croatia, as with Turkey and Ukraine, also does not have a NCD policy that describes an integrated approach to both these diseases and their risk factors – the sort of approach that will be needed for MCC. Human resource in Croatia's health system is low, with fewer physicians and nurses than in many other EU countries. This shortage of physicians lies in primary care, which does not do the care of MCC any favours, given the general consensus that good MCC care goes hand in hand with comprehensive primary care. Croatia spends a lot on primary care—at around 35% of total health expenditure in 2015—yet primary care is still underdeveloped, with very little emphasis on primary prevention and co-ordination of care for people with chronic illnesses.[61]

It might be quite surprising that **Denmark** falls in the "less prepared" category, although it does gain some credit because of its score in the *clinical information systems/*

digital transformation domain. Clinical information systems are something that Denmark excels in. Denmark has strong mobile connectivity, an eHealth policy, a national EMR service that is robust enough to enable sharing of data between health professionals in different health services and a pharmacy information system.

Health system infrastructure is not Denmark's strong point. Some plausible explanations for this include a fall in the number of GPs, resulting in less availability of primary care, which is essential for the management of MCC. In addition, the number of primary care clinics fell by 5.9% from 2007 to 2017. A reduced number of GPs is predicted to have an effect on later referral of patients to specialists and hospitals. Denmark also scores poorly on *patient centricity, training and research*. Although Denmark produces a lot of scientific publications in the field of MCC, there are no training frameworks on MCC or incentives to train healthcare professionals to become care co-ordinators or nurse practitioners.

Russia, sores "less prepared" in all the domains apart from *clinical information systems/digital transformation*. According to the WHO, Russia has a national electronic medical record system that was introduced in 2013.[62] Several hospitals have switched from paper-based medical records to an EMR system designed to provide fast EMR exchange while also meeting stricter medical record information requirements and delivering more secure access to patient information.

Russia does not have particularly holistic guidelines of the sort that promote multidisciplinary care for people with MCC. Although there is a policy on integrated care, polices and/or guidelines on MCC do not

exist yet in Russia. Of five selected clinical guidelines for chronic conditions, three are nuanced enough to mention comorbidities in clinical management.

Saudi Arabia is one of two high-income countries (alongside Israel) in our index which sits in the latter two preparedness groups for MCC. There are a few plausible explanations for this. Firstly, the index tells us that having a robust health system infrastructure is one of the most influential factors for effectively preparing a health system for MCC, and Saudi Arabia scores poorly in this domain. This is most likely because Saudi Arabia relies heavily on an expatriate population to provide and deliver healthcare services, the nomadic nature of which makes it very difficult to quantify. Reliance on such an amorphous workforce also means that there is high staff turnover, leading to instability in the healthcare system. The nursing workforce is especially affected, as it is largely recruited from abroad.

The quality of data is also poor in Saudi Arabia, and adoption of e·Health systems has been slow in Ministry of Health institutions.[63] Medical research is limited, with only a few institutions capable of conducting it; even then, this is focused on cancer, genetics, infectious diseases and cardiovascular diseases—not MCC. Papers produced in Saudi Arabia are infrequently cited by other researchers, indicating that research conducted within the country has limited impact.

In **South Africa**, the health and wellbeing of most citizens has been inundated with challenges far more pressing than MCC. These include a constant stream of infectious and non·communicable diseases, social disparities, and poor human resources through which to provide care for the growing population. Much of South Africa's healthcare workforce is provided by non-

profit organisations. For example, community health workers are used to improve access to healthcare by encouraging community participation (similarly to community health workers in Brazil).[64] The use of non-profits and tackling alternate health problems, makes it difficult to compare South Africa to the other countries in the index. However, South Africa does rank relatively creditably in the *patient centricity, training and research* domain. This is due to the existence of a national community health worker programme called the ward-based outreach team, multi-disciplinary healthcare teams which help integrate care at the community level.[65] South Africa also scores points in the *guidelines and policy to support MCC* domain. It does have a policy on integrated care called the Integrated Chronic Disease Management Model, which was initiated in 2011. The chronic disease guidelines for five selected chronic conditions also all mention comorbidities.

Ukraine does fairly well in the *guidelines and policy to support MCC* domain, its chronic condition guidelines are nuanced for the management of comorbidities, and are developed with multidisciplinary teams. Ukraine does less well in the *health system infrastructure* domain. Similarly to South Africa, however, it is difficult to compare Ukraine to some of the other countries in the index because of the developing nature of the country's healthcare system. For example, it was not possible to measure the number of generalists in the country, because the concept of a generalist does not exist. Ukraine is also the only country in the index that does not have an operational unit, branch or department in the Ministry of Health that has a responsibility for NCDs. These units are likely to evolve to also be responsible for MCC care. Ukraine is also the only country in the Europe and Central Asia group that does not have patient advocacy groups for people with chronic conditions.

Despite these shortfalls, since 2018 Ukraine has been implementing profound reforms to the healthcare sector. These reforms aim to move the country towards universal health coverage, as well as enhancing efficiency and equity in public spending. Although Ukraine offers all citizens and permanent residents free healthcare in public facilities, coverage is poor, leading to high levels of unmet need. The current system limits the Government's ability to protect poor people and regular users of healthcare, such as those with chronic conditions, from out-of-pocket payments.[66]

Indonesia, although sitting in the "not very prepared" group, did fairly well in the *guidelines and policy to support MCC* domain. Although there are no clinical guidelines or policies on MCC care in Indonesia, there are clinical guidelines for chronic conditions which mention within them the management of comorbid conditions. Some of these guidelines are comprehensive enough to include information on self-care and include family members in the care plan.[67]

The geography of Indonesia (the country's population is spread across more than 2,000 islands) will always make the delivery of effective and efficient healthcare a challenge. However, eHealth is one of the solutions expected to bring the health system together. Although Indonesia currently scores poorly on the *clinical information systems/digital transformation* domain, there are several initiatives to introduce eHealth services. However, these are currently only being conducted by certain institutions and their use is not evenly distributed throughout the country.[62] Indonesia also scores very poorly–alongside Turkey–in *patient centricity, training and research*. Research into MCCs is very limited in Indonesia, with the country producing the fewest research papers of all 25 countries in the index.

Israel has fluctuating scores across the five domains in the index, reflecting the complex nature of the health service. Although the 1995 National Health Insurance Law mandates universal coverage, only 62% of health expenditures were publically financed in 2015, one of the lowest levels among OECD countries. Within the national health insurance framework, there are four non-profit competing plans that provide different levels of coverage. The majority of primary care physicians in Israel provide care through only one of the four plans, Clalit, meaning that the other three offer varying levels of primary care access. In the Clalit plan each patient has a primary

> **Not very prepared: Indonesia, Israel, Mexico, Peru, Thailand and Turkey**

care physician who co-ordinates care, whereas the other three do not receive any care co-ordination support. Although there are efforts to improve access to primary care and associate all those covered under the four plans with a specific primary care physician, Clalit is the only plan that also refers people to secondary care.[68]

A further barrier to MCC care in Israel comes via the provision of mental health services, which, although it exists, has limited integration with primary care. Despite falling in the not very prepared category, things may improve rapidly for Israel if the government supports it appropriately. Currently access to primary and secondary care across the different health plans in Israel is disjointed, but the fact that they are both insurers as well as the main providers of both primary and secondary care means that they are structurally capable of providing integrated care for all those insured. This would greatly

benefit people with MCC. Furthermore, the EMR system in Israel has decent coverage, with every primary care physician using an EMR system, and the Ministry of Health working on further improving the linkage of data between primary and secondary care.[68] Israel also scores highly on the *patient-centricity, training and research* domain because the healthcare workforce includes professionals trained to undertake healthcare co-ordination tasks, and there is also a fairly high volume of research on MCC stemming from Israeli universities. However Israel scores poorly in terms of its clinical guidelines, as there is also no evidence of a systematic approach to the availability of clinical practice guidelines in Israel, instead clinical/medical associations endorse the use of international guidelines.[69]

Mexico falls short when it comes to employing healthcare professionals capable of care co-ordination tasks. On the other hand, Mexico has the strongest guidelines and better clinical information systems than Brazil and Chile. Mexico's system is comprehensive enough to allow the sharing of data between professionals, as well as allowing individuals to access their own data and specify which data can be shared, although the Mexican system only covers 25-50% of primary care facilities.[62] Mexico also does better in the *patient centricity, training and research* domain, as primary care visits (albeit only for those who have health insurance) are between 10-14 minutes long, giving enough time to discuss more than one health condition and there are healthcare professionals trained to undertake healthcare coordination tasks, although it is unclear to what extent this training is implemented in practice.

Peru ranks poorly on the index overall. There seems to be a lack of national clinical guidelines for MCC in Peru, although there are guidelines for the management of NCDs. Furthermore, individual chronic condition guidelines only exist for some conditions, such as diabetes and cardiovascular disease, although these do mention the clinical management of comorbidities. Some chronic care guidelines promote self-care, but others do not. This lack of comprehensive national guidelines causes problems for delivering care to people with MCC.

Peru's approach to MCC is not all bad: the country scores fairly high in the *clinical information systems/digital transformation* domain. According to the WHO, Peru's EMR system is national in scope. However, it does not operate in primary care clinics, only in secondary and tertiary care facilities. Even then, the adoption of EMR systems is low, covering less than 25% of patients.[62]

Thailand placing in the "not very prepared" group may seem somewhat surprising, given Thailand's achievements in terms of establishing universal healthcare in 2002, which resulted in a significant reduction in out-of-pocket expenditure (from 27.2% to 12.4%). However, despite relatively good healthcare being available at a low cost, adult mortality levels have not decreased notably compared with neighbouring countries.

Among other problems, Thailand continues to face challenges in terms of financing and service-provision for the elderly and gaps in urban primary healthcare, two factors that are likely to have the most impact on the care of people with MCC.[70] The country's clinical guidelines are also not very supportive of

MCC; most clinical guidelines for chronic conditions in Thailand address treatment of specific chronic diseases in complete isolation to others, nor are they nuanced enough to encourage self-care or involving family members in decisions.

In **Turkey,** like South Africa, the country has been pre-occupied with other threats. It has suffered in terms of regional warfare, the Syrian refugee crisis and political upheaval, all of which threaten both health financing and political focus on the healthcare system, thus hindering further reforms.[64]

By the late 1990s, Turkey's primary healthcare system had become highly fragmented, mainly owing to it being governed by two ministries and regulated by multiple health insurance schemes, with only two-thirds of the population covered by health insurance. Similar to attitudes in China, primary health care was generally not trusted, owing to poor quality of care, with most people accessing care directly from hospitals and private centres. Consequential overcrowding and high out-of-pocket costs encouraged the government to launch a health transformation plan in 2003, in conjunction with the World Bank and the WHO.

In 2004 Turkey introduced the family practice model to address equity gaps in healthcare. This model established family health centres and community health centres as the backbone of first contact care, led by a family doctor and an auxiliary health worker. In addition, a new cadre of providers called "field co-ordinators" collaborated with family health centres to serve as a communication link with relevant stakeholders in the Ministry of Health. The issue with this model is that 20,000-45,000 family doctors were estimated to be needed to implement it, but there were only 1,200 in Turkey in 2004. Although efforts were made to increase this number, geographical disparities exist and improvements in access are still required. Major political challenges since 2004 have made further progress difficult. Despite its difficulties, the health transformation plan also included a number of successful healthcare IT infrastructures in Turkey, including the creation of an EMR system.[71] According to the WHO, the national EMR system, which was introduced in 2008, has pretty good coverage across primary and secondary care (>75%).[62] Turkey therefore has a solid EMR foundation for MCC care, capable of managing the growth of the primary care system.

Opportunities for action

The index has helped to identify some emerging tailwinds for the care of people with MCC:
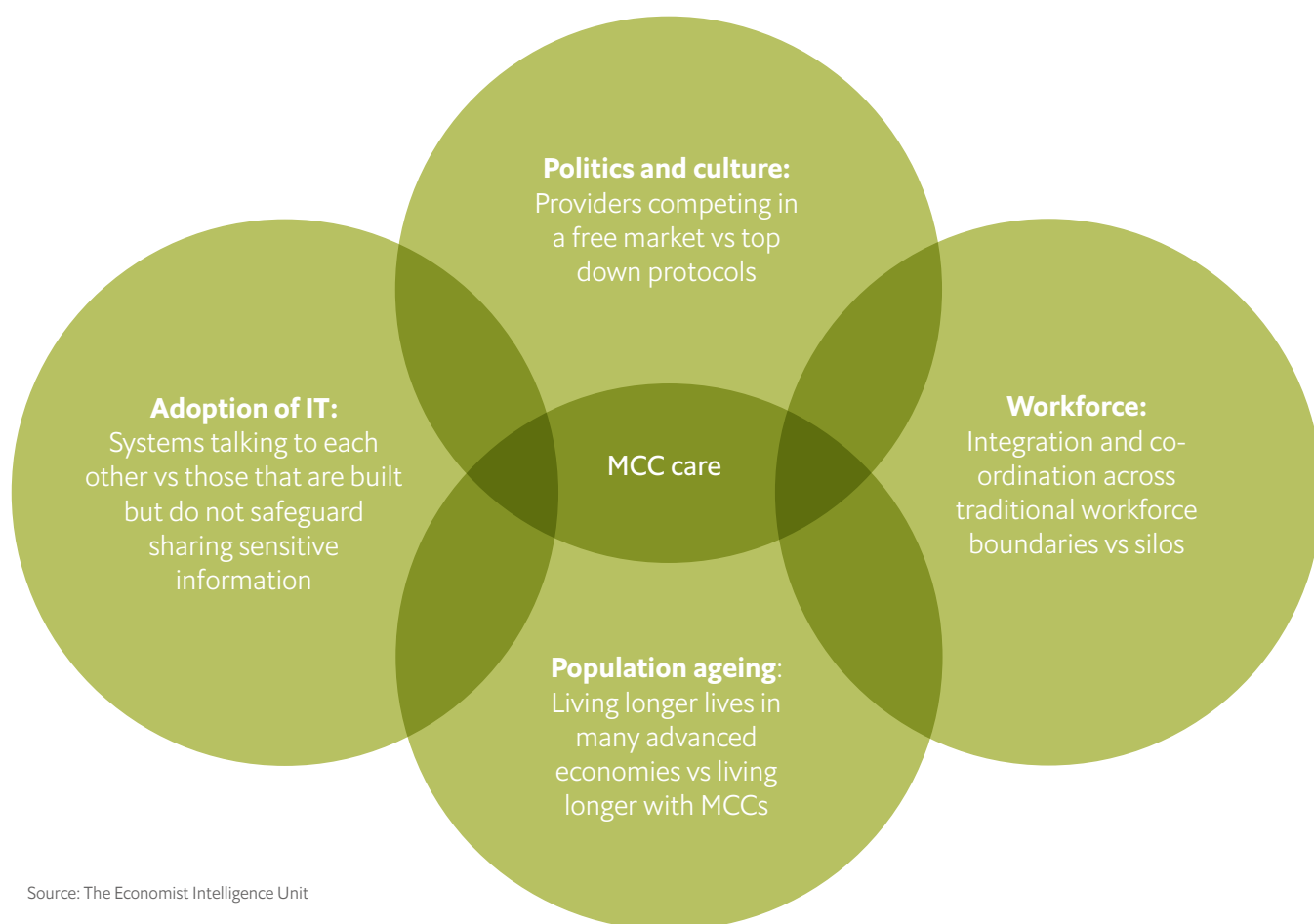
- Very few countries are routinely collecting data on the incidence and prevalence of MCC. These efforts are being hampered by the lack of a universally accepted definition. Greater efforts to understand the epidemiology of MCC are needed.

- Strong political leadership is essential. Political instability is a huge barrier in terms of making effective and efficient healthcare decisions. An unstable political climate often leads to infrastructure change which hinders streamlined care, essential for MCC.

- Access to and efficient use of information and technology is paramount for MCC management.

- Placing families and carers at the centre of care is essential and should be reflected in the organisation of services and in clinical guidelines.

The index also identified headwinds that are likely to hinder the care of people with MCC:

- Complex, disjointed healthcare systems comprising elements that do not talk to each other. These are a huge barrier to providing co-ordinated care even for those with single conditions—let alone to a patient with many conditions.

- Gaps in healthcare coverage. These increase the complexity of the healthcare system and can accrue high costs for patients due to out-of-pocket spending.

- Funding and workforce efforts are often channeled into treatment of chronic diseases, rather than prevention. This does not solve growing disease prevalence. Coordinated efforts to prevent as well as treat MCC are required.

A framework for action

The Venn diagram represents the varying pressures that countries are under—politically, economically, culturally and from the consumer market—and that they need to respond to in order to meet the demands of MCC.

Politics and culture:
Providers competing in a free market vs top down protocols

Adoption of IT:
Systems talking to each other vs those that are built but do not safeguard sharing sensitive information

MCC care

Workforce:
Integration and co-ordination across traditional workforce boundaries vs silos

Population ageing:
Living longer lives in many advanced economies vs living longer with MCCs

Source: The Economist Intelligence Unit

Appendix 1: scorecard framework and detailed indication descriptions

Literature review

The initial step in the development of the index methodology was a literature review carried out by experienced health specialists at The Economist Intelligence Unit (EIU). The search took in health policy documents, academic literature and other health system studies. Its goal was to identify existing frameworks, indicators and data sources on the topic of health system preparedness for multiple chronic conditions (MCC). The literature review used a range of search approaches, including a focused bibliographic database search (in MEDLINE, PubMed and Embase); iterative grey literature searches; and supplemental search techniques such as citation and author searches, scanning of references lists and related·articles searching.

Preliminary indicators selection

An initial set of domains and indicators were then selected, guided by the concept of "tracer indicators", which involves the selection of a subset of indicators that are representative of a group of services. Such an approach has been used in multiple publications identified in the literature review—and recently by the World Health Organisation (WHO) in developing a universal health coverage index published in 2016.

We then convened a panel of international experts in chronic conditions management to discuss and validate the preliminary approach during a virtual teleconference in London. During this session, the most relevant indicators of health system preparedness were determined for each of the index domains.

Further to expert recommendations, we performed additional rounds of verifications to establish best possible metrics, such as data audits, literature searches and data analysis. We would like to thank the following experts:

- Ian Litchfield – (University of Birmingham, UK)

- Cother Hajat – (Royal College of Physicians, UK)

- Juan Carlos Contel Segura – (University of Barcelona, Spain)

- Srinath Reddy – (Public Health Foundation of India, India)

- Stephen MacMahon – (The George Institute for Global Health, Australia)

- Alan Lopez – (University of Melbourne, Australia)

- Nigel Crisp – (Nursing Now, Independent Crossbench member of the House of Lords, UK)

Country selection

The index covers 25 countries from across five broad regions of the world. These include the Americas, East Asia and the Pacific, Europe and Central Asia, and the Middle East and Africa (table 1). Within each region, we tended to select countries with the largest populations, along with examples of smaller countries that represent interesting or unusual approaches to health system preparedness for MCC. We wanted to not only capture the diversity in policy adoption and implementation in high·income countries,

but also include comparisons from where the burden of MCC is more of an urgent problem: in upper- and lower-middle income countries. We hope to extend the research to more countries in future iterations of the index.

Construction of the preparedness groups

The Index of Health System Preparedness is a composite index, and overall scores for each country are produced through normalising, weighting and combining scores of the five domains and their indicators. In turn, sub-domain scores are calculated as the weighted sum of individual indicator scores. All scores are presented in a normalised scale of 1 to 100 (where 100 is the best possible score), displaying the relative performance of each country.

Normalisation is based on a formula:

$$x = (x - Min(x)) / (Max(x) - Min(x))$$

Min(x) and Max(x) are, respectively, the lowest and highest values possible for any given indicator. For quantitative indicators with pre-existing data sets—for example the number of clinical oncologists in a country—Max(x) is simply the highest score in the data set. For qualitative data sets, where we set the scoring range (see section on qualitative indicators on the next page), Max(x) is the highest possible score, whether or not any country actually met that score. We used the min-max technique, as it is widely accepted, frequently used and an easily understandable method of normalisation. Countries are then placed into preparedness groups, dependent on their scores.

Weightings and index consistency

Weightings are intended to reflect the importance attached to each dimension of the index. We decided—through discussion with the expert panel—that the first two domains were relatively more impactful than the latter three, and they consisted of more indicators. Therefore, we attached 30% weights to domain 1 (*guidelines and policy to support MCC*) and 40% to domain 2 (*health system infrastructure to support MCC*). Within domain 1, two of the subdomains were considered to hold more importance for health systems to be prepared for MCC, so were given a higher weighting.

These were *integrated care* and *MCC policy and guidelines*. Similarly, in domain 3, two of the subdomains were considered to hold higher importance for MCC, so were weighted higher. These were *training and continuing improvement* and *personalised care*. However, there is functionality in the workbook that allows the user to apply different weights and recalculate index results.

We checked the consistency of the index by running correlations between subdomains. None were found to be significantly overlapping or co-linear. We did not run a formal principal component analysis or sensitivity analysis, because the index was designed as a combination of desired policy inputs, and so has value beyond simply giving a final composite score; the framework is not statistically determined, but rather based on elements of health system preparedness that are inherently desirable. Moreover, given the relatively limited number of countries included in the first wave of the study, and with the vision to expand the coverage in the future, a purely statistically determined framework would be sensitive to addition of any new countries. Rankings and scores were checked in an iterative process by EIU

specialists, which allowed us to identify data anomalies that could then be corrected.

Quantitative and qualitative indicators

The 18 quantitative indicators in the index draw on numeric raw data from key global healthcare organisations including the WHO and the World Bank. Where possible, missing data points were imputed by calculating regional averages or using alternative datasets. A total of 20 qualitative indicators were designed by The EIU for this study; they analyse topics for which no cross-country data were previously available. These are based on standardised assessments of country performance using detailed scoring guidelines and are displayed as scores in a numeric scale (usually 0 to 3, where 3 is best):

- Seven indicators measure the existence and scope of clinical guidelines and policies to support MCC care. The first two of the seven address integrated care including; the presence or absence of a specific policy, strategy or action plan on integrated care, and whether health and social care is coordinated by the same ministry. The following four indicators assess the presence or absence of clinical guidelines and policies for MCC. The first two of the four specifically look for MCC guidelines and policies, and the second two look for chronic conditions guidelines which include the management of comorbidities within them. The seventh indicator assesses the coverage of mental health guidelines for including family and carers in managing the care, and whether they consider physical health comorbidities.

- Eight indicators assess the health system infrastructure to support MCC care. The first of these looks at whether community pharmacy services exist, and if they are trained to provide generalist services, while the following three dig into the reimbursement structure in a country – whether there are performance based payment models in hospitals, primary care, and financial protection for people with MCC. Two indicators address the existence of patient advocacy groups, one which assesses the availability of advocacy groups for people with MCC, and another looking for advocacy groups for specific chronic conditions. The final two of the eight assess self-care management. They do so by checking the MCC guidelines, and/or policies, as well as chronic condition guidelines in each country specify the importance of self-care.

- Four indicators assess the level of training, research and patient-centred approaches adopted by healthcare staff. This includes two indicators which assess training programmes and the existence of a healthcare quality improvement initiative. Another two indicators assess whether primary care consultations are long enough to provide person centred care, and the existence of staff whose particular role it is to assist with care coordination.

- One indicator assesses the existence of national bodies that function as public health observatories, collecting data on population risk factors for chronic diseases such as smoking, poverty and socioeconomic status.

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Appendix 2: Best practice case studies

Brazil: dealing with the MCC challenge in a middle-income country

The challenge of multiple chronic conditions (MCCs) is a reality for low- and middle-income countries (LMICs), many of which are still struggling to construct healthcare systems capable of tackling population needs. Brazil is one such example. As a whole, chronic diseases were responsible for 73% of deaths in Brazil in 2016.[72] National surveys in 2013/14 found that between 17% and 24% of adults self-reported having two or more chronic conditions.[73] But although Brazil is a large and politically complicated country, a scattering of examples exist in several states of good practice in delivering healthcare for

interest in improving integrated primary healthcare in Brazil, which has contributed to the development of the public Unified Health System (SUS) and the Family Health Strategy (FHS).[74] The FHS was created in 1994 to consolidate primary care, and since its inception has rapidly increased coverage to reach about two–thirds of the Brazilian population by 2015.[74, 75]

A key component of the FHS are family health teams, community primary healthcare clinics that are staffed with health professionals responsible for a particular neighbourhood. Each team consists of a physician, a nurse, two nurse assistants and six full-time salaried community health workers, who are recruited from the neighbourhoods they serve. Each team

> " How do you get the mayors of 5,570 municipalities in Brazil to agree with your idea? That is a lot of people to influence on a topic as critical as healthcare, which often divides opinions.
>
> Professor Mônica Viegas Andrade, economist and population health expert, Federal University of Minas Gerais, Brazil

people with MCCs. At a national level, the government has recognised and made efforts to manage the growing number of people with MCCs; one solution is to provide integrated healthcare teams. There has been growing

serves a population of up to 1,000 households.[73] The Ministry of Health also targeted three cities in Brazil to launch the Lab for Innovation in Chronic Conditions Care (LIACC), a forward-thinking primary care pilot project operating within community primary healthcare clinics.[2]

Mônica Viegas Andrade, an economist and population health expert who is involved in the LIACC pilot, explains that the project works by setting protocols and standards specific to the care of chronic conditions, to guide care by primary health providers. Implementation of these protocols are then supported and monitored by community health managers assigned to each primary health network. Within each primary care practice, community health workers are responsible for day-to-day tasks such as visiting the households registered to each primary health network.[76]

Ms Viegas Andrade elaborates:

"The key to the success of primary care are the community health workers, as they bridge the gap between the community and the health system. They visit patients registered with the primary care practice in their own homes and keep an eye out for signs of vulnerability or ill health. They do this on a monthly basis and report back to the surgery. They also check things like immunisations and medications for older people, and also check the status of certain chronic conditions, mainly diabetes and hypertension."

Building a rapport with patients—and therefore trust in health professionals—is known to improve health outcomes.[77] Ms Viegas Andrade describes how the innovation lab leverages social capital in Brazilian communities to target people with chronic conditions:

What is really important is that the community health workers in each primary care practice belong to the community that they work in. Although they have no formal medical training, they are under the supervision of the nurse. The innovation lab also runs community groups, which helps people understand the importance of self-care, as well as set targets

and goals for conditions. The community health workers encourage people to attend.

In Brazil, and many other LMICs, healthcare systems have scarce resources. With the growth in chronic conditions and comorbidities in ageing populations, cost-effective ways of staffing a healthcare workforce are needed. Nurses, with their holistic values and patient-centred practice, are ideally placed to provide the sort of care that is needed as the number of people with chronic conditions grow and caring for people becomes more complex. The World Health Organisation (WHO) recognises that nurses have especially crucial roles to play in health promotion and health literacy. Ms Viegas Andrade talks passionately about how healthcare systems must adapt their approach to manage chronic conditions in the same way that the LIACC does.[78] She makes it very clear, both verbally and in her academic work, that the nursing profession forms the backbone of primary care.

"The manager of the practice is also a nurse," she says. **"Aside from one doctor, the primary care practice is run entirely by nurses and community health workers. If more specialist skills are needed the primary care practice is linked with another health centre where specialists can be accessed."**

With the right support, knowledge, skills and financial backing, nurses are uniquely placed to act as effective practitioners, health coaches and a source of information and support for people with chronic conditions at any age.[78] In many LMICs, a nurse or midwife may be the only health professional that sick people ever see, and are often the sole source of training and knowledge for the primary care practice and community health workers.

Nursing Now, a campaign that recognises the central role of nurses globally, across all country income groups, was launched in

2018 to improve health globally by raising the profile and the status of the nursing profession. Its overall aim is to influence policymakers and support nurses to lead, learn and build a global movement. Nursing Now groups have been established and launched in 40 countries, from the UK to South Africa. Because nurses often live within the community that they serve, they understand the needs of isolated individuals and hard-to-reach populations, as well as being able to design services accordingly.[78] Lord Nigel Crisp, who co-chairs Nursing Now and is also an independent crossbench member of the House of Lords in the UK, provides his insights on the importance of the nursing profession for managing chronic conditions:

"Nurses are generally women which means by and large they suffer from the disadvantages that most women suffer around the world. Nurses are undervalued and are not able to work to the top of their licence. What is clear is that healthcare expenditure in the future is around 60-70% attributable to chronic conditions, and the mind-set you need to tackle chronic conditions is a bio-psychosocial one. Nurses are trained in bio-psychosocial approaches throughout their professional practice. The key message is: if you want to develop your health service, you have to develop nurses."

Nursing Now, which was inspired by and continues to advocate for nurses playing a leading role in new and innovative services, is assessed in "Nursing and Midwifery, the key to the rapid and cost effective expansion of high-quality universal health coverage," a 2018 report produced by Lord Crisp and colleagues to address global healthcare challenges from within the nursing profession. As well as Nursing Now, the report provides examples of nurse-led initiatives to tackle chronic diseases in Brazil and improve access to care.

Nursing Now has representation in Brazil and advocates the following goals for the nursing profession in the country:

- invest in strengthening the education and development of nursing professionals with a focus on leadership;

- invest in improving the working conditions of nursing professionals; and

- disseminate effective and innovative nursing practices based on scientific evidence, at the national and regional levels.

One example of a nurse-led initiative to improve access to primary care in Brazil for a hard to reach group is a service set up by a nurse working in the Albert Einstein Hospital in São Paulo.[78] This service, Bar Talk, was set up in 2013, for men living in the Paraisópolis district. As with many deprived communities, there is a reliance in Paraisópolis on emergency health services and limited understanding of primary care. This nurse held meetings in local bars on a monthly basis for men aged between 20 and 59, to cover topics that men might otherwise feel too inhibited to discuss. A week later, at the local primary healthcare centre, a follow-up clinic was held, called After-Bar, which allowed men attending the Bar Talk sessions to book an appointment with a doctor to talk about their health needs in more detail. Because of Bar Talk and the initiative of one nurse, male visits to the primary health care centre increased by 80%; the programme has since expanded to other bars in the same area.[78]

There are currently not enough nurses in primary care. We need to turn the world upside down. Currently, in developed countries it is the norm to have more doctors in primary care and less nurses, whereas in developing countries there are not many doctors but more nurses. Last year the number of staff in primary care *[in the UK]* went up by 4000—that was an increase of 5000 nurses and a reduction of 1000 GPs. It may not be policy that is making that change, but that change is happening. The reason that change is happening is not just that nurses are better equipped for primary care; the other reason is that not all doctors want to work in primary care.

Both the LIACC and Nursing Now assist nurses in being the driving force behind successful primary care services. Lord Crisp states:

The Practical Approach to Care Kit (PACK) programme is another solution designed to empower and strengthen the delivery of primary care by all healthcare professionals across primary care in LMICs. PACK, which was initially developed, tested and scaled up in South Africa, provides locally applicable, evidence-informed guidance and training for clinicians working in primary healthcare. Since being established, the programme has expanded from South Africa to Nigeria, Ethiopia and Brazil. The Brazilian programme is reported to be the first localisation of PACK being led by an in-country team, with mentorship provided by the developers in South Africa.[79]

Dr Tracy Eastman, the Global Lead for the implementation of PACK, has a varied professional background, having started her career as a medical doctor in South Africa,

before working as a health manager, mainly in health IT systems. She moved to the UK in 2004, and now leads the BMJ Knowledge Centre/University of Cape Town Knowledge Translation Unit (KTU) partnership which is disseminating PACK. Dr Eastman's wide-ranging professional experience informs her view on the benefits of an approach such as that taken by PACK:

The people that deliver care in primary care practices and health centres in low- and middle-income countries are usually nurses, midwifes, community health officers who perhaps have two to three years of training, community health workers who have no [formal] training, and sometimes doctors. The PACK philosophy is to deliver care not just on a vertical level [for specific diseases] but also a horizontal level [across disease areas]. Historically, funding for programmes has often been based on a disease-based vertical, such as allocating funding for specific diseases only, such as malaria. At PACK, non-communicable diseases are one vertical, but we also include communicable diseases, women's health, mental health, palliative care and, more widely, we are trying to get coverage for all the common symptoms and conditions that present in primary care and need to be managed.

In Brazil, PACK is being implemented in Florianópolis municipality, in the southern state of Santa Catarina. **"The primary care practices in Florianópolis have a high turnover of staff, so the aim was to provide PACK training with the hope of helping the staff feel equipped and confident in their roles and improving staff retention,"** says Dr Eastman. **"All 49 clinics in Florianópolis, which is around 250 medical staff, were exposed to PACK. The training was scaled for nurses, community health workers and doctors [and tailored] according to their prescribing rights."**

Dr Eastman has received quite a lot of interest from different states in Brazil for PACK implementation and is currently in discussion with these different states, including the state of Santa Catarina itself. There has also been interest in PACK from academic institutions and the private sector in Brazil. The impact of PACK on chronic diseases is being assessed in two randomised studies, one looking at the impact on chronic lower respiratory diseases and the other at cardiovascular disease and diabetes. The studies are due to be completed in 2019. Should positive outcomes be reported, this is likely to further increase interest in its implementation.[79]

Perhaps not surprisingly, the localisation and implementation of the PACK programme is being affected by an unpredictable period in Brazil, marked by austerity measures and political instability, coupled with frequent changes to leadership in healthcare.[80] But Ms Viegas Andrade believes that both loyalty and belief in the change process, driven by the healthcare professionals delivering the care, are a driving force in Brazil. **"Yes of course, in Brazil political will is a problem"**, she says. **"But I think the approach taken by the innovation lab will have great success, as it is not only beneficial in terms of healthcare and welfare of local communities, it also saves money. This should grab [politicians'] attention."**

Ms Viegas Andrade, Lord Crisp and Dr Eastman all share a common goal: empowering nurses and community health workers to provide effective primary care services, and in doing so, increasing the nurse to doctor ratio. Dr Eastman also thinks that the value of PACK for upskilling nurses and community health workers to manage primary care practices when face to face contact with doctors is precious may not be limited to LMICs:

> **I have been working with PACK for four years and have been approached many times to adapt PACK for implementation in high-income countries. There is no problem with doing that, aside from time and resources. Currently, the senior staff and I at PACK devote our time to low- and middle-income countries, but that does not mean high-income countries can't use our model to save on resources.**
>
> Dr Tracy Eastman, the Global Lead for the implementation of PACK

China: the family doctor team

In China, the world's most populous country, primary care has been developing for the past few decades. In 2009 8,669 community health centres were established. By 2014 such centres employed more than 300,000 staff.[81] There have been other great progressions, such as the expansion of health insurance, public hospital reform and the strengthening of primary care.[82] However, China's healthcare system still faces significant challenges in terms of structural characteristics, policies and quality of care. National policies are trying to create better primary care facilities to essentially form the foundation of the healthcare system, improve access for all, and reduce the spread of chronic conditions and multi-morbidity.[83]

into the development and implementation of primary care since 2010, this case study aims to describe an emerging primary care model known as the family doctor team. Mr Wang has established and currently leads a community-based study investigating the care of multiple chronic conditions in Guangdong Province.

With a large chunk of the Chinese population heading straight to hospital to seek treatment even for minor ailments, China will struggle to sustain a workable response to health challenges in the future. Some evidence suggests that China's reliance on healthcare delivered at the hospital level is the result of limited education and awareness in relation to primary care.[84] People who could receive less costly health services from GPs in primary

> "
> **Chinese people do not access primary care as much as secondary care, as they do not see primary care as safe.**
>
> Mr Harry Wang, Associate Professor at the School of Public Health, Sun Yat-Sen University, China

The main problem in China is that the health system is dominated by a hospital-centric approach. Community health centres are underused because of public mistrust,[81] with people favouring the hospital system more than primary care. Using insights from Mr Harry Wang, Associate Professor at the School of Public Health, Sun Yat-Sen University in China, who has been conducting research

care centres are more likely to choose costlier specialist physicians in tertiary hospitals, a trend that is likely to be linked to patients having limited knowledge about GP services.[85] There is a general perception that the quality of care provided in hospitals is better. Mr Wang reveals that this is partly because, traditionally speaking, doctors that work in Chinese hospitals get paid more; on the whole,

The Healthy China 2030 plan is a policy initiative which aims to improve healthcare across all departments. This plan encourages the Chinese population to use primary care services to alleviate the burden on secondary care. In terms of service provision and the care of multiple chronic conditions, the government is trying to streamline more services at the community level rather than the hospital level.

this has attracted the best doctors to hospitals rather than primary care. But, he says, policymaking is moving in the right direction:

The Healthy China 2030 plan, introduced by the government in October 2016, is the first medium to long term strategic health sector plan developed at the national level since the founding of the People's Republic of China in 1949.[86] This plan provides a glimmer of hope that China is politically committed to participating in Global Health Governance and also aligning with the UN Sustainable Development Goals agenda. Multi-sectorial collaboration is highlighted as a key component to making this plan work, which will require drawing on one of China's key strengths, its innovative health science and technology sector, which is among the best in the world. Healthy China 2030 recognises that primary care is the most efficient and cost-effective way to meet the health needs of people.[86] Mr Wang adds some context:

Healthy China 2030 encourages the government to provide primary care services to alleviate the burden on secondary care. This also includes service provision at a primary care level with a particular focus on the care of two chronic conditions—hypertension and diabetes. This includes free services provided to people with these conditions. For example,

blood pressure checks, blood glucose checks, a follow-up twice a year, providing health education and sending health education materials to patient's homes. The government is therefore making some effort towards chronic care management at the community level rather than the hospital level.

Since 2011 encouraging organisational models of service provision with the aim of improving the referral system between primary care and secondary care has been the focus of those tasked with strengthening primary care. Steps to achieve this include employing more staff and changing the slow manner in which service provision is currently organised.[82] And, as Mr Wang explains, changing staff payment schemes are also an important factor:

"Improved policies are one approach which may encourage doctors to consider the primary care sector and raise their income level so they are willing to work in primary care. There are very large differences in the income levels between doctors in primary and secondary care."

At the national level and in response to Healthy China 2030, the "family doctor team" model was developed as an emerging primary care model that attempts to embrace family-centred, co-ordinated care, as opposed to episodic care. One of the motivations for the model is to tackle the increasing complexity of patients' needs as presented at the doorstep of China's healthcare system. On top of routine care such as diagnosis and treatment of general health concerns, the service will also address preventative care (including health assessment), health interventions with follow-up, health advice and, where necessary, home visits.[84] Preliminary evidence has shown that the care services delivered through the family doctor team model are more satisfactory than those delivered by a single physician.[87] Partly, Mr Wang explains, this is because China has limited resources when it comes to GPs:

A typical family doctor team will consist of one GP, a nurse, public health doctors, and, if possible, pharmacists, psychology consultants and social workers. This multi-disciplinary approach both addresses the physician shortage in China and the need for more complex patient care. The family doctor team also encourages other healthcare professionals working in primary care to develop their expertise to the extent that they too may lighten GPs' load.[84] But although this approach is incentivised at a national level, Mr Wang says that its implementation currently only exists in pockets across China:

"The family doctor team is already implemented in certain states in China, but there is also no clear definition of this model or a clear checklist for what sort of model or services this should include. It's difficult to therefore to expect all regions to follow a rigid plan, which means achieving a consistent family doctor team across all regions in China is difficult."

A more recent step in the right direction, in December 2017 China published a draft National Health and Health Promotion Law, which makes access to basic healthcare services a legal right. Further new measures, announced in November 2018, aim to set

The national target is to have three GPs per 10,000 population by 2020; this is still a very low number. Therefore, to manage the population of people with multiple chronic conditions, other healthcare professionals also need to take responsibility in the delivery of the family doctor team. The idea is that the local community will be registered with a certain family doctor team, so the team as a whole will take responsibility for registered individuals. This model will help develop integrated care and solve the problem of physician shortage.

the standards for healthcare delivery and the availability and safety of medicines.[88] Generally speaking, restructuring China's healthcare system will require co-operation and co-ordination between public hospitals, a strengthening of primary care, and payment reform. And, as with most systemic changes to a healthcare system, success will not be achieved without strong political will and leadership.[82]

Spain: Models of care for improved integration of care in Spain

These are the words of Juan Carlos Contel, a qualified nurse who has dedicated his career to research into chronic disease prevention and integrated health and social care programmes with the Catalonia Department of Health in Spain. Despite a lack of international alignment, a healthy scattering exists of wholly- or part-funded projects aimed at improving care for people with multiple chronic conditions (MCC) across the EU. These include ICARE4EU, ACT@Scale, Scirocco and ICT4Life, with several interesting case studies coming out of these projects. A large chunk of these EU-focused projects have been based in Spain, a country that in 2011 estimated just over half of its population had multimorbidity.[89] Three of these projects are described here in a little more detail, with insights from some of the Spanish affiliates responsible for developing these projects locally in Spain.

The **ACT@Scale** project, like its predecessor, the Advancing Care Co-ordination & Telehealth Deployment (ACT) Programme, was a collaboration between European healthcare authorities and providers, as well as industry and academic institutions. ACT@

Scale ran from 2016 to 2019 and aimed to scale up the best practices identified in the original programme to reach 100,000 patients in six regions across five countries (Spain, Denmark, the Netherlands, Germany and Scotland). This project has organised integrated care, telehealth and care co-ordination in two waves across the six European regions involved.[90]

"I think there are examples of best practice in integration of healthcare services in Europe," says Dr Josep Roca, Professor of Medicine at the University of Barcelona. **"The ACT@Scale project [was] precisely devoted to characterising holistic services, including deciding what exactly the drivers are and how these should be measured."**

To decide which projects had the potential to be scaled up, ACT@scale identified four drivers that most significantly contributed to the sustainability of services. These drivers were chosen based on the experience of ACT@scale members and the research literature. The drivers were:

- **Citizen empowerment.** Citizen-centred care is essential to the delivery of integrated care. This driver sought aspects of each

> **There is no international code related to multi-morbidity or complex conditions.**
>
> Juan Carlos Contel, nurse

project that engaged users, such as shared decision making, attention to patient journeys, development of empowerment skills and citizen networks.

- **Service selection.** The healthcare services chosen to be scaled up had to be dynamic enough to cover the needs of the patients and populations, as well as encouraging risk stratification and prediction.

- **Stakeholder and change management.** There had to be evidence of strong organisational adaptations that supported change, such as staff engagement, change management and stakeholder management.

- **Sustainability and business models.** To increase the chance of the service achieving long-term adoption into routine care the projects had to be cost-effective.

Two of the European regions chosen for ACT@scale projects were in Spain: Catalonia and the Basque Country. One example of a chosen best practice is the Multimorbid Integration Programme, which was based in the Basque Country. This programme aimed to provide patients with several co-morbidities with co-ordinated multi-level and multidisciplinary care. The service was designed to make sure that such patients, each with complex healthcare needs and who might otherwise be at high risk of hospital or care home admission, could lead independent lives and have improved clinical outcomes. The programme achieved this using ICT-enabled health and social care service co-ordination, monitoring, care involvement, and patient self-management. The ICT-based platforms in this project had the potential to improve treatment compliance, enhance self-management, and increase the understanding of multi-morbidity for both patients and professionals.[91] **"We redefined the care pathways across the whole of the Basque country"** says Ane Fullando Zabala, coordination manager of the Multimorbid

Integration Programme chosen for ACT@scale. **"There were 13 different integrated care organisations in the Basque country, and we introduced a common care pathway across all of these. Of course there was resistance at first [from staff], everyone thought they were too different for one pathway. We worked with individual centres to help them adapt, and tell us [programme coordinators] why they were different, which not only helped us but have them a sense of belonging in the change process."**

The Innovating care for people with multiple chronic conditions in Europe (**ICARE4EU**) project, which ran from 2013 to 2016, identified and analysed innovative approaches in multidisciplinary care that were being used for people with MCC across 31 European countries.

The project found 101 approaches that had been implemented in 25 of these countries to deliver care to people with complex, long-term health problems, including people with multimorbidity. However, hardly any countries or regions had strategies or policies focused on integrated care for people with multimorbidity specifically; most chronic disease policies were focused on a single illness.

Most often, these approaches focused on increasing multidisciplinary collaboration, improving patient involvement and/ or improving care co-ordination. Most approaches were being implemented in primary care, and most had only a relatively limited scope (for example, addressing a specific combination of diseases, or integrating only specific organisations or disciplines).

In ICARE4EU, the largest number of programmes identified (15 of the 101) were in Spain. The Strategy for Chronic Care in the Valencia Region is one such programme, introduced by the regional Ministry of Health

in 2014 to promote change in the healthcare system towards organising care for people with chronic conditions and multi-morbidity. In defining a patient with complex needs, the approach in Valencia is holistic, paying special attention to not only multimorbidity, but also the patient's family circumstances and their environment. The model incorporates primary care services, hospital and community healthcare to ensure that each patient is monitored across the care pathway. The model also assigns two nurses to manage care co-ordination and case management. The model also requires ICT support and information systems that can stratify the population into risk profiles. The whole strategy is financed through the regional health system, which is largely funded by general taxation.

A key takeaway from the ICARE4EU project was the importance of eHealth, otherwise known as services delivered through ICT. These have the potential to improve MCC care through:

- allowing better integration and co-ordination of care by facilitating sharing of information between professionals, patients and carers;

- supporting self-management by providing the patient with feedback or checking adherence to treatment;

- improving clinical decision-making by providing decision support systems that help to share evidence on how best to deal with MCC;

- making care more proactive by monitoring and analysing risk factors to identify the patients who are the most complex and most in need of care; and

- increasing access to care for people with MCC living in more remote or deprived areas through mobile applications or telehealth services.

Despite this, the ICARE4EU project found that eHealth does not yet play a major part in most European health systems, with better regulation, funding and standardisation of these tools required.

The Sustainable intEgrated care modeLs for multi-morbidity: delivery, FInancing and performancE (**SELFIE**) project has developed and compared new models for safe and efficient prevention-oriented health and care systems. The Spanish partner in the SELFIE project is based in Catalonia and backed by the regional government, which has a health system supported by one public payer that provides healthcare to a population of 7.5m.[92] The region is attempting to develop an ambitious plan for the deployment of eHealth-supported integrated care for people with chronic conditions. Mr Contel further elaborates on the professional activities within the Chronic Prevention and Care Programme at the Department of Health:

"In Catalonia over 90% of GP surgeries use the same clinical records. Because of this high coverage, it is expected that primary care physicians can establish prevalence of MCC and share this in the electronic medical record which is made accessible for any organisation that has involvement in [caring for] the particular patient."

Healthcare professionals can benefit greatly from the shared electronic medical record system in Catalonia, as it can be used as a tool to support clinicians in making the best decisions about patient care. Shared electronic medical records promote continuity of care and improves co-ordination between care levels, including primary care and specialised care.[93] Mr Contel tells us about other features of the system:

"As well as prevalence, we are also developing a system in Catalonia in which all patients can be identified according to

their level of risk, which is also attached to the electronic medical record. This means that any healthcare professional accessing the record can be made aware of each patient's level of risk. This helps physicians to make treatment decisions."

The initial driver for the integration of services was a policy commitment towards a patient-centric model. This has led to a reorganisation of services that are specifically designed to promote co-operation between tiers of care and between health and social care.[93] A case management nurse plays a pivotal role in this process. Mr Contel further explains:

"In Catalonia, we have attached the chronic care programme into the health plan of Catalonia. The chronic care programme lays out the care for complex patients, which includes patients with singular chronic diseases, multiple chronic conditions and a further variation which is one chronic condition with social problems."

Despite the various successes of the SELFIE project in the Catalan region, there remains limited integration of health and social care, with the health and welfare departments in Catalonia organised separately. **"Of course, there are barriers to this system,"** says Mr Contel, **"The problem we have in**

Catalonia, as in many other counties and regions within these, is the sharing of information between health and social care. This kind of sharing does not operate in many places in Spain. Currently it only exists in Barcelona, and it has taken three years just to achieve that. Financing is also an issue, as money comes from different places for health and social care. Pooling funding in this way is very tricky. You have to be very resilient and patient to encourage health and social care sectors to work together over long periods of time. There are many cultural barriers."

There have been some steps in the right direction, including integrated health and social care plans, and the "Spanish Dependency Law", which introduces universal coverage for moderate to severely dependent people.[93] However, since the 2008-2014 economic crisis a tight budget and severe cuts in healthcare have stalled progress. Despite this, creative funding schemes for integrated care such as per capita payments for primary care services are being introduced by the Catalan government called "adjusted multi-morbidity groups". Catalan policy makers push forward by reviewing and tailoring health plans every five years, adapting to the financial environment and making sure goals set for the region are realistic.

UK: Guy's and St Thomas' Charity Programme on Multiple Long-term Conditions

Guy's and St Thomas' Charity is running a ten-year programme to explore how people living in urban environments develop multiple long-term conditions and what works to help slow down progression from one to many conditions. This multi-million pound programme which started in 2017 is running across the diverse London boroughs of Lambeth and Southwark.[94, 95]

As an independent urban health foundation, the Charity tackles key health challenges that affect inner-cities. It takes a whole-systems and place-based approach, running focused programmes that come at a small number of complex health issues from different angles. To do this, the Charity works in partnership and at different scales to drive impact in their place. Through its programme on multiple long-term conditions the Charity collaborated with a range of partners on small and large projects including the NHS, the Richmond Group of Charities, the Royal College of General Practitioners, local governments,

Clinical Commissioning Groups, corporates, community organisations and local health services.

The reasons some people develop multiple health conditions sooner than others is not well understood. While it's not yet clear which factors contribute more than others, the Charity's research and work to date show significant variation in the length of time between people developing one and subsequent conditions. For example, in Lambeth, people living in the areas with the highest levels of deprivation are developing long-term conditions on average 10 years earlier than those living in the most affluent.

The programme focuses on people, of working age, living with one condition who are most at risk of developing many conditions. It aims to reduce the variation in progression seen in Lambeth and Southwark, and share learning of what does and doesn't work with others.

According to Barbara Reichwein, Programme Director, Multiple long-term conditions at Guy's and St Thomas' Charity, they are focussing on two main areas, "intervening upstream to fill the gap in early intervention

> **The evidence base on what works is small, so in this 'exploratory programme' we are assembling a broad portfolio of interventions and activities aiming to reduce people's progression from one to many conditions**
>
> Barbara Reichwein, Programme Director, Multiple long-term conditions, Guy's and St Thomas' Charity

and preventative healthcare and social risk factors of health that we think influence the variance in people's progression to multiple long-term conditions".

Research published by the Charity in July 2018 in partnership with Kings College London has helped hone the programme strategy – for example by focussing on working age adults and on social risk factors. It's *From one to many* report showed that in Lambeth, around a third of people with multiple long-term conditions are diagnosed under the age of 65. Whilst age is a significant factor in predicting the risk of multiple long-term conditions, it is by no means the only one. A closer look at age shows a breakdown of patients living with multiple long-term conditions in the borough by age:

- **34.6% of people under the age of 65**
- **22.8% of people aged 65 to 75**
- **42.6% of people 75 or more years old**

People living with long-term health conditions are also significantly more likely to be living with health risk factors including obesity (60%) and hypertension (50%). In Lambeth, 96% of people living with multiple long-term conditions have more than one associated risk factor.

The research explored common patterns of progression from one to multiple chronic illnesses in the borough using GP records over time in order to better understand prevalence and target prevention. The variability and compounding effect of conditions, as well as the time between diagnoses makes this a complex issue. However, some patterns were clear. For example, diabetes was the starting point for the majority of the most common sequences of conditions and chronic pain is a common feature in more than half of recorded sequences in Lambeth, followed by chronic kidney disease and depression.

People's social context also appears to influence risk. In Lambeth, the report found

a higher prevalence of people living with three or more long-term conditions in black and Asian ethnic groups, and that people from these communities are often diagnosed years earlier than their white neighbours. Similarly, the research suggests that levels of deprivation also seem to play a part in the burden of multiple long-term conditions experienced by a community. People living in areas with the highest levels of deprivation are diagnosed with multiple long-term conditions earlier than their more affluent neighbours.

Ms Reichwein explains that this research has highlighted **"postcode inequalities with stark contrasts in opportunities for good health"**. She goes on to say that **"multiple long-term conditions are a relatively new concept with a variety of definitions. Our strategy has a strong focus on early secondary prevention because we see there is a gap here. A minority of the NHS budget is spent on prevention"**. The charity has several areas of focus for an improved approach:

- The programme must target the working population who have one long-term condition such as type 2 diabetes or chronic pain and aim to arrest the development of other conditions through reducing risk factors and increasing protective factors.

- The charity will focus on 32 conditions that effect people in the most deprived areas (lowest two quintiles in the Index of Multiple Deprivation).

- It plans a multi-pronged approach to address social risk factors, for example by working with local employers on making workplaces healthier or with local community groups to co-locate social and healthcare support. Reaching out through different channels will hopefully capture some of the same people at risk in a local neighbourhood.

- A range of interventions and activities will

be put in place to optimise management of the primary condition and reduce risk factors including stress, hypertension, obesity and anxiety.

- The programme aims to track the effect of interventions on health outcomes over time. One of the metrics they are aiming for is to "level the median age of onset" of multiple chronic conditions.

From its work on the ground, the Charity is finding that multiple long-term conditions are a complex health issue and that the answers aren't just medical. They must also encompass wider social risk factors, like people's employment, housing and financial health. In line with the NHS long-term plan, the charity is planning to support social prescribing. The programme's staff are also looking at non-traditional ways of "reaching out through different channels to augment and speed up support" to people in their Boroughs, such as:

- Supporting employers to create health-promoting environments

- Help people with long term conditions find appropriate work and progress at work

- Invest in building partner relationships, capacity and capability which allow people in our Boroughs to protect their health, including looking at housing issues.

- Improving contract conditions, money advice and financial health interventions to try and stabilise people's money

The charity is also testing "whole-system solutions" in the form of three specific projects:

1. North Lambeth Neighbourhood Scheme

One in six Lambeth residents is a Portuguese speaker (around 35,000 people). They have a higher than average prevalence of long-term conditions and are 20% more likely to have three or more long-term conditions than the general Lambeth population. A

disproportionate number of Portuguese speakers in the borough live with multiple long-term conditions, including cardiovascular disease, hypertension and diabetes. The charity is supporting the Lambeth Portuguese Wellbeing Partnership (LPWP). This is an emerging grassroots network of over 40 local groups and community members built around a shared goal of supporting the health and wellbeing of local Portuguese-speaking residents. Since December 2017 the charity and LPWP have worked to identify people with or at risk of multiple long-term conditions, such as those who are socially isolated or suffering from domestic violence. They also work with families of people living with long-term conditions. Community workers help:

- reduce barriers to accessing GPs (e.g. through language difficulties)

- address unhealthy lifestyle behaviours

- connect isolated people with community groups

- engage people with mental health problems with appropriate services

- with finances and welfare support

- negotiate home improvements with landlords for healthier homes so that they can manage their long-term conditions most effectively.

2. Walworth Neighbourhood Scheme

The charity has partnered with Pembroke House, a local "community anchor" which has been providing community services for over 100 years. Ms Reichwein describes the charity's involvement as "finding, activating and growing local energy" in order to provide a number of projects including:

- **Walworth Living Room**, a shared public building to bring professionals from different disciplines together and combine community, social, work and health

activities so that people with multiple long-term conditions can access more integrated care. This opened in the summer of 2019 with nearly £500,000 funding.

- Supporting social prescribing - such as the **Safe and Independent Living (SAIL) Navigators,** who assist people with health and/or social care needs to get access and referrals to the relevant local agencies. In particular, SAIL Navigators help with social isolation and poor housing.

The charity also aims to better support people newly diagnosed and people living with a combination of social risk factors and long-term conditions. There is a lot of investment within the NHS in earlier diagnosis and on-going management of long-term conditions, however this support offer tends to focus on single conditions, clinical risk and short-term patient education and self-management courses. Within its programme strategy, the charity also seeks out opportunities to augment and improve this offer for groups at risk of rapid progression to multiple long-term conditions such as co-funding neighbourhood based care and wellbeing networks.

3. Neighbourhood Based Care, Coordination and Wellbeing Networks

In both Boroughs, the programme co-funds partnerships between primary care, secondary care, social care, community organisations patients and carers. The aim of these partnerships is to re-group care around neighbourhoods and to achieve the following objectives:

- Identifying people with multiple long-term conditions earlier

- Addressing health and social risk factors through holistic, preventative care

- Mapping out available services in each area to raise awareness and improve access.

Key insights

One of the strengths of this partnership is that Guy's and St Thomas' Charity is an independent health foundation, which Ms Reichwein says, enables it "to invest differently". As the charity is a funder, it does not provide direct services. "But at arm's length," says Ms Reichwein, "we are an enabler to nudge the system to shift". There were loose networks in the boroughs before, but the involvement of Guy's and St Thomas' Charity has helped to bring organisations together. The charity is also able to fund and support these organisations, providing business skills, evaluation, governance and safeguarding expertise.

UK: Multi-morbidity guidelines and integrated care in the UK

Consultant pharmacist Nina Barnett works in older people's care in the UK National Health Service (NHS). Dr Barnett provides practical insights on how healthcare professionals manage people with multiple chronic conditions through the prism of clinical guidelines that empower co-ordinated, person-centred care. In 2016 the National Institute for Clinical Excellence (NICE), which has a strong influence on both service provision and clinical practice in the UK, published a guideline specifically on how to manage patients with more than one long term conditions. Dr Barnett provides insights into how this guideline is being used to implement change in pharmacy practice in the NHS to effectively manage a growing population of people with multiple chronic conditions.

Although multiple chronic conditions are familiar to some healthcare professionals, mainly geriatricians, who treat frail older people often living with more than one chronic condition, the rest of modern medicine has not adapted quickly enough to address the consequences of multiple chronic conditions.[96] Both primary and secondary care for long-term conditions in the UK have traditionally been—and largely still are—organised around single disease management systems.[5] This has resulted in healthcare services being designed according to clinical guidelines that, on the whole, recommend treatment protocols that are irrelevant to a person with multiple chronic conditions. The evidence base is also largely dominated by research into single conditions, providing very little basis for developing new guidelines for people with multiple chronic conditions.[97] Dr Barnett states:

"There is limited evidence on managing multiple chronic conditions in practice through personalised approaches, as it is very difficult to quantify outcomes in trials. However, even with evidence, it is not possible to expect change to happen in healthcare practice with evidence only. For the management of multi-morbidity, looking at evidence in the form of the outcomes of conversations with different people and recording their quality of life, you might determine quality of care for people for multi-morbidity. Looking for evidence or trying to do research in the field of multi-morbidity and managing patients with multi-morbidity is very difficult. This is because success is measured by having conversations with patients about what matters to them. Changes to practice should be focussed

"

A simple way to start the conversation with a patient with multi-morbidity is to ask: 'If you can get one thing from this consultation what would it be?'

Nina Barnett, consultant pharmacist

on quality of life and be about what the patient wants to achieve by taking medicines."

Previous policy in the UK has made steps towards improving MCC care, such as the 2014 NHS Five Year Forward View which set out a plan for developing "expert generalists" in GP practices.[96] This policy highlighted the need to target services at patients with complex ongoing needs, such as the frail elderly or people with chronic conditions. However, implementation of the NHS Five Year Forward Review has remained varied in the UK.[96] NICE used the lack of evidence base and the lack of an appropriate healthcare approach for people with MCCs as the spring board for developing a multi-morbidity guideline.[98] This guideline lays out the care procedures of people with two or more long-term health conditions. All NICE guidelines are developed with a multi-disciplinary group consisting of clinical experts from across all sectors to ensure that they are applicable to healthcare practice.[98] The opinions and experiences of clinical experts, as well as their clinical judgement, are used to piece these guidelines together, promoting shared decision making and holistic planning.[97]

Translating the holistic approach to care laid out in this multi-morbidity guideline into applied changes to the healthcare system requires a cultural shift for both patients and clinicians.[97] Dr Barnett elaborates from a pharmaceutical perspective:

The broad definition of multi-morbidity is a person with more than one long-term conditions, as it's is very rare to see an older person with only one long-term condition. So what this means is changing the focus of what you are trying to do with medicines in the first place. The principle of the NICE guideline on multi-morbidity is to optimise people's overall quality of life, rather than manage conditions specifically and individually. In younger people

Some of the key recommendations from the NICE multi-morbidity guideline include:

- responsibility for co-ordination of care should be assigned, ensuring that this is communicated to other healthcare professionals and services, especially if care has become fragmented;

- responsibility for co-ordination of care could be assigned to a case manager or a GP;

- benefits from existing treatments must be maximised and treatments of limited benefit stopped;

- treatment and follow-ups with high burden must be optimised;

- ensure that higher-risk medications are appropriately given and take consideration of non-pharmacological alternatives;

- optimise appointments.[98]

with or without multi-morbidity, management of conditions might be more about extending life expectancy whilst also taking into account quality of life, so it's a combination of quality and quantity of life. For older people, sometimes the focus is more about quality over quantity or, to put it another way, what can we do to improve quality of life in the later phase of life.

Although the NICE multi-morbidity guideline does not provide specific advice on how to manage multi-morbidity, it recommends that local providers have an action plan and a project group, including staff, associated services, and financial and information professionals. One of the strengths of the NICE guideline is that is lays out a pragmatic

approach to treating people with MCCs.[98] It highlights how to identify the kind of people who may benefit from an approach to care that takes into account multi-morbidity before a person requires emergency hospitalisation, both during routine health encounters and also by searching electronic medical records.[97] It has the potential to re-empower healthcare professionals as holistic physicians and remove the constraints of contemporary protocol-based medicine.[5] The guideline also highlights areas where research and knowledge on people with multi-morbidity is lacking. For example, there is still a lack of information and guidance on how to manage frailty in younger people and vulnerable populations, such as those with learning difficulties, serious mental health problems or addiction issues, or migrants.[99]

There have been some efforts to conduct research into multiple chronic conditions, although the results have been mixed. The National Institutes for Healthcare Research conducted a randomised controlled trial (RCT) of a three-dimensional review of care conducted for individual patients every six months.[100] This was performed by a nurse, GP and pharmacist. The trial was conducted in 33 general practices in England and Scotland, and included 1,546 people with at least three long-term conditions. Those having the three-dimensional review scored slightly higher on the Patient Assessment of Care for Chronic Conditions score, which ranges from 1 to 5 (adjusted mean difference 0.29, 96% CI 0.16 to 0.41). These patients were also more likely to be satisfied with their care (56% versus 39%) and report that they were able to talk with a healthcare professional about their most important issues (42% versus 26%). However, there was no difference in patient quality of life or burden of illness and treatment after 15 months. The study was hampered by only 49% of the intervention group having both review sessions. This highlights one of the difficulties in managing people with multi-morbidity—

the process is reliant on people wanting and accepting help. Indeed, two-thirds of eligible patients either did not respond to the study opportunity or declined to take part.

As Dr Barnett explains, when embarking on a project that involves making changes to healthcare practice for people with MCCs, relying on medical research alone will not result in effective change:

"In order to effect a change in practice around management of medicines in people with multimorbidity, change needs to come from a variety of sources. This may include the evidence base but also can be supported by individual and organisational role models, case examples, NHS policy and political will for change. It's a coalescence of a lot of different factors, not one on its own."

Another UK initiative, which mirrors the approach laid out in the NICE multi-morbidity guideline, is the Comprehensive Geriatric Assessment (CGA). This assessment aims to reduce frailty (thereby decreasing the risk of hospitalisation or rehospitalisation) and try to enable people to live independently at home for as long as possible. GPs or community geriatricians are expected to perform most CGAs with the help of multi-disciplinary teams.

Studies measuring the impact of the CGA have been mixed.[101] A recent review of the CGA as applied in care homes found that it is not effective unless all three components— standardised assessment, communication of the plan within a multidisciplinary team and co-ordination of the delivery—are performed adequately. A feasibility study of 186 people on eight or more medications found that having a CGA with a geriatrician resulted in an average of four changes to those medications, predominantly stopping some or reducing the dose.[102] However, a trial of 433 older adults found that conducting the CGA prior to discharge from hospital had no effect on

readmission rates or transference of patients into care homes.[103]

Medication reviews and streamlining patient treatments may seem like a beneficial result of the CGA, but, as Dr Barnett explains, without a person-centred approach, treatment reviews such as this can be quite destructive and may not improve quality of life:

As pharmacists, if performing a medication review, we need to think carefully before broaching the subject of reducing the amount of medications the patient is taking. People have very different views about stopping medicines: some are very pleased to take less medicines, and for others this can be quite distressing, confusing and possibly destructive for the patient-clinician relationship. For example, if you are thinking about a review of pain medication, the patient might be thinking "I am in a lot of pain already; stopping medicines will make me worse". Introducing the idea of reducing or stopping these medicines will be doomed to failure unless effective person-centred consultations, which include shared decision making, are undertaken to ensure that any changes are acceptable, agreed and followed up.

Dr Barnett has developed training modules for pharmacists to encourage person-centred consultations in hospitals, a successful

Dr Barnett has helped to transform pharmacy practice by empowering staff to place person-centred conversations with patients at the heart of pharmacists' everyday responsibilities. For people with MCCs, Dr Barnett's ethos is to conduct pharmacy consultations with quality of life at the heart, making sure that what the patient wants to achieve from taking medicines is understood and respected. "This line of questioning encourages the patient to take the lead in terms of what they want out of a consultation, rather than assuming you know what the person wants", she says.

example of how a guideline can have a trickledown effect into healthcare practice. The NICE guideline on multi-morbidity is one of a kind in terms of writing and publishing a guideline specifically related to organising services and the care approach for people with multi-morbidity, meaning that the UK serves as global leader in this topic. Although NICE technically only has authority in the UK, it is generally seen as providing high-quality evidence that is highly influential worldwide.[5]

US: The AGING Initiative: devising a new paradigm of medical education in the US

In 2010 the Health and Human Services (HHS) Initiative on Multiple Chronic Conditions published guidelines and a framework on multiple chronic conditions (MCCs) in the US. The HHS Assistant Secretary for Health convened a working group on the topic, in order to get a clear picture of the problem and develop a roadmap for ways to handle the growing disease burden.[1] The materials produced were partly based on input from various community stakeholders and were intended for internal use within the HHS and correlating government entities. This was one of the first national efforts by the US to take steps in combating the rise of MCCs. Following the publication of the framework, additional measures were taken by HHS to halt the rise of MCCs. These measures included forming a research network, creating a measurement framework, and developing an inventory of existing programmes, tools and research initiatives already focussed on addressing MCCs in the US.[1]

Three years after the launch of the initial framework, HHS published the Education and Training Resources on Multiple Chronic Conditions for the Healthcare Workforce. These are a set of educational tools, curriculum guides and a training repository for the purpose of improving outcomes across the care continuum.[2] The educational component is an important contributor to MCC care, because so much of the US healthcare system is currently based on a more traditional single-disease paradigm.[3] **"The system we practice [...] works well for a single-disease approach to medicine,"** says Dr Heather Whitson of the Duke Centre for Ageing. **"[It is based on] a paradigm by which the purpose of the system is to provide the most aggressive and thorough care to a particular diagnosis or an acute event."**

Although the HHS provided ground breaking work in the realm of addressing MCCs in the US, it is difficult to find examples of the educational and training materials in practice. Although knowledge exists about the need for change in medical schools and treatment of MCCs, the educational reforms still need to be fully implemented on a larger scale.

The AGING Initiative's Role in MCC care

Other smaller-scale initiatives have since emerged that seek to shape the next generation of physicians into medical professionals who understand the vastly different treatment modalities and preferences for patients with MCCs. One such programme is the Advancing Geriatrics Infrastructure & Network Growth (AGING) Initiative. This initiative was originally formed to connect and improve communication between the Healthcare Systems Research Network (HCSRN) and The Claude D Pepper Older Americans Independence Centres (referred to as Pepper Centres or OAIC).[5]

The HCSRN was founded in 1994 and is comprised of 20 non-profit healthcare delivery systems. One thousand nine hundred faculty members and staff work at HCSRN member centres to provide research for over 28m patients.[4] Research is conducted using electronic medical records from each of the member organisations. The Pepper Centres, which are funded by the National Institute on Ageing (NIA), serve as centres of excellence that focus on geriatrics research and education for medical students on maintaining and restoring functional independence for the geriatric population.[4] Currently there are 15 Pepper Centres in the US, each one operated by its own advisory committee and the NIA. The OAICs also provide important datasets and biospecimens for research.

The idea to unite the two research powerhouses into the AGING Initiative came from Dr Jerry Gurwitz, a geriatrician at the

University of Massachusetts. According to Dr Whitson, who currently serves as the director for the AGING Initiative MCC Scholars Programme, Dr Gurwitz saw the two organisations as being complementary to one another but with little contact occurring between them, as research was often conducted in siloes with little concept of team science. (Although there are many definitions of team science, it can be summarised as a **"means of attending to complex clinical problems by applying conceptual and methodological approaches from multiple scientific disciplines and health professions"**.[6])

The AGING Initiative was designed as a way to bridge the two distinct organisations in order to create a national resource to "nurture and advance an interdisciplinary research agenda focused on older adults with multiple chronic conditions".[5]

The AGING Initiative has three core strands: methods and measures, career development and knowledge dissemination, and patient-priority alignment. These are used as the guiding facets of research for the partnership. Recently, the initiative has expanded into the realm of education, through the establishment of the MCC Scholars Programme. Leaders of the programme (including Dr Whitson) select a cohort of students on a yearly basis, who then receive training and career development in the field of MCCs. In addition to receiving this training, students become part of a community of physicians around the country who remain connected as they work to better understand MCCs. This, as Dr Whitson sees it, is one of the most powerful parts of the programme.

The AGING Initiative Scholars Programme is designed to train physicians in the patient engagement, methodology and study design, and burden of the problem (in terms of economic impacts, consequences to the healthcare system, and so on). The curriculum was not explicitly guided by the original HHS guidelines previously mentioned, but the Scholars Programme did utilise principles produced by the American Geriatric Society, which are derivatives of the HHS work. These are not guidelines, but rather recommendations from an expert panel for the clinical management of older patients who have MCCs.[7]

The Future of MCCs in the US

When asked about the wider state of medical education for MCCs in the US, Dr Whitson notes that it is improving, but concedes that the healthcare system continues to fall back on the single disease paradigm. She also notes that establishing quality metrics has been difficult for patients with MCCs, because disease guidelines currently focus on treatment of a single disease. In thinking about the future of medical education for MCCs in the US, Dr Whitson envisions that **"maybe tomorrow's clinicians will be trained to understand that it's often not completely black and white, but it's a spectrum. Being mindful of where it is appropriate to be on that spectrum from disease-driven care to preference-driven care is something that [new doctors] will think about with every patient."**

The structure of medical education and research for MCCs is also posed with difficulties from within the publishing realm, where study sections of the National Institutes of Health and academic journals are still organised on the basis of the single-disease system. This reflects the disparate nature of work that is being done around MCCs

currently, in that no single body is responsible for providing resources or training the medical workforce to care for patients with MCCs.

Ultimately, MCC care necessitates team science because of the diversity of every patient. The purpose of the larger AGING Initiative is to foster research that is founded on team science in order to improve outcomes for patients with MCCs. Putting in place a holistic approach to improving MCC care in the US has always been at the forefront of the AGING Initiative's purpose, which is why the leadership seeks to address all aspects, from research, to point of care, to economic burdens.[4]

Although the programme is fairly new, the personnel overseeing it have observed notable improvements for patients with MCCs around the country. An expansion of this type of training and research is needed on a large scale in order to prepare medical professionals for the increasing numbers of patients with MCCs and their differing care needs.

"There are these other patients that are *living* with—not dying from—they are living with multiple chronic conditions, and that merits a different approach to their care," says Dr Whitson. With this in mind, it is clear that efforts surrounding MCC care need to be unified and strategic in order to achieve better outcomes for patients.

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