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（筋骨格系の健康を含む非感染性疾患の統合的予防と管理：
OECD 諸国の体系的な政策分析）

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BMJ Global Health

Integrated prevention and management of non-communicable diseases, including musculoskeletal health: a systematic policy analysis among OECD countries

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ABSTRACT

Introduction Development and implementation of appropriate health policy is essential to address the rising global burden of non-communicable diseases (NCDs). The aim of this study was to evaluate existing health policies for integrated prevention/management of NCDs among Member States of the Organisation for Economic Co-operation and Development (OECD). We sought to describe policies' aims and strategies to achieve those aims, and evaluate extent of integration of musculoskeletal conditions as a leading cause of global morbidity.

Methods Policies submitted by OECD Member States in response to a World Health Organization (WHO) NCD Capacity Survey were extracted from the WHO document clearing-house and analysed following a standard protocol. Policies were eligible for inclusion when they described an integrated approach to prevention/management of NCDs. Internal validity was evaluated using a standard instrument (sum score: 0–14; higher scores indicate better quality). Quantitative data were expressed as frequencies, while text data were content-analysed and meta-synthesised using standardised methods.

Results After removal of duplicates and screening, 44 policies from 30 OECD Member States were included. Three key themes emerged to describe the general aims of included policies: system strengthening approaches; improved service delivery; and better population health. Whereas the policies of most countries covered cancer (83.3%), cardiovascular disease (76.6%), diabetes/endocrine disorders (76.6%), respiratory conditions (63.3%) and mental health conditions (63.3%), only half the countries included musculoskeletal health and pain (50.0%) as explicit foci. General strategies were outlined in 42 (95.5%) policies—all were relevant to musculoskeletal health in 12 policies, some relevant in 27 policies and none relevant in three policies. Three key themes described the strategies: general principles for people-centred NCD prevention/management; enhanced service delivery; and system strengthening approaches. Internal validity sum scores ranged from 0 to 13; mean: 7.6 (95% CI 6.5 to 8.7).

Conclusion Relative to other NCDs, musculoskeletal health did not feature as prominently, although many general prevention/management strategies were relevant to musculoskeletal health improvement.

Key questions

What is already known?

- Health policy is recognised as essential to build capacity in health systems to respond to the increasing burden associated with non-communicable diseases (NCDs).
- Although musculoskeletal conditions and persistent pain are leading causes of global morbidity, global action plans and monitoring frameworks for NCDs have historically not explicitly included these conditions.

What are the new findings?

- Health policies for integrated prevention/management of NCDs among OECD countries typically address NCDs closely aligned to mortality, in alignment with target 3.4 of the Sustainable Development Goals.
- Musculoskeletal health conditions and persistent pain feature less prominently than other NCDs.
- The aims and strategies for integrated management of NCDs among OECD Member States align with the WHO System Building Blocks and Integrated People-Centred Health Services frameworks.

What do the new findings imply?

- There is close alignment between NCD global action plans and monitoring frameworks and the NCD policy foci of OECD Member States.
- While many general strategies outlined in the included policies are relevant to addressing musculoskeletal health, without an explicit focus in national policy and global strategies meaningful improvements in global morbidity may not be achievable.

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INTRODUCTION

Non-communicable diseases (NCDs) represent one of the most important and urgent threats to human health globally,[1–3] with a disproportionate and increasing burden experienced by older people and those in low-income and middle-income countries (LMICs). The burden of disease attributed to NCDs now far outweighs that associated with communicable, maternal, neonatal and nutritional deficiency diseases in most countries.[4] The impacts of NCDs are significant and wide-reaching. These include direct health consequences (such as premature death, reduced functional ability, impaired quality of life) and also dramatic social and economic sequelae that impact human capital and prosperity leading to poverty and threats to achieving targets of the Sustainable Development Goals (SDGs).[3 5–7]

On a background of global population ageing and an increasing prevalence of risk factors for the development of NCDs (eg, harmful use of alcohol and tobacco, physical inactivity, poor diet, and pollution), the magnitude of the burden of disease attributed to NCDs is expected to increase and further threaten the sustainability of health systems.[8 9] In the most recent analysis of the Global Burden of Disease Study, NCDs accounted for the majority (62%) of total burden of disease globally, expressed as disability-adjusted life years (DALYs), representing an increase of 16% from 2007 to 2017.[4] NCDs as a major contributor to total disease burden was observed across all economies. As a disaggregated DALY burden, NCDs accounted for the greatest proportion of deaths in 2017 (73%), reflecting an increase of 23% from 2007 to 2017[10] and 80% of the total years lived with disability (YLDs), or morbidity burden, in 2017.[9] Critically, the number YLDs attributed to NCDs from 1990 to 2017 has risen by 61%.[9] In particular, musculoskeletal conditions are a major contributor to the NCD disability burden, particularly in association with ageing.[9 11 12] YLDs for musculoskeletal conditions have risen by 20% from 2007 to 2017 and low back pain remains the single leading cause of global disability since 1990.[9] Recent systematic review evidence suggests that a third to a half of the population in the UK lives with chronic pain, the majority of which is musculoskeletal in aetiology,[13] mirroring trends in LMICs.[14] Despite the identified burden of disease of musculoskeletal pain, and evidence of pain as a key determinant of disability,[15] historically it has not been integrated into NCD prevention and management policy or strategy in most countries, or by the World Health Organization (WHO).[11 16]

Against this backdrop, health systems globally are often ill-equipped to effectively address prevention and management of NCDs.[2 6 17 18] Urgent attention to system strengthening approaches to more effectively address prevention and management of NCDs and support healthy ageing, is therefore, well justified.[6 19] While strengthening approaches should be nationally-specific, global leadership and support from high-income economies, such as Member States of the Organisation for Economic Co-operation and Development (OECD), is important.

However, multiple barriers have been identified as limiting progress in addressing the burden of NCDs: political will, appropriate policy, commercial forces, inadequate technical and operational capacity, insufficient financing, inadequate action to the social determinants of health and lack of accountability.[20] The *Lancet Global Health Commission* argues that health system strengthening approaches that include formulation of national policy to prioritise prevention and management of NCDs is essential,[2] mirroring objectives of the WHO global action plan[21] and other calls for urgent policy formulation.[11 22–25] Despite the identified burden of disease, political action on NCDs has been criticised and deemed inadequate to ensure global health security into the future and achievement of the 2030 targets for SDG 3.4 will not be achieved.[1 6 22]

Since NCDs often co-occur, particularly in the context of ageing,[26] and many share common behavioural and environmental risk factors, system reform for NCDs should typically be approached in an integrated manner at both system and service levels, rather than in disease-specific siloes.[18] The WHO has provided guidance, or 'best buys',[27] on how to prevent and manage NCDs as part of the Global Action Plan for the Prevention and Control of NCDs 2013–2020.[21] This Action Plan and the targets for SDG 3.4 are largely aligned to mortality reduction for cancer, diabetes, cardiovascular disease and lung disease. While imperative, this focus inadequately considers the profound morbidity burden associated with NCDs, especially musculoskeletal conditions, and contemporary global health estimate data pointing to an increasing life expectancy associated with poor health.[4]

The aim of this study was to evaluate health policies for integrated prevention/management of NCDs among Member States of the OECD. Specifically, we sought to describe the aims, and strategies to achieve those aims, among policies and evaluate the extent to which musculoskeletal conditions were integrated. We limited our analysis to OECD Member States as a starting point for this research, recognising that these nations are considered policy leaders and work to support global social and economic development.

METHODS

Design

Systematic document review and data analysis of health policies on integrated NCD prevention or management of OECD Member States that participated in a WHO NCD Country Capacity Survey.[22]

Patient and public involvement

Patients were not directly involved in the design or execution of the research. The research was co-designed with representatives from patient advocacy organisations (JGP, AC) and government (JGP, MLD, YS).

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Eligibility for inclusion

Health policies of the 36 OCED Member States that reported on integrated NCD prevention/management and were submitted to WHO between 2015 and 2017 as part of a WHO NCD Country Capacity Survey were eligible for inclusion. We defined 'policy document' as any national or regional health policy, strategy or action plan submitted by a country in response a WHO NCD Country Capacity Survey, consistent with aligned research.[28]

Document selection

A document repository of Member States' policies, strategies and action plans for NCDs and their risk factors, NCD clinical guidelines, and NCD legislation and regulation, submitted in response to periodic WHO NCD Country Capacity Survey was created by the WHO in 2016 (https://extranet.who.int/ncdccs/documents/db). We used this document clearing-house to identify and download the relevant policy document(s) for each country. Where documents were not available from the clearing-house for some countries (Austria, Finland, Greece, Luxembourg, New Zealand, Turkey), the WHO secretariat was contacted in 2018 to confirm that no submissions were made from these countries. We confirmed that Finland, Greece, Luxembourg and New Zealand had not made submissions, while policies were under development (in 2017) for Austria and Turkey. We therefore undertook a desktop internet search for relevant policies from the Ministries of Health of Austria (in German) and Turkey (in English) and identified the relevant Turkish policy. No specific policy for NCD prevention or management was identified for Austria, other than 2013 action plans for nutrition and physical activity.[29 30] Since policies were not under development for Finland, Greece, Luxembourg or New Zealand, internet searches were not undertaken for these nations, although we recognise that potentially suitable policies may exist.

Document review and data extraction

A multidisciplinary and multilingual team of 13 reviewers was assembled to review documents and extract data (five from Australia; five from Western Europe; one from Eastern Europe; one from Asia and one from North America). For those documents published in a language outside the language competencies of the review team, online translation software was used to translate the text to English (https://www.onlinedoctranslator.com/en/).

A standardised data extraction template was developed to ensure a consistent approach to document reviews and data extraction (online supplementary file 1). The data extraction template collected data on: publication information; vision and scope of the policy; health conditions explicitly included; strategies/actions proposed to achieve the objectives/aims of the policy; and the extent of explicit integration of musculoskeletal conditions, mobility/functional impairment or persistent non-cancer pain within the scope of prevention/management for NCDs. The template was initially piloted on nine policies across seven countries between four reviewers (September–October 2018), before being revised and piloted again on two policies from one country by one reviewer (November 2018). The main review period was December 2018 to April 2019, with each reviewer assigned to one or more countries based on their language skills. A review protocol document was also prepared after the pilot phase, to accompany the data extraction sheet and guide reviewers in standardised document review and data extraction tasks.

Quality appraisal

A quality appraisal (internal validity) of each policy document was undertaken as a component of the review task. A quality appraisal tool using assessment criteria and a response scale established and used previously for evaluation of chronic disease policies was used.[31] The tool was based on important evaluation criteria previously identified in the literature.[31–33] It consisted of seven items covering seven domains reflecting best-practice policy development (background and case for change; goals; resource considerations; monitoring and evaluation; public opportunity; obligations; and potential for public health impact) and rated on a 3-point nominal response scale (scored from 0 to 2; total score range 0–14). The inter-rater reliability of the tool was assessed across nine policies in the first pilot phase. A kappa (k) statistic was computed for each domain, with 6 out of 7 categorised as fair/good (k=0.4–0.75) to excellent (k>0.75), based on thresholds recommended by Fleiss.[34] The domain 'goals' had poor reliability (k<0.4). The inter-rater reliability of sum scores was, however, high, expressed as an intra-class correlation coefficient (ICC); ICC: 0.91 (95% CI 0.68 to 0.98).

Data analysis

Reviewers submitted their completed data extraction sheets to a project officer who quality-checked the submissions, based on a quality checklist established *a priori*. Simple (short-text) data were recorded verbatim, while content analysis was undertaken to analyse extensive text responses,[35] using standard methods for inductive coding and meta-synthesis.[36 37] Content analysis was applied to the following data fields: (1) Aim/vision of the policy. (2) Strategies to achieve the policy aims/objectives. (3) Relevance of the strategies to the prevention/management of musculoskeletal health.

For each of these three data fields, a five-step process was undertaken. First, a primary analyst (AMB) inductively developed a coding framework (first-order codes) based on the provided responses. Second, the coding framework was verified independently by two reviewers (EMGH, HS) using a 20% subset of responses, with discrepancies resolved through consensus. Third, the primary analyst coded each response against the coding framework. Fourth, coding was verified independently by two reviewers (EMGH, HS) using a 20% subset of responses, with discrepancies resolved through

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consensus. Discordance in coding ranged from 0% to 7% across questions. Finally, an interdisciplinary group (AMB, JGP, MLD, EMGH, HS) representing clinicians, researchers, civil society represenatives and policy makers met and familiarised themselves with the derived coding framework. These initial codes were then iteratively and inductively organised into consensus-based descriptive subthemes. We then derived new, higher-order themes that extended beyond the initial coding framework. Findings were linked back to the research questions to ensure relevance and appropriate contextualisation for a narratively reported meta-synthesis. Frequencies of first-order codes were calculated to provide an indication of overall weighting.

RESULTS

Overview of included policies

Document selection

We identified 48 policies for inclusion across 31 OECD Member States from the WHO document clearing-house (see PRISMA-aligned flow chart, online supplementary file 2). No policies were included for five OECD Member States (Austria, Finland, Greece, Luxembourg and New Zealand). An additional six policies were identified through other means, including: one document for each of Portugal,[38] Turkey[39] and the Republic of Korea,[40] identified through desktop internet searches (as these documents were not available in the WHO database or were outdated); and, based on advice from Public Health Canada, three documents linked to the primary Canadian policy,[41–43] 'Canadian Integrated Strategy on Healthy Living and Chronic Disease' (N=54).[44] At screening and eligibility assessment, 10 policy documents were excluded: 6 duplicates and 4 did not meet the inclusion criteria (Belgium, Canada, Israel, Italy; online supplementary file 2). Consequently, 44 policies from 30 OECD Member States were included in the final review.[38–81]

Policy characteristics and aims

A summary of included policies is provided in table 1. Policies were regionally represented as 1 (2.3%) from Oceania, 28 (63.6%) from the European Union, 5 (11.4%) from Europe, 5 (11.4%) from North America, 1 (2.3%) from South America, 1 (2.3%) from Central America and 3 (6.8%) from Asia. Forty-two (95.4%) polices originated from high-income economies and two (4.6%) from upper-income middle-income economies. All policies were national in reach; 13 (29.5%) explicitly aligned with the WHO Global Action Plan[21]; and 11 (25%) focused on NCD prevention only, 1 (2.3%) on NCD management only, and 32 (72.7%) on NCD prevention and management.

The purpose/aims of included policies (table 1) were summarised with three overarching themes, supported by a range of subthemes and linked to 22 first-order codes (online supplementary file 3). These are described in the meta-synthesis below.

System strengthening

Policies outlined a system-strengthening focus that included aspects of governance (such as the creation of disease-specific models of care and public policy), financing to achieve health service sustainability and building workforce capacity. A number of policies also included a focus on building emergency and disaster response capacity. Expanding the reach of health services through improved coverage and access to minimise inequality due to socioeconomic or geographical factors, were also identified. Some policies identified population health monitoring as a focus.

Service delivery

Policies cited improvement in health service delivery as a key focus through effective, efficient and comprehensive management approaches for NCDs, including addressing multimorbidity. Quality in service delivery and support for integrated care, active self-management and innovation in service delivery were identified as common aims.

Population health

Policies aimed to target risk factors for poor health, to support screening and to promote healthy lifestyles across the life course as a means to improve physical and mental health and functional ability. Specific policy foci included a reduction in use and harms related to substance abuse, decreasing the incidence and prevalence of overweight and obesity, and improving population-level physical activity. Policies aimed to reduce the impact of NCDs by reducing incidence of disease (NCDs and communicable diseases) and premature mortality and injury, thereby improving the quality of life of the population. Environmental factors influencing health were also cited, including food and workplace safety.

Integration of musculoskeletal health, persistent pain and mobility/functional ability in NCD health policies

Figure 1 illustrates the conditions (health states) explicitly stated as being covered by the policies across nations, while table 2 summarises this detail by policy. Whereas the polices of most countries covered cancer (83.3%), cardiovascular disease (76.6%), diabetes/endocrine disorders (76.6%), respiratory conditions (63.3%) and mental health conditions (63.3%), only half the countries included musculoskeletal health and pain (50.0%) as conditions covered within the policies. Five (16.7%) countries had policies that included any chronic health conditions. Among the 41 (93.2%) policies of 30 countries that included a background commentary, 23 (56.1%) mentioned musculoskeletal health, pain or mobility/functional ability in some way. Within the specific context of prevention and/or management of NCDs, 23 (52.3%) policies of 19 (63.3%) countries referred explicitly to musculoskeletal health, pain or mobility/functional ability, including: 20 (45.4%) to musculoskeletal health, 5 (11.4%) to pain and 11 (25.0%) to mobility/functional

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Table 1 Characteristics of included policies

Nation (income band†)	Policy title (year of publication; classification‡)	Time span	Explicit alignment with the WHO Action Plan§ (yes/no)	Focus (NCD prevention; NCD management; both)	Purpose, aim or vision
Australia (high)	National Strategic Framework for Chronic Conditions (2017; primary)*[45]	2017–2025	Yes	Prevention +management	All Australians live healthier lives through effective prevention and management of chronic conditions.
Belgium (high)	Chronic Disease Plan. Integrated Health Services for Better Health (2015; primary)[46]	n.s.	No	Prevention +management	To support the improvement of the quality of life of the population, in particular people suffering from multiple chronic conditions and ensure that they can live better in their own environment (family, school, work) and the community, and can engage in active self-management of their own health.
Canada (high)	Integrated Strategy on Healthy Living and Chronic Disease (2005; secondary)*[44]	n.s	No	Prevention +management	To provide a framework for the federal government to promote the health of Canadians and reduce the impact of chronic disease in Canada.
	Canada's Tobacco Strategy (2018; secondary)*[41]	2018–2035	No	Prevention	To achieve a target of <5% tobacco use by 2035.
	Curbing Childhood Obesity: A Federal, Provincial and Territorial Framework for Action to Promote Healthy Weights (2010; primary)*[42]	n.s.	No	Prevention	Canada is a country that creates and maintains the conditions for healthy weights so that children can have the healthiest possible lives.
	Let's get moving: A common vision for increasing physical activity and reducing sedentary living in Canada (2018; primary)*[43]	n.s.	No	Prevention	A Canada where all Canadians move more and sit less, more often.
Chile (high)	National Health Strategy to Complete the Health Objectives of the Decade (2011; primary)[47]	2011–2020	No	Prevention +management	Reduce the impact of chronic communicable and non-communicable disease, traffic accidents and family violence, through actions, screening and prevention strategies, improved health coverage and treatment; target risk factors for NCDs; enhance workplace health and safety and food safety; strengthen the public health system and health workforce; and build preparedness for emergency and disaster relief.
Czech Republic (high)	HEALTH 2020 – National Strategy for Health Protection and Promotion and Disease Prevention (2014; primary)*[48]	2014–2020	No	Prevention +management	Stabilise the system of disease prevention, health protection and promotion and to initiate efficient mechanisms to improve health of the population, sustainable in the long term.
	Long-term programme of improving the health status of the population of the Czech Republic – Health for All in the 21st Century (2002; primary)**[49]	n.s.	No	Prevention +management	Protect human health and development over the life course and reduce the incidence of diseases and injuries and limit suffering.
Denmark (high)	Recommendations for preventative services for citizens with chronic diseases (2016; primary)[50]	n.s.	No	Prevention +management	Guide how services in the municipalities can implement important preventative measures in the best possible way, so citizens all over the country will receive high-quality services for prevention of chronic diseases.
	Care pathways for chronic diseases – the generic model (2012; primary)[51]	n.s.	No	Prevention +management	To present a generic model of care to use as a basis for creating other (disease-specific) care pathways.
Estonia (high)	National Health Plan 2009–2020 (2012; primary)*[52]	2009–2020	No	Management	A longer health-adjusted life expectancy by decreasing premature mortality and illnesses.
France (high)	Laws Official Journal of the French Republic of January 27th, 2016: Law no 2016–41, January 26th, 2016 of the Modernisation of Our Health System (1). Keynote Title: Mobilising Health System Members Around a Shared Strategy (2016; primary)[53]	n.s.	No	Prevention +management	To mobilise health system members around a shared (health) strategy.
	National Health Strategy: Roadmap (2013; primary)[54]	n.s.	No	Prevention +management	To address growing social and geographical inequalities which limit access to healthcare in France.
Germany (high)	IN FORM: Germany's initiative for healthy nutrition (diet) and more physical activity. National action plan for prevention of malnutrition, lack of physical activity overweight and associated diseases (2014; primary)[55]	n.s.	Yes	Prevention +management	To improve the nutrition and physical activity behaviour in Germany in a sustainable way, such that: adults live healthier, children grow up healthier and benefit from a higher quality of life and an increased performance in their education, profession and private life; and diseases that are caused by an unhealthy lifestyle will decline.

Continued

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Table 1 Continued

Nation (income band†)	Policy title (year of publication; classification‡)	Time span	Explicit alignment with the WHO Action Plan§ (yes/no)	Focus (NCD prevention; NCD management; both)	Purpose, aim or vision
Hungary (high)	'Healthy Hungary 2014–2020'—Health Sector Strategy (2015; primary)[56]	2014–2020	No	Prevention +management	To improve the health of Hungarians through different interventions (prevention, rehabilitation) and through further improvement to the whole healthcare system across sectors with a focus on responsible and cooperative citizen participation.
Iceland (high)	Public health policy and actions to encourage a healthier society—with emphasis on children and adolescents under 18 years of age (2016; primary)[57]	2016–2018	No	Prevention +management	Iceland will be one of the healthiest nations worldwide by 2030.
Ireland (high)	Tackling Chronic Disease: A Policy Framework for the Management of Chronic Diseases (2008; primary)*[58]	n.s.	No	Prevention +management	To promote and to improve the health of the population and reduce the risk factors that contribute to the development of chronic diseases; and to promote structured and integrated care in the appropriate setting that improves outcomes and quality of life for patients with chronic conditions.
	Healthy Ireland: A framework for improved health and well-being 2013–2025 (2013; primary)*[59]	2013–2025	No	Prevention +management	A healthy Ireland, where everyone can enjoy physical and mental health and well-being to their full potential, where well-being is valued and supported at every level of society and is everyone's responsibility.
Italy (high)	National Prevention Plan 2014–2018 (2014; primary)[60]	2014–2018	Yes	Prevention	To establish the crucial role of health promotion and prevention as factors of social development and welfare sustainability, in light of demographic changes; adopt a public health approach that will guarantee equality and contrast disparities; express the cultural vision in public health values, objectives and methods; base health prevention, promotion and care interventions on best effective evidence, implemented with equality and planned to reduce disparities; accept and manage the challenge of cost-effective interventions, innovation and governance; and develop competence in professionals, people and individuals aiming at an appropriate and responsible use of available resources.
	National Chronicity Plan (2016; primary)[61]	n.s.	Yes	Prevention +management	To contribute to the improvement of health protection for chronically ill people, reducing the burden on the individual, on his/her family and on the social context, improving the quality of life, making health services more effective and efficient in terms of prevention and assistance and assuring a higher harmonisation and equity for citizens' access. This will be achieved by identifying a common strategy aiming at promoting a unified approach to interventions centred on the individual and oriented towards a better service organisation and responsibilities of all the service-providing actors.
	Gaining Health: Making healthy choices easy (2008; primary)[62]	n.s.	No	Prevention	To make healthy life choices easier for Italians and to promote information campaigns aimed at changing unhelpful behaviours, which contribute to causing non-communicable diseases of a major epidemiological significance.
Japan (high)	Health Japan 21 (the second term) (2012; primary)[63]	2013–2022	No	Prevention	To improve lifestyles and the social environment; to enable all citizens from infancy to older adulthood to have hope and meaning for living; to achieve a vibrant society with healthy and spiritually rich lives according to life stages; and to improve sustainability of the social security system.
Republic of Korea (high)	National Health Plan 2020 in Korea (2011; secondary)*[64]	2011–2020	No	Prevention +management	To create a healthy world all people can enjoy together through an extension of healthy life expectancy, an improvement in health equity and monitoring of health trends.
	The Third National Health Promotion Plan (2011–2020) (2011; primary)[40]	2011–2020	Yes	Prevention +management	To establish national policies aimed at enhancing the health of individuals and groups through health education, disease prevention, nutrition improvement and the practice of healthy lifestyles.

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Table 1 Continued

Nation (income band†)	Policy title (year of publication; classification‡)	Time span	Explicit alignment with the WHO Action Plan§ (yes/no)	Focus (NCD prevention; NCD management; both)	Purpose, aim or vision
Latvia (high)	Public Health Guidelines 2014–2020 (2014; primary)**[65]	2014–2020	Yes	Prevention +management	To increase the lived healthy life years of the Latvian population and prevent premature death through maintaining, improving and restoring health.
Lithuania (high)	Seimas of the Republic of Lithuania Resolution No XII-964 of Approval of the Lithuanian Health Strategy 2014–2025 (2014; primary)*[66]	2014–2025	No	Prevention	The attainment of improved health of the Lithuanian population by 2025 as well as longer life and reduced health inequities.
	The 2014–2020 National Programme Progress Horizontal Priority 'Health for All' Interinstitutional Operations Plan (2014; primary)**[67]	2014–2020	No	Prevention +management	To coordinate measures to enhance public health outcomes and implement the principle of health in all policies to achieve closer interagency cooperation on public health issues.
	The National Public Healthcare Development Programme for 2016–2023 (2015; primary)*[68]	2016–2023	No	Prevention +management	To set goals, tasks, assessment criteria and anticipated values of national public healthcare strategies and to ensure implementation of public healthcare goals and tasks set in the Lithuanian Health Programme for 2014–2025.
Mexico (upper middle)	National Strategy for the Prevention and Control of Overweight, Obesity and Diabetes (2013; primary)[69]	n.s.	Yes	Prevention +management	To improve the well-being of the population and contribute to the sustainability of national development by decreasing the prevalence of overweight and obesity among Mexicans, in order to impact the epidemic of non-communicable diseases, particularly type 2 diabetes, through public health interventions, a comprehensive model of medical attention and intersectoral political action.
The Netherlands (high)	All about health (2013; primary)*[70]	2014–2016	No	Prevention	To promote individual health and prevent chronic illness by means of an integrated approach within the settings in which people live, work and learn; give prevention a prominent place within healthcare; and maintain the quality of health protection, responding promptly to any new threats.
Norway (high)	NCD-Strategy 2013–2017. For the prevention, diagnosis, treatment and rehabilitation of four non-communicable diseases: cardiovascular disease, diabetes, COPD and cancer (2013; primary)*[71]	2013–2017	Yes	Prevention +management	To reduce premature death from cardiovascular disease, diabetes, chronic lung disease and cancer by 25% by 2025.
Poland (high)	The National Health Programme for the years 2016–2020, Council of Ministers' Decree (2016; primary)**[72]	2016–2020	Yes	Prevention +management	To extend healthy life, improve health and related quality of life of the population, and reduce social inequalities in health.
Portugal (high)	National Health Plan 2020 Review and Outreach (2015; primary)**[38]	2015–2020	Yes	Prevention +management	To maximise the health gains by integrating sustained efforts in all sectors of society, and the use of strategies based on citizenship, equity and access in quality and in healthy policies.
Slovakia (high)	Updated National Health Promotion Programme in the Slovak Republic (2014; primary)**[73]	2014–2030	No	Prevention	To achieve a long-term improvement in the health of the Slovak population, extending life expectancy and quality of life, eliminating the incidence of health disorders that reduce quality of life and threaten premature human death. The policy is primarily aimed at influencing the determinants of health, reducing population-based risk factors and increasing involvement of various sectors of society.
Slovenia (high)	Resolution on the National Healthcare Plan 2016–2025 (2016; primary)*[74]	2016–2025	No	Prevention +management	To promote health and prevent diseases; optimise healthcare; enhance the performance of the healthcare system; and achieve equity, solidarity and sustainability in financing of healthcare.
Spain (high)	Strategy for Addressing Chronicity in the National Health System (2012; primary)[75]	n.s.	No	Prevention +management	To decrease the prevalence of health conditions and chronic limitations of activity, reduce premature mortality of people who already have any of these conditions, prevent deterioration of functional capacity and complications associated with each process, and improve the quality of life of people and their caregivers.

Continued

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Table 1 Continued

Nation (income band†)	Policy title (year of publication; classification‡)	Time span	Explicit alignment with the WHO Action Plan§ (yes/no)	Focus (NCD prevention; NCD management; both)	Purpose, aim or vision
Sweden (high)	A person-centred public health policy (2012; primary)[76]	n.s.	No	Prevention	To present a person-centred public health policy.
	A cohesive strategy for alcohol, narcotic drugs, doping and tobacco (ANDT) policy (2011; primary)*[77]	2011–2025	No	Prevention +management	A society free from illegal drugs and doping, with reduced alcohol-related medical and social harm, and reduced tobacco use.
Switzerland (high)	Action plan for the National Strategy on the Prevention of Non-Communicable Diseases (NCD-Strategy) 2017–2024 (2016; primary)[78]	2017–2024	Yes	Prevention +management	To improve the coordination between actors and agencies and to increase the efficiency in prevention and health promotion.
	National strategy for the prevention of non-communicable diseases (NCD-Strategy) 2017–2024 (2016; primary)[79]	2017–2024	Yes	Prevention +management	More people stay healthy or have, despite chronic illness, a high quality of life. Less people fall ill with avoidable, non-communicable diseases or die prematurely. Independent of their socioeconomic status, people are enabled to have a healthy lifestyle in a conducive healthy environment.
Turkey (upper middle)	Multisectoral Action Plan of Turkey for Non-communicable Diseases 2017–2025 (2017; primary)*[39]	2017–2025	Yes	Prevention +management	To raise the health and well-being of the Turkish population through reducing preventable deaths and the disability burden attributable to NCDs and thus enabling citizens to maintain the highest attainable health status at all ages.
United Kingdom (high)	Living Well for Longer: A call for action to reduce avoidable premature mortality (2013; primary)*[80]	n.s.	No	Prevention +management	To challenge and inspire the health and care system, in its widest sense, to take action to reduce the numbers of people dying prematurely, defined as premature deaths due to cancer, heart disease, stroke, respiratory disease and liver disease under the age of 75 years.
United States of America (high)	National Prevention Council Action Plan: Implementing the National Prevention Strategy (2012; primary)*[81]	n.s.The development of a pragmatic	No	Prevention	To identify National Prevention Council shared departmental commitments and unique department actions to further each of the strategic directions and priorities of the National Prevention Strategy.

*Source document published in English.
**Source document translated to English.
†Classification: documents classified as primary or secondary. Primary documents are full or stand-alone national or jurisdictional policy or strategy documents. Primary documents may be brief, but should be interpretable as a stand-alone document. Secondary documents accompany primary documents (eg, infographics, summary pages, excerpts from primary documents) and do not represent the full policy or document.
‡Refers to the WHO Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013–2020.[21]
COPD, chronic obstructive pulmonary disease;NCD, non-communicable disease; n.s., not stated.

ability. The context in which musculoskeletal health was mentioned included:

- Within prevention and management strategies for NCDs (n=12 policies);
- A leading cause of disability in the country (n=8 policies);
- A determinant of healthy ageing (n=4 policies);
- A priority condition for care pathways (n=2 policies);
- Arthritis as a priority condition (n=3 policies);
- Conditions amenable to lifestyle/behaviour change (n=3 policies);
- An indicator for population health monitoring (n=1 policy).

Strategies outlined within and across policies, including relevance to musculoskeletal health, pain and mobility

General strategies to address the stated policy aims were outlined in 42 (95.5%) policies. From these, all strategies were relevant to prevention/management of musculoskeletal health, pain and mobility/functional ability in 12 (28.6%) policies, some were relevant in 27 (64.3%) policies and none were relevant in 3 (7.1%) policies. Thirty first-order codes were derived to summarise these general strategies. An additional 12 first-order codes were derived to summarise strategies specific to the prevention or management of musculoskeletal conditions, pain or mobility/functional ability. This resulted in a net 42 first-order codes, and these were subsequently aggregated into three overarching themes with supporting subthemes (figure 2; table 3). Twenty-eight (93.3%) of the 30 first-order codes in table 3 describing general policy strategies were relevant to the prevention/management of musculoskeletal health conditions, persistent pain or loss of functional ability/mobility (range: 2.1%–71.4% of policies), with the exception of 1.2.1 and 3.1.1. The frequency of policies with strategies specific to musculoskeletal health (ie, general strategies linked to musculoskeletal health based on the initial 30 first-order codes, or strategies cited in policies as explicitly related to musculoskeletal health based on the additional 12 first-order codes), is also included in table 3; range: 2.6%–55.3% of policies. A narrative meta-synthesis of the themes aligned to general and specific strategies is provided below.

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Nation	Number of policies	Cancer	Cardiovascular / cerebrovascular diseases	Diabetes / metabolic conditions	Mental health / psychiatric conditions	Respiratory conditions	Musculoskeletal conditions	Obesity / overweight	Chronic communicable diseases	Neurological conditions	Oral health conditions	Any chronic health conditions	Hypertension	Chronic kidney disease	Neurosensory conditions	Rare diseases	Liver diseases	Endocrine conditions	Gastrointestinal conditions	Diseases associated with substance abuse	Injury / accidents / trauma	Health states in population sub-groups	Diseases associated with unhealthy lifestyle choices	Disability in general	Reproductive and sexual health	Diseases associated with environmental toxins	Disasters and emergencies
Australia	1								◆			◆				◆					◆			◆			
Belgium	1	◆		◆	◆	◆			◆	◆					◆	◆					◆	◆					
Canada	4	◆	◆	◆		◆		◆				◆								◆							
Chile	1	◆	◆	◆	◆	◆	◆		◆		◆		◆	◆							◆			◆			◆
Czech Republic	2	◆	◆	◆	◆	◆	◆		◆	◆										◆							
Denmark	2											◆															
Estonia	1	◆	◆	◆	◆	◆																					
France	2	◆			◆		◆	◆			◆									◆	◆	◆	◆	◆		◆	
Germany	1						◆	◆														◆	◆				
Hungary	1	◆	◆	◆	◆	◆	◆		◆												◆						
Iceland	1	◆	◆	◆	◆		◆			◆										◆							
Ireland	2	◆	◆	◆	◆	◆	◆	◆																◆	◆		
Italy	3	◆	◆	◆	◆	◆	◆			◆				◆	◆			◆	◆			◆					
Japan	1	◆	◆	◆		◆																					
Korea	2	◆	◆		◆		◆	◆	◆		◆										◆	◆					
Latvia	1	◆	◆		◆																	◆					
Lithuania	3	◆	◆	◆	◆	◆		◆																			
Mexico	1			◆				◆																			
Netherlands	1			◆	◆			◆												◆			◆				
Norway	1	◆	◆	◆		◆																					
Poland	1	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆			◆					◆	◆	◆		◆	◆		
Portugal	1	◆	◆	◆		◆		◆	◆														◆	◆			
Slovakia	1	◆	◆	◆					◆			◆															
Slovenia	1	◆	◆	◆	◆	◆	◆	◆		◆	◆									◆							
Spain	1	◆	◆	◆	◆	◆	◆									◆						◆					
Sweden	2	◆	◆	◆	◆		◆	◆	◆				◆				◆			◆	◆		◆		◆		
Switzerland	2	◆	◆	◆	◆	◆	◆													◆							
Turkey	1	◆	◆	◆		◆	◆	◆					◆	◆						◆			◆				
United Kingdom	1	◆	◆			◆											◆										
United States	1	◆	◆	◆	◆	◆		◆					◆							◆	◆		◆		◆		
Counts	*44*	*25*	*23*	*23*	*19*	*19*	*15*	*13*	*10*	*6*	*5*	*5*	*4*	*3*	*3*	*3*	*2*	*1*	*1*	*11*	*9*	*8*	*7*	*6*	*4*	*1*	*1*
% by country	*-*	*83.3*	*76.7*	*76.7*	*63.3*	*63.3*	*50.0*	*43.3*	*33.3*	*20.0*	*16.7*	*16.7*	*13.3*	*10.0*	*10.0*	*10.0*	*6.7*	*3.3*	*3.3*	*36.6*	*30.0*	*26.7*	*23.3*	*20.0*	*13.3*	*3.3*	*3.3*

Figure 1 Frequency map of diseases/health conditions (left panel) and health states (right panel) explicitly cited as within the scope or coverage of the included policies by nation. Musculoskeletal conditions encompass any condition of the musculoskeletal system or persistent non-cancer pain. Neurological conditions include any neurological or neurodegenerative condition.

General principles for people-centred NCD prevention and management

Policies strongly identified that NCD prevention and management should be based on a continuum of care across the life course. Further, NCD prevention and management should be underpinned by a people-centred (biopsychosocial) approach to planning and delivery. In addition to optimising health, this should consider social and financial consequences and the risks associated with NCDs. Efforts to prevent and manage NCDs should consider healthy behaviours (nutrition, physical activity, safe use of substances) with a strong focus on obesity prevention and management; facilitating a healthy environment (including food safety, air/noise/chemical pollution, climate change); and supporting an active lifestyle. In particular, a focus on increasing population-level physical activity and reducing sedentary exposure across all ages and environments (school, work, home) through multifaceted programmes should be encouraged, monitored and measured. Promoting healthy behaviours and reducing risks for NCDs should also incorporate public health education tailored to target groups with the aim of improving health literacy, supporting positive health beliefs and encouraging effective self-management behaviours. Policies and programmes that target reducing the negative effects of alcohol, narcotics, doping substances and tobacco may also be helpful in reducing harm to people's musculoskeletal systems.

Person-centred NCD care that includes policy, service design and delivery should be developed and implemented through effective, cross-sector partnerships that include people and their families (including vulnerable groups), government, civil society, health services and industry.

Research that is accessible to decision makers, that addresses societal need in NCD prevention/management, that considers emerging technologies/technology innovations, that examines the value of complementary and alternative medicines, and is policy-relevant, was also cited as an important strategy in some policies.

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Table 2 Health conditions/priority areas included within scope; the extent of integration of musculoskeletal health (MSK), mobility (Mob) or functional ability (FA) and persistent non-cancer pain; and internal validity scores across included policies

Nation	Policy title (year of publication)	Health conditions/priority areas included within stated scope	Policy *explicitly* includes MSK health, mobility/ functional ability or persistent pain in the context of NCD management			Aims/objectives and strategies/actions relevant to prevention or management of MSK, Mob/FA or pain (all, some, none, n/a)	Internal validity sum score (range: 0–14)
			MSK	Mob / FA	Pain		
Australia	National Strategic Framework for Chronic Conditions (2017; primary)[45]	All chronic and complex health conditions across the spectrum of illness, including mental illness, trauma, disability and genetic disorders, including communicable diseases and NCDs.	No	No	No	All	11
Belgium	Chronic Disease Plan. Integrated Health Services for Better Health (2015; primary)[46]	NCDs (diabetes, cancer, asthma), chronic communicable disease (HIV-AIDS), mental health (psychoses), certain anatomical/functional conditions (blindness, multiple sclerosis), rare diseases, following accidental injury (amputation, paralysis), complex multimorbidities in the stages of high dependency or palliative care.	No	No	No	All	11
Canada	Integrated Strategy on Healthy Living and Chronic Disease (2005; secondary)[44]	All chronic diseases and explicitly states inclusion of diabetes, cancer, respiratory diseases and cardiovascular disease.	No	No	No	All	0
	Canada's Tobacco Strategy (2018; secondary)[41]	Chronic diseases associated with tobacco use.	No	No	No	None	3
	Curbing Childhood Obesity: A Federal, Provincial and Territorial Framework for Action to Promote Healthy Weights (2010; primary)[42]	Obesity and overweight.	No	No	No	All	3
	Let's get moving: A common vision for increasing physical activity and reducing sedentary living in Canada (2018; primary)[43]	n.s.	No	No	No	All	10
Chile	National Health Strategy to Complete the Health Objectives of the Decade (2011; primary)[47]	Communicable diseases—HIV/AIDS, tuberculosis, acute respiratory disorders. NCDs—explicitly covers cardiovascular disease, hypertension, diabetes, chronic kidney disease, cancer, chronic respiratory disorders, mental health disorders, disability, oral health conditions and musculoskeletal conditions. Injury—traffic accidents, workplace injury and family violence. Emergencies and disasters.	Yes	Yes	Yes	Some	13

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Table 2 Continued

Nation	Policy title (year of publication)	Health conditions/priority areas included within stated scope	Policy *explicitly* includes MSK health, mobility/ functional ability or persistent pain in the context of NCD management			Aims/objectives and strategies/actions relevant to prevention or management of MSK, Mob/FA or pain (all, some, none, n/a)	Internal validity sum score (range: 0–14)
			MSK	Mob / FA	Pain		
Czech Republic	HEALTH 2020 National Strategy for Health Protection and Promotion and Disease Prevention (2014; primary)[48]	Serious NCDs such as type 2 diabetes, cancer, cardiovascular diseases, mental disorders and musculoskeletal diseases, among others.	Yes	No	No	Some	10
	Long-term programme of improving the health status of the population of the Czech Republic – Health for All in the 21st Century (2002; primary)**[49]	New cancers, metabolic diseases especially diabetes, musculoskeletal diseases, respiratory diseases, cardiovascular disease, nervous and mental diseases, psychosomatic consequences of drug use, certain infections (AIDS).	Yes	No	No	Some	7
Denmark	Recommendations for preventative services for citizens with chronic diseases (2016; primary)[50]	All chronic conditions.	Yes	Yes	Yes	All	6
	Care pathways for chronic diseases – the generic model (2012; primary)[51]	All chronic conditions.	Yes	Yes	No	All	1
Estonia	National Health Plan 2009–2020 (2012; primary)*[52]	Cancer, cardiovascular diseases, asthma, diabetes, mental health conditions.	No	No	No	Some	10
France	Laws Official Journal of the French Republic of January 27th, 2016: Law no 2016–41 January 26th, 2016 of the Modernisation of Our Health System (1). Keynote Title: Mobilising Health System Members Around a Shared Strategy (2016; primary)[53]	NCDs including: mental disorders, cancer, pain; diseases related to poor nutrition; diseases related to lifestyle conditions that are susceptible to change; diseases related to tobacco use; diseases related to illicit drug use (narcotics, psychoactive drugs); diseases related to poor oral health; conditions related to environmental conditions (eg, air pollution); conditions related to exposure to harmful chemicals in consumer products (lead, asbestos, bisphenol A); injury; disability.	No	No	Yes	Some	5
	National Health Strategy: Roadmap (2013; primary)[54]	NCDs related to unfavourable health behaviours (tobacco consumption, excessive alcohol consumption, malnutrition, sedentary behaviours); individuals living with a disability or age-related loss of autonomy; other public health priority areas including youth health, obesity, mental health, cancer and age-related illness.	No	No	No	All	10
Germany	IN FORM: Germany's initiative for healthy nutrition (diet) and more physical activity. National action plan for prevention of malnutrition, lack of physical activity overweight and associated diseases (2014; primary)[55]	Overweight and obesity and their sequelae; diseases associated with inadequate physical activity; malnutrition and eating disorders (eg, anorexia, bulimia); postural deformities in children and teenagers; work-related musculoskeletal disorders.	No	No	No	Some	7
Hungary	"Healthy Hungary 2014–2020"—Health Sector Strategy (2015; primary)[56]	Cardiovascular conditions; diabetes; chronic respiratory disease; musculoskeletal diseases; cancer; mental health; accident/injury; communicable diseases.	Yes	No	No	Some	8

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Table 2 Continued

Nation	Policy title (year of publication)	Health conditions/priority areas included within stated scope	Policy *explicitly* includes MSK health, mobility/ functional ability or persistent pain in the context of NCD management			Aims/objectives and strategies/actions relevant to prevention or management of MSK, Mob/FA or pain (all, some, none, n/a)	Internal validity sum score (range: 0–14)
			MSK	Mob / FA	Pain		
Iceland	Public health policy and actions to encourage a healthier society—with emphasis on children and adolescents under 18 years of age (2016; primary)[57]	Heart disease; diabetes; cancer; musculoskeletal conditions; migraine; drug abuse and mental health conditions.	Yes	No	No	Some	11
Ireland	Tackling Chronic Disease: A Policy Framework for the Management of Chronic Diseases (2008; primary)*[58]	Cardiovascular disease; diabetes; cancer; musculoskeletal conditions and osteoporosis; mental disorders; asthma and chronic bronchitis.	Yes	No	No	Some	5
	Healthy Ireland: A framework for improved health and well-being 2013–2025 (2013; primary)*[59]	Overweight and obesity; mental health; sexual health; disability.	No	No	No	None	9
Italy	National Prevention Plan 2014–2018 (2014; primary)[60]	NCDs including cardiovascular diseases, cancer, respiratory diseases, diabetes, mental health conditions; neurosensory conditions, including hearing impairment and deafness, visual impairment and blindness; occupational health, including musculoskeletal conditions.	No	No	No	None	4
	National Chronicity Plan (2016; primary)[61]	Chronic kidney disease; rheumatoid arthritis and chronic arthritis in developmental age (juvenile arthritis); ulcerative colitis and Crohn's disease; chronic heart failure; Parkinson's disease and Parkinsonism; COPD; chronic respiratory failure; asthma; chronic endocrine diseases.	Yes	Yes	No	Some	6
	Gaining Health: Making healthy choices easier (2008; primary)([62])	Cardiovascular diseases; cancer; diabetes; chronic respiratory diseases; mental health conditions; musculoskeletal conditions.	Yes	No	No	n.s	0
Japan	Health Japan 21 (the second term) (2012; primary)[63]	Cancer; cardiovascular diseases; diabetes and COPD.	No	No	No	Some	9
Republic of Korea	National Health Plan 2020 in Korea (2011; secondary)[64]	Cancer; arthritis; cardiocerebrovascular disease; obesity; mental health conditions; oral health; infectious diseases (tuberculosis, AIDS); injury prevention; health of population subgroups (maternal, infant, elderly, worker's health, military health).	Yes	Yes	No	n.s.	6
	The Third National Health Promotion Plan (2011–2020) (2011; primary)[40]	Cardiovascular disease; arthritis; obesity; diabetes; cancer; mental health; oral health; communicable diseases.	Yes	Yes	Yes	Some	12
Latvia	Public Health Guidelines 2014 – 2020 (2014; primary)**[65]	Cardiovascular disease; cancer; paediatric/neonatal health; mental health.	No	No	No	Some	10

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Table 2 Continued

Nation	Policy title (year of publication)	Health conditions/priority areas included within stated scope	Policy *explicitly* includes MSK health, mobility/ functional ability or persistent pain in the context of NCD management			Aims/objectives and strategies/actions relevant to prevention or management of MSK, Mob/FA or pain (all, some, none, n/a)	Internal validity sum score (range: 0–14)
			MSK	Mob / FA	Pain		
Lithuania	Seimas of the Republic of Lithuania Resolution No XII-964 of Approval of the Lithuanian Health Strategy 2014–2025 (2014; primary)*[66]	Cardiovascular disease; cancer; diabetes; chronic respiratory diseases and mental health disorders.	No	No	No	Some	5
	The 2014–2020 National Programme Progress Horizontal Priority 'Health for All' Interinstitutional Operations Plan (2014; primary)**[67]	Cardiovascular disease; cerebrovascular conditions; cancer; mental health conditions.	No	No	No	Some	7
	The National Public Healthcare Development Programme for 2016–2023 (2015; primary)*[68]	Mental health conditions; obesity; diabetes; cancer and cardiovascular disease.	Yes	No	No	Some	10
Mexico	National strategy for the prevention and control of overweight, obesity and diabetes (2013; primary)[69]	Overweight; obesity; diabetes.	No	No	No	Some	12
The Netherlands	All about health (2013; primary)[70]	Health conditions related to: smoking, overweight/obesity, excessive alcohol consumption, and physical inactivity; depression; diabetes.	No	No	No	Some	10
Norway	NCD-Strategy 2013–2017. For the prevention, diagnosis, treatment and rehabilitation of four non-communicable diseases: cardiovascular disease, diabetes, COPD and cancer (2013; primary)[71]	Cardiovascular disease; diabetes; COPD and cancer.	No	No	No	All	4
Poland	The National Health Programme for the years 2016–2020, Council of Ministers' Decree (2016; primary)**[72]	NCDs in general, with specific reference to acute myocardial infarction; stroke; cancer; asthma; COPD; diabetes; depression and mental distress; dental caries; dementia; musculoskeletal pain; infertility; substance abuse conditions; specific communicable diseases (HCV, HBV, HIV, rubella, measles, polio); suicide; functional limitations on physical and sensory organs; and women's and children's health (pregnancy/labour/perinatal maternal health, child health problems diagnosed in utero, developmental problems of newborns, low birth weight, fertility, infant and maternal mortality).	Yes	Yes	No	Some	8
Portugal	National Health Plan 2020[8] Review and Outreach (2015; primary)**[38]	Cardiovascular disease; cancer; diabetes; obesity; chronic respiratory diseases; disability; nutrition-related diseases, HIV/AIDs.	No	Yes	No	Some	10

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Table 2 Continued

Nation	Policy title (year of publication)	Health conditions/priority areas included within stated scope	Policy *explicitly* includes MSK health, mobility/ functional ability or persistent pain in the context of NCD management			Aims/objectives and strategies/actions relevant to prevention or management of MSK, Mob/FA or pain (all, some, none, n/a)	Internal validity sum score (range: 0–14)
			MSK	Mob / FA	Pain		
Slovakia	Updated National Health Promotion Program in the Slovak Republic (2014; primary)**[73]	All health conditions (communicable and non-communicable), with specific foci including cardiovascular diseases; diabetes and selected cancers (cervical, breast, colon/rectal).	No	No	No	Some	6
Slovenia	Resolution on National Healthcare Plan 2016–2025 (2016; primary)*[74]	Cardiovascular disease; cancer; obesity; diabetes; chronic respiratory diseases; neurodegenerative diseases; autism; epilepsy; musculoskeletal diseases; diseases of the teeth and oral cavity; mental illness; conditions related to substance abuse (alcohol, tobacco smoking).	Yes	Yes	No	Some	12
Spain	Strategy for Addressing Chronicity in the National Health System (2012; primary)[75]	Cancer; ischaemic heart disease; stroke; diabetes; mental health; COPD; rare diseases; pain; palliative care.	No	Yes	Yes	All	8
Sweden	A person-centred public health policy (2012; primary)[76]	NCDs related to lifestyle with specific reference to: diabetes, cardiovascular disease, cancer, liver damage, hypertension, psychiatric diseases, stroke, musculoskeletal conditions and overweight; accidents and injury; communicable diseases, including sexually transmitted diseases.	Yes	Yes	No	Some	4
	A cohesive strategy for alcohol, narcotic drugs, doping and tobacco (ANDT) policy (2011; primary)*[77]	Any conditions associated with substance abuse.	No	No	No	Some	4
Switzerland	Action plan for the National Strategy on the Prevention of Non-Communicable Diseases (NCD-Strategy) 2017–2024 (2016; primary)[78]	Respiratory diseases; cancer; cardiovascular diseases; diabetes, musculoskeletal disorders; conditions related to substance abuse; mental health disorders.	Yes	No	No	Some	13
	National strategy for the prevention of non-communicable diseases (NCD-Strategy) 2017–2024 (2016; primary)[79]	Respiratory diseases; cardiovascular disease; cancer; diabetes, musculoskeletal disorders.	Yes	No	No	All	13
Turkey	Multisectoral Action Plan of Turkey for Non-communicable Diseases 2017–2025 (2017; primary)*[39]	Cardiovascular diseases; malignant neoplasms; respiratory diseases; diabetes; cancer (specifically breast and cervical cancers); chronic airway diseases; COPD; asthma; disease related to lifestyle choices (tobacco consumption, secondhand smoke, alcohol consumption, unhealthy diet (high salt consumption), raised blood cholesterol, and insufficient physical activity); obesity; hypertension; chronic kidney disease; musculoskeletal system diseases.	Yes	No	No	Some	13

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Table 2 Continued

Nation	Policy title (year of publication)	Health conditions/priority areas included within stated scope	Policy *explicitly* includes MSK health, mobility/ functional ability or persistent pain in the context of NCD management: MSK	Mob / FA	Pain	Aims/objectives and strategies/actions relevant to prevention or management of MSK, Mob/FA or pain (all, some, none, n/a)	Internal validity sum score (range: 0–14)
United Kingdom	Living Well for Longer: a Call to Action to Reduce Avoidable Premature mortality (2013; primary)*[80]	Cancer; circulatory disease (heart disease, stroke); respiratory and liver disease.	No	No	No	All	4
United States of America	National Prevention Council Action Plan: Implementing the National Prevention Strategy (2012; primary)[81]	Diseases related to lifestyle choices (tobacco, substance abuse, nutrition, physical inactivity; for example, obesity, heart disease, hypertension, diabetes, certain cancers, respiratory infections, asthma, depression); injury/ accidents (including violence); reproductive and sexual health; mental health.	Yes	No	No	Some	5

*Source document published in English.
**Source document translated to English.
COPD, chronic obstructive pulmonary disease; FA, functional ability or functional impairment; HBV, hepatitis B virus; HCV, hepatitis C virus; Mob, mobility;MSK, musculoskeletal;NCD, non-communicable disease; n.s., not stated; Pain, persistent non-cancer pain.

Service delivery

Interventions/programmes/services for NCD prevention/management should be effective based on health and cost outcomes, should be safe, and be acceptable to consumers. In the context of prevention, timely interventions to identify and manage risk factors, to enable early diagnosis (eg, health checks, screening, education campaigns), and to enable risk classification/stratification, was identified as important. For musculoskeletal health specifically, some policies rationalised the need to include disability assessments as part of national health checks while others cited the need for strategies to prevent injuries across various settings (work, school, recreational).

In the context of disease management, evidence from policies supported that NCDs may be addressed through disease-specific and technology-enabled models of care. Such models must address a specific population/clinical group (such as the Danish care pathway for musculoskeletal conditions); be informed by clinical guidelines/evidence and by criteria that support effective clinical decision making (eg, improved diagnostics) and adopt appropriate stepped care; and identify implementation strategies and mechanisms for monitoring effectiveness, safety and quality improvement. Specific to musculoskeletal health, some policies identified the need to support specific strategies for obesity prevention/reduction, to improve mental healthcare and for targeting arthritis as a specific priority condition.

Policies identified that improved NCD management may be achieved through services that are accessible (ie, geographically accessible, accessible thorugh appropriate infrastructure, and supported by technology eg telehealth and information exchange to improve access) irrespective of age, gender, residence and socioeconomic status; and that are culturally acceptable. Access to essential medicines and laboratory medicine facilities were considered critical. Leveraging digital technologies to mitigate care disparities imposed by geographical and socioeconomic barriers and to facilitate access to high-value NCD care for vulnerable groups/populations, was supported.

Where possible, evidence suggested that health services should be delivered in community settings by multidisciplinary care teams. For musculoskeletal health specifically, rehabilitation providers within multidisciplinary teams and community-based rehabilitation services were seen as important, together with comprehensive care plans that support return to work and/or social participation. To ensure holistic care, policies indicated that service delivery should be integrated between services, settings and regions. Capacity building in the workforce was highlighted as a critical enabler to supporting the delivery of the right NCD care (eg, development of core competencies that include ageing, mental health, obesity management, physical activity), with a particular focus on primary care providers.

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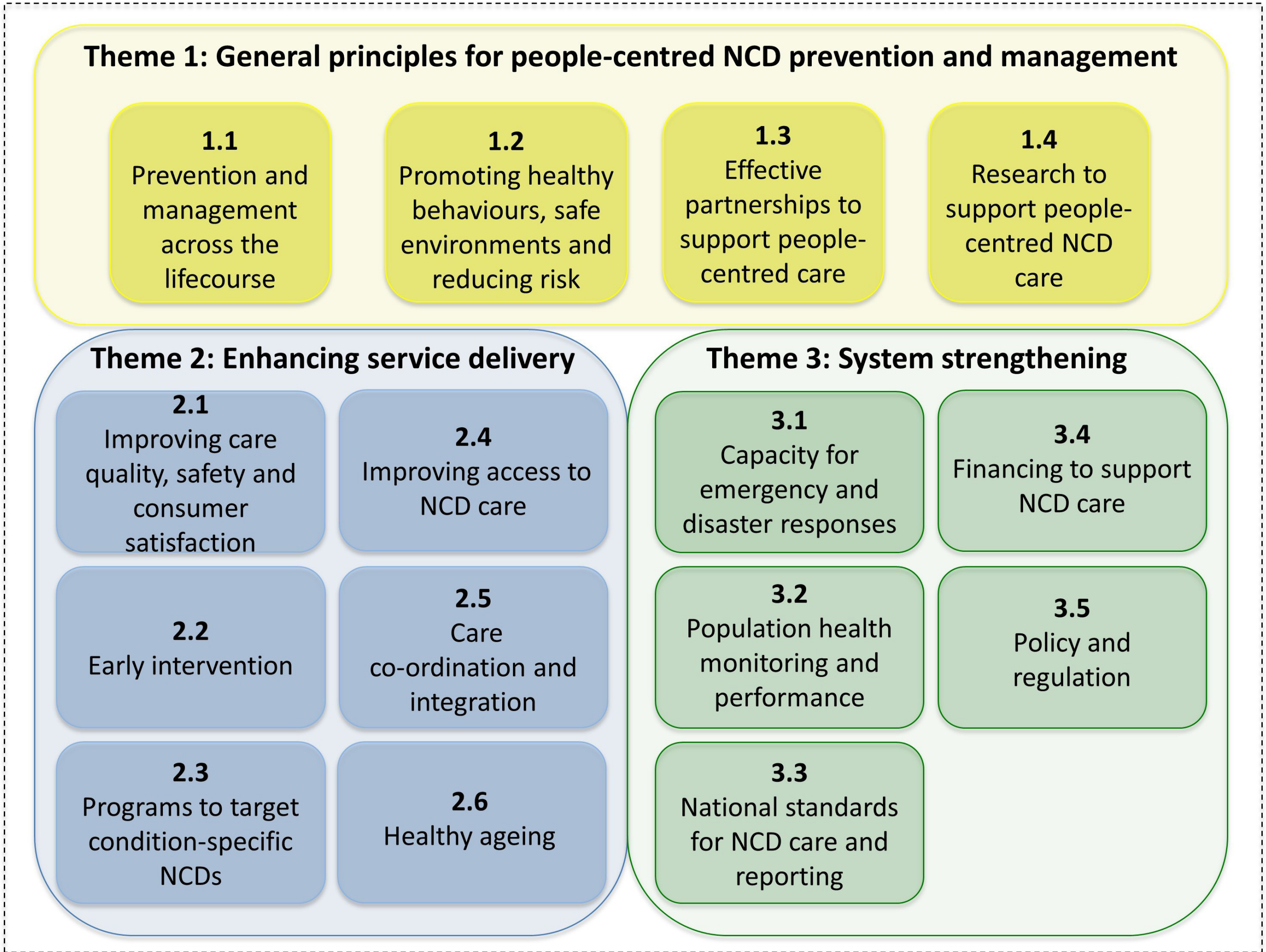

Figure 2 Schematic of the themes and subthemes describing the strategies outlined in the included policies for integrated management of non-communicable diseases (NCDs). The themes align with the WHO Framework on Integrated People-Centred Health Services (IPCHS).[85]. Theme 1 aligns with IPCHS strategy 1 ('engaging and empowering people and communities'); theme 2 aligns with IPCHS strategies 3 and 4 ('reorienting the model of care' and 'coordinating services within and across sectors', respectively); theme 3 aligns with IPCHS strategy 5 ('creating an enabling environment').

In the context of supporting older people living with NCDs, policies recommended the implementation of specific strategies and indicators to support healthy ageing, including: health promotion, health checks, interventions to address functional impairments, development of a model of care for older people that includes geriatric care and support for long-term care systems.

System strengthening

To inform NCD prevention/management planning and system-level responses, there is a need for population health monitoring. Relevant system performance targets should include NCD risk factor reduction, prevention of premature mortality, morbidity reduction, disease incidence reduction, reduction in health economic burden associated with NCD care, and health inequality and care disparity reductions. To support health systems, there is a need to establish national care/quality standards and standardise reporting practices for NCDs. Findings suggested a need to develop guidelines or quality care standards that are relevant for people living with musculoskeletal health impairments, such as rehabilitation and disability guidelines. At a broader level, building capacity in the system to respond to health disasters and epidemics was identified as important.

Financing for NCD care was considered essential to address long-term health spending, to ensure appropriate resourcing of policy/programme implementation initiatives, to ensure there are compulsory insurance schemes to act as a mechanism for financial sustainability (eg, universal health insurance), and to support funding of only interventions and technologies with proven effectiveness and safety, and finally, develop and implement financing models linked to performance and quality. In the context of positively influencing musculoskeletal health services, providing appropriate financing for rehabilitation services and for social and financial support packages for people living with disability, were identified

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Table 3 Summary of overarching themes, supported by subthemes and first-order codes to describe the scope and content of the strategies outlined in the included policies. Frequencies of general strategies and frequencies of specific strategies relevant to musculoskeletal (MSK) health, pain or mobility/functional ability, by policy, are included to provide a measure of prominence for first-order codes. Frequencies are colour coded for ease of interpretation (red <25%; amber ≥25% to <50%; green ≥50%).

Subthemes	First-order codes describing strategies contained in policies	Frequency of policies with general strategies; n (%)	Frequency of policies with strategies relevant to MSK, pain or mobility/functional ability care; n (%)
Theme 1: General principles for people-centred NCD care			
1.1 *NCD prevention and management across the life course*	1.1.1 NCD prevention/management should be based on a care continuum across the life course from prevention (including maternal and child healthcare) through to rehabilitation and palliative care that is tailored to the individual's needs and that considers physical health, mental well-being and injury protection. A focus on vulnerable groups should be prioritised.	16 (38.1)*	8 (21.1)
	1.1.2 NCD prevention/management should include initiatives that address social and financial consequences of, or risk factors for, NCDs and that promote physical and social function.	13 (31.0)*	8 (21.1)
	1.1.3 NCD management should adopt a people-centred model in service delivery.	1 (2.4)*	2 (5.3)
1.2 *Promoting healthy behaviours, safe environments and reducing risk*	1.2.1 NCD prevention/management should be based on promoting a healthy and safe environment to minimise risk factors for NCDs including food safety, exposure to chemicals, air and noise pollution, and climate change. This approach should extend to education and work environments.	15 (35.7)	3 (7.9)
	1.2.2 NCD prevention/management should support the development and implementation of multifaceted interventions to increase the volume of physical activity (PA) and reduce sedentary behaviour at the population level targeting all ages (eg, population awareness campaigns; supportive environments and transport options; work and school-based PA; leadership in PA initiatives; upskilling teachers in PA) with indicators to monitor performance.	14 (33.3)*	16 (42.1)
	1.2.3 NCD prevention/management should be based on promoting healthy behaviours/lifestyles to minimise risk factors for NCDs (primary and secondary prevention) with a strong focus on obesity management. Foci should include healthy lifestyle (nutrition focusing on a reduction of sugar, salt and saturated fats; PA; safe use of alcohol/tobacco; minimising substance abuse especially in youth; mental health strategies; and oral hygiene). This approach should extend to education and work environments, with particular attention paid to supporting healthy lifestyle environments for children in schools.	30 (71.4)*	22 (57.9)
	1.2.4 NCD prevention/management should include public health education that is accessible and disseminated across various settings (eg, work, education/school, kindergarten) and is tailored to target groups, with the outcome being a change in health beliefs and empowering positive health behaviours (improved health literacy) and improved capacity for self-management. In some settings, mass media is recommended.	25 (59.5)*	17 (44.7)
	1.2.5 †NCD prevention/management should support the development and implementation of policies and/or programmes that target reducing the potentially negative effects of alcohol, narcotics, doping substances and tobacco (ANDT) on the MSK system, on the mental health system and that reduce the chances of injury to the MSK system.	–	2 (5.3)
1.3 *Effective partnerships to support people-centred care*	1.3.1 NCD prevention/management efforts (inclusive of service delivery, service design and policy formulation) should be approached with effective partnerships across the sector (eg, government, civil society, volunteers, health services, industry) and with consumers and their families, including indigenous communities.	21 (50.0)*	11 (28.9)
1.4 *Research to support people-centred NCD care*	1.4.1 NCD prevention/management should support research that is accessible to decision makers, that addresses societal need in NCD prevention/management, that considers emerging technologies/technology innovations, that examines the value of complementary and alternative medicines, and is system-relevant.	12 (28.6)*	7 (18.4)
Theme 2: Service delivery			
2.1 *Improving care quality, safety and consumer satisfaction*	2.1.1 Deliver interventions or services that are effective and safe (high-value) and that improve care quality and consumer satisfaction.	15 (35.7)*	7 (18.4)
	2.1.2 Prevention initiatives (eg, programmes, policies) should be underpinned by quality criteria for NCD prevention, including evaluation of effectiveness.	4 (9.5)*	4 (10.5)
2.2 *Early intervention*	2.2.1 NCD prevention should include timely interventions to identify and manage risk factors, enable early diagnosis (eg, health checks, screening, education campaigns) and enable risk classification/stratification.	20 (47.6)*	14 (36.8)
	2.2.2 †National health assessments or 'health checks' should include assessment of disability.	–	1 (2.6)
	2.2.3 †Implement strategies and policy for injury prevention at work, for leisure and sport and that monitor injury prevalence.	–	3 (7.9)

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Table 3 Continued

Subthemes	First-order codes describing strategies contained in policies	Frequency of policies with general strategies; n (%)	Frequency of policies with strategies relevant to MSK, pain or mobility/functional ability care; n (%)
2.3 *Programmes targeting condition-specific NCDs*	2.3.1 NCD management of major conditions should include programmes that are evaluated and supported by disease-specific clinical guidelines and established criteria for diagnosis and stratification. Mechanisms to update programmes based on new evidence should be included.	8 (19.0)*	3 (7.9)
	2.3.2 NCDs management should include disease-specific and technology-enabled models of care, that address a specific population or condition/disease group and contain evidence-based components of care, implementation strategies, and mechanisms for monitoring and quality improvement.	4 (9.5)*	2 (5.3)
	2.3.3 †NCD management should include support strategies for obesity reduction/prevention strategies, in addition to general nutrition and PA strategies.	–	1 (2.6)
	2.3.4 †Support delivery of mental healthcare through targeted health promotion, through accessible services (inclusive of mind-body therapies) and through provider training in mental healthcare.	–	5 (13.2)
	2.3.5 †Support specific system and service strategies for arthritis (identification of disease, supporting adherence to pharmacological and non-pharmacological care, integrated management between health services and clinicians, development of models of service delivery and models of care).	–	2 (5.3)
2.4 *Improving access to NCD care*	2.4.1 Support NCD management by harnessing digital technologies (eg, eHealth, telehealth, electronic medical records) to enable information/service access and exchange for consumers and health professionals to support self-management, system navigation and care delivery.	10 (23.8)*	6 (15.8)
	2.4.2 Support accessible NCD care services (geographically accessible, appropriate infrastructure, ICT support) irrespective of age, gender, residence and socioeconomic status, and ensure that services are culturally acceptable.	17 (40.5)*	12 (31.6)
	2.4.3 NCD prevention and management needs to be supported by population access to essential medicines and essential laboratory medicine.	3 (7.1)*	4 (10.5)
2.5 *Care coordination and integration*	2.5.1 Create community-based, multidisciplinary healthcare teams responsive to local needs, supported by a referral network for providers.	5 (11.9)*	4 (10.5)
	2.5.2 Build and monitor capacity/competencies in the workforce (particularly in primary care) to deliver high-value NCD care, including a focus on ageing, mental health, obesity management, PA and competencies in technology use.	17 (40.5)*	10 (26.3)
	2.5.3 Support care coordination between the workforce and support coordination and integration between services, regions and existing programme (eg, with ICT infrastructure, referral networks).	20 (47.6)*	11 (28.9)
	2.5.4 †Ensure that health facilities have rehabilitation professionals working in multidisciplinary teams.	–	1 (2.6)
	2.5.5 †Ensure that citizens who have NCDs have comprehensive health plans developed, inclusive of supports for return to work.	–	3 (7.9)
	2.5.6 †Support the provision of community-based rehabilitation services, especially in areas where care disparities exist.	–	2 (5.3)
2.6 *Supporting healthy ageing*	2.6.1 In the context of supporting older people living with NCDs, implement specific strategies and indicators to support *healthy ageing* (health promotion; health checks; interventions to address functional impairments; develop models of care for older people that include geriatric care and long-term care systems).	8 (19.0)*	5 (13.2)
Theme 3: System strengthening			
3.1 *Capacity for emergency response to disasters and epidemics*	3.1.1 Strengthen emergency response capacity to better manage disasters and epidemics.	5 (11.9)*	1 (2.6)
3.2 *Population health monitoring and performance*	3.2.1 To inform NCD prevention and management initiatives, population health monitoring/surveillance is needed through electronic health information systems, that should include health and injury outcomes and the social determinants of health.	14 (33.3)*	6 (15.8)
	3.2.2 Performance targets for NCD management/prevention should be based on: reduction in risk factors for NCDs; prevention of premature mortality; minimising morbidity (reduce disability and increase healthy life years); reduction in disease incidence; reduction in cost associated with NCDs; reduction in care disparities and health inequalities due to financial or social factors in vulnerable groups (eg, indigenous groups, ethnic minorities); and empowerment of citizens to more actively manage their health/participate in their healthcare.	23 (54.8)*	9 (23.7)

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Table 3 Continued

Subthemes	First-order codes describing strategies contained in policies	Frequency of policies with general strategies; n (%)	Frequency of policies with strategies relevant to MSK, pain or mobility/functional ability care; n (%)
3.3 *National care standards and reporting*	3.3.1 Establish national care/quality standards and standardised reporting for NCDs, care delivery and health outcomes to enable monitoring of care quality.	8 (19.0)*	6 (15.8)
	3.3.2 †Develop care guidelines/quality standards relevant to the care of people with MSK conditions (eg, rehabilitation guidelines; disability guidelines; community health promotion guidelines that include PA, nutrition, injury prevention and mental health).	–	1 (2.6)
3.4 *Financing to support NCD care*	3.4.1 Financing for NCD care needs to consider long-term health spending, resources to support implementation of policy/programmes, compulsory insurance, funding only interventions and technologies with proven effectiveness, universal health insurance, and payments linked to performance and quality.	11 (26.2)*	7 (18.4)
	3.4.2 †Appropriately finance rehabilitation services to ensure appropriate quality care can be delivered sustainably.	–	1 (2.6)
	3.4.3 †Provide social and financial support packages for people living with disability and/or their carers.	–	1 (2.6)
3.5 *Policy and regulation*	3.5.1 Ensure health, especially NCD prevention/management, is considered in all public policy and interministerial activity (eg, social policy, ageing policy, employment policy), including the evaluation of policies in terms of health impact.	12 (28.6)*	6 (15.8)
	3.5.2 NCD prevention and management should be nationally prioritised agenda items.	1 (2.4)*	0 (0)
	3.5.3 NCD prevention and management requires strengthening of health governance through the formulation of appropriate health and social policies. These should be evidence-based, enable monitoring of outcomes that are aligned to international targets, address the needs of people with disability and support citizens to actively and positively manage their health.	9 (21.4)*	5 (13.2)
	3.5.4 Develop and implement financial and marketing regulation and/or policy measures to support citizens make healthy choices and limit unhelpful commercial influences on health behaviours and outcomes (eg, nutritional information for food, making healthy food affordable, regulation of advertising unhealthy foods, regulation of sales of illicit drugs via social media, tobacco control).	14 (33.3)*	4 (10.5)

*Strategies relevant to the prevention/management of musculoskeletal health conditions, persistent pain or loss of functional ability/mobility.
†Additional codes added where strategies were specifically related to persistent pain or mobility/functional ability care.
ICT, information and communication technology; MSK, musculoskeletal; NCD, non-communicable disease; PA, physical activity.

as important factors for the prevention and management of musculoskeletal health, pain and mobility.

NCD prevention and management was considered as needing to be nationally prioritised and actioned through a whole-of-government approach. Health and social care policy was identified as necessary for NCD care and public health and policies indicated that this should be evidence-informed for effective prevention and management initiatives. Further, policy should explicitly allow for capture of outcomes that align with international targets. Regulation (eg, through policy and financial levers) also emerged as a key area that should be used to enable healthy lifestyle choices and support healthy behaviours; for example, disincentivising unhealthy foods, tobacco, substance use and unhelpful advertising.

Implementation and internal validity

Information to support implementation was provided in 38 (86.4%) polices from 29 (96.7%) countries. Across specific domains of implementation, priorities for implementation were described in 19 (50.0%) policies, timelines or phasing of implementation activity in 23 (60.5%) policies, financing arrangements to support implementation in 26 (68.4%) policies, and identification of agencies responsible for implementation actions in 37 (97.4%) policies (online supplementary file 4 provides these details by policy).

Internal validity sum scores ranged from 0 to 13 across policies, with a mean score of 7.6 (95% CI 6.5 to 8.7).

DISCUSSION

Main findings

To our knowledge, this is the first analytical review of contemporary health policies for the integrated management of NCDs among OECD Member States. This analysis provides an important snapshot of trends in aims and strategies for integrated management of NCDs among high-income nations, and for the first time, examines the extent of integration of musculoskeletal health as a leading cause of morbidity in most nations. Our findings are important for characterising and understanding the evidence on emergent priorities and strategies as outlined in contemporary health policies for NCDs, particularly in the context of the prevention/management of musculoskeletal health. We identified a broad range of internal validity scores among the included policies, suggesting diverse criteria for policy development across nations. From a broader NCD prevention and management perspective, our findings related to the aims and strategies outlined in the included policies

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align with many of the targets and indictors for the WHO NCD monitoring framework (eg, https://www.who.int/nmh/global_monitoring_framework/en/), with a strong focus on mortality reduction, consistent with the target for SDG 3.4. Our meta-synthesis of aims and strategies provides evidence that aligns with a system-strengthening approach for NCDs, covering the important system building blocks of service delivery, health workforce, information and information systems, medical products and essential medicines, financing, and leadership and governance.[82] The majority of countries (63%–83%) had policies that focused on cancer, cardiovascular disease, diabetes and respiratory conditions. This is unsurprising given that these conditions are the foci of the WHO NCD monitoring framework, are most strongly associated with mortality, and are therefore more strongly linked to SDG target 3.4. Relative to other NCDs, musculoskeletal health did not feature as prominently.

Integrated approaches to NCD prevention/management

An integrated approach to NCD care is recognised as essential for effective system strengthening,[27 83 84] particularly in the context of an ageing population, an increasing prevalence of multimorbidity[18] and in recognition of the limitations in LMICs to address multiple health states in parallel.[16] Overall, the included policies aimed to address three key areas relevant to this point: strengthening health systems to respond to NCDs, improving service delivery for citizens and improving population health. Similarly, the specific strategies outlined to achieve these aims focused on system strengthening, service delivery and a suite of general principles for NCD prevention/management (taking a life course approach, establishment of cross-sectoral partnerships, and systems and services support for healthy behaviours and environments). Our meta-synthesis of evidence in this context aligns with the relatively recent WHO Framework on Integrated People-Centred Health Services (IPCHS)[85] and advocacy efforts in promoting NCD control as a component of universal health coverage.[86] The derived specific actions (first-order codes) also mirror those of the WHO recommended interventions, or ‘Best Buys’, for NCD prevention and management.[27] For example, the included policies focused strongly on interventions for physical activity and healthy behaviours and lifestyle choices relating to nutrition, enhancing activity levels and minimising substance abuse (alcohol and tobacco). The synergy between our data and these WHO frameworks suggest a policy shift from curative and hospital-centred biomedical care towards the delivery of integrated long-term health and social care for people who live with, or are at risk of, chronic and frequently comorbid NCDs. Our data also support the implementation strategies and priorities outlined in the WHO Integrated Care for Older People approach (a flagship programme of the Global Strategy and Action Plan on Ageing and Health that identifies musculoskeletal health as a key component of intrinsic capacity and necessary for healthy ageing) and the Rehabilitation 2030 agenda.[23 24 87]

Notably, only 19% of policies specifically referred to addressing healthy ageing. This may suggest a deprioritisation of ageing in the context of NCD care, that ageing policy is independent of NCD care for most countries, or that implementation of the Global Strategy and Action Plan for Ageing and Health will take some time to have an enduring influence on national policy.[24] Nonetheless, the 2020–2030 Decade of Healthy Ageing is likely to be a catalyst for driving the evolution of healthy ageing policy in NCD care. Of note, few policies specifically addressed multimorbidity explicitly. Although multimorbidity may be implicitly addressed among policies focusing on ‘all’ NCDs, and also through strategies that are not disease-specific (eg, health promotion, improving access, integrated care), the absence of an explicit focus on multimorbidity collides with the prevalence of NCD multimorbidity, particularly that associated with ageing.[88 89] This suggests a policy vacuum and potential system capacity gap in this critical area of health burden.[90]

Musculoskeletal health in a broader NCD context

Despite unequivocal evidence of the global burden imposed by impaired musculoskeletal health and pain,[9 91] historically, these health states have not featured within policy and strategy in the context of prevention/management for NCDs in high-income countries and LMICs.[11 16 92] Further, they are not included in the WHO NCD monitoring activities apart from the WHO European Region NCD plan.[93] Although our data suggest that only half of the countries specifically identified musculoskeletal health or persistent pain as lying within the scope of their policies, this proportion nonetheless highlights recognition of, and in some cases, planned action towards improving the musculoskeletal health of populations in OECD countries.

Evidence from our meta-synthesis points to the need for system-level (macro) and service-level (meso) strengthening in NCD prevention and management, underpinned by a person-centred and life course approach. Prominent foci included health promotion (including healthy behaviours and environments, education, and early intervention, self-management) and monitoring; optimising service access and delivery including support for leveraging digital technologies, integrated and coordinated care, high-value interventions and workforce capacity building; and the formulation of appropriate policy, regulation and financing models—aligned to the WHO IPCHS framework.[85] Although only 50% of countries specifically identified musculoskeletal health or pain as within the scope of included policies, and only 17% of countries had policies that covered ‘all’ NCDs (implicitly including musculoskeletal health), these foci are relevant across NCDs. Further, these foci typically feature as priority areas in contemporary models of care for musculoskeletal health and pain.[94 95] As highlighted in table 3, a range of musculoskeletal-specific strategies

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were identified that also align with these broader domains suggesting that effective prevention and management of musculoskeletal conditions could be achieved through policy implementation in countries without an explicit policy focus on these conditions. However, multiple factors will limit this progress, including: the current landscape of constrained fiscal healthcare resources, the widespread delivery of low-value care for musculoskeletal health conditions,[96–99] the alignment of health monitoring and investment with the WHO NCD monitoring framework that excludes musculoskeletal health, the target for SDG 3.4 focusing on mortality reduction alone, and generally slow progress in achieving NCD targets.[6] Meaningful population health gains in musculoskeletal health and pain outcomes may be limited until these health states are explicitly integrated into national policy, programme and financing models for NCD prevention and management, and into the WHO NCD monitoring framework.[11] Further, it will remain essential to measure population health states, communicate the health and economic burden and national development threats imposed by musculoskeletal conditions, and support scalable system reform initiatives for musculoskeletal health conditions.[11 94 96 99 100]

Policy implementation

The majority of evaluated policies did outline implementation information. There was a strong focus on cross-sectoral agencies as providing joint responsibility for implementation, with less emphasis on specific details relating to timelines, prioritisation of initiatives and financing arrangements. These findings likely relate to the scope of the policies, the majority of which were focused on a whole-of-system reform agenda, rather than specific operational plans.

Strengths, limitations and future directions

The strengths of this research lay in the application of a standardised approach to reviewing and evaluating internal validity of the included policies using a multilingual research team, undertaking a comprehensive content analysis and deriving a meta-synthesis of the rich data with minimal discordance evident between reviewers. This analysis could be used as a model to prospectively monitor NCD policy evolution with a more specific focus on musculoskeletal health. For example, the current Norwegian NCD policy focuses on cardiovascular disease, diabetes, chronic obstructive pulmonary disease and cancer, while the planned update of that policy suggests a strong focus on musculoskeletal health (https://www.regjeringen.no/no/dokumenter/meld.-st.-19-20182019/id2639770/sec3#KAP6-1-1). We recognise that many countries have developed and implemented system-level disease-specific policies and frameworks (eg, models of care, strategies or care pathways), including those for musculoskeletal conditions.[94 95] We did not evaluate these disease-specific policies, since we primarily sought to identify the extent of integration of musculoskeletal health within a broader policy framework for the prevention and management of NCDs.

The findings in this review should be interpreted in the context of some important limitations. First, our data are limited to policies submitted by OECD Member States in response to periodic NCD Country Capacity Surveys undertaken by the WHO. While this approach ensured that we accessed the most relevant policies as determined by the individual Member States, thereby providing a level of standardisation in document selection and minimising potential selection bias, it did preclude the inclusion of other potentially relevant policies, especially for the countries excluded from this review. Second, our data relied on the interpretations of reviewers who performed the data extractions and may therefore be subject to reviewer bias and variance. We attempted to minimise these threats through reviewer briefings, development of a protocol, inter-rater reliability testing of the data extraction tool, and quality checks of each submission received from the review team. Third, our scope was limited to OECD Member States. Therefore, the findings and implications are limited to predominantly high-income nations, with a disproportionate representation of European countries. In order to derive a broader and representative global profile of policy capacity in integrated NCD prevention and management (including musculoskeletal health), it would be important to extend the analysis to policies from LMICs and other non-OECD Member States. It would also be informative to repeat the analysis in 3–5 years, when revised policies are submitted by OCED Member States to assess policy evolution. In the longer term, evaluating the impact of policy change on musculoskeletal health outcomes, such as burden of disease, will be important.

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ORIGINAL RESEARCH

FRAMEWORK IMPLEMENTATION OF THE INSPIRE ICOPE-CARE PROGRAM IN COLLABORATION WITH THE WORLD HEALTH ORGANIZATION (WHO) IN THE OCCITANIA REGION

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Abstract: *Introduction:* Limiting the number of dependent older people in coming years will be a major economic and human challenge. In response, the World Health Organization (WHO) has developed the «Integrated Care for Older People (ICOPE)» approach. The aim of the ICOPE program is to enable as many people as possible to age in good health. To reach this objective, the WHO proposes to follow the trajectory of an individual's intrinsic capacity, which is the composite of all their physical and mental capacities and comprised of multiple domains including mobility, cognition, vitality / nutrition, psychological state, vision, hearing. *Objective:* The main objective of the INSPIRE ICOPE-CARE program is to implement, in clinical practice at a large scale, the WHO ICOPE program in the Occitania region, in France, to promote healthy aging and maintain the autonomy of seniors using digital medicine. *Method:* The target population is independent seniors aged 60 years and over. To follow this population, the 6 domains of intrinsic capacity are systematically monitored with pre-established tools proposed by WHO especially STEP 1 which has been adapted in digital form to make remote and large-scale monitoring possible. Two tools were developed: the ICOPE MONITOR, an application, and the BOTFRAIL, a conversational robot. Both are connected to the Gerontopole frailty database. STEP 1 is performed every 4-6 months by professionals or seniors themselves. If a deterioration in one or more domains of intrinsic capacity is identified, an alert is generated by an algorithm which allows health professionals to quickly intervene. The operational implementation of the INSPIRE ICOPE-CARE program in Occitania is done by the network of Territorial Teams of Aging and Prevention of Dependency (ETVPD) which have more than 2,200 members composed of professionals in the medical, medico-social and social sectors. Targeted actions have started to deploy the use of STEP 1 by healthcare professionals (physicians, nurses, pharmacists,...) or different institutions like French National old age insurance fund (CNAV), complementary pension funds (CEDIP), Departmental Council of Haute Garonne, etc. *Perspective:* The INSPIRE ICOPE-CARE program draws significantly on numeric tools, e-health and digital medicine to facilitate communication and coordination between professionals and seniors. It seeks to screen and monitor 200,000 older people in Occitania region within 3 to 5 years and promote preventive actions. The French Presidential Plan Grand Age aims to largely implement the WHO ICOPE program in France following the experience of the INSPIRE ICOPE-CARE program in Occitania.

Key words: ICOPE program, older people, dependency, remote monitoring, STEP, intrinsic capacity, INSPIRE, Occitania, care implementation, clinical practice.

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Introduction

The INSPIRE program was recently funded in Toulouse, France, which aims to identify the hallmarks of biological aging and allows us to propose, in the future, innovative therapeutics to prevent or restore impaired function (1). To achieve this objective, a Human Translational Cohort as well as an Animal cohort will be created to discover biomarkers of aging. The INSPIRE ICOPE-CARE program is a part of the INSPIRE program. Its main objective is to implement, at a large scale in the Occitania region, South-Western France, the WHO ICOPE program in the daily clinical routine. The ambition of INSPIRE ICOPE-CARE is to evaluate and follow about 200,000 older adults by 2025.

WHO defines the notion of healthy aging (2), not as having no pathology since diseases happen throughout life, but as being able to keep doing what we have reason to value for as long as possible. Healthy aging partly depends on the maintenance of optimal levels of intrinsic capacity during aging, intrinsic capacity being a combination of all mental

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and physical capacities. WHO has developed the Integrated Care for Older People (ICOPE) program, a function- and person-centered care pathway during aging (3); as WHO Collaborative center for frailty, clinical research and geriatric training, the Gerontopole of Toulouse University Hospital played an important role in its elaboration. This program was created based on the analysis of more than 500 major original publications and the recommendations of a committee on aging including experts from WHO and almost 50 international experts from research, care and the academic world.

The ICOPE program is a care pathway, which consists of a participative and integrated healthcare approach that takes into account the individuals' capacities, their associated pathologies, the environment, their lifestyle, but also their wishes and aspirations. Emphasis is placed on the fact that the patient must be involved in his/her care and monitoring (4). In the ICOPE program, there are 5 steps in the care of the subject: STEP 1: Screen for declines in intrinsic capacity; STEP 2: Undertake a person-centered assessment in primary care; STEP 3: Define the goal of care and develop a personalized care plan; STEP 4: Ensure a referral pathway and monitoring of the care plan with links to specialized geriatric care; STEP 5: Engage community and support caregivers (Figure 1). The focus of the ICOPE program is on three important points: 1- the patient is centrally involved in his/her care and monitoring, 2- the care plan considers the importance of caregivers and the use of local resources offered by the community; 3- a large place is given to new technologies or "digital medicine" (3,4). Indeed, information and communication technologies are crucial in the current context of medical demographic constraints, as well as the need to continuously monitor large populations.

The objective of ICOPE program is to prevent or delay the onset, and decrease the severity of care dependency. The goal is to enable as many people as possible to age in good health. To reach this objective, WHO proposes to follow the trajectory of intrinsic capacity covering six operational domains: mobility, cognition, vitality / nutrition, psychological state, vision, hearing (5, 6).

The large INSPIRE Program has two principal objectives (1). The first main objective is to build a resource and research platform for Geroscience extending from animals to humans, from cells to individuals, from research to clinical care. Although chronological age (civil age, date of birth) has always been used as the operational definition of aging, it does not necessarily reflect the biological process of aging. The second main objective of INSPIRE program is to implement in clinical care the WHO ICOPE Program. In the current paper, we describe the methods of implementation of the ICOPE program in the context of the INSPIRE initiative, the « INSPIRE ICOPE-CARE program".

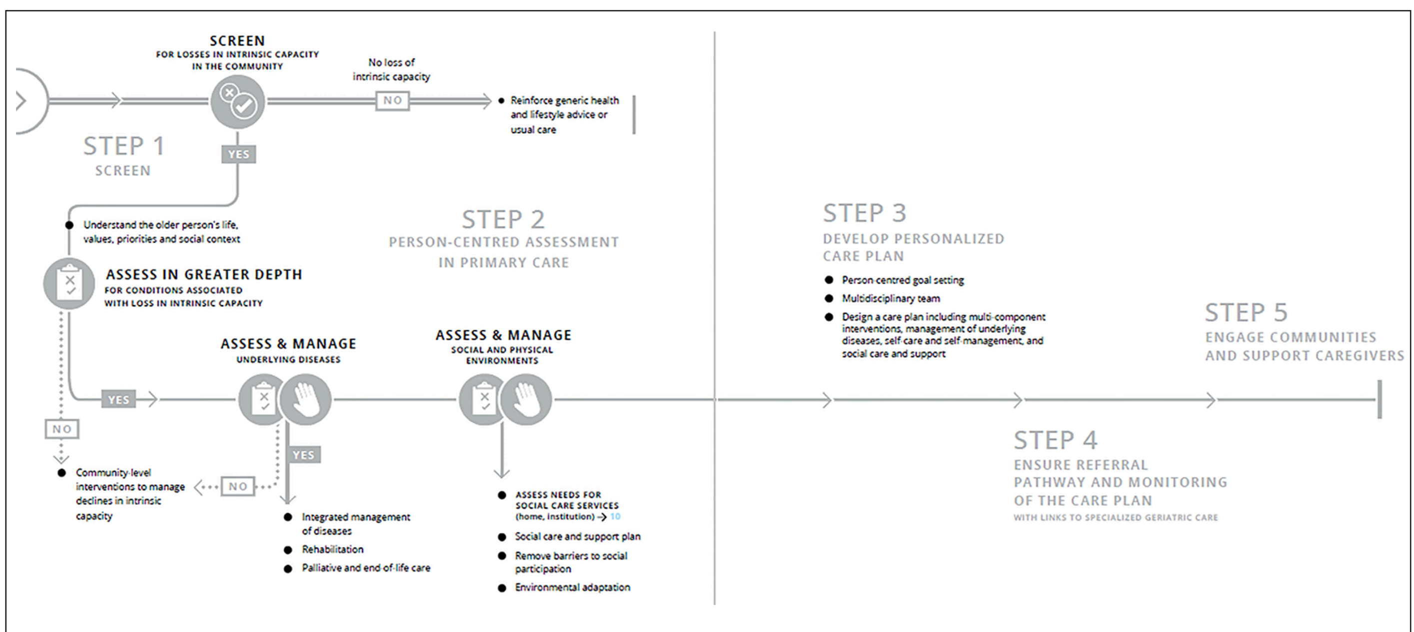
Method

Objectives of the "INSPIRE ICOPE-CARE program"

The main objective of the INSPIRE ICOPE-CARE program is to implement, at a large scale in the Occitania region, South-Western France, the WHO ICOPE program in a daily clinical routine. Secondary objectives are to explore the acceptability of the INSPIRE ICOPE-CARE program by both older adults and health care professionals, as well as to examine the use of new digital tools in the evaluation and monitoring of intrinsic capacity.

Figure 1

5 Steps of WHO ICOPE program



Population

The target population in the INSPIRE ICOPE-CARE program is independent seniors aged 60 years and over in Occitania region, in France. The actors are healthcare professionals, trained professionals, but also caregivers and seniors themselves. Indeed, the STEP 1 tool may be used by any person who has undergone a training course on ICOPE. To follow this population, the six domains of intrinsic capacity are systematically monitored with pre-established tools (STEP 1, and then if appropriate STEP 2, STEP 3, STEP 4, STEP 5). This allows the health professionals to intervene quickly if a decline occurs in any domain.

STEP 1 – Screen for declines in intrinsic capacity

The first tool proposed by WHO to evaluate intrinsic capacity is a screening tool referred to as ICOPE STEP 1. It is very simple, and usable by actors who are not necessarily health professionals after a brief training course (Figure 2). It allows a rapid assessment of the six operational domains of intrinsic capacity by very simple tests. In the INSPIRE ICOPE-CARE program, this tool has been adapted by the Toulouse Gerontopole to become a tool capable of monitoring intrinsic capacity over time. Then, the adapted ICOPE STEP 1 was elaborated in digital format to make it possible to undertake remote monitoring in a large-scale.

Figure 2

WHO STEP 1 screening tool (from WHO with permission)

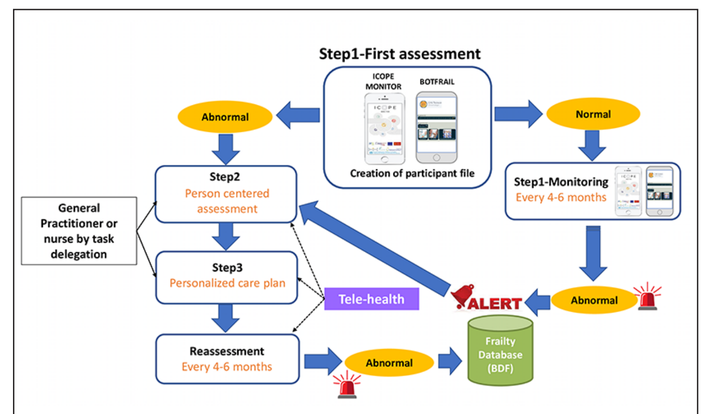
Priority conditions associated with declines in intrinsic capacity	Tests	Assess fully if any answer in each domain triggers this
COGNITIVE DECLINE (Chapter 4)	1. Remember three words: flower, door, rice (for example)	
	2. Orientation in time and space: What is the full date today? Where are you now (home, clinic, etc)?	Wrong to either question or does not know
	3. Recalls the three words?	Cannot recall all three words
LIMITED MOBILITY (Chapter 5)	Chair rise test: Rise from chair five times without using arms. Did the person complete five chair rises within 14 seconds?	No
MALNUTRITION (Chapter 6)	1. Weight loss: Have you unintentionally lost more than 3 kg over the last three months?	Yes
	2. Appetite loss: Have you experienced loss of appetite?	Yes
VISUAL IMPAIRMENT (Chapter 7)	Do you have any problems with your eyes: difficulties in seeing far, reading, eye diseases or currently under medical treatment (e.g. diabetes, high blood pressure)?	Yes
HEARING LOSS (Chapter 8)	Hears whispers (whisper test) *or* Screening audiometry result is 35 dB or less *or* Passes automated app-based digits-in-noise test	Fail
DEPRESSIVE SYMPTOMS (Chapter 9)	Over the past two weeks, have you been bothered by – feeling down, depressed or hopeless?	Yes
	– little interest or pleasure in doing things?	Yes

The mobile phone is the technology that has spread best among the older population and is therefore an ideal support to remotely screen or monitor health indicators (7). Thus, two tools were developed by the Toulouse Gerontopole: a) the ICOPE MONITOR, an application, which is an adapted version of the ICOPE WHO application, accessible via smartphone or tablet; and b) the BOTFRAIL, an internet conversational robot, accessible via computer, smartphone or tablet. These two complementary tools can be used in two modes: professional mode and self-assessment mode for the senior or his/her caregiver. Both are connected to the pre-existing Gerontopole frailty database created in 2016 to collect medical and socio-demographic data from frail older people who received a face to face standardized gerontological assessment in the Occitania region. Data from more than 6,000 patients in 180 different health centers have already been collected since 2017. The database complies with all French and European regulations in terms of health data security. The authorization of the French "National Commission for Data Protection" was granted on April 13, 2017 (Ref. Nb. MMS/OSS/NDT171027, authorization request Nb. 19141154).

These tools may be used by everyone. However, in the context of the INSPIRE ICOPE-CARE program, during the first (face to face) STEP 1 screening, the professional collects the senior's oral consent to keep his/her data in the frailty database as well as to monitor his/her intrinsic capacity regularly. If the assessment is normal, lifestyle advice is provided by the professional who also trains the senior or his family/caregiver to use the tools in «self-assessment» mode.

Figure 3

Diagram of the INSPIRE ICOPE-CARE program



<u>Remote screening of STEP 1 – ongoing monitoring</u>

The ongoing screening of intrinsic capacity deficits is based on a remote monitoring system. After having been taught by health professionals how to use the ICOPE MONITOR app and/or BOTFRAIL tool, seniors are invited to continuously use the STEP 1 every 4-6 months. If the senior cannot carry out the self-assessment, a professional will intervene every 6 months to perform the STEP 1 follow-up. STEP 1 data collected using the ICOPE MONITOR application or BOTFRAIL every 4 to 6 months are transmitted to the Gerontopole frailty database. If a deterioration in one or more domains of intrinsic capacity is identified during monitoring, an alert is generated by an algorithm. During the first deployment phase of the project, the management and processing of these alerts is carried out by the experienced nurses of the Gerontopole in collaboration with the primary care providers [General Practitioners (GP) and nurses].

Table 1
Tele-health supports and INSPIRE ICOPE-CARE program

	STEP 1	STEP 2 / STEP 3	STEP 4
Face to face	First assessment / Health professional	Assessment by the nurse/GP if STEP 1 is abnormal or if an alert is generated during follow-up	-
Remote monitoring and support, dashboard (alerts)	Time repetition of STEP 1 every 4-6 months / self-assessment	-	a. Time repetition of STEP 1 every 4-6 months / self-assessment b. Strengthening adherence to the care plan / nurse c. Care coordination / nurse
Tele-consultation (Nurse, GP, G)	-	Assessment by the nurse/GP if STEP 1 is abnormal or if an alert is generated during follow-up	a. Time repetition of STEP 1 every 4-6 months / nurse support b. Teleconsultation with the reference center (e.g. geriatrician, psychiatrist, nutritionist)
Tele-expertise	-	A concertation meeting is organized: nurse / GP, GP / G, «outside the walls» team / GP.	Remote support from the reference center: specialized unit / GP, specialized unit / nurse.

Note. The follow-up is always digital (self-assessment / caregiver or nurse support). Depending on the geographical context and health resources, STEP 2 can be performed face-to-face or through telemedicine tools. The actors involved are also context-dependent; Note: Tele -consultation is a tele-health consultation between a doctor/nurse and the senior. Tele expertise is between two health professionals; General Practitioner, GP, geriatricians, G.

When an alert is detected, the senior or family (as appropriate) will be contacted to verify the clinical relevance of the intrinsic capacity deficit. If the deficit is confirmed, the GP will be contacted to initiate STEP 2. This first phase makes it possible to evaluate the relevance of the alerts, adjust the algorithm and develop decision trees (Figure 3 & Table 1).

STEP 2 and STEP 3 – Undertake a person-centered assessment in primary care, define the goal of care and develop a personalized care plan

If the screening of intrinsic capacity is abnormal, STEP 2 (person-centered assessment) and STEP 3 (personalized care plan) are carried out by the GP or, if possible, by a nurse trained in geriatrics using the delegation of task as part of the "French protocol of cooperation" or the «Hospital outside the walls» care unit, as described below:

- The cooperation protocol was developed by the Gerontopole of Toulouse and the Occitania Regional Health Agency (ARS) and obtained the approval from the High Authority for Health (HAS) on December 4, 2013 (8, 9). It aims to delegate to a self-employed trained nurse (40 hours of training), the geriatric assessment of older people identified as frail. At the end of this assessment, the nurse, can immediately refer the person to the GP (in the case of warning signs or unexplained or multiple anomalies), to social services, appropriate health professionals (specialist physicians, physiotherapists,…) or themselves initiate preventive measures. The delegated nurse intervenes at the request of the GP after obtaining the consent of the patient. The nurse's evaluations and proposed interventions are re-analyzed and discussed during a multi-professional concertation meeting with patient's GP, organized no later than 30 days following the geriatric assessment. This model of care is funded by local health authorities. To date, more than 160 nurses have been trained in the Occitania region.

- The «Hospital outside the walls» care unit of Gerontopole is an innovative unit of care created in 2015 at the Toulouse University Hospital to take care of frail older people outside the hospital. The geriatric evaluation of the older people is carried out by experienced trained nurses of the Gerontopole at their homes or in public spaces close to their homes. These nurses, with the support of a hospital geriatrician, propose a personalized care plan to the older people evaluated. This plan is then sent to the person's GP who ensures its implementation and follow-up. This model has been rolled out in other hospital centers in the Occitania region. To date seven hospitals in the region have their own «Hospital outside the walls» care unit.

STEP 4 - Ensure a referral pathway and monitoring of the care plan with links to specialized geriatric care

As mentioned above, monitoring consists of the repetition every 4-6 months of STEP 1, either by self-assessment or with the help of a family member or professional caregiver. Digital medicine used in the INSPIRE ICOPE-CARE program makes it possible to simultaneously monitor large populations regardless of where they live and the extent of local medical resources and can also ensure the implementation and follow up of the personalized care plan proposed in STEP 3. Thus, digital medicine allows to focus the action of the health professionals on those who need and when they

need (efficient use of resources and personalized medicine) using a dashboard and by the generation of automatized and graduated alerts (the algorithm will evolve over time). When a coordination meeting is necessary between the GP and other health professionals especially nurses who realized STEP2 and STEP3, tele-health consultations may be used (called tele-expertise). To make it possible, we are deploying the use of a tele-health platform to facilitate access to this expertise throughout the region regardless of location. In the context of "complexes cases", the GP may request a tele-consultation or tele-expertise with geriatricians and other physicians (e.g. psychiatrists) in the reference center. In these situations all the Gerontopole's paramedical resources: physiotherapists, nutritionists, neuropsychologists and social workers may be involved, as well.

Lastly, digital remote monitoring tools are an excellent support for assessing adherence to the care plan, coordinate care, but also for providing information or educational content (nutrition, physical activity) to seniors.

STEP 5 - Engage community and support caregivers

This stage allows the establishment of an ecosystem favorable to «healthy aging». At this step, town halls, departments, and regions as well as several organizations (Departmental Councils, pension funds, insurances,…) can set up efficient organizations to encourage and promote «healthy aging». The INSPIRE ICOPE-CARE program is part of this step and plays an important role in bringing together different actors and organizations around the same objective which is the adaptation of our society to aging well.

Implementation of concrete actions in the Occitania region

The operational implementation of the INSPIRE ICOPE-CARE program in Occitania will be promoted by the network of Territorial Teams of Aging and Prevention of Dependency (ETVPD) which have more than 2,200 members composed of professionals in the medical, medico-social and social sectors. This Network was created in 2012 by the Gerontopole of Toulouse with the support of the Occitania Regional Health Agency (ARS). The objective of this network is to prevent dependency among seniors in Occitania by promoting care, training, research and innovation in gerontology. Several meetings take place every year in different territories in Occitania allowing to exchange with the actors of the field and to advance on innovative projects. The INSPIRE ICOPE-CARE program is currently the main project on which the territorial teams are working.

A number of targeted actions have started to facilitate the use of STEP 1 by healthcare professionals or different institutions:

Physicians: The GP has the principal role for the implementation of the intervention plan proposed to the senior in the INSPIRE ICOPE-CARE program. His/her adherence to the program is essential. We are currently working with the regional union of physicians and the University Department of General Medicine (DUMG) to establish a follow-up strategy adapted to the GP's work.

Nurses: In the INSPIRE ICOPE-CARE program, the nurse, in connection with the GP, will coordinate the implementation of intervention plans. First, we started the implementation of the INSPIRE ICOPE-CARE program with our experienced nurses of the Gerontopole who work at the «Hospital outside the walls» care unit of Toulouse University Hospital. Since January 2019, these nurses have used the STEP 1 tool for all their patients; to date (March 2020), around 950 seniors have been assessed. Some preliminary data on step 1 in 755 subjects showed that mean age was 80.9 ± 7.3 years, 67.3% were female (n=298) and 699 (92.6%) had at least one domain of intrinsic capacity affected. Table 2 shows the results of the STEP 1 evaluations.

The nurses especially those trained on frailty assessment in the framework of cooperation protocol (more than 160 nurses) are also involved. Since January 2020, the Gerontopole has organized several training courses on the use of STEP 1 and ICOPE. To date, 94 nurses have been trained and 240 are registered for the next sessions. An agreement was signed between the Toulouse University Hospital and the Occitania Regional Health Agency to pay nurses 15 euros for this evaluation.

Table 2

STEP 1 analysis performed on the first 755 subjects evaluated

Characteristics	**Mean ± SD or n (%)**
Age (years); n=442	80.9 ± 7.3
Gender (female); n=443	298 (67.3)
Mobility (chair rise test)	
Test not feasible; n=740	96 (13.0)
Time to do 5chair rises (seconds); n=644	13.6 ± 5.4
Abnormality in mobility domain; n=749	333 (44.5)
Cognition (3 words recall and orientation)	
Abnormality in cognition domain; n=746	362 (51.7)
Psychology (depression symptoms)	
Abnormality in psychology domain; n=743	250 (33.6)
Vision (eye problems)	
Abnormality in vision domain; n=737	430 (58.3)
Hearing (whisper test)	
Abnormality in hearing domain; n=747	313 (41.9)
Vitality/nutrition (weight or appetite loss)	
Abnormality in nutrition domain; n=741	124 (16.7)

Pharmacists: In collaboration with the regional union of pharmacists and the pharmacy unit of Toulouse University Hospital, volunteer pharmacists and 6th year pharmacy students are also trained on the ICOPE program. To date (March 2020),

65 pharmacists have been trained and approximately 80 are registered for the next training sessions. The STEP 1 will be performed in the pharmacies by the pharmacists and in the event of an abnormal STEP 1, the pharmacist will direct the patient to his/her GP.

Institutions: A partnership is set up with CEDIP (CEntre D'Information et de Prévention - Agirc-Arrco), which is a complementary pension fund in France, to carry out STEP 1 for their beneficiaries. To date (March 2020), more than 300 seniors have been assessed. An analysis made on 207 subjects with usable data showed that mean age was 70.1 years, 61.8% were female (n=128) and 86.5% (n=179) had at least one domain of intrinsic capacity affected. The domain most affected was vision (64.7%) followed by hearing (60.9%) and cognition (41.5%).

A collaboration is developed with French National old age insurance fund (CNAV) to implement STEP 1 within the usual professional practices of home caregivers and create an innovative and specific prevention offer for young precarious retirees (62-70 years old).

Departmental Council of Haute Garonne is a partner of the Gerontopole of Toulouse. Their assessors are planned to be trained in June 2020 to carry out STEP 1 for all independent seniors who request them for a personalized autonomy allowance.

Several other actions are planned. A project is being developed with the French Mutual Insurance, which brings together the majority of existing mutual health insurance companies in France, to disseminate information about this program to primary healthcare providers. The Federation of Health Homes of Occitania (FORMS) was contacted to set up the INSPIRE ICOPE-CARE program in Health Homes. We are also collaborating with the Post Office, to set up an experiment in three cities in the Toulouse agglomeration in order to carry out STEP 1 by trained postmen from the Post Office. The experiment is due to start in September 2020. We are also working with spas, which receive a large number of seniors each year.

INSPIRE ICOPE-CARE program: perspectives and future challenges for the care of individuals during aging

It is always difficult to change habits and implement new care pathways in clinical practice. The INSPIRE ICOPE-CARE program plans to screen and monitor the intrinsic capacity of 200,000 older people in Occitania region within five years and promote preventive actions, instead of only punctual, curative ones. WHO with ICOPE program is determined to reduce the number of older people worldwide who are care dependent by 15 million by 2025, which would mean 150,000 in France and 15,000 in Occitania (10).

The INSPIRE ICOPE-CARE program is in full agreement with the national project of "Ma santé 2022" (My Health 2022) (11), in which the French Ministry of Health highlights the following aspects: to organize healthcare around the older people and give them a qualified and relevant care, be more active in prevention in order to promote home maintenance and develop a better organization of care between healthcare providers with the support of digital medicine. In order to achieve these objectives, the nurses' role has to be redefined, giving them a stronger place in the assessment and the coordination of the patient's healthcare pathway. Another change has to take place in communication and organization between hospital and primary healthcare providers, especially GPs. To establish this new organization, the INSPIRE ICOPE-CARE program supports "Ma Santé 2022" by joining the projects of several Professional regional health communities (CPTS) in the Occitania region. The CPTS are a new mode of organization that allows health professionals to come together in the same territory around a common medical and medico-social project. Moreover, The French Presidential Plan Grand Age aims to largely implement the WHO ICOPE program in France following the experience of the INSPIRE ICOPE-CARE program in Occitania.

This initiative draws significantly on numeric tools, e-health and digital medicine to facilitate communication and coordination between professionals and seniors (12, 13), it plays an important role in the future of geriatrics (14-17). The INSPIRE ICOPE-CARE program will also allow us to implement in clinical practice the discoveries of INSPIRE platform concerning clinical and biological biomarkers (18-22).

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Ethical standards: The INSPIRE protocol has been approved by the French Ethical Committee located in Rennes (CPP Ouest V) in October 2019. This research has been registered on the site http://clinicaltrials.gov (ID NCT04224038). In the INSPIRE ICOPE-CARE program, all the senior's data are collected in the Gerontopole Frailty database. This database complies with all French and European regulations in terms of health data security. The authorization of the French "National Commission for Data Protection" was granted on April 13, 2017 (Ref. Nb. MMS/OSS/NDT171027, authorization request Nb. 19141154). During the first (face to face) STEP 1 screening, the professional collects the

senior's oral consent to keep his/her data in the frailty database as well as to monitor his/her intrinsic capacity regularly.

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