



## SPINE20 recommendations 2022: spine care—working together to recover stronger

Bambang Darwono<sup>1</sup> · Koji Tamai<sup>2</sup> · Pierre Côté<sup>3</sup> · Sami Aleissa<sup>4</sup> · Agus Hadian Rahim<sup>5</sup> · Paulo Pereira<sup>6</sup> · Hana Alsobayel<sup>7</sup> · Harvinder S. Chhabra<sup>8</sup> · Giuseppe Costanzo<sup>9</sup> · Manabu Ito<sup>10</sup> · Frank Kandziora<sup>11</sup> · Donna Lahey<sup>12</sup> · Cristiano M. Menezes<sup>13</sup> · Sohail Bajammal<sup>14</sup> · William J. Sullivan<sup>15</sup> · Peter Vajkoczy<sup>16</sup> · Alaa Ahmad<sup>17</sup> · Markus Arand<sup>18</sup> · Saiful Asmiragani<sup>19</sup> · Thomas R. Blattert<sup>20</sup> · Jamiu Busari<sup>21</sup> · Edward J. Dohring<sup>12</sup> · Bernardo Misaggi<sup>22</sup> · Eric J. Muehlbauer<sup>23</sup> · Raghava D. Mulukutla<sup>24</sup> · Everard Munting<sup>25</sup> · Michael Piccirillo<sup>23</sup> · Carlo Ruosi<sup>26</sup> · Ahmed Alturkistany<sup>27</sup> · Marco Campello<sup>28</sup> · Patrick C. Hsieh<sup>29</sup> · Marco G. A. Teli<sup>30</sup> · Jeffrey C. Wang<sup>29</sup> · Margareta Nordin<sup>31</sup>

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### Abstract

**Purpose** Globally, spine disorders are the leading cause of disability, affecting more than half a billion individuals. However, less than 50% of G20 countries specifically identify spine health within their public policy priorities. Therefore, it is crucial to raise awareness among policy makers of the disabling effect of spine disorders and their impact on the economic welfare of G20 nations. In 2019, SPINE20 was established as the leading advocacy group to bring global attention to spine disorders.

**Methods** Recommendations were developed through two Delphi methods with international and multi-professional panels.

**Results** In 2022, seven recommendations were delivered to the leaders of G20 countries, urging them to: Develop action plans to provide universal access to evidence-based spine care that incorporates the needs of minorities and vulnerable populations. Invest in the development of sustainable human resource capacity, through multisectoral and inter-professional competency-based education and training to promote evidence-based approaches to spine care, and to build an appropriate healthcare working environment that optimizes the delivery of safe health services. Develop policies using the best available evidence to properly manage spine disorders and to prolong functional healthy life expectancy in the era of an aging population. Create a competent workforce and improve the healthcare infrastructure/facilities including equipment to provide evidence-based inter-professional rehabilitation services to patients with spinal cord injury throughout their continuum of care. Build collaborative and innovative translational research capacity within national, regional, and global healthcare systems for state-of-the-art and cost-effective spine care across the healthcare continuum ensuring equality, diversity, and inclusion of all stakeholders. Develop international consensus statements on patient outcomes and how they can be used to define and develop pathways for value-based care. Recognize that intervening on determinants of health including physical activity, nutrition, physical and psychosocial workplace environment, and smoking-free lifestyle can reduce the burden of spine disabilities and improve the health status and wellness of the population.

At the third SPINE20 summit 2022 which took place in Bali, Indonesia, in August 2022, 17 associations endorsed its recommendations.

**Conclusion** SPINE20 advocacy efforts focus on developing public policy recommendations to improve the health, welfare, and wellness of all who suffer from spinal pain and disability. We propose that focusing on facilitating access to systems that prioritize value-based care delivered by a competent healthcare workforce will reduce disability and improve the productivity of the G20 nations.

**Keywords** SPINE20 · Value-based care · Rehabilitation · Capacity building · Wellness

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✉ Koji Tamai  
koji.tamai.707@gmail.com

Extended author information available on the last page of the article

## Introduction

Changes in global demographics and lifestyle behaviors have led to a rapid increase in people experiencing disability due to non-communicable diseases (NCDs) [1–3]. NCDs are major and urgent threats to human health globally that disproportionately burden older individuals and those in low- and middle-income countries [4]. The impacts of NCDs are far-reaching and associated with health consequences such as premature death, reduced functional ability, and impaired quality of life. Additionally, NCDs lead to social and economic ills that impact the welfare of our populations and increase the propensity for poverty [5]. Multiple barriers limit progress in addressing the burden of NCDs. Reasons include political prioritization, lack of evidence-based public policies, commercial forces, conflict of interest, inadequate technical and operational capacity, inadequate healthcare workforce, insufficient financing, inadequate action to address the social determinants of health, and lack of accountability.

Musculoskeletal disorders (MSD) are the leading cause of disability within NCDs; 1.71 billion people across the globe are affected, representing 149 million years lived with disability [3]. Among all MSD, spine ailments are the leading cause of disability, with more than half a billion individuals worldwide experiencing disability due to low back pain and neck pain [1]. Back and neck pain is associated with more disability than myocardial infarction, neoplasms, dementia, or stroke [3].

Therefore, it is urgent to raise awareness among policymakers of the disabling effect of global spine disorders and its impact on the economy of the G20 nations. Of the 44 health policies submitted by the Organization for Economic Co-operation and Development (OECD) member states to the World Health Organization (WHO) NCD Capacity Survey, most countries had health policies that focused on cancer, cardiovascular disease, diabetes, and respiratory conditions [6]. Meanwhile, MSDs were not prominently featured, with only 50% of countries identifying musculoskeletal health as within the scope of the included policies [6]. An international resolution on the standardized management of spinal disorders, from prevention to primary care and rehabilitation, may have a positive impact on economies through a reduction of direct and indirect costs.

To improve this situation, in 2019, four major spine care and non-governmental professional organizations (EURO-SPINE, the North American Spine Society, the German Spine Society, and the Saudi Spine Society) formed SPINE20, an advocacy group to bring global attention to spine disorders. In August 2022, 17 professional societies agreed to participate in SPINE20 (Table 1). The main goal

**Table 1** Societies participating in SPINE20 (August 2022)

Society	Nations
Asociación Mexicana de Cirujanos de Columna	Mexico
Association of Spine Surgeons of India	India
Australian Physiotherapy Association	Australia
Brazilian Spine Society	Brazil
EUROSPINE	International
German Spine Society	Germany
Hellenic spine society	Greece
Indonesia Spine Society	Indonesia
Italian Spine Society (SICV&GIS)	Italy
Japanese Society for Spine Surgery and Related Research	Japan
North America Spine Society	United States
Saudi Association of Neurological Surgery	Saudi Arabia
Saudi Spine Society	Saudi Arabia
Sociedad Iberoamericana de Columna (SILACO)	International
Society of Spine Surgeons of Pakistan	Pakistan
World Federation of Chiropractic	International
World Spine Care	International

of SPINE20 is to develop evidence-based policy recommendations for the G20 governments to reduce the burden of spine disorders, disability, and injuries. [7, 8] The recommendations are intended to benefit individuals with spine disorders, benefiting the community and, ultimately, the country. Countries have different abilities to implement recommendations depending on their geographical location and wealth. Therefore, our recommendations must be adapted to the cultural environment, produce a positive economic impact, and evolve gradually.

## Method to make recommendations 2022

### Taskforce membership

SPINE20 Scientific taskforce members and Recommendation and Publication taskforce members developed the recommendations. Both taskforces involved multi-professional panels, including surgeons, physical medicine and rehabilitation physicians, researchers, epidemiologists, physical therapists, primary care physicians, education professionals, and management professionals.

### Domains of focus

The SPINE20 recommendations identified 12 priority domains and 15 subdomains related to spine disorders. Domains were designed to include broad topics, and

subdomains were intended to focus on specific topics. All domains were identified between 17 and 31 December 2021 by the SPINE20 scientific task force, which includes 32 international and multidisciplinary members (Appendix 1).

### Selection of domains

An online Delphi consensus meeting was held on January 13, 2022, to select the domains of focus. [9, 10] Two facilitators (KT from Japan and MN from France) managed the meeting, and 21 scientific taskforce members participated in the consensus process. The Delphi method selected six domains from 12 proposed domains using an online voting program (Forms, Microsoft, Redmond, WA). For voting, participants were asked to score each proposed domain from a minimum of 1–10. In the subsequent rounds of voting, participants were asked to either agree or disagree with a specific domain. Agreement  $\geq 75\%$  was defined as consensus, and the first six domains that reached the consensus were selected. As a result, a total of 8 votes were conducted. The main domains of the SPINE20 2022 recommendations selected through this process are “Access to care” (85.7% agreement in 2nd vote), “Value-based care” (81.0% agreement in 2nd vote), “Rehabilitation” (84.2% in 5th vote), “Research” (76.2% agreement in 6th vote), “Future of spine care” (88.2% agreement in 8th vote), and “Capacity building” (82.5% agreement in 8th vote). Each year, SPINE20 adopts one additional domain proposed by the host country of the SPINE20 summit. This year, the Indonesia Spine Society proposed a domain focused on “Wellness.”

### Development of recommendations

Two authors were assigned by the SPINE20 scientific task force to draft the recommendations. Authors were allowed to select one subdomain from the list. In 2022, the recommendations were prepared by:

- Access to care: PP from Portugal and HC from India,
- Value-based care: DL from US and FK from Germany,
- Rehabilitation: WS from US and PC from Canada,
- Research: PV from Germany and HA from Saudi Arabia,
- Future of spine care: MI from Japan and CM from Brazil,
- Capacity building: SB from Saudi Arabia and AHR from Indonesia,
- Wellness: BD from Indonesia and GC from Italy.

Each pair of writers submitted 3–4 candidate recommendations for their domain. The candidate recommendations were discussed and refined at the Scientific Task Force through weekly online meetings from February 24 to May 12.

### Selection of recommendations

An online consensus meeting was held on May 19, 2022, using the real-time Delphi method to select the recommendations. Two facilitators (KT from Japan and MN from France) managed the meeting, and 37 international multidisciplinary experts participated. Recommendations were selected using an online voting software (Forms, Microsoft, Redmond, WA). A week before the Delphi consensus meeting, participants scored each candidate recommendation from a minimum of 1 to a maximum of 10 to provide an initial prioritization by the group. An average score of 8/10 was considered the anchor of the first scoring. Recommendations that reached a level of agreement  $\geq 75\%$  were kept and advanced to the next round of voting, with a maximum of five rounds per recommendation. Recommendations that did not reach the 75% level of agreement after five rounds were rejected. All potential recommendation statements, and the voting results are shown in Appendices 2 and 3.

### Finalization of recommendations

Proposed recommendation statements and rationales were published on the SPINE20 website (<https://spine20.org>) 14 days before the SPINE20 summit in 2022. In addition, we solicited public comments via a dedicated website. If comments were deemed relevant by the Publication and Recommendation taskforce, we amended the recommendations accordingly. Finally, the recommendations were discussed at the SPINE20 summit 2022 on August 5, 2022, allowing all summit participants to debate the recommendations and suggest modifications. As a result, all recommendation statements obtained conditional approvals from summit participants with 31 comments. Finally, after being carefully reviewed by Recommendation and Publication taskforce members based on the comments, the final recommendations were published (Fig. 1).

## Recommendations and rationale from SPINE20 2022 summit

### Access to care | diversity

**SPINE20 calls upon G20 countries to develop action plans to provide universal access to spine care that incorporates the needs of minorities and vulnerable populations.**

### Background

Access to care relates to the timely use of health services to achieve the best health outcomes [11]. Globally, individuals

# SPINE20 Proposed Recommendations to G20 Indonesia, 2022

## RECOMMENDATIONS

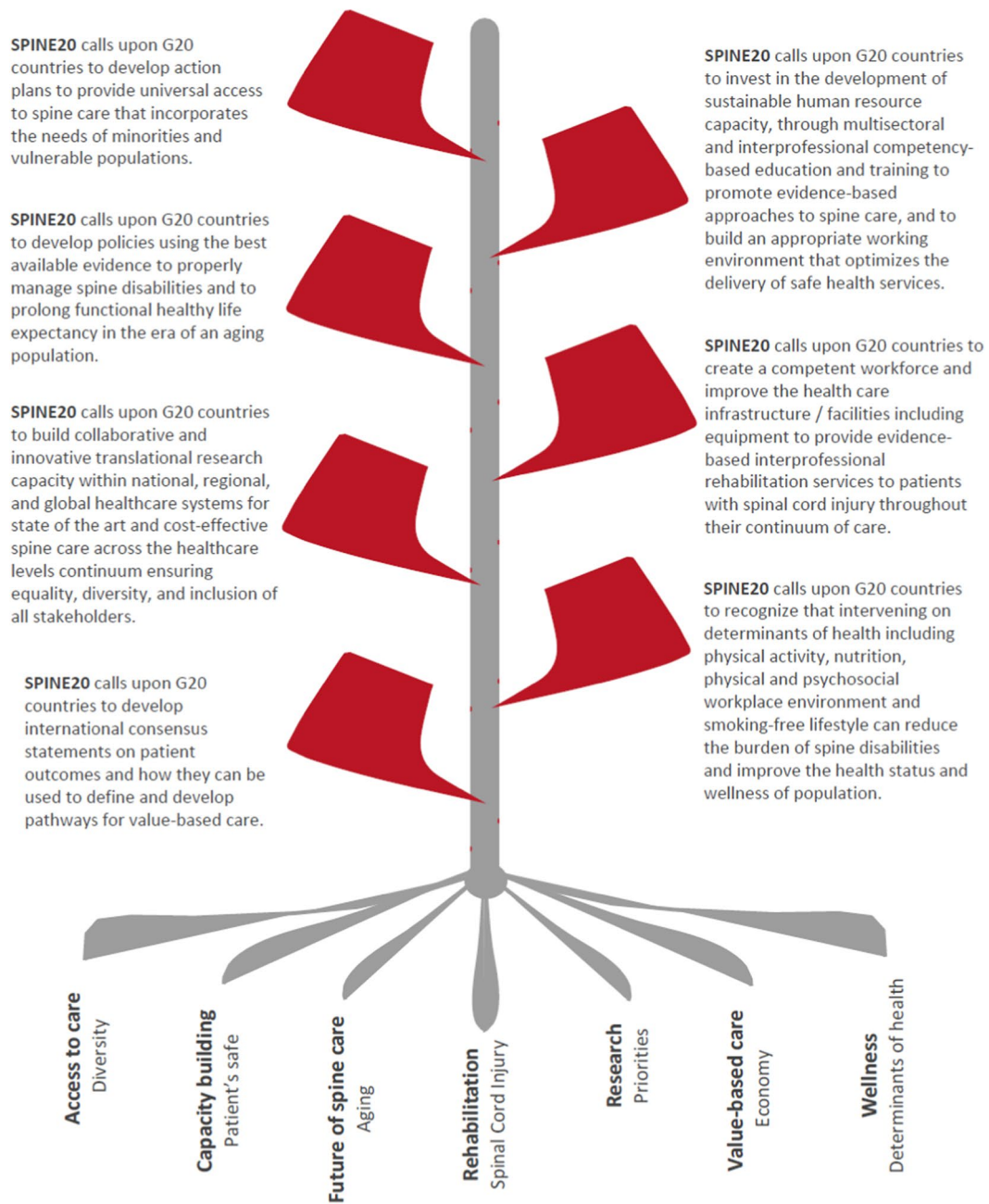


Fig. 1 SPINE20 recommendations to G20 countries, 2021

of lower socioeconomic status, women, visible minorities, people with disabilities, and other vulnerable populations are significantly disadvantaged by limited access to care and suboptimal health outcomes [12]. This is mainly due to the multiple challenges related to achieving equity [12]. Diverse healthcare systems exist around the globe, and several are equipped to benefit patients while managing significant financial constraints [13]. It is, therefore, imperative that all healthcare systems aim to provide the best services to patients to improve their health status and well-being.

### Problem

Despite significant healthcare investments and research, many people with spinal disorders around the globe are unable to access evidence-based care [12, 14, 15]. Diversities and disparities among the population, including those related to ethnicity, religious and cultural backgrounds and beliefs, and socioeconomic status, contribute to this problem. A custom-tailored approach is hence imperative.

### Potential solutions

G20 needs to promote interdisciplinary care through awareness, education and policies to reinforce the different healthcare professionals to commit to improve equitability, access to cost-effective spine care [15]. Assessment of the particularities of the population is of utmost importance to identify the best healthcare systems for their needs [16]. Promotion of education of both population and politics may valuably determine positive effects in a middle-to-long-term project. A tailored approach should be implemented, keeping in mind the availability of resources, religious beliefs, and ethnic sentiments.

### Capacity building | patient safety

**SPINE20 calls upon G20 countries to invest in the development of sustainable human resource capacity, through multisectoral and inter-professional competency-based education and training to promote evidence-based approaches to spine care, and to build an appropriate healthcare environment that optimizes the delivery of safe health services [17].**

### Background

Patient safety continues to be a global concern. Unsafe care results in over three million deaths each year globally [18]. It is estimated that one in ten patients is subject to an adverse event while receiving hospital care in high-income countries, while as many as 4 in 100 people die from unsafe care in the developing world [18]. Furthermore, unsafe care leads

to increased strain on health system finances and a loss of trust in health systems [18, 19]. Due to these alarming statistics, the World Health Assembly passed the WHA72.6 resolution on “Global action on patient safety” in 2019 [17].

### Problem

Despite the patient safety improvement efforts, including capacity building, patient harm due to adverse events is likely among the ten leading causes of death and disability worldwide [20].

### Potential solutions

Given the multidisciplinary nature of SPINE20, it is well positioned to play a major role in promoting interdisciplinary patient safety capacity building by endorsing the WHO Global Patient Safety Action Plan 2021–2030, specifically strategic objective number 5, which states, “Inspire, educate, skill and protect every health worker to contribute to the design and delivery of safe care systems” [21]. Capacity building is one of the strategic objectives to achieve this goal. SPINE20 endorses the detailed actions under each strategy assigned to governments, healthcare facilities and services, stakeholders, and the WHO secretariat (WHO Global Patient Safety Action Plan 2021–2030, pp. 48–35) [21].

### Future of spine care | aging

**SPINE20 calls upon G20 countries to develop policies using the best available evidence to properly manage spine disorders and to prolong functional healthy life expectancy in the era of an aging population.**

### Background

The world is rapidly aging. This trend is advancing at an unprecedented pace and will accelerate in the coming several decades, particularly in developing countries. In 2050, 80% of aged people will be living in low- and middle-income countries [22]. With prolonged life expectancy in many countries, whether the additional years of life are spent in good or poor health has become of significant social importance due to its potential policy implications, such as healthcare provisions and extending retirement ages [23]. Spinal disability (neck pain and back pain) is one of the five leading disorders associated with an increase in disability-adjusted life-years (DALYs) among the elderly in 369 diseases and injuries [23].

## Problem

If an increase in healthy life expectancy (HALE) has been halted despite prolonged life expectancy, people will suffer for more years from poor health due to disabilities related to spinal disorders [1].

## Potential solutions

It is essential to recognize that spinal disorders are the most common source of disability in the elderly population and to develop policies using the best available evidence to manage spine disabilities properly and to reduce DALY's caused by spinal disorders in our aging population. Some G20 countries, such as Japan, started implementing these medical strategies for spinal disorders into their policy to promote extending DALY under a sustainable healthcare system [24]. With awareness of global aging trends, all G20 countries and other developing countries should recognize the impact of age-related spinal ailments on healthy life expectancy to maintain a sustainable healthcare system and take immediate medical or social actions to alleviate the unnecessary suffering of vulnerable populations.

## Rehabilitation | spinal cord injury

**SPINE20 calls upon G20 countries to create a competent workforce and improve the healthcare infrastructure/facilities including equipment to provide evidence-based inter-professional rehabilitation services to patients with spinal cord injury throughout their continuum of care.**

### Background

Spinal cord injury (SCI) is a significant cause of disability. Although the incidence and causes vary globally, SCI puts a critical burden on healthcare systems and the economic welfare of individuals, families, and society [25]. However, many people who would benefit from rehabilitation for SCI do not have access to services because they are not available, not affordable, or because of absence or limited access to qualified healthcare providers and facilities [26]. In many countries, including G20 nations, the rehabilitation workforce is too small or not adequately trained to meet the population's needs.

### Problem

The global burden of disability related to SCI continues to grow despite prevention efforts. One reason is that timely access to high-quality, value-based rehabilitation is limited in most countries, including G20 nations.

## Potential solutions

The health, well-being, and productivity of the population with SCI will benefit from: 1. developing a rehabilitation workforce that can deliver high-quality and value-based rehabilitation for people with SCI; 2. promoting the delivery of high-quality and value-based rehabilitation for people with SCI; and 3. facilitating easy access to high-quality, value-based rehabilitation aimed at returning injured persons to a productive life. Government efforts should target the timely delivery of the surgical intervention and quality rehabilitation to these individuals to achieve population prosperity. The delivery and accessibility of rehabilitation services that are supported by high-quality evidence must be prioritized. If implemented, this recommendation will promote improvements in the population's health, well-being, and quality of life.

## Research | priorities

**SPINE20 calls upon G20 countries to build collaborative and innovative translational research capacity within national, regional, and global healthcare systems for state-of-the-art and cost-effective spine care across the healthcare continuum ensuring equality, diversity, and inclusion of all stakeholders.**

### Background

Spinal pain prevalence and disability have increased markedly over the past 25 years and will likely increase with the aging of the population [27]. Spinal disorders should be a priority for research funding, given the vast and growing global burden. Internationally, more than US \$240 billion is spent annually on health research, including spine research [28].

### Problem

Two problems are prevalent. First, compared to the big players in research activities, i.e., oncology, cardiovascular, and neurosciences, research priorities in spine science are ill-defined and less focused. Second, research in spine science lacks strategies that enhance the translation of evidence-based discoveries into patient benefit at a global level through effective implementation processes [28]. In addition, assessing the cost-effectiveness of implementing evidence-based technologies and innovations is not always conducted at the health system level [29].

## Potential solutions

Countries must adapt and/or adopt strategies for building collaborative research capacity concerning spine care. G20 countries are well-equipped to develop a generic framework that could be fine-tuned to meet specific national needs. The framework should cover the six pillars of evidence-informed policymaking, including national surveys, ad hoc studies, monitoring and evaluation, knowledge translation, health technology assessment, guideline development and adaptation, and routine data and health information systems [26]. The framework should also consider the regulatory environment, governance, organizational structures, leadership and management buy-in, systems, tools, resources and time, and attributes of individual clinicians [27]. A global effort is urgently needed to overcome the burden of spine ailments that increase healthcare systems' demands.

## Value-based care | economy

**SPINE20 calls upon G20 countries to develop international consensus statements on patient outcomes and how they can be used to define and develop pathways for value-based care.**

### Background

Value in health care is defined as health outcomes achieved (quality of care) per dollar spent to achieve those outcomes (cost of care). Around 30% of resources spent on healthcare are wasted on avoidable complications, unnecessary treatments, or administrative inefficiencies [30, 31]. Due to this, traditional healthcare models that emphasized volume of services over quality and patient health gain are now being adjusted. Reimbursement for healthcare services is shifting from reimbursing providers primarily based on the service provided to a model that links outcomes to cost, which then determines value; hence, value-based care is needed. With value-based care, patient outcomes are at the center of the healthcare process (patient centricity) [32]. The goal of value-based care is to improve patient outcomes through quality-based care while at the same time aligning and optimizing factors such as healthcare personnel, hospital resources, healthcare innovation, information technology, and administrative inefficiencies.

### Problem

Spinal disorders are a significant contributor to the global burden of disease. However, there is considerable waste and inefficiency in treating spinal disorders. Currently, outcomes are not clearly defined and treatment is often not patient-centered.

## Potential solutions

Spine disease-specific outcomes need to be clearly defined and used to develop standardized sets of pathways for value-based care. These outcomes should be relevant and patient-centered, and the outcome measuring system should be designed in partnership with physicians and healthcare providers. The data generated can then be used to develop standardized pathways for value-based care of spinal disorders. As a result, payors of care can allocate funds and resources most cost-effectively to reduce the spinal disorder contribution to the Global Burden of Disease.

## Wellness | determinants of health

**SPINE20 calls upon G20 countries to recognize that intervening on determinants of health including physical activity, nutrition, physical and psychosocial workplace environment, and smoking-free lifestyle can reduce the burden of spine disabilities and improve the health status and wellness of population.**

### Background

The WHO defines “health” as complete physical, mental, and social well-being and not merely the absence of disease or infirmity [33]. Wellness is the state or condition of being in good physical and mental “health” that plays a crucial role in human quality of life. Common spine disorders such as back pain impact the wellness of the population [3]. Back pain affects more than 80% of the population during their lifetime; the disease could negatively impact many patients’ wellness, including physical and mental aspects [34]. Additionally, back pain is the leading cause of work absenteeism in many countries, which may lead to significant social and economic loss to individuals [35, 36].

### Problem

Spine disorders are not life-threatening, which may lead to an underestimation of their burden and impact on wellness by political leaders [37].

## Potential solutions

Determinants of health are non-medical factors that influence health outcomes [38, 39]. In terms of spinal disorders, several determinants of health factors are known to impact the experience of disability. For example, physical activity, exercise, and a smoking-free lifestyle help individuals maintain optimal functioning [40–42]. Additionally, interventions targeting the physical work environment that promote

occupational standing or walking may reduce sedentary occupational time and prevent back pain disability [43]. A proper multimodal prevention strategy targeting determinants of health for patients with spinal diseases should be defined according to scientific evidence and evaluated for its ability to improve long-term health outcomes and reduce the financial burden associated with back and neck pain.

## Successes, shortcomings, and future directions

SPINE20 is the first global initiative to successfully bring together professional associations involved in the management of spine disorders. Its primary goal is to create an international advocacy body to improve the delivery and access of evidence-based care. At the third SPINE20 summit 2022 which took place in Bali, Indonesia, in August 2022, 17 associations endorsed its recommendations (Table 1). The main shortcoming of this project is the use of expert opinions to select domains and develop recommendations. However, recommendations were developed through two Delphi methods with international and multi-professional panels. Future recommendations should be based on scientific evidence collected through high-quality systematic reviews.

A future goal of SPINE20 is to broaden its multidisciplinary nature. To achieve this goal, we will submit the current list of recommendations to professional associations engaged in spine care and seek endorsement of the recommendations. The number of endorsed societies would be updated to our website (<https://spine20.org>) regularly. We are also committed to including patient advocates, policy makers, primary care providers, and rehabilitation professionals in future SPINE20 working groups. SPINE20 is committed to expanding its knowledge transfer activities and to disseminating its recommendations to G20 stakeholders via many ways, including presentation through various channels such as presenting at the World Health Summit Regional Meeting 2022 (<https://www.worldhealthsummit.org/regional-meeting/2022-italy.html>), and engaging and presenting the recommendations to Sherpa.

## Conclusions

SPINE 20 is an international coalition created to bring global attention to the burden of disability caused by spinal disorders. Our advocacy efforts focus on developing public policy recommendations to improve the health, welfare, and wellness of all who suffer from spinal pain and disability. We propose that focusing on facilitating access to systems that prioritize value-based care delivered by a competent

healthcare workforce will reduce disability and improve the productivity of the G20 nations.

## Appendix 1 Domain and subdomain proposed in SPINE20 2022

Proposed domains	Proposed subdomains
Access to care	Spine trauma
Capacity building	Psychology
Diversity	Basic science
Economy of spine care	Treatment options
Future of spine care	Aging
Implementation	Pediatric
Patient safety	Spinal cord injury
Prevention	Low back pain
Rehabilitation	Surgery
Research	Education
Spinal disability	Wellness
Value-based care	Woman's health
	Labor health
	Evidence-based care
	Other topics

## Appendix 2 All candidates of recommendation statements

Domain Subdomain	Candidate statements
Access to care Diversity	<p>A. SPINE20 recommends implementing action plans to provide universal access to spine care, coping with the challenges posed by ethnic minorities and other diverse populations.</p> <p>B. SPINE20 recommends devoting resources to education of healthcare professionals to promote consistent inter-professional spine care.</p> <p>C. SPINE20 recommends an in-depth reflection on healthcare systems to implement the model capable of guaranteeing the best spine care to the population.</p>



Domain Subdomain	Candidate statements
Value-based care Economy	<p>A. SPINE20 calls on the G20 to advocate for the international development of a standardized, accurate method by which the value of spine care can be clearly defined.</p> <p>B. SPINE20 calls on the G20 to advocate for the development of an international registry for patient data collection. This data collection will be used to define how we can best provide cost-effective, patient-centered, and outcome-based spine care uniformly across the globe.</p> <p>C. SPINE20 calls on the G20 to develop international consensus statements regarding patient care outcomes that will lead to pathways for value-based care.</p>
Rehabilitation Spinal cord injury	<p>A. Improve the infrastructure, including health-care facilities and equipment, to provide evidence-based rehabilitation services to patients with SCI</p> <p>B. Invest in rehabilitation research to develop an evidentiary basis for the managements of patients those with SCI</p> <p>C. Develop vocational training programs specific to individuals with SCI to optimize their participation in the workforce</p>
Research Priorities	<p>A. SPINE20 calls upon G20 countries to facilitate and promote regenerative medicine and translational research in relation to spinal and spinal cord ailments</p> <p>B. SPINE20 calls upon G20 countries to build capacity for evidence-based practice, knowledge translation and dissemination to advance spine care pathways across all healthcare levels (preventative care, primary care, secondary care, and tertiary care)</p> <p>C. SPINE20 calls upon G20 countries to provide funding opportunities for collaborative research between high-income and low-/middle-income countries toward advancement of spine care in those countries</p>
Future of spine care Aging	<p>A.A.A.A. SPINE20 calls upon G20 countries to recognize the increasing burden of spinal disabilities in the elderly to maintain the sustainable healthcare system in the current global aging</p> <p>B.B.B.B. SPINE20 calls upon G20 countries to recognize spinal disabilities as most prevalent but preventable by social or medical efforts to prolong healthy life expectancy for all human beings</p> <p>C.C.C.C. SPINE20 calls upon G20 countries to recognize the strength of national or international registries of spinal diseases for future planning of medical care system in each society</p>

Domain Subdomain	Candidate statements
Capacity building Patient safety	<p>A. SPINE20 calls upon G20 countries to promote safety culture by providing training to all health professionals, addressing human factors, and building leadership and management capacity and efficient multidisciplinary teams</p> <p>B. SPINE20 calls upon G20 countries to build sustainable human resource capacity, through multisectoral and inter-professional competency-based education and training to promote a multidisciplinary approach, and to build an appropriate working environment that optimizes the delivery of safe health services</p> <p>C. SPINE20 calls upon G20 countries to put in place systems for the engagement and empowerment of patients' families and communities in the delivery of safer healthcare</p> <p>D. SPINE20 calls upon G20 countries to promote safe spine care through public engagement, patient empowerment, and capacity building of healthcare teams and institutions</p>
Wellness Quality of life	<p>A. Spine20 calls upon G20 countries to recognize the spinal disabilities as a global and most prevalent burden, in fifth place between the Non- Transmissible Diseases for Wellness impairments.</p> <p>B. Spine20 calls upon G20 countries to consider that life habits (obesity, lack of physical activity, inadequate ergonomics of workplaces) considerably increase incidence and severity of the spine illness.</p> <p>C. Spine20 calls upon G20 countries to promote social and medical endeavors to prevent spine disabilities and prolong wellness and healthy life expectancy of human beings.</p>

### Appendix 3 All candidates of recommendation statements

Domain   Subdomain	Voting results
Access to care   Diversity	Vote1: A 89.5%, B 5.3%, C5.3%
Value-based care   Economy	Vote1: A 21.1%, B 42.1%, C 36.8%
	Vote2: A 11.1%, B 50.0%, C 38.9%
	Vote3: A 0.0%, 53.8%, C 46.2%
	Vote4: A 0.0%, B 25.0%, C 75.0%
Rehabilitation   Spinal cord injury	Vote1: A 84.2%, B 10.6%, C 5.3%
Research   Priorities	Vote1: A 5.3%, B 73.7%, C 21.1%
	Vote2: A 0.0%, B 94.4%, C 5.6%

Domain   Subdomain	Voting results
Future of spine care   Aging	Vote1: A 36.8%, B 57.9%, C 5.3% Vote2: A 22.2%, B 66.7%, C 11.1% Vote3: A 7.1%, B 92.9%, C 0.0%
Capacity building   Patient safety	Vote1: A 10.5%, B 84.2%, C 0%, D 5.3%
Wellness   Quality of life	Vote1: A 21.1%, B 57.9%, C 21.1% Vote2: A 16.7%, B 77.8%, C 5.6%

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**Code availability** Not applicable.

## Declarations

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## Authors and Affiliations

Bambang Darwono<sup>1</sup> · Koji Tamai<sup>2</sup>  · Pierre Côté<sup>3</sup> · Sami Aleissa<sup>4</sup> · Agus Hadian Rahim<sup>5</sup> · Paulo Pereira<sup>6</sup> · Hana Alsobayel<sup>7</sup> · Harvinder S. Chhabra<sup>8</sup> · Giuseppe Costanzo<sup>9</sup> · Manabu Ito<sup>10</sup> · Frank Kandziora<sup>11</sup> · Donna Lahey<sup>12</sup> · Cristiano M. Menezes<sup>13</sup> · Sohail Bajamma<sup>14</sup> · William J. Sullivan<sup>15</sup> · Peter Vajkoczy<sup>16</sup> · Alaa Ahmad<sup>17</sup> · Markus Arand<sup>18</sup> · Saiful Asmiragani<sup>19</sup> · Thomas R. Blattert<sup>20</sup> · Jamiu Busari<sup>21</sup> · Edward J. Dohring<sup>12</sup> · Bernardo Misaggi<sup>22</sup> · Eric J. Muehlbauer<sup>23</sup> · Raghava D. Mulukutla<sup>24</sup> · Everard Munting<sup>25</sup> · Michael Piccirillo<sup>23</sup> · Carlo Ruosi<sup>26</sup> · Ahmed Alturkistany<sup>27</sup> · Marco Campello<sup>28</sup> · Patrick C. Hsieh<sup>29</sup> · Marco G. A. Teli<sup>30</sup> · Jeffrey C. Wang<sup>29</sup> · Margareta Nordin<sup>31</sup>

<sup>1</sup> Gading Pluit Hospital, Jakarta, Indonesia

<sup>2</sup> Osaka Metropolitan University Graduate School of Medicine, Osaka, Japan

<sup>3</sup> Institute for Disability and Rehabilitation Research, Ontario Tech University, Oshawa, ON, Canada

<sup>4</sup> National Guard Health Affairs, Riyadh, Saudi Arabia

<sup>5</sup> Dr. Hasan Sadikin Hospital, Bandung, Indonesia

<sup>6</sup> Faculty of Medicine, University of Porto, Porto, Portugal

<sup>7</sup> King Saud University, Riyadh, Saudi Arabia

<sup>8</sup> Indian Spinal Injuries Center, New Delhi, India

<sup>9</sup> Sapienza Rome University, Rome, Italy

<sup>10</sup> Hokkaido Medical Center, Sapporo, Japan

<sup>11</sup> Center for Spinal Surgery and Neurotraumatology, Frankfurt, Germany

<sup>12</sup> Spine Institute of Arizona, Scottsdale, AZ, USA

<sup>13</sup> Universidade Federal de Minas Gerais, Belo Horizonte, Brazil

<sup>14</sup> Umm Al-Qura University, Mecca, Saudi Arabia

<sup>15</sup> Vanderbilt University Medical Center, Nashville, USA

<sup>16</sup> Charite Universitätsmedizin, Berlin, Germany

<sup>17</sup> Palestine Polytechnic University, Hebron, Palestine

<sup>18</sup> Trauma Surgery, Ludwigsburg, Germany

<sup>19</sup> Brawijaya University, Malang, Jawa Timur, Indonesia

<sup>20</sup> Interdisciplinary Spine Center, Ingolstadt, Germany

<sup>21</sup> Maastricht University, Maastricht, The Netherlands

<sup>22</sup> Orthopaedic Institute Gaetano Pini-CTO, Milan, Italy

<sup>23</sup> North American Spine Society, Chicago, USA

<sup>24</sup> Udaiomni Hospital, Hyderabad, India

<sup>25</sup> Community Hospital, Ottignies, Belgium

<sup>26</sup> Federico II University, Napoli, Italy

<sup>27</sup> King Faisal Specialist Hospital & Research Center, Jeddah, Saudi Arabia

<sup>28</sup> New York University Grossman School of Medicine, New York, NY, USA

<sup>29</sup> University of Southern California Keck School of Medicine, Los Angeles, CA, USA

<sup>30</sup> Santi Paolo e Carlo University Hospital, Milan, Italy

<sup>31</sup> New York University, New York, NY, USA