

# BMJ Open Quality Preventing the next fragility fracture: a cross-sectional survey of secondary fragility fracture prevention services worldwide

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## ABSTRACT

**Background** There has been an increasing awareness of the public health impact of fragility fractures due to osteoporosis and the imperative of addressing this health burden with well-designed secondary fragility fracture prevention services (SFFPS). The objectives of this survey, conducted within the international membership of the Fragility Fracture Network (FFN), were to identify gaps in services and identify the needs for further training and mentorship to improve the quality of SFFPS provided to patients who sustain fragility fractures.

**Methods** We conducted an electronic cross-sectional survey of FFN Secondary Fracture Prevention Special Interest Group (SIG) members from April 2021 to June 2021 using SurveyMonkey. The survey questions were developed by four SIG members from New Zealand, Australia, Canada and the Netherlands, who have experience in developing, implementing and evaluating SFFPS. The sampling framework was convenience sampling of all 1162 registered FFN Secondary Fracture Prevention SIG members. Descriptive analyses were performed for all variables and presented as frequencies and percentages.

**Results** 69 individuals participated in the survey, from 34 different countries over six continents, with a response rate of 6% (69/1162). Almost one-third of respondents (22/69) were from 15 countries within the European continent. Key findings included: (1) 25% of SFFPS only included patients with hip fracture; (2) less than 5% of SFFPS had any mandatory core competencies for training; (3) 38.7% of SFFPS were required to collect key performance indicators; and (4) 9% were collecting patient-reported outcome measures.

**Conclusions** This survey identified key areas for improving SFFPS, including: expanding the reach of SFFPS to more patients with fragility fracture, developing international core competencies for health provider training, using key performance indicators to improve SFFPS and including the patient voice in SFFPS development. These findings will be used by the FFN to support SFFPS development internationally.

## INTRODUCTION

Fragility fractures (occurring spontaneously or following minor trauma) are a frequent

### WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ It is imperative to address the health burden of fragility fractures with well-designed secondary fragility fracture prevention services (SFFPS).

### WHAT THIS STUDY ADDS

⇒ This survey provides a preliminary overview of how SFFPS are operating within 34 countries over six continents.

### HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Our survey identified needs for further training and mentorship to improve the quality of SFFPS provided to patients who sustain fragility fractures.

consequence of osteoporosis, leading to significant disability and early death.<sup>1-5</sup> One fragility fracture often leads to a cycle of recurrent fractures.<sup>6</sup> Despite the availability of effective strategies that reduce future fracture risk by up to 60%,<sup>7</sup> less than 20% of patients with fragility fractures receive these treatments after a fracture.<sup>8-10</sup>

Over the last 10 years, there has been an increasing awareness of the public health impact of fragility fractures due to osteoporosis and the imperative of addressing this health burden with well-designed secondary fragility fracture prevention programmes.<sup>11</sup> Systematic reviews of different clinical models of care found that the fracture liaison services (FLS) was the most effective model to improve patient care outcomes.<sup>12 13</sup> The goal of FLS is to ensure that all patients aged 50 years or over, who sustain a fragility fracture, undergo fracture risk assessment and receive treatment in alignment with prevailing national clinical guidelines for osteoporosis. The FLS also addresses fall risk in older patients through referral to local fall prevention services.<sup>14</sup> In addition, many FLS now include long-term



follow-up for assessing persistence with treatment recommendations and linkage with primary care providers to ensure good communication during patient assessment and on discharge from the FLS.

In 2012, the American Society for Bone and Mineral Research task force on secondary fracture prevention published a pivotal paper titled: 'Making the first fracture the last fracture'.<sup>15</sup> This paper outlined the osteoporosis care gap, supported the FLS model as being the most effective way to close the care gap and set some targets around hip fracture reduction. The International Osteoporosis Foundation (IOF) launched the Capture the Fracture initiative in 2012 that continues to provide best practice frameworks for FLS programmes.<sup>16 17</sup> The IOF also published toolkits for development and sustainability of FLS programmes and recognition for programmes that fit framework standards. Over time, the FLS model has proven to reduce repeat fractures, decrease mortality and to be highly cost-effective and even cost saving in some jurisdictions.<sup>12 13</sup> However, despite efforts to ensure that clinical standards for FLS programmes are available in all countries, there continues to be a major gap in secondary fragility fracture prevention on a global scale.<sup>8-10</sup> Although the term FLS has been adopted in many countries, other terminology for this type of secondary fragility fracture prevention model is used in different countries. For the purposes of this report, we will use the term secondary fragility fracture prevention service (SFFPS).

The Fragility Fracture Network (FFN) is a global organisation of health professionals who envision a world where every person who sustains a fragility fracture 'will achieve the optimal recovery of independent function and quality of life, with no further fractures'. The FFN's mission is 'to optimise the multidisciplinary management of patients with fragility fracture, including secondary fracture prevention'.<sup>18</sup> The FFN Secondary Fracture Prevention Special Interest Group (SIG) was created during the FFN world congress held in Oxford, England, in 2019. The focus of the SIG is to support continued improvement in patient-centred SFFPS around the world through networking, training and mentorship. One of the first activities of the SIG was to conduct a survey of SIG members with the purpose of better understanding the full scope of SFFPS from a global perspective. The objectives of the survey were to identify gaps in services and identify the needs for further training and mentorship to improve the quality of SFFPS provided to patients who sustain fragility fractures. To our knowledge, this is the first survey describing SFFPS around the world.

## METHODS

We conducted an electronic cross-sectional survey of FFN Secondary Fracture Prevention SIG members from April 2021 to June 2021 using SurveyMonkey. The survey questions were developed by SIG members from New Zealand, Australia, Canada and the Netherlands, who have experience in developing, implementing and evaluating SFFPS.

In formulating the questions for our survey, we drew on both formal (patient-reported outcome and experience measures) and informal information gained over our many years of clinical observation and experience in multiple settings and different countries.

The first draft of the survey was completed in November 2020 and was reviewed by the FFN scientific committee. Revisions were undertaken and a second draft pilot tested on 15 SIG members from five countries (Australia, Canada, New Zealand, the Netherlands and England) in March 2021. Further refinements to the survey were completed and the final version was sent out to the SIG membership in April 2021. The survey was closed in June 2021.

The sampling framework was convenience sampling of all 1162 registered FFN Secondary Fracture Prevention SIG members. This survey is part of a quality improvement initiative undertaken by the Secondary Fracture Prevention SIG, therefore no ethics approval was obtained. No personal identifiers were collected; the survey was anonymous and was completely voluntary. The survey (online supplemental appendix A) contained 50 questions, took approximately 30 min to complete and was divided into seven sections addressing the following questions: (1) Who is responding to survey and how is their service organised? (2) How are services provided? (3) What interventions were provided? (4) What patient follow-up occurs after interventions are provided? (5) What electronic record keeping takes place? (6) What key performance indicators (KPI)/quality indicators are collected and how are they being used to improve their service? (7) What are the barriers and facilitators to providing services? Sections 1–6 were multiple-choice or short-answer questions. Questions around barriers and facilitators were open-ended questions with free text responses. Respondents were also provided the opportunity to make free text comments at the end of the survey.

Quantitative data from the online survey were automatically generated into an Excel worksheet which was subsequently imported into the Statistical Package Social Sciences (SPSS) programme V.22 for Windows. Descriptive analyses were performed for all variables and presented as frequencies and percentages. Responses to open-ended questions around barriers and facilitators to providing services were thematically grouped by one author and subsequently reviewed and validated by two additional authors.

## Patient and public involvement

There was no direct patient or public involvement in the development, conduct or analysis of the survey.

## RESULTS

There were 69 individuals who participated in the survey from April 2021 to June 2021 with a response rate of 6% (69/1162). The response rate for individual sections of the survey steadily decreased from 90% in section 1 to



North America (n=10)		South America (n=12)		Europe (n=22)		Ireland	2	Asia (n=15)	
Canada	2	Argentina	4	Belgium	1	Netherlands	1	Hong Kong	1
USA	7	Brazil	3	Croatia	1	Portugal	2	India	2
Cuba	1	Ecuador	1	Denmark	1	Sweden	1	Japan	1
<b>Oceania (n=5)</b>		Peru	4	England	4	Turkey	1	Malaysia	2
Australia	3	<b>Africa (n=2)</b>		Estonia	1	United Kingdom	1	Pakistan	1
New Zealand	2	Egypt	1	Germany	1	Ukraine	2	Philippines	5
		South Africa	1	Greece	2	<b>Unknown (n=3)</b>		Singapore	1
				Italy	1	Unknown	3	Thailand	2

**Figure 1** Survey respondents by continent and country (N=69).

39% by the end of section 6. The open-ended questions around barriers and facilitators to providing SFFPS were answered by 23.2% (16/69) of the respondents.

### Demographics of survey respondents

Survey respondents were from 34 different countries over six continents (figure 1). Almost one-third of respondents (31.8%) were from 15 countries within Europe with five respondents identifying as residing in England or the UK. The lowest representation was from Africa (3%, South Africa and Egypt) and Oceania (7.6%, Australia and New Zealand) (figure 1). No respondents identified from Central America, Russia or the Middle East regions. Three respondents did not identify which country they resided in. Physicians represented 63.7% of respondents of which 23.2% were orthopaedic surgeons and 27.6% were geriatricians. The remainder of the respondents identified as nurses/nurse practitioners, physiotherapists and researchers/research assistants (table 1).

### How is the service organised and provided?

The funding for most SFFPS came from government health funds or insurance (64.5%) with other sources reported as private hospital organisation, private health insurance, research foundations, workplace health insurance and industry. Inpatient (46.9%) or outpatient (54.7%) in the hospital was the most commonly reported setting for providing services, followed by specialist medical doctor consulting rooms (20.3%). Multiple

locations for providing services were reported by 14.1% of respondents with small numbers of SFFPS operating in primary care and community care settings (table 1).

The largest proportion of SFFPS was operating 5 days/week (48.3%) but 22.6% of the services were operating 'as required'. The majority of respondents (76.3%) reported using a local, national or international guideline to frame their SFFPS and used standardised treatment principles to guide activities. The SFFPS coordinator was the most commonly reported team member that completed patient assessments (52%), followed by the medical officer (36%). Few services (27.5%) had a specific job description for the SFFPS coordinator. Education and training for team members in the areas specified in our survey was rarely mandatory and most commonly reported as 'not available' (table 2).

### What interventions are provided? What patient follow-up occurs?

The majority (62.5%) of services reached out to all patients with fragility fracture (except skull, face, fingers and toes). However, 25% of services (three in the Philippines, one in each of Japan, Pakistan, Portugal, Argentina and Australia) focused on patients with hip fracture only, primarily due to resource allocation issues. Although most services engaged patients individually, 22.6% conducted medical record assessment only and sent recommendations to the primary care physician with no

**Table 1** Characterisation according to profession of survey respondents and secondary fragility fracture prevention service (SFFPS) setting and funding

Profession of survey respondents (N=69)	n	Valid %
Physician	44	63.7
Geriatrician	19	27.6
Orthopaedic surgeon	16	23.2
Endocrinologist	4	5.8
Hospitalist	3	4.3
Rheumatologist	1	1.4
General/family	1	1.4
Nurse or nurse practitioner	15	21.8
Physiotherapist	7	10.2
Researcher/data coordinator	3	4.3
<b>Setting where SFFPS is provided (N=64)*</b>		
Hospital inpatient	30	46.9
Hospital outpatient setting	35	54.7
Community setting funded by hospital	5	7.8
Primary care setting	4	6.3
Specialist medical doctor consulting room	13	20.3
Multiple settings	9	14.1
Other	6	9.4
<b>Funding of SFFPS (N=58)*</b>		
SFFPS funded by government health funds	34	58.6
SFFPS funded by government health insurance	10	17.2
SFFPS funded by private hospital organisation	8	13.8
SFFPS funded by private health insurance	5	8.6
SFFPS funded by workplace health insurance	2	3.4
SFFPS funded by industry	2	3.4
SFFPS funded by research foundation	2	3.4

\*Survey participants could respond to more than one category.

direct patient engagement. Of the services that engaged with patients individually, 80.1% reported face-to-face engagement, with 35.5% engaging by phone and 25.8% engaging through a bone density test report. Almost all services (90.9%) started or recommended medication for their patients, with 38.5% following patients at 1 month, 34.6% at 3 months, 11.5% at 6 months and 11.5% at 12 months after fracture. One service followed patients up to 24 months (table 3). In addition, 68.8% (22/32) of SFFPS reported following up on non-medication fracture prevention recommendations. The most common referral made by the SFFPS was to a fall prevention programme (59.4%), followed by older adult exercise programmes (56.3%), physiotherapist (56.3%), dietician (31.3%) and occupational therapist (21.9%).

**Table 2** Organisational structure of secondary fragility fracture prevention service (SFFPS)

	n	Valid %
Days/week SFFPS is operating (N=64)		
1 day or less	8	11.3
2–4 days	9	14.5
5 days	30	48.3
7 days	3	4.8
As required	14	22.6
Guideline used to structure SFFPS (N=38)		
Yes	29	76.3
No	9	23.7
If guideline is used, where does it come from? (N=29)*		
Local practice	8	24.1
National practice	10	30.3
Global practice	5	15.2
Mixed (local+national and/or global)	5	15.2
Services with a job description for SFFPS coordinator (N=40)		
Yes as their only role	11	27.5
Yes as part of other roles that the coordinator has	8	20
No job description	22	55
<b>Education or training available for staff*</b>		
UK Royal Osteoporosis Society training (N=33)		
Mandatory	1	3
Not available	20	60.6
Management of refracture prevention (N=36)		
Mandatory	3	8.3
Not available	13	36.1
DEXA interpretation (N=33)		
Mandatory	0	0
Not available	14	36.4
Management of falls (N=34)		
Mandatory	5	14.7
Not available	11	32.4
Behaviour change methodology (N=31)		
Mandatory	1	3.2
Not available	19	61.3
Quality improvement methodology (N=31)		
Mandatory	4	12.9
Not available	15	48.4

\*Survey participants could respond to more than one category. DEXA, dual-energy X-ray absorptiometry.

Over half of SFFPS (62.5%) developed a care plan for patients that was shared with patients and/or family, and entered into the medical record for the entire healthcare

**Table 3** Secondary fragility fracture prevention service (SFFPS) processes

	n	Valid %
Uses fracture type as inclusion criteria (N=32)		
Yes	12	37.5
Hip only	8	25
Other site (arms, shoulder, vertebra, hip, tibia)	4	12.5
No, includes all fracture types except skull, face, fingers and toes	20	62.5
Method of initial assessment of patients included in service (N=31)*		
One-on-one assessment face to face	25	80.1
One-on-one assessment via phone call or teleconference	11	35.5
Patient group assessment face to face	2	6.5
Assessment by questionnaire	4	12.9
Assessment via a DEXA scan report	8	25.8
Notification of fracture to primary care provider	7	22.6
Plan of care prepared with no patient contact based on medical record only	7	22.6
Collects validated patient-reported measures (N=33)	3	9.0
Starts or recommends starting medicines to prevent fractures (N=33)	30	90.9
Follows up to assess whether medicine has been started/continued (N=26)*		
Within 1 month of assessing the patient	10	38.5
Within 3 months	9	34.6
Within 6 months	3	11.5
Within 12 months	3	11.5
Within 24 months	1	3.8
Develops a plan of recommended care with patient and/or family (N=32)	20	62.5
This plan is saved in the medical record for all staff to access.	20	62.5
Uses data system to record assessments and interventions (N=32)	20	62.5
Microsoft Excel or Access	11	34.3
Electronic health service record	9	28.1
Uses data system to record patient outcomes (N=32)	15	46.8
Reports KPI/quality indicators to organisation/hospital (N=31)	12	38.7

\*Survey participants could respond to more than one category.  
DEXA, dual-energy X-ray absorptiometry; KPI, key performance indicator.

team to access. Patient-reported outcome measures (PROM) were rarely collected (9%) (table 3).

### Electronic record keeping and quality measures

Most respondents reported using some type of electronic spreadsheet or database to record patient assessment and interventions initiated (62.5%) with a smaller proportion (46.8%) recording patient outcomes. Only 38.7% of services were required to report KPIs or quality indicators (table 3). Four quality indicators were collected: patient numbers, patient outcomes, patient-reported measures/experience and health professional satisfaction. Only 15.4% of respondents who collected KPIs knew how the quality measures were being used to improve their service.

### Distribution of responses to survey questions by continent

Table 4 categorises by continent the responses to a select number of questions around SFFPS setting, operationalisation, funding and processes. Analysis was limited to descriptive statistics due to the small number of respondents for some continents. South America and North America had a low proportion of SFFPS funded by government health funds (35.7% and 12.5%, respectively). South America, North America and Africa had a high proportion of SFFPS with no job description for the SFFPS coordinator (83.3%, 100% and 100%, respectively), while Europe and Oceania had a high proportion of SFFPS coordinator job descriptions dedicated solely or partially to the SFFPS (50% and 66.7%, respectively). South America and Oceania had a high proportion (100%

**Table 4** Setting, operationalisation, funding and process of secondary fragility fracture prevention service (SFFPS) categorised by continent\*

	Europe	Asia	South America	North America	Africa	Oceania
	<b>n (valid %)</b>					
SFFPS is located in a hospital inpatient setting.	7 (33.3)	9 (56.3)	6 (42.9)	1 (12.5)	2 (100)	4 (80)
SFFPS is funded by government health funds.	14 (70)	8 (50)	5 (35.7)	1 (12.5)	2 (100)	4 (80)
SFFPS operates as required by patients.	3 (14.3)	5 (31.3)	2 (14.3)	2 (25)	0	0
SFFPS with a job description for the SFFPS coordinator						
Yes—as their only role at our health service	6 (42.9)	2 (16.7)	1 (16.7)	0	0	2 (66.7)
Yes—as a part of other roles the coordinator has at our health service	1 (7.1)	6 (50)	0	0	0	0
No	7 (50)	4 (33.3)	5 (83.3)	4 (100)	1 (100)	1 (33.3)
SFFPS has mandatory educational or training opportunities available to all team members.	3 (14.3)	4 (25)	1 (7.1)	2 (25)	0	1 (20)
SFFPS uses a guideline to structure the SFFPS.	10 (76.9)	10 (83.3)	3 (60)	2 (50)	1 (100)	3 (100)
SFFPS collects validated patient-reported outcome measures.	2 (18.2)	1 (9.1)	1 (20)	0	0	0
SFFPS uses specific data system to record patient assessments and interventions.	8 (72.7)	7 (63.6)	3 (75)	1 (33.3)	0	1 (50)
SFFPS uses a specific data system to record patient outcomes.	5 (45.5)	4 (36.4)	2 (50)	2 (63.7)	1 (100)	1 (50)
SFFPS reports KPIs/quality indicators to organisation/hospital.	2 (18.2)	3 (30)	4 (100)	1 (33.3)	0	2 (100)

\*Three respondents did not identify their country and are excluded from this table.  
KPI, key performance indicator.

and 100%, respectively) of SFFPS reporting quality indicators to their organisations. Use of a guideline to structure SFFPS was consistently high across all continents (50% or higher). Mandatory training for SFFPS team members and the reporting of patient-reported measures was less than 25% across all continents.

### Facilitators and barriers to service development

Sixteen respondents from 14 countries responded to the open-ended questions around barriers and facilitators: 5 from Europe (Netherlands, Portugal, Ireland, England and Ukraine), 8 from Asia (two from India, two from the Philippines, Japan, Singapore, Thailand and Pakistan), 1 from Oceania (New Zealand), 1 from South America (Argentina) and 1 from North America (USA). The most commonly reported facilitator was the people involved in the service development: the support of colleagues, teamwork/staff engagement and administrative support (reported in some form by 93.8% of respondents). Three respondents from Asia (Philippines, India, Pakistan) emphasised the link with international organisations as being a facilitator. The most commonly reported barriers to service development and sustainability included: lack of funding (England, Netherlands, Japan, Singapore, Philippines, India, Ukraine, New Zealand), lack of staffing/manpower (Ireland, Japan, Singapore, India, Pakistan), technology and database issues (Ireland,

Portugal, Singapore, Philippines, New Zealand) and lack of knowledge or interest by health providers and/or patients (Netherlands, Japan, Philippines, India, Argentina) (online supplemental appendix B).

Final comments at the end of the survey were provided by seven respondents (Netherlands, Philippines, Pakistan, Estonia, Turkey, India and Ireland). The Netherlands commented around the need to embed SFFPS into routine care: 'The issue of (subsequent) fragility fracture needs global as well as governmental attention in positioning FLS care as normal and regular necessary care.' The Philippines emphasised the importance of peer mentorship to support new SFFPS: 'In countries where secondary fracture prevention is not yet given much importance by the government, perseverance is very important. Peer mentoring from experienced leaders, in my opinion, can be a big help in encouraging country champions to promote Secondary Fracture Prevention programmes in their respective countries.' Pakistan highlighted that nurse training programmes in FLS could support long-term sustainability of FLS: 'Nurse education to develop as coordinator for FLS as a part of nursing education service may have a long-lasting impact and is important to address for sustainable success of any FLS programme.' Two respondents (Turkey and Estonia) had no secondary fracture prevention service in their

countries but were motivated to start one and were looking for mentorship support.

## DISCUSSION

The results of our survey provide a preliminary overview of SFFPS from 34 countries over six continents. Our results highlight the important supports that SFFPS are providing for patients with fragility fracture to ensure that patients have access to the best possible interventions to prevent a future fragility fracture. The majority of services are connecting with patients with fragility at the time of their fracture in the hospital, are including all fracture types, are operating 5 days/week or more and using local, national or international guidelines to structure their services. In addition, the majority of services conduct one-on-one in-person assessments, create care plans in collaboration with patients and/or family, start or recommend medications to prevent future fragility fractures and undertake follow-up to ensure treatment persistence. Despite these positive findings, our team identified some key areas for improvement of SFFPS.

Our results suggest the need to support expanding the reach of SFFPS to include more patients with fragility fracture as 25% of SFFPS reported that they were limiting their reach to patients with hip fracture only due to resource allocation and therefore are not adequately addressing the existing osteoporosis care gap.<sup>8-10</sup> There is good epidemiological evidence that fragility fractures of the wrist, pelvis, spine and humerus often lead to hip fractures later in life.<sup>6</sup> These SFFPS are missing an opportunity to prevent hip fractures in the future by treating all patients with fragility fracture.

A systematic review of the different models of secondary fracture prevention by Ganda *et al* highlights that models with a dedicated coordinator and systematic case finding lead to better patient outcomes than less intense models.<sup>19</sup> SFFPS based in medical specialists' office were reported by 20.6% of respondents, suggesting that there was no systematic identification of patients with fragility fracture when they initially presented for acute fracture care (commonly at a hospital or urgent care centre). Almost 25% of SFFPS were operating 'as required' which suggested that no dedicated personnel were assigned to case finding. In addition, over half of the services had no job description for a coordinator and only 27.5% of services had a coordinator who was dedicated to the role, with another 20% where the SFFPS was only part of their role. The results of our survey suggest that there is still much progress to be made towards optimal SFFPS for patients.

In our survey, we found that very few SFFPS had mandatory training in any of the key areas that we believe are needed for a high-functioning SFFPS: comprehensive management strategies for refracture prevention, bone mineral density (dual-energy X-ray absorptiometry) interpretation, fall prevention management, behaviour change methods and quality improvement methods. In

addition, even when comprehensive training programmes are freely available through the UK Royal Osteoporosis Society training,<sup>20</sup> the majority of respondents (60.6%) reported that training was unavailable to them. We hypothesise that this finding may be related to language barriers, as the UK training is only available in English, or to simply a lack of awareness.

Our findings are aligned with the results of a 2020 systematic review around the role of coordinators in SFFPS which found that only six of the 65 (9%) included studies reported having a specific education programme for coordinators.<sup>21</sup> The systematic review concluded that there is a need to clearly define the role and scope of the coordinator in addition to developing accredited education programmes. Similarly, a systematic review of integrated osteoporosis care initiatives found that only 14 of the 69 (20%) included studies reported a training programme for healthcare workers with only five of the 69 (7%) included studies reporting multidisciplinary training.<sup>22</sup>

Our results suggest the need to develop core educational competencies for SFFPS coordinators and the multidisciplinary teams that are freely available in local languages, adapted to local healthcare contexts and well publicised so health providers are aware of them. The European Alliance of Associations for Rheumatology (EULAR) recently published a research and education agenda that could serve as a guide for such educational competencies in our future planning.<sup>23</sup> EULAR identified core competencies which they recommend to be incorporated in education and training to optimise SFFPS: (1) how to use (multi-component) screening tools to understand fracture risk; (2) how to deliver and what to include in a fall prevention programme; (3) how to tailor education for patients with fracture with varying risks of falls; (4) the scope and role of non-physician health providers in FLS care; (5) how to support and promote medication adherence; (6) how to effectively promote bone health; and (7) medication side effects that impact on bone health.

Although the majority of SFFPS used a data system to record assessments and interventions, less than 50% used a data system to record patient outcomes and less than 40% are reporting KPIs or quality indicators to their healthcare organisations. Of those SFFPS collecting KPIs, only 15% knew how these indicators were used to improve the quality of care of their service. The Institute for Healthcare Improvement highlights the importance of collecting data to measure how a service is operating and using the data to continuously improve the care being provided.<sup>24 25</sup> The results of our survey identified the need to support SFFPS to collect quality metrics and to identify clear pathways within their organisations to share the metrics and use them to improve their SFFPS. A recommended framework of KPIs for SFFPS has been developed by the National Osteoporosis Foundation, IOF and FFN to guide practice and to be inclusive of different SFFPS stage of development and access to healthcare resources.<sup>26</sup>



The majority of SFFPS that responded to our survey reported developing care plans in collaboration with the patient or their family member (62.5%). However, very few (9%) reported the use of validated PROMs. Many publications have reported the value of using PROMs for assessing service outcomes, in addition to individual patient assessment and follow-up of outcomes. Speerin and colleagues described how value-based care includes efforts to improve patient outcomes and their experience through better patient engagement with respect to clinical decision-making.<sup>27 28</sup> The Integrated People-Centered Health Services (IPCHS) strategy developed by the WHO validates the need to incorporate a range of strategies that will help empower individuals to make effective decisions and take action about their own health.<sup>28 29</sup> These strategies include using behaviour change theoretical models and shared decision-making.<sup>30 31</sup> PROMs can be an important resource to help inform shared decision-making, empower the patient voice and to provide valuable information around adherence and persistence to treatment recommendations.<sup>32</sup> A recent systematic review of the evidence on how SFFPS meet the elements of the IPCHS has confirmed that there is a significant need to support teams internationally to incorporate strategies such as PROMs in their SFFPS development.<sup>22</sup> In 2016, the Australian Commission on Safety and Quality in Health Care commissioned a literature review that concluded health services should be encouraged to use PROMs as a standard element of clinical practice.<sup>33</sup> With the increasing awareness of the importance of patient input into healthcare planning, SFFPS are largely missing the opportunity to incorporate the patient voice to improve their service.<sup>34 35</sup>

A very small number of survey respondents answered the open-ended questions around facilitators and barriers and therefore our interpretation is limited. The support of colleagues, teamwork/staff engagement and administrative support were the most commonly reported facilitators. The most commonly reported barriers were funding, lack of staff, technology and database issues and a lack of interest by health providers and patients. Our results are consistent with a scoping review that found implementing new health programmes was enabled in scenarios when: (1) there is dedicated funding, (2) there are pre-existing relationships and networks to build on, (3) there are clear and agreed-on goals, roles and expectations, (4) there is strong leadership commitment, skill and experience and (5) decision maker partnerships are established early in the process.<sup>36</sup> Our results also align with previous research that identified having an expert physician lead, decision maker support and addressing concerns around added workload for health providers were important facilitators for implementing and sustaining FLS programmes.<sup>37</sup> A more recent study also aligns with our work by identifying the importance of demonstrating value for stakeholders and providing adequate resources for implementation.<sup>38</sup> Our survey results highlighted barriers related to lack of technology and databases to support SFFPS and the

importance of addressing both health provider and patient awareness around the need for secondary fracture prevention.

### Limitations

Our study has several limitations. First, the response rate to our survey was low at 6% and there was a steady drop-off in responses to questions, which may have been due to the length of the survey. Our results may not be representative of all SFFPS worldwide. Second, almost a third (31.2%) of our respondents were from Europe and the majority of respondents (63.7%) were physicians; this bias is representative of the membership of FFN, which has a majority of physicians and a large membership from Europe where the FFN first started. Third, the survey was only available in English, possibly limiting participation from respondents whose first language is not English and could have contributed to misinterpretation of both questions and possible responses. Fourth, terminology is not consistently used across different countries (even within English-speaking countries) for describing key aspects of their services, possibly creating confusion around how to answer some of the questions. Finally, this survey may not reflect changes in practice brought on by the COVID-19 pandemic, such as the shift to telemedicine over traditional face-to-face interactions.<sup>39</sup>

### CONCLUSION

Our survey results have provided a preliminary overview of how SFFPS are operating around the world and highlighted some gaps in care, in addition to identifying opportunities for mentorship and training that we plan to incorporate into our future SIG initiatives. We identified the need to gather additional information around how best to support countries with no existing SFFPS and to broaden input from the perspective of allied health professionals. Key opportunities for mentorship and training include: (1) broadening the reach of services to all patients with fragility fractures, (2) improving awareness and access to existing secondary fragility fracture prevention educational tools and establishing core competencies for training, (3) supporting SFFPS to both collect and effectively use quality metrics to improve their services and (4) including the patient voice in SFFPS development, evaluation and personalised care planning. Lastly, we need to find better ways to communicate to both patients and policy makers the imperative of moving secondary fragility fracture prevention to the top of the list of healthcare priorities.

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