

# BEPPOP

## Benchmarking Exercise Programmes for Older People

Wave 1 Data collection and analysis (2022)



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## Executive Summary

### *Background:*

The Benchmarking Exercise Programmes for Older People (BEPOP) project is a UK-wide service improvement initiative. It uses a benchmarking and feedback model to identify and promote areas of good practice in the prescription of exercise interventions for older people living with sarcopenia and frailty, in order to support ongoing service development.

### *Methods:*

Ten services, across the UK, providing exercise interventions to older people took part in the first wave of data collection, submitting data on 188 older people accessing services between October 2021 and September 2022.

### *Results:*

156 (83%) people referred for exercise interventions were living with frailty or were vulnerable to frailty (a Rockwood Clinical Frailty Score of 4 or greater). For the majority of individuals, a diagnosis of sarcopenia had not been made prior to their referral. Prior to commencement of prescribed exercise programmes, a variety of assessment methods were used. These were most commonly non-strength based assessments, such as the Tinetti score and Berg Balance score, or were subjective assessments of muscle strength such as the Oxford scale. Only 61% received an objective strength-based assessment of physical performance prior to an exercise prescription.

Most individuals were prescribed some method of resistance exercise training. Bodyweight exercises were most commonly employed; in 45% of cases this was the only element of resistance training used. Where additional equipment was prescribed, resistance bands and wrist/ankle weights were used most frequently, with free weights being used with fewer than 10% of individuals.

Progression of resistance exercises was predominantly achieved by increased volume (increased sets and repetitions), rather than by increased intensity, (increased resistance or weight). Following completion of the prescribed exercise intervention, 30% of individuals did not receive any reassessment. In those who did, this was often using non strength-based assessment methods. Only 41% of individuals were referred or signposted onto further exercise services following completion of the prescribed exercise programme.

### *Conclusions:*

Sarcopenia and frailty are common conditions affecting older people in the UK and resistance exercise training has been established as an effective, evidence-based intervention in these conditions. Recent European Working Group on Sarcopenia in Older People (EWGSOP) guidelines provide a practical algorithm for case finding and clear diagnostic cut-offs in assessments of muscle strength. Although the results from this first round of data collection show that resistance exercise training is often being prescribed, re-assessment during the

exercise programme often does not take place, meaning exercises are not being optimally progressed. Opportunities to diagnose probable sarcopenia through the objective strength-based assessments are being missed.

*Next steps:*

The BEPOP project provides an opportunity to harness the variability in practice across the UK in the prescription of exercise interventions for older people, to drive evidence-based service development, in order to ensure we are achieving best outcomes for older people living with sarcopenia and frailty. These results are being disseminated to a broad range of stakeholders working with older people, and individualised reports for each site will be fed back to those sites contributing data.

The BEPOP team wish to thank all those who participated in this first wave of data collection for both your time and efforts during data submission, and in providing feedback to the BEPOP team on how this benchmarking project could develop in future waves. We plan to seek funding to enable future waves of data collection and benchmarking to build on the encouraging foundations of this initial work.

## Key Recommendations following wave 1

1. **Assessment:** All older people referred for exercise programmes should be assessed using an objective strength-based assessment method, such as five times sit-to-stand test, before starting an exercise programme.
2. **Diagnosis:** Probable sarcopenia can be diagnosed, as per EWGSOP guidelines and diagnostic cut-offs, using objective strength-based assessment methods (by measuring grip strength AND five times sit-to stand test). This should be clearly documented and shared with the patient's GP.
3. **Exercise prescription:** Progressive resistance exercise training should be included in all exercise prescriptions for older people living with sarcopenia (probable or confirmed) or frailty.
4. **Progress and Re-assess:** Resistance exercises should be progressed by increasing intensity of exercises (e.g. greater weight, stronger therabands), not just by increasing the volume of exercises.

At the end of an exercise programme, all older people should be re-assessed using the same objective strength-based assessment method that was used at baseline (paired outcome assessment), to assess progress and guide ongoing prescription.

5. **Take forwards:** All older people completing an exercise programme should be offered signposting, or referral onwards to ongoing exercise services where possible.

## Introduction to BEPOP

Sarcopenia (the age-related loss of muscle mass and strength) and physical frailty are key health conditions affecting older people. Both are common, and both increase the risk of adverse health outcomes such as falls, hospital admission, longer length of hospital stay, loss of independence, an increased need for care, and earlier death<sup>1</sup>.

Resistance exercise has been established as an evidence-based, effective intervention for treating sarcopenia and frailty<sup>2</sup>. However, we know that even when sarcopenia or frailty are diagnosed, older people with these conditions often do not receive this effective treatment.

Survey work undertaken in 2019 by the British Geriatrics Society (BGS)<sup>3</sup> found that although exercise interventions are being offered, the content of these interventions varied significantly, with the majority focusing on falls prevention and balance training rather than on the resistance exercise known to provide the most benefit to people with sarcopenia and frailty. Even in those programmes focused on addressing sarcopenia and frailty, resistance training was offered in only two-thirds of programmes. Outcome measures were related in the most part to falls rather than to assessment of muscle strength.

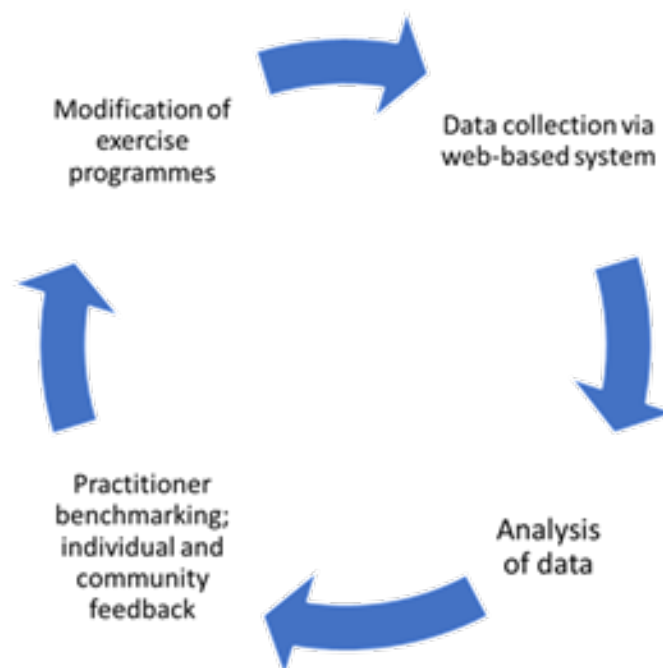
These results highlight that current practice does not reflect the existing evidence base and that we need to improve what we deliver and how we monitor exercise programmes for people living with sarcopenia or frailty.

1. Cruz-Jentoft AJ, Sayer AA. *Lancet* 2019;393:2636-2646
2. Hurst C et al. *Age Ageing*. 2022;51:afac003. doi: 10.1093/ageing/afac003
3. Witham M et al. *J Frailty Sarcopenia Falls* 2020;5:17-23

## The aim of BEPOP

BEPOP aims to develop and implement a UK-wide **benchmarking and feedback system** to determine and promote the exercise training characteristics that are most associated with positive outcomes for older people living with sarcopenia or frailty.

By highlighting which features of exercise programmes are associated with better outcomes, BEPOP will provide the data that practitioners need to refine and optimise their local exercise programmes. Data comparing different services (benchmarking) has been a powerful driver for quality improvement in other areas of clinical practice, such as hip fracture care, and can help build the business case for service improvement both locally and nationally.



**Figure 1. The BEPOP improvement cycle**

We envisage that multiple rounds of data collection and feedback will enable a virtuous circle of continuous quality improvement, as illustrated in Figure 1. By taking part in future waves of data collection, participating services can demonstrate ongoing and sustainable improvements to their services at a local level. This report presents data from Wave 1 of BEPOP data collection and we are planning further rounds of data collection from an ever-widening number of participating services across the UK.

## Overview of project methods

### Participating services selection

Services providing community-based exercise interventions to older people living with sarcopenia (probable or confirmed) and frailty across the UK were invited to participate in the project.

Fifty-two expressions of interest, including descriptions of services, were reviewed by the BEPOP team against the following exclusion criteria:

- Services which were based outside the NHS
- Services which were based in inpatient settings
- Services offering disease-specific interventions (for example cardiac rehabilitation, post-stroke rehabilitation)
- Post-operative rehabilitation services
- Early supported discharge services
- Services which were primarily focussed on interventions specifically for falls
- Services which had closed at time of data collection
- Services operating within the same NHS Trust as another participating service and which covered a similar population
- Information provided was insufficient to determine suitability to participate

Following this, 26 services were invited to participate, of which 12 were able to obtain local Caldicott Guardian approval to participate. During the data collection period, two of these services did not submit any data.

### Governance

Although no patient-identifiable data were transferred outside participating Trusts, we encouraged each participating service to discuss the need for Caldicott approval with their local Caldicott Guardian. Caldicott guardians provide oversight on the use of person-identifiable information within an organisation, ensuring that this is used legally and appropriately, in keeping with the eight Caldicott Principles.

We provided sample documentation to help with Caldicott Guardian applications including descriptions of the BEPOP project, lists of data to be collected, and explanations of why BEPOP is a service improvement project and not a research project. The majority of services required Caldicott approval; some were unable to take part because local information governance offices interpreted the project as being research rather than service improvement.

### Identification of individuals for data reporting

Services were asked to identify twenty individuals consecutively referred to their service meeting the following criteria:

1. Aged 65 years or over

2. Exercise intervention to be delivered in an outpatient/community-based setting
3. Not referred for a disease-specific intervention (for example pulmonary or cardiac rehabilitation); patients referred because of falls as part of the reason for referral could be included
4. Not referred for rehabilitation or early supported discharge following a stroke diagnosis
5. Not referred for rehabilitation post-operatively

No checks were performed at participating services to determine whether individuals were consecutive.

### Data collection

Data collection was launched on 18<sup>th</sup> October 2021. Participants entered data into a RedCAP electronic data collection system held by Newcastle Hospitals NHS Trust. No identifiable data were uploaded to the RedCAP system. Each patient was assigned a unique identifier and the analysis team were unable to access patient names, dates of birth, addresses, or other identifying variables.

For this wave of data collection, we asked participants to upload initial descriptive information on each patient contemporaneously during their exercise interventions from the time of their first assessment to completion.

Data were collected on the following domains:

- Baseline demographic data
- Initial assessment including means of assessing muscle strength
- Details of prescribed exercise intervention including modalities of exercise training, method of delivery, and planned duration of intervention.
- Review and re-assessment of the patient during the course of the prescribed exercise intervention
- Post-intervention review and assessment including reasons for discontinuation

### Data analysis

Data were checked and cleaned in Newcastle by the BEPOP analysis team before exporting from RedCAP as comma separated variable files. Simple descriptive analyses were performed using Microsoft Excel and additional statistical analyses were performed using SPSS version 25 (IBM, New York, USA).

Waterfall plots were used to present comparative data between sites. Individual sites are not identified on these plots; the site number on each graph refers to the order of sites on the waterfall plot and does not identify the site – the same number refers to different sites on different graphs to preserve site anonymity.



### Qualitative research data collection and analysis

We approached and invited all therapists involved in the project to take part in a semi-structured interview. The aim of this qualitative work was to explore and understand participating therapists' roles and experiences of being involved in BEPOP.

Interviews were conducted by a member of the BEPOP core team experienced in qualitative interviewing (SA). Each participating therapist gave verbal consent to be interviewed and they were all carried out remotely, via telephone or video conferencing. We used a flexible topic guide with prompts (*Appendix A*) to encourage therapists to tell us about why they agreed to take part in BEPOP, the training provided, their perceptions of what the project is trying to achieve, their overall experiences of collecting and entering data and the impact on their clinical work. All interviews were audio recorded, transcribed verbatim and checked for accuracy.

Transcripts were organised using QSR NVivo 12. Based on Braun & Clarke's\* six-phase framework, thematic analysis was used to identify important and interesting patterns across the data to derive themes.

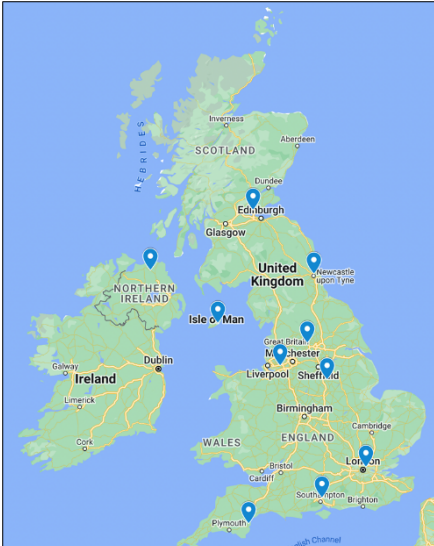
\*Braun V, Clark V. Using thematic analysis in psychology. Qual Res Psychol 2006;3:77-101.

## Results – quantitative

### Participating services and patient description

Ten services providing community-based exercise interventions to older people contributed data to wave 1 of BEPOP (Table 1).

**Table 1. Participating services in BEPOP wave 1**

Armour Complex, Ballymoney	
Belsay Unit, Newcastle upon Tyne NHS Foundation Trust	
Bradford Teaching Hospitals Foundation Trust	
Community Adult Therapy Service, Isle of Man	
Integrated Independence Team, London Borough of Hackney	
Mansfield Community Hospital	
Southern Health NHS Foundation Trust	
Torbay and South Devon NHS Foundation Trust	
Warrington and Halton Teaching Hospitals NHS Foundation Trust	
Whitefield Assessment and Rehabilitation Centre, Edinburgh	

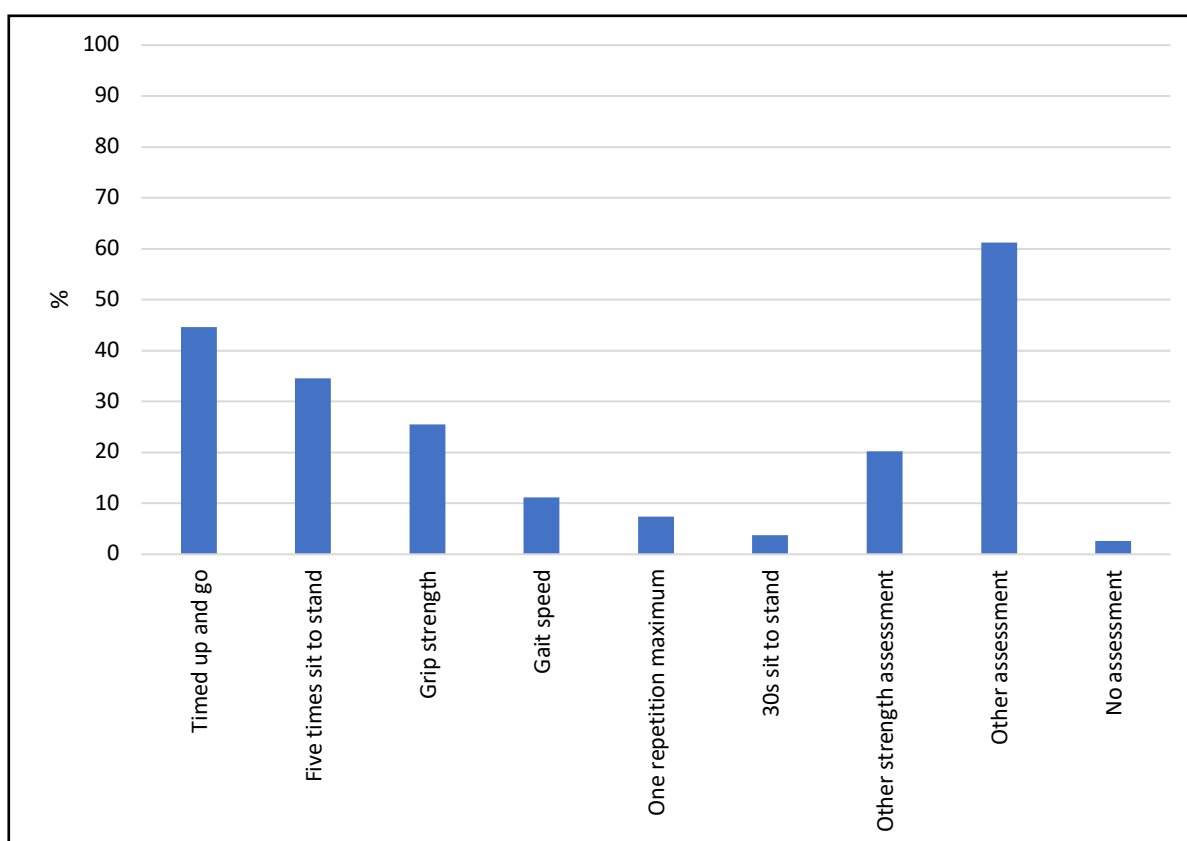
Data on a total of 188 individuals were collected between 18<sup>th</sup> October 2021 and 27<sup>th</sup> September 2022. Descriptive data for these individuals are presented in Table 2:

**Table 2. Details of individuals included in BEPOP Wave 1 analysis**

Mean age (years) (range)	80 (60 to 101)	
Female sex (%)	110 (59)	
Living in own home (%)	155 (92)	
Reason for referral (%):	Falls prevention	150 (80)
	Improve physical performance	143 (76)
	Mobility assessment	93 (50)
	Improve sarcopenia/frailty	67 (36)
	Other	5 (3)
Mean Rockwood Clinical Frailty Scale (range)	4.8 (1 to 7)	
Diagnosis of sarcopenia made before referral (%)	32 (17)	

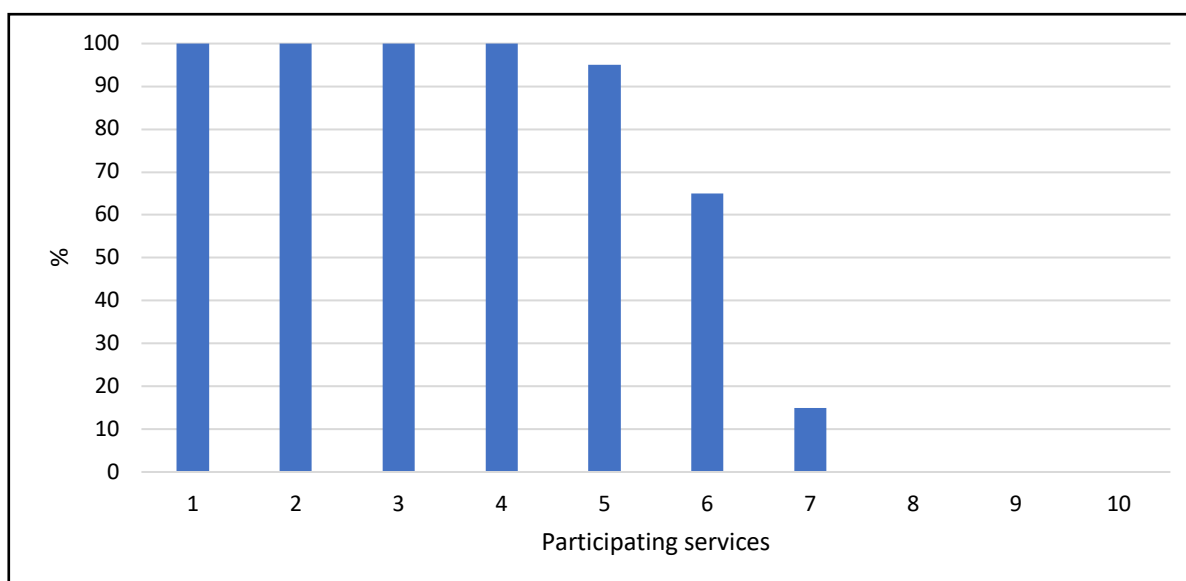
## Baseline assessments

Figure 2 shows the percentage of individuals assessed at baseline and the range of different strength-based assessment methods. Many individuals were assessed using more than one method, with a high percentage of individuals undergoing non-strength based assessments (e.g. Tinetti score or Berg balance score, labelled as 'other' on this graph), which reflects the large number of older people referred for exercise interventions for fall prevention. Other subjective assessments of strength, such as the Oxford Scale, were also employed.



**Figure 2: Baseline assessment methods**

Figure 3 demonstrates the percentage of individuals who received any assessment using an objective strength-based assessment method at baseline at each participating service. Overall, 115 (61%) individuals received at least one objective strength-based assessment of physical performance, such as grip strength, timed up and go (TUG) test, gait speed assessment, one-repetition maximum, five times sit-to-stand test, and 30 second sit-to-stand test.



**Figure 3: Percentage of individuals undergoing any objective strength-based assessment method at baseline by participating service.**

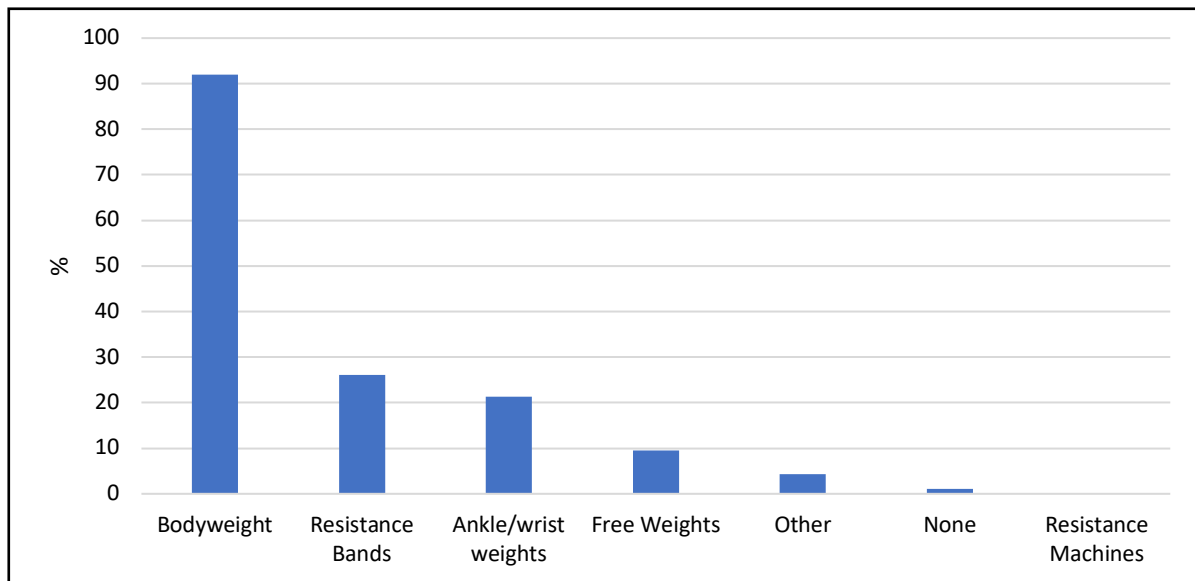
### Exercise Delivery

Table 3 shows the planned frequency and duration of prescribed exercise interventions. The majority of individuals were reviewed on average once a week with a quarter being reviewed less frequently. Self-directed (i.e. unsupervised) practice made up the majority of sessions prescribed (n=1771, 64%). Of sessions involving contact with a member of the prescribing team, sessions were delivered face to face in 88% of cases with 55% of these being individual sessions and 45% being group sessions. The remaining 12% of contact sessions were delivered remotely (by telephone or video). 29% of individuals did not complete the prescribed exercise intervention as planned with illness being cited as the most common reason (n=27, 55%).

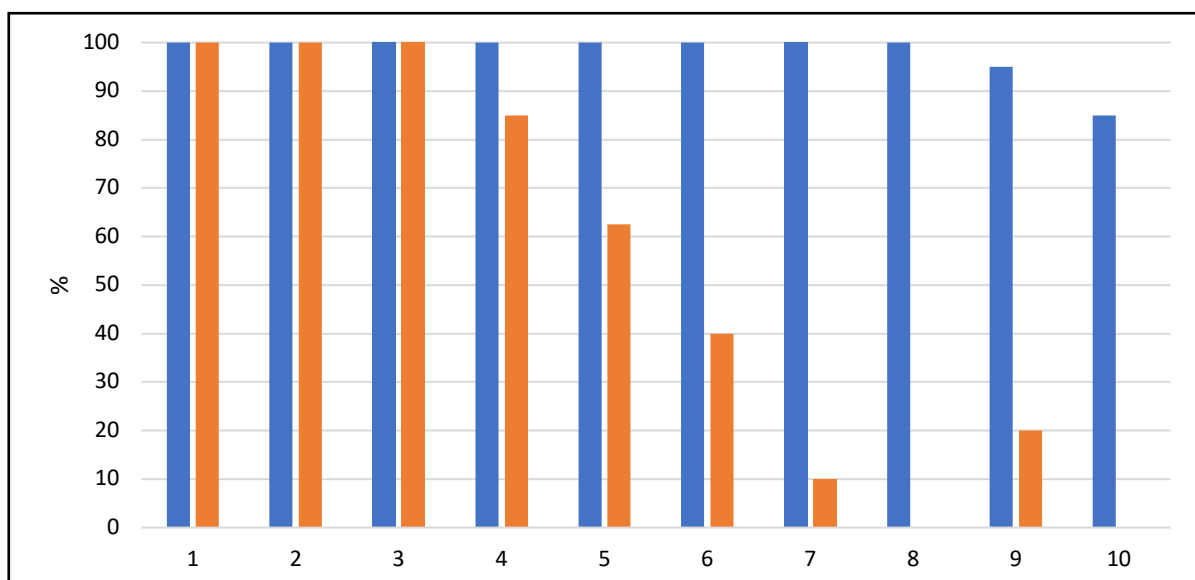
**Table 3: Details of exercise session frequency, duration, and delivery route**

Frequency of contacts (%)	Less than once a week	25.5
	Once a week	63.8
	Twice a week	8.5
	More than twice a week	2.1
Median planned duration of intervention (weeks) (range)		8 (4 to 14)
No. of sessions delivered face to face (excl. self-directed practice) (%)		865 (88)
Median number of sessions delivered face to face per patient (range)		4 (0 to 23)
Number who discontinued prior to end of planned programme (%)		49 (29)

Figure 4 shows the methods of resistance exercise training prescribed across the cohort. Almost all services included some element of resistance exercise training in the prescribed exercise programmes (Figure 5). Bodyweight resistance training exercises were the most commonly prescribed method of resistance training (n=173, 92%). For 82 individuals (45%) this was the only modality of resistance exercise prescribed. 98 individuals (52%) were prescribed an additional element of resistance exercise, most commonly exercises involving the use of resistance bands (n=49, 26%) or ankle/wrist weights (n=40, 21%).



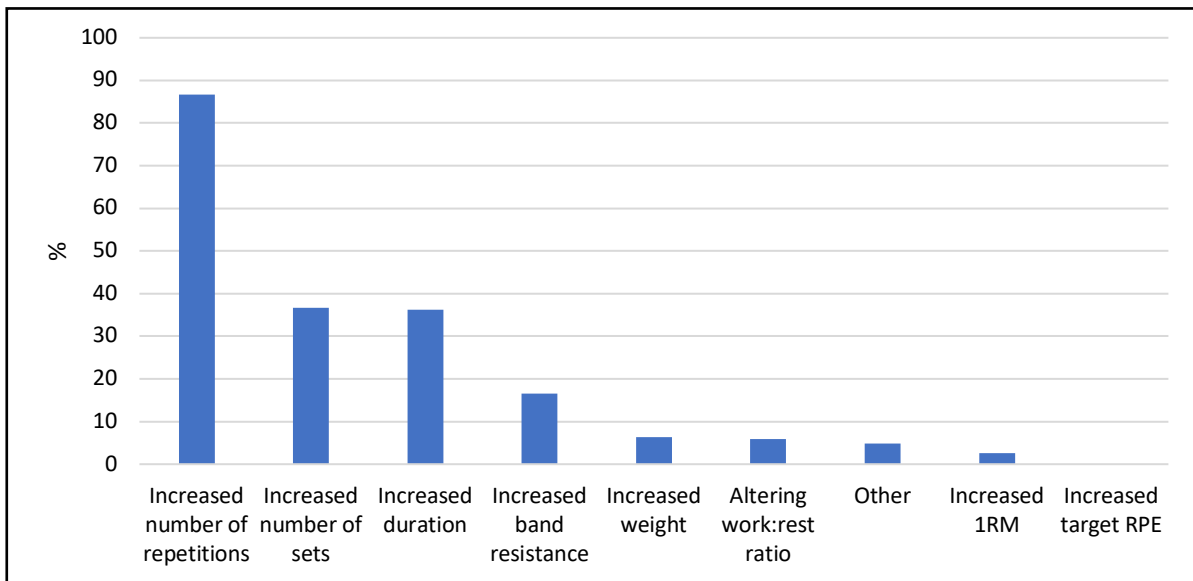
**Figure 4: Methods of resistance exercise training prescribed**



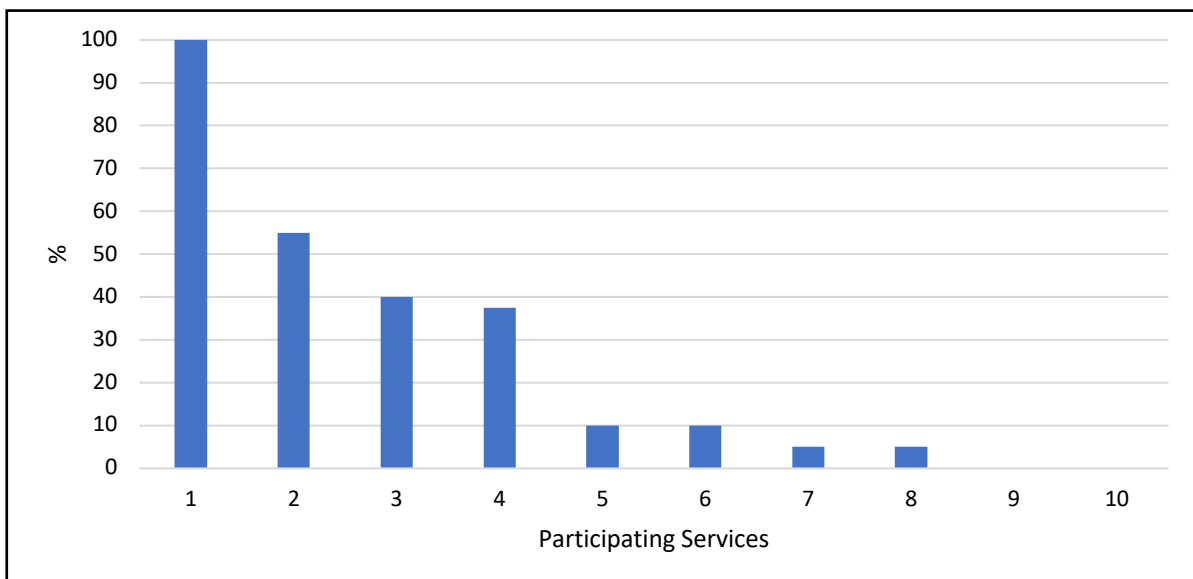
**Figure 5: Percentage of individuals by participating service whose exercise prescription included any resistance exercise (blue) and non-bodyweight resistance exercise (orange)**

## Exercise Progression

Figure 6 shows methods used to progress resistance exercises. Most individuals had resistance exercise training progressed by an increase in volume; 163 (86%) via an increased number of repetitions, 69 (37%) by increased number of sets, and 68 (36%) by increased duration. However, only 48 (26%) were progressed via an increase in intensity, such as by an increase in weights used, greater resistance band, or progression based on one-repetition maximum. Figure 7 shows the differences between participating services in the percentage of individuals whose resistance exercises were progressed by intensity.



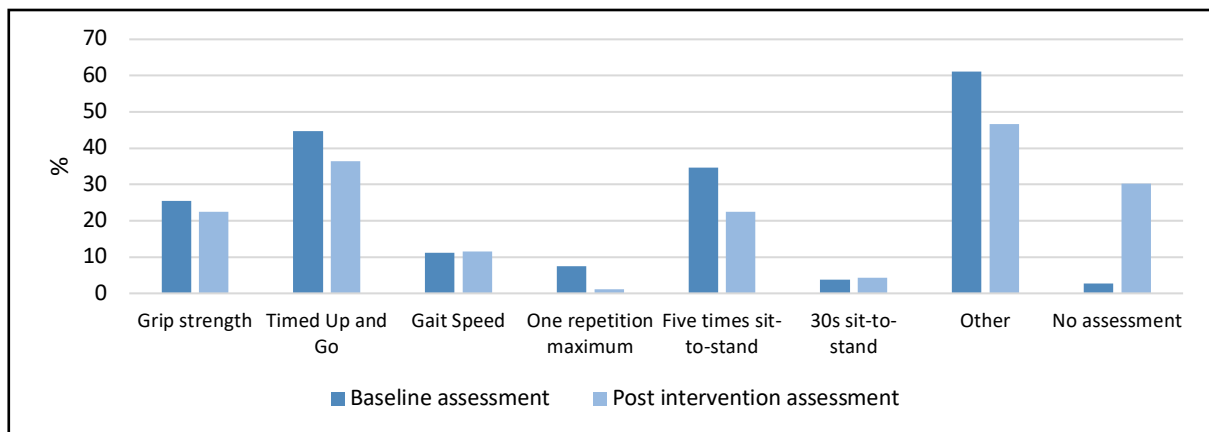
**Figure 6: Methods of progressing resistance exercise training**



**Figure 7: Percentage of individuals whose resistance exercise prescription was progressed by intensity**

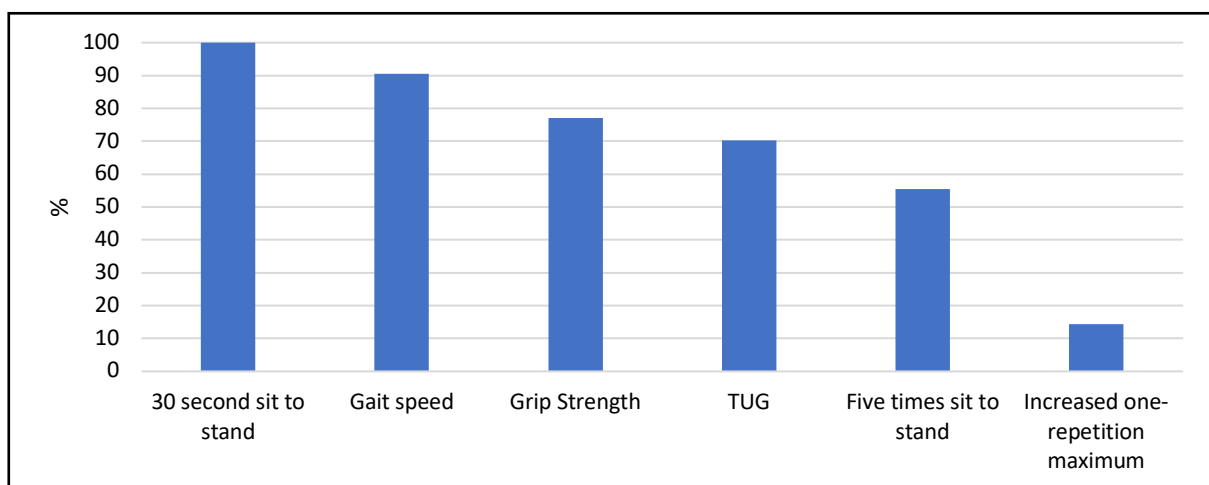
## Post-intervention assessment and outcomes

Post-exercise intervention assessment data were submitted for 165 individuals as shown in Figure 8. Across almost all methods of assessment, rates of assessment following an intervention were lower than at baseline. 50 individuals (30%) had no assessment following completion of the prescribed exercise programme.



**Figure 8: Percentage of individuals who received re-assessment following completion of exercise intervention by assessment method.**

Rates of paired outcome assessment, using the same assessment method before and after an exercise intervention, varied across assessment methods as demonstrated in Figure 9. All individuals who performed the 30-second sit-to-stand test at baseline underwent the same test after completion of the prescribed exercise intervention but other baseline tests had lower rates of paired completion.



**Figure 9: Percentage of individuals who had a paired outcome assessment (before and after intervention), using an objective strength-based assessment method**

## Factors associated with greater improvement in strength-related measures

The wide range of outcome measures used, and incomplete post-intervention measurement data make it challenging to analyse which aspects of exercise programme delivery are associated with greater gains from exercise programmes. We obtained a crude measure of improvement by converting changes between baseline and post-exercise measures into percentage differences for the most commonly used strength-related measures, and the relationship between a limited number of exercise programme related factors and these metrics of improvement is shown in Table 4. Differences in outcomes do not necessarily reflect differences in the effectiveness of different type of exercise progression, but are more likely to reflect differences in the progress of the individuals concerned – i.e. those who are doing well are more likely to be given more repetitions or sets than those who are struggling to complete the starting level of exercise.

**Table 4: Association between exercise programme characteristics and outcomes**

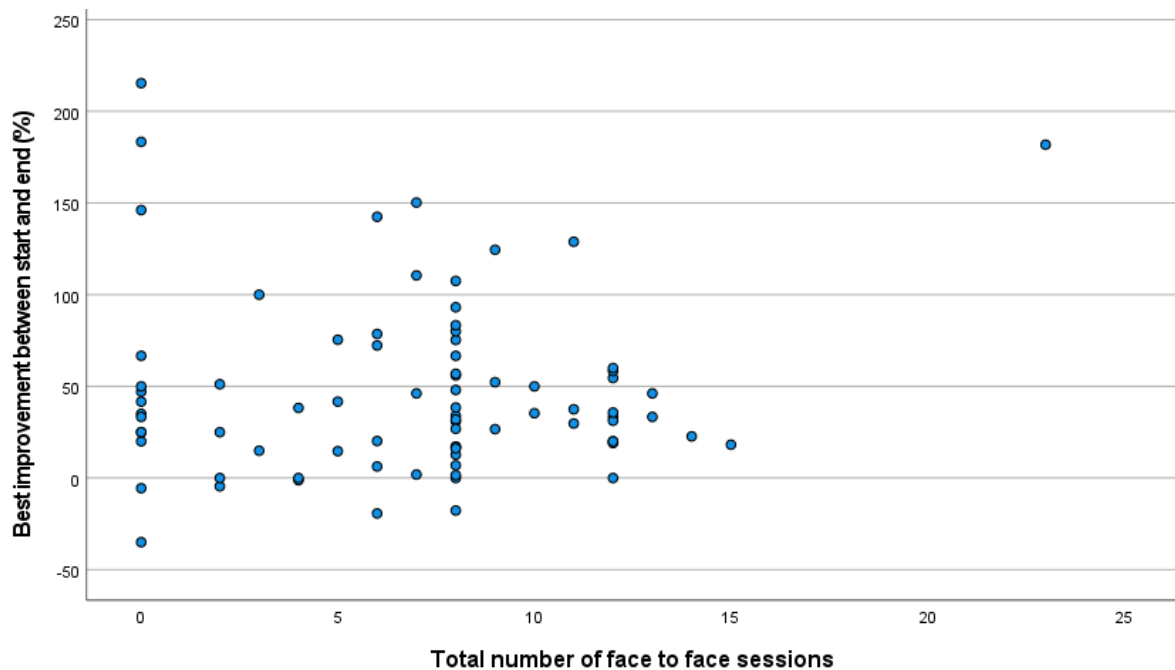
Characteristic	% improvement* (median, IQR)	P
<i>Frequency face to face:</i>		
Less than once a week (n=11)	33 [23 to 46]	-
At least once a week but less than twice a week (n=67)	35 [18 to 60]	0.71
Twice a week or more (n=3)	79 [30 to 89]	0.77
<i>Completed exercise plan as scheduled (n=74)</i>		
Completed exercise plan as scheduled (n=74)	36 [20 to 73]	0.11
Discontinued before end of scheduled exercise plan (n=8)	20 [0 to 51]	
<i>Progression:</i>		
No progression of intensity or volume (n=2)	13 [0 to 25]	-
Progression of number of reps (n=76)	37 [20 to 70]	0.03
No progression of number of reps (n=6)	12 [0 to 25]	
Progression of number of sets (n=27)	47 [25 to 129]	0.02
No progression of number of sets (n=55)	32 [16 to 55]	
Progression of duration (n=30)	33 [17-58]	0.60
No progression of duration (n=52)	36 [18 to 75]	
Any progression of volume (reps, sets or duration (n=79)	35 [18-67]	0.38
No progression of volume (n=3)	25 [13 to 36]	
Progression of intensity (n=25)	36 [20 to 56]	0.67
No progression of intensity (n=57)	34 [17 to 69]	

\*best improvement from grip strength, gait speed, 5x sit to stand, 30s sit to stand or timed up and go. 5xSTS and TUG times converted to reciprocals before analysis

Figure 10 shows the association between the number of face-to-face sessions and the percentage change in strength-related measures. Total sessions were closely related to face to face sessions and were therefore not analysed separately. No significant association was



seen between the number of sessions and the percentage improvement in strength-related measures; the correlation coefficient (Spearman's rho) was 0.07 (p=0.53).

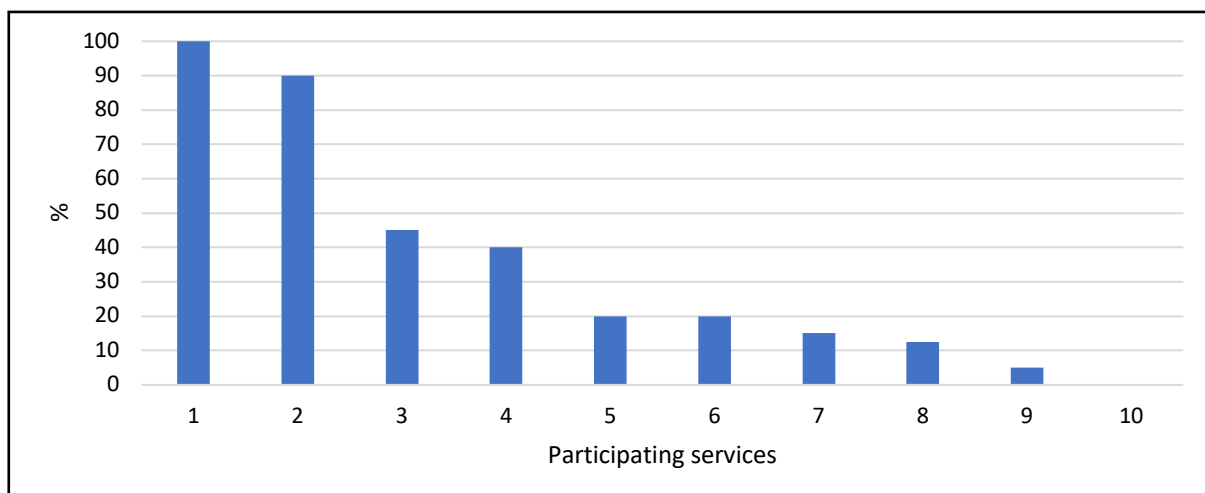


**Figure 10: % improvement\* vs total number of face-to-face therapy sessions**

\*best improvement from grip strength, gait speed, 5x sit to stand, 30s sit to stand or timed up and go. 5xSTS and TUG times converted to reciprocals before analysis. NB. Outlier (900% improvement) omitted from graph for clarity but included in correlation calculation

### Referral and signposting to exercise services

A total of 68 (41%) individuals were signposted or referred on to further exercise services following completion of the prescribed exercise intervention. Figure 11 shows how this metric varied between services.



**Figure 11: Percentage of individuals signposted or referred on to further services after the end of exercise intervention**

## Results – qualitative

### Participants

Seventeen clinicians from 10 services were invited to take part in the qualitative interview study. Eight agreed to be interviewed from five different services, one declined due to lack of time, and eight did not respond. Five of the clinicians were qualified physiotherapists and two were rehabilitation assistants. Six interviews were conducted via Microsoft Teams and two over the telephone. Mean duration of the interviews was 30 minutes (range 18 to 38 minutes).

### Themes

Four overarching themes were developed from the interview data:

“Never quite knowing if we are doing the right thing”

“Are we diagnosing sarcopenia?”

“We collect a lot of that data anyway”

“It has made us think”

### *Never quite knowing if we are doing the right thing*

A key reason for wanting to participate in BEPOP was for clinicians to find out more about their own practice and reflect on their service provision in comparison to others, as well as exercise guidelines:

“I thought it would be interesting to reflect on what I’m providing; you know what my service is doing and how that measures up to the guidance” (PT5)

“We are trying to do the right thing but have no idea if what we are doing is similar, different or anything compared to other services” (PT1)

The project also raised questions for some clinicians about their skills and knowledge in prescribing strength exercises for older people:

“I just don’t think it is something that we’re terribly good at as physios. Which is bizarre because exercise is supposed to be our thing. But we’re not very well trained in strength training” (PT2)

“Is my job worthwhile... like, is it worthwhile issuing these exercises? Is it beneficial for the patient” (SRA2)

“Even as physios, a lot of us underestimate how much older people need these sorts of exercises” (PT6)

### *Are we diagnosing sarcopenia?*

In discussing exercise prescription for older people referred into the various services, it became apparent that sarcopenia is rarely given as a reason for referral. This raises the question as to whether it is being diagnosed formally, diagnosed but not recorded on referrals, or whether (like the clinicians who were interviewed), clinicians just 'think' or 'assume' that older people have it based on clinical judgement and experience:

"Sarcopenia is never given as a diagnosis but I'm sure they have it" (PT4)

"There's some people I've actually ticked that they've got sarcopenia... because I know they have... but that's just because I know they have" (PT2)

"Deconditioning sometimes... or weakness. But sarcopenia is not something that's ever really mentioned" (PT5)

### *We collect a lot of that data anyway*

The practicalities of being involved in and collecting data for BEPOP were not considered too onerous as the data we were asking for was information that was being collected routinely.

"I didn't really find it any extra work because I needed that information anyway" (SRA2)

"it's part of the stuff we do on a normal day-to day basis...the data we collect, we're now collecting for BEPOP" (PT1)

However, some of the clinicians felt that the format of some of the questions was not particularly user-friendly:

"One thing that has been difficult to interpret onto the form is the frequency of sessions. There is no option for less than once a week" (PT5)

And whilst the importance of objective measures was acknowledged, it was felt that the things that were important to older people were not captured:

"...but it hasn't picked up the kind of more subjective stuff. Although I'm putting in Berg's and TUGTs, what's making the difference to the patient is they can get out of a chair, they can get off the floor" (PT2)

### *It has made us think*

Although the project was not yet complete, those interviewed were keen to hear the results and share resources were possible:

"I'd be interested in knowing the other types of exercises that other people do. We have a falls leaflet that tends to be a go to for lots of exercises but there could be other exercises that are really beneficial" (SRA1)

Linked to the 'never quite knowing if we are doing the right thing' theme, being involved and having to answer our specific questions has also already made some clinicians think a little more about prescribing and progressing strength exercises for older people:

"... we prescribe an exercise programme and our assistants will do it. We haven't particularly thought about how we're going to progress people" (PT3)

"...it has highlighted the lack of strength training that we do. And I still think we still don't always prescribe it. I think we're a little too cautious" (PT5)

"Progressing resistance exercises is more in our minds than it was" (PT6)

### Summary of key findings

- Physiotherapists want guidance on best practice and recommendations for managing frailty and sarcopenia.
- There is a need to diagnose and assess sarcopenia and frailty.
- We need to ensure that we are prescribing and progressing appropriate resistance exercises.

## Discussion

Measurement is the first step towards improvement. The results from this first wave of data collection in BEPOP provide a snapshot of current UK practice in exercise prescription for older people with sarcopenia and frailty, but importantly provide site level data that we hope will empower local teams to develop their services.

No data collection exercise is perfect, but this first wave of data collection has taught us how we can refine future work. In particular, there is a need to simplify the task of gaining Caldicott Guardian approval for sites and to make data entry easier. Increasing the scale of BEPOP in future waves of data collection is likely to require dedicated, skilled administrative support if we are to maximise the ease, scale, and benefit of this work.

The multiple ways in which physical performance is measured by therapy teams presents challenges in conducting national comparisons. Future data collection would be greatly facilitated by adoption of a common set of measures which reflected strength-related physical performance. Our suggestion is that these common measures should include hand grip strength and the five times sit-to-stand test, as both of these form part of the diagnostic criteria for sarcopenia, can be done anywhere, and together provide information on both upper and lower limb function. The timed up and go is an alternative already in widespread use which would also have utility for national comparison. As highlighted in our key recommendations, retesting at the end of an exercise programme would greatly enhance the value of the data collected, by enabling us to understand which features of exercise programmes are associated with the best outcomes in practice.

There is also great heterogeneity in the way that exercise programmes are designed and delivered, and in the way that this information is recorded and reported. We hope that as BEPOP evolves, it will provide a template for how we might record key features of exercise programme delivery which reflect the key aspects of an exercise prescription. This is not to stymie either innovation or personalised programme delivery, but clear recording and alignment with the principles of exercise prescription could provide considerable benefits both for national comparison and for translating research into effective practice. It is also notable from the qualitative work that there is a disconnect between what practitioners want to do and their perceived or actual skills; bridging this disconnect needs to be a key goal for training and education, and the promotion of new guidance on resistance exercise for sarcopenia (<https://doi.org/10.1093/ageing/afac003>) and the CSP's "Stronger My Way" (<https://www.csp.org.uk/campaigns-influencing/campaigns/stronger-my-way/i-help-people-feel-stronger>) resources is necessary.

The diagnosis of sarcopenia is still not commonly made or recorded in clinical practice by any healthcare profession, and the low rates of sarcopenia diagnosis prior to referral in BEPOP support previous similar findings. There is a real opportunity here for therapists to lead improvement in this area by measuring strength based physical performance, making and recording the diagnosis of sarcopenia. Making the diagnosis provides a powerful steer to ensuring that appropriate, evidence-based therapy for sarcopenia is offered and ownership of the diagnostic process by therapists would give a strong link between diagnosis and

treatment. The widespread adoption of frailty assessment tools such as the clinical frailty scale by therapists provides a path to follow; the widespread diagnosis of frailty in recent years has influenced pathways of care, conversations about prognosis, and joint decision-making about treatment.

We would like to thank the 10 centres who contributed data to this first wave of BEPOP; It is a hallmark of high-quality services that they are willing to interrogate their practice and are constantly seeking to improve. We hope that future waves of BEPOP will include a growing number of sites; there is much that we have learned from this first wave of data collection that will enable us to refine the metrics that we seek to measure and make it as easy as possible for sites to join in and benefit.

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## The BEPOP team

The BEPOP team are:

- Lorna Caulfield: Specialist Registrar in Geriatric Medicine, South Tyneside and Sunderland NHS Foundation Trust
- Sarah de Biase: Senior Programme Manager, Long-term Conditions and Personalisation, West Yorkshire Health & Care Partnership | AGILE Falls and Bone Health Officer
- Susanne Arnold: Assistant Professor at Warwick Clinical Trials Unit, Warwick University; Chair of AGILE (Professional Network for Physiotherapists working with Older People).

- Charlotte Buckland: Frailty Clinical Specialist Physiotherapist, Newcastle upon Tyne Hospitals NHS Foundation Trust
- Christopher Hurst: Postdoctoral Research Associate in Lifestyle and Health, Newcastle University
- Philip Heslop: Postdoctoral Research Associate and informatician, Northumbria University
- Dawn A Skelton: Professor of Ageing and Health, Glasgow Caledonian University; Chair, British Geriatrics Society Rehabilitation Group
- Miles Witham: Professor of Trials for Older People, Newcastle University; Theme co-lead for Ageing, Sarcopenia and Multimorbidity, NIHR Newcastle Biomedical Research Centre
- Avan Sayer: William Leech Professor of Geriatric Medicine, Newcastle University; Director, NIHR Newcastle Biomedical Research Centre

## Appendix A: Topic guide used to conduct interviews with therapists

### **Process Evaluation: BEPOP Qualitative Interview Topic Guide**

**Aim:** Qualitative interviews using semi-structured questions to aid research team to understand participants role and experience of being a participant in BEPOP

**Target group:** aim to capture feedback from participants:

- a) working in different contexts e.g., delivering exercise for sarcopenia through different service models/care pathways and/or
- b) working with different populations (e.g., at risk versus confirmed sarcopenic)

### **Introduction**

- Interviewer to introduce themselves and recap on the aims of the interview.
- Explain what will happen during the interview.
- Discuss confidentiality.
- Ask the interviewee if they have any questions.

### **Professional experience**

1. Can you tell me a little about your clinical/professional role and your role in BEPOP?

### **Experiences of BEPOP**

1. How did you hear about BEPOP? What made you decide to participate?
  - a. *Explore what made them want to participate, if relevant.*
  - b. *Was it what you expected?*
2. What information/training were you given about BEPOP?
  - a. *Was it adequate?*
  - b. *Is there anything that you think was missing from the information/training?*
3. How would you describe BEPOP? What do you think the study is trying to achieve?
4. What was your experience of being a participant?
  - a. *What did it involve for you?*
  - b. *What did being a participant of BEPOP mean to you? Tell us how it felt to participate?*
5. What materials, investments, time etc were required of you to be a participant?
  - a. *How does BEPOP fit with your normal working methods for this patient group/your existing clinical pathways?*



- b. Did your team meet the full set of inclusion criteria for involvement? If not, why apply? If not, why do you think you were selected?*
6. What impact does recruiting and recording data for patients in the study have on the day to day running of your service?
  7. What has helped you contribute to BEPOP? Has your participation gone according to plan?
    - a. What problems did you encounter?*
  8. Can you tell me about the specific data that you were required to enter and how you go about doing it?
  9. What is your understanding of the reasons why you were asked to enter that data requested through the REDCAP data collection system?
  10. What might have made the data collection process more user friendly (or acceptable) to you/others responsible for entering the data e.g., more information; training on using REDCAP etc.
  11. Can you tell me about the data entry targets/project aims?
    - a. Did you/your team meet these? If not, why not?*
  12. Has your practice changed, or have you implemented anything new based on BEPOP since starting the study?
  13. Was else might have been done to support you participating? What changes would you make for future participants which might support more participation?

### **Closing and thanks**

1. Is there anything else you'd like to tell me about your experiences of BEPOP?
2. Conclude the discussion and thank the participant for their time and contribution.