






OPEN ACCESS

Measuring older people's socioeconomic position: a scoping review of studies of self-rated health, health service and social care use

Gemma Frances Spiers ¹, Jennifer E Liddle,¹ Daniel Stow ², Ben Searle,¹ Ishbel Orla Whitehead,¹ Andrew Kingston,¹ Suzanne Moffatt,¹ Fiona E Matthews,¹ Barbara Hanratty ¹

► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/jech-2021-218265>).

¹Faculty of Medical Sciences, Newcastle University, Newcastle upon Tyne, UK

²Population and Health Sciences Institute, Newcastle University, Newcastle upon Tyne, UK

Correspondence to

Dr Gemma Frances Spiers, Newcastle University Faculty of Medical Sciences, Newcastle upon Tyne NE4 5PL, UK; gemma-frances.spiers@newcastle.ac.uk

Received 18 October 2021

Accepted 17 February 2022

Published Online First

15 March 2022

ABSTRACT

Background The challenges of measuring socioeconomic position in older populations were first set out two decades ago. However, the question of how best to measure older people's socioeconomic position remains pertinent as populations age and health inequalities widen.

Methods A scoping review aimed to identify and appraise measures of socioeconomic position used in studies of health inequalities in older populations in high-income countries. Medline, Scopus, EMBASE, HMIC and references lists of systematic reviews were searched for observational studies of socioeconomic health inequalities in adults aged 60 years and over, published between 2000 and 2020. A narrative synthesis was conducted.

Findings One-hundred and thirty-eight studies were included; 20 approaches to measuring socioeconomic position were identified. Few studies considered which pathways the chosen measures of socioeconomic position intended to capture. The validity of subjective socioeconomic position measures, and measures that assume shared income and educational capital, should be verified in older populations. Incomplete financial data risk under-representation of some older groups when missing data are socially patterned. Older study samples were largely homogeneous on measures of housing tenure, and to a lesser extent, measures of educational attainment. Measures that use only two response categories risk missing subtle differences in older people's socioeconomic circumstances.

Conclusion Poor choice of measures of socioeconomic position risk underestimating the size of health inequalities in older populations. Choice of measures should be shaped by considerations of theory, context and response categories that detect subtle, yet important, inequalities. Further evidence is required to ascertain the validity of some measures identified in this review.

used in the health inequalities literature. However, some advocate for position, because status poorly distinguishes between economic resources (eg, income, wealth, education) and social prestige.³ While there is no consensus on this distinction and both continue to be used, we use the term socioeconomic position in recognition of this push for clarity.

Measuring socioeconomic position is challenging. Health inequalities are shaped by a complex interplay of material (eg, financial resources), psychosocial (eg, social and emotional support networks) and behavioural (eg, health behaviours) pathways linked to a person's socioeconomic circumstance across the life course.^{3 4 6} Measures are wide-ranging,⁷ but not interchangeable.⁸ Some measures may be more relevant than others depending on which of these pathways, hypothetically, underpin unequal health outcomes.⁴ Given the different ways that (dis)advantage manifests, socioeconomic circumstances can be measured at the level of the individual, family, household or area. The relevance and fit of measures will also change depending on life stage, while the cumulative effect of (dis)advantage over time is also a critical consideration when choosing measures. Some measures will align to economic capital, and others to social capital, yet even these dimensions are multifaceted. As Galobardes *et al* note, no single measure captures the entire breadth of the influence exerted by a person's socioeconomic position at each point in their life.⁹

In older populations, measuring socioeconomic position accrues additional complexity.¹⁰ Many measures are designed for working-age populations and lack relevance for older people.¹¹ Historic differences between men and women in educational and workforce participation make some measures prone to gender bias.^{12 13} Others have noted that a majority in some older cohorts—particularly in the UK—are home owners.¹⁰ Home ownership is an important source of wealth in older populations, yet this measure may identify very little variation if owning a home is widespread. Furthermore, home ownership can mask huge variations in house value, which may be a more sensitive marker of socioeconomic differences than ownership alone. Similar observations have been made for educational attainment, where the majority of older people in the UK have similar levels of education. As Grundy and Holt note, a

BACKGROUND

Socioeconomic status is a construct that reflects a person's economic circumstances and their social capital relative to that of others.¹ The concept is central to understanding health inequalities,^{2 3} where a gradient describes differences in health outcomes between the least and most advantaged.⁴ Both socioeconomic status and position are



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY. Published by BMJ.

To cite: Spiers GF, Liddle JE, Stow D, *et al*. *J Epidemiol Community Health* 2022;**76**:572–579.

measure of educational attainment may identify only the most advantaged. Whether these measures are sufficient to identify variation in socioeconomic circumstance is therefore questionable. To enable a judgement on this, evidence is needed about the extent to which study populations—including those beyond the UK—vary on these indicators.

Concerns have also been raised about the ease of collecting financial data from older people who may have numerous income sources, such as multiple pensions, savings and age-specific state welfare support (eg, Attendance Allowance in the UK, Medicare in the USA).^{10–14} Certainly, some evidence suggests that missing income data are more likely for households with more income sources.¹⁵ Thus, while challenges of collecting financial data are not specific to older groups, the complex income sources at older age is an important consideration and a potential limitation of income-related metrics.

A further consideration is the greater risk of cognitive impairment (mild or otherwise) in older groups, which may impact recall. This is a potential limitation to data collected from a number of socioeconomic measures, but perhaps more so for measures that require more information, such as income sources.

For older populations living in care homes, some measures become even more challenging to implement. Home ownership, for example, is an important source of wealth. Yet for those who have sold their assets to fund care, being classed as not a home owner potentially misrepresents that dimension of their economic circumstance. Similarly, income sources may be challenging to document for people living in care homes where some income is paid directly to the care provider.

Perhaps most critically, many measures of socioeconomic position risk overlooking economic resources accumulated over the life-course. Accrued economic capital, such as housing wealth (for home owners) and other long-term held assets, is important because (dis)advantage accumulates over time.¹¹ Measures that differentiate between those with and without such accrued capital will therefore be particularly advantageous in identifying health inequalities in later life. Accumulated (dis)advantage in later life should not, however, be considered a resultant endpoint for working-age inequalities, with welfare policies also shaping older people's socioeconomic circumstance.¹⁶

The need for review

The challenges of measuring socioeconomic position in older populations were first set out by Grundy and Holt.¹⁰ Two decades later, the question of how best to measure socioeconomic position in older populations remains pertinent. As people live longer with greater levels of disability,^{17–20} understanding and preventing health inequalities in ageing populations remains critical. Revisiting this issue is important and timely.

This work aimed to (1) identify which measures of socioeconomic position have been used in studies of older people's health inequalities and (2) critically appraise the application of these measures in older populations.

METHODS

A scoping review was used to address the aims of this work. Scoping reviews map evidence in relation to a defined question or topic using systematic searches, criteria, selection process, data coding and synthesis.^{21–23} We outline the methods below according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews Checklist.²⁴

Search strategy

A search strategy was developed, tested and refined based on two concepts: socioeconomic position and older people (see online supplemental material 1).

Searches were conducted in Medline (OVID Medline and In-Process & Other Non-Indexed Citations), Scopus, EMBASE (OVID) and Health Management Information Consortium (OVID), on 24 September 2020, and limited to publications from 2000. We also checked the reference lists of relevant systematic reviews,^{25–26} and the publications of authors known to have carried out work on this topic.

Review criteria

Observational studies were included if they examined a measure of socioeconomic position in relation to a health, health service use or social care use outcome in populations aged 60 years and over (table 1). Both populations living in the community or care homes were eligible. To identify new approaches to quantifying older people's socioeconomic position, measures were not predefined for the review.

Due to the wide variation in terminology used,⁹ it was not necessary for eligible studies to explicitly refer to such measures as 'socioeconomic status' or 'position'. Rather, eligible studies must have examined socioeconomic inequalities in outcomes relating to health, health service utilisation and social care utilisation. Self-rated health was selected as an exemplar health outcome: it is one of the strongest indicators of health,²⁷ consistently predicts mortality, including in older age groups,^{28–29} and has a high level of predictive power across the socioeconomic spectrum.^{30–31} Health service utilisation included any primary or secondary service utilisation (eg, general practice contacts, hospital admissions). We did not include studies that focused on individual aspects of the content of care, such as medications or surgical procedures. Social care or long-term care use utilisation included admission to or stays in care homes with or without nursing, and use of community based services such as home care or day centres.

Studies published before 2000 were excluded to ensure only contemporary measures were identified. Translation of non-English studies risked loss of meaning and accuracy in terminology used to describe socioeconomic position. Thus, studies not published in the English language were excluded. Finally, additional complexities of measuring socioeconomic position in low and middle income countries,³² which would require specialist searches, warranted the inclusion of studies only from Organisation for Economic and Co-operative Development (OECD)-listed high-income countries.³³

Study selection

Records were managed in Rayyan (<https://rayyan.qcri.org>), an online platform to assist screening for reviews.³⁴ Titles and abstracts of records were screened for relevance by two researchers (GFS, DS, JEL, IOW and BS), with conflicts resolved through discussion. The full texts of selected records were obtained and assessed against the review criteria by one researcher (GFS), with 35% assessed by a second researcher (DS and JEL).

Data extraction and synthesis

A data extraction form was developed and piloted using Excel, and relevant study information summarised. A narrative synthesis was conducted,³⁵ where evidence was interrogated to address five questions (box 1).

Table 1 Review criteria

	Inclusion	Exclusion
Population	<ul style="list-style-type: none"> ▶ Aged 60+ years. ▶ If sample include those aged less than 60 years, only studies presenting data separately for those aged 60+ are eligible. ▶ No limits were placed on setting/residence (eg, community dwelling, care home populations). 	
Exposure	<ul style="list-style-type: none"> ▶ Any measure of socioeconomic status/position/circumstance, including but not limited to: education, wealth, financial/material resources, income, net wealth, assets, area deprivation, housing tenure, occupational classification. ▶ Measures do not need to be explicitly described as 'socioeconomic'. ▶ Composite measures (ie, combining multiple indicators) are eligible. ▶ Subjective (eg, financial strain) or objective measures (eg, net wealth). 	<ul style="list-style-type: none"> ▶ Socioeconomic status/position measured in childhood.
Outcome	<ul style="list-style-type: none"> ▶ Self-rated health. ▶ Any primary or secondary health service utilisation. ▶ Any social care or long-term care use utilisation including care homes with or without nursing, and community-based services such as home care or day centres. ▶ Outcomes must be examined in relation to a measure of socioeconomic position (see exposure, above) 	<ul style="list-style-type: none"> ▶ Health service use does not include treatment, surgery or medication use.
Study design	<ul style="list-style-type: none"> ▶ Observational. ▶ English language studies. ▶ Published from 2000. ▶ Published in OECD-listed high-income countries. 	<ul style="list-style-type: none"> ▶ Commentaries, literature reviews (unless relevant for reference checking)

OECD, Organisation for Economic and Co-operative Development.

Quality assessment

An assessment of study quality and bias is important when making a judgement about the confidence and reliability of evidence. The purpose of this review was to identify and appraise measures of socioeconomic position used in older populations, and was therefore focused on methodology. The review did not synthesise evidence about the relationship between socioeconomic position and the specified outcomes. An assessment of study quality was therefore unnecessary to meet the review's objectives.

FINDINGS

One hundred and thirty-eight studies met the review criteria (figure 1 and online supplemental table S1, online supplemental materials 1 and 2). Twenty approaches to measuring socioeconomic position were identified (table 2). Fewer than half of the measures used hierarchical response categories (46.8%), from which to assess a gradient (table 3).

In this section, we present findings according to the data interrogation questions that guided the synthesis (box 1).

What are the strengths and limitations of measures of socioeconomic position in older populations?

Online supplemental table S2 summarises the strengths and limitations of applying each identified measure to older populations. This builds on the challenges set out previously,¹⁰ and

Box 1 Questions addressed in narrative synthesis

1. What measures of socioeconomic position are used in studies with older populations?
2. What are the strengths and limitations of using each measure with older populations?
3. Are measures grounded in theory and justified for use in older populations?
4. Are older populations homogeneous on measures of educational attainment and housing tenure?
5. Were there any reports of difficulties collecting financial data?

highlights additional considerations. From this appraisal, we summarise three issues that have not been previously explored in relation to measuring socioeconomic position in older populations and which warrant further scrutiny.

Subjective socioeconomic position

These measures reflected older people's self-assessed satisfaction with economic circumstance, perceived adequacy of income or economic resources and perceived financial security, strain and problems. Applied to older populations, a subjective measure could overcome the challenges of collecting financial data that

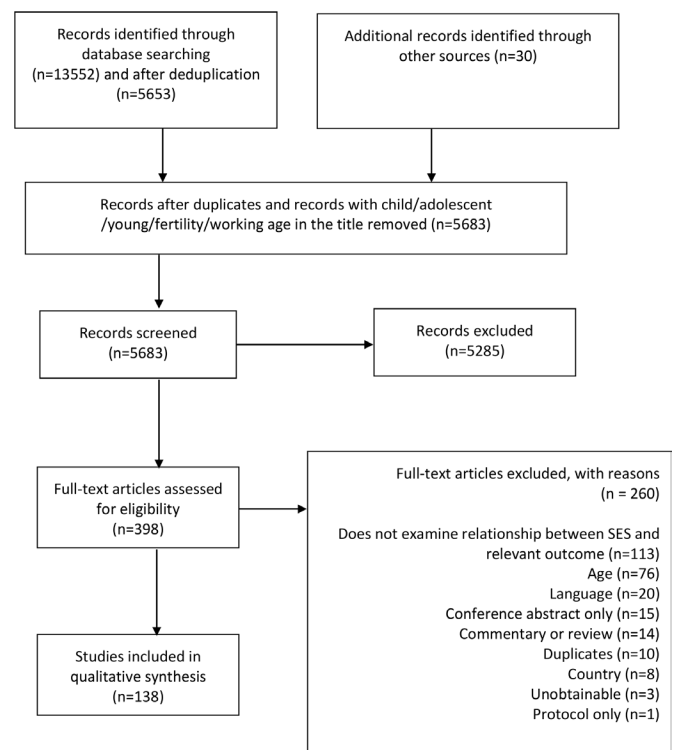


Figure 1 PRISMA Flowchart. SES, socioeconomic status.

Table 2 Measures of socioeconomic position in studies with older populations

Type of measure	No of studies using type of measure*,†
Education	86
Objective income	71
Employment/occupational classification	25
Housing tenure	22
Subjective assessment of economic circumstance	19
Area deprivation or other area level measure	16
Wealth/assets‡	14
Household material deprivation	4
Health insurance status	4
House value	3
Composite measure comprising 2+indicators	3
Car ownership	2
Geography profile of residence	2
Living arrangements§	2
Proportion of life working part time	1
Marital status§	1
Perceived access to healthcare§	1
Out of pocket payments for healthcare	1
Poverty income ratio	1
Poverty threshold status	1

*Number of studies not mutually exclusive as studies often used multiple measures.
†Figure does not represent the total number of *measures* as some studies used multiple versions of one type of measure (eg, two types of area deprivation measure).
‡Some measures were net (ie, accounted for debt and outgoings).
§Described as socioeconomic measures but their relevance to socioeconomic position unclear in publication.

may be sensitive and/or wide-ranging. However, older people tend to rate their economic situation better than it objectively appears.³⁶ Subjective assessments of economic circumstance may also be compounded by the health of the individual. Furthermore, subjective ratings depend on whom people use as a reference for comparison, which could change over time and between circumstances. Thus, while a subjective assessment may be an attractive option for measuring socioeconomic position in older populations, evidence is needed to ascertain the validity of this approach.

Incorporating others' income in measures

Income was measured at the level of the individual, family or household. Measures of household or family income may reflect two circumstances: cohabiting older couples and older people living with younger family members. In the latter circumstance, a measure of household or family income assumes that an older person benefits from this shared resource, thus enhancing their position of advantage. However, the reverse is also possible. Other household and family members may benefit from the income of older family members, thus potentially depleting this resource and lowering their level of advantage. Income sharing within households is complex, influenced by who is the primary earner, family type, power dynamics and consumption levels.^{37–40} The extent to which an older person may or may not benefit, if at all, from others' incomes may therefore be highly variable.

Household educational attainment

While most studies measured the older person's attainment, two studies measured the highest educational attainment within the household. Study authors argued that older members of the household could benefit from potentially greater levels of education of other household members. This approach may overcome the challenge of potential homogeneity in older people's educational attainment. However, it is unclear to what extent the benefits of educational attainment: are shared within households and families; relate to material circumstance; and, represents a valid approach to measuring older people's socioeconomic position.

Are measures grounded in theory and justified for use in older populations?

Typically, studies did not explain which pathway to inequality (ie, behavioural, materialist and psychosocial) their chosen measure intended to capture within the older population. Pragmatism drove some choices, where proxy measures were used in the absence of other data. Study authors seldom reflected on the limitations of chosen socioeconomic position measures within older populations.

Are older populations homogeneous on measures of educational attainment and housing tenure?

Online supplemental table S3 summarises the spread of study samples by categories of educational attainment and home ownership, where these data were reported in studies using these measures. A small number of studies demonstrated homogeneous levels of educational attainment within their older population, where over 70% of the sample was classified in the lowest attainment category. Where these data were reported by sex, the proportion in the lowest educational attainment category was usually higher for women.

On measures of housing tenure, older populations in most studies were often home owners, who typically comprised more than 70% of study samples (online supplemental table S3). This pattern may reflect current trends in home ownership, or it could be a product of selection biases in study samples.

Did studies report difficulties collecting financial data?

There was some evidence that financial data (income and assets) were difficult to collect, with reports of missing data. There was also some evidence that missing data were socially patterned. Non-report of income data was most likely for home owners (one study), those with lower educational attainment (one study), older female participants (one study), those over 75 years (one study) and those in poor health (one study).

DISCUSSION

Previous work has highlighted the challenges of measuring socioeconomic position in older populations.¹⁰ This scoping review has updated and expanded this work, providing a comprehensive picture of the approaches that have been used in contemporary studies of health inequalities. We now consider what factors should drive the choice of measure and where further evidence is needed about measuring older people's socioeconomic position.

What should be considered when choosing measures of socioeconomic position in studies of health inequalities in older populations?

While different approaches to measuring older people's socioeconomic position have merits and drawbacks, choice of measures should be driven by three broad considerations.

Table 3 Response format of measures of socioeconomic position in older populations

Measure	Response format	How categorised (if applicable)
Education	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) ▶ 3+ categories (non-hierarchical) ▶ Count (years) ▶ Two categories 	<ul style="list-style-type: none"> ▶ Level of education attained (years or by qualification) ▶ Quartiles/Quintiles based on years of schooling (relative) ▶ Above/below a given level
Income	<ul style="list-style-type: none"> ▶ Count ▶ 3+ categories (hierarchical) ▶ 3+ categories (non-hierarchical) ▶ Two categories 	<ul style="list-style-type: none"> ▶ Quartiles/quintiles/deciles (relative and absolute) ▶ Income bands ▶ Above/below a given level
Occupational classification or employment	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) ▶ 3+ categories (non-hierarchical) ▶ Two categories 	<ul style="list-style-type: none"> ▶ By occupational classification ▶ Employed/not employed
Housing tenure/home ownership	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) ▶ Two categories 	<ul style="list-style-type: none"> ▶ Home owned/not owned ▶ Home owned/rented (social)/rented (private)
House value	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) 	<ul style="list-style-type: none"> ▶ House value bands
(Net) Assets	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) ▶ Count 	<ul style="list-style-type: none"> ▶ Total value of worth/wealth bands ▶ Quartiles/quintiles/deciles (relative)
Subjective SEP	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) ▶ Two categories 	<ul style="list-style-type: none"> ▶ Rating of circumstance ▶ Yes/no
Area deprivation or other area measure	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) ▶ Score/proportion ▶ Index 	<ul style="list-style-type: none"> ▶ Quartiles/quintiles (relative and absolute)
Car ownership	<ul style="list-style-type: none"> ▶ Count ▶ Two categories 	<ul style="list-style-type: none"> ▶ Owned/no owned car
Insurance status	<ul style="list-style-type: none"> ▶ Two categories ▶ 3+ categories (hierarchical) 	<ul style="list-style-type: none"> ▶ Whether participant meets an insurance threshold signalling low income ▶ None/public/private ▶ Has private/public insurance yes/no
Geography profile of residence	<ul style="list-style-type: none"> ▶ Two categories 	<ul style="list-style-type: none"> ▶ Metropolitan/non-metropolitan ▶ Urban/rural
Living Arrangements	<ul style="list-style-type: none"> ▶ Two categories ▶ 3+ categories (non-hierarchical) 	<ul style="list-style-type: none"> ▶ Alone/not alone ▶ Live with spouse/live with other/live alone
Household material deprivation	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) ▶ Two categories 	<ul style="list-style-type: none"> ▶ 0, 1 or 2+basic items lacked ▶ <3 or 3+household items unable to afford ▶ Good/bad, based on split of a household conditions index
Proportion of life working part time	<ul style="list-style-type: none"> ▶ Proportion 	NA
Marital status	<ul style="list-style-type: none"> ▶ Two categories 	<ul style="list-style-type: none"> ▶ Married/other
Perceived access to healthcare	<ul style="list-style-type: none"> ▶ Score (0–1) 	NA
Out of pocket payments for healthcare	<ul style="list-style-type: none"> ▶ Two categories 	<ul style="list-style-type: none"> ▶ Yes/no
Poverty income ratio	<ul style="list-style-type: none"> ▶ 3+ categories (hierarchical) 	<ul style="list-style-type: none"> ▶ Bands of poverty-income ratio
Poverty threshold status	<ul style="list-style-type: none"> ▶ Two categories 	<ul style="list-style-type: none"> ▶ Above or below a given poverty threshold

N/A, not available; SEP, socioeconomic position.

(1) As previously advocated,^{3 4 6 8} measures of socioeconomic position should be chosen based on what aspect of older people's socioeconomic circumstance is thought to underlie unequal health outcomes. Where material conditions are proposed to underpin unequal outcomes, measures that combine income, home ownership or other assets may best capture accumulated economic capital in later life. Some studies did indeed use this approach, but it was not common. The most common measure was educational attainment. Yet early life education may be a weak indicator of later life resources, especially where social mobility has played a more important role in boosting employment opportunities.

(2) Measures should be chosen with consideration of how macroeconomic and policy contexts shape the socioeconomic profile of the older population studied, including how these contexts change over time. Education and housing continue to be popular measures, yet the extent to which an older population varies on these indicators is shaped by

the public policies to which they are exposed over the life course. Similarly, macroeconomic factors influence subjective assessments of economic circumstance.^{41 42} These influences, which may differ by country, means that the 'fit' of a measure to older populations will vary across contexts and make cross-country comparisons challenging.

Changes in policy contexts over time should also be considered when choosing measures. For example, trends in home ownership are declining among 18–34 years olds across Europe.⁴³ Home ownership as a measure of socioeconomic position may, therefore, capture greater heterogeneity for future older cohorts if such trends in ownership continue. Similarly, educational attainment may become more varied for later (and future) older cohorts in countries where access to postschool education is increasing.⁴⁴

(3) Measures should maximise the detection of subtle variations in older people's socioeconomic circumstance. Measures often used two response categories, which may be due

to limitations in sample size, or minimal variation on the measure. Even so, in the oldest old, the gap between the most and least advantaged may be smaller due to premature mortality in lower socioeconomic groups.⁴⁵ A two-category measure will be too blunt to detect these subtle, yet important, differences. While some binary measures capture key aspects of material resource (eg, home ownership), used in isolation such measures may be unhelpful.

Inevitably, choice of measures is often pragmatic and based on available data. This presents an important consideration for future longitudinal cohort studies of older populations, particularly those with long-term prospective follow-up periods. Data collected on a range of socioeconomic indicators will enable researchers to (1) choose those most theoretically relevant to the study question and population, (2) respond to changes in populations and contexts over time and (3) select multiple measures to capture different dimensions of (dis) advantage over the life-course.

Where is more evidence needed to ascertain the validity of approaches to measuring older people's socioeconomic position?

Subjective assessments of socioeconomic position may be compounded by health status and a tendency for older people to rate their economic circumstances favourably.³⁶ Further research could explore the validity of this approach, including how assessments vary over time and between contexts. Measures that include others' educational attainment and income require verification about whether shared capital (from income or education) equates to greater or lower levels of advantage for the older person, and the validity of these approaches with older populations.

Earlier concerns about missing financial data were also confirmed in a small number of studies.^{46–54} While there is evidence that missing income data is socially patterned in studies not specific to older groups,^{55 56} there is less clarity about the patterning specifically at older ages. Further research could explore whether it is the most or least advantaged older people who are most likely to be under-represented on these measures. This is important given that participation in cohort studies is already biased towards more advantaged populations.⁵⁷

Finally, the changing nature of economic factors shaping a person's socioeconomic circumstance means that the best measurement approaches will differ for future older cohorts. Falling rates of home ownership,⁵⁸ projected lower retirement incomes⁵⁹ and women's increased labour force participation,⁶⁰ necessitate regular assessment of the fit of measures in older populations. A related point is that the limitations of some socioeconomic position measures in older groups may also become relevant to younger groups as populations, policies and the economy evolve. The extent to which the challenges of socioeconomic position measures outlined in this paper remain specific to, or extend beyond, older populations in future is important to monitor.

Strengths and limitations

Systematic scoping methods have provided a comprehensive up-to-date picture of the socioeconomic position measures used in contemporary studies with in older populations. We have expanded earlier appraisals of existing measures, appraised new approaches and identified gaps where evidence is needed to ascertain the validity of measures.

What is already known on this topic

⇒ Measuring socioeconomic position in older populations is challenging.

What this study adds

⇒ Choosing measures of older people's socioeconomic position should be shaped by theory, context and opportunity to assess a gradient.
 ⇒ Some measures require evidence to ascertain their validity in older populations.

How this study might affect research, policy and/or practice

⇒ Measures should be reviewed regularly as socioeconomic profiles, economic and public policies change over time

We focused our review on studies examining inequalities in health and social care use, and self-rated health. Health outcomes are wide ranging and it would not have been possible to include studies of all such outcomes here. This is an important limitation; studies using other health outcomes may have implemented socioeconomic measures not identified here. Thus, we do not claim that our review offers a complete picture of measures of socioeconomic position in older populations. Self-rated health was chosen as the exemplar health outcome because it is one of the most common and strongest measures of health.²⁷ Inevitably, this measure is also subject to variations between countries, age, gender, ethnicity and socioeconomic position.^{31 61 62} However, these limitations have little impact on the work reported here as we did not make comparisons of self-rated health between these groups.

No studies were identified that explicitly used ethnicity as a proxy for socioeconomic position. Ethnicity is sometimes used as a measure of socioeconomic position in US studies, and the two are often conflated.⁶³ That is, both are related to each other but have independent effects on health outcomes. The absence of studies using ethnicity as a measure of socioeconomic position is not a major shortcoming, as the limitations of this approach have been highlighted previously.⁶³

CONCLUSION

Choosing measures of older people's socioeconomic position should be shaped by considerations of theory, context and opportunity to assess a gradient. Some measures require evidence to ascertain their validity. Measures should be reviewed regularly to assess fit for purpose in older populations, as socioeconomic profiles, economic and public policies change over time.

Contributors GFS designed the protocol, undertook all parts of the review, coauthored the paper and acts as the guarantor. BH, FM, SM and AK codesigned the protocol and coauthored the paper. JEL, DS, IOW and BS undertook screening/study selection and coauthored the paper.

Funding This paper presents independent research funded by the National Institute for Health Research School for Primary Care Research (NIHR SPQR) and the Research

Capacity Funding provided by the NHS North England Commissioning Support. The review was carried out as part of a PhD studentship funded by the NIHR SPGR. JEL and BH are funded by the NIHR Applied Research Collaboration (ARC) for the North East and North Cumbria (NENC).

Disclaimer The views expressed are those of the authors and not necessarily those of the NIHR, the NHS or the Department of Health.

Competing interests None declared.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing not applicable as no datasets generated and/or analysed for this study. No datasets were generated and/or analysed for this study.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution 4.0 Unported (CC BY 4.0) license, which permits others to copy, redistribute, remix, transform and build upon this work for any purpose, provided the original work is properly cited, a link to the licence is given, and indication of whether changes were made. See: <https://creativecommons.org/licenses/by/4.0/>.

ORCID iDs

Gemma Frances Spiers <http://orcid.org/0000-0003-2121-4529>

Daniel Stow <http://orcid.org/0000-0002-9534-4521>

Barbara Hanratty <http://orcid.org/0000-0002-3122-7190>

REFERENCES

- Cutler D, Lleras-Muney A, Vogl T. *Socioeconomic status and health: dimensions and mechanisms*. NBER Working Paper, 14333. Cambridge, USA: National Bureau of Economic Research, 2008.
- Adler NE, Boyce T, Chesney MA, et al. Socioeconomic status and health. The challenge of the gradient. *Am Psychol* 1994;49:15–24.
- Adler NE, Ostrove JM. Socioeconomic status and health: what we know and what we don't. *Ann N Y Acad Sci* 1999;896:3–15.
- Bartley M. *Health inequality: an introduction to concepts, theories and methods*. 2nd Edition. Polity Press, 2017.
- Krieger N, Williams DR, Moss NE. Measuring social class in US public health research: concepts, methodologies, and guidelines. *Annu Rev Public Health* 1997;18:341–78.
- van Oort FVA, van Lenthe FJ, Mackenbach JP. Material, psychosocial, and behavioural factors in the explanation of educational inequalities in mortality in the Netherlands. *J Epidemiol Community Health* 2005;59:214–20.
- Galobardes B, Shaw M, Lawlor DA, et al. Indicators of socioeconomic position (Part 2). *J Epidemiol Community Health* 2006;60:95–101.
- Braveman PA, Cubbin C, Egerter S, et al. Socioeconomic status in health research: one size does not fit all. *JAMA* 2005;294:2879–88.
- Galobardes B, Shaw M, Lawlor DA, et al. Indicators of socioeconomic position (Part 1). *J Epidemiol Community Health* 2006;60:7–12.
- Grundy E, Holt G. The socioeconomic status of older adults: how should we measure it in studies of health inequalities? *J Epidemiol Community Health* 2001;55:895–904.
- Crystal S, Shea D. Cumulative advantage, cumulative disadvantage, and inequality among elderly people. *Gerontologist* 1990;30:437–43.
- Scharf T, Shaw C. *Inequalities in later life: centre for ageing better*, 2017.
- Roantree B, Vira K. *The rise and rise of women's employment in the UK*. IFS Briefing Note BN234: Institute for Fiscal Studies, 2018.
- Gornick JC, Sierminska E, Smeeding TM. The income and wealth packages of older women in cross-national perspective. *J Gerontol B Psychol Sci Soc Sci* 2009;64:402–14.
- Frick JR, Grabka MM. *Missing income data in the German SOEP: incidence, imputation and its impact on the income distribution*, SOEP survey papers, no. 225. Berlin: Deutsches Institut für Wirtschaftsforschung (DIW), 2014.
- Higgs P, Formosa M. The changing significance of social class in later life. In: Formosa M, Higgs P, eds. *Social class in later life power, identity and lifestyle*. Great Britain: Policy Press, 2015.
- Jagger C, Collerton JC, Davies K, et al. Capability and dependency in the Newcastle 85+ cohort study. projections of future care needs. *BMC Geriatr* 2011;11:21.
- Kingston A, Comas-Herrera A, Jagger C, et al. Forecasting the care needs of the older population in England over the next 20 years: estimates from the population ageing and care simulation (PACSim) modelling study. *Lancet Public Health* 2018;3:e447–55.
- Kingston A, Robinson L, Booth H, et al. Projections of multi-morbidity in the older population in England to 2035: estimates from the population ageing and care simulation (PACSim) model. *Age Ageing* 2018;47:374–80.
- Wittenberg R, Hu B. *Projections of demand for and costs of social care for older people and younger adults in England 2015-2035: personal social services research unit*, 2015.
- Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19–32.
- Colquhoun HL, Levac D, O'Brien KK, et al. Scoping reviews: time for clarity in definition, methods, and reporting. *J Clin Epidemiol* 2014;67:1291–4.
- Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci* 2010;5:69.
- Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 2018;169:467–73.
- Almeida APSC, Nunes BP, Duro SMS, et al. Socioeconomic determinants of access to health services among older adults: a systematic review. *Rev Saude Publica* 2017;51:50.
- Read S, Grundy E, Foverskov E. Socio-Economic position and subjective health and well-being among older people in Europe: a systematic narrative review. *Ageing Ment Health* 2016;20:529–42.
- Fayers PM, Sprangers MAG. Understanding self-rated health. *Lancet* 2002;359:187–8.
- Falk H, Skoog I, Johansson L, et al. Self-Rated health and its association with mortality in older adults in China, India and Latin America—a 10/66 dementia research group study. *Age Ageing* 2017;46:932–9.
- DeSalvo KB, Bloser N, Reynolds K, et al. Mortality prediction with a single General self-rated health question. A meta-analysis. *J Gen Intern Med* 2006;21:267–75.
- Burström B, Fredlund P. Self rated health: is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes? *J Epidemiol Community Health* 2001;55:836–40.
- Dowd JB, Zajacova A. Does the predictive power of self-rated health for subsequent mortality risk vary by socioeconomic status in the us? *Int J Epidemiol* 2007;36:1214–21.
- Fotso J-C, Kuate-Defo B. Measuring socioeconomic status in health research in developing countries: should we be focusing on households, communities or both? *Soc Indic Res* 2005;72:189–237.
- World Bank Group. *Fact sheet: OECD high-income: world bank*, 2019.
- Ouzzani M, Hammady H, Fedorowicz Z, et al. Rayyan—a web and mobile APP for systematic reviews. *Syst Rev* 2016;5:210.
- Higgins JPT, Green S. *Cochrane Handbook for systematic reviews of interventions version 5.1.0*, 2011. Available: http://handbook.cochrane.org/front_page.htm [Accessed 19 Jan 2017].
- Price D. *Measuring the poverty of older people: a critical review*. London: Economic & Social Research Council, Institute of Gerontology, 2008.
- Pepin JR. Beliefs about money in families: balancing unity, autonomy, and gender equality. *J Marriage Fam* 2019;81:361–79.
- Eickmeyer KJ, Manning WD, Brown SL. What's Mine Is Ours? Income Pooling in American Families. *J Marriage Fam* 2019;81:968–78.
- Bonke J. Pooling of income and sharing of consumption within households. *Rev Econ Househ* 2015;13:73–93.
- Bonke J, Uldall-Poulsen H. *Income pooling within families – survey evidence of Denmark. globalization, society and welfare. Working paper 05:2005: the Danish National Institute of social research*, 2005.
- Glei DA, Goldman N, Weinstein M. Perception has its own reality: subjective versus objective measures of economic distress. *Popul Dev Rev* 2018;44:695–722.
- Vauclair C-M, Marques S, Lima ML, et al. Subjective social status of older people across countries: the role of modernization and employment. *J Gerontol B Psychol Sci Soc Sci* 2015;70:650–60.
- Arundel R, Doling J. The end of mass homeownership? changes in labour markets and housing tenure opportunities across Europe. *J Hous Built Environ* 2017;32:649–72.
- United Nations Educational SaCO. *Towards universal access to higher education: international trends*, 2020.
- Bowling A. Socioeconomic differentials in mortality among older people. *J Epidemiol Community Health* 2004;58:438–40.
- Hancock R, Arthur A, Jagger C, et al. The effect of older people's economic resources on care home entry under the United Kingdom's long-term care financing system. *J Gerontol B Psychol Sci Soc Sci* 2002;57:5285–93.
- Angel RJ, Frisco M, Angel JL, et al. Financial strain and health among elderly Mexican-origin individuals. *J Health Soc Behav* 2003;44:536–51.
- Robert SA, Cherepanov D, Palta M, et al. Socioeconomic status and age variations in health-related quality of life: results from the National health measurement study. *J Gerontol B Psychol Sci Soc Sci* 2009;64:378–89.
- Robert SA, Lee KY. Explaining race differences in health among older adults: the contribution of community socioeconomic context. *Research on Aging* 2002;24:654–83.

- 50 Allan DE, Funk LM, Reid RC, *et al.* Exploring the influence of income and geography on access to services for older adults in British Columbia: a multivariate analysis using the Canadian community health survey (cycle 3.1). *Can J Aging* 2011;30:69–82.
- 51 Fernandez-Martinez B, Prieto-Flores M-E, Forjaz MJ, *et al.* Self-Perceived health status in older adults: regional and sociodemographic inequalities in Spain. *Rev Saude Publica* 2012;46:310–9.
- 52 Freedman VA, Rogowski J, Wickstrom SL, *et al.* Socioeconomic disparities in the use of home health services in a Medicare managed care population. *Health Serv Res* 2004;39:1277–97.
- 53 Ornstein KA, Garrido MM, Bollens-Lund E, *et al.* The association between income and incident Homebound status among older Medicare beneficiaries. *J Am Geriatr Soc* 2020;68:2594–601.
- 54 Huijts T, Eikemo TA, Skalická V. Income-Related health inequalities in the Nordic countries: examining the role of education, occupational class, and age. *Soc Sci Med* 2010;71:1964–72.
- 55 Park HA. Rate of missing socioeconomic factors in the 4th KNHANES. *Korean J Fam Med* 2012;33:406–9.
- 56 Yan T, Curtin RT, Jans ME. Trends in income nonresponse over two decades. *Journal of Official Statistics* 2010;26:145–64.
- 57 Galea S, Tracy M. Participation rates in epidemiologic studies. *Ann Epidemiol* 2007;17:643–53.
- 58 UK Parliament. Home ownership and renting: demographics, 2017. Available: <http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7706#fullreport> [Accessed 9 Nov 2017].
- 59 Resolution Foundation,, Intergenerational Commission. *As good as it gets? the adequacy of retirement income for current and future generations of pensioners: resolution Foundation*, 2017.
- 60 Office for National Statistics. *Women in the labour market: 2013*. Office for National Statistics, 2013.
- 61 Bardage C, Pluijm SMF, Pedersen NL, *et al.* Self-Rated health among older adults: a cross-national comparison. *Eur J Ageing* 2005;2:149–58.
- 62 Young H, Grundy E, O'Reilly D, *et al.* Self-Rated health and mortality in the UK: results from the first comparative analysis of the England and Wales, Scotland, and Northern Ireland longitudinal studies. *Popul Trends* 2010;139:11–36.
- 63 LaVeist TA. Disentangling race and socioeconomic status: a key to understanding health inequalities. *J Urban Health* 2005;82:iii26–34.