General Psychiatry

What do we mean when we talk about socioeconomic status? Implications for measurement, mechanisms and interventions from a critical review on adolescent mental health

Mirela Zaneva ,[1] Tsvetomira Dumbalska,[2] Aaron Reeves,[3] Lucy Bowes[2]

To cite: Zaneva M, Dumbalska T, Reeves A, *et al*. What do we mean when we talk about socioeconomic status? Implications for measurement, mechanisms and interventions from a critical review on adolescent mental health. *General Psychiatry* 2024;**37**:e101455. doi:10.1136/gpsych-2023-101455

► Additional supplemental material is published online only. To view, please visit the journal online (https://doi.org/10.1136/gpsych-2023-101455).

AR and LB contributed equally.

AR and LB are joint senior authors.

Received 22 November 2023
Accepted 09 July 2024

[1]Christ Church College, University of Oxford, Oxford, UK
[2]Department of Experimental Psychology, University of Oxford, Oxford, UK
[3]Department of Social Policy, University of Oxford, Oxford, UK

Correspondence to
Dr Mirela Zaneva;
mirela.zaneva@chch.ox.ac.uk

ABSTRACT

Low socioeconomic status (SES) is a well-established risk factor for general and mental health problems. However, there is no widely accepted definition or operationalisation for SES, leading to varied interpretations in research. In a critical review of the child and adolescent mental health literature, we map how SES is defined and measured. We examined 334 relevant papers from 2013 to 2024 and found significant variability in the operationalisation of SES. Our analysis revealed fundamental problems such as the lack of clear definitions, insufficient detail on variables used and limited measures directly reported by adolescents. We discuss issues related to measurement techniques and their impact on reproducibility, policy development and intervention design. Based on our findings, we recommend using SES measures that directly assess the socioeconomic position of children and adolescents. Additionally, we recommend researchers improve transparency and specificity in reporting the measures used and the rationale behind their selection. The wide range of distinct measures used to represent SES, coupled with insufficient reporting, likely hampers our understanding of which underlying factors truly drive observed effects and impedes the establishment of causal relationships. This, in turn, makes the path to effective health interventions more challenging.

INTRODUCTION

There is a well-established literature indicating that low socioeconomic status (SES) is a risk factor for general and mental health problems.[1–3] With inequality globally on the rise,[4 5] we urgently need evidence on the mechanisms through which SES affects mental health, especially for young people. Mental ill health in childhood and adolescence can lead to lifelong psychological problems and material deprivation, and so early intervention might be particularly impactful.

However, knowing how to intervene is challenging, as there is no universal definition of SES.[6 7] The recent American Psychological Association task force review on SES[6] considered various measures corresponding to education, income, occupation, social class and material inequality. A systematic review focusing on the effect of SES on child and adolescent mental health similarly included a wide range of possible SES measures (conceptualising SES with a range of search terms including 'poverty', 'social inequality' and 'income').[8] This heterogeneity in measurement is grounded in the fact that SES is a broad concept, designed to capture access to varied opportunities and resources (eg, cultural capital, housing quality). Further, different research fields within mental health may have different conventions around what SES should be: for instance, child development researchers have argued about the need to capture parental income, education, occupation and household composition.[9] Others have argued that in health research, SES should capture differential access to desired social goods, such as material goods and prestige or rank-related measures.[10] Although in theory studying the same core idea, such different views about SES may translate to inconsistent measurement practices and difficulties in generalising findings, conceptual ambiguity and barriers to interdisciplinary collaboration.

The varied operationalisations of SES pose a challenge to aggregating evidence and identifying paths to intervention. Different SES facets (eg, income vs education) can yield distinct effects on child and adolescent mental health and taking them together may produce inconclusive results. Indeed, a recent meta-analysis of evidence in the USA[11] found that the effects on child mental health varied across five different operationalisations of SES. For interventions, it is crucial to understand the most impactful facets of SES. For

instance, some empirical evidence suggests that different proxy measures of SES have varying relationships with adolescents' health and that correlations between various SES indicators range from weak to moderate.[12] Additionally, most existing work surveying SES has been implemented in high-income settings, particularly in the USA,[6 11] leaving a gap in our knowledge for low- and middle-income contexts.

Worryingly, at the same time, we still lack a more fundamental literature survey to understand how cohesive or varied SES operationalisations are in practice, as well as the potential implications of different operationalisations. As a related subquestion, we also query the extent to which researchers theoretically motivate their specific choices of measures. One problem is whether SES should be a measure more closely associated with theories and measures of poverty or inequality and there is currently no cohesively established view on this. Some researchers define the central aim of SES as capturing absolute levels of resources,[13] and so position SES as more closely related to poverty measures. Others see SES as aiming to understand where individuals fall in a socioeconomic gradient relative to others, and so treat SES as more closely related to inequality measures.[14]

Here, we focus on measuring SES within the child and adolescent mental health literature. This is particularly important as early intervention, targeting potentially malleable socioeconomic risk factors, can prevent various adverse outcomes over the life course, such as the clustering of health, crime and social welfare inequality.[15] Concurrently, measuring and conceptualising the SES of young people, especially adolescents and children, is notably challenging. Previous work has done so through varied measures including parental or household income, job status and education level of family members, perceived neighbourhood safety or area-level deprivation among others. As some researchers have cautioned about missing data and the validity of such measures when they are reported by children or adolescents, it remains common for these SES proxies to be widely caregiver reported. However, it is not always clear which facets of parentally reported or other higher level (eg, neighbourhood or school-level) measures are most relevant to adolescents' lives and mental health or how well differing aspects are captured under varied SES measures.[16] Here, we chart the definitional space of SES within the child and adolescent mental health literature, with a view to examine the operationalisations of this concept in practice and provide recommendations for transparent reporting to facilitate social policy and intervention work.

METHODS

We conducted a preregistered review of published papers investigating the impact of SES on child and adolescent health. We searched PsycINFO for relevant publications from 2013 to 2021. In February 2024, we extended our PsycINFO search to capture January 2021–February 2024. We also implemented our search strategy in the educational database (Education Resources Information Center (ERIC)) and Google Scholar for the period 2013–2024. Our search strategy was: (child* OR adolescent*) AND 'socioeconomic status' AND ('mental health' OR 'mental status' OR 'internalizing symptoms' OR 'externalizing symptoms' OR 'behavior problems' OR 'behavior disorders' OR 'emotional disturbances' OR 'child psychopathology'). This search yielded 1558 unique papers. We used only 'socioeconomic status' as we are interested in unravelling the heterogeneity underneath this specific and exact term rather than any related ones. Similarly, we excluded papers that only discussed associated concepts such as 'socioeconomic background', 'socioeconomic position', 'socioeconomic disadvantage', 'income inequality', etc. Thus, we strived to limit the heterogeneity that would be associated with the inclusion of related terms and keep our review focused on the specific concept of SES. We required that papers specifically focus on the effects of SES on mental health and provide quantitative estimates for these. We included all papers with a measure of SES that researchers used in the context of children and adolescents' mental health with no restriction on what the SES construct measures, how it is constructed or by whom it was reported (eg, parent, adolescent). There were no inclusion criteria related to the study design or the language of publication. We included empirical papers with children or adolescents (0–18 years old). If the age range extended beyond 18 years, we included papers as long as the majority (>50%) of participants were 18 or younger.

We originally preregistered that the first reviewer would conduct title and abstract screening, following which both the first and second reviewers would carry out a full-text screening on the remaining papers. Instead, given the small sample of retrieved papers (n=1558), both reviewers agreed to full-text screen the entire set of papers. Inter-rater reliability was high (Cohen's kappa, k=0.95), and discrepancies were resolved with a consensus meeting between the two reviewers. We retained 334 papers that met all our inclusion criteria. Both reviewers extracted the description of the SES variable(s), the description of the mental health variable(s) and whether SES was a main (direct) effect or moderator. We coded the SES variable(s) in terms of type (eg, income, education, etc) and corresponding level (eg, individual, neighbourhood, etc). The degree of provided detail and clarity regarding wording varied substantially. We strived to apply a consistent criterion for categorisation across all papers. In some cases, this led to disagreements between the authors' wording and our coding. For instance, if a paper called their SES measure 'family SES' but used a neighbourhood disadvantage index as a proxy, we coded this as a neighbourhood-level measure. Employment (ie, *Is the individual employed?*), occupation (ie, *What is the individual's occupation?*) and full-time versus part-time job status were sometimes used interchangeably. Thus, we coded all these as 'occupation', although we appreciate that

they track different concepts. Relatedly, it was not always possible to discern whether a paper used a measure of the number of years of education or the type of educational degree; we coded both as 'education'.

Papers that aggregated more than one different variable or indicator into a single metric tracking SES (eg, index with education, occupation) were coded as 'composite'. We recorded the type and level of each metric included in the composite. If this composite variable was calculated based on an existing index, we recorded its name (eg, Hollingshead Index). By contrast, if a paper included more than one SES measure, and these measures were not joined together but examined separately as indicators for SES, we coded this as 'multiple' metrics and additionally recorded the type and level of each metric included. We coded income as a household-level metric unless it was specified in the paper that solely the income of a particular family member was used (eg, mother's income was coded as maternal level). Hence, many composite metrics, including parental education and income, were categorised as comprising multiple levels (parental and household).

We first analysed data quantitatively, examining descriptive trends in our extracted results to understand and compare the most common types and levels of SES measures. Qualitatively, we used a thematic analysis approach to study common topics, ideas and ways of operationalising SES closely. For these purposes, the first and second authors carefully read all included papers, generated initial themes and refined these in discussion with the senior authors.

Data and code are available on the Open Science Framework, https://osf.io/cnfsb/, alongside our preregistration, https://osf.io/5anrz.

RESULTS

Quantitative synthesis

We included a total of 334 papers investigating the effect of SES on different facets of child and adolescent mental health. The included mental health measures captured internalising and externalising problems, behavioural problems and specific diagnoses (most commonly anxiety, depression and post-traumatic stress disorder (PTSD)). Of the included papers, 299 examined the direct effects of SES on mental health, including both cases where SES was the factor of main interest and cases where SES was used as a control in regression models. Note that in all cases, we found SES mentioned while screening abstracts, suggesting a theoretical focus on the relationship between SES and mental health. In 57 papers, SES was used as a moderator for the relationship of interest. As a main finding, we note a high degree of variation in the ways SES is operationalised.

Type of SES measures

Next, we report the types of SES measures in our sample and the total number of papers featuring each type in parentheses (figure 1A). In the papers we included, the most commonly used composite SES measures featured multiple metrics (156) or included multiple SES metrics separately in their analysis (58). Among the papers that used a single SES metric, income (30), occupation (19),

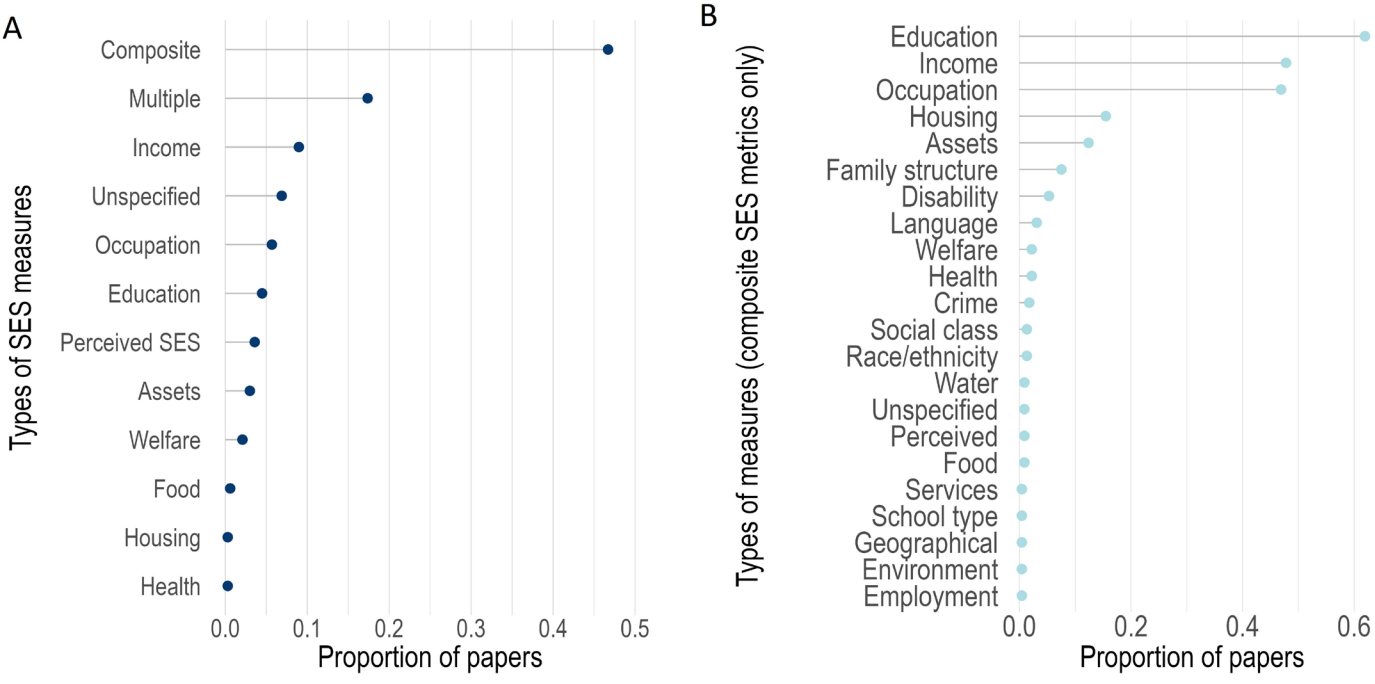

Figure 1 (A) The proportion of papers using different types of socioeconomic status (SES) measures from our included sample. (B) The proportion of papers using different types of measures from the papers using composite metrics for SES. As composite metrics include more than one measure, the sum of all the measures exceeds 1.

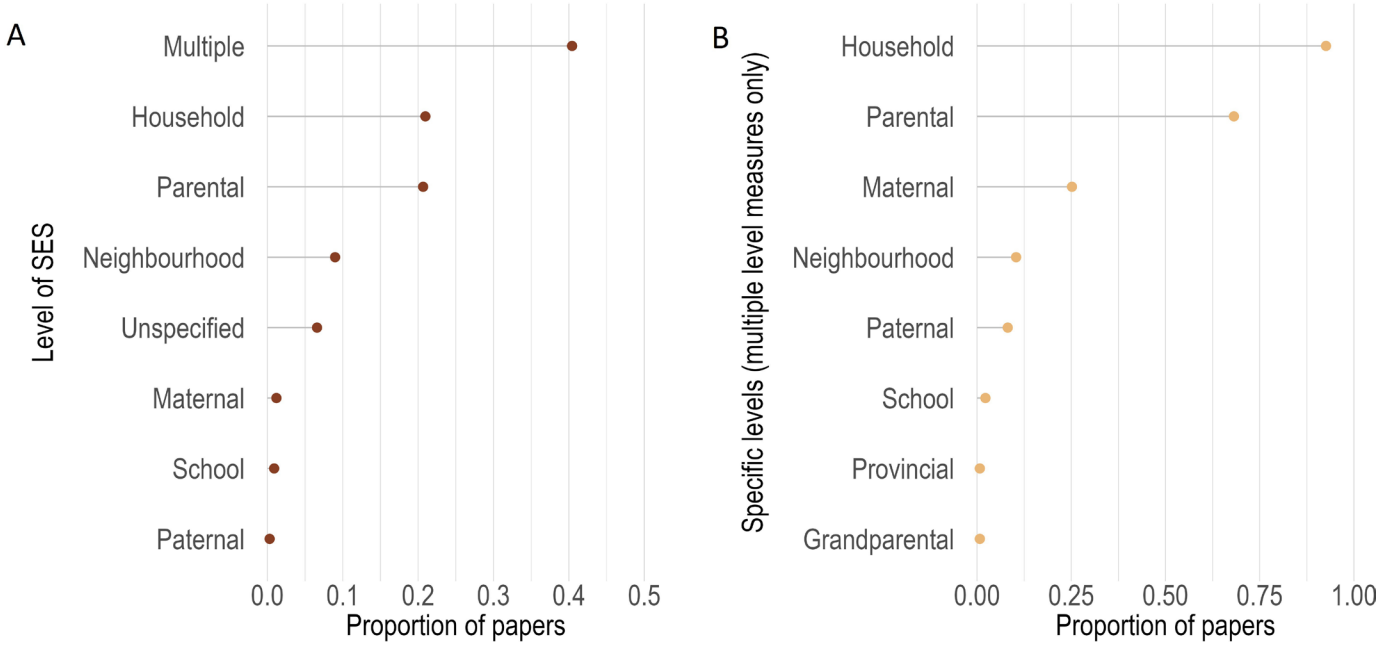

Figure 2 (A) The proportion of papers using socioeconomic status (SES) variables on different levels from our included sample. (B) The proportion of papers using different levels from the papers using multiple levels.

assets and education (15) were most common. We also included papers using a perceived (or subjective) metric of SES (12), metrics based on welfare receipt or eligibility (7), metrics based on food (2) and metrics based on housing (1). 23 papers did not specify the type of SES measure used.

Level of SES measures

135 papers used SES measures comprising multiple levels (figure 2). Commonly, papers used SES measures on the household (70), parental (69) or neighbourhood level (30). Less often, papers included SES measures on the level of the mother (4), school (3) or father (1). 22 papers did not specify the level of SES measure used.

Of the 135 papers using metrics comprising multiple levels (figure 2B), the vast majority included household (125) and parental level (92) measurements. Often, multilevel SES measures included maternal (34) and neighbourhood-level (14) measures. Less often, multilevel SES measures included paternal (11), school (3), grandparental (1) and provincial-level (1) measures.

Composite metrics

156 papers featured composite metrics (figure 1B). The majority of those included measures of education (140), income (108) and occupation (106). Often, composite metrics of SES included measures of housing (35), assets (28) and family structure (17). Less commonly, composite metrics of SES included measures about disability (12), language proficiency (7), welfare eligibility or receipt (5), health (5), race or ethnicity (3), crime (4), social class (3), food (2), water (2), geography (1) and perceived (or subjective) SES (2). Two papers did not specify the types of measures included in their composite metrics.

Most of the composite metrics were not based on established SES indices (239). Some of the more widely used established composite measures included the Hollingshead Index (25), the Family Affluence Scale (13), the Associação Brasileira das Empresas de Pesquisas (ABEP) Critério de Classificação Econômica Brasil (10), income-to-needs ratio (8), the Winkler Index (6), the MacArthur Scale of Subjective Socioeconomic Status (6), Socio-Economic Indexes for Areas–Index of Relative Socioeconomic Disadvantage (SEIFA IRSD, 8) and Socio-Economic Indexes for Areas–Index of Relative Socioeconomic Advantage and Disadvantage (SEIFA IRSAD, 4).

Multiple measures

58 papers used multiple SES measures in their analyses. The majority included education (49) and income (42) measures. Often, the multiple measures featured occupation (14) and assets (14) metrics. Less commonly, they included composite measures (6), measures of family structure (6), welfare eligibility or receipt (6), housing (5), perceived (or subjective) SES (4), race/ethnicity (3), food (2), adversity (1), immigration status (1) and age (1). Three of the papers featured multiple metrics that were not specified.

Narrative synthesis

In many cases, definitions for SES were limited, unclear or not present.[17–24] Even though we accepted definitions of SES that were reported in supplements, other papers or manuals (as long as those were cited by the original work), 7% (23/334) papers provided no definition. Moreover, few papers provided a justification for using a given SES metric, whether theoretical, practical or based on established conventions, such as previously used similar

methods. Definitions were especially scarce when SES was used as a control variable in regression models, even though the fact that SES was controlled for was typically highlighted in the abstract. SES variables were sometimes missing from the methods section and were instead specified in results tables and footnotes.[25]

Notably, the choice of SES operationalisation in some of our included papers was practically motivated. Such motivations included the availability of suitable variables in the dataset(s) of interest[26] or the requirements of the statistical analysis. For instance, Nepomnyaschy and colleagues[27] investigated how the effect of a father's involvement on adolescent mental health differs across the SES gradient. The authors used maternal and grandparental (on the mother's side) measures as proxies of SES, as they considered that paternal socioeconomic characteristics would likely be confounded with the father's involvement. Similarly, Wang *et al*[28] reported that their sample was homogenous in terms of parental occupation and education, and so they used household income as a proxy for SES.

Income indicators

Income was among the most commonly used indicators or proxies for SES, sometimes chosen without a justification.[29] Income-based metrics varied regarding frequency (eg, monthly or annual income), level (eg, parent or household) and whether they were reported in absolute or relative terms. For relative income measures, the reference point was often determined by the proximal context (eg, the household federal poverty level in the USA,[30] purchasing power of consumer groups in Brazil).[31] Similar relativity was embedded in other proxies for income, such as eligibility for welfare programmes (eg, free school meals,[32] Medicaid programme participation,[33] the receipt of public assistance[34]) and financial difficulties ('trouble paying utility bills in the past year').[35] While using measures relating to medical coverage as proxies for SES were few, we note that these generally were from the USA.

Regional variability

In many of our included papers, contextual and cultural factors were deeply entwined with the operationalisation of SES measures. In low- and middle-income countries, many SES metrics often included measures concerning living conditions, housing and material assets related to the home, such as whether families live in brick houses (Congo,[36] South Africa[37]); if they have access to water supply (Ecuador,[38] Uganda[39]); if they have food security or experience hunger (Haiti,[40] Pacific islands,[41] Caribbean countries[42]); if they have cooking resources, food, electricity, a stove and refrigerator (Uganda,[39] South Africa,[37 43] Egypt[44]); if they have access to sewage and garbage disposal (Ecuador[38]); and if they have access to a latrine, a toilet or flush toilet (Haiti,[40] Ecuador,[38] South Africa).[37] In China, Zhu *et al*[45] included the characteristics of the geographical area in their measure of SES, where living in a metropolis denoted a high SES and living in a rural area denoted a low SES.

Where existing regional measures were available, justification for their use tended to be poor. For instance, of the 11 papers that used the Australian SEIFA index, none explained directly in the text the specific measures contained in their chosen index. The majority of SEIFA papers (8) preferred the IRSD index over the IRSAD index (3), yet no papers provided a theoretical justification for their selection. Without speculation, it is impossible to understand why researchers preferred a measure of disadvantage (IRSD) over a measure of disadvantage and advantage (IRSAD).

Overcrowding was another commonly used measure of SES in low- and middle-income countries relating to housing. In Jamaica, Samms-Vaughan and Lambert's[46] measure of crowding was calculated by dividing the number of rooms used for sleeping by the number of people living in the home. In Malaysia, Zahir Izuan and colleagues[47] assessed neighbourhood SES via the Townsend Index, which splits neighbourhoods into high/low SES based on the percentage of unemployment, car ownership, households that are owner-occupied and the percentage of households with more than one person per room as an overcrowding measure. Some household or neighbourhood-level composite metrics were specifically developed for certain settings (eg, country: Iran,[48] Germany[49]).

Parental and household measures

Different approaches have been taken when measuring SES via parental variables. In our included sample, we found papers that combined the same SES data for mothers and fathers into one measure,[50] as well as a variety of papers that only used data from one parent.[51] Other papers combined different data from each parent[52] or combined data from a parent and their partner[53] (eg, Smith *et al*). In two-parent households, we found remarkable variability in operationalising SES, including papers that use 'the highest ranking parent' and 'the lowest ranking parent'.[54] Rodriguez and colleagues[55] considered the occupation and education of up to two family members who financially contributed to the household. Some SES measures featured distinct maternal and paternal characteristics, such as the father's occupation and the mother's education.[46 56] Some of the articles referred to the head of the household in their operationalisation of SES[38 57–59] or the individual who is the 'main source of income' in the household,[60] sometimes explicitly specifying that this is usually the father.[59 60]

In some cases, parental and household levels were conflated and treated as theoretically similar by authors. Some papers used family-level SES composites by including one parent in addition to a family or household variable (eg, Herbert *et al*[61]: number of years of father's education and family income were standardised and averaged to create a single SES measure; Gerstein *et al*[62]: maternal education and family income were standardised

and averaged into a single SES measure). Household-level SES measures most frequently tracked household income, although there was significant variability in how this was defined, ranging from the income of one parent or caregiver to any two adults or the income of anyone residing in the household and not solely blood-related family members.[63]

Several papers examining family-level SES did so through variables about the family's structure. For instance, in India, Sama *et al*[59] distinguished between 'nuclear' and 'joint' families when evaluating family SES, as they considered the head of the family would differ between the father of the child or an elder family member. In Russia, Kozlova *et al*[64] similarly included family structure as an SES measure by assessing whether a family was nuclear, comprised a single parent only or included a new partner. In Japan, Kachi *et al*[65] classified family SES through the family by asking whether families included two parents or a single parent and whether the family was a three-generation family or another type of multiperson family. Family structure was included in some composite neighbourhood socioeconomic disadvantage indices, for example, as '% of female-headed families',[66] and in the 4-factor version of the Hollingshead Index, 'marital status'.

Perceived (or subjective) SES

Our sample also included subjective measures of SES. Some papers considered subjective SES as a distinct concept from 'objective' SES and sought to contrast the effect of subjective SES with measures tracking income and/or education. By contrast, some papers used subjective SES as their only measure of SES or as part of a composite metric.[67–70] The MacArthur Scale was the most common questionnaire of subjective SES; one paper used Schor's Consumer Involvement Scale. We found only seven papers (2% of included papers) where adolescents were asked to report their perception of their SES. We note in passing that in some cases, there is a lack of clarity regarding what constitutes a subjective or perceived metric of SES. For instance, Novak and Kawachi[71] described their measure based on parental occupations (where high SES=managers and professionals, low SES=blue-collar workers) as 'self-perceived' SES.

DISCUSSION

Our findings demonstrate a staggering degree of heterogeneity in the way SES is operationalised in the literature on child and adolescent mental health. This heterogeneity is reflected in the types and levels of measures. Below, we first discuss our principal findings about income, education, occupation, composite and regionally specific measures and our limitations. Then, we discuss the main issues surrounding the operationalisation of SES in the literature more granularly and outline practical recommendations (table 1).

Principal findings

We found that SES was most often measured by capturing income, education and/or occupation. Importantly, in the child and adolescent literature, these measures typically relate to the caregivers or household (rather than a child's own education). Taken together, these three measures can capture multifaceted factors about a person's circumstances and so could work well to track SES. However, their use (either jointly or in isolation) warrants consideration of their key limitations. When using income, researchers should be aware of potential reverse causality, such that current income may be affected by current mental health problems; in practice, when studying child and adolescent mental health, this also means understanding parental mental health.[72] An understanding of wealth is complimentary, as income is generally reported as a static measure for current resources, whereas measures of wealth track accumulated assets and so offer a longer-term perspective of an individual's circumstance: for instance, someone who is retired may report lower income but have high wealth. When using education, a key consideration should be the ability to differentiate between the research population (and thus differentially predict mental health outcomes). As many contemporary studies are delivered in universities, asking adolescents attending the same institutions to report their own education will not distinguish among them (figure 3) and may not always be a granular measure when tracking parents' education, given the correlation between parental and child education in some contexts. Moreover, the comparability of education measures over longer periods of time may be susceptible to cohort effects, such that the meaning of the same degree over time changes.[73] Further, education could be contextualised by an expanded understanding of skills and abilities, as it is possible for individuals without higher degrees to work in high-skilled jobs. In this sense, occupational measures are particularly informative, though they too may be affected by cohort effects, such that over time the perceived status associated with the same job may change. Occupational categories can be heterogeneous; variation in income, prestige, working conditions and future opportunities may differ for the same position between contexts, such as different companies or countries.

Composite measures were widely used, although the majority of these were not pre-established, validated indexes. This means authors are left with more researchers' degrees of freedom and choice in how to operationalise a potential measure for SES. From this follows the need to clearly report the construction of any new composite measure and the justification of its use, as well as the need to establish its validity and contextual appropriateness. For existing composite measures, we examined cases of discrepancies between the originally intended level according to its statistical manual and its actual use (eg, area vs individual) and its theoretically suggested application versus actual use (eg, not distinguishing populations in low-income settings, as such data

Table 1 Summary of specific recommendations for research using socioeconomic status

Definition	► Provide a clear definition of socioeconomic status (SES) in the context of your work. ► Specify the corresponding variable(s) for SES. ► Justify the relevance of these variables. (How do they relate to the construct of SES?) ► If using a single variable or a single construct (eg, only income), report as studying that construct rather than broader constructs such as SES. ► If using only a few constructs (eg, only income and education), report as studying those constructs and explaining how they correspond to a definition or proxy of SES that is appropriate for your research. ► State how variables are coded, when/where data were collected and further survey details, if applicable.
Selection of measure	► Report what considerations guided the selection of each variable (eg, describe relevant theories, previous research, practical constraints). ► Consider the mechanism through which your selected measure should impact the outcome variable (eg, Do you need to address reverse causality? Is the measure appropriate for your proposed mechanism?). ► Consider any limitations or assumptions embedded in the measure, particularly for measures coming from different cultural or historical contexts; if relevant, justify their use. ► Provide information regarding validity and reliability. ► Use or include child and adolescent-reported measures of SES, where possible.
Construction of measure	► Clearly report any quantitative adjustments or manipulations (combining, transforming or creating new variables). ► Justify why these manipulations were necessary and appropriate and address any implications/limitations.
Level of measure	► Provide sufficient detail about the level of reported variables (eg, parental vs household). ► Justify the appropriateness of the level of the variable(s) or discuss relevant limitations. ► Describe higher-order measures (eg, at the provincial or country level) of inequality or deprivation appropriately as macro-level measures of inequality/deprivation. Do not use them as measures of SES for individuals.
Discussion of results	► Present results and discussion in correspondence to your selected variables' type and levels. ► State any relevant (causal) mechanisms for SES given your specific measures in the context of your research question. ► Evaluate the strength of evidence in the context of your variable(s) strengths and limitations.

are already included in the index). We have more broadly seen these issues in the literature we surveyed and believe such practices minimise the utility of the used measures and can introduce distortions in results, thus warranting greater reflection in measure selection.

Regional composite measures could pose challenges for readers without cultural context. The overall justification for using specific composite measures was poor. Moreover, regional measures could ideally contain culturally informed, meaningful information, but without a higher degree of reporting standards, their utility and intelligibility may not be fully realised. Outside of composite measures, we saw a tentative trend to use measures of material conditions and assets for SES in low- and middle-income countries, which are measures more traditionally associated with the concept of poverty. This likely means we know comparatively less, across a less holistic set of measures, about SES in these contexts. In turn, this means we likely do not have a full picture of socioeconomic risk factors for child and mental health globally.

Limitations of the current review

A key limitation of our review is the limited coverage of search databases. Although we have carried out our search in three fairly diverse databases covering psychology (PsycINFO), education (ERIC) and general domains (Google Scholar), we acknowledge that a wider array of disciplines survey SES. Relatedly, we had constrained our search to query exclusively for the term 'socioeconomic status' as we wanted to obtain precision in understanding one cohesive concept. We initially considered that related terms would still contain important conceptual differences (for instance, 'socioeconomic disadvantages' and 'socioeconomic inequalities' would be associated with greater heterogeneity in measurement levels). However, it is likely that some researchers still treat these concepts as functionally equivalent (eg, 'socioeconomic position') and that by excluding them, we missed relevant papers. As a further limitation, our search strategy captured terms for broader mental health that we had selected as appropriate for the younger age group we study here but

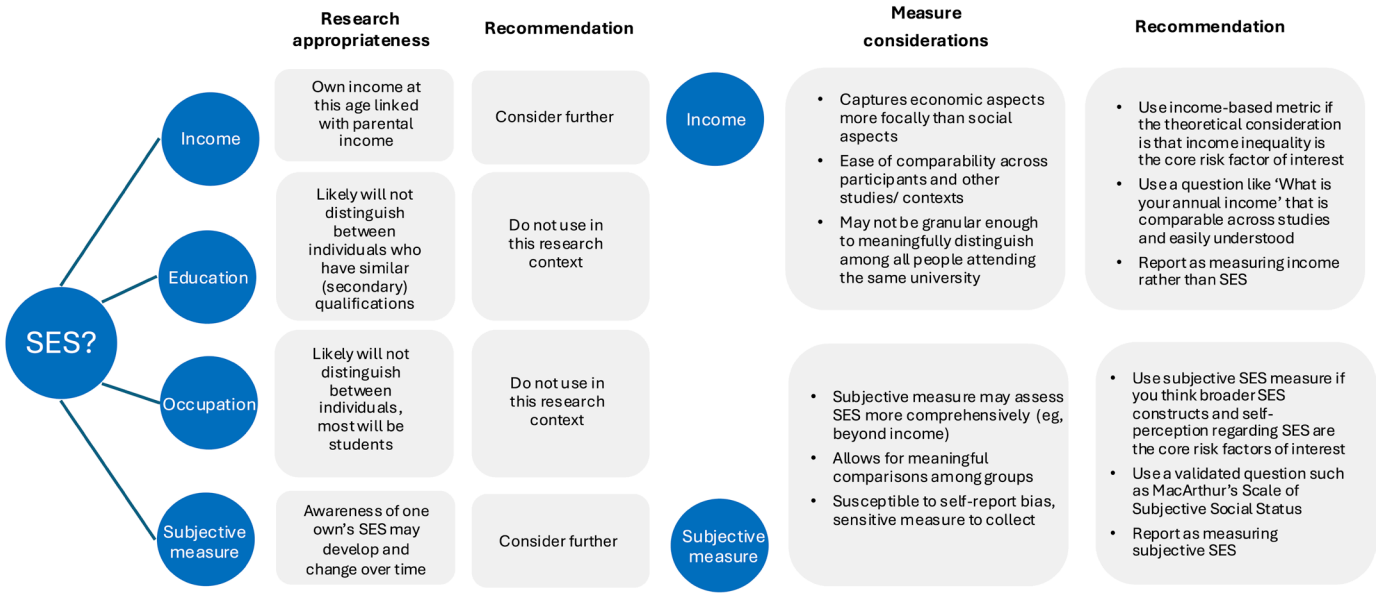

Figure 3 Illustrative case for the selection of a candidate socioeconomic status (SES) measure. In this example, researchers wish to identify a suitable single-item question to measure SES for use in a short Qualtrics survey of university students aged 17–19 years, where SES is considered as a risk factor for mental health. Here, we showcase how researchers might evaluate candidate measures in terms of their fit with the research framework and context, what each measure's advantages and disadvantages are, and offer recommendations for selection and reporting.

not for specific diagnoses (eg, PTSD). Although we found papers focusing on specific mental health conditions, it is possible we missed some. We believe that the inclusion of further papers (whether by including more databases or search terms) would have increased the heterogeneity in SES measurement and thus would not have changed our main conclusions.

Definition and measurement

It is important to clearly describe the methodology and motivation for the choice of SES measures. Providing the operationalisation of SES is necessary for the computational reproducibility and (conceptual) replication of the analysis. For this purpose, it is also necessary to provide details on the measurement of the variable(s) used.

Further, the operationalisation is crucial for a theoretical interpretation of the results. In many of the included papers, the effect of SES was not the main factor in the analysis; instead, it was used as a control variable to partial out variance driven by socioeconomic differences, which are (presumably) independent of the main effect of interest. Similarly, sometimes, the choice of SES metric was constrained by what variables were available in the dataset of interest. In both scenarios, nevertheless, it is important to clearly outline the considerations driving the choice of the SES measures and state which variable(s) were used. A question that arises is if, for instance, household income was used as a proxy for SES, why not frame the results and discussion in terms of the relationship between income and children and adolescents' mental health, rather than the relationship between SES and children and adolescents' mental health. More broadly, without a specific definition, the validity of the construct used will be hard to ascertain.

Theoretical underpinning

Although we wanted to better understand what theories most commonly motivated the choice of different SES measures, this was not possible due to the paucity of theoretical motivation in the included papers. This may be understandable in some cases, for instance, when there is an explicit recognition of practical constraints (a single variable as the only plausible SES candidate; figure 4). Similarly, when working with established indices with a long-standing history (eg, Hollingshead Index), authors may carry an assumption that further motivation is not needed. This, however, does not necessarily mean measures are theoretically sound in their applied context.

We also aimed to position specific operationalisations of SES in relation to the literature distinguishing between poverty and inequality. We initially aimed to do so by tallying up authors' theoretical motivation, although we find that authors rarely report any theoretical motivation, let alone more specific ones that would allow such a categorisation. Inference regarding where specific measures fall regarding different econometric theories is difficult and may not align with the primary researchers' own views. Instead, we highlight the fact that we have captured a range of measures that could relate to theories of poverty either explicitly through their intended original purposes (eg, the Townsend Index of Disadvantage and Deprivation is a measure that aims to capture material deprivation) or plausibly so, at face validity (eg, assets, income thresholds, eligibility for welfare programmes).

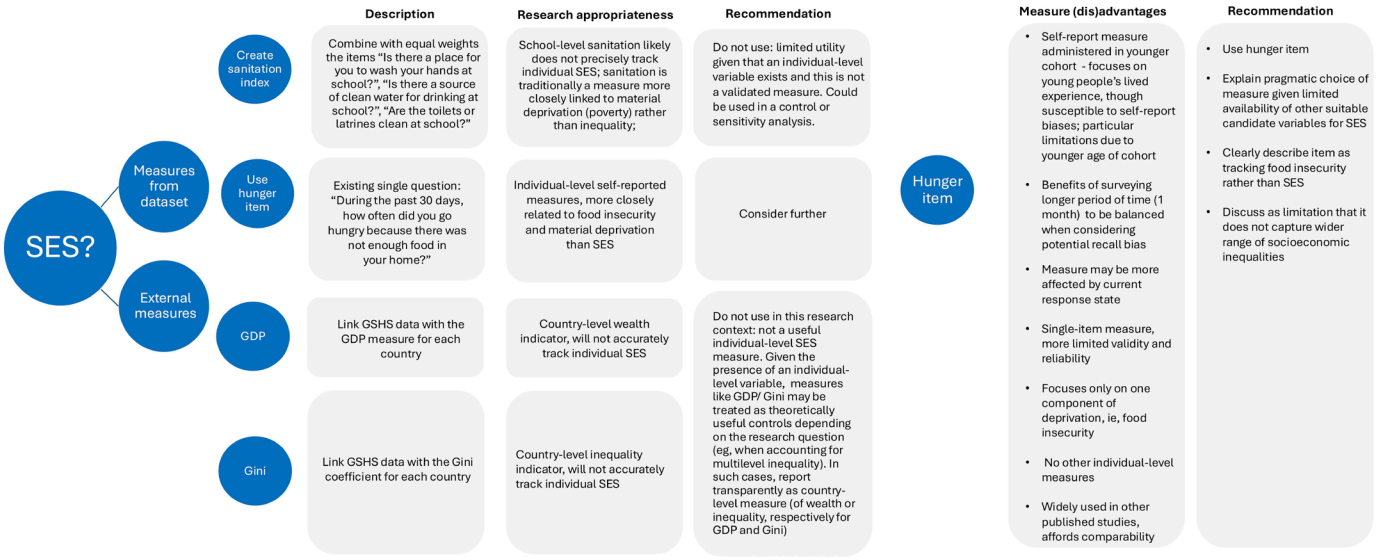

Figure 4 Illustrative case for the selection of a candidate socioeconomic status (SES) measure. In this example, researchers wish to identify a suitable measure of SES of school-going children (11–17 years) for a secondary analysis of the Global School-based Student Health Survey (GSHS), with the purpose of examining SES as a risk factor for mental health. Potential measures may come from the dataset itself (a single-item question about experiencing hunger, or questions about sanitation) or from external sources (such as country-level indicators). The Gini coefficient is referred to simply as GINI. GDP, gross domestic product.

We find the same regarding SES measures that more closely relate to inequality (eg, percentage employment between neighbourhoods, measures of perceived social inequality). There are, too, measures that do not immediately fall into a categorisation between poverty and inequality (eg, family composition).

Here, we do not advocate that SES should be considered more closely aligned with either poverty or inequality. Indeed, SES may be better treated as a complementary, independent concept that further addresses individuals' socioeconomic realities. Rather, we use the poverty versus inequality comparison as a framework to better contextualise and illustrate the multidimensional nature of SES and the need for theoretical justification of its specific operationalisations.

Composite metrics

In the case of composite metrics (eg, established indices and latent/combined variables), it is crucial to transparently report what measures are included. Many of the existing indices carry assumptions that are tied to their specific original purpose and/or context, such as a particular point in time or region. For instance, the 4-factor Hollingshead Index includes a measure of marital status, and some of the neighbourhood indices we found included measures of race/ethnicity (eg, a high proportion of African Americans living in the area considered as low SES). It is important to interrogate the assumptions of the metrics (why should we classify unmarried and minority ethnicity/race individuals as lower SES?) and their relevance for child and adolescent mental health.

Some existing recommendations warn against using composite measures,[6] as aggregating several different variables into one composite SES measure can make it challenging to uncover the mechanism through which SES affects child and adolescent mental health. For instance, specific facets of SES may impact child and adolescent mental health through distinct mechanisms and have different effects; combining measures tracking those facets would conflate their influence. On the other hand, composite metrics may also be more robust and valid. Constructing a latent SES variable (eg, via a data-driven approach such as principal component analysis) reduces the dimensionality of the data (ie, number of measurements: income, education, occupation, etc) and decreases the measurement error, thus, making the analysis more robust (ie, reducing noise in the predictor(s) to capture more variance in the outcome, which may be pertinent in cases when SES is considered to function as a 'covariate' or 'control' in the model). Similarly, some measurements may not meaningfully capture SES on their own (eg, crime rates, food insecurity, welfare receipt), but their combination may more reliably track SES. As with existing indices and formulas, it is important to scrutinise the assumptions embedded in latent analyses (eg, the composition of the resulting factors) to ensure the composite is a theoretically valid measure of SES.

Dichotomisation

Further, there is an important yet often overlooked choice in deciding whether to use SES as a continuous or categorical variable. Dichotomising SES measures (eg, into high vs low SES) can illustrate a contrast between the ends of the distribution. However, there are caveats. Collapsing a continuous scale onto a binary classification necessarily reduces the level of nuance. This can limit the conclusions we can draw from an analysis. For instance, a negative effect of a binary SES measure on mental health

may be driven by the protective influence of high SES versus the effect of low SES as a risk factor for mental ill health (eg, see trichotomisation analysis in Hendriks *et al*[74]).

Level of variable

The concept of SES refers to the individual. Thus, it can straightforwardly correspond to individual-level or perhaps even household variables. In the context of children and adolescents, parental and household measures are clearly informative. However, beyond these proximal levels, we found a variety of other higher order levels, such as measures at the neighbourhood or province level. First, we question the appropriateness of labelling variables at these levels as SES as their correspondence to an individual's circumstances is likely less direct. The links between higher order deprivation and inequality and individual-level SES have not extensively been studied. Second, we question the usefulness of examining macro-level variables in isolation. One critical review of 25 multilevel studies examining neighbourhood socioeconomic context warned that attributing (mental) health disparities to neighbourhood social context would first require the isolation of individual-level socioeconomic influences.[75] Further, a meta-analysis examining the impact of income inequality on depression found trends suggesting null effects at district and national levels.[76] This could be because higher order levels may include strong contrasts of individuals with high and low SES.[77]

Thus, it is important to accurately specify the level at which the SES metric is constructed, as this is crucial for the interpretation and contextualisation of the observed effects. For instance, if a neighbourhood-level measure (eg, metric based on postcode) is used for the analysis, it is inappropriate to frame the discussion in terms of family or household SES, as we found in our review.[78 79] The mechanisms through which neighbourhood-level disadvantage affects mental health likely differ from the mechanisms through which socioeconomic deprivation of the family does. It may also be that these two levels act in opposition, which has been identified as an important determinant of adolescent mental ill health.[80] Further, previous work has also pointed to the problematic use of area-level deprivation as a measure of individual SES and has argued that this has significant policy implications, such that policies oriented towards improvements on the area level (eg, construction of more schools) could be preferred over interventions that are more responsive to individuals' needs (eg, targeting income).[81]

Child and adolescent-focused measures of SES

We found that most measures were parent-reported and tracked parental or household SES. In only seven papers, adolescents reported their perception of their SES. Including such adolescent-reported SES measures may be particularly important. For instance, previous research has shown that measures capturing adolescents' experiences have strong associations with their health and health behaviours and that, moreover, inequalities in adolescent health outcomes were stronger when measured through variables capturing adolescents' own education and perceived relative family SES as opposed to objective measures of family affluence or parents' education.[12] Relatedly, a recent twin study has indicated that twins' differential perceptions of their family's social standing underpin differential mental health outcomes.[82] Although very young children might not be able to meaningfully report on SES, previous work found that those 11 years and above provided informative perceived SES responses that tracked with health-related quality of life.[83] We recommend, when working with these age groups, to survey adolescents' perception of their SES.

More broadly, not including child and adolescent-focused measures of SES may mean we focus on addressing risk factors that are not most salient to their lives and perhaps have less of a direct effect on their health. A previous systematic review suggests that even in interventions that aim to alleviate poverty experienced by children and adolescents, financial support such as cash transfers is most commonly given to caregivers rather than adolescents themselves.[84] Taking this together, we recommend that more consideration is given upfront to plausible mechanisms for improving children and adolescents' lives, including the use of more focused measures of SES.

Mechanisms and interventions

The considerations regarding transparency in definition and measurement, composite metrics and the level of the variables all pose challenges in understanding the causal mechanisms through which SES may impact mental health. To design effective interventions for child and adolescent mental health, it is vital to understand the strength and direction of the effect(s),the exact mechanism (direct/indirect effect, or mediation effect?), how malleable the relationship is, and at what level it operates. For instance, a specific mechanism (differential exposure to environmental hazards/toxins) could operate at two different levels (eg, through parent's occupation or neighbourhood characteristics), and different interventions will be suitable to target the risk at each level. Further consideration is also needed to distinguish the impacts of subjective versus objective measures of SES in terms of their implications for child and adolescent mental health.

Effective interventions also require a deeper understanding of whether SES is a genuinely multidimensional concept and whether specific aspects of SES are separable from the others. For example, can increases in income affect mental health without altering other aspects of the social world in which young people live? Is it even possible to increase income while holding all other aspects of SES constant? Theoretically, this may boost the effectiveness of interventions if increasing income may improve other aspects of SES, too.

Finally, we caution that SES is, by definition, shaped by social circumstances and is sensitive to the context in which the individual is embedded. The same definition/operationalisation may not be appropriate across different regions and times. Further, the effect of SES may interact with the social context and/or the characteristics of the individual. It is important to investigate how different subgroups may be differentially affected[11]; subgroup effects need not be additive, as different characteristics may intersect.

CONCLUSION

In this critical review, we found a tremendous degree of heterogeneity in the different measures used as proxies for SES. The wide variety of distinct measures may prevent our understanding of what truly drives observed effects and obfuscates causal relationships, in turn making the path to effective intervention more difficult. Based on our review, we recommend improved clarity and specificity when defining SES (eg, specific variables, how they are measured and at what level), as well as transparency in the motivation for selecting a given SES measure. Rather than advocating for the use of any specific individual or composite levels, we encourage the more fundamental disclosure of variable selection and construction with theoretical or practical justification. Further, methodological decisions, such as dichotomisation, need to be carefully considered and justified.[85] Similarly, researchers should ensure the level of a given variable is appropriate for their proposed mechanisms and that results are framed with consideration of the relevant level. While we have specifically examined the case of SES within the mental health literature, these implications can extend to other topics and be considered regarding guidelines for variable reporting and measurement more broadly.

Contributors Conceptualisation: MZ, TD, AR, LB. Methodology: MZ, TD, AR, LB. Validation: MZ, TD. Formal analysis: MZ, TD, AR, LB. Investigation: MZ, TD. Data curation: MZ. Writing—original draft: MZ. Writing—review and editing: MZ, TD, AR, LB. Visualisation: MZ, TD. Supervision: AR, LB. Project administration: MZ.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iD

Mirela Zaneva http://orcid.org/0000-0003-3569-931X

REFERENCES

1 Marmot M, Bell R. Fair society, healthy lives. *Pub Health (Fairfax)* 2012;126 Suppl 1:S4–10.
2 Wilkinson R, Pickett K. The Spirit Level: Why Equal Better Everyone. Penguin, 2010.
3 Lund C, Brooke-Sumner C, Baingana F, *et al*. Social determinants of mental disorders and the Sustainable Development Goals: a systematic review of reviews. *Lancet Psychiatry* 2018;5:357–69.
4 Nolan B, Richiardi MG, Valenzuela L. The drivers of income inequality in rich countries. *J Econ Surv* 2019;33:1285–324.
5 Ravallion M. Income inequality in the developing world. *Science* 2014;344:851–5.
6 Saegert SC, Adler NE, Bullock HE, *et al*. *APA task force on socioeconomic status (SES)*. Am Psychol Assoc, 2006.
7 Shavers VL. Measurement of socioeconomic status in health disparities research. *J Natl Med Assoc* 2007;99:1013–23.
8 Reiss F. Socioeconomic inequalities and mental health problems in children and adolescents: a systematic review. *Soc Sci Med* 2013;90:24–31.
9 Hauser RM. Measuring socioeconomic status in studies of child development. *Child Dev* 1994;65:1541–5.
10 Oakes JM, Rossi PH. The measurement of SES in health research: current practice and steps toward a new approach. *Soc Sci Med* 2003;56:769–84.
11 Peverill M, Dirks MA, Narvaja T, *et al*. Socioeconomic status and child psychopathology in the United States: a meta-analysis of population-based studies. *Clin Psychol Rev* 2021;83:101933.
12 Moor I, Kuipers MAG, Lorant V, *et al*. Inequalities in adolescent self-rated health and smoking in Europe: comparing different indicators of socioeconomic status. *J Epidemiol Community Health* 2019;73:963–70.
13 Bukowski WM, Dirks M, Persram RJ, *et al*. Peer relations and socioeconomic status and inequality. *New Dir Child Adolesc Dev* 2020;2020:27–37.
14 Quon EC, McGrath JJ. Community, family, and subjective socioeconomic status: relative status and adolescent health. *Health Psychol* 2015;34:591–601.
15 Richmond-Rakerd LS, D'Souza S, Andersen SH, *et al*. Clustering of health, crime and social-welfare inequality in 4 million citizens from two nations. *Nat Hum Behav* 2020;4:255–64.
16 Potter BK, Speechley KN, Gutmanis IA, *et al*. A comparison of measures of socioeconomics status for adolescents in a canadian national health survey. *Chronic Dis Inj Can* 2005;26:80.
17 Ezpeleta L, de la Osa N, Doménech JM. Prevalence of DSM-IV disorders, comorbidity and impairment in 3-year-old Spanish preschoolers. *Soc Psychiatry Psychiatr Epidemiol* 2014;49:145–55.
18 Capaldi DM, Tiberio SS, Shortt JW, *et al*. Associations of exposure to intimate partner violence and parent-to-child aggression with child competence and psychopathology symptoms in two generations. *Child Abuse Negl* 2020;103:104434.
19 Lee GY, Choi YJ. Association of school, family, and mental health characteristics with suicidal ideation among Korean adolescents. *Res Nurs Health* 2015;38:301–10.
20 Hunter MB, Yoong M, Sumpter RE, *et al*. Neurobehavioral problems in children with early-onset epilepsy: a population-based study. *Epilepsy Behav* 2019;93:87–93.
21 Macul Ferreira de Barros P, do Rosário MC, Szejko N, *et al*. Risk factors for obsessive-compulsive symptoms. Follow-up of a community-based youth cohort. *Eur Child Adolesc Psychiatry* 2021;30:89–104.
22 Hong SA, Peltzer K. Dietary behaviour, psychological well-being and mental distress among adolescents in Korea. *Child Adolesc Psychiatry Ment Health* 2017;11:56.
23 Tomoda A, Nishitani S, Matsuura N, *et al*. No interaction between serotonin transporter gene (5-HTTLPR) polymorphism and adversity on depression among Japanese children and adolescents. *BMC Psychiatry* 2013;13:134.
24 Theunissen SCPM, Rieffe C, Kouwenberg M, *et al*. Behavioral problems in school-aged hearing-impaired children: the influence of sociodemographic, linguistic, and medical factors. *Eur Child Adolesc Psychiatry* 2014;23:187–96.
25 Wlodarczyk O, Pawils S, Metzner F, *et al*. Mental health problems among preschoolers in Germany: results of the BELLA preschool study. *Child Psychiatry Hum Dev* 2016;47:529–38.
26 Thornton E, Patalay P, Matthews D, *et al*. Does early child language predict internalizing symptoms in adolescence? An investigation in two birth cohorts born 30 years apart. *Chil Dev* 2021;92:2106–27.
27 Nepomnyaschy L, Miller DP, Waller MR, *et al*. The role of fathers in reducing socioeconomic inequalities in adolescent behavioral outcomes. *Soc Serv Rev* 2020;94:521–66.

28 Wang Q, Xiong Y, Liu X. Family unity or money? The roles of parent–child cohesion and socioeconomic status in the relationship between stressful life events and nonsuicidal self-injury among chinese left-behind children. *Suicide & Life Threat Behav* 2020;50:963–74.
29 Nelson BW, Flannery JE, Duell N, *et al*. Concurrent and prospective associations between fitbit derived RDoC arousal and regulation constructs and adolescent internalizing symptoms. *PsyArXiv* [Preprint] 2021.
30 Tran A. Family contexts: parental experiences of discrimination and child mental health. *Am J Community Psychol* 2014;53:37–46.
31 Saur AM, Loureiro SR. Behavioral and emotional problems of schoolchildren according to gender. *Arq Bras Psicol* 2014;66:102–16.
32 McKay MT, Cole JC. Mental well-being and psychological symptomatology in Northern Irish youth: the role of gender, place of residence, and socioeconomic status. *J Rural Ment Health* 2017;41:299–305.
33 Peinado J, Theresa Villanos M, Singh N, *et al*. The association between exposure to violence, alcohol, and drugs and psychosocial and behavioral outcomes among Mexican-American adolescents of low socioeconomic status. *Adicciones* 2014;26:27–33.
34 Xiao Y, Lindsey MA. Racial/ethnic, sex, sexual orientation, and socioeconomic disparities in suicidal trajectories and mental health treatment among adolescents transitioning to young adulthood in the USA: a population-based cohort study. *Adm Policy Ment Health* 2021;48:742–56.
35 Patler C, Laster Pirtle W. From undocumented to lawfully present: do changes to legal status impact psychological wellbeing among latino immigrant young adults? *Soc Sci Med* 2018;199:39–48.
36 Verelst A, De Schryver M, De Haene L, *et al*. The mediating role of stigmatization in the mental health of adolescent victims of sexual violence in Eastern Congo. *Child Abuse Negl* 2014;38:1139–46.
37 Pappin M, Marais L, Sharp C, *et al*. Socio-economic status and socio-emotional health of orphans in South Africa. *J Community Health* 2015;40:92–102.
38 Pérez-Marfil MN, Fernández-Alcántara M, Fasfous AF, *et al*. Influence of socio-economic status on psychopathology in Ecuadorian children. *Front Psychiatry* 2020;11:43.
39 Ssenkusu JM, Hodges JS, Opoka RO, *et al*. Long-term behavioral problems in children with severe malaria. *Pediatrics* 2016;138:e20161965.
40 Li M, Betancourt T, Eustache E, *et al*. Risk and protective factors for internalizing and externalizing outcomes among HIV-affected youth in Haiti. *AIDS Care* 2015;27:995–9.
41 Pengpid S, Peltzer K. Parental involvement, health behaviour and mental health among school-going adolescents in seven Pacific Island countries. *J Hum Behav Soc Environ* 2018;28:1068–77.
42 Pengpid S, Peltzer K. Parental involvement and mental health among school-going adolescents in five Caribbean countries. *J Psychol Afr* 2018;28:394–9.
43 Profe W, Wild LG. Mother, father, and grandparent involvement: associations with adolescent mental health and substance use. *J Fam Issues* 2017;38:776–97.
44 McNeilly EA, Peverill M, Jung J, *et al*. Executive function as a mechanism linking socioeconomic status to internalizing and externalizing psychopathology in children and adolescents. *J Adolesc* 2021;89:149–60.
45 Zhu J, Yu C, Zhang W, *et al*. Peer victimization, deviant peer affiliation and impulsivity: predicting adolescent problem behaviors. *Child Abuse Negl* 2016;58:39–50.
46 Samms-Vaughan M, Lambert M. The impact of polyvictimisation on children in LMICs: the case of Jamaica. *Psychol Health Med* 2017;22:67–80.
47 Zahir Izuan A, Shamsul Azhar S, Tan MKS, *et al*. Neighbourhood influences and its association with the mental health of adolescents in Kuala Lumpur, Malaysia. *Asian J Psychiatr* 2018;38:35–41.
48 Nik-Azin A, Shairi MR, Nainian MR. Health related quality of life in adolescents: mental health, socio-economic status, gender, and age differences. *Dev Psychol J Iran Psychol* 2013;9:271–82.
49 Winkler J, Stolzenberg H. Social class index in the Federal Health Survey. *Gesundheitswesen Bundesverb Arzte Offentlichen Gesundheitsdienstes Ger* 1999;61:S178–83.
50 Voltas Moreso N, Hernández-Martínez C, Arija Val V, *et al*. Socio-demographic and psychopathological risk factors in obsessive-compulsive disorder: epidemiologic study of school population. *Int J Clin Health Psychol* 2013;13:118–26.
51 Choi J-K, Wang D, Jackson AP. Adverse experiences in early childhood and their longitudinal impact on later behavioral problems of children living in poverty. *Child Abuse Negl* 2019;98:104181.
52 Maneta EK, White M, Mezzacappa E. Parent-child aggression, adult-partner violence, and child outcomes: a prospective, population-based study. *Child Abuse Negl* 2017;68:1–10.
53 Smith HR, Eryigit-Madzwamuse S, Barnes J. Paternal postnatal and subsequent mental health symptoms and child socio-emotional and behavioural problems at school entry. *Infant Child Dev* 2013;22:335–48.
54 Coley RL, O'Brien M, Spielvogel B. Secular trends in adolescent depressive symptoms: growing disparities between advantaged and disadvantaged schools. *J Youth Adolesc* 2019;48:2087–98.
55 Rodriguez EM, Nichols SR, Javdani S, *et al*. Economic hardship, parent positive communication and mental health in urban adolescents seeking outpatient psychiatric care. *J Child Fam Stud* 2015;24:617–27.
56 Haag AC, Zehnder D, Landolt MA. Guilt is associated with acute stress symptoms in children after road traffic accidents. *Eur J Psychotraumatol* 2015;6:29074.
57 Fidalgo TM, Sanchez ZM, Caetano SC, *et al*. Exposure to violence: associations with psychiatric disorders in Brazilian youth. *Braz J Psychiatry* 2018;40:277–83.
58 Paula CS, Mari JJ, Bordin IAS, *et al*. Early vulnerabilities for psychiatric disorders in elementary schoolchildren from four Brazilian regions. *Soc Psychiatry Psychiatr Epidemiol* 2018;53:477–86.
59 Sama BK, Kaur P, Thind PS, *et al*. Implications of COVID-19-induced nationwide lockdown on children's behaviour in Punjab, India. *Child Care Health Dev* 2021;47:128–35.
60 Kakaje A, Al Zohbi R, Alyousbashi A, *et al*. Post-traumatic stress disorder (PTSD), anger and mental health of school students in Syria after nine years of conflict: a large-scale school-based study. *Psychol Med* 2022;52:1923–33.
61 Herbert SD, Harvey EA, Lugo-Candelas CI, *et al*. Early fathering as a predictor of later psychosocial functioning among preschool children with behavior problems. *J Abnorm Child Psychol* 2013;41:691–703.
62 Gerstein ED, Woodman AC, Burnson C, *et al*. Trajectories of externalizing and internalizing behaviors in preterm children admitted to a neonatal intensive care unit. *J Pediatr* 2017;187:111–8.
63 Mills EJ, Adhvaryu A, Jakiela P, *et al*. Unconditional cash transfers for clinical and economic outcomes among HIV-affected Ugandan households. *AIDS* 2018;32:2023–31.
64 Kozlova EA, Slobodskaya ER, Akhmetova OA. Individual and socioeconomic characteristics of families as factors of mental health in children. *Cult Hist Psychol* 2014;10:46–53.
65 Kachi Y, Abe A, Ando E, *et al*. Socioeconomic disparities in psychological distress in a nationally representative sample of Japanese adolescents: a time trend study. *Aust N Z J Psychiatry* 2017;51:278–86.
66 Anderson S, Johnston W, Leventhal T. When neighborhoods matter: developmental timing and youth reading achievement and problem behaviors. *Soc Sci Res* 2019;81:1–11.
67 Sivertsen B, Harvey AG, Pallesen S, *et al*. Mental health problems in adolescents with delayed sleep phase: results from a large population-based study in Norway. *J Sleep Res* 2015;24:11–8.
68 Weinberg D, Stevens G, Currie C, *et al*. Country-level meritocratic beliefs moderate the social gradient in adolescent mental health: a multilevel study in 30 European countries. *J Adolesc Health* 2021;68:548–57.
69 Russell MA, Odgers CL. Adolescents' subjective social status predicts day-to-day mental health and future substance use. *J Res Adolesc* 2020;30 Suppl 2:532–44.
70 Roy AL, Isaia A, Li-Grining CP. Making meaning from money: subjective social status and young children's behavior problems. *J Fam Psychol* 2019;33:240–5.
71 Novak D, Kawachi I. Influence of different domains of social capital on psychological distress among Croatian high school students. *Int J Ment Health Syst* 2015;9:18.
72 Daly MC, Duncan GJ, McDonough P, *et al*. Optimal indicators of socioeconomic status for health research. *Am J Public Health* 2002;92:1151–7.
73 Oakes JM, Kaufman JS. *Methods in social epidemiology*. John Wiley & Sons, 2017.
74 Hendriks AM, Finkenauer C, Nivard MG, *et al*. Comparing the genetic architecture of childhood behavioral problems across socioeconomic strata in the Netherlands and the United Kingdom. *Eur Child Adolesc Psychiatry* 2020;29:353–62.
75 Pickett KE, Pearl M. Multilevel analyses of neighbourhood socioeconomic context and health outcomes: a critical review. *J Epidemiol Community Health* 2001;55:111–22.
76 Patel V, Burns JK, Dhingra M, *et al*. Income inequality and depression: a systematic review and meta-analysis of the association and a scoping review of mechanisms. *World Psychiatry* 2018;17:76–89.
77 Ahern J, Galea S. Social context and depression after a disaster: the role of income inequality. *J Epidemiol Community Health* 2006;60:766–70.

78 Wade SL, Taylor HG, Cassedy A, *et al*. Long-term behavioral outcomes after a randomized, clinical trial of counselor-assisted problem solving for adolescents with complicated mild-to-severe traumatic brain injury. *J Neurotrauma* 2015;32:967–75.
79 Mulraney M, Schilpzand EJ, Anderson V, *et al*. Correlates of anxiety in 6- to 8-year-old children with ADHD: a community-based study. *J Atten Disord* 2018;22:425–34.
80 Odgers CL. Income inequality and the developing child: is it all relative? *Am Psychol* 2015;70:722–31.
81 Katikireddi SV, Valles SA. Coupled ethical-epistemic analysis of public health research and practice: categorizing variables to improve population health and equity. *Am J Public Health* 2015;105:e36–42.
82 Rivenbark J, Arseneault L, Caspi A, *et al*. Adolescents' perceptions of family social status correlate with health and life chances: a twin difference longitudinal cohort study. *Proc Natl Acad Sci U S A* 2020;117:23323–8.
83 Svedberg P, Nygren JM, Staland-Nyman C, *et al*. The validity of socioeconomic status measures among adolescents based on self-reported information about parents occupations, FAS and perceived SES; implication for health related quality of life studies. *BMC Med Res Methodol* 2016;16:48.
84 Zaneva M, Guzman-Holst C, Reeves A, *et al*. The impact of monetary poverty alleviation programs on children's and adolescents' mental health: a systematic review and meta-analysis across low-, middle-, and high-income countries. *J Adolesc Health* 2022;71:147–56.
85 Zaneva M. Analytical decisions pose moral questions. 2024. Available: https://doi.org/10.31234/osf.io/sd7qh

Mirela Zaneva completed her PhD at the Department of Experimental Psychology at the University of Oxford in the UK in 2023, where she studied the impacts of poverty and inequality on children and adolescents' mental health. She currently is a Junior Research Fellow at Christ Church College at the University of Oxford. She is interested in understanding and building the evidence base for effective interventions that are responsive to patients' mental health problems and lived experiences, including social determinants like inequality.