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## Review of Major Social Determinants of Health in Schizophrenia-Spectrum Disorders: II. Assessments

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**Background and Aims:** Social determinants of health (SDoHs) impact the development and course of schizophrenia-spectrum psychotic disorders (SSPDs). Yet, we found no published scholarly reviews of psychometric properties and pragmatic utility of SDoH assessments among people with SSPDs. We aim to review those aspects of SDoH assessments. **Study Design:** PsychInfo, PubMed, and Google Scholar databases were examined to obtain data on reliability, validity, administration process, strengths, and limitations of the measures for SDoHs identified in a paired scoping review. **Study Results:** SDoHs were assessed using different approaches including self-reports, interviews, rating scales, and review of public databases. Of the major SDoHs, early-life adversities, social disconnection, racism, social fragmentation, and food insecurity had measures with satisfactory psychometric properties. Internal consistency reliabilities—evaluated in the general population for 13 measures of early-life adversities, social disconnection, racism, social fragmentation, and food insecurity—ranged from poor to excellent (0.68–0.96). The number of items varied from 1 to more than 100 and administration time ranged from less than 5 minutes to over an hour. Measures of urbanicity, low socioeconomic status, immigration status, homelessness/housing instability, and incarceration were based on public records or targeted sampling. **Conclusions:** Although the reported assessments of SDoHs show promise, there is a need to develop and test brief but validated screening measures suitable for clinical application. Novel assessment tools, including objective

assessments at individual and community levels utilizing new technology, and sophisticated psychometric evaluations for reliability, validity, and sensitivity to change with effective interventions are recommended, and suggestions for training curricula are offered.

**Keywords:** early-life adversity/food insecurity/social connections/racism/socioeconomic status

### Introduction

External conditions such as the quality of the places where a person lives, learns, works, and interacts socially are considered social determinants of health (SDoHs).<sup>1–4</sup> SDoHs impact physical, cognitive, and mental health, quality-of-life, daily functioning, and longevity.<sup>5</sup> Both episodic and enduring environmental experiences play an important role in the integrated model of well-being in schizophrenia.<sup>6</sup> SDoHs may contribute to the initial development of schizophrenia-spectrum psychotic disorders (SSPD),<sup>7</sup> and/or worse course and outcomes of the illness<sup>8</sup> and greater medical comorbidity, which may result in premature mortality.<sup>9,10</sup>

In a paired scoping review, that precedes this article in the current Section on SDoHs in SSPD, we identified 9 SDoHs as reasonably well-studied major factors relevant to clinical outcomes in patients with SSPD: early-life adversities, social disconnection, racism, disadvantaged neighborhood (urbanicity and lower socioeconomic

status), migration, social fragmentation, homelessness/housing instability, food insecurity, and incarceration.<sup>11</sup> These factors were associated with a greater risk of a diagnosis of SSPD and/or more severe illness. A critical issue in studies of SDoHs relates to the methods of their assessments.<sup>12,13</sup> While published studies and reviews of SDoHs include a discussion of measurement of specific SDoHs,<sup>3,14–23</sup> we did not find a review of the psychometric quality and practical clinical utility of these measures in people with SSPD. Assessments of seriously mentally ill individuals involve special challenges,<sup>24</sup> including cognitive impairment, delusions, or hallucinations that interfere with the validity of responses, and apathy that reduces motivation. Our aims for this review were to examine the psychometric properties (reliability and validity) and clinical utility (constructs measured, number of items, time required for administration, and developmental timeframe [ie, length of time period to which the measure refers]) of measures used to assess SDoHs in persons with SSPD and to provide recommendations for clinical care, research, and training.

## Methods

We first systematically identified all the SDoH measures used in the studies that were identified in meta-analyses and systematic reviews covered in a paired scoping review by Jester et al.<sup>11</sup> By “measures,” we broadly refer to any data that can form a variable that characterizes individual, group, or other differences in an SDoH. Next, relevant data were extracted from each article that included a specific measure of each SDoH, focusing on format of the measure, construct assessed, reliability, validity, number of items, number of Likert scale options (if applicable), time required, and developmental timeframe. Considering the diverse range of measures included in this review, and because not all of the articles reviewed included each of these data points, secondary nonsystematic reviews were conducted, as needed, on PubMed, PsycInfo, and Google Scholar using each measure name (eg, “childhood trauma questionnaire,” “experience of discrimination”) and characteristic (eg, “reliability,” “validity”) until we could identify reliability, validity, number of items, Likert scaling (if applicable), time required, and developmental timeframe. Nonsystematic secondary reviews were used because it is not feasible to systematically review every measure of each SDoH domain within a single paper; however, the systematic approach was needed to determine which measures were used most commonly in the literature included in the selected umbrella reviews. In the main text, we report data on both psychometric properties (reliability, validity) and clinical utility (construct measured, developmental timeframe, time required) for the most commonly used measures from the articles identified from meta-analysis or systematic reviews, within each domain. In the [supplementary material](#), we report

data on clinical utility (construct measured, developmental timeframe, time required) for all the measures employed in the various studies.

## Results

**Table 1** summarizes characteristics of the selected measures for each of the 9 SDoHs. An expanded version of this table containing all the named measures from the reviewed articles is reported in the [supplementary material](#).

### 1. Early-life adversities

Of the 19 measures used for investigating early-life adversities, 14 were self-report-based questionnaires, 4 were interviews, and others utilized public or medical records (see [supplementary table 1](#)). A majority of these were study-specific questionnaires (ie, questions developed specifically for a particular study). The number of items varied from 1 to 70, and administration time ranged from less 5 minutes to over 15 minutes (see [table 1](#)).

The Childhood Trauma Questionnaire (CTQ) was the single most commonly used measure. The CTQ is a 70-item questionnaire in its original form, but there is also a 28-item version and also a 21-item version (developed when the goal is to avoid exposing young children to explicit material in questions).<sup>40,45</sup> Additionally, the CTQ has been translated into multiple languages. Clinical and nonclinical samples have been used in studies of its reliability and validity. The measure has good reliability and its validity<sup>169</sup> is broadly supported but there is lack of research in cross-cultural samples.<sup>45</sup>

Clinical interviews were also used to evaluate early childhood adversities, specifically relying on questions from post-traumatic stress disorder modules or modifications within the schizophrenia modules from structured clinical interviews (see [table 1](#)). Other approaches included evaluation of medical and public records such as police records (eg, reports of domestic violence and assault), records from services related to trauma such as victim centers, and hospital records.<sup>25,53–55</sup>

### 2. Social disconnection

Of the 12 social disconnection measures reviewed, 2 were self-report questionnaires and 10 were interviews (see [supplementary table 1](#)). The 2 most commonly used measures of social disconnection were the Social Network Schedule (SNS)<sup>76</sup> and the WHO Quality of Life (WHOQOL)—Social Relationships questionnaire (see [table 1](#)).

The most commonly used interview within this domain was the SNS,<sup>76</sup> which is available in both English and Spanish. The SNS was developed with a population of long-stay psychiatric patients. Patients are asked to identify the people they have had contact with over an extended period of time and then assess the quality of each relationship mentioned.<sup>76</sup> The inter-rater

**Table 1.** Psychometric Properties of Selected Measures

Instrument	Constructs Measured	Reliability	Validity	# Items	Likert Scoring	Time Required (in Minutes)	Developmental Timeframe
Early-life adversities Questionnaires							
Short questionnaires <sup>25-39</sup>	NF	NF	NF	2-7	Yes/no	NA	Childhood (<18 years old)
Childhood Trauma Questionnaire (CTQ) <sup>40-44</sup>	Physical and emotional neglect/abuse	SF = strong internal consistency (see review <sup>45</sup> )	SF = strong structural and content (see review <sup>45</sup> )	70 28 (SF) 21 (nonexplicit)	5-Point	15 5 (SF) <sup>46</sup>	Lifetime
Interviews							
Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS) <sup>39,47</sup>	Physical abuse, sexual abuse, and domestic violence	Unknown for modified use	Unknown for modified use	NF	NA	NF	Childhood or lifetime
Bullying and Friendship Interview Schedule (BFIS) <sup>38,48,49</sup>	Bullying/social support	Cronbach's $\alpha$ s = 0.62-0.77 <sup>50-52</sup>	Predictive (victimization) in elementary school and middle school	12	4-Point	NF	Past 6 months, 8, 10, or 13 years old
Medical or public records <sup>23,53-56</sup>	Physical abuse, sexual abuse, parental loss, divorce, use of childhood protective services	NA	NA	NA	NA	NA	<16, <24, and 14-24 years old
Limited social network Questionnaires							
WHO Quality of Life-Social Relationships <sup>57-70</sup>	Network size	Cronbach's $\alpha$ s = 0.82-0.92 <sup>71</sup> Test-retest $r$ = 0.68-0.95 <sup>71,72</sup>	Good convergent and discriminant <sup>71,72</sup>	100 36 (SF) 16 (screener)	7-Point	<40-90	Current
Interview							
Social Network Schedule (SNS) <sup>73-75</sup>	Network size and quality of relationships	Inter-rater $r$ = 0.94-0.99 <sup>32</sup>	Good convergent <sup>76</sup>	3 + 6 follow-up questions for each individual in network	NA	30	Current
Racism Questionnaires							
Study-specific questionnaires <sup>77-84</sup>	Perceived racial discrimination	Cronbach's $\alpha$ s $\geq$ 0.74 Test-retest $r$ = 0.70 <sup>88</sup>	Best convergent compared to other measures <sup>85</sup>	9+ frequency	NA	NF	Lifetime
Experience of Discrimination (EOD) <sup>77,85-87</sup>	lifetime discrimination, recent discrimination, everyday mistreatment	Cronbach's $\alpha$ s = 0.63-0.88 <sup>90</sup> Older African Americans (0.44-0.80) <sup>91</sup> Latinx (0.91) <sup>92</sup> Asian Americans (0.91) <sup>89</sup>	Good convergent	9+ follow-up questions	5-, 4-point	NF	Past year and lifetime

Table 1. Continued

Instrument	Constructs Measured	Reliability	Validity	# Items	Likert Scoring	Time Required (in Minutes)	Developmental Timeframe
Urbanicity and socioeconomic status							
Geographical location of address <sup>93-100</sup>	Population density of home location	NA	NA	NA	NA	NA	Current
Census data <sup>98,99,101,102</sup>	Material deprivation (assessed via components of census data such as unemployment, poverty, housing quality, etc.)	NA	NA	NA	NA	NA	Current
Immigration							
Hospital records <sup>103-114</sup>	Country of birth/current residence	NA	NA	NA	NA	NA	Birth/current
Census/national registry <sup>79,106,108,115-138</sup>							
Self-report <sup>95,104,123,124,139-146</sup>	Immigration status	NA	NA	NA	NA	NA	Birth/current
Interview <sup>106,114,147-149</sup>	First-/second-generation status	NA	NA	NA	NA	NA	Birth/current/parents
Social fragmentation							
Census data							
Social Fragmentation Index (SFI) <sup>150</sup>	Social fragmentation assessed via combination of homeownership, mobility, marital status, nonfamily households, single-person households, children, immigrants, non-English/Maori speakers, and long-term residents	Cronbach's $\alpha$ = 0.73 <sup>150</sup>	Moderate convergent <sup>150</sup>	NA	NA	NA	Current
Homelessness or housing instability							
Interview <sup>151-153</sup>	Housing instability	NA	NA	NA	NA	NA	Current
Food insecurity							
Interview							
USDA Household Food Security Survey (USDA-HFSS) <sup>154-157</sup>	Food security	Cronbach's $\alpha$ = 0.73-0.95	Evidence supports structural and convergent <sup>158</sup>	18	NF	NF	1 year
Proxy							
Poverty, height/weight, iodine deficiency, low birth-weight <sup>159-163</sup>	Nutritional availability	NA	NA	NA	NA	NA	NA
Incarceration							
Sampling method <sup>164-168</sup>	Incarceration	NA	NA	NA	NA	NA	Current
Public records <sup>167,168</sup>	History of incarceration	NA	NA	NA	NA	NA	Lifetime

Note: a, adapted; aka, also known as; avg., average; hr., hour; m, modified; min., minutes; NA, not applicable; NF, not found; SF, short form; SMI, severe mental illness; WHO, World Health Organization.

<sup>a</sup>Tested in samples other than healthy controls.

reliability for the SNS is generally excellent for the English language version. In a Spanish-language study the test-retest reliability was mostly acceptable.<sup>76,170</sup> A recent review cited the SNS as the best combination of practicality and accuracy among measures of social network.<sup>171</sup>

The most commonly used self-report-based tool within this domain was the WHOQOL Social Relationships questionnaire, which is available in multiple languages. The measure was developed from 15 international field centers simultaneously.<sup>57</sup> Test-retest reliability is generally adequate to excellent, and internal consistency reliability is generally good to excellent (see [table 1](#)). The WHOQOL also has well-established convergent and discriminant validity.

### 3. Racism

All 7 of the racism measures reviewed were self-report questionnaires to evaluate experiences with racism (ie, discrimination on the basis of race or ethnicity) (see [supplementary table 1](#)). The 3 most commonly used tools were study-specific questionnaires, the Experience of Discrimination questionnaire (EOD),<sup>77,85–87</sup> and the Everyday Discrimination Scale-Lifetime Discrimination Subscale (EDS) (see [table 1](#)).<sup>77,89,90</sup> The EOD and EDS contain 9 items each but differ in their follow-up questions regarding frequency as well as context and timeframe of events included. Both of these scales offer variable levels of resolution regarding types of discrimination (ie, racial vs. ethnic), frequency, and impact on daily life. Neither measure has been specifically validated in people with SSPD. The EOD has shown adequate reliability in a racially and ethnically diverse group of healthy individuals.<sup>88</sup> EDS scores have shown a range of reliability from poor to good when tested in populations of different ethnic and racial identities.

### 4. Disadvantaged neighborhoods (urbanicity and lower socioeconomic status)

Only geographical methods (eg, locations of addresses in city or rural areas) and census data were employed to measure urbanicity defined as a city or a part of a city (see [supplementary table 1](#)). Urbanicity was sometimes compared to rural areas nearby—using population or population density to divide the participants into urban/rural groups<sup>93–95</sup>—occasionally with an additional suburban category.<sup>96–100</sup> Given the nature of these measures, reliability and validity are often not considered in research. Socioeconomic status was measured at the neighborhood level in 4 articles used in the meta-analysis (see [table 1](#)). Each article had a slightly different combination of census questions included in the examination of socioeconomic status (eg, unemployment, housing quality, and poverty). Importantly, socioeconomic status was defined at either the individual-level or at the area-level.

### 5. Migration

There were 4 methods utilized to evaluate migrant status: hospital records, reviews of census-type demographic data (sometimes adjusting for potential under-reporting of migrant status), self-report questions about country of birth (written or verbally asked), or more extensive interviews (see [supplementary table 1](#)). The self-report question approach was mostly used when exploring first- and second-generation immigrant status since census data often do not include information about parents' country of birth (see [table 1](#)). Additionally, 1 article required staff of mental health facilities to report ethnicity or country of birth on behalf of the patient when severe mental illness hindered direct verbal communication.<sup>103</sup> Two studies mentioned the use of an interpreter when needed,<sup>147,148</sup> and one<sup>147</sup> collected a more detailed migration history including stress around the reasons for migration and level of competency in the interview language. Although convenience and face validity make the census-type review or self-report question approaches attractive, the reliability and validity of such measures are unknown.

### 6. Social fragmentation

One measure of social fragmentation was used in the papers reviewed: the Social Fragmentation Index (SFI).<sup>150</sup> The SFI is a neighborhood-based measure that uses commonly available census data that relate to social cohesion (eg, number of single-person households, number of single people, etc.) to assign values of social fragmentation to neighborhoods. SFI scores have shown adequate reliability.<sup>150</sup>

### 7. Homelessness or housing instability

No structured measures or questionnaires were used to assess homelessness in the articles used for meta-analyses about SSPD despite the existence of such measures mentioned below in the discussion (see [supplementary table 1](#)). Nearly every study of homeless populations recruited from places where people shelter or other places of service (such as meal providers). Investigators then used diagnostic clinical interviews to determine rates of SSPD. A small number of studies utilized interviews with demographic questions, including questions about homelessness, and a few assessed extended history of homelessness.<sup>151–153</sup>

### 8. Food insecurity

Of the 16 food insecurity measures reviewed, 8 were self-report questionnaires, and others employed proxies of food insecurity (see [supplementary table 1](#)). The most commonly used measures were the U.S. Department of Agriculture Household Food Security Survey Module (USDA-HFSS),<sup>154–157</sup> and proxies of food insecurity<sup>159–163</sup> (see [table 1](#)). The USDA-HFSS is also known as the Core Food Security Measurement

(CFSM)<sup>172</sup> and Current Population Survey (CPS) Food Security Supplement.<sup>173</sup> This measure can be administered in-person or via telephone interview and contains skip logic to reduce administration time. The USDA-HFSS has been investigated extensively in several languages.<sup>158,174–177</sup> In studies of SSPD, the USDA-HFSS has demonstrated good to excellent reliability.<sup>178</sup> A separate review of measures of food insecurity described the USDA-HFSS as one of the most highly validated and reliable measures available.<sup>158</sup>

Obtaining both individual- and area-level measures is useful to understand the broad undercurrents of SDoHs as they impact persons with SSPD. For example, food insecurity was sometimes evaluated through proxies such as income-level of country of residence,<sup>162</sup> height and weight of babies and children,<sup>163</sup> nutrition deficiencies,<sup>163</sup> poverty,<sup>159,160</sup> biological measurements, and survey questions.<sup>161</sup> Additionally, survey measures of food insecurity have been used for both screening/assessing individuals and gathering area-level data. These methods may be useful when other direct measures are not available, but they lack specificity.

## 9. Incarceration

As with homelessness, incarceration was assessed simply by recruiting individuals from incarcerated populations (see [supplementary table 1](#)). This often results in unisex samples from a single prison, often with heterogeneous criminal histories and sentence lengths. Some but not all studies collected criminal histories using self-report or criminal records. No standardized self-report or interview-based measures were used. Additionally, no data on reliability or validity were reported.

## Discussion

The methods for assessing SDoHs were highly variable. Self-report was most common, followed by interview-based assessments, reviews of census-type data and other records, and targeted sampling methods (eg, recruiting from homeless shelters or prisons). Unsurprisingly, psychometric data on reliability and validity were often available for the first 2 types of assessment methods, but almost never for the last 2. Where reported, the psychometric quality of the tools generally ranged from adequate to excellent. Overall, our review paints an uneven picture of the quality of SDoH assessments in people with SSPD. Below we discuss assessments for each SDoH listed above, followed by limitations of this review and recommendations for next steps.

### *Early-Life Adversities*

Early-life adversities had a relatively large number of measures that often-demonstrated good psychometric properties. The most common measure used was the

CTQ, a reliable and valid measure of abuse and neglect experienced during childhood that exists in multiple languages. Responses are collected via self-report. The briefest form can be completed in 5 minutes (compared to the original long form which can take 15 minutes). Additionally, the CTQ is readily available, unlike some similar measures of early-life adversities that are difficult to obtain.<sup>169</sup> The CTQ is a favorable option for both research assessments and clinical screenings; however, it restricts the broader construct of early-life adversities to abuse and neglect. Bullying is another topic of study within this SDoH, and there are several other constructs that were not discussed in the meta-analyses and umbrella reviews that formed the basis of our review<sup>11</sup> (eg, exposure to violence). Thus, it may be useful to consider more comprehensive measures such as the Adverse Childhood Experience (ACE) questionnaire<sup>179</sup> for more general assessment of adversities. The ACE is a 10-item self-report questionnaire that measures personal and family-related trauma that occurred before the age of 18.<sup>180</sup>

Another critical set of measures of childhood risk factors for SSPD includes pre-, peri-, and postnatal traumas of various types, based on hospital records and parental interviews, including poor maternal health and nutrition, parental psychopathology, and birth traumas. A recent analysis of SDoHs concluded that prenatal and perinatal complications were among the top 3 most important intermediary factors that link structural racism to outcomes in people with SSPD.<sup>181</sup> Targeting this category of SDoHs for early intervention and prevention could be highly effective as cost efficient.

Applying lessons learned from SDoH research enhances the role of clinicians from being only “interventionists” to also becoming “preventionists.” For psychiatrists, this means not only treating patients but also becoming aware of (and addressing, if possible) the early-life adversities that children might be experiencing.

### *Social Disconnection*

We found several self-report and interview-based measures of social disconnection that have good reliability and were developed and/or validated in seriously mentally ill populations. Of these, the SNS and WHOQOL Social Relationships questionnaire are excellent measures for obtaining interview- or self-reported social network size (respectively); however, additional qualities such as perceived support or participation in group membership would also be useful.<sup>182</sup> For more in-depth assessment, other tools are needed. The Inventory of Socially Supportive Behaviors is a 40-item self-report measure of social network size, quality, and types of support, and has good reliability and validity in the general population and should be included in future research in SSPD.<sup>182</sup>

### *Social Fragmentation*

The SFI was the only measure used in the literature on this SDoH. Interestingly, it has high measurement quality but does not rely on self-report or interview-based data; instead, it relies on objective census data, which are not influenced by patients' mental states at the time of reporting. On the negative side, relying only on census-based measures may not be adequate in an individual patient context. Thus, self-report measures of social fragmentation (subjective experiences) should be added to objective community-level assessments. Social fragmentation at the school-level may be particularly important as it has been shown to partly explain the association between urban upbringing and onset of non-affective psychotic disorders.<sup>183,184</sup> In addition to social fragmentation, neighborhood-level measures of social support should also be validated in people with SSPD in order to enrich the understanding of the possibly bidirectional relationship between symptoms of SSPD and social support. An example of such tools is the Social Cohesion Neighborhood Scale (SCNS), a 30-item survey with 4 items measuring social cohesion that ask whether people in the neighborhood are helpful, get along, can be trusted, and share the same values. The SCNS is currently being used in the Research All of Us initiative.<sup>185,186</sup>

### *Racism*

Structural, institutional, and interpersonal racism are major causes of toxic stress and adverse socioeconomic consequences at a public health level for minoritized communities.<sup>187</sup> All of the measures of racism employed in the studies discussed above were based on individual experiences, and not on societal structure despite the existence of measures like redlining policies and the Institutional Racism subscale of the Index of Race-Related Stress.<sup>77,188</sup> Reviews of measures of perceptions of race/ethnicity-based discrimination already exist but they need to be tested in people with SSPD.<sup>189</sup> There is also a need to address other forms of harmful social discrimination in relation to psychosis, such as discrimination related to gender, sexuality, and aging. Measures for these experiences exist,<sup>190-192</sup> but have not been studied as well in persons with SSPD.

### *Migration*

Studies of immigrants with SSPD routinely include questions about their country of birth; however, this may not provide enough detail to accurately characterize relationships between SSPD and migrant status. This review defined migration as any measure which attempted to quantify the geographic stability of individuals' home addresses across national borders. Measures of time spent in the new country, legal status, refugee status, first- versus second-generation immigrant status, and

being expatriates were rarely included but should also be assessed. Internal migration (moving during childhood and adolescence) was not measured in any of the articles searched for measures despite being an important risk factor for nonaffective psychotic disorders.<sup>193-196</sup> Difference in the Gross Domestic Product (GDP) between birth and destination countries may also be considered, along with diplomatic relationships between the 2 countries as expressed by visa rules, presence of trade embargos, etc. Immigration within a country is often not considered despite the difficulties that may exist in moving from one culturally distinct region of a country to another. New technology-based geographical assessment methods, such as Global Positioning Systems (GPS), are available via smartphones and might be useful for measuring national migration statistics and could also be used to characterize an individual's experience with migration.<sup>197</sup> Intersectionality of gender and other cultural characteristics with immigration and refugee status are important considerations as well.<sup>115,139</sup> One study included a culturally sensitive clinical interview to address possible cultural confounds.<sup>116</sup> While migration is often associated with urbanicity, lower socioeconomic status, discrimination, and homelessness, these constructs should be measured separately as related but distinct factors contributing to neurological correlates.<sup>198</sup> Importantly, social, rather than physical qualities of environment could be more influential in the pathophysiology of SSPD. Growing up in poor cities does not confer the same risk for psychosis as growing up in poor neighborhoods after adjusting for potential confounders.<sup>199</sup>

In a third paired article that follows the SDH articles on Clinical Outcomes and Assessment, we address putative systemic pathophysiological processes (eg, epigenetics, alostatic load, accelerated aging with inflammation, and the microbiome) which have impacts on brain structures, brain function, neurochemistry, and neuroplasticity, leading to clinical outcomes in terms of development, severity, and course of SSPD.<sup>200</sup>

### *Homelessness (Housing Instability)*

A lack of structured measures to assess housing instability in people with SSPD is an important limitation of studies of homelessness. The main approach employed in these reports consists of sampling methods seeking out people experiencing homelessness in shelters and utilizing services. Here, a clinical interview is conducted with participants experiencing homelessness, and the prevalence of SSPD is assessed in comparison to that in the general population or another cohort. Although informative, the sampling method for homelessness lacks reliability and validity information and can lead to varying results since no consensus definition of homelessness is employed. For example, many researchers do not include women living in battered women's shelters because they



are not identified as homeless, and these women do not see themselves as being homeless despite their housing instability.<sup>151</sup> In addition, homelessness is characterized by complex, multidimensional features such as duration (eg, no place to sleep for 1 night in the past 30 days vs majority of past 30 days)<sup>201</sup> and recency (eg, currently homeless vs having experienced homelessness in the last 30–90 days). Important clinical differences exist among persons with SSPD depending on how much time they have spent unhoused within recent years, suggesting a need for a history-taking approach as a complement to the sampling method.<sup>202,203</sup> Migration should also be carefully considered when evaluating homelessness.<sup>204</sup> The Residential TimeLine Follow-Back Inventory is a promising measure that has been validated in psychiatric and nonpsychiatric populations of homeless individuals, but restricted to only a few longitudinal studies involving participants with SSPD.<sup>205,206</sup>

### *Food Insecurity*

The USDA-HFSS is a well-validated self-report measure. However, 1 issue with such census-type questionnaires, whether used at the individual- or area-level is that they are often answered per household, making it difficult to assess which household members specifically experience significant stress directly associated with food insecurity. On the other hand, broader community-level aspects of food insecurity such as living in a food desert could be useful when investigating how food insecurity, housing instability, and structural racism interact as risk factors for SSPD.<sup>207</sup>

### *Incarceration*

Challenges related to evaluating incarceration as an SDoH are similar to those for homelessness; instead of obtaining detailed histories or completing questionnaires, data are generally collected via sampling from a prison or a correctional institution. This leads to heterogeneity in the definition of incarceration, resulting in unaccounted-for differences among incarcerated persons in terms of lengths of their sentences, types of prison wards, etc. It would be useful to understand how the attitudes and behaviors that develop during incarceration interact with mental illness, especially openness to treatment. In this regard, the Structured Assessment of Correctional Adaptation (SACA) may be a useful tool.<sup>208</sup> The SACA is a structured interview that assesses 16 clinically relevant attitudes and behaviors related to incarceration, such as stigma and vigilance.<sup>208</sup>

### *Positive SDoHs*

Positive SDoHs are markedly understudied. Future endeavors to measure positive SDoHs should expand upon existing assessments such as the APGAR instrument

for family support.<sup>209,210</sup> There are numerous measures for assessing adult resiliency to childhood adversity (eg, Connor-Davidson Resilience Scale,<sup>211</sup> the Resilience Scale for Adults,<sup>212</sup> and Brief Resilience Scale<sup>213</sup>). Resilience has been linked to improved outcomes, especially in older patients.<sup>214,215</sup> Psychometrically, assessments on the “healthy” side of outcome distributions are often ignored in favor of those on the “unhealthy” side<sup>216</sup> despite factors like education,<sup>217</sup> nutrition,<sup>218</sup> instrumental support,<sup>219</sup> emotional support,<sup>220</sup> and active rather than avoidant coping styles,<sup>221,222</sup> being known to positively impact outcomes.<sup>216</sup> Measuring protective qualities of education presents particular challenges due to the possibility of masking quality of education by measuring only years of education and interaction with racial, ethnic, and gender identities.<sup>223,224</sup> Investigators need to intentionally evaluate positive and protective factors by adding appropriate tools to their clinical assessment battery.

### *Limitations of This Review*

This review was restricted to assessments of the 9 major SDoHs in SSPD identified in our paired review.<sup>11</sup> It is not feasible to provide a systematic review of all possible SDoH measures used in SSPD research. Thus, 1 limitation is that our review necessarily omits work related to SDoHs and tools defined in ways that do not align with our methods. However, by conducting a high-level review of measures identified through meta-analyses and systematic reviews, this article highlights some of the more commonly reported measures and assessment methods published. Additionally, there is no unified SDoH framework in the field, making it difficult for clinicians to integrate SDoH concepts into their work,<sup>225</sup> and ultimately limiting the development of comprehensive assessment methods. Despite this, there have been attempts to create unified assessment tools such as the comprehensive but lengthy Accountable Health Communities Health-Related Social Needs Screening Tool,<sup>226</sup> NIH’s PhenX Social Determinants of Health Assessments Collection,<sup>227</sup> and the HealthBegins Upstream Risks Screening Tool.<sup>228</sup>

### *Recommendations*

Below we offer several recommendations for promoting meaningful research, clinical, educational, and public health practices and policies.

- (1) *Definition of SDoHs:* It is important to create a consensus definition of major SDoH constructs. There is significant overlap among various fields and perspectives that relate to SDoHs, and increasing evidence linking SDoHs with a range of physical and mental health outcomes.<sup>229</sup> However, the translation of this evidence into clinical practice has been hampered by a lack of consensus definition of SDoH constructs or

even about the language or vocabulary used to discuss social determinants.

- (2) *Quality of SDoH measures*: It is necessary to promote development and testing of SDoH measures that are psychometrically robust, practical, and sensitive to the interrelatedness among SDoHs. As noted above, there are thoughtfully designed and broad-based measures; however, their use in daily clinical practice has drawbacks in terms of practicality and implementation. SDoHs are also hamstrung by a lack of specificity—that is, similar risk factors have been associated with multiple clinical outcomes and in different psychiatric disorders.<sup>230</sup>
- (3) *Training and education*: Efforts aimed at unraveling the complex interaction of SDoHs and psychopathology are also hindered by a lack of training and education about SDoH assessments for current and future clinical practitioners.<sup>231</sup> Since its inception over a century ago, modern medical education has continued its traditional focus on the individual doctor-patient interaction rather than on the doctor-community relationship.<sup>232</sup> Clinical practitioners tend to see themselves as being solely responsible for the care of the individual patients but not for addressing community-level SDoHs. We need to build training capacity in the medical field that can support SDoHs assessment. In terms of educators and learners this should include curricula that provide a more extensive focus on the interaction between SDoHs and health, digital literacy needed to enable the use of new assessment technologies and data, clear focus on formulation skills using data on SDoHs obtained with validated assessment tools, and training and assessment resources that drive learners to acquire key knowledge, skills, and attitudes related to SDoHs and their role in clinical practice.
- (4) *Multifaceted assessments*: Research should focus on more balanced use of different types of assessments—self-report-based, informant report-based, objective, and community-based. While there is no shortage of subjective evaluations, objective assessments using technology have been poorly researched. An example of such tools is the measurement of the quantity and quality of social connections using a combination of smartphone-based GPS and ecological momentary assessment employing a small number of questions related to the cognitive and emotional quality of social connections.<sup>233</sup> Methodologically, multitrait, multimethod psychometric techniques can be used to support integrated assessment approaches. It would be helpful to distinguish between, and incorporate, both individual- and community-level measures. Providing holistic care requires 2 lenses: understanding the individual and understanding the environment where the person comes from. These 2 perspectives are being employed in the new Royal College of Psychiatrists' curricula<sup>234</sup> based on its Report on person-centered

care.<sup>235</sup> Community-based measures of racism offer an example of evaluating SDoHs at a societal level. Efforts are required to validate such tools specifically in SSPD populations. Whereas individual-level assessments can help with individual-level interventions, community-level measures can help examine the impact of changes in public health policies in an objective way. Given the increasing need for making essential changes in social and structural factors that impact health and longevity, it is critical to prioritize this mission and propose successive steps at community level to be taken during the coming years and decades.

- (5) *Assessments in routine clinical practice*: At the same time, it is our job to improve individual patients' abilities to cope with the existing social anomalies like social fragmentation and racism in order to improve the well-being of the patients and their families. Thus, clinicians should use brief but reliable and valid SDoH tools in their daily practice. They should make a concerted effort to know the environments their patients emanate from, including both the assets and the liabilities, and choose assessment tools accordingly. Practitioners need to become aware of the resources that will provide them with this information. Clinical assessments of SDoHs do not have to be performed by busy clinicians but can be done by paramedical staff or via computerized tools.

Knowledge of SDoHs is useful only if the clinical practice and broader healthcare policies are changed appropriately to understand and improve the patients' health and well-being at individual and population levels. The recommendations listed above should help initiate that process.

### Supplementary Material

Supplementary material is available at *Schizophrenia Bulletin* online.

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