A scoping review of health-related stigma outcomes for high-burden diseases in low- and middle-income countries

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Abstract

Background: Stigma is associated with health conditions that drive disease burden in low- and middle-income countries (LMICs), including HIV, tuberculosis, mental health problems, epilepsy, and substance use disorders. However, the literature discussing the relationship between stigma and health outcomes is largely fragmented within disease-specific siloes, thus limiting the identification of common moderators or mechanisms through which stigma potentiates adverse health outcomes as well as the development of broadly relevant stigma mitigation interventions.

Methods: We conducted a scoping review to provide a critical overview of the breadth of research on stigma for each of the five aforementioned conditions in LMICs, including their methodological strengths and limitations.

Results: Across the range of diseases and disorders studied, stigma is associated with poor health outcomes, including help- and treatment-seeking behaviors. Common methodological limitations include a lack of prospective studies, non-representative samples resulting in limited generalizability, and a dearth of data on mediators and moderators of the relationship between stigma and health outcomes.

Conclusions: Implementing effective stigma mitigation interventions at scale necessitates transdisciplinary longitudinal studies that examine how stigma potentiates the risk for adverse outcomes for high-burden health conditions in community-based samples in LMICs.

Keywords: Stigma, Low- and middle-income countries, HIV, Tuberculosis, Epilepsy, Depression, Substance use, Scoping review

Background

Stigma is a major social determinant of health that drives morbidity, mortality, and health disparities [1], and has been described by the World Health Organization as a ‘hidden’ burden of disease [2]. Stigma is characterized by cognitive, emotional, and behavioral components and can be reflected both in the attitudes, often conceptualized as perceived, anticipated, or internalized stigmas, and experiences, including enacted or experienced stigmas affecting a particular trait, among individuals [3–5]. Perceived stigma refers to a person’s understanding of how others may act towards, and think or feel about, an individual with a certain trait or identity [6]. Anticipated stigma refers to expectations of stigma experiences happening in the future [7]. Internalized stigma refers to the individual level process of awareness, acceptance, and application of stigma (to oneself) [8–10]. Finally, experienced or enacted stigma refers to discriminatory acts or behaviors [11].

Stigma adversely impacts individual health outcomes as well as related ‘life chances’, including educational opportunities, employment, housing, and social relationships [1]. It has also been shown to negatively affect help- and treatment-seeking behaviors, hindering the ability of public health agencies to treat and prevent stigmatized health conditions [12]. HIV-related stigma, in particular, has been cited as one of the most enduring barriers to ending the HIV pandemic [13, 14]. Yet, while HIV-related stigma has
received greater attention, tuberculosis (TB), mental, neurological, and substance use disorders are also highly stigmatized drivers of the global burden of disease, with significant unmet treatment needs in low- and middle-income countries (LMICs) [15–20].

Hatzenbuehler et al. [1] argued that research on stigma and health outcomes is inappropriately siloed within specific disease/disorder domains. Across health disciplines, this separation has limited the ability to understand the overall impact of stigma on individual wellbeing and on global disease burden [1]. Research siloes have also restricted our ability to develop interventions addressing stigma, particularly in LMICs and among at-risk populations (e.g., lesbian, gay, bisexual, transgender, queer populations (LGBTQ); racial/ethnic minorities; refugees) for whom effective interventions are needed. Despite considerable progress in stigma research over the past decade, a critical review of the literature on the consequences of stigma across health conditions has not been undertaken.

This paper presents a scoping review of the literature on the health consequences of stigma at both the individual and healthcare system levels in LMICs. The review focuses on the main drivers of disease burden in LMICs, namely HIV, TB, mental health, epilepsy, and substance use. The purpose is to summarize recent research on the association between stigma and health for these populations, focusing on commonalities across disorders.

Methods

Search strategy, data charting, and data summary

We conducted a scoping literature review [21] to summarize current research on stigma and health in relation to five high-burden conditions in LMICs, highlighting the gaps and informing future directions [22]. Five searches of peer-reviewed manuscripts published between 2008 and 2017 were conducted between November 2017 and February 2018 using the PubMed (MEDLINE), PsychINFO, and EMBASE databases. Searches included terms related to (1) ‘stigma’ or other associated terms such as ‘discrimination’; (2) ‘LMICs’ including all countries with this classification according to the World Bank; and (3) specific diseases or disorders. Epilepsy was selected to represent neurologic disorders due to the lack of stigma data related to other neurologic conditions. Additional file 1 includes the full list of search terms for each database searched.

Each review and synthesis was conducted by a single study author with condition-specific expertise. An initial title and abstract review was performed, followed by full-text review of any article included during the first phase. For charting, data were extracted according to study authors and year of publication, study design, sample size and sampling characteristics, type of stigma measured (i.e., perceived, anticipated, internalized, experienced/enacted), strength and significance, if applicable, of the stigma and health outcome association, and mediators or moderators.

In reviewing stigma related to the five diseases/disorders assessed, our team identified three populations most adversely affected by stigma, namely LGBTQ individuals, racial and ethnic minorities, and refugees. Boxes 1, 2 and 3 present further details on the relationship between stigma and health for these populations, focusing on commonalities across disorders.

Box 1. Population of concern: LGBTQ

A study done among transgender female sex workers in China reveals limited access to services due to amplified stigma because of their gender identity and their profession [230]. Thus, many decide to engage in self-medication, especially for the transitioning phase, including self-administering hormone use. A case study exploring the economic costs of stigma in India indicates different reasons; if discussing LGBTQ, it is the fear of family degradation, professional discrimination, and overall societal rejection, yet healthcare providers confidentiality can also lead to discrimination, ultimately leading to breach of human rights [231]. All of them could potentially lead to adverse sexual health outcomes, suicide, and depression. A study performed in Vietnam [232], as a part of a case study series on researching LGBTQ in Asia, found that due to the stigma around the transgender society, transgender people end up doing their own research on gender-confirmation surgery or self-inject cheap and impure chemicals such as silicone and other petroleum products, which in some cases lead to serious harm and even fatalities. The same case study series, with findings from Nepal [233], reported that LGBTQ encounter stigma on daily basis from an early age, shaping how they perceive and interact with all aspects of society, including healthcare. The vast number of institutions, including those in Nepal, stigmatize gender and sexual minorities, with important implications for the ability of healthcare providers and institutions to address their health needs [233].
Box 2. Population of concern: Racial and ethnic minorities

Qualitative studies with refugee, asylum seeking, and immigrant new mothers [234] with depressive symptoms seeking mental health services, including a study with Korean American immigrant women [235], showed a challenging path to recovery due to social isolation and perceived stigma. A study that explored depression and care among Asian Indians in the USA collected data from interviews of 23 multidisciplinary mental health professionals and retrospective review of 20 medical records of patients [236]. Findings revealed that the social stigma contributed to the prolonged denial of a condition, difficulty in communicating the problem, and delayed professional intervention in those suffering from depression. People living with HIV are stigmatized and looked at negatively, with the fear of discrimination preventing patients from accessing care and the stigma remains a barrier to effectively addressing the disease [237]. Immigrant HIV-positive Latina women in the Midwest USA experienced feelings of stigma, leading to depression, rejection, or suicidal attempts; few had received any type of mental health care intervention [238]. Few cases of self-imposed stigma or ‘self-stigma’ as a result of minority status has led to reduced health-seeking behavior from health professionals due to fear that disclosing the minority status might be an obstacle from receiving care [239]. Similar findings were presented as part of a qualitative study in mental health among Asian communities in Australia and the unwillingness to access help from healthcare services due to stigma and shame [240]. Immigration and transmission of tuberculosis were reinforcing each other’s stigma [241].

Box 3. Population of concern: Refugees

Tibetan refugees in Nepal faced different layers of barriers, behavioral norms, and institutional structures that impair the diffusion of relevant information, creating a challenge to develop a comprehensive understanding of HIV/AIDS [242]. The stigma in both host and their own societies was hindering the individual’s willingness to discuss the issue with their peers and with medical professionals [242]. A case study based on a literature review and semi-structured interviews of urban refugees in Egypt at high risk for HIV/AIDS [243] revealed that intense stigma and discrimination, vulnerability, and social stability resulted in a lack of adequate health resources and a chain of causation that marginalized refugees in Egyptian society. These social processes result in unequal access to health resources, thereby increasing their potential exposure to HIV transmission. The sexual violence being used as a weapon of war during conflicts (conflict-related sexual violence) has caused significant trauma in both women and men survivors. The experience of refugees in Ethiopia shows that the stigma associated with conflict-related sexual violence makes it challenging for the survivors to mitigate the potential long-term physical, mental, reproductive health, and social consequences [244].

Internalized stigma was the most common stigma type measured (44% of studies), whereas fewer studies focused on experienced (enacted), anticipated, or perceived stigma. Children and adolescents were under-represented in the included studies, with less than 5% of the included studies involving youth populations. Cross-sectional (68%) and qualitative (15%) study designs were most common, and only 9% of studies used longitudinal data.

Herein, a summary of the reviews for each disease/disorder is provided (Tables 1, 2, 3, 4 and 5), followed by a discussion on the overlap and intersection of these stigmas.

**HIV**

Among people with HIV, both internalized and experienced stigma have been associated with increased prevalence of HIV-related symptoms and poorer self-reported health [23–26] (Table 1). Internalized and experienced HIV-related stigma have been associated with increased prevalence of mental health disorders [27–29], particularly depression [30–40] and anxiety [41, 42]. For example, among Nigerians with HIV [43], stigma was associated with a diagnosis of severe depression, although it was not associated with mild or moderately severe depression. Among Tanzanian youth [28] and South African adults [28, 36], post-traumatic stress...
disorder was also more common among those with high levels of internalized stigma. All forms of stigma have been associated with decreased resilience and self-esteem among Chinese adults [32].

HIV-related stigma has been linked to poor health behaviors. Anticipated, experienced, and internalized stigma have been repeatedly associated with decreased voluntary HIV testing and disclosure of infection [24, 44–49]. For example, among Tanzanian adults obtaining HIV services [50], internalized stigma has been linked to increased denial of HIV infection. HIV-positive individuals who report experienced (enacted) stigma are more likely to delay initiation or continuation of HIV care [25, 51, 52]. Those who experience stigma in a healthcare setting are also less likely to initiate antiretroviral therapy [25]. Available cohort data suggests that perceived stigma is associated with poor medication adherence according to participant reports and chart reviews [53–55]. A longitudinal cohort study of adults living with HIV in South Africa revealed that internalized stigma was associated with a greater incidence of condomless sex with both HIV-negative/unknown and HIV-positive partners [5]. Finally, stigma has been associated with increases in smoking, alcohol, and drug use [32], as well as with suicidal ideation and attempted suicide [56, 57].

Significant mediators of the relationships between HIV-related stigma and health outcomes included individual resilience [23], depression, negative condom use attitudes [5], and self-efficacy [58]. While most data demonstrated an inverse relationship between quality of life and HIV-related stigma [59–61], this relationship may be mediated by depression [33, 38] and self-efficacy [58]. The association between HIV stigma and depression has been shown to be moderated by individual affect, social support, socioeconomic status, employment status, rural versus urban residence, and disclosure avoidance [32, 35, 62].

Tuberculosis
TB-related stigma negatively impacts health outcomes by impeding healthcare seeking behavior, care delivery, and recovery (Table 2). Qualitative and quantitative studies have generally shown that stigma delays healthcare seeking, although a recent quantitative study did not find a strong deterrent effect of TB-related stigma when major drivers of healthcare seeking were included in a model [63]. Additionally, TB-related stigma can temporarily diminish social capital during treatment [64], and damage to family reputation can impact
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|-------------|------------------------|-------------------------------------------------------------|---------------------------------|
| Abboud, 2010 [59]               | Lebanon  | Convenience sample of PLWHA obtaining care at two hospitals | 41          | Cross-sectional | Experienced Anticipated Internalized | Strong inverse correlation between stigma scale score and QoL-HIV | None                            |
| Bitew, 2016 [56]                | Ethiopia | PLWHA seeking care from a hospital | 393         | Cross-sectional | Perceived stigma | Perceived stigma was associated with suicide attempts | None                            |
| Breet, 2013 [36]                | South Africa | Convenience sample of PLWHA | 210         | Cross-sectional | Experienced Anticipated Internalized | HIV stigma and PTSD \( p < 0.001 \) | Med: Social support               |
| Calabrese, 2016 [26]            | Russia   | Respondent-driven sampling among individuals who were HIV-positive and reported using injection drugs in past 4 weeks | 383         | Cross-sectional | Internalized Anticipated | HIV stigma not associated with subjective health eating, but associated with subjective symptom count | Med: Injection drug stigma       |
| Carlucci, 2008 [53]             | Zambia   | PLWHA initiating ART | 409         | Cross-sectional | Not specified | Perceived stigma present vs. absent (35% vs. 65%; \( p = 0.9 \)) | None                            |
| Cluver, 2009 [157]              | South Africa | AIDS-orphaned youth vs. non-AIDS orphaned and non-orphaned recruited from schools | 1025        | Cross-sectional | Not specified | Stigma associated with increased depression, anxiety, PTSD | Mod: Food insecurity             |
| Colombini, 2014 [47]            | Kenya    | Randomly selected from a larger study of HIV+ women obtaining care | 48          | Qualitative | Not specified | Participants reported that anticipated stigma limited disclosure | None                            |
| Denison, 2015 [158]             | Tanzania, Uganda, Zambia | PLWHA seeking care at 18 ART facilities | 4495        | Cross-sectional | Anticipated Internalized | High internalized stigma associated with incomplete adherence | Mod: Social support, depression, alcohol abuse |
| Deribew, 2009 [159]             | Ethiopia | HIV and TB patients obtaining clinical care | 591         | Cross-sectional | Perceived | Negative correlations between stigma and with spiritual, psychological, and social QoL | Mod: TB co-infection             |
| Deribew, 2010 [29]              | Ethiopia | TB/HIV co-infected patients and HIV non-co-infected patients in three hospitals | 620         | Cross-sectional | Experienced Anticipated Internalized | Stigma score associated with common mental disorders | None                            |
| Diamini, 2009 [54]              | Lesotho, Malawi, South Africa, Swaziland, Tanzania | HIV support groups, clinics, flyers | 1457        | Cohort | Enacted Internalized | Greater stigma among participants missing medications | Mod: Fewer medication worries decreases stigma score |
| Dow, 2016                       | Tanzania | Youth (12–24 years) living with HIV attending HIV focused youth clinic | 182         | Cross-sectional | Experienced Anticipated Internalized | Stigma associated with worse mental health | None                            |
| Duff, 2010 [160]                | Uganda   | Women with HIV attending a PMTCT program | 45          | Qualitative | Not specified | Stigma cited as common barrier to taking medication | None                            |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|-------------|-------------------------|----------------------------------------------------------|--------------------------------|
| Earnshaw, 2014 [5] | South Africa | PLWHA obtaining care at 16 primary care clinics | 924 | Cohort | Internalized | Self-stigma associated with increased depression, negative condom use attitude, and increased unprotected sex with HIV-positive partners | Med: Depression and condom use attitudes mediate association between self-stigma and unprotected sex |
| Endeshaw, 2014 [30] | Ethiopia | Convenience sampling of PLWHA obtaining care at a clinic | 55 | Cross-sectional | Internalized Perceived | Stigma associated with depression | None |
| Erku, 2016 [55] | Ethiopia | Patients on ART and obtaining care from one ART clinic | 548 | Cohort | Not specified | Perceived stigma associated with decreased adherence. Individuals who adhere to ART report decreased stigma over time | None |
| Garrido-Hernansaiz, 2016 [161] | India | PLWHA recruited through flyers in healthcare settings and NGOs | 961 | Cross-sectional | Internalized Experienced | Internalized and enacted stigma negatively associated with HQoL | None |
| Greeff, 2010 [162] | Lesotho, Malawi, South Africa, Swaziland, Tanzania | Purposive sample of PLWHA | 1454 | Cohort | Experienced Anticipated Internalized | Life satisfaction negatively associated with reported stigma | None |
| Holzemer, 2009 [60] | Kenya, USA | Convenience sample of HIV infected adults | 726 | Cross-sectional | Experienced Anticipated Internalized | Stigma accounted for 5.3% of variance in HQoL | None |
| Kalomo, 2017 [31] | Namibia | PLWHA obtaining care at a clinic | 124 | Cross-sectional | Experienced Anticipated Internalized | Felt stigma was significantly associated with depression | None |
| Kingori, 2012 [34] | Kenya | PLWHA recruited while obtaining care | 370 | Cross-sectional | Internalized | Self-stigma associated with self-reported poor health, reduced disclosure, and decreased adherence | None |
| Li, 2009 [33] | Thailand | Hospital-recruited PLWHA | 408 | Cross-sectional | Internalized Perceived | Depression associated with internalized shame and perceived shame | Med: Emotional support |
| Li, 2014 [163] | Thailand | Convenience sample of PLWHA obtaining care | 128 | Cross-sectional | Experienced Anticipated Internalized | Stigma negatively associated with adherence | Med: Social support was measured but not significant |
| Li, 2015 [164] | China | PLWHA recruited from clinics | 114 | Cross-sectional | Internalized | Stigma not associated with HQoL | Med: Relationship fully mediated by depression |
| Li, 2016 [165] | China | MSM who were HIV-infected were recruited by local NGO | 321 | Cross-sectional | Enacted | Enacted stigma associated with increased depression | None |
| Li, 2017 [35] | China | MSM who were HIV-infected were recruited by local NGO | 321 | Cross-sectional | Internalized | Self-stigma was associated with depression | Med: Positive affect, negative affect, and social support |
| Liu, 2014 [41] | China | PLWHA who had registered with the CDC | 290 | Cross-sectional | Experienced Anticipated | Stigma associated with anxiety | None |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|-------------|-------------------------|----------------------------------------------------------|-------------------------------|
| Lyimo, 2014 [50]                | Tanzania | PLWHA obtaining care at two clinics and on ART for 6 months | 158         | Cross-sectional | Experienced, Anticipated, Internalized | Denial of HIV status associated with perceived stigma; Self-stigmatization negatively associated with adherence | None                          |
| Makin, 2008 [48]                | South Africa | Pregnant women living with HIV attending antenatal clinics | 293         | Cohort (interviews at enrolment and 3 months after giving birth) | Perceived, Internalized | Stigma associated with lower likelihood of disclosure | None                          |
| Mekuria, 2015 [166]             | Ethiopia  | PLWHA obtaining care at selected health facilities; selected from national ART-registrar, then randomly selected | 664         | Cross-sectional | Internalized | HIV-stigma directly associated with all domains of HQoL except physical domain | Med: Depression mediates association between stigma and physical HRQoL |
| Mohite, 2015 [34]               | India     | Purposive sample of women with HIV attending a care center | 50          | Cross-sectional | Perceived | Correlation between perceived stigma and depression | None                          |
| Nyamathi, 2017 [167]            | India     | Women with HIV at primary care clinics | 400         | Cross-sectional | Internalized | Internalized stigma associated with HQoL (p < 0.0001) | None                          |
| Ojikutu, 2016 [49]              | Thailand, Brazil, Zambia | Women with HIV receiving care | 299         | Cohort | Anticipated | Decreased disclosure associated with anticipated stigma | Med: Cohabitation and marital status |
| Olley, 2016 [46]                | Nigeria   | PLWHA obtaining follow-up care at one hospital | 139         | Cross-sectional | Experienced, Anticipated, Internalized | Perceived stigma associated with decreased self-disclosure | Med: Anticipated discrimination |
| Olley, 2017 [43]                | Nigeria   | PLWHA obtaining care at two hospitals | 502         | Cross-sectional | Experienced, Anticipated, Internalized | Stigma associated with severe depression | None                          |
| Peitzmeier, 2015 [25]           | Gambia    | PLWHA attending support groups | 317         | Cross-sectional | Experienced, Internalized | Enacted stigma in healthcare setting associated with avoiding or delaying care and not using ART | None                          |
| Peltzer, 2011 [168]             | South Africa | Treatment-naive patients from three public hospitals | 735         | Cohort | Internalized | HQoL not predictive of stigma | None                          |
| Rael, 2017 [37]                 | Dominican Republic | Purposive sample of women with HIV, female sex workers and control group of women without HIV and non-female sex workers | 876         | Cross-sectional | Internalized | Internalized stigma associated with increased depression | None                          |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|--------------|-------------------------|----------------------------------------------------------|-------------------------------|
| Robinson, 2015 [44]              | Turks and Caicos | Data analyzed from 2011 Knowledge, Attitudes, Practices and Behaviors Survey | 837         | Cross-sectional | Enacted | Self-reported HIV discrimination related to willingness to disclose HIV status | None |
| Rodriguez, 2017 [57]             | South Africa | Pregnant women with HIV obtaining care at a clinic | 673         | Cross-sectional | Internalized | Stigma associated with suicidality | Med: Physical intimate partner violence |
| Sanjobo, 2008 [169]              | Zambia | PLWHA obtaining care at ART centers | 60          | Cross-sectional | Not specified | HIV stigma was a barrier to adherence | None |
| Shrestha, 2017 [38]              | Malaysia | Prisoners with HIV and opioid dependence who are prisoners | 301         | Cross-sectional | Experienced Internalized | HIV-related stigma was associated with depression ($p < 0.001$); no direct association between stigma and HQoL | Med: Depression mediated stigma and HQoL |
| Steward, 2008 [62]               | India | PLWHA on ART obtaining care at a large, urban, private hospital | 229         | Cross-sectional | Enacted | Enacted stigma associated with disclosure avoidance and depression | Med: Stigma and depression mediated by use of coping strategies to avoid disclosure of HIV status |
| Subramanian, 2009 [170]          | India | PLWHA obtaining care at one government clinic | 646         | Cross-sectional | Experienced Internalized | All stigma domains (perceived stigma, internalized stigma, and actual stigma) associated with all domains of HQoL instrument (physical, psychological, social and environmental) | None |
| Takada, 2014 [171]               | Uganda | Selected sample of PLWHA from ongoing cohort study | 422         | Cohort | Internalized | Lagged internalized stigma associated with depression | None |
| Tao, 2017 [39]                   | China | MSM newly diagnosed with HIV | 367         | Cross-sectional | Experienced Internalized | Stigma associated with depression; strongest associated was between internalized stigma and depression | None |
| Tesfaw, 2016 [42]                | Ethiopia | PLWHA obtaining care from one hospital | 417         | Cross-sectional | Perceived | Stigma associated with depression | None |
| Tesfay, 2015 [61]                | Ethiopia | Randomly selected PLWHA on ART with regular follow up at an HIV clinic | 594         | Cross-sectional | Perceived | Stigma associated with psychological HQoL | Med: Gender |
| Tsai, 2013 [45]                  | Uganda | Treatment-naïve patients obtaining care at a clinic | 299         | Cohort | Internalized | Stigma associated with decreased disclosure to household members | Med: Social distance |
| Turan, 2015 [172]                | Kenya | Pregnant women with HIV obtaining care at an antenatal clinic | 135         | Cohort | Experienced Internalized | Decreased linkage to care predictive of increased stigma; Increased stigma associated with increased depression | None |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|-----------------------------------|----------|--------------------------|-------------|--------------|-------------------------|---------------------------------------------------------|-------------------------------|
| Valencia-Garcia, 2017 [52]        | Peru     | Pregnant women with HIV  | 15          | Qualitative  | Enacted                 | Healthcare stigma reduced participants' willingness to return for care | None                          |
| Valenzuela, 2015 [51]             | Peru     | Patients initiating care at a national referral center Cases out of care for > 12 months, Controls: those in care | 176         | Case-control | Anticipated, Internalized | Enacted stigma associated with and being out of care | None                          |
| Wu, 2008 [40]                     | Peru     | Women with HIV initiating ART | 78          | Cross-sectional | Experienced, Anticipated, Internalized | Stigma associated with depression | Mod: Food scarcity |
| Wu, 2015 [173]                    | China    | PLWHA obtaining care at two hospitals | 190         | Cross-sectional | Experienced, Anticipated, Internalized | Higher QoL associated with lower levels of stigma | None                          |
| Wu, 2015 [174]                    | China    | MSM with HIV listed in the CDC register | 184         | Cross-sectional | Experienced, Anticipated, Internalized | Stigma associated with suicidal ideation | None                          |
| Yi, 2015 [27]                     | Cambodia | PLWHA recruited through cluster sampling method of provinces and HIV clinics | 1003        | Cross-sectional | Perceived               | HIV-related stigma and discrimination associated with higher levels of mental disorders | None                          |
| Zhang, 2015 [23]                  | China    | Persons living with HIV were randomly selected for participation from a parent study | 2987        | Cross-sectional | Experienced, Anticipated, Internalized | Internalized stigma negatively associated with self-rated health status | Mod: Resilience |
| Zhang, 2016 [32]                  | China    | Persons living with HIV were randomly selected for participation from a parent study | 2987        | Cross-sectional | Experienced, Anticipated, Internalized | Enacted perceived and internalized stigma were associated with anxiety, depression, decreased resilience, and decreased self-esteem Perceived stigma associated was associated with increased drug use | Mod: Income |
| Zhou, 2017 [58]                   | China    | Persons living with HIV were randomly selected for participation from a parent study | 2987        | Cross-sectional | Experienced, Anticipated, Internalized | Stigma negatively associated with QoL | Mod: HIV symptom management self-efficacy |

ART antiretroviral therapy, CDC Centers for Disease Control, HQoL health-related quality of life, Med mediators, Mod moderators, MSM men who have sex with men, NGO non-governmental organization, PLWHA persons living with HIV and aids, PMTCT prevention of mother-to-child transmission, PTSD post-traumatic stress disorder, QoL quality of life, TB tuberculosis
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|--------------|------------------------|----------------------------------------------------------|---------------------------------|
| Atre, 2011 [83]                  | India    | Participants without TB in the general population of Western Maharashtra, India, were interviewed from six randomly selected villages | 160         | Cross-sectional | EMIC interviews with same-sex and cross-sex vignettes depicting a person with typical features of TB | Non-disclosure of disease was associated with fear of losing social status, marital problems, and hurtful behavior by the community | Mod: Among females, heredity was perceived as a cause for stigmatization; males reported marital problems in response to the vignette; men perceived greater spousal support than women, who viewed support as more conditional |
| Chang, 2014 [175]               | Global   | Descriptive studies | 83 studies | Systematic review | Influence of TB stigma on knowledge, attitudes, and responses to TB | Negative attitude and misperceptions of causes of TB were associated with stigma as was TB’s association with HIV Illness disclosure and help-seeking were influenced by stigma | Mod: Cultural variations were found for TB-related stigma across countries |
| Chikovore, 2014 [176]          | Malawi   | 8 focus group discussions with general community members; 2 with health workers Individual interviews with TB patients and chronic coughers | 34          | Qualitative | Perceived stigma | A compound stigma emerged related to beliefs that cough was a ‘serious’ illness and that a concern among men was failure to perform role expectations, which resulted in mental distress | None |
| Corell, 2010 [66]              | Haiti    | Community residents recruited from community locations, TB patients, and healthcare providers recruited from healthcare centers | 101         | Qualitative | EMIC, internal stigma, external actions | Stigma was associated with poverty, poor nutrition, and HIV infection | None |
| Courtwright, 2010               | Global   | Studies that measured or characterized TB stigma, measured impact of TB stigma on outcomes, or described interventions were included | 69 studies | Systematic review | Perceived, internalized, experienced stigma | Fear of infection was most common cause of stigma; TB stigma associated with adverse socioeconomic outcomes; TB stigma is perceived to be associated with adverse treatment-seeking outcomes (diagnostic delay and non-compliance) | Mod: Socioeconomic consequences of TB stigma are more acute among women |
| Gramm, 2011 [177]             | South Africa | Area-stratified sampling of households in suburban South Africa One adult of each household randomly chosen to complete survey | 1020        | Cross-sectional | Modified AIDS-related stigma scale for TB including domains of social identity, blame, shame, avoidance, social sanction | Participants who had stigmatizing views of TB had preferences for special TB queues, treatment provision at clinics (vs. TB hospitals or at home) and held negative views of information provision on TB at work or school and disability grants for TB patients | None |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|-------------|-------------------------|----------------------------------------------------------|----------------------------------|
| **Cremers, 2015, 2016** [178, 179] | Zambia   | TB patients were interviewed in a local clinic and surrounding areas | 300         | Mixed methods | Anticipated, internalized, experienced | Stigma was precipitated by perceptions on co-infection with HIV, perceived immoral behavior, perceived incurability, and traditional beliefs about causes of TB Outcomes of stigma included low self-esteem, discrimination, social exclusion, decreased quality of life, and poor treatment adherence/compliance | Mod; Women reported more problems associated with stigma compared to men |
| **Daftary, 2014** [79] | South Africa | Focus groups were conducted with patients receiving treatment for MDR-TB or XDR-TB | 23 | Qualitative | Not specified | Stigma was associated with poor adherence to MDR-TB and XDR-TB treatment adherence | None |
| **Dhuria, 2009** [84] | India | TB patients were recruited from two DOTS centers in an urban area; controls were recruited from the community and matched by age, gender, and SES | 180 | Case–control | Not specified | Social domain of the quality of life scale differed significantly between cases (TB patients) and controls (non-TB patients) | None |
| **Dodor, 2009** [70] | Ghana | Interviews and focus groups were held with community members and TB patients | 100 interviews; 22 focus groups | Qualitative | Not specified | Five health professional practices were associated with stigmatization of patients, including exclusionary practices, health professional behaviors, discourse around TB, food safety/hygiene, prohibition of burial rites. Stigma may be associated with poor treatment-seeking and diagnostic delay, and poor adherence | None |
| **Finnie, 2011** [150] | Sub-Saharan Africa | Studies were included that collected data on patient and health care system delay in diagnosing and treating TB among patients 15 and older in sub-Saharan Africa | 20 studies | Systematic review | Not specified | Stigma of being perceived to have HIV was associated with poor TB treatment seeking | None |
| **Hassard, 2017** [76] | Uganda | Patients in continuation phase of treatment for Pulmonary TB were included using systematic sampling in TB clinics | 201 | Cross-sectional | Not specified | 39% of TB patients did not want anyone to know their status Perceptions of being rejected by the community were associated with non-adherence to TB treatment | None |
| **Hayes-Larson, 2017** | Lesotho | Baseline data from a mixed | 371 | Cross-sectional | Not specified | Greater TB stigma associated | None |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|-------------|-------------------------|------------------------------------------------------------------------------------------------|----------------------------------|
| [87]                             | Methods cluster randomized trial of HIV-TB co-infected patients |                                  |             |             |                         | with depression                                     | None                             |
| Isaakidis, 2013 [81]             | India    | Patients receiving treatment for MDR-TB and HIV purposively selected to represent range of gender, SES, and treatment phase | 12          | Qualitative | Not specified           | Greater external HIV and TB stigma associated with hazardous/harmful alcohol use | None                             |
| Juniarti, 2011 [180]             | Global   | Included qualitative and mixed methods studies focusing on stigma and TB | 30 studies  | Systematic review | Not specified   | Patients considered both TB and HIV to be stigmatizing but HIV more so | None                             |
| Kipp, 2011 [72]                  | Thailand | TB patients who started treatment within the past month were recruited from hospital-based TB clinics; a convenience sample of community members without TB was also recruited | 780         | Cross-sectional | Perceived TB stigma, experienced TB stigma, perceived HIV stigma | Co-infection with HIV, HIV stigma, and lower level of education were associated with greater TB stigma among patients | None                             |
| Kipp, 2011 [77]                  | Thailand | TB patients who started treatment within the past month were recruited from hospital-based TB clinics | 459         | Cohort       | Experienced and perceived TB and HIV stigma | Stigma had a minimal association with adherence to TB treatment overall | Mod: Among women and patients with HIV co-infection, experienced stigma was associated with worse adherence |
| Kumwenda, 2016 [181]             | Malawi   | Community members, TB patients, and health workers participated in focus group discussions and in-depth interviews | 114         | Qualitative | Not specified           | Stigma was associated with fear over confidentiality of diagnosis, delays in health seeking | Mod: Gender                          |
| Kurspahić-Mujić, 2013 [63]      | Bosnia and Herzegovina | TB patients were recruited from a university TB clinic in Sarajevo | 300         | Cohort       | Perceived TB stigma     | 26% of patients reported that TB was a stigmatizing disease | Mod: Females were more likely to report TB was stigmatizing than males |
| Mavhu, 2010 [182]                | Zimbabwe | Participants from a parent study who had a chronic   | 40          | Qualitative | Not specified           | Participants reported an expectation of being mistreated | None                             |
| Study (First author, year [ref.]) | Location          | Sampling characteristics                                                                 | Sample size | Study design       | Type of stigma assessed                      | Description of stigma association (strength, significance)                                                                 | Significant mediators/moderators |
|----------------------------------|-------------------|-------------------------------------------------------------------------------------------|-------------|--------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Méda, 2014 [73]                  | Burkina Faso      | TB and HIV patients were recruited from health centers and NGOs                            | 1030        | Cross-sectional    | Not specified                               | Perceived association between TB and HIV was associated with delayed treatment seeking                                  | None                          |
| Miller, 2017 [183]               | Tanzania          | Focus group discussions were held with TB patients and their household members             | 48          | Qualitative        | Not specified                               | Domains of stigma described by participants included fear, social isolation, loss of social status, and discrimination perpetrated by healthcare providers. | Mod: Women reported stigma associated with perceptions of promiscuity and rejection by their partners; men reported ‘survival challenges’ |
| O’Donnell, 2014 [82]             | South Africa      | MDR-TB patients were enrolled consecutively on initiation of treatment at a public TB hospital | 104         | Cohort             | Not specified                               | Knowledge, attitudes, and beliefs, including HIV stigma, were not associated with TB treatment adherence 6 months later.    | None                          |
| Sima, 2017 [85]                  | Ethiopia          | Systematic sampling of households in randomly selected villages in a pastoralist and a neighboring sedentary community | 584         | Mixed methods      | Perceived TB stigma                         | Participants reported that TB is less stigmatized than HIV. Pastoralists were more likely to have stigma towards TB patients, more likely to feel ashamed if they had TB, and more likely to reject someone with TB in their community than those from sedentary community. | None                          |
| Skinner, 2016, 2016 [184, 185]   | South Africa      | TB patients were recruited from a parent study, including those who had remained treatment adherent and those who were initially lost to follow-up | 41          | Qualitative        | Not specified                               | Stigma and the connection between TB and HIV were associated with not starting treatment and loss to follow-up. Greater stigma was associated with MDR-TB; the creation of a discrete TB service for patients reduced stigma; having someone close to them who was on TB treatment also reduced stigma; some participants expressed anger and also resistance to the stigma. | None                          |
| Somma, 2008 [65]                 | Bangladesh        | Interviews were conducted                                                                | 427         | Cross-sectional    | Interviews were                             | Stigma index varied across                                                                                                  | None                          |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|--------------|-------------------------|----------------------------------------------------------|---------------------------------|
| Sommerland, 2017 [186]           | South Africa | Representative sample of healthcare workers was recruited from 6 hospitals | 804         | Cross-sectional | Perceived stigma | Significant inverse relationship between perceived stigma/negative attitudes of colleagues and the use of occupational healthcare units for TB screening | None |
| Xu, 2017 [69]                    | China    | Multi-stage randomized sample of TB patients receiving treatment at home | 342         | Cross-sectional | Experienced stigma | Experienced stigma was significantly associated with psychological distress | None |
| Yan, 2017 [75]                   | China    | Multi-stage randomized sample of TB patients from TB dispensaries in three counties | 1342        | Cross-sectional | Experienced stigma | TB-related stigma and depression were common and both were associated with poor treatment adherence | None |

DOTS directly observed treatment, short-course, EMIC Explanatory Model Interview Catalogue, MDR-TB multi-drug resistant tuberculosis, NGO non-governmental organization, SES socioeconomic status, XDR-TB extensively drug resistant tuberculosis
| Study (First author, year [ref.]) | Location          | Sampling characteristics          | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance)                                                                                                                                                                                                                                                                                                                                 | Significant mediators/moderators |
|---------------------------------|-------------------|-----------------------------------|-------------|--------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Adewuya, 2009 [94]              | Nigeria           | Facility-based sample; any disorder | 342         | Cross-sectional | Internalized (ISMI)    | Poor medication adherence for high relative to low stigma                                                                                                                                                                                                                                                                                                                                                                              | None                             |
| Assefa, 2012 [93]               | Ethiopia          | Facility-based sample; schizophrenia | 212         | Cross-sectional | Internalized (ISMI)    | Discontinuation of psychotropic medication for high relative to low stigma Psychotic symptoms for high relative to low stigma Suicide attempt for those with high relative to low stigma                                                                                                                                                                                                                                           | None                             |
| Biftu, 2014, 2014 [95, 187]     | Ethiopia          | Facility-based sample; schizophrenia | 411         | Cross-sectional | Perceived (PDD), resistance (ISMI-SR) | Poor antipsychotic medication adherence for high perceived relative to low perceived stigma and for high relative to low stigma resistance Duration of illness less than 1 year for high relative to low perceived stigma (NS for stigma resistance) Poor follow-up care NS for perceived stigma or stigma resistance                                                                                                                                                     | None                             |
| Cai, 2017 [188]                 | China             | Facility-based sample; schizophrenia | 172         | Cross-sectional | Internalized (ISMI)    | Stigma not associated with quality of life                                                                                                                                                                                                                                                                                                                                                                                        | None                             |
| Dardas, 2017 [106]              | Jordan            | School-based; depression          | 2349        | Cross-sectional | Personal and perceived (DSS) | Stigma associated with care seeking Mod: Significant interaction between stigma and depression for willingness to seek help                                                                                                                                                                                                                                                                                                               | None                             |
| Devi Thakoor, 2016 [189]        | China, Mauritius  | Facility-based sample; SMI         | 300         | Cross-sectional | Internalized (ISMI)    | Duration of psychosis of greater than 3 months relative to less than 3 months was associated only with the following ISMI items: increased perceived breakup due to illness and increased perceived disinherence due to illness by family (China); decreased patient awareness of illness and decreased family awareness of illness (Mauritius)                                                                                                                                 | None                             |
| Elkington, 2010 [92]            | Brazil            | Facility-based sample; SMI         | 98          | Cross-sectional | Internalized, experienced discrimination, perceived (SPISEW) | Significantly higher mean personal experiences of stigma score for individuals in the mild to moderate vs. moderate to marked illness severity group Perceived attractiveness and relationship discrimination stigma scales were NS HIV risk and protective behaviors associated with relationship discrimination for sexual activity, unprotected sex, and fewer partners; perceived attractiveness – all NS; personal experiences – all NS                                                                                                                                 | None                             |
| Fawzi, 2016 [91]                | Egypt             | Facility-based sample;            | 196         | Cohort         | Internalized (ISMI)    | Treatment acceptance: patients refusing                                                                                                                                                                                                                                                                                                                                                                                         | None                             |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed (strength, significance) | Description of stigma association | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|-------------|-----------------------------------------------|----------------------------------|---------------------------------|
| **depression**                   |          |                          |             |             |                                               |                                  |                                 |
| Fresan, 2017 [190]               | Mexico   | Facility-based sample; schizophrenia | 217         | Cross-sectional | Perceived and experienced discrimination (KSS) | Length of hospitalization increase of 1 week associated with KSS score | None                            |
| Grover, 2017 [99]                | India    | Facility-based sample; SMI | 1403        | Cross-sectional | Internalized (ISMI) | Duration of untreated psychosis was NS | None                            |
| Koschorke, 2014 [101]            | India    | Schizophrenia             | 282         | Cross-sectional | Anticipated and experienced discrimination | Symptom severity, as measured by total PANSS score, was NS in association with | None                            |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|---------------------------------|----------|--------------------------|-------------|--------------|------------------------|---------------------------------------------------------|---------------------------------|
| Kulesza, 2014 [102] | India | Facility-based sample; majority exhibited depression | 60 | Cross-sectional | Anticipated and perceived (EMIC-SS) | Symptom severity for depression was positively correlated with stigma | None |
| Lahariya, 2010 [97] | India | Facility-based sample; SMI | 295 | Cross-sectional | One question on fear of stigma related to care seeking | Delay in care seeking: 73% of patients had delayed seeking care at least in part due to a fear of stigma | None |
| Li, 2017 [88] | China | Facility-based sample; schizophrenia | 384 | Cross-sectional | Internalized (ISMI) | Psychiatric symptoms: Stigma significantly increased with an increase in general symptoms measured via the BPRS in multiple regression analyses; PANSS-N: NS Functioning: Stigma score significantly decreased with an increase in GAF in multiple regression analyses Quality of life: Stigma score significantly increased $b = 0.01$ ($0.01–0.02$) with an increase in SQLS score in multiple regression analyses | None |
| Loch, 2012 [191] | Brazil | Facility-based sample; mostly SMI | 169 | Cohort | Question on dangerousness stereotyping | Re-hospitalization: Individuals who were readmitted over the year were significantly more likely to be stereotyped as dangerous by family members that those who were not readmitted | None |
| Lu, 2012 [192] | China | Facility-based sample; schizophrenia | 92 | Cross-sectional | Internalized (ISMI); experienced discrimination (MCESQ) | Insight: MCESQ and ISMI total score was NS in multiple regression with insight as the outcome | None |
| Lv, 2013 [100] | China | Facility-based sample; schizophrenia | 95 | Cross-sectional | Internalized (ISMI) | Symptom severity: Positive and negative symptoms of psychosis both NS Greater duration of illness was associated with a change in stigma score; greater number of hospitalizations was NS; greater quality of life was associated with a change in stigma score | None |
| Mosanya, 2014 [98] | Nigeria | Facility-based sample; schizophrenia | 256 | Cross-sectional | Internalized (ISMI) | Medication side effects, comorbid medical problem, duration of illness, and number of episodes all NS Increase in BPRS score increased the | None |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed (strength, significance) | Description of stigma association | Significant mediators/moderators |
|---------------------------------|----------|--------------------------|-------------|-------------|------------------------------------------------|----------------------------------|---------------------------------|
| Rayan, 2017 [103]               | Jordan   | Facility-based sample; depression | 160         | Cross-sectional | Perceived (PDD) | Odds of having high vs. low stigma. Individual in the high stigma group had significantly lower mean quality of life as measured by all WHOQOL-Brief subscales (physical, psychological, social, and environment) as well as the overall quality of life and general health. | None |
| Rayan, 2017 [104]               | Jordan   | Facility-based sample; schizophrenia | 161         | Cross-sectional | Perceived (PDD) | Pain was NS. An increase in number of relapses was associated with a significant change in stigma score. Symptom severity of depression was associated with a significant change in stigma score. | None |
| Roberts, 2017 [96]              | Ukraine  | Community-based time-location sampling; depression, anxiety or PTSD | 2203        | Cross-sectional | One question on stigma related to care seeking | In a multivariate regression, increase in stigma was associated with a significant reduction in quality of life. Symptom severity for depression was significantly correlated with stigma. | None |
| Sharaf, 2012 [107]              | Egypt    | Facility-based sample; schizophrenia | 200         | Cross-sectional | Internalized (ISM1) | In multivariate regression, increase in stigma was associated with increase in suicide risk. Insight was correlated positively with stigma. | Mod: Insight was measured but not a significant moderator of stigma–suicide relationship |
| Shi-Jie, 2017 [90]              | China    | Facility-based sample; depression | 158         | Cross-sectional | Anticipated and perceived (EMIC) | The depression subscale of the SCL-90 was associated with a significant increase in stigma in multivariate regression. MADRS, somatization, and the SCL-90 total and anxiety subscale score were all NS; fatigue was associated with a significant increase in stigma in multivariate regression; disability NS in multivariate regression; duration of illness NS in multivariate regression. | None |
| Singh, 2016 [89]                | India    | Facility-based sample; schizophrenia | 100         | Cross-sectional | Internalized (ISM1); anticipated and perceived (EMIC) | Functioning was significantly associated with decrease in all ISMI subscales in regression analyses except ISMI-A and ISMI-SR. | None |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|-----------------------------------|----------|--------------------------|-------------|--------------|------------------------|----------------------------------------------------------|-------------------------------|
| Vidojevic, 2015 [193]             | Serbia   | Facility-based sample; depression | 52          | Cross-sectional | Anticipated and experienced discrimination (DISC) | Increase in GAF score was associated with reduced odds of having high vs. low overall ISMI score | None |
| Wang, 2017 [194]                  | China    | Facility-based sample; schizophrenia | 146         | Cross-sectional | Perceived and internalized (LSS) | Functioning was negatively correlated with EMIC score | None |
|                                   |          |                          |             |              |                        | Duration of illness was NS in regression analyses, except an increase in duration was associated with increased odds of having high vs. low ISMI-SR score; treatment duration was NS | |
|                                   |          |                          |             |              |                        | Symptom severity was NS in regression analyses, except an increase in the general PANSS subscale was associated with increased odds of having high vs. low ISMI-A score | |
| Xu, 2013 [105]                    | China    | Facility-based sample; schizophrenia | 133         | Cross-sectional | Self-blame (CSQ-SB) | Symptom severity for depression was predicted by self-blame | None |

BPRS Brief Psychiatric Rating Scale, CSQ-SB Self-Blame subscale of the Coping Style Questionnaire, DISC Discrimination and Stigma Scale, DSS Depression Stigma Scale, EMIC-SS Explanatory Model Interview Catalogue Stigma Scale, GAF General Assessment of Functioning, HDRS Hamilton Depression Rating Scale, ISMI Internalized Stigma of Mental Illness Scale (-SR Stigma Resistance subscale, -A Alienation subscale), KSS King’s Stigma Scale, LSS Link’s Stigma Scale, SE ‘stereotype endorsement’, SR stigma resistance, DE discrimination experience, SW social withdrawal, MADRS Montgomery and Asberg Depression Rating Scale, MCESQ Modified Consumer Experiences of Stigma Questionnaire, Mod moderator, NS not significant, PANSS Positive and Negative Syndrome Scale (-A negative, -P positive), PDD Perceived Devaluation and Discrimination Scale, SQLS Schizophrenia Quality of Life Scale, WHOQOL World Health Organization Quality-of-Life Scale
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|---------------------------------|----------|--------------------------|-------------|--------------|-------------------------|------------------------------------------------------------|-------------------------------|
| Alkhamees, 2013 [195]           | Saudi Arabia | Not specified           | 110         | Cross-sectional | Not specified          | Stigma associated with overall QoL                          | None                          |
| Aydemir, 2011 [117]             | Turkey     | People with epilepsy for the past 4 years, compared to people with migraines and people with no symptoms (controls) | 172         | Case-control | Internalized            | Stigma associated with decreased disclosure                | None                          |
| Bhalla, 2012 [196]              | Cambodia   | People with epilepsy with controls matched on age, sex, and village | 288         | Case-control | Internalized            | Stigma associated with worse QoL, limitations in work due to epilepsy, and social limitations due to epilepsy | None                          |
| Doganavsargil-Baysal, 2017 [112] | Turkey     | Adults with epilepsy obtaining care at one outpatient clinic | 89          | Cross-sectional | Internalized           | Stigma associated with lower scores on HQoL and greater psychiatric symptomatology | None                          |
| Elafros, 2013 [119]             | Zambia     | Caregivers of children aged < 8 years with epilepsy obtaining care at local clinics | 100         | Cross-sectional | Internalized           | Maternal stigma associated with psychiatric morbidity and need for psychiatric support; actively limiting child activities | None                          |
| Espinola-Nadurielle, 2014 [114] | Mexico     | Patients with epilepsy treated at one outpatient clinic and their caregivers | 10          | Qualitative  | Not specified           | Stigma associated with social withdrawal                   | None                          |
| Fawale, 2014 [115]              | Nigeria    | Adult patients with epilepsy treated at an outpatient clinic with age- and sex-matched controls | 93          | Case-control | Internalized           | Stigma associated with worse QoL and worse social function | None                          |
| Getnet, 2016 [120]              | Ethiopia   | Adults with epilepsy on AEDs for at least 3 months obtaining care at outpatient clinics | 450        | Cross-sectional | Internalized           | Perceived stigma associated with worse AED adherence        | None                          |
| Hamid, 2013 [197]               | Jordan     | Adult patients with epilepsy obtaining care at an outpatient clinic | 45          | Cross-sectional | Not specified          | Severity of stigma associated with worse mental health QoL | None                          |
| Hifianoglu, 2009 [109]          | Turkey     | Children with epilepsy (aged 8–17 years) and their parents | 533         | Cross-sectional | Not specified          | Child stigmatization associated with greater negativity about epilepsy, greater perceived lack of support, low self-esteem | None                          |
| Iqbal, 2013 [118]               | Pakistan   | Married women obtaining care at a tertiary center | 381         | Cross-sectional | Not specified          | Stigma associated with concealment of epilepsy from future husbands | None                          |
| Komolafe, 2011 [198]            | Nigeria    | Women with epilepsy obtaining care from local clinics | 6 groups of 8–15 women with epilepsy | Qualitative  | Not specified          | Stigma associated with concealment of epilepsy from future husbands | None                          |
| Kumari, 2009 [199]              | India      | People with epilepsy obtaining care at an outpatient clinic, selected randomly | 45          | Cross-sectional | Internalized, anticipated, enacted | Stigma associated with decreased HQoL | None                          |
| Lopez, 2009 [200]               | Mexico     | Children aged 6–18 years with epilepsy | ~200      | Cross-sectional | Not specified          | Perceived stigma influences QoL                             | None                          |
| Luna, 2017 [116]                | Ecuador    | Adults with epilepsy or parents of children aged < 15 years with epilepsy | 143         | Cross-sectional | Internalized           | Stigma associated with decreased disclosure of epilepsy     | None                          |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/ moderators |
|--------------------------------|----------|--------------------------|-------------|--------------|-------------------------|----------------------------------------------------------|--------------------------------|
| Nagarathnam, 2017 [201]       | India    | Adults with epilepsy on an AED for a year | 170         | Cross-sectional | Not specified          | Stigma associated with worse QoL                          | None                          |
| Nehra, 2014 [202]             | India    | Adults with active epilepsy obtaining care from a clinic | 208         | Cross-sectional | Experienced, anticipated, internalized | Stigma correlated with worse overall function               | None                          |
| Saadi, 2016 [203]             | Bhutan   | Patients with epilepsy obtaining care at a tertiary referral center | 172         | Cross-sectional | Not specified          | Increased stigma associated with lower QoL                | None                          |
| Tegegne, 2015 [204]           | Ethiopia | Adults with epilepsy obtaining care from a hospital-based outpatient clinic | 415         | Cross-sectional | Internalized           | Perceived stigma is associated with increased depression  | None                          |
| Tsegabrhan, 2014 [205]        | Ethiopia | Adults with epilepsy obtaining treatment from one hospital | 300         | Cross-sectional | Internalized           | Stigma associated with increased depression               | None                          |
| Turki, 2016 [110]             | Tunisia  | Patients with epilepsy followed by one clinic | 20          | Cross-sectional | Not specified          | Absence of stigma associated with better self-esteem      | None                          |
| Viteva, 2012 [206]            | Bulgaria | ‘Representative selection’ of patients with epilepsy at a neurology clinic | 164         | Cross-sectional | Internalized           | Stigmatization frequency and severity correlated with depression | None                          |
| Viteva, 2013 [207]            | Bulgaria | Consecutive patients with refractory and pharmaco-sensitive epilepsy | 246         | Cross-sectional | Internalized           | Stigma associated with all subscales of QoL except change in health and sexual relations | None                          |
| Viteva, 2016 [121]            | Bulgaria | Adults with epilepsy obtaining care from one hospital-based clinic | 153         | Cross-sectional | Internalized           | Greater stigma associated with increased reporting of medication side effects | None                          |
| Yeni, 2016 [111]              | Turkey   | Outpatients with epilepsy obtaining care at one university | 70          | Cross-sectional | Internalized           | Stigma associated with increased anxiety, depression, increased effects of disease on life, decreased role functioning and worse disease-associated attitudes | None                          |

AED anti-epileptic drug, HQoL health-related quality of life, QoL quality of life
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/ moderators |
|----------------------------------|----------|--------------------------|-------------|--------------|------------------------|----------------------------------------------------------|-------------------------------|
| Brittain, 2017 [208]             | South Africa | HIV-infected women receiving antenatal care in Cape Town primary care clinic were enrolled when entering PMTCT services | 580 | Cross-sectional | HIV stigma (non-specified) | Higher HIV-related stigma was associated with reduced odds of alcohol use ($p < 0.001$) | None |
| Budhwani, 2017 [209]             | Dominican Republic | Transgender women who did and did not report recent drug use were recruited and interviewed using a snowball sampling approach | 287 | Cross-sectional | Experienced stigma | Higher stigma scale score associated with greater odds of recent cocaine use ($p < 0.01$) but not other drug use | None |
| Capezza, 2012 [144]              | Chile | Adults in 10 primary care centers were recruited using a time-limited sampling from a clinical population | 2839 | Cross-sectional | Perceived stigma/discrimination | Past 6-month discrimination (based on race, sex, age, appearance, disability, sexual orientation, economic status, political affiliation, and/or religion) was associated with significantly higher odds of past 6-month hazardous drinking ($p = 0.001$) and any illegal drug use ($p < 0.001$) | None |
| Coelho, 2015 [145]               | Brazil | Undergraduate students were selected using a two-stage sampling procedure at a university | 1264 | Cross-sectional | Experienced stigma/discrimination | There was no association between lifetime discrimination and recent alcohol use in the overall sample; however, moderator analyses indicated that last-year students with discrimination had higher odds of alcohol-related problems than first-year students who did not experience discrimination ($p < 0.001$) and those who experienced two or more types of discrimination had higher odds of alcohol-related problems compared to those who experienced no discrimination or discrimination of one type only | Mod: Year of study in university (last year students who experienced discrimination had higher odds of alcohol-related problems compared to first year students who did not experience discrimination) |
| Culbert, 2015 [210]              | Indonesia | Stratified random | 102 | Mixed | HIV stigma scale | Significantly higher stigma | None |
| Study (First author, year) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|---------------------------|----------|--------------------------|-------------|--------------|------------------------|----------------------------------------------------------|-------------------------------|
| Deryabina, 2017 [132]    | Kyrgyzstan | sample of prisoners who were HIV-infected in two prisons in Jakarta | 123         | Qualitative  | Not specified           | scale scores were reported among participants who were incarcerated for a drug offense, had sought treatment for substance use problems, and those who reported opioid withdrawal symptoms during incarceration | None                          |
| Du, 2012 [127]           | China     | Persons with injection drug use were recruited from a computerized database and were asked to complete a survey; clients in a methadone maintenance program were invited to participate in focus groups; clinic staff also participated in focus groups | 610         | Mixed methods | Not specified           | ‘Fear to be a known drug user’ was commonly cited as barrier to accessing NSP services; concerns about disclosure of using injection drugs were cited including fears of losing employment, social stigma, rejection from family/friends, fear of police, and being treated poorly by healthcare professionals | None                          |
| Fan, 2016 [211]          | China     | MSM were recruited from local community-based organizations and through snowball sampling | 391         | Cross-sectional | HIV-related stigma scale (domains: shame, blame, social isolation, discrimination, equity) | MSM who reported any alcohol use also reported significantly higher levels of stigma than non-drinkers; stigma scale scores were highest among those with heavy alcohol use | None                          |
| Go, 2016 [212]           | Vietnam   | PWID who were newly diagnosed with HIV were enrolled from a parent RCT; data were collected at baseline and 1 month later (pre-intervention) | 336         | Cohort       | HIV and drug stigma (non-specified) | Neither HIV nor drug stigma were associated with HIV status disclosure in adjusted models | None                          |
| Goldstone, 2017 [213]    | South Africa | Mental healthcare workers who worked with persons with substance use disorders and suicidal ideation were interviewed | 18          | Qualitative  | Not specified           | Stigma related to substance use, mental illness, and suicide was identified as a barrier to suicide prevention among persons who have | None                          |
| Study (First author, year) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|---------------------------|----------|--------------------------|-------------|--------------|-------------------------|----------------------------------------------------------|-------------------------------|
| Greene, 2013 [214]        | China    | Clinic-based sample of current or former PWID who were HIV-infected were recruited; caregivers (outside of clinical care) of patients also interviewed | 96          | Cross-sectional | Patient-level perceived HIV-related stigma; caregiver-level stigma towards HIV | Patient-perceived stigma was associated with poor mental health and a lack of social support among caregivers; caregivers lack of social support was attributable to their own HIV stigma; higher caregiver stigma was also associated with less caregiver self-efficacy | None                          |
| Ha, 2015 [147]            | Vietnam  | Respondent-driven sampling to recruit MSM | 451         | Cross-sectional | Experienced, perceived, and internalized homosexuality-related stigma | Experienced and perceived stigma were both associated with depression, which in turn predicted drug and alcohol use, and, ultimately, sexual risk behaviors | Med: Relationship of stigma and sexual risk behaviors was mediated by depression and alcohol/substance use |
| Hayes-Larson, 2017 [141]  | Lesotho  | Baseline data from a mixed methods cluster randomized trial of HIV-TB co-infected patients | 371         | Cross-sectional | Not specified | 25% of the sample reported hazardous/harmful alcohol use; greater external HIV and TB stigma associated with hazardous/harmful alcohol use | None                          |
| Heath, 2016 [215]         | Thailand | Peer-based recruitment used to recruit participants who had injection drug use in the past 6 months | 437         | Cross-sectional | Experienced stigma | Experienced stigma, including verbal abuse about their drug use, being discouraged from participating in family activities, and refused medical care by healthcare workers, were associated with avoiding accessing health services | None                          |
| Howard, 2017 [124]        | South Africa | Street-outreach methods were used to recruit women who use substances for FGDs; primary healthcare and rehab staff were also recruited for FGDs | 60          | Qualitative | Not specified | Stigma was identified as a barrier to accessing primary care and substance use treatment services for women who use substances | None                          |
| Ibragimov, 2017 [138]     | Tajikistan | Purposive sampling used in pharmacies to recruit pharmacists and pharmacy students for in-depth interviews | 28          | Qualitative | Not specified | Themes related to stigma among pharmacists and pharmacy students towards PWID included having negative emotions, connotations, and stereotypes of PWID; examples included support for isolation of PWID | None                          |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|-----------------------------------|----------|--------------------------|-------------|--------------|------------------------|---------------------------------------------------------|---------------------------------|
| James, 2012 [139]                | Nigeria  | Medical students who had completed a clerkship in Psychiatry and recent medical graduates were interviewed | 254         | Cross-sectional | Attitudes Towards Mental Illness Questionnaire | Medical students and recent medical graduates displayed significantly stigmatizing attitudes towards persons who use alcohol and cannabis | None |
| Jamshidimanesh, 2016 [125]       | Iran     | Women with substance abuse were recruited from local drop-in center clinics | 32          | Qualitative   | Not specified          | Stigma towards addiction was identified as a barrier to healthcare treatment | None |
| Johansson, 2017 [216]            | Estonia  | Respondent-driven sampling used to recruit PWID who were HIV infected | 312         | Cross-sectional | Internalized HIV and drug stigma | Internalized HIV and drug stigma were high; internal drug use stigma was negatively associated with disclosure of drug use to family members (non-parents) and healthcare workers; internalized HIV stigma was positively associated with disclosure to healthcare workers; neither HIV nor drug stigma were associated with disclosure of use to sexual partners, close friends, or parents | Mod: Authors investigated interaction of HIV and drug stigma; interaction effects on disclosure were non-significant |
| Kekwaletswe, 2014 [131]          | South Africa | Purposive sample of HIV patients in ART clinics | 304         | Cross-sectional | Experienced and anticipated HIV stigma | Among those who reported using alcohol, higher levels of HIV stigma were associated with skipping ART doses | None |
| Kerrigan, 2017 [143]             | Brazil   | Proportional random sampling of persons with HIV in six public health facilities | 900         | Cross-sectional | Internalized and experienced HIV stigma (Berger scale) | History of drug use was associated with higher levels of stigma/discrimination | None |
| Khuat, 2015 [217]                | Vietnam  | Respondent-driven sampling of women with injection drug use | 403         | Cross-sectional | Gender-based stigma | Women with injection drug use reported substantial gender-related stigma | None |
| Krawczyk, 2015 [218]             | Brazil   | Purposive sample recruited by community leaders of adults who used crack | 38          | Qualitative   | Not specified          | Almost all participants reported significant stigmatization due to their crack use, including being labelled as 'thieves' or 'sick'; many also reported discrimination in health services | None |
| Study (First author, year) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/ moderators |
|---------------------------|----------|--------------------------|-------------|--------------|-------------------------|-----------------------------------------------------------|----------------------------------|
| Lan, 2017 [126]           | Vietnam  | Baseline data from an RCT; participants were persons with injection drug use from 60 randomly selected commune health centers | 900         | Cross-sectional | Perceived and internalized drug-related stigma | Drug-related stigma was associated with reduced overall access to general healthcare but was not associated with MMT or needle exchange program access | None                              |
| Lembke, 2015 [219]        | China    | Persons who used heroin and were seeking treatment were recruited from a local hospital for in-depth interviews | 9           | Qualitative    | Not specified            | All participants reported intense stigma towards persons who use drugs, including social exclusion; participants also reported confidential, anonymous treatment as a facilitator for accessing services | None                              |
| Liao, 2014 [220]          | China    | Mixed recruitment methods (community outreach, snowball sampling) was used to recruit MSM | 1230        | Cross-sectional | HIV-related stigma scale (domains: shame, blame, social isolation, discrimination, equity) | HIV-related stigma was common among this MSM sample and was associated with increased alcohol use | None                              |
| Lim, 2013 [134]           | Vietnam  | Baseline data from RCT; PWID recruited from active recruiters and peer referral; community members recruited through systematic sampling | 3023        | Cross-sectional | HIV-related stigma scale (domains: shame, blame, social isolation, discrimination, equity) Drug-related stigma (internalized, perceived, experienced) among PWID; perceptions of PWID among community members | Higher education inequality was associated with more HIV-related stigma among PWID and among community members; lower individual education associated with greater HIV and drug stigma among both PWID and community members; individual level education negated the effect of community-level education inequality; part-time employed PWID reported more perceived and experienced stigma than full-time employed PWID | Mod: Cross-level interactions of community and individual predictors that community SES did not vary by individual level SES |
| Lozano-Verduzco, 2016 [221]| Mexico  | Women were recruited from an addiction treatment clinic and through snowball sampling for in-depth interviews | 13          | Qualitative    | Not specified            | Women reported experiences of gender-based stigma and stigma related to their substance use they reported that women who use substances experience significantly more stigma than men Psychiatric comorbidities lead to additional stigmatization; these combined stigmas reduce treatment seeking | None                              |
| Luo, 2014 [222]           | China    | Random sample of households in two communities was | 848         | Cross-sectional | Community members were asked about labelling, stereotyping, and social | Vast majority of participants labelled persons with drug dependence as ‘addicts’ | None                              |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|------------------------------------|----------|--------------------------|-------------|--------------|-------------------------|----------------------------------------------------------|----------------------------------|
| Mattoo, 2015 [223]                | India    | Purposive sample of persons with alcohol and opioid dependence and one of their family members, recruited from a drug treatment center | 200 (100 patient/family member dyads) | Cross-sectional | Perceived drug-related stigma | Perceived stigma about persons who use substances was highly concordant between persons with alcohol and opioid dependence and their family members | None |
| Mimiaga, 2010 [130]               | Ukraine  | Participants who were receiving HIV treatment at a local clinic and had been infected through injection drug use were recruited for FGDs | 16 | Qualitative | Not specified | HIV-related stigma was mentioned by all participants as a barrier to treatment adherence; participants feared that disclosing HIV status would identify them as a person who injects drugs; others reported fear of rejection from family if they disclosed their HIV status; discrimination by healthcare providers was also mentioned as a source of HIV-related stigma | None |
| Moomal, 2009 [146]                | South Africa | Representative sample of South African adults from the South African Stress and Health Survey | 4851 | Cross-sectional | Acute and chronic discrimination both related and unrelated to race | Acute racial and non-racial discrimination and chronic non-racial discrimination were associated with increased risk for substance use disorders | None |
| Mora-Rios, 2017 [133]             | Mexico   | Persons who use drugs and their family members were recruited through psychiatric care facilities; healthcare personnel were also recruited | 35 | Qualitative | Not specified | Persons who used alcohol and drugs, their family members, and healthcare workers frequently reported family, healthcare personnel, and persons in the street/neighbors as sources of stigma; all persons who used substances reported being an object of social distancing in response to vignettes about drug users and non-drug users | None |
Table 5 Research on substance use and stigma in LMIC, 2008–2017 (Continued)

| Study (First author, year) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|---------------------------|----------|--------------------------|-------------|--------------|-------------------------|-----------------------------------------------------------|----------------------------------|
| Myers, 2013 [224]         | South Africa | Participants were South Africans who self-identified as Black African or colored who had alcohol or other drug use problems and had sought treatment (cases) or had not sought treatment (controls); cases were recruited from treatment facilities; controls were recruited from the community | 434         | Case–control | Stigma consciousness scale (perceived drug-related stigma) | There was no association between stigma and alcohol or other drug service use among Black African participants; among colored participants, perceived stigma was associated with increased odds of service use | None |
| Otiashvili, 2013 [225]   | Georgia  | Women who used injection drugs were recruited through peer-to-peer and peer-to-professional word-of-mouth for in-depth interviews; purposive sampling was used to recruit healthcare staff | 89          | Qualitative  | Not specified           | Participants described intense stigmatization that was a major barrier to treatment seeking and access; stigma was also thought to be a more significant barrier to treatment access among women than among men who use substances | None |
| Papaś, 2017 [142]        | Kenya    | Baseline data from RCT participants who were HIV-infected outpatients and used alcohol | 614         | Cross-sectional | HIV-related stigma (public attitudes towards HIV, ostracization, discrimination, personal life disruption) | Women reported higher levels of HIV-related stigma than men; stigma was associated with an increased odds of experiencing sexual or physical violence among both men and women | None |
| Peacock, 2015 [226]      | El Salvador | Respondent-driven sample of MSM and transgender women | 670         | Cross-sectional | Internalized homonegativity scale | Binge drinking prevalence was high in the overall sample; higher levels of internalized homonegativity were associated with increased binge drinking | None |
| Rathod, 2015 [227]       | India    | Community sample recruited through cluster sampling design in a rural district | 3220        | Cross-sectional | Internalized stigma of mental illness | Stigmatizing belief of shame was commonly reported among those with alcohol use disorders, which may have resulted in a low rate of treatment seeking | None |
| Ronzani, 2009 [140]      | Brazil   | Primary healthcare professionals were recruited to participate | 609         | Cross-sectional | Attitudes towards use of alcohol and other drugs | Alcohol, tobacco, marijuana, and cocaine use were negatively judged behaviors by healthcare professionals relative to other conditions (e.g., mental health problems, | None |
### Table 5: Research on substance use and stigma in LMIC, 2008–2017 (Continued)

| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/moderators |
|----------------------------------|----------|--------------------------|-------------|--------------|-------------------------|----------------------------------------------------------|---------------------------------|
| Sarkar, 2017 [135]               | India    | Persons with alcohol or opioid use disorders were recruited from a treatment facility | 201         | Cross-sectional | Internalized stigma of mental illness | HIV; persons with alcohol, marijuana, and cocaine problems suffered the highest rate of service refusal | None |
| Schensul, 2017 [129]             | India    | Men living with HIV were recruited from ART treatment centers | 361         | Mixed methods   | Experienced stigma | There were high levels of internalized stigma across study participants; persons with alcohol and opioid use disorder with severe stigma had significantly lower physical, social, psychological, and environmental quality of life scores than those with mild-to-moderate stigma | None |
| Sharma, 2017 [228]               | India    | Purposive sampling to recruit women with non-injection drug use; women who had injection drug use were also recruited from a parent prospective cohort study | 48          | Qualitative     | Not specified            | Men who drank alcohol at higher levels had a greater risk of non-ART adherence; men also reported skipping ART doses when drinking with friends due to fear of HIV status disclosure | None |
| Spooner, 2015 [229]              | Indonesia| Outreach workers recruited women who had injection drug use | 19          | Qualitative     | Not specified            | Stigma from healthcare providers was reported as a significant barrier to accessing services | None |
| Ti, 2013 [128]                   | Thailand | Peer-based outreach and word-of-mouth recruiting used to recruit persons who injected drugs; sample restricted to those HIV-negative or unknown HIV serostatus | 350         | Cross-sectional | Experienced stigma | Having been refused healthcare services was associated with avoiding getting an HIV test | None |
| Van Nguyen, 2017 [137]           | Vietnam  | Patients taking MMT at one of two MMT sites were recruited | 241         | Cross-sectional | HIV and drug-related stigma (blame/judgment, shame, discrimination, | Almost all participants reported experiencing blame/judgment, | None |
| Study (First author, year [ref.]) | Location | Sampling characteristics | Sample size | Study design | Type of stigma assessed | Description of stigma association (strength, significance) | Significant mediators/ moderators |
|----------------------------------|----------|--------------------------|-------------|--------------|--------------------------|----------------------------------------------------------|----------------------------------|
| Yang, 2015 [136]                 | China    | Males with drug dependence who were formerly abstinent were purposively recruited from a compulsory drug treatment center | 18          | Qualitative  | Not specified            | disclosure, others' fear of HIV transmission | None                             |
| Zhang, 2016 [32]                 | China    | Persons living with HIV were randomly selected for participation from a parent study | 2987        | Cross-sectional | Perceived, experienced, and internalized HIV stigma (Berger scale) | In overall sample, perceived stigma was associated with drug use; among those with higher incomes, internalized stigma was associated with drug use and experienced stigma was associated with alcohol use Perceived stigma was associated with drug use in rural areas | Mod: Relationship between stigma and drug use modified by income; odds of alcohol and drug use were highest among those with both higher levels of stigma and higher income; also modified by place of residence Those with higher levels of perceived stigma living in rural areas had increased odds of drug use compared to urban areas |
employment, education, and the marriage prospects of its members [65, 66].

Secondary stigma may manifest as a reluctance to expedite emergency care for acutely ill family members due to fear of disease disclosure to the broader community [66]. In communities where social capital functions as the safety net, loss of social status can imperil family survival [66, 67]. TB-related stigma was shown to damage the support networks and quality of services given to those who have a stigmatized condition [66]. Mis-treatment of TB patients can contribute to mental health sequelae, poor coping behaviors, and other comorbidities [68, 69]. TB-related stigma may also erode patients’ resilience to disease and household-level wellbeing [70]. Finally, healthcare workers who perceive TB stigma defer TB screening and prophylaxis [71].

Studies have suggested that the impact of stigma on TB treatment adherence varies [72–74], with some suggesting a decrease [75] and others an increase [76, 77] in adherence. The predominance of cross-sectional data limits the ability to tease apart this relationship. Much of this variance can also likely be attributable to the diversity across studies with regards to measurement metrics and statistical power [78].

It is likely that drug-resistant TB (DRTB) has a different impact on the association of TB-related stigma with outcomes compared to drug-susceptible TB [79, 80]. DRTB disease may be more susceptible to blame, shame, and self-stigma because healthcare workers often assume it is caused by non-adherence. Further, DRTB treatment side effects can expose DRTB patients to mental health, disability, and poverty stigmas [81]. Stigma fed by perceived dangerousness and isolation policies that erode social capital and resilience may disproportionately affect people with DRTB. DRTB-related stigma may also be considered more of a barrier to adherence than HIV stigma among co-morbid persons [79, 82].

TB-related stigma can be exacerbated or attenuated by other forms of prejudice, including misogyny [83, 84]. Studies of TB-related stigma have also drawn attention to the moderating role of gender. Two studies found women were more adherent to TB treatment when they perceived high levels of stigma, while men were less so, particularly if they found TB treatment humiliating [65, 77]. There is also evident variation in the health impacts of TB-related stigma among sub-populations (e.g., people who inject drugs, alcohol dependent, pastoralists) [85–87].

**Mental health**

Studies have indicated that mental health-related stigma is negatively associated with quality of life, functioning, and other positive health outcomes (Table 3). Quality of life was associated with either internalized or perceived stigma [89] and general functioning was inversely associated with internalized and perceived stigma [88, 89]. Greater stigma was also associated with fatigue [90] and poorer diabetes-related outcomes [91] among those with depression, and with HIV-risk behaviors among those with a severe mental illness [92].

Treatment outcomes were a major area of focus within the mental health articles identified. For example, studies on treatment adherence found internalized stigma to be associated with poorer medication adherence both among those with schizophrenia [93] and among those with any diagnosis of a mental disorder [94]. Perceived discrimination was also associated with higher odds of discontinuing medication among individuals diagnosed with schizophrenia [95]. Data on treatment-seeking behaviors for mental health problems were mixed. For example, one study found that individuals identified as having depression yet rejected treatment were more likely to have higher internalized stigma relative to those who accepted treatment [91]. In a community-based study from Ukraine [96], only 8% of individuals who were identified as having a mental health problem but not having sought help from any medical source cited stigma as a reason. However, nearly 75% of individuals living with severe mental illness in India reported delaying seeking care in part due to fear of stigma [97].

Symptom severity was the most common health-related outcome tested for associations with stigma; however, findings on the impacts of mental health-related stigma on mental disorder symptom severity are mixed. For example, two studies found that, among those diagnosed with schizophrenia, those with higher levels of internalized stigma had greater general psychiatric symptoms [88, 98]. In contrast, two studies found no relationship between general symptoms of psychopathology and most forms of internalized stigma assessed [89, 99], and one study found fewer experiences of stigma among those with more severe general psychiatric symptoms who were living with a severe mental illness [92]. Findings related to symptoms specific to schizophrenia were similarly mixed. Negative schizophrenia symptoms were not significantly associated with most forms of internalized stigma [35, 89, 99, 100]. Of three studies examining positive symptoms of schizophrenia [99–101], two found significant associations with stigma operating in opposite directions [99, 101]. For individuals with depression, greater symptom severity was associated with greater perceived stigma [90, 102–105], though one study found less stigma among those with higher levels of symptoms [99].

Moderators were assessed in only two studies on mental health-related stigma and health outcomes and no studies assessed mediators. In Jordan [106], depression was a moderator of the relationship between stigma and treatment seeking. Adolescents with mild depression who reported high levels of stigma were more likely to
seek care from a variety of sources (counselor, general practitioner, religious leader, or family member) and express willingness to take medication or receive therapy than adolescents with mild depression who reported low levels of stigma. While moderate to severe depression was associated with lower likelihood of seeking care overall, there was no association between stigma and care-seeking for adolescents with moderate to severe depression. In Egypt [107], insight did not significantly modify the relationship between stigma and suicide risk among persons with schizophrenia.

**Epilepsy**

Epilepsy-related stigma has been repeatedly linked to poor quality of life and associated with increased epilepsy-related concerns [108, 109], poor self-esteem [110], and increased self-reported burden of disease [111], including increased psychiatric burden such as that attributed to anxiety and depression [111–113] (Table 4). Qualitative and quantitative data suggest that epilepsy-related stigma leads to poor overall function, particularly regarding social engagement and employment [111, 114, 115]. Further, increased stigma has been associated with decreased disclosure and discussion about epilepsy [116, 117]. For example, 34% of married Pakistani women with epilepsy actively concealed their epilepsy diagnosis during marriage negotiations in response to misconceptions regarding their diagnosis, pressure from family members, and to avoid rejection and further stigmatization [118].

Epilepsy-associated stigma has also been shown to affect family members of people with epilepsy. Among mothers of children younger than 8 years with epilepsy, stigma has been associated with increased maternal psychopathology [119]. Mothers were also more likely to actively limit their child’s activities based on their own and perceived interpretation of their child’s internalized stigma [119].

Epilepsy-related stigma has been associated with social withdrawal and adverse health behaviors such as poor medication adherence [120]. This relationship may be mediated by increased medication side-effects reported among adults with epilepsy [121] as these side-effects have previously been associated with increased stigma [122, 123], though this relationship has yet to be formally examined as none of the epilepsy studies included in the review evaluated mediators or moderators.

**Substance use**

Stigma is often prevalent among persons who use alcohol or other substances in both the community and in healthcare settings, with possible adverse consequences (Table 5). Among persons using alcohol or other substances, substance-related stigma was identified as a barrier to accessing drug treatment services [124, 125], general healthcare services [124, 126], HIV testing [127, 128], reduced antiretroviral therapy or treatment adherence [129–131], needle exchange programs [132], and to recovery generally [133]. Stigma among persons who use substances was also associated with less education and not being employed full-time [134], as well as lower quality of life across several domains, including the social, physical, psychological, and environmental domains [135], higher risk of relapse [136], social isolation, anxiety, and depression [137]. Healthcare professionals and trainees, including pharmacists and pharmacy students [138], medical students and recent medical graduates [139], and primary healthcare workers [140], expressed stigmatizing beliefs and attitudes towards persons who use drugs.

In addition to stigma occurring as a result of substance use, stigma related to HIV and other health conditions can also be associated with an increased risk for alcohol and other substance misuse. HIV stigma was associated with hazardous/harmful alcohol use among persons co-infected with HIV and TB [141]. Further, among persons with HIV and alcohol use, high levels of HIV-related stigma were associated with increased odds of experiencing physical and sexual violence [142]. Higher levels of HIV stigma were also associated with other (non-alcohol) substance use [143]. Stigma not attached to a health condition can also increase the risk of alcohol and other substance use; indeed, recent discrimination (e.g., based on race, age) was associated with increased odds of both alcohol and drug use [144–146].

Two studies investigated moderators. Years of study at university [145], income, and place of residence were found to be significant moderators of stigma–substance use relationships. One study investigated mediators and found that, among men who have sex with men, alcohol and substance use mediated the relationship between stigma and risky sexual behaviors [147].

**Intersectional stigmas**

Stigmatized medical co-morbidities were common across the five conditions. In many LMICs, the prevalence of HIV and TB can be high and the burden of chronic non-infectious disorders like epilepsy, mental illness, and substance use is growing. HIV-related stigma has been associated with harmful alcohol use among individuals with comorbid HIV and TB infection [87] as well as increased (non-alcohol) substance use among individuals with HIV (alone) compared to those without HIV [143]. Stigma due to other marginalized characteristics (sex, race, gender, country of origin, etc.) also increases the risk of substance use and physical and sexual violence [142, 144–146]. This interaction has culminated in a syndemic, with an increased burden of stigma [148].
HIV-related stigma has been shown to attenuate the impact of TB-related stigma in some settings [77, 149], while potentiating it in others [150]. Comorbid stigmas do not always result in worse health outcomes. For example, while Zambian adults with HIV and epilepsy endorsed greater stigma, this did not translate into an increased prevalence of depression [151]. However, stigma due to one medical condition, such as substance use, has also been shown to hinder preventative care, including HIV testing [127, 128] and, among individuals with comorbid HIV infection, medication adherence [129–131].

Discussion
Across disease types included in this scoping review, stigma was associated with poor individual health outcomes and health utilization patterns. Stigmas related to HIV, TB, epilepsy, and substance use were associated with increased psychiatric morbidity, particularly depression and anxiety. Stigma has repeatedly been associated with decreased quality of life and poorer functioning across conditions. Highly stigmatized individuals are more likely to conceal their condition and, as a result, are less likely to seek care or more likely to delay care. This is consistent with the literature from high-income countries on stigma related to mental health conditions. In a systematic review of 144 studies (the vast majority of which were from high income countries) [152], the median effect size of stigma on help-seeking for mental health disorder was -0.27, though there was some evidence that this relationship was stronger among ethnic minority groups within these countries; qualitative studies suggested that this is both a direct relationship and may be mediated through decreasing disclosure.

Among those obtaining treatment for all five conditions examined in this review, stigma was associated with decreased medication adherence and, among patients with substance use, relapse. In high-income countries, the relationships between treatment adherence and stigma related to mental health problems is varied. Perceived stigma has been found to predict poorer treatment outcomes for individuals with depression [153, 154]; though this evidence is mixed, internalized stigma has also been found to be related to poorer treatment adherence for individuals living with multiple mental health conditions [155]. Conversely, anticipated and experienced discrimination has been found to not be significantly associated with antipsychotic medication adherence for people living with schizophrenia [156].

Studies examining individuals with multiple stigmatized conditions suggest that the effects of health-related stigma can be felt across all domains. Just as stigma among individuals with mental health problems or injection drug use decreases their use of mental health and substance disorder services, it also decreases HIV testing and medication adherence. Unfortunately, the effects of stigma across conditions are complex and, similar to studies describing stigma in high-income countries [1], our review found that studies of stigma and health outcomes in LMICs are largely focused on one stigmatizing condition (often only internalized stigma) and one health outcome. Few studies described the complex interactions between different types of stigma and the co-occurring health conditions likely to be present.

As highlighted in Boxes 1, 2 and 3, the review results showed that marginalized members of society are increasingly vulnerable to health-related stigma. LGBTQ individuals, racial and ethnic minorities, and refugees suffer from increased stigma due to lack of social and economic stability, fear of encountering stigma, and increased self-stigmatization. Unequal access to treatment and, among refugee communities, decreased access to information, result in reduced healthcare-seeking behaviors. These associations can be amplified by perceived stigma from the healthcare community, which further delays care and reduces healthcare-seeking behavior. The effects of trauma, particularly among LGBTQ individuals and refugees, are often under-recognized, which also affects care. Unfortunately, as most studies recruit participants from healthcare settings, these individuals may have been overlooked within the available stigma data, and particularly in that related to HIV, mental health, and epilepsy. Similarly, difficulty in recruiting these populations presents a research challenge and affects data availability. Therefore, the effect of stigma on the health and health outcomes of vulnerable populations may be underestimated. While the substance use literature featured a wider range of populations, including representation of sexual and gender minorities, as well as geographies, the generalizability of this data is limited by its focus on alcohol and injection drug use; other substance types (e.g., inhalants, cocaine, prescription drugs) that may have associations with stigma have been largely neglected. Further, the effect of stigma on child and adolescent populations is poorly understood as only one study examining epilepsy-associated stigma focused on this vulnerable population [107]. Given that risk factors, symptom presentation, and trajectories of mental health and substance use problems may vary across the life course, increased research on stigma among children and adolescents is essential.

Comprehensive, multidisciplinary stigma-focused prevention and treatment approaches are warranted in LMICs. However, the design and implementation of these interventions is limited by the data available. This review highlights the paucity of longitudinal stigma studies on health-related stigma in LMICs, particularly among community-based samples, which limits our understanding of the mechanisms by which stigma impacts
Limitations of the review
The purpose of the review was to inform both potential future research studies and possible research questions that could be addressed by systematic reviews. Formal study inclusion and exclusion criteria were not used as the review was not systematic; however, similar search terms and databases were used across the five disease reviews. Although the types of study designs described in the literature were often noted, individual study quality was not assessed, as is typical in scoping reviews. Finally, we focused on five disease/disorders that significantly drive the disease burden in LMICs. Future reviews should focus on other stigmatized conditions affecting individuals in this setting, including abortion, cancer, leprosy, albinism, gender identity, sex work, sexual violence, and sexually transmitted infections.

Conclusion
A rapidly growing body of literature, mostly qualitative and cross-sectional in design, suggests that stigma is associated with poor health outcomes, including less help-seeking, among persons with HIV, TB, mental health, neurologic disorders, and substance use. This review highlights consistencies in the relationship of stigma with health outcomes, but also common methodological limitations. Future studies can address these limitations by (1) recognizing that comorbidity is the rule and not the exception and that the complex inter-connected relationships between stigma and multiple health outcomes must be accounted for in the study design phase; (2) measuring multiple types of stigma at multiple health outcome levels; and (3) featuring longitudinal designs, investigation into mediators and moderators, and community-based study samples to improve generalizability. Removing the siloes from health-related stigma research in LMICs and addressing these limitations will improve the epidemiological literature on evidence-based stigma interventions, ultimately improving outcomes associated with high-burden diseases.
43. Olley B, Adebayo K, Ogunde M, Ishola A, Ogar A. Psychosocial factors predicting severity of depression among treatment-seeking HIV/AIDS patients: a multi-site Nigerian study. Niger J Clin Pract. 2017;20:296.

44. Robinson A, Malcolm S. P14:16 Self reported hiv discrimination and willingness to disclose hiv seropositivity among a sample of turks and caucasi islands. Sex Transm Infect. 2015;91:A204-S.

45. Tsai AC, Bangsberg DR, Kegeles SM, Katz T, Haberer JE, Muzoza C, et al. Internalized stigma, social distance, and disclosure of HIV seropositivity in rural Uganda. Ann Behav Med. 2013;46:285–94.

46. Olley BO, Ogunde MJ, Oso PO, Ishola A. HIV-related stigma and self-disclosure: the mediating and moderating role of anticipated discrimination among people living with HIV/AIDS in Akure Nigeria. AIDS Care. 2016;28:726–30.

47. Colombini M, Mutemwa R, Xivungura J, Stackpool Moore L, Mayhew SH, Integra Initiative. Experiences of stigma among women living with HIV attending sexual and reproductive health services in Kenya: a qualitative study. BMC Health Serv Res. 2014;14:1412.

48. Makin JD, Forsyth BC, Visser MJ, Sikkema KJ, Neufeld J, Beyer J. Factors affecting disclosure in South African HIV-positive pregnant women. AIDS Patient Care STDS. 2008;22:907–16.

49. Ojikutu BO, Pathak S, Srinthanaviboolkach N, Limbada M, Friedman R, Li S, et al. Community cultural norms, stigma and disclosure to sexual partners among women living with HIV in Thailand, Brazil and Zambia (HPTN 063). PLoS One. 2016;11:e0153600.

50. Lyimo RA, Stutterheim SE, Hosphers HJ, de Glee T, van der Ven A, de Bruin C. Stigma, disclosure, coping, and medication adherence among people living with HIV/AIDS in Northern Tanzania. AIDS Patient Care STDS. 2014;28:98–105.

51. Valenzuela C, Ugarte-Gil C, Paz J, Echevarria J, Gotuzzo E, Vermund SH, et al. Predictors of adherence to antiretroviral therapy in rural Zambia. J Infect Dis. 2011;204:1554–61.

52. Olley BO, Ogunde MJ, Oso PO, Ishola A. HIV-related stigma and self-disclosure: the mediating and moderating role of anticipated discrimination among people living with HIV/AIDS in Akure Nigeria. AIDS Care. 2016;28:726–30.

53. Colombini M, Mutemwa R, Xivungura J, Stackpool Moore L, Mayhew SH, Integra Initiative. Experiences of stigma among women living with HIV attending sexual and reproductive health services in Kenya: a qualitative study. BMC Health Serv Res. 2014;14:1412.

54. Makin JD, Forsyth BC, Visser MJ, Sikkema KJ, Neufeld J, Beyer J. Factors affecting disclosure in South African HIV-positive pregnant women. AIDS Patient Care STDS. 2008;22:907–16.

55. Ojikutu BO, Pathak S, Srinthanaviboolkach N, Limbada M, Friedman R, Li S, et al. Community cultural norms, stigma and disclosure to sexual partners among women living with HIV in Thailand, Brazil and Zambia (HPTN 063). PLoS One. 2016;11:e0153600.

56. Lyimo RA, Stutterheim SE, Hosphers HJ, de Glee T, van der Ven A, de Bruin C. Stigma, disclosure, coping, and medication adherence among people living with HIV/AIDS in Northern Tanzania. AIDS Patient Care STDS. 2014;28:98–105.

57. Valenzuela C, Ugarte-Gil C, Paz J, Echevarria J, Gotuzzo E, Vermund SH, et al. Predictors of adherence to antiretroviral therapy in rural Zambia. J Infect Dis. 2011;204:1554–61.

58. Olley BO, Ogunde MJ, Oso PO, Ishola A. HIV-related stigma and self-disclosure: the mediating and moderating role of anticipated discrimination among people living with HIV/AIDS in Akure Nigeria. AIDS Care. 2016;28:726–30.

59. Colombini M, Mutemwa R, Xivungura J, Stackpool Moore L, Mayhew SH, Integra Initiative. Experiences of stigma among women living with HIV attending sexual and reproductive health services in Kenya: a qualitative study. BMC Health Serv Res. 2014;14:1412.

60. Makin JD, Forsyth BC, Visser MJ, Sikkema KJ, Neufeld J, Beyer J. Factors affecting disclosure in South African HIV-positive pregnant women. AIDS Patient Care STDS. 2008;22:907–16.

61. Ojikutu BO, Pathak S, Srinthanaviboolkach N, Limbada M, Friedman R, Li S, et al. Community cultural norms, stigma and disclosure to sexual partners among women living with HIV in Thailand, Brazil and Zambia (HPTN 063). PLoS One. 2016;11:e0153600.

62. Lyimo RA, Stutterheim SE, Hosphers HJ, de Glee T, van der Ven A, de Bruin C. Stigma, disclosure, coping, and medication adherence among people living with HIV/AIDS in Northern Tanzania. AIDS Patient Care STDS. 2014;28:98–105.

63. Valenzuela C, Ugarte-Gil C, Paz J, Echevarria J, Gotuzzo E, Vermund SH, et al. Predictors of adherence to antiretroviral therapy in rural Zambia. J Infect Dis. 2011;204:1554–61.

64. Olley BO, Ogunde MJ, Oso PO, Ishola A. HIV-related stigma and self-disclosure: the mediating and moderating role of anticipated discrimination among people living with HIV/AIDS in Akure Nigeria. AIDS Care. 2016;28:726–30.

65. Colombini M, Mutemwa R, Xivungura J, Stackpool Moore L, Mayhew SH, Integra Initiative. Experiences of stigma among women living with HIV attending sexual and reproductive health services in Kenya: a qualitative study. BMC Health Serv Res. 2014;14:1412.

66. Makin JD, Forsyth BC, Visser MJ, Sikkema KJ, Neufeld J, Beyer J. Factors affecting disclosure in South African HIV-positive pregnant women. AIDS Patient Care STDS. 2008;22:907–16.

67. Ojikutu BO, Pathak S, Srinthanaviboolkach N, Limbada M, Friedman R, Li S, et al. Community cultural norms, stigma and disclosure to sexual partners among women living with HIV in Thailand, Brazil and Zambia (HPTN 063). PLoS One. 2016;11:e0153600.

68. Lyimo RA, Stutterheim SE, Hosphers HJ, de Glee T, van der Ven A, de Bruin C. Stigma, disclosure, coping, and medication adherence among people living with HIV/AIDS in Northern Tanzania. AIDS Patient Care STDS. 2014;28:98–105.

69. Valenzuela C, Ugarte-Gil C, Paz J, Echevarria J, Gotuzzo E, Vermund SH, et al. Predictors of adherence to antiretroviral therapy in rural Zambia. J Infect Dis. 2011;204:1554–61.

70. Olley BO, Ogunde MJ, Oso PO, Ishola A. HIV-related stigma and self-disclosure: the mediating and moderating role of anticipated discrimination among people living with HIV/AIDS in Akure Nigeria. AIDS Care. 2016;28:726–30.

71. Colombini M, Mutemwa R, Xivungura J, Stackpool Moore L, Mayhew SH, Integra Initiative. Experiences of stigma among women living with HIV attending sexual and reproductive health services in Kenya: a qualitative study. BMC Health Serv Res. 2014;14:1412.
91. Fawzi MH, Said NS, Fawzi MM, Kira IA, Fawzi MM, Abdel-Moety H. Psychiatric
86. Li SP, Zheng ZY, Meng QY, Yuan CH. Barriers to tuberculosis care for drug
users in two provinces of China: a qualitative study. Int J Tuberc Lung Dis.
2013;17:1538–63.
87. Hayes-Larson E, Hinch-Moxverman Y, Saeto S, Koen F, Pitt B, Maama-Maire L,
et al. High baseline prevalence of stigma, depressive symptoms and hazardous alcohol use among TB/HIV patients in Lesotho. Int J Tuberc Lung Dis.
2017;21(11):34–41.
88. Li J, Guo Y-B, Huang Y-G, Liu J-W, Chen W, Zhang X-Y, et al. Stigma and
discrimination experienced by people with schizophrenia living in the
community in Guangzhou, China. Psychiatry Res. 2017;255:225–31.
89. Singh A, Mattoo SK, Grover S. Stigma and its correlates in patients with
schizophrenia attending a general hospital psychiatric unit. Indian J
Psychiatry. 2016;58:291–300.
90. Shi-jie F, Hong-Mei G, Li W, Bin-Hong W, Yi-Ru F, Gang W, et al. Perceptions of
stigma and its correlates among patients with major depressive disorder:
an multicenter survey from China. Asia-Pac Psychiatry. 2017;9:e12260. https://doi.org/10.1111/appy.12260.
91. Fawzi MH, Said NS, Fawzi MM, Kira IA, Fawzi MM, Abdel-Moety H. Psychiatric
86. Li SP, Zheng ZY, Meng QY, Yuan CH. Barriers to tuberculosis care for drug
users in two provinces of China: a qualitative study. Int J Tuberc Lung Dis.
2013;17:1538–63.
87. Hayes-Larson E, Hinch-Moxverman Y, Saeto S, Koen F, Pitt B, Maama-Maire L,
et al. High baseline prevalence of stigma, depressive symptoms and hazardous alcohol use among TB/HIV patients in Lesotho. Int J Tuberc Lung Dis.
2017;21(11):34–41.
88. Li J, Guo Y-B, Huang Y-G, Liu J-W, Chen W, Zhang X-Y, et al. Stigma and
discrimination experienced by people with schizophrenia living in the
community in Guangzhou, China. Psychiatry Res. 2017;255:225–31.
89. Singh A, Mattoo SK, Grover S. Stigma and its correlates in patients with
schizophrenia attending a general hospital psychiatric unit. Indian J
Psychiatry. 2016;58:291–300.
90. Shi-jie F, Hong-Mei G, Li W, Bin-Hong W, Yi-Ru F, Gang W, et al. Perceptions of
stigma and its correlates among patients with major depressive disorder:
an multicenter survey from China. Asia-Pac Psychiatry. 2017;9:e12260. https://doi.org/10.1111/appy.12260.
91. Fawzi MH, Said NS, Fawzi MM, Kira IA, Fawzi MM, Abdel-Moety H. Psychiatric
86. Li SP, Zheng ZY, Meng QY, Yuan CH. Barriers to tuberculosis care for drug
users in two provinces of China: a qualitative study. Int J Tuberc Lung Dis.
2013;17:1538–63.
87. Hayes-Larson E, Hinch-Moxverman Y, Saeto S, Koen F, Pitt B, Maama-Maire L,
et al. High baseline prevalence of stigma, depressive symptoms and hazardous alcohol use among TB/HIV patients in Lesotho. Int J Tuberc Lung Dis.
2017;21(11):34–41.
88. Li J, Guo Y-B, Huang Y-G, Liu J-W, Chen W, Zhang X-Y, et al. Stigma and
discrimination experienced by people with schizophrenia living in the
community in Guangzhou, China. Psychiatry Res. 2017;255:225–31.
89. Singh A, Mattoo SK, Grover S. Stigma and its correlates in patients with
schizophrenia attending a general hospital psychiatric unit. Indian J
Psychiatry. 2016;58:291–300.
90. Shi-jie F, Hong-Mei G, Li W, Bin-Hong W, Yi-Ru F, Gang W, et al. Perceptions of
stigma and its correlates among patients with major depressive disorder:
an multicenter survey from China. Asia-Pac Psychiatry. 2017;9:e12260. https://doi.org/10.1111/appy.12260.
132. Deryabina A, El-Sadr WM. Uptake of needle and syringe program services in the Kyrgyz Republic: key barriers and facilitators. Drug Alcohol Depend. 2017;179:180–6.

133. Mora-Ros J, Ortega-Ortega M, Medina-Mora ME. Addiction-related stigma and discrimination: a qualitative study in treatment centers in Mexico City. Subst Use Misuse. 2017;52:694–603.

134. Lim T, Zelaya C, Latkin C, Quan VM, Franckis C, Ha TV, et al. Individual-level socioeconomic status and community-level inequality as determinants of stigma towards persons living with HIV who inject drugs in Thai Nguyen, Vietnam. J Int AIDS Soc. 2013;16:18637.

135. Sarkar S, Balharh YPS, Kumar S, Saini V, Kamran A, Patil V, et al. Internalized stigma among patients with substance use disorders at a tertiary care center in India. J Ethn Subst Abuse. 2017. https://doi.org/10.1080/15332640.2017.1357158.

136. Yang M, Mamy J, Gao Q, Xiao S. From abstinence to relapse: a preliminary qualitative study of drug users in a compulsory drug rehabilitation center in Changsha, China. PLoS One. 2015;10:e0130711.

137. Van Nguyen H, Nguyen HLT, Mai HT, Le HQ, Tran BX, Hoang CD, et al. Stigmatization among methadone maintenance treatment patients in mountainous areas in northern Vietnam. Harm Reduct J. 2017;14:1.

138. Ibragimov U, Cooper HL, Haardorfer R, Dunkle KL, Zule WA, Wong FY. Internalized stigma and discrimination is a potential contributing factor to substance use among other drug users by primary care providers in five African countries: A longitudinal study. Int J Nurs Stud. 2010;47:475–86.

139. Li MJ, Murray JK, Suwanteerangkul J, Wiwatnadee P. Stigma, social support, and treatment adherence among HIV-positive patients in Chiang Mai, Thailand. AIDS Educ Prev. 2014;26:471–83.

140. Li X, Li L, Wang H, Fennie KP, Chen J, Williams AB. Mediation analysis of health-related quality of life among people living with HIV infection in China. Nurs Health Sci. 2015;17:250–6.

141. Li J, Mo PKH, Kahler CW, Lau JT, Du M, Dai Y, et al. Prevalence and associated factors of depressive and anxiety symptoms among HIV-infected men who have sex with men in China. AIDS Care. 2016;28:465–70.

142. Melkuria LA, Sprangers MAG, Prins JM, Yalew AW, Nieuwkerk PT. Health-related quality of life of HIV-infected adults receiving combination antiretroviral therapy in Addis Ababa: AIDS Care. 2015;27:934–45.

143. Nyamathi AM, Ekstrand M, Yadav K, Ramakrishna P, Heylen E, Carpenter C, et al. Quality of life among women living with HIV in rural India. J Assoc Nurses AIDS Care. 2017;28:575–86.

144. Peltzer K, Rambagan S. Perceived stigma among patients receiving antiretroviral therapy: a prospective study in KwaZulu-Natal, South Africa. AIDS Care. 2011;23:60–8.

145. Sangboje N, Frich JC, Fretheim A. Barriers and facilitators to patients’ adherence to antiretroviral treatment in Zambia: a qualitative study. SAHARA J. 2008;5:136–43.

146. Subramanian T, Gupta MD, Dorairaj VS, Perianan V, Mathai AK. Psychosocial impact and quality of life of people living with HIV/AIDS in South India. AIDS Care. 2009;21:473–81.

147. Takada S, Weiser SD, Kumbakumba E, Muzoxo C, Martin JN, Hunt PW, et al. The dynamic relationship between social support and HIV-related stigma in rural Uganda. Ann Behav Med. 2014;48:26–37.

148. Tanun B, Stringer KL, Onomo M, Bukusi EA, Weiser SD, Cohen CR, et al. Linkage to HIV care, postpartum depression, and HIV-related stigma in newly diagnosed pregnant women living with HIV in Kenya: a longitudinal observational study. BMC Pregnancy Childbirth. 2014;14:400.

149. Wu X, Chen J, Huang H, Liu Z, Li X, Wang H. Perceived stigma, medical social support and quality of life among people living with HIV/AIDS in Hunan, China. Appl Nurs Res. 2015;28:169–74.

150. Wu Y-L, Yang H-Y, Wang J, Yao H, Zhao X, Chen J, et al. Prevalence of suicidal ideation and associated factors among HIV-positive MSM in Anhui, China. Int J STD AIDS. 2015;26:496–503.
221. Lozano-Verduzco I, Romero-Mendoza M, Marin-Navarrete R. Violence narratives of Mexican women treated in mutual-aid residential centers for addiction treatment. Subst Abuse Treat Prev Policy. 2016;11:39.

222. Luo T, Wang J, Li Y, Wang X, Tan L, Deng Q, et al. Stigmatization of people with drug dependence in China: a community-based study in Hunan province. Drug Alcohol Depend. 2014;144:285–9.

223. Mattoo SK, Sarfar S, Nebhuni N, Gupta S, Parakh P, Basu D. How do Indian substance users perceive stigma towards substance use vis-a-vis their family members? J Ethn Subst Abuse. 2015;14:223–31.

224. Myers B. Barriers to alcohol and other drug treatment use among Black African and coloured South Africans. BMC Health Serv Res. 2013;13:177.

225. Otiashvili D, Kirtadze I, Grady KE, Zule W, Krupitsky E, Wechsberg WM, et al. Access to treatment for substance-using women in the Republic of Georgia: socio-cultural and structural barriers. Int J Drug Policy. 2013;24:566–72.

226. Peacock E, Andrinopoulos K, Hembling J. Binge drinking among men who have sex with men and transgender women in San Salvador: correlates and sexual health implications. J Urban Health. 2015;92:701–16.

227. Rathod SD, Nadkarni A, Bhana A, Shidhaye R. Epidemiological features of alcohol use in rural India: a population-based cross-sectional study. BMJ Open. 2015;5:e009802.

228. Sharma V, Sama A, Tun W, Saraswati LR, Thor I, Madan L, et al. Women and substance use: a qualitative study on sexual and reproductive health of women who use drugs in Delhi, India. BMJ Open. 2017;7:e018530.

229. Spooner C, Saktiawati AMI, Lazuardi E, Worth H, Subronto YW, Padmawati RS. Impacts of stigma on HIV risk for women who inject drugs in Java: a qualitative study. Int J Drug Policy. 2015;26:1244–50.

230. Asia Catalyst. Survey of Chinese Transgender Female Sex Workers. 2015. http://zh.asiacatalyst.org/blog/2015/01/15/new-report-survey-of-chinese-transgender-female-sex-workers/. Accessed 19 Dec 2018.

231. Badgett MVL. The Economic Cost of Stigma and the Exclusion of LGBT People: A Case Study of India. 2014. http://documents.worldbank.org/curated/en/527281468035379692/pdf/940400WP0Box380usion0of0LGBT0People.pdf. Accessed 4 Feb 2018.

232. UNDP, USAID. Being LGBT in Asia: The Vietnam Country Report. 2014. https://www.usaid.gov/sites/default/files/documents/1861/Being_LGBT_in_Asia_Viet_Nam_report_ENG.pdf. Accessed 19 Dec 2018.

233. UNDP, USAID. Being LGBT in Asia: Nepal Country Report. 2014. https://www.usaid.gov/documents/1861/being-lgbt-asia-nepal-country-report. Accessed 11 Dec 2018.

234. Ahmed A, Stewart DE, Teng L, Wahoush O, Gagnon AJ. Experiences of immigrant new mothers with symptoms of depression. Arch Womens Ment Health. 2008;11:295–303.

235. Wu MC, Kviz FJ, Miller AM. Identifying individual and contextual barriers to seeking mental health services among Korean American immigrant women. Issues Ment Health Nurs. 2009;30:78–85.

236. Conrad MM, Pacquiao DF. Manifestation, attribution, and coping with depression among Asian Indians from the perspectives of health care practitioners. J Transcult Nurs. 2005;16:32–40.

237. Pulerwitz J, Michaelis AP, Lippman SA, Chinaglia M, Diaz J. HIV-related stigma, service utilization, and status disclosure among truck drivers crossing the Southern borders in Brazil. AIDS Care. 2008;20:764–70.

238. Enriquez M, Kelly PJ, Witt J, Rodriguez L, Lopez N, Smueles J, et al. Silence is not golden: invisible Latinas living with HIV in the Midwest. J Immigr Minor Heal. 2010;12:932–9.

239. Mak WWS, Cheung RYM. Self-stigma among concealable minorities in Hong Kong: Conceptualization and unified measurement. Am J Orthopsychiatry. 2010;80:267–81.

240. Wynaden D, Chapman R, Otb A, McGowan S, Zeeman Z, Yeak S. Factors that influence Asian communities’ access to mental health care. Int J Ment Health Nurs. 2005;14:88–95.

241. Abarca Tomás B, Pell C, Bueno Cavanillas A, Guillén Solvas J, Pool R, Roura M. Tuberculosis in migrant populations. A systematic review of the qualitative literature. PLoS One. 2013;8:e82440.