

# Measurements of Sexuality-Based Stigma among Gay, Bisexual, and Other Men Who Have Sex with Men (GBMSM) in Resource-Poor Settings: A Review

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**Abstract** Gay, bisexual, and other men who have sex with men (GBMSM) in resource-poor settings are disproportionately affected by the HIV/AIDS epidemic. GBMSM living in these settings may face unique barriers to HIV prevention, including legal barriers and increased sexuality-based stigma. It is therefore imperative to tailor HIV prevention and care resources to recognize the lived realities of GBMSM in these settings. Central to this is the accurate measurement of sexuality-based stigma. However, there is wide inconsistency in how sexuality-based stigma is measured among GBMSM in resource-poor settings. This paper reviews recent studies of sexuality-based stigma among GBMSM in resource-poor settings, finding great variability in measurements. The results of the review call for greater attention to the development of contextually and culturally specific measures of sexuality-based stigma for GBMSM living in resource-poor settings.

**Keywords** MSM · Stigma · Measurement · Resource poor settings

## Introduction

The United Nations Population Fund reports that gay, bisexual and other men who have sex with men (GBMSM) in resource-poor settings have an approximately 19 times greater odds of acquiring HIV compared to the general adult male population [1]. Historically, the focus of research and programmatic attention around HIV in resource-poor settings has focused on the epidemic among heterosexuals [2], however, emerging evidence illustrates that the prevalence of HIV among GBMSM in resource-poor settings ranges from approximately 14–25%, with the Caribbean containing the highest prevalence of HIV among GBMSM at 25.4% [3]. GBMSM in resource-poor settings often face unique HIV risk factors, including legal and stigma-based barriers to HIV prevention, treatment, and care, as well as a lack of culturally competent HIV prevention services tailored to their specific needs [4]. Though there is a preponderance of HIV prevention efforts targeted towards heterosexual adults and couples in resource-poor settings, there remains a lack of GBMSM-centric HIV prevention services in these settings. GBMSM are often vastly disregarded in interventions, ostracized by their communities, and removed from accessing highly-effective, evidence-based HIV prevention materials [6]. If adequate coverage and thoroughly-planned HIV prevention interventions are developed, prior research shows that > 40% of new HIV infections among GBMSM in resource-poor settings can be decreased [3, 4].

The experience of sexuality-based stigma has been shown to be linked to the risk of HIV infection among GBMSM in resource-poor settings [5–8]. Sexuality-based stigma stems

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from the belief that homosexuality is unacceptable and discredited in a heteronormative society [10, 11]. Sexuality-based stigma is comprised of internal stressors, external stressors, or a combination of both internal and external stressors [10]. Internal stressors describe negatively internalized feelings towards homosexuality or self-homosexuality (internalized stigma/homophobia), while external stressors describe either (a) expectations of stigmatized or discriminatory events based on sexual-minority status (perceived stigma) or (b) actual experiences of stigma due to sexual-minority status (enacted stigma) [10]. Previous research in resource-rich settings has shown significant associations between sexuality-based stigma and a range of health outcomes including, but not restricted to, depression, anxiety, reduced housing security, and reduced HIV testing [12–15].

There is an emerging body of evidence suggesting that sexuality-based stigma and its impact on HIV is high among GBMSM living in resource-poor settings, as homosexuality is illegal in many of these countries and minimal HIV prevention resources and services are accessible [16]. A recent study identified a strong association between sexuality-based stigma and HIV prevention seeking behavior among MSM living in Malawi, Namibia, and Botswana [17]. Specifically, only 67% of MSM living in these countries had ever received HIV prevention information, 19% reported being afraid when seeking the service of a health care professional, and 21% reported ever being blackmailed based on their sexuality [17]. Additionally, a study conducted among MSM living in San Salvador showed that MSM who reported high internalized homonegativity had 54% lower adjusted odds of ever testing for HIV [5]. Though the current body of work reveals many strong linkages between sexuality-based stigma and HIV-related prevention, it heavily relies on measures of sexuality-based stigma originally developed for use in resource-rich settings. The use of sexuality-based measures in resource-poor settings that were originally designed for use in and validated in resource-rich settings has the potential to miss the measurement of context and culturally specific forms of sexuality-based stigma that may be specific to GBMSM living in resource poor settings.

With an increasing body of research focused on the HIV risk behaviors, prevention needs, and HIV care experiences of GBMSM in resource-poor settings, it is vital that measures of sexuality-based stigma—often central to these studies—are appropriately tailored to the study location via the incorporation of cultural, environmental, and structural variables that accurately reflect the lived experiences of GBMSM in these settings. The current study conducts a review of how the relationship between sexuality-based stigma and HIV risk among GBMSM is studied in resource-poor settings. The goals of this review are (1) to identify the differences in sexuality-based stigma measurements used and (2) to make recommendations for the measurement of

sexuality-based stigma among GBMSM living in resource-poor settings.

## Methods

The objectives, inclusion criteria, and methods for this review were determined in advance and documented in a brief protocol, according to scoping review methodology [18]. The process was guided by Arksey and O’Mailey [19], in which (1) a research question was identified, (2) relevant studies were identified, (3) a search strategy was developed, (4) relevant studies were reviewed and selected, (5) data was charted, and (6) results were collated, summarized, and reported.

### Identifying a Research Question

Before establishing the research question, the review’s objective was determined: to identify (1) the types of sexuality-based stigma measurements and (2) sexuality-based stigma prevalence among GBMSM living in resource-poor settings. This objective was then used to formulate the research question: “*What types of quantitative measures of sexuality-based stigma have been used to record stigma prevalence among GBMSM in low-income-, middle-income-, and upper-middle-income countries?*” Low-income, middle-income, and upper-middle-income countries, condensed to “resource-poor settings” in this review, are defined based on the World Bank’s classifications [20].

### Identifying Relevant Studies

A search strategy was developed to include all relevant articles that fit within the review’s objective and research question [18].

### Developing a Search Strategy

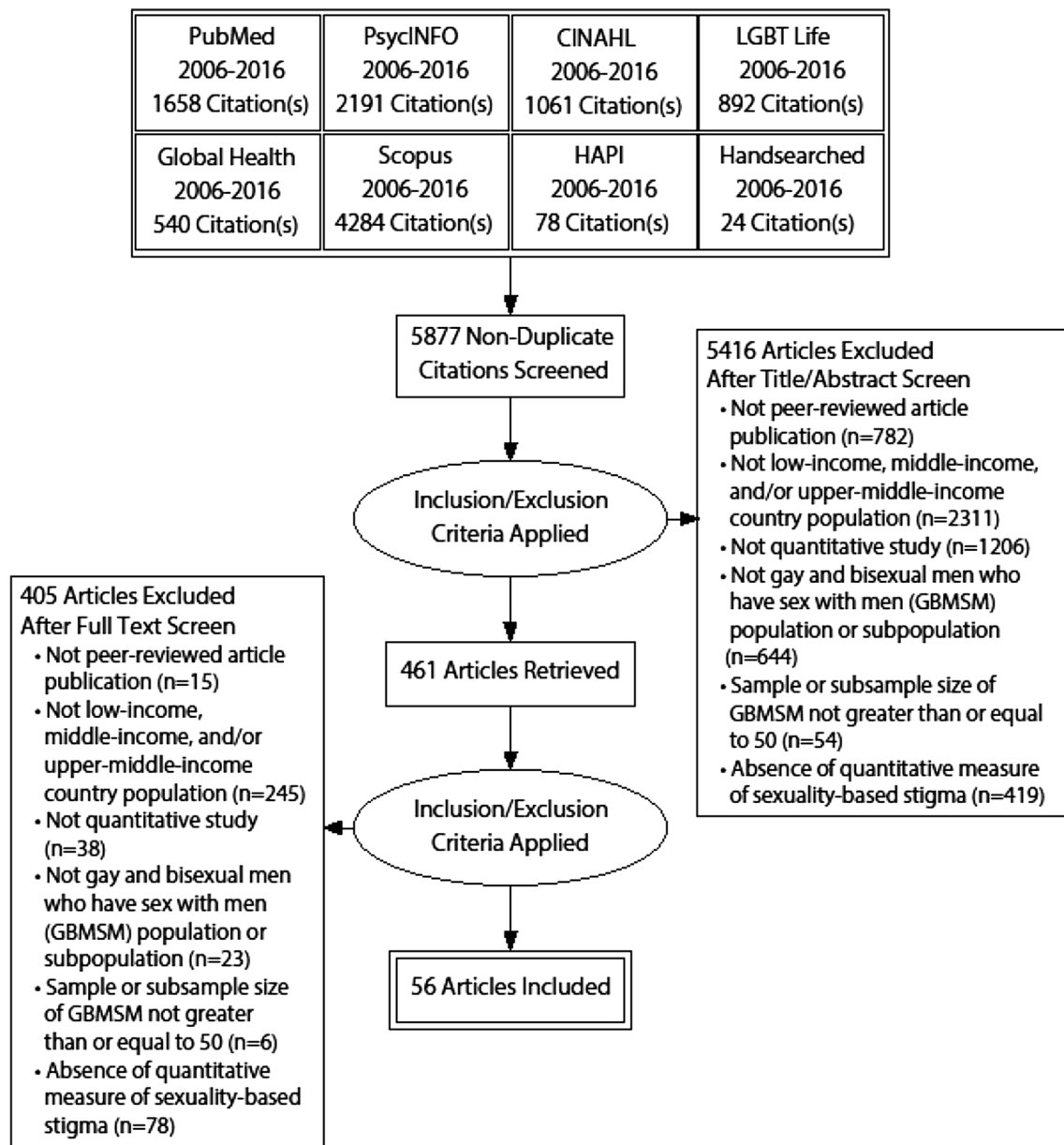
The review team worked with an informationist from Taubman Health Sciences Library at the University of Michigan to develop a basic search strategy in PubMed with the following core concepts: “men who have sex with men,” “stigma,” and “measures.” Search terms specific to “low-income countries” or “resource-poor settings” were not included in the basic search strategy, as the team aimed to capture every article that studied sexuality-based stigma among GBMSM in low-income countries, which may not be captured within a general search. After reviewing relevant titles and abstracts from the initial set of results, the team identified additionally controlled vocabulary and search terms. The informationist revised the PubMed search strategy and translated it for six additional databases: CINAHL,

PsycINFO, LGBT Life, Global Health, Health and Psychosocial Instruments, and Scopus. Each new search strategy was reviewed by the team and revised as appropriate terms were discovered from the additional databases. A final set of searches were run by the informationist using the publication date range limit of January 1, 2006 through May 19, 2016 and the English-language limit. Within the protocol, it was decided not to include grey literature in this review, and when available, appropriate filters were applied to eliminate irrelevant articles within each search. The informationist exported the final set of citations into a shared RefWorks account. The combined database searches yielded 10,728

citations, of which 4851 duplicate citations were removed prior to the review. The title and abstract review examined 5877 citations. A flowchart of the study selection process is provided (Fig. 1). A full description of the search strategy, including databases and used search terms, are listed in the [Appendix](#).

### Study Review and Selection

The 5877 citations were divided between two investigators for title and abstract review. An initial review of ten articles' title and abstracts were reviewed by two investigators (RF



**Fig. 1** Inclusion/exclusion criteria for review, with number of articles not meeting criteria

and ER) to ensure articles were chosen correctly without bias or error. All of the included citations had their titles and abstracts reviewed. The title and abstract review used the following inclusion criteria: peer-reviewed article publication, low-middle, middle-income, and/or upper-middle-income population, quantitative study, population or subpopulation of GBMSM, sample or subsample size of GBMSM greater than or equal to 50, and quantitative measure(s) of sexuality-based stigma. After reviewing the title and abstracts of the 5877 citations, 461 articles were included in full-text review. The 461 articles were randomly divided again between the two investigators to limit bias. A second initial review of ten articles' full text was reviewed by both investigators to ensure articles were chosen correctly without bias or error. The same inclusion criteria for the title and abstract review were reapplied to the full-text review. The full-text review excluded an additional 405 articles, resulting in 56 articles. A detailed summary of the final 56 articles is provided in Table 1.

### Charting the Data

A table was generated through an electronically shared spreadsheet, safely secured online. The spreadsheet contained the following information: first author, publication year, study location, population type, sample size, brief description of article's methodology, brief description of sample recruitment, study period, type of stigma measure (i.e., internalized, enacted, perceived), scale validation information, and stigma prevalence. Many of the articles also provided linked outcomes to their stigma measurements, which are identified in Table 2.

### Collating, Summarizing, and Reporting the Results

After all of the article's data were extracted, the research team divided the stigma measures into the three main areas of stigma, as presented by previous sexuality-based stigma conceptualizations [21]: internalized stigma, perceived stigma, and enacted stigma. This classification of the results provided a stronger understanding of how measuring stigma among GBMSM varies across resource-poor settings.

### Results

After reviewing the 5877 non-duplicate articles, 56 articles fit each inclusion criteria and were analyzed (Table 1).

### Methods of Included Articles

The 56 articles included 32 low-income, middle-income, and upper-middle-income countries. Frequencies of the

32 resource-poor settings studied across the 56 articles are listed: Angola (n = 2), Belarus (n = 2), Bosnia & Herzegovina (n = 2), Botswana (n = 2), Brazil (n = 4), Bulgaria (n = 2), China (n = 9), Côte d'Ivoire, El Salvador, Gambia, India (n = 4), Kenya (n = 3), Lebanon, Lesotho (n = 3), Macedonia (n = 2), Malawi (n = 3), Malaysia, Mexico, Moldova (n = 2), Namibia (n = 2), Nigeria (n = 3), Romania (n = 2), Russia (n = 2), Serbia (n = 2), South Africa (n = 11), Swaziland (n = 2), Tanzania, Thailand, Turkey (n = 3), Uganda (n = 2), Ukraine (n = 2), and Vietnam (n = 4). Some of the listed countries were in more than one of the 56 articles and some articles measured sexuality-based stigma in more than one country; hence, the country sample size is greater than the 56 articles included in this review.

### Study Design

Cross-sectional study designs were most common across the 56 articles (n = 53). One study consisted of a longitudinal design [22], one study consisted of a cohort study design [23], and one study employed a mixed methods study design (cross-sectional and in-depth-interviews) [24].

### Recruitment

A variety of recruitment methods were used among the 56 articles: respondent-driven sampling (n = 24), chain-link referral/snowball sampling (n = 8), online sampling (n = 8); time-space sampling (n = 2); outreach (e.g., community, peer, LGBT centers, etc.; n = 4), or multiple methods of recruitment (n = 8). One study used an ongoing cohort for their study [25].

### Data Collection

The majority of articles collected their data via face-to-face, semi-structured interviews or questionnaires administered by trained interviewers (n = 30). The remaining articles collected data via online surveys (n = 9), computer-assisted surveys (n = 9), and individually-performed questionnaires (n = 7). One study used multiple forms of data collection (i.e., community surveys, postage mail surveys, online survey) [26].

### Sample Characteristics

The majority of studies (n = 47) categorized their sample population as *men who have sex with men* or "MSM." Other studies used gay and/or bisexual and/or homosexual men (n = 8), while one study used sexual minority men [27] as labels for their "MSM" population. Sample sizes ranged from N = 51 [28] to N = 144,17,7 [29, 30].

**Table 1** Description of final (n = 56) included articles for review

First author (year)	Study location	Population (N <sup>a</sup> )	Stigma measure(s)	Source(s) of measure(s)	Reliability ( $\alpha$ )	Prevalence (% or mean, SD or median, IQR)	Range <sup>b</sup>
Adebajo et al. [31]	Nigeria	MSM (1125)	Internalized homophobia (11 items; 3-point Likert)	Not specified	0.79	16.6–74.4%	
Aho et al. [24]	Côte d'Ivoire	MSM (601)	Self-perceived history of stigma related to being an MSM (4 survey questions)	Not specified	Not specified	6.3–38.5%	
Anderson et al. [32]	Tanzania	MSM (200)	Internalized homophobia (8 items; 6-point Likert)	Smolenski et al. [72], Smolenski et al. [63]	Not specified	Not specified	
Andrinopoulos et al. [5]	El Salvador	MSM (506) and Transgender Women	1. Experienced discrimination because of sexual orientation/behavior 2. Experienced discrimination within the healthcare setting because of sexual orientation/behavior (5 items; 4-point Likert) 3. Internalized homophobia (23 items; 4-point Likert)	1. Not specified 2. Not specified 3. Mayfield [69]	1. Not specified 2. 0.89 3. 0.90	1. 21.7% 2. 41.0% 3. Not specified	
Arnold et al. [6]	South Africa	MSM (377)	1. Internalized homophobia (5 items; 6-point Likert) 2. Experiences of homonegativity (11 items, originally 15 items; 4-point frequency)	(Diaz et al., 2004)	1. 0.85 2. 0.81	1. 0.37, 0.32 2. 0.15, 0.15	0–1
Baral et al. [73]	Lesotho	MSM (252)	Human rights abuse related to sexuality (9 survey questions)	Not specified	Not specified	3.2–59.8%	

**Table 1** (continued)

First author (year)	Study location	Population (N <sup>a</sup> )	Stigma measure(s)	Source(s) of measure(s)	Reliability ( $\alpha$ )	Prevalence (% or mean, or mean, SD or median, IQR)	Range <sup>b</sup>
Berg et al. [29]	N = 38 countries; n = 10 resource-poor settings Bosnia & Herzegovina; Bulgaria; Belarus; Moldova; Macadonia; Romania; Russia, Serbia; Turkey, Ukraine	MSM (Bosnia and Herzegovina = 105 Bulgaria = 777 Belarus = 299 Moldova = 88 Macadonia = 90 Romania = 1644 Russia = 4080 Serbia = 842 Turkey = 1358 Ukraine = 1344)	Internalized homophobia (7 items; 7-point Likert)	Ross and Rosser [71], Smolenski et al. [72]	0.76	Bosnia and Herzegovina = 2.560 Bulgaria=2.579 Belarus = 2.262 Moldova = 2.497 Macadonia = 2.243 Romania = 2.216 Russia = 2.067 Serbia = 2.246 Turkey = 2.392 Ukraine = 2.184	0–6
Brown et al. [33]	Australia and Malaysia	Gay men (Malaysia = 234)	Internalized homophobia (23 items, 5-point Likert)	Mayfield [69]	0.80–0.91	0.95, 0.7–2.04, 0.9	1–5
Chard et al. [34]	N = 7 countries; n = 3 resource-poor settings: Brazil, South Africa, Thailand	Gay and bisexual men (Brazil = 466 South Africa = 470 Thailand = 282)	1. External homophobic discrimination (11 survey questions) 2. Internalized homophobia (20 items; 5-point Likert)	1. Diaz et al. [79] 2. Brady and Busse [51]	Not specified	1. Brazil = 6, 3 South Africa = 6, 3 Thailand = 4, 3 2. Brazil = 15, 16 South Africa = 11, 14 Thailand = 29, 18 23%	1. 0–11 2. 0–80
Choi et al. [7]	China	MSM (477)	Experiences of homophobia (6 items; 4-point frequency)	Diaz et al. [79]	0.69		
Choi et al. [22]	China	MSM (455)	1. Internalized MSM stigma (15 items; 6-point Likert) 2. Anticipated MSM stigma (18 items; 6-point Likert)	1. Steward et al. [64] 2. Wolfe et al. [94]	1. 0.84 2. 0.92	1. 2.16, 0.79 2. 2.78, 1.05	1–6
Cook et al. [26]	South Africa	Gay and bisexual men (353)	1. School discrimination, due to sexual orientation (3-point Likert) 2. Discrimination in general, due to sexual orientation (4-point Likert)	Not specified	1. 0.73 2. 0.77	1. Nonconforming men: 2.30, 0.88 Conforming men: 1.85, 0.81 2. Nonconforming men: 1.19, 0.34 Conforming men: 1.15, 0.38	1. 1–3 2. 1–4



Table 1 (continued)

First author (year)	Study location	Population (N <sup>a</sup> )	Stigma measure(s)	Source(s) of measure(s)	Reliability ( $\alpha$ )	Prevalence (% or mean, SD or median, IQR)	Range <sup>b</sup>
Dunn [27]	Brazil	Sexual minority men (388)	1. Enacted stigma (5 items; 4-point Likert) 2. Internalized homophobia (6 items, originally 7 items; 7-point Likert)	1. Herek (2008) 2. (Smolenski et al. [72], Ross and Rosser [71])	1. 0.66 2. 0.67	1. 0.62, 0.56 2. 2.41, 1.13	1. 0–3 2. 1–7
Fay et al. [17]	Malawi, Namibia, Botswana	MSM (Malawi = 202, Namibia = 218, Botswana = 117)	Experienced stigma on basis of sexuality (2 items)	Not specified	Not specified	Malawi = 19.1% Botswana = 27.4% Namibia = 24.7%	
Finneran et al. [35]	N = 6 countries; n = 2 resource-poor settings: South Africa, Brazil	MSM (South Africa = 451, Brazil = 443)	1. Internalized homophobia (20 items) 2. Experiences of homophobic discrimination (11 items)	1. (Williamson et al., 2008) 2. Diaz et al. [79]	Not specified	1. South Africa = 13.00 Brazil = 16.97 2. South Africa = 5.91 Brazil = 5.68	1. 0–80 2. 0–11
Gençöz et al. [36]	Turkey	Homosexual or Bisexual men (132)	Internalized homophobia (10 items, originally 9 items; 5-point Likert)	Herek et al. [57], APA (1980)	0.82	16.94, 6.71	10–39
Guo et al. [46]	China	Migrant MSM (307)	1. Perception of homosexuality-related stigma (10 items; 4-point Likert) 2. Internalized stigma of homosexuality (8 items; 4-point Likert)	Not specified	1. 0.93 2. 0.85	1. 2.54, 0.61 2. 2.47, 0.54	1–4
Ha et al. [8]	Vietnam	MSM (451)	1. Enacted stigma (8 items; 4-point Likert) 2. Perceived stigma (11 items; 4-point Likert) 3. Internalized stigma (7 items; 4-point Likert)	Liu et al. [48], Neilands et al. [60], Ha et al. [50]	1. 0.82 2. 0.82 3. 0.79	1. 3.8, 6.1 2. 25.1, 5.4 3. 17.5, 4	Not specified
Ha et al. [50]	Vietnam	MSM (451)	1. Enacted homosexual stigma (9 items, originally 6 items; 4-point Likert) 2. Perceived homosexual stigma (11 items; 4-point Likert) 3. Internalized homosexual stigma (8 items, originally 7 items; 4-point Likert)	1. Neilands et al. [60], Diaz et al. [79] 2. & 3. Liu et al. [48], Bruce (2006)	1. 0.75 2. 0.85 3. 0.78	1. 1.59, 0.43 2. 2.28, 0.49 3. 2.19, 0.51	1–4

**Table 1** (continued)

First author (year)	Study location	Population (N <sup>a</sup> )	Stigma measure(s)	Source(s) of measure(s)	Reliability ( $\alpha$ )	Prevalence (% or mean, or mean, SD or median, IQR)	Range <sup>b</sup>
Ha et al. [47]	Vietnam	MSM (451)	1. Enacted homosexual stigma (8 items; 4-point frequency) 2. Perceived homosexual stigma (11 items; 4-point Likert) 3. Self-homosexual stigma (7 items; 4-point Likert)	1. Diaz et al. [79] 2. & 3. (Bruce, 2006, Liu et al. [48])	Not specified	1. 4.7–20.4% 2. 27.5–83.6% 3. 56.1–81.6%	
Harper et al. [9]	Kenya	Gay and bisexual MSM (511)	1. Internalized homonegativity (3 items; 6-point Likert) 2. Experiences of sexual orientation-based discrimination (19 items)	1. Mohr and Kendra [59] 2. Herek and Berrill [78]	1. 0.776 2. Not specified	1. 8.32, 3.58 2. 3.15, 4.98	Not specified
Kendall et al. [80]	Angola	MSM (351)	Homophobia, discrimination, and violence (4 survey questions)	Not specified	Not specified	13.7–46.2%	
Knox et al. [37]	South Africa	MSM (300)	1. Internalized homophobia 2. Sexual orientation-based discrimination over (a) lifetime and (b) past-year	1. Mohr and Fassinger [70], D'Augelli et al. [52] 2. Not specified	Not specified	1. 2.3, 1.1 2. (a) 0.3, 0.5 (b) 0.8, 0.8	Not specified
Liu et al. [48]	China	MSM (351)	1. Public homosexual stigma (10 items) 2. Self-homosexual stigma (8 items)	Preston [61], Bruce (2006)	1. 0.85 2. 0.78	1. 2.56, 0.39 2. 2.66, 0.35	1–4
Liu et al. [49]	China	Homosexual men (351)	1. Public homosexual stigma (10 items) 2. Self-homosexual stigma (8 items)	Liu et al. [48]	1. 0.85 2. 0.78	1. 2.50, 0.35 2. 2.66, 0.35	Not specified
Logie et al. [95]	India	MSM (200)	Sexual stigma (enacted and perceived)	Neilands et al. [60], Diaz et al. [79]	0.83	Not specified	Not specified



Table 1 (continued)

First author (year)	Study location	Population (N <sup>a</sup> )	Stigma measure(s)	Source(s) of measure(s)	Reliability ( $\alpha$ )	Prevalence (% or mean, or mean, SD or median, IQR)	Range <sup>b</sup>
Maroky et al. [28]	India	Homosexual men (51)	1. Comfort regarding one's homosexuality (26 items; 7-point Likert) 2. Internalized homophobia (15 items; 4-point frequency) 3. Stigma scale (15 items; 4-point frequency)	1. Not specified 2. Ross and Rosser [71] 3. Neilands et al. [60]	Not specified	1. 8.5, 2.2 2. & 3. Not specified	1–10
Mason et al. [81]	Gambia	MSM (207)	1. Perceived stigma based on sexual orientation (8 items) 2. Enacted stigma based on sexual orientation (12 items)	Not specified	Not specified	1. 3.9–36.8% 2. 1.0–25.5%	
Neilands et al. [60]	China	MSM (477)	1. Perceived stigma (3 items) 2. Enacted stigma (6 items)	Diaz et al. [79]	0.75	1. 58–89% 2. 1–16%	
Newman et al. [82]	India	MSM (200)	Sexual-orientation based harassment (1 item)	Not specified	Not specified	35%	
Pitpitian et al. [38]	Mexico	MSM (191)	Internalized homophobia (9 items; 5-point Likert)	Herek and Glunt 1995, Meyer and Dean [52]	Not specified	19.04, 0.45	9–36
Pyun et al. [39]	China	MSM (318)	1. Sexuality-based stigma (5 items; 4-point Likert) 2. Internalized homophobia (7 items; 4-point Likert)	1. Kessler et al. [93] 2. Rosenberg [54], Herek and Glunt (1995)	1. 0.85 2. 0.79	1. 2.7, 0.7 2. 2.0, 0.7	1–4
Risher et al. [83]	Swaziland	MSM (323)	1. Enacted stigma (4 items, dichotomous) 2. Perceived stigma (3 items; dichotomous)	Not specified	Not specified	1. 46.1% 2. 76.2%	

**Table 1** (continued)

First author (year)	Study location	Population (N <sup>a</sup> )	Stigma measure(s)	Source(s) of measure(s)	Reliability ( $\alpha$ )	Prevalence (% or mean, SD or median, IQR)	Range <sup>b</sup>
Ross et al. [30]	N = 38 countries; n = 10 resource-poor settings: Bosnia and Herzegovina, Bulgaria, Belarus, Moldova, Macedonia, Romania, Serbia, Russia, Turkey, and Ukraine	MSM (Bosnia and Herzegovina = 105, Bulgaria = 777, Belarus = 299, Moldova = 88, Macedonia = 90, Romania = 1644, Serbia = 842, Russia = 4080, Turkey = 1358, Ukraine = 1344)	Internalized homophobia (7 items; 7-point Likert)	Ross et al. [40, 62], Smolenski et al. [72]	0.70	Bosnia and Herzegovina = 2.56 Bulgaria = 2.58 Belarus = 2.26 Moldova = 2.50 Macedonia = 2.24 Romania = 2.22 Serbia = 2.25 Russia = 2.07 Turkey = 2.39 Ukraine = 2.18	0–6
Ross et al. [41]	Uganda	Gay and bisexual men (216)	Internalized homophobia (7 items; 7-point Likert)	Ross and Rosser [71], Smolenski et al. [72], Kajubi et al. [58]	Not specified	Not specified	Not specified
Ross et al. [40, 62]	Uganda	Gay and bisexual men (216)	Internalized homophobia (7 items, originally 8 items; 6-point Likert)	Ross and Rosser [71], Smolenski et al. [72]	Not specified	Not specified	Not specified
Sabido et al. [92]	Brazil	MSM (3859)	Perceived discrimination due to sexual orientation in the last year	Not specified	Not specified	27.2%	27.2%
Sandfort et al. [42]	South Africa	MSM (480)	1. Sexual identity confusion (4 item scale) 2. Internalized homophobia (7 item scale)	Mohr and Fassinger [53], Mohr and Fassinger [70]	1. 0.892 2. 0.849	Not specified	Not specified
Sandfort et al. [43]	South Africa	MSM (196)	1. Discrimination while growing up (4 items; 4-point frequency) 2. Discrimination in past year (11 items) 3. Sexual identity confusion (4 items; 6-point Likert) 4. Internalized homophobia (10 items; 6-point Likert)	1. Diaz et al. [79] 2. Herek and Berrill [78] 3. & 4. Mohr and Fassinger [70]	1. 0.79 2. Not specified 3. 0.89 4. 0.72	1. 2.01, 0.81 2. 2.15, 2.26 3. 1.87, 1.30 4. 2.48, 1.12	1. 1–4 2. 0–9 3. 1–6 4. 1–6
Schwartz et al. [23]	Nigeria	MSM (707)	Pre-law and post law reports of stigma and discrimination because of MSM-status (5 items)	Not specified	Not specified	$\cong$ 20% to $\cong$ 50% <sup>c</sup>	$\cong$ 20% to $\cong$ 50% <sup>c</sup>

Table 1 (continued)

First author (year)	Study location	Population (N <sup>a</sup> )	Stigma measure(s)	Source(s) of measure(s)	Reliability ( $\alpha$ )	Prevalence (% or mean, or mean, SD or median, IQR)	Range <sup>b</sup>
Secor et al. [25]	Kenya	MSM (112)	Sexual stigma (enacted and perceived) (11 items)	Logie et al. [95]	0.85	11, 6–17	0–33
Sekoni et al. [84]	Nigeria	MSM (291)	Human rights abuses and experiences of gender-based violence	Not specified	Not specified	35.7%	
Shangani et al. [45]	Kenya	MSM (89)	1. Social stigma (12 items; 4-point frequency) 2. Self-stigma (7 items; 4-point Likert)	Not specified	1. 0.90 2. 0.78	1. 8.22, 1.67 2. 6.14, 0.36	1. 0–36 2. 0–21
Song et al. [91]	China	Migrant MSM (307)	Homosexuality-related public stigma (10 items; 4-point Likert)	Liu et al. [48]	0.93	25.4, 6.1	Not specified
Stahlman et al. [96]	Lesotho Swaziland	MSM (Lesotho = 530 Swaziland = 322)	1. Social stigma (10 items; dichotomous) 2. Health care stigma (3 items; dichotomous)	Wirtz et al. [97], Baral et al. [73], Baral et al. [98], Fay et al. [17]	Not specified	Lesotho 1. $\cong$ 3.396% to $\cong$ 77.925% <sup>c</sup> 2. $\cong$ 3.585% to $\cong$ 11.887% <sup>c</sup> Swaziland: 1. $\cong$ 25.155% to $\cong$ 62.112% <sup>c</sup> 2. $\cong$ 16.770% to $\cong$ 54.969% <sup>c</sup>	
Stahlman et al. [99]	Lesotho	MSM (530)	1. Social stigma (9 items; 5-point Likert) 2. Health care stigma (4 items; 5-point Likert)	Wirtz et al. [97], Baral et al. [73], Fay et al. [17], Baral et al. [98]	Not specified	Not specified	
Stephenson et al. [85]	South Africa	MSM (521)	Experience of homophobia (13 items)	Not specified	Not specified	Not specified	
Thomas et al. [88]	India	MSM (210)	Experiences of MSM-related stigma/discrimination (11 items; 4-point Likert)	Lewis et al. [75, 76]	0.99	12, 2.0	11–19
Tucker et al. [101]	South Africa	MSM (316)	Homophobic stigma (5 items; originally 9 items)	Neilands et al. [60]	0.82	Not specified	Not specified
Tun et al. [86]	Brazil	MSM (658)	Homophobic discrimination (3 items)	Not specified	Not specified	Not specified	Not specified

**Table 1** (continued)

First author (year)	Study location	Population (N <sup>a</sup> )	Stigma measure(s)	Source(s) of measure(s)	Reliability ( $\alpha$ )	Prevalence (% or mean, SD or median, IQR)	Range <sup>b</sup>
Yu et al. [44]	South Africa	MSM (324)	Internalized homophobia (9 items; 4-point Likert)	APA 1980)	0.84	7.5–35.0%	
Yu et al. [90]	Vietnam	MSM (622)	1. Enacted homosexuality-related stigma (8 items; 4-point Likert) 2. Perceived homosexual stigma (10 items; 4-point Likert) 3. Self-stigma (8 items; 4-point Likert)	Ha et al. [50]	0.74	1. 1.3, 0.4 2. 3.5, 0.8 3. 3.1, 0.8	Not specified
Wagner et al. [100]	Lebanon	MSM (213)	Experienced gay-related discrimination (5 items)	Bogart et al. [77]	Not specified	Not specified	
Wei et al. [89]	China	MSM (523)	Experiences of homophobia (9 items; dichotomous)	Diaz et al. [79]	0.766	$\cong$ 98.27% <sup>c</sup>	
Wirtz et al. [97]	Malawi	MSM (338)	Human rights measures (5 items)	Not specified	Not specified	20.1% - 66.8%	
Zahn et al. [87]	South Africa Botswana Namibia Malawi	MSM (South Africa = 200 Botswana = 117 Namibia = 218 Malawi = 202)	Human rights abuse due to sexuality	Not specified	Not specified	South Africa: 41.71% Botswana: 58.62% Namibia: 52.13% Malawi: 39.00%	

<sup>a</sup>N signifies MSM residing in resource-poor settings only

<sup>b</sup>Only applicable to prevalence of sexuality-based stigma reported as a mean, SD, or IQR

<sup>c</sup>Prevalence was estimated by analysts from table data within the article

**Table 2** Summary of stigma measures with linked outcomes in (n = 36) included articles for review

First author (year)	Study location	Stigma measure (s)	Linked outcome (s)
Anderson et al. [32]	Tanzania	Internalized homophobia	Violence
Andrinopoulos et al. [5]	El Salvador	1. Experienced discrimination because of sexual orientation 2. Experienced discrimination within the healthcare setting due to MSM status 3. Internalized homophobia	Having ever tested for HIV
Arnold et al. [6]	South Africa	1. Internalized homophobia 2. Experiences of homonegativity	Unprotected anal intercourse
Choi et al. [7]	China	Experiences of homophobia	1. Unprotected anal intercourse with men and having concurrent male sex partners as mediator 2. Unprotected anal or vaginal intercourse with men and women and having concurrent male and female sex partners as mediator
Choi et al. [22]	China	1. Internalized MSM stigma 2. Anticipated MSM stigma	Pearson correlation matrix 1. Internalized MSM stigma at baseline 2. Anticipated MSM stigma at baseline 3. Avoidant coping at 6 months 4. Social support coping at 6 months 5. Depressive symptoms at 12 months 6. Anxiety at 12 months
Cook et al. [26]	South Africa	1. School discrimination, due to sexual orientation 2. Discrimination in general, due to sexual orientation	Pearson correlation matrix 1. Gender nonconformity 2. Depression 3. School discrimination, due to sexual orientation 4. Discrimination in general, due to sexual orientation 5. Gay community involvement 6. Outness
Dunn et al. [27]	Brazil	1. Enacted stigma 2. Internalized homophobia	Bivariate correlation 1. Age 2. Race/Ethnicity 3. Education 4. Region 5. Enacted Stigma 6. Internalized homonegativity 7. Concealment 8. Resilience 9. Depressive symptomatology
Finneran et al. [35]	N = 6 countries; n = 2 resource-poor settings: South Africa, Brazil	1. Internalized homophobia 2. Experienced homophobic discrimination 3. Experienced heteronormative social pressure	1. Experience of physical violence 2. Experience of sexual violence 3. Perpetration of physical violence 4. Perpetration of sexual violence
Gençöz et al. [36]	Turkey	Internalized homophobia	Correlation 1. Psychological problem as assessed by total score of brief symptom inventory 2. Depression 3. Anxiety 4. Self-esteem 5. Hostility
Guo et al. [46]	China	1. Perception of homosexuality-related stigma 2. Internalized stigma of homosexuality	Openness to 1. Family 2. Friends 3. Coworkers 4. Doctors

**Table 2** (continued)

First author (year)	Study location	Stigma measure (s)	Linked outcome (s)
Ha et al. [8]	Vietnam	1. Enacted stigma 2. Perceived stigma 3. Internalized stigma	Levels (no, low, moderate, high) of sexual risk
Harper et al. [9]	Kenya	1. Identity uncertainty 2. Internalized homonegativity 3. Experiences of sexual orientation-based discrimination	Hierarchical linear regression models 1. Depression/Anxiety 2. Self-Esteem 3. Condom Use 4. HIV testing
Knox et al. [37]	South Africa	1. Internalized homophobia 2. Sexual Orientation-Based Discrimination; (a) lifetime and (b) past-year	1. Having never tested for HIV 2. Having ever tested for HIV 3. Having tested once for HIV 4. Having tested >once for HIV 5. Having tested >1 year ago for HIV 6. Having tested for HIV in the past year Regression models 1. Ever tested vs. never tested 2. Tested multiple times vs. tested once 3. Tested in the past year vs. tested over a year ago
Logie et al. [95]	India	Sexual stigma (enacted and perceived)	Depression
Liu et al. [49]	China	1. Public homosexual stigma 2. Self-homosexual stigma	Correlations 1. Vertical collectivism 2. Horizontal collectivism 3. Vertical individualism 4. Horizontal individualism 5. Public homosexual stigma 6. Self homosexual stigma 7. HIV stigma 8. Perceived social support from non-sexual-partner peers 9. Perceived social support from sexual partners
Maroky et al. [28]	India	1. Comfort regarding one's homosexuality 2. Internalized homophobia 3. Perceived stigma 4. Stigma scale	Pearson Correlation “between the degree of discomfort with their sexuality and measures of acceptance, discrimination, awareness of non-heteronormative lifestyles, and trait affect”
Mason et al. [81]	Gambia	1. Perceived stigma based on sexual orientation 2. Enacted stigma based on sexual orientation	1. Outness to family member 2. Disclosure of sexual orientation to healthcare worker
Newman et al. [82]	India	Sexual-orientation based harassment	Percentage paid for sex in past 3 months
Pitpitan et al. [38]	Mexico	Internalized homophobia	Bivariate associations 1. Lifetime drug use 2. Sexual compulsivity 3. Depression 4. Lifetime abuse
Pyun et al. [39]	China	1. Sexuality-based stigma 2. Internalized homophobia	HIV testing
Risher et al. [83]	Swaziland	1. Enacted stigma 2. Perceived stigma	Fear of seeking healthcare due to sexual orientation or practice
Sabido et al. [92]	Brazil	Perceived discrimination due to sexual orientation in the last year	1. Non sexual violence experience 2. Sexual violence experience
Sandfort et al. [42]	South Africa	1. Sexual identity confusion 2. Internalized homophobia	Mean scores of both scales were compared among those who were HIV negative those who were HIV positive.

**Table 2** (continued)

First author (year)	Study location	Stigma measure (s)	Linked outcome (s)
Sandfort et al. [43]	South Africa	1. Discrimination while growing up 2. Discrimination in past year 3. Sexual Identity Confusion 4. Internalized homophobia	Pearson correlation 1. Gender nonconformity 2. Sexual identity confusion 3. Internalized homophobia 4. Discrimination growing up 5. Discrimination past year 6. Openness 7. Social support 8. Gay community identification 9. Depression 10. Anxiety
Secor et al. [25]	Kenya	Sexual stigma	Correlation 1. Alcohol abuse 2. Other substance abuse 3. Sexual stigma 4. HIV stigma 5. Social support 6. Childhood abuse 7. Recent abuse 8. HIV status 9. Depressive symptoms
Shangani et al. [45]	Kenya	1. Social stigma 2. Self-stigma	1. Ever HIV tested 2. Not HIV tested 3. HIV testing in the past 12 months
Song et al. [91]	China	Homosexuality-related public stigma	1. HIV tested 2. HIV not tested
Stahlman et al. [96]	Lesotho Swaziland	1. Social stigma 2. Health care stigma	Meeting sex partners online
Stahlman et al. [99]	Lesotho	1. Social stigma 2. Health care stigma	1. Unprotected anal sex with depression as a mediator 2. Any self-reported STI with and without depression as a mediator 3. Syphilis Positive with and without depression as a mediator 4. HIV Positive with and without depression as a mediator
Stephenson et al. [85]	South Africa	Experienced homophobia	Regression models 1. Reporting experience of physical IPV 2. Reporting experience of sexual IPV 3. Reporting perpetration of physical IPV 4. Reporting recent unprotected anal sex
Tucker et al. [101]	South Africa	Homophobic discrimination	Structural equation models were formed to show relationships between homophobia, depression, self-efficacy and UAI
Tun et al. [86]	Brazil	Homophobic Discrimination	1. MSM who sold sex 2. MSM who did not sell sex
Vu et al. [90]	Vietnam	1. Enacted homosexuality-related stigma 2. Perceived homosexual stigma 3. Self-stigma	Methamphetamine use among MSM
Wagner et al. [100]	Lebanon	Experienced gay-related discrimination	Bivariate and multivariate correlations 1. Any unprotected anal intercourse 2. Any unprotected anal intercourse [with HIV-positive partners or partners of unknown HIV status] 3. Ever been tested for HIV
Wei et al. [89]	China	Experienced gay-related discrimination	1. No (HIV testing in the past year) 2. Yes (HIV testing in the past year)



**Table 2** (continued)

First author (year)	Study location	Stigma measure (s)	Linked outcome (s)
Wirtz et al. [97]	Malawi	Human rights measures	1. HIV positive 2. HIV negative

**Stigma Measures** The sexuality-based stigma measures of the final 56 articles were categorized into three conceptualized forms of stigma: *internalized stigma*, *enacted stigma*, and *perceived stigma*. An additional category, *combined measures of sexuality-based stigma*, was included in the results, as several articles ( $n = 6$ ) measured stigma and reported the prevalence as a combination of both enacted and perceived measures of sexuality-based stigma:

### Internalized Stigma

The majority of articles ( $n = 30$ ) measured a form of internalized stigma. Internalized stigma was measured under a variety of titles, such as: “internalized homophobia” [5, 6, 27–44], “self-stigma” [45], “internalized stigma of homosexuality” [46], “sexual identity confusion” [42], “comfort regarding one’s homosexuality” [28], “self-homosexual stigma” [47–49], “internalized homosexual stigma” [50], “internalized MSM stigma” [22], and “internalized homonegativity” [9]. Across the 30 articles, 16 different measures were used to measure internalized stigma [50–65]. Further, eight of the 16 different measures were used by multiple articles included in the review [48, 66–72]. Among the 30 articles measuring internalized stigma, three articles used more than one measure to investigate internalized stigma across their sample [28, 42, 43]. There were three studies that reported measures of internalized stigma, but did not indicate the specific measure used to report the results [31, 45, 46].

### Methods

Of the 30 articles that measured internalized stigma, 29 used multiple item scales, which ranged in length from 3-items to 26-items. Maroky et al. [28], an article that used more than one measure to investigate internalized stigma, also used a single item to assess the level of a participant’s internalized stigma [28]. One article did not specify the number of items used to evaluate internalized stigma [37]. Likert scales, ranging from 3 points to 7 points, were the most common responses used to evaluate internalized stigma across the 29 articles using multiple item scales to measure internalized stigma. One article used a visual scale (“Visual Analog Scale”), ranging from 0 to 10, to evaluate internalized stigma [28]. Across the 29 articles using a multiple item scale, six articles did not report a response item format to measure internalized stigma [28, 35, 37, 42, 48, 49]. Reliability

(Cronbach’s  $\alpha$ ) of the internalized stigma measures was reported by 21 articles, ranging from 0.70 [41] to 0.91 [33].

### Prevalence

Across the 30 articles that measured internalized stigma, 24 articles reported a prevalence of internalized stigma among their sample. Prevalence of internalized homophobia was reported as percentages ( $n = 3$ ), mean scores on a stigma scale ( $n = 21$ ), or a median score on a stigma scale ( $n = 1$ ). The percentage of MSM who reported internalized homophobia among the 24 articles ranged from 7.5% (South Africa) [44] to 81.6% (Vietnam) [47]. The mean score of internalized stigma on a scale ranged from 0.37 (South Africa; SD: 0.32; Range: 0–1) [6] to 19.04 (Mexico; SD: 0.45; Range: 9–36) [38]. All 21 articles reporting prevalence of internalized stigma as a mean score on a stigma scale stated that higher scores on the scale indicated higher levels of internalized stigma. The median score of internalized stigma on a scale ranged from 11 (Brazil, South Africa, Thailand; IQR: 14; Range: 0–80) [34] to 29 (Brazil, South Africa, Thailand; IQR: 18; Range: 0–80) [34].

### Enacted Stigma

Enacted stigma was measured by 31 articles. This form of stigma was measured under a variety of titles, such as: “experienced discrimination because of sexual orientation” [5], “experienced discrimination within healthcare setting because of sexual orientation” [5], “experienced stigma on basis of sexuality” [17], “human rights abuse related to sexuality” [73], “external homophobia discrimination” [34], “self-perceived history of stigma related to being an MSM” [24], “experiences of homonegativity” [6], “experiences of homophobic discrimination” [35], “experiences of sexual-orientation based discrimination” [9], “school discrimination due to sexual orientation” [26], “social stigma” [45], “discrimination in general due to sexual orientation” [26], and “experiences of homophobia” [7]. Of the 31 articles measuring enacted stigma, seven different measures [48, 50, 56, 74–77] of enacted stigma were used and three measures [60, 78, 79] were used by multiple articles. Though 31 articles indicated that a form of enacted stigma was measured among their sample, 15 articles did not specify a source of measure for enacted stigma [5, 17, 24, 26, 37, 45, 73, 80–87].

## Methods

Multiple items scales, ranging from 2 items [5, 17, 82] to 19 items [9], were used by a majority of the articles measuring enacted stigma. Two articles measured enacted stigma via a single item [82, 84]. Three articles did not specify the number of items used to evaluate enacted stigma [26, 37, 87]. Across the 25 articles that used a multiple item enacted stigma scale, Likert scales ranging from 3 points to 4 points were used as response options by seven articles [5, 8, 26, 27, 47, 50, 88]. Three articles measured enacted stigma through dichotomous response options [82, 83, 89]. Five articles measured enacted stigma through frequency options, each containing four frequency responses [6, 7, 43, 45, 90]. Fifteen of the articles measuring enacted stigma did not specify the response type for their scale items. Reliability (Cronbach's alpha) of the enacted stigma measures was provided by 14 articles, ranging from 0.66 [27] to 0.99 [88].

## Prevalence

Twenty-seven articles reported the prevalence of enacted stigma. Prevalence of enacted stigma was reported as percentages ( $n = 14$ ), mean scores on a stigma scale ( $n = 12$ ), or a median score on a stigma scale ( $n = 1$ ). Enacted stigma ranged from 1% (Gambia & China) [60, 81] to 98.27% (China) [89]. The mean score of enacted stigma on a scale ranged from 0.15 (South Africa; SD: 0.15; Range 0–1) [6] to 12 (India; SD: 2.0; Range: 11–19) [88]. Each of the 12 articles reporting enacted stigma as a mean score reported higher scores on the scale as an indication of higher enacted stigma. The median score of enacted stigma on a scale ranged from 4 (Brazil, South Africa, Thailand; IQR: 3) [34] to 6 (Brazil, South Africa, Thailand; IQR: 3; Range: 0–11) [34].

## Perceived Stigma

Fourteen articles measured a form of perceived stigma. Perceived stigma was measured under a variety of terms, including: “anticipated stigma” [22], “perceived homosexual stigma” [47, 49, 50], “perceived stigma based on sexual orientation” [81], “perception of homosexuality-related stigma” [46], “homosexuality-related public stigma” [91], “perceived discrimination” [92], and “sexuality-based stigma” [39]. Across the 14 articles, five different measures of perceived stigma were used [50, 61, 79, 93, 94]. Additionally, two measures [48, 67] of perceived stigma were used by multiple articles. Five articles did not indicate a measure that was used to evaluate perceived stigma across their sample [46, 81, 83, 90, 92].

## Methods

A multiple item scale measuring perceived stigma was used by 13 articles, ranging from 3 items [60] to 18 items [22]. There were no articles that measured perceived stigma on a single item. One article did not indicate the number of items used to measure perceived stigma [92]. The most common form ( $n = 8$ ) of response options on multiple item scales were Likert scales, ranging from 4 points to 6 points [8, 22, 39, 46, 47, 50, 90, 91]. One article used dichotomous response options for their items measuring perceived stigma [83]. The remaining articles ( $n = 5$ ) did not specify the response options to their items evaluating perceived stigma [48, 49, 60, 81, 92]. Ten articles provided the reliability (Cronbach's alpha) of their items measuring perceived stigma, ranging from 0.74 [90] to 0.93 [91].

## Prevalence

All 14 articles provided a prevalence of perceived stigma among their sample of MSM residing in resource-poor settings. Prevalence of perceived stigma was reported as percentages ( $n = 5$ ), mean scores on stigma scales ( $n = 8$ ), or a median score on a stigma scale ( $n = 1$ ). The percentage of MSM who reported perceived stigma among the 14 articles ranged from 3.9% (Gambia) [81] to 89% (China) [60]. Perceived stigma that was reported as a mean score on a stigma scale ranged from 2.28 (Vietnam; SD: 0.49; Range: 1–4) [50] to 25.4 (China; SD: 6.1; Range not specified) [91]. All 14 articles reporting perceived stigma as a mean score reported higher scores on the scale as an indication of higher levels of perceived stigma. The median score of perceived stigma measured on a stigma scale was 3.5 (Vietnam; IQR: 0.8) [90].

## Combined Measures of Sexuality-Based Stigma

Six of the 56 final articles measured sexuality-based stigma as a combination of enacted and perceived stigma [23, 25, 28, 95–97]. Several terms were used to demonstrate that enacted and perceived stigma were measured as one unit: “sexual stigma” [25, 95], “China MSM Stigma Scale” [28], “social stigma” [96], “healthcare stigma” [96], and “reporting of discrimination and stigma during study visits in the prelaw and post-law periods” [23]. Across the six articles, six different measures of combined stigma were used [17, 73, 79, 95, 97, 98]. Two articles did not specify a source of measure for their combined enacted and perceived sexuality-based stigma [23, 97].

## Methods

Across the six articles, four used a multiple item scale to measure the combined form of stigma [23, 25, 28, 96], ranging from 4 items [99] to 15 items [28]. One article did not specify the number of items used to evaluate the combined form of stigma [95]. Response options to the multiple scale items varied across the five articles. One article used a five-point Likert scale [96] and two articles used a four-point frequency response option [25, 28]. None of the articles measuring a combined form of stigma used a single item to measure this form of stigma. Two articles did not specify the type of response options that were used across their items measuring combined stigma [23, 95]. Two articles provided the reliability (Cronbach's alpha) of their stigma measures, ranging from 0.83 [95] to 0.85 [25].

## Prevalence

Prevalence of stigma was reported by three articles, either as percentages [23, 97, 99] or a median score on a stigma scale [25]. The percentage of MSM who reported stigma on a multiple item combined stigma scale ranged from  $\cong$  20% [23] to 66.8% [97]. The median score of stigma measured on a stigma scale was 11 (IQR: 6–17; Range: 0–33) [25]. Three articles did not report a prevalence of combined stigma in their results [28, 95, 96].

## Links to Health Outcomes

Of the 56 final articles measuring a form of sexuality-based stigma, 36 articles linked their measure of sexuality-based stigma to a health outcome (Table 2). A variety of linked health outcomes existed across these 36 articles. The most common linked health outcomes included HIV testing ( $n = 8$ ) [5, 9, 37, 39, 45, 89, 91, 100], unprotected anal intercourse ( $n = 6$ ) [6, 7, 85, 96, 100, 101], psychosocial factors (e.g., depression, anxiety, resilience;  $n = 10$ ) [7, 9, 25–27, 36, 38, 43, 95, 101], and sexual, intimate partner, or general violence ( $n = 5$ ) [32, 35, 38, 85, 92].

## Validation of Sexuality-Based Stigma Measures

The majority of articles ( $n = 42$ ) indicated either that the measure of sexuality-based stigma had been validated ( $n = 7$ ) [6, 8, 9, 35, 48, 50, 73], previously validated, but with a different population ( $n = 6$ ) [28, 29, 32, 37, 47, 85], translated ( $n = 4$ ) [24, 30, 33, 97], adapted/modified ( $n = 14$ ) [7, 17, 25, 36, 42, 43, 45, 80, 87–89, 95, 99, 101], or previously used by other studies to measure the specific type of stigma ( $n = 5$ ) [27, 39, 44, 60, 90, 100]. Six articles indicated that

the measures of sexuality-based stigma had been a combination of either a previous validation, but with a different population, translation, and/or adaptation.

## Discussion

The final set of articles ( $n = 56$ ) reflects a recent increase in research focused on sexuality-based stigma among GBMSM living in resource-poor settings, with 90% of the articles published in the past 5 years. However, the review only identified 32 resource-poor countries for which sexuality-based stigma research among GBMSM has been conducted. The relatively limited scope of research in this area is due in part to the laws which deem identifying as a gay and/or bisexual male or having sex with other men as illegal and punishable by death in many resource poor countries [102]. Given that the illegal nature of this particular sexual identity has been shown to cause high internal and/or external sexuality-based stigma and associated poor health outcomes among GBMSM, it is imperative that research examining sexuality-based stigma and HIV risk continue to grow in resource-poor settings [103].

Overall, the review highlighted the need to look critically at the varying measures of sexuality-based stigma that are currently employed in research focused on GBMSM living in resource-poor settings. Though a majority of the 56 final articles used multiple item scales to evaluate the prevalence of a specific type of sexuality-based stigma, single items to measure a level of stigma were also used. The different measurements created a wide range in the reported prevalence of sexuality-based stigmas among GBMSM within resource-poor settings. Each form of stigma measured had a vast range in reported prevalence: internalized 7.5% [42] to 81.6% [45], enacted 1% [59, 81] to 98.3% [90], and perceived 3.9% [81] to 89% [59]. However, caution should be used when interpreting these ranges, as the number of items used to measure sexuality-based stigma across the 56 articles varied substantially. The use of multiple measures of sexuality based stigma across the studies identified makes it challenging to compare prevalence estimates. Further, almost 20% of the articles did not provide a prevalence of sexuality-based stigma, even though the article's methods stated that a form of sexuality-based stigma was measured. Understanding the true prevalence of sexuality-based stigma among this population is crucial to HIV prevention planning, as it allows for programs to be appropriately tailored to the type of sexuality-based stigma (i.e., internal, external, perceived) within resource-poor settings.

A large number ( $n = 42$ ) of the final 56 included articles expressed that their measures had either been validated; previously validated, but with a different population; translated; adapted/modified; or previously used by other studies

to measure the specific type of stigma. However, only seven of the 56 articles specifically stated that their measure was validated within the study country; thus, the ensuing wide range of sexuality-based stigma prevalence may be due to the misappropriation of stigma measures or lack of locally and culturally appropriate validation techniques. While it is possible that studies which sampled populations in resource-poor settings were similar in demographic characteristics (i.e. age) to the studies in resource-rich settings in which the scale was originally developed and validated, this does not recognize the context specific lived realities of GBMSM. Using measures of sexuality-based stigma that are validated for the local country or context is crucial, as sexuality-based stigma may vary by location due to cultural, historical, societal, and environmental factors. Further, results identified from validated sexuality-based stigma measures will assure HIV programs are appropriately designed for the specific setting and population. This approach entails efforts to develop such measures that are salient to, and respectful of, GBMSM in differing locales of resource-poor settings.

## Limitations

Several limitations exist in this review. While two investigators were used to limit bias and error of selecting the final included articles, there is the possibility that some articles meeting inclusion criteria were not identified and/or missed. Further, the term “sexuality-based stigma” is very broad and encompasses several levels of stigma (i.e., internalized, experienced, perceived); thus, the established search strings may not have encompassed every term used across sexuality-based stigma measures among GBMSM in resource-poor settings. Although the analyzed sexuality-based stigma measures were categorized under one of the review’s four types of sexuality-based stigma, classification or misclassification of each type of sexuality-based stigma by the research team could have resulted in error. Articles were also limited to English-language and peer-reviewed articles. This further limits the ability to accurately estimate the global prevalence of sexuality-based stigma among GBMSM in resource-poor settings. Grey literature, non-peer reviewed, was excluded from the review, restricting the number of studies included.

## Conclusion

This review demonstrates the wide variation in sexuality-based stigma measures used among studies of GBMSM living in resource-poor settings. The research identified has demonstrated that differences exist in (a) definitions of sexuality-based stigma, (b) measures of sexuality-based stigma, (c) the extent to which measures of sexuality-based

stigma are validated in cultural contexts, and (d) reporting of sexuality-based stigma prevalence. Understanding these variations is an important step in refining the measures and methodologies used to understand sexuality-based stigma and its effects on overall health among GBMSM in resource poor settings—a group largely overlooked in research and programming.

There is a need for research to focus on developing tailored measures of sexuality-based stigma for GBMSM living in resource-poor settings. While 75% (n = 42) of the 56 articles identified in this review reported prior validation/translation/adaptation of their measures, only 13% (n = 7) of the 56 articles stated that their measures were specifically validated within the study country. This gap demonstrates the need for context specific validation to ensure measures are culturally and contextually appropriate. This may also explain some of the wide variation in prevalence of sexuality-based stigma reported across the studies.

In conclusion, this review highlights the importance of developing, testing, implementing, and evaluating *tailored* measures of sexuality-based stigma for GBMSM in resource-poor settings. With a tailored measure of sexuality-based stigma, discrepancies between sexuality-based definitions and reporting of prevalence may be reduced. Without a culturally and contextually tailored measure and collection of sexuality-based stigma, measurement of sexuality-based stigma among GBMSM in resource-poor settings is limited. This review highlights areas of misalignment and ambiguity within measures of sexuality-based stigma commonly used GBMSM in resource-poor settings, and calls for the development and validation of culturally tailored sexuality-stigma based measures to increase the accuracy of measuring the prevalence of sexuality-based stigma, understanding how sexuality-based stigma shapes HIV risk, and ultimately informing the design of interventions aimed at reducing sexuality-based stigma and its effects on health outcomes.

## Compliance with Ethical Standards

**Funding** This study did not require any funding.

**Conflict of interest** The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Ethical Approval** This article does not contain any studies with human participants or animals performed by any of the authors.

## Appendix: Database Search Strings

### PubMed <http://www.lib.umich.edu/database/link/9817>

1. (“Homosexuality”[Mesh] OR “Homosexuality, Male”[Mesh] OR “Bisexuality”[Mesh] OR MSM [tiab] OR “men who have sex with men” [tiab] OR Homosexual\* [tiab] OR Bisexual\*[tiab] OR gay[tiab] OR gays[tiab] OR queer\*[tiab])
2. (“Social Stigma”[Mesh] OR “Homophobia”[Mesh] OR “Prejudice”[Mesh] OR “Rejection (Psychology)”[Mesh] OR “Violence”[Mesh] OR “Workplace Violence”[Mesh] OR “Social Discrimination”[Mesh] OR “Stereotyping”[Mesh] OR “Stress, Psychological”[Mesh] OR “Scapegoating”[Mesh] OR “Crime Victims”[Mesh] OR homophob\*[tiab] OR prejudice\*[tiab] OR violence [tiab] OR violent[tiab] OR Discrimination[tiab] OR Discriminate\*[tiab] OR Stereotyp\*[tiab] OR “Anti-Homosexuality”[tiab] OR antigay [tiab] OR Scapegoat\*[tiab] OR stress [tiab] OR homonegativity[tiab] OR Stigma\*[tiab])
3. (“Surveys and Questionnaires”[Mesh] OR “Interviews as Topic”[Mesh] OR “Interview, Psychological”[Mesh] OR quantitative[tiab] OR Scale [tiab] OR scales[tiab] OR Questionnaire[tiab] OR Questionnaires [tiab] OR Survey [tiab] OR Surveys [tiab] OR Surveyed [tiab] OR interviews [tiab] OR interviewed [tiab] OR interview [tiab] OR measure[title] OR measured[title] OR measures[title] OR study[title])

### CINAHL <http://www.lib.umich.edu/database/link/9911>

1. (MH “Homosexuals” OR MH “Homosexuals, Male” OR MH “Bisexuals” OR MH “GLBT Persons”) OR TI (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*) OR AB (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*)
2. (MH “Prejudice” OR MH “Stigma” OR MH “Attitude to Sexuality” OR MH “Homophobia” OR MH “Violence” OR MH “Workplace Violence” OR MH “Scapegoating” OR MH “Discrimination”) OR TI (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR Scapegoat\* OR victim\* OR stress) OR AB (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR Scapegoat\* OR stress)
3. (MH “Surveys” OR MH “Interviews+” OR MH “Self Report” OR MH “Survey Research” OR MH “Attitude Measures” OR MH “Scales” OR MH “Questionnaires+”) OR TI(survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative) OR AB(survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative)

naires+”) OR TI(survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative) OR AB(survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative)

### PsycINFO <http://www.lib.umich.edu/database/link/8375>

1. (DE “Same Sex Intercourse” OR DE “Bisexuality” OR DE “Sexual Orientation” OR DE “Male Homosexuality” OR DE “Homosexuality”) OR TI (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*) OR AB (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*)
2. (DE “Prejudice” OR DE “Employment Discrimination” OR DE “Hate Crimes” OR DE “Stigma” OR DE “Sexual Attitudes” OR DE “Attitudes” OR DE “Homosexuality (Attitudes Toward)” OR DE “Violence” OR DE “Social Discrimination” OR DE “Discrimination” OR DE “Social Issues” OR DE “Oppression” OR DE “Stereotyped Attitudes”) OR TI (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress) OR AB (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress)
3. (DE “Measurement” OR DE “Attitude Measurement” OR DE “Attitude Measures” OR DE “Checklist (Testing)” OR DE “Coding Scheme” OR DE “Diary Measure” OR DE “Index (Testing)” OR DE “Individual Testing” OR DE “Inventories” OR DE “Multidimensional Scaling” OR DE “Needs Assessment” OR DE “Occupational Interest Measures” OR DE “Organizational and Occupational Measures” OR DE “Perceptual Measures” OR DE “Personality Measures” OR DE “Posttesting” OR DE “Preference Measures” OR DE “Pretesting” OR DE “Profiles (Measurement)” OR DE “Projective Testing Technique” OR DE “Psychological Assessment” OR DE “Psychometrics” OR DE “Q-Sort” OR DE “Questionnaires” OR DE “Rating Scales” OR DE “Screening” OR DE “Screening Tests” OR DE “Selection Tests” OR DE “Social and Interpersonal Measures” OR DE “Sociometric Tests” OR DE “Statistical Measurement” OR DE “Stress and Coping Measures” OR DE “Subtests” OR DE “Surveys” OR DE “Test Battery” OR DE “Testing” OR DE “Verbal Tests” OR DE “Vignette Measure”) OR TI(survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative OR study) OR AB(survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative)



**LGBT Life** <http://www.lib.umich.edu/database/link/10121>

1. (DE “HOMOSEXUALITY” OR DE “MALE homosexuality” OR DE “BISEXUALITY” OR DE “GAY men”) OR TI (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*) OR AB (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*)
2. (DE “STIGMA (Social psychology)” OR DE “SHAME” OR DE “SOCIAL psychology” OR DE “STEREOTYPES (Social psychology)” OR DE “REJECTION (Psychology)” OR DE “SOCIAL acceptance” OR DE “DISCRIMINATION” OR DE “HOMOPHOBIA” OR DE “OPPRESSION (Psychology)” OR DE “ATTITUDES toward homosexuality”) OR TI (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress) OR AB (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress)
3. (DE “SURVEYS” OR DE “INTERVIEWS” OR DE “QUESTIONNAIRES” OR DE “QUANTITATIVE research”) OR TI (survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative OR study) OR AB (survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative)

**Global Health** <http://www.lib.umich.edu/database/link/9591>

1. (DE “homosexuality” OR DE “bisexuality”) OR TI (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*) OR AB (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*)
2. (DE “social stigma” OR DE “discrimination” OR DE “racial discrimination” OR DE “sexual discrimination”) OR TI (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress) OR AB (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress)
3. (DE “measurement” OR DE “interviews” OR DE “data collection” OR DE “questionnaires” OR DE “sampling” OR DE “surveys” OR DE “quantitative analysis” OR

DE “quantitative techniques” OR DE “interviews”) OR TI (survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative OR study) OR AB (survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative)

**Health and Psychosocial Instruments** <http://www.lib.umich.edu/database/link/10005>

1. DE “Homosexuality Male” OR DE “Male Homosexuality” OR DE “Gay Men” OR DE “Bisexuality” OR TI (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*) OR ME (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*) OR RC (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*)
2. DE “Discrimination” OR DE “Shame” OR DE “Social Discrimination” OR DE “Social Stigma” OR DE “Stigma” OR DE “Fairness” OR TI (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress) OR ME (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress) OR RC (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress)

**Scopus** <http://www.lib.umich.edu/database/link/10049>

1. (MSM OR “men who have sex with men” OR Homosexual\* OR Bisexual\* OR gay OR gays OR queer\*)
2. (Stigma\* OR Homophob\* OR Prejudice\* OR violent OR violence OR Scapegoat\* OR Discrimination OR Discriminate\* OR Stereotyp\* OR Anti-Homosexuality OR antigay OR victim\* OR stress)
3. (survey\* OR interview\* OR scale\* OR Questionnaire\* OR quantitative OR study)

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