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# Estimating the number of men who have sex with men in low and middle income countries

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**Objectives:** To collect and analyse published and unpublished surveillance and research data on the prevalence of same sex sexual activity among male adults (including male-to-female transgenders and sex workers) in low and middle income countries.

**Methods:** Key indicators were operationalised (ever sex with a man, sex with a man last year, high risk sex last year (as defined by unprotected anal sex or commercial sex)) and a database was designed for data collection. Searches were conducted (PubMed, databases (US Census Bureau, World Bank, conferences)) and regional informants helped. Reference reports were used to assess the methodology and quality of information in each record. The best data available per region were identified and indicator estimates were used to propose regional range estimates.

**Results:** Of 561 studies on male sexual behaviour and/or MSM population characteristics, 67 addressed prevalence of sex between men, with diverse numbers per region and virtual unavailability in sub-Saharan Africa, Middle East/North Africa, and the English speaking Caribbean. Overall, data on lifetime prevalence of sex with men (among males) yielded figures of 3–5% for East Asia, 6–12% for South and South East Asia, 6–15% for Eastern Europe, and 6–20% for Latin America. Last year figures were approximately half of lifetime figures, and prevalence of high risk sex among MSM last year was approximately 40–60% in all regions except South Asia, where it is 70–90%.

**Conclusions:** Data available on the prevalence of male same sex sexual activity across regions are scarce (non-existent in some areas), with validity and comparability problems. In South and South East Asia, Eastern Europe, and Latin America, a lifetime prevalence of 6–20% was estimated, with smaller figures in East Asia. A cross cultural analysis of terminology and practices is needed, as is continued work on epidemiological and social analysis of male-male sexual practices in societies across regions.

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Data on HIV transmission through sex between men, and on the incidence and prevalence of HIV and other STIs among men who have sex with men (MSM), are very poor in most of the developing world, perhaps with the exception of Latin America.<sup>1</sup> The most glaring data gaps are in Africa, Central Asia, Eastern Europe, and the Middle East. Even in South and South East Asia, Latin America, and the Caribbean, where relatively more information is available, the contribution to the HIV/AIDS epidemic of male same sex sexual behaviour is not fully appreciated, in part due to either a lack of data or lack of analysis of the available data. A limited number of more detailed recent epidemiological studies have shown that both prevalence of same sex behaviour and prevalence of HIV among MSM are higher than previously thought.<sup>2–3</sup> In regions where HIV prevalence among MSM is known to be high since the beginning of the epidemic (for example, in urban centres of Latin America), data show that HIV prevalence still remains very high among MSM, even though the epidemic has expanded to other populations.<sup>4</sup>

In the above regions, many or most MSM also have sex with women, and the prevalence of condom use for sex with both their male and female partners is often very low.<sup>1–6</sup> Given the prevalence of HIV and STI among MSM, the much higher transmission efficiency of anal sex,<sup>7</sup> and that the context of behaviours, including stigma and violence,<sup>8–10</sup> pose a greater risk for transmission, the contribution to the HIV epidemic from MSM to their female partners may therefore be greatly underestimated.<sup>1–6 11 12</sup>

This study was aimed at systematically bringing together published and unpublished surveillance and research data, on the prevalence of same sex sexual activity (including sex with male-to-female transgendered people and male sex workers) among general male populations, in low and middle

income countries of Africa, Asia, the Middle East, Eastern Europe, and Latin America, and the Caribbean.

## METHODS

A database in Microsoft Access was designed after discussion with the Joint United Nations Programme on AIDS (UNAIDS). It included an extensive number of variables to be extracted from studies on MSM and HIV, such as various potential estimations of prevalence of sex between men (in the general population), as well as prevalence estimations of HIV infection, condom use, and sex with women (among MSM). An analysis of the latter is beyond the scope of this report.

## Data collection

Once the database was in place we proceeded to:

1. Classify low and middle income countries into nine regions: Asia (East, South, and South East); Africa (East-South and West-Central); Eastern Europe/Central Asia; Middle East/North Africa, Latin America, and the Caribbean.
2. Identify focal points in each region. The database was then sent to the focal points with instructions, and asked to identify estimating the *prevalence of male-male sexual behaviour* (in the general population) and/or *MSM population key characteristics* (that is, prevalence of HIV infection, condom use, and sex with women), including unpublished reports and documents in local languages.
3. The central team conducted searches in PubMed, conference databases, as well as outside libraries and

**Abbreviations:** MSM, men who have sex with men; UNAIDS, Joint United Nations Programme on AIDS.

databases such as the World Bank and the US Census Bureau. These were complemented with searches in general engines (for example, Google). Studies were included if they provided estimates for at least one key variable in the database.

- Data were entered centrally in Lima and Buenos Aires, except for some of the data for China (data originally in Chinese were entered by the region's focal point).

An effort was made to locate either printed or internet-accessible references for all records. Availability of reference reports was essential to assess the methodology and quality of the information within.

### Data quality assessment

A five-point scale was designed to assess the quality of each reference in terms of the information key to this analysis; the assessment scale is included in Appendix 1. All references identified were scored on its basis by the central team.

### Data analysis

Summary tables were prepared to illustrate the types of studies in the database actually providing estimates of male-to-male sex prevalence measures included in this report. We then established the range of estimates for key indicators from excellent entries based on the data quality assessment (or, if unavailable, from the best quality estimates usable). The key male-to-male sex prevalence indicators assessed were: *ever sex with a man*; *ever anal sex with a man*; *sex with another man in the last year*, and *anal sex with a man in the last year*. For the indicators *ever sex with a man* and *sex with another man in the last year* the broadest definition of "sex" was allowed. Most surveys reported this indicator without stating how sex had been defined in their survey, so that this could include anything from anal sex to mutual masturbation.

We then generated prevalence ranges for each region. This was done by taking into account the range of estimates for each value and excluding studies with special populations, such as male sex workers, STD clinic patients, or other methodological issues making the data values unrepresentative.

An estimation of the prevalence of *high risk MSM* was important because most HIV sentinel studies in this population are based in samples of high risk men. Therefore, we proposed a definition for this group (that is, high risk sex last

year as defined by unprotected anal sex *or* commercial sex). We then estimated what proportion of men who had had sex with other men in the last year could fit this category in each region. This became a key indicator of MSM prevalence.

### Urban-rural and age specific estimates

In addition to regional estimates, we intended to find sufficient data to provide, to the extent possible, urban-rural and age group breakdowns for each estimate. However, as we will show, the scarcity of data in most countries made a further breakdown clearly unfeasible.

## RESULTS

A total of 561 entries were entered into the database, although this total does not reflect the extremely uneven number of studies coming from each region and subregion. There were 8 studies found for sub-Saharan Africa, 235 for Asia, 21 from the Caribbean, 42 from Eastern Europe and Central Asia, 224 from Latin America, and 31 for the Middle East and North Africa. The majority of studies were conducted in Asia and Latin America, and in most cases they were jurisdiction based (for example, circumscribed to one or more cities within a country).

However, most of the studies included in the database did not contain data regarding the main variables of interest in this report; rather they focused on characteristics of MSM populations. There were 67 studies with data on the prevalence of male same sex sexual activity (that is, *ever sex with another man*, *ever anal sex with another man*, and *sex with another man last year*); the prevalence ranges found for each indicator are shown in table 1.

A total of 29 of the 67 studies (including 21 of 51 studies with data on lifetime male-to-male sex prevalence, 5 of 9 studies of lifetime prevalence of anal sex with other men, and 3 of 7 studies on last year male-to-male sex prevalence) were considered "excellent", or were included as "the best data available" in regions without "excellent" entries. Estimates and related confidence intervals provided by those studies were used to generate a set of prevalence ranges per subregion shown in table 2.

The most common indicator used by studies on male same sex activity is *ever sex with another man*. This indicator is useful for research on sexuality, but less appropriate for risk estimations. The second most common measure is *ever anal*

**Table 1** Studies on indicators of male same sex sexual behaviour

	Prevalence of selected characteristics of male same sex sexual behaviour, 1990–2004*		
	Ever sex with a man, lifetime. No of studies (range of results)	Anal sex with another man, lifetime. No of studies (range of results)	Sex with a man, last year. No of studies (range of results)
Africa			
East-South	1 (60.0)	1 (8.4)	ND
West-Central	ND†	ND	ND
Total	1 (60.0)	1 (8.4)	ND
Asia			
East	5 (3.5–15.0)	ND	ND
South	21 (0.01–58.8)	3 (0.2–25.0)	4 (7.2–22.0)
South East	3 (3.4–11.6)	1 (2.8)	1 (4.3)
Total	29 (0.01–58.8)	4 (0.2–25.0)	5 (4.3–22.0)
Caribbean	3 (1.0–18.0)	ND	ND
Eastern Europe and Central Asia	2 (6.0–27.0)	ND	ND
Latin America	16 (2.5–48.5)	4 (5.8–9.2)	2 (1.0–7.6)
Middle East and North Africa	ND	ND	ND
Total	51 (0.01–60.0)	9 (0.2–25.0)	7 (1.0–22.0)

\*Some studies used men attending STI clinics as the study sample.

†ND, no data.

**Table 2** Estimated ranges for selected indicators by region based on best available data (1990–2004, unless otherwise indicated)

	Male-to-male sex prevalence, lifetime (range)	Male-to-male sex prevalence, last year (range)	High risk male-male sex (proportion of MSM last year) (range)	High risk male-male sex (estimated proportion of all men)	Reference(s)
Africa	ND*	ND	ND	ND	13
Asia					
East Asia (China)	4%	ND	49%	ND (less than 1.4–2.8%)	14–16
South Asia	6–8%	7–8%	85–86%	3.5–7.2%	2, 15, 17–26
South East Asia	7–12%	4%	46–50%	1.2–3.3%	15, 27–34
English speaking Caribbean	1–3%	ND	ND	ND	35, 36
E Europe/Central Asia	6–27%	ND	45–52%	1–5.5%	15, 37–43
Latin America (including Dominican Republic)	2–25%	1–8%	34–80%	0.8–4.8%	15, 44–65
Middle East/North Africa	ND	ND	ND	ND	15

\*ND, no data.

sex with a man, slightly more indicative of risk, but also vague in terms of timeframe. The next most frequent measure is *sex with a man in last 12 months*; this indicator can better assess the presence of current risk, although would not distinguish across a wide range of risk taking among these men's sexual behaviour. In other words, the most important use of this indicator would be the generation of an estimated number of MSM for whom the available figures for HIV prevalence in MSM could be used to produce estimates of MSM living with HIV. However, figures of HIV prevalence among MSM largely derive from convenience samples of MSM at high risk, recruited on the streets or at STI clinics. These samples probably include a higher proportion of sex workers and male-to-female transgenders than the general MSM population; both of the aforementioned groups are more affected by HIV than other MSM.<sup>66–68</sup>

The uncritical assumption of correspondence between HIV prevalence estimates from high risk convenience samples, on one side, and general MSM populations, on the other side, might lead to a mistaken estimation of very large numbers of HIV infections among MSM. To avoid this, it is important to develop a more appropriate definition of “high risk MSM” and subsequently to produce reasonable regional estimates of that subgroup, at least as a gross estimate of the fraction of those men who ever had sex with other males.

Here we have proposed a definition of “high risk MSM” as: men who had sex with other men during the last 12 months and who either report unprotected anal sex or commercial sex during that period. The estimated ranges of high risk MSM prevalence by region can be found in table 2. The ranges for each region show that approximately half of men who report ever having sex with a man also report recent high risk male-male sexual behaviour, following the definition of high risk proposed.

### Data availability by region

#### Sub-Saharan Africa

In spite of ethnographic evidence,<sup>9, 13</sup> no quantitative data on the prevalence of male same-sex sexual activity in the general population were available for this region. There were, however, estimates of such prevalence among HIV/AIDS cases or prison inmates. This absence is likely due to the overwhelming heterosexual HIV epidemic as well as the widespread assumption of the non-existence of homosexual behaviour in Africa. Most of the available behavioural studies are conducted on young people or women and include no questions on the subject of MSM.

#### Middle East/North Africa

No data on the prevalence of male-male sex were available, even though a significant proportion of AIDS cases occur

among MSM.<sup>69</sup> While there is significant anthropological and anecdotal evidence of male-male sexual behaviour, heavy stigma of non-marital sexuality apparently contributes to the avoidance of questions on male same-sex sexual activity in behavioural surveys.

#### South East Asia/Pacific

Accessible studies focus primarily on special MSM populations (for example, sex workers and their clients), although some ascertain the prevalence of male-male sex in the general population. The issue of how males see their male partners also comes into play due to the significant social presence of a third gender (that is, male-to-female transgender) that may not be considered male by researchers or respondents. There are significant differences among countries in the region.

#### South Asia

A substantial number of studies, particularly in India, were found on the prevalence of male-male sex among different groups. Many studies have surveyed groups defined by social class and occupation (for example, “middle and upper class men”, long distance truckers, mine workers, and young men in slums). Ethnographic and qualitative studies report that the lack of access to women for sex due to traditional societal norms influences the high numbers of men reporting MSM behaviour. Questions arise here as well regarding the way in which studies (and participants) conceptualise third gender people (such as *hijra*), both as subjects and as sexual partners.

#### East Asia

There are recent studies that investigate the prevalence of sex between men in relatively small samples of the general population in China. No studies were available in Laos or North Korea.

#### Eastern Europe/Central Asia

Very few studies were available on the prevalence of male-male sex, mainly conducted in cities. Most of the research in this region has focused on populations of injecting drug users. The stigma and discrimination toward MSM, sexual minorities, and HIV/AIDS in general influence the lack of information available in this region.

#### English speaking Caribbean

There is a limited amount of data available, probably as a result of the generalised HIV epidemic that affects much of the area, putting the emphasis on heterosexual transmission (much like the situation in sub-Saharan Africa). Studies with available information on male-male sexual behaviour were

conducted with general population samples; however, the definitions used in the questions are not clear.

### Latin America and the Dominican Republic

This region has the largest number of population based studies with questions on the prevalence of male-male sex and studies on MSM. However, in most cases only summary reports are available, leaving doubts as to the specific questions asked. The definitions used and questions asked are not necessarily comparable. Additionally, at times the questions focused on sexual identity and not MSM practice. Significant variations among countries and within countries have been found.

## DISCUSSION

The AIDS epidemic significantly affects men who have sex with men (MSM) in many parts of the world.<sup>70</sup> However, epidemiological or demographic studies on the subject are scarce.<sup>1</sup> This is due in part to the contradiction between the relatively simple epidemiological and demographic perspectives on sexual behaviour and the extreme complexity and diversity of those behaviours, as well as the social preference to avoid communication on non-normative sexualities.<sup>4</sup> Due to this lack of comprehensive information, the figures and estimations we present here should be considered preliminary.

A number of methodological limitations described below imply that our estimates involve gross assumptions about people's sexuality and they inevitably ignore part of the diversity and complexity that qualitative studies are increasingly uncovering in all these countries.<sup>4 67 71-74</sup>

### Methodological limitations

Cross study definitions of MSM, sex practices, varied timeframes, focus on large urban areas, and sampling criteria make composite numbers difficult to estimate. The category of "men who have sex with men" was established in order to define a comprehensive, clear, cross cultural expression to refer to "homo-bisexual" behaviours and identities.<sup>4 69</sup> We will not discuss the potential cultural and political difficulties posed by this definition, but will address some of the epidemiological difficulties.

Neither "men" nor "sex" are necessarily unambiguous terms. Ambiguities for "men" arise from non-normative gender identities (notably male-to-female transgenders); sexual role (that is, who penetrates whom); and situation (for example, sex workers, prison inmates).<sup>75-77</sup> In general, transgender populations are not included in these studies as participants, nor specified as potential sex partners of the participants; therefore, whether they are considered in the subjects' responses remains unclear. Similarly, the term "sex" is also problematic: it can be used in a restrictive sense (only penetrative sex) or in a broader sense (any practice that leads to orgasm); this distinction is often not addressed in studies and it is therefore unclear how subjects chose to respond. Some epidemiologists tend to assume that sex between men implies anal penetration, while people may use the expression "having sex" to refer to various sexual practices posing diverse levels of risk for HIV transmission.

Timeframe (ever, last year, current) varies substantially or it is not specified. Some studies ask questions about current sexual identity rather than practices over time. Similarly, the most commonly used indicator to establish prevalence of male same-sex sexual activity is the lifetime experience of sex with another man, while HIV prevalence data used by countries is usually estimated in convenience samples of men who currently have sex with other men. In this sense, it is important to avoid assuming that HIV prevalences estimated

in this way correspond to population sizes yielded by lifetime prevalence estimates of male same-sex sexual activity.

Condom use is seldom measured in a standardised way. Rather, questions are ambiguous and vary enormously in terms of timeframe, focus (frequency, consistency), associated practices (penile-vaginal, anal, oral), type of sex (homosexual, heterosexual), and type of partners (steady, occasional, commercial), etc.

There are also difficulties in sampling within studies estimating the prevalence of MSM.<sup>4 78</sup> Very few studies have been conducted with population based probability samples and even fewer are truly national, most are based in urban areas and often only in capital cities. Rather, several studies focused on core high risk or closed group populations such as sex workers or their clients, truck drivers, or prison inmates. In addition to this, given that most studies considered here were based on samples of the general population, under-reporting linked to the stigma of non-heterosexual behaviours must be taken into account. Additionally, as the estimates are related to numbers primarily from urban settings, these may not actually represent the prevalence of MSM found throughout the regions as rural areas are underrepresented.

In some countries, the only data available are the number and/or proportion of MSM among known HIV/AIDS cases (in these cases there is a strong presumption of underreporting). In many countries, same sex sexual practices are stigmatised, illegal, and/or clandestine,<sup>10</sup> so quantitative instruments such as surveys may not be the most adequate to study the phenomenon.

## Conclusions and recommendations

This study provides evidence of the limited amount of data on prevalence of male-male sexual activity, particularly in sub-Saharan Africa, the Middle-East/North Africa, and the English speaking Caribbean. We also found low validity and comparability of existing information, even in regions with many studies.

Regional estimates were produced for three indicators of male same sex sexual activity: lifetime prevalence of sex with other men; prevalence of sex with other men last year, and, among the latter, prevalence of high risk sex (defined as either selling sex last year or having unprotected anal sex last year). Data on lifetime prevalence of male same sex sexual behaviour yield similar estimates for South and South East Asia, Eastern Europe/Central Asia, and Latin America: between 6% and 10-20%. The data for male same-sex sexual behaviour last year are approximately half of the lifetime figures. Finally, the prevalence of high risk sex among men who had sex with other men last year is approximately 40-60% in East and South East Asia, Eastern Europe/Central Asia, and Latin America, and somewhat higher (70-90%) in South Asia.

For a more meaningful interpretation of comparisons, a cross cultural analysis of terminology and practices would be needed, as well as continued work on epidemiological and social analysis of male-male sexual practices in societies across regions. Multinational/multiregional and multidisciplinary work should address epidemiological, anthropological, and sociopolitical aspects of male-male sex and HIV/AIDS. This work needs to occur with a standardised group of indicators, in order to yield comparable data across studies and across regions.

The regions with substantial amounts of information on MSM (that is, Latin America, Asia, and South-East Asia) suffer epidemics where this population plays a substantial role. In the regions where MSM populations have been ignored there is either evidence of a generalised epidemic (sub-Saharan Africa and the English speaking Caribbean) or

a lack of interest in focusing on MSM behaviour due to cultural norms (the Middle East and North Africa, Central Asia, and Eastern Europe). In the latter regions, however, the HIV epidemic is still concentrated, and in most cases MSM populations represent a large fraction of those with high risk of infection and should be a priority for study.

Established studies should provide new information. National surveys, such as behavioural surveillance surveys (BSS) or demographic and health surveys (DHS), should include questions regarding sex between men. To date, these surveys focus on reproductive health and are mostly conducted with women, restricting questions to their heterosexual behaviour. Again, these surveys must collect comparable indicators.

Recent ethnographic appraisals should be used to develop an adequate framework for epidemiological studies on MSM populations identified, and for the continuation of sociological or ethnographic work to better understand the occurrence of male-male sex. Prisons and other closed institutions (mental hospitals, correctional facilities for minors) deserve separate and focused study. Data from clients or sexual partners of male and transsexual sex workers or of transsexuals not involved in commercial sex are also needed.

Implementing a limited number of specific, cross regional studies using culturally appropriate yet comparable questionnaires remains a crucial challenge, for research both in general population samples as well in MSM populations around the world. The focus should be on those areas with the least data—for example, Africa, the Middle East, the Caribbean, Central Asia, and Eastern Europe, without neglecting the other areas. Although especially in sub-Saharan Africa other issues take precedence, the lack of information on MSM and their risk is a glaring fault that should be addressed.

Information is a key element to implement sound and effective public policy. Integrating interventions with epidemiological and social science research is thus necessary to improve our understanding of specific situations and to evaluate their impact. In the field of reproductive health, validated instruments exist that are used in most of the regions to describe and measure heterosexual, reproductive practices; this is not the case yet for non-heterosexual, non-reproductive sexual practices that are crucial to the HIV and other STI epidemics. As Manzelli and Pecheny pointed out, “another core aspect is broad political discussion on the abolition of legal and social barriers to the adoption of safer sexual behaviour. In particular we refer to explicit or implicit prohibitions on access to condoms in closed institutions; to the issue of youth, for whom the recognition of active sexuality is refused; and to the absence of protection against discriminatory attitudes to sexual orientation and/or HIV/AIDS in the workplace, at home, and among health professionals.”<sup>79</sup> Not only does stigma surround practices and policies, but also epidemiological, clinical, and social research on MSM.

Furthermore, not all men who recognise themselves as homosexual or gay are at risk of contracting HIV; and not all those who run the risk of contracting HIV (or who have already done so) through sex with other men admit to being homosexual or gay.<sup>79</sup> Better ways to reach non-gay identified MSM at risk who do not perceive that risk are urgently needed.

Finally, it should be ensured that new studies, as well as existing periodical surveys incorporating new enquiries, are planned and conducted in ways that prevent the expansion of stigma and discrimination, and endanger members of usually hidden populations. In order to accomplish this, MSM groups and organisations need to become involved in these studies and mobilise their communities to contribute to their success. Community involvement not only ensures that the MSM community can comment on and direct some of the focus of

these studies, but can also help to diminish the stigma and exclusion of these populations. If anything, this new endeavour should help address an urgent need with clear implications in disease prevention and control, and also in the recognition of the human rights of secularly marginalised populations.

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## AUTHORS' CONTRIBUTIONS

Each of the authors listed played a vital role in the development of this manuscript: Carlos Cáceres led the study effort, overseeing the collection, analysis and interpretation of data. Kelika Konda collected and entered data in the database as well as analysed the data and helped to put together the final tables and write the paper. Mario Pecheny also helped with the design of the database, data collection and interpretation and also helped to write the paper. Anindya Chatterjee and Robert Lyerla provided feedback during all stages of the project, from initiating the research by coming up with the idea for the study through providing insight into the final draft of the publication.

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## APPENDIX 1

### REVIEW OF STUDIES ON PREVALENCE OF SAME GENDER SEXUAL ACTIVITY AMONG MEN, AND RELATED MEASURES, IN LOWER AND MIDDLE INCOME COUNTRIES

#### Quality scale for estimates

The following scale is proposed to assess the quality of each key study estimate in the records in the database (for example, prevalence of MSM in each of its possible definitions\*; prevalence of condom use; prevalence of heterosexual activity among MSM; prevalence of HIV infection among MSM).

1. *Excellent*:
  - (a) Published as a full report in international peer-reviewed journal (where accessible report includes a full methodological description† showing a sound study), or
  - (b) Alternatively, accessible report includes a full methodological description,† and, according to it, this is a sound study (that is, valid methodology and valid conclusions). Estimation of precision is provided or possible.
  - (c) Any other report recommended by a highly trustable contact as very useful unpublished material (for example, conference abstract of recent study).

\* Potentially the following definitions of MSM can be considered: (1) ever sex with other men (“ever MSM”); (2) sex with other men in past X months (“currently MSM”); (3) sex with other men in past X months and highly sexually active (“high risk MSM”).

† “Full methodological description” includes a definition of MSM appropriate to the specific research question.

2. *Very good*: Accessible report includes a full methodological description,† and, according to it, this is a sound study (that is, valid methodology and valid conclusions). Not well known among key contacts. Estimation of precision is provided or possible.
3. *Good*: Accessible report includes a full methodological description.† According to it, the study has methodological limitations (for example, potential selection or response bias, etc), or estimation of precision is not possible.
4. *Fair*: The only accessible report includes a partial methodological description, or potentially important design issues (for example, wrong definition of variables or construction of questions).
5. *Poor*: The only accessible report includes a poor methodological description that makes it impossible to assess study quality, or source is highly unreliable, or there are evident indications of lack of validity.

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