



# Global Systematic Review of Common Mental Health Disorders in Adults Living with HIV

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## Abstract

**Purpose of the review** By reviewing the most recent common mental health disorders (CMHD) studies in people living with HIV (PLWH) (2018–2020), this review discusses the prevalence of CMHD, factors associated with CMHD in PLWH, mental health in PLWH from vulnerable groups, the impact of CMHD on HIV disease progression and adherence to antiretroviral therapy and the efficacy of different treatment approaches.

**Recent findings** After screening for eligibility 142 studies were included in the final systematic review. Only 27% of studies were conducted in Sub-Saharan Africa, which carries the highest burn of HIV disease globally. Despite the well-established increased risk of CMHD in PLWH, the current prevalence remains high, with studies reporting 28%–62% of PLWH having mental health symptoms.

**Conclusion** Despite the significant challenges that CMHDs present to successful HIV treatment, there are many mental health treatments and interventions which can improve outcomes in PLWH and opportunities to task-shift and integrate mental health care with HIV care.

**Keywords** HIV · Adults · Mental health · Systematic review · Global

## Introduction

People living with HIV (PLWH) are at risk of common mental health disorders (CMHD), including a higher suicide burden [1]. Poor mental health has been associated with HIV disease progression and poor adherence to treatment, making the treatment of mental illness alongside HIV key to strengthening HIV care and outcomes. CMHD may exacerbate many of the social and economic barriers to accessing adequate and sustained healthcare and are among the most challenging barriers to achieving sustained viral suppression [2]. In fact, the burden of CMHD is likely to have been

underestimated due to a lack of appreciation of the connect-edness between mental health and HIV. Mental health can affect the progress towards the achievement of many Sustainable Development Goals (SDGs), such as gender equality and empowerment of women, improvement of maternal health, and ending the AIDS epidemic [3].

Women living with HIV (WLWH) have a higher burden of CMHD compared to women without HIV and men living with HIV. Mental health issues in WLWH, such as depression, posttraumatic stress (PTSD), and anxiety, are associated with poor quality of life and worse HIV health outcomes [4]. Mental health symptoms, particularly depression, and mental health vulnerabilities are also widespread among pregnant WLWH and have the potential to affect well-being, quality of life, and clinical obstetric outcomes [5]. Intimate partner violence (IPV) is a global health problem of epidemic proportions, with strong evidence that the risk of IPV is heightened in WLWH, and emerging evidence linking experiencing IPV and HIV to an increased risk of mental health problems. This triple burden makes women in Africa, living in the epicenter of HIV, all the more vulnerable [6]. Mental health problems in PLWH has been quantitatively associated in many other vulnerable groups such

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as conflict-affected populations [7], transgender and gender-nonconforming people [8], sex workers [8], incarcerated people [9], and men who have sex with men (MSM) [10].

A recent meta-analysis of the global prevalence of depression in PLWH found a higher prevalence rate of depression in poorer countries [11]. Accurately, diagnosing depression in PLWH is an ongoing challenge to healthcare workers, particularly those in resource-limited settings and complicated by the complex biological, psychological, and social factors associated with HIV infection [12]. Gaps remain between the recognition of mental health factors as critical to the lives of PLWH and the application of adequate resources to provide quality mental healthcare [13]. In addition, the compounded stigma of both HIV and CMHD may have a detrimental impact on health-related outcomes in PLWH [14, 15]. CMHD diagnoses or symptoms are barriers to retention in HIV care and highlight the importance of providing mental healthcare to PLWH in need [16]. PLWH with mental health disorders also have significantly higher treatment costs for both mental health and physical conditions [17]. Integration of mental healthcare into all HIV testing and treatment settings would not only strengthen HIV care outcomes, but it would additionally improve global access to mental healthcare [2].

By reviewing the most recent CMHD studies in PLWH (2018–2020), this review discusses the prevalence of CMHD, factors associated with/drivers of CMHD in PLWH, mental health in PLWH from vulnerable groups, the impact of CMHD on HIV disease progression, the impact of CMHD on adherence to antiretroviral therapy (ART) and treatment outcomes, and the efficacy of different treatment approaches, including psychosocial interventions and psychopharmacology.

## Methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement [18]. The PICOS method [19] was used to develop the research questions, which were: “What is the prevalence of CMHD in PLWH, factors associated with/drivers of CMHD in PLWH, mental health in PLWH from vulnerable groups, the impact of CMHD on HIV disease progression, the impact of CMHD on adherence to antiretroviral therapy (ART) and treatment outcomes, and the efficacy of different treatment approaches, including psychosocial interventions and psychopharmacology?”

## Eligibility

Titles, abstracts, and full texts were assessed for inclusion by four independent reviewers (BM, NP, SH, and TS). The following a priori eligibility criteria were applied: the study sample was composed of (1) adults (aged 18+ years) living with HIV, (2) the study where the primary outcome was the assessment of CMHD in PLWH, (3) the study used a standardized mental health assessment tool/measure/questionnaire. This 2-year review of the literature (search time limit: 2018–2020 inclusive) excludes review articles and case study reports. Studies reporting on severe mental illness, behavioral and risk behavior problems, and substance use/abuse disorders as primary outcome measures were excluded, as were studies with a primary focus on HIV-carer mental health. A full list of exclusion criteria is included in Supplement 1.

## Search Strategy

We conducted a systematic search using a search protocol specifically designed for this study (Supplement 1) in three electronic databases: PubMed, EBSCOHost Academic Search Premier, and Scopus. The initial screening process involved four independent reviewers (BM, NP, SH, and TS) who assessed the titles and abstracts yielded from the systematic search and classified studies as either “include” or “exclude” based on the eligibility criteria as set out above. Full text articles were sought for the “included” studies. Finally, the full text articles were assessed once again to make a final decision regarding inclusion in the review according to the eligibility. Disagreements between reviewers regarding the inclusion or exclusion of particular studies were settled by consultation with a senior author (JH).

The initial systematic search produced 342 studies which we all assessed for possible inclusion into the final review. Of the 342 studies, after screening of the titles and full text, 139 were excluded. A further 61 studies were excluded after screening the full text article because they did not meet the eligibility criteria. Thus, 142 studies were included in the final qualitative synthesis and review. See Figure 1.

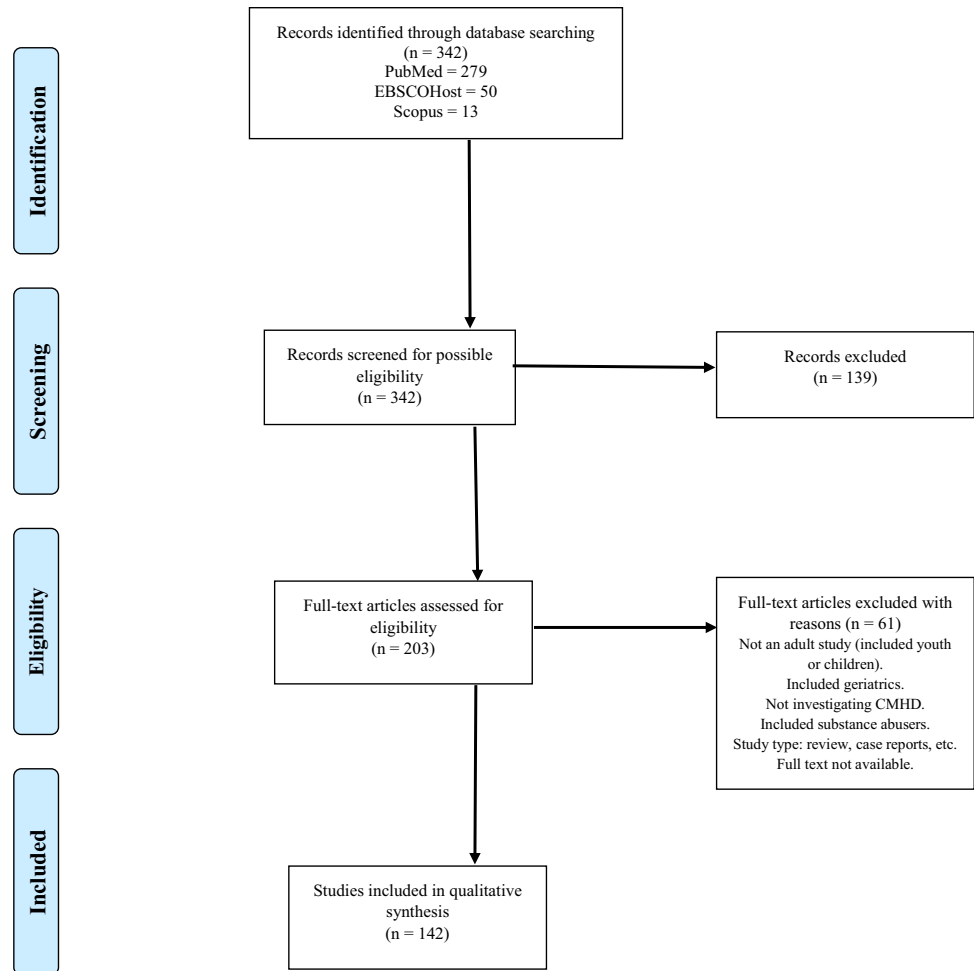
## Data Extraction

Data from the included studies were extracted into Microsoft Excel. We extracted descriptive (e.g., country, sample demographics, measures used, etc.) and qualitative data on the findings reported by each included study.

## Quality Assessments

All included studies were assessed for validity and reliability with regards to the measures they used to assess mental

**Fig. 1** PRISMA diagram detailing the identification of eligible studies



health in PLWH. With regard to the validity of measures, we assessed the content, construct, and criterion validity. With regard to the reliability, we assessed the homogeneity, stability, and equivalence of the measures used.

Assessing the methodological quality of studies highlights the strengths and weaknesses of a particular study. It is important to acknowledge the fact that any quality assessment also reflects the standard of reporting of a particular study. The quality assessments of the studies were used only to evaluate the methodological rigor of studies included in this review and to provide commentary and interpretation of the generalizability of the findings. See Supplement 1 for the findings of the quality assessment.

## Results

### Description of Search Results

The electronic database search strategy yielded a total of 342 records. After screening for eligibility, 142 studies

were included in the final qualitative review. The characteristics of the final 142 included studies is presented in Supplement 1. The list of full references for the included studies is presented in Supplement 2 [20–162].

### Setting and participants

Only 27% (38/142) studies were conducted in sub-Saharan Africa (SSA), which carries the highest burn of HIV disease globally. The majority of studies were conducted in the USA (39%) with the remainder of studies being conducted across Europe and Asia (34% combined). All studies included PLWH 18 years and older (range: 18–54 years). Across all included studies, 54,757 females (19.17%) and 173,428 males (60.72) were included. Some studies did not report the sex distribution, which accounts for 20.11% of the total participants across all studies. Only 20 of the 142 included studies included an HIV-uninfected control group as a comparison group.

## Assessment of CMHD

The majority of the included studies assessed depression or depressive symptoms in PLWH ( $N=128$ ). Thirty-eight studies assessed symptoms of anxiety, 18 assessed suicidality, and only 7 assessed anxiety disorders. All the included studies utilized standardized measures of the above mental health problems. The most commonly used tool to screen for depression were the Center for Epidemiological Studies-Depression (CES-D), Patient Health Questionnaire-9 (PHQ-9), Hamilton Depression Rating Scale (HAM-D), and Beck Depression Inventory.

## Findings from the Qualitative Synthesis

We categorized each of the included studies according to the type of HIV mental health study, namely, psychosocial interventions and psychopharmacology treatment studies, mental health impact on disease progression, adherence and treatment outcomes, mental health of vulnerable groups living with HIV, social factors associated with poor mental health in PLWH, and other (studies which didn't fit into any of the above categories). We extracted study-specific data for each of the categories which is summarized in Table 1. The detailed extracted information is contained in Supplement 1.

## Discussion

CMHD remain a significant concern in PLWH. We discuss the findings of our review under the following headings: prevalence of CMHD, mental health in PLWH from vulnerable groups, factors associated with/drivers of CMHD in PLWH, the impact of CMHD on HIV disease progression, the impact of CMHD on adherence to antiretroviral therapy (ART) and treatment outcomes, and the efficacy of different treatment approaches, including psychosocial interventions and psychopharmacology.

### The Prevalence of CMHD

Despite the well-established increased risk of CMHD in PLWH, the findings of our systematic review are that current prevalence remains high, with studies reporting 28–62% of PLWH having mental health symptoms [58]. Depression remains the most common mental health disorder with a reported prevalence ranging from 14 to 78% [42]. Severe depression prevalence ranges from 18 to 22% [66]. Lifetime suicidal ideation was identified in 23–38% of PLWH [45], with 21% reported suicidal ideation in the past week and 28% reported in the past two weeks [60, 89]. High perceived stigma was associated with increased suicidal ideation [64]. The mortality rate from suicide is 1%, with suicide mortality

rates declining post ART initiation [54]. Anxiety disorders, particularly generalized anxiety disorder (GAD), are also commonly comorbid conditions in PLWH, with 25–33% experiencing clinically significant anxiety [47, 57, 63]. Internalized stigma has a significant indirect effect on anxiety through self-blame [49]. GAD is associated with condomless sex, HIV stigma, poor ART adherence, and reduced sustained viral suppression [63]. Variations in prevalence of CMHD reported over the 2-year period may be due to the wide range of mental health screening tools used across the studies as well regional population differences.

### Mental Health in PLWH from Vulnerable Groups

PLWH from vulnerable groups such as perinatal WLWH, low-income WLWH, survivors of sexual assault, transgender and gender-nonconforming people, gay and bisexual men, MSM, prisoners, and migrants are particularly at risk of CMHD. In perinatal WLWH, experiencing internalized stigma significantly increased the odds of reporting depressive symptoms [72]. The psychosocial factors significantly associated with antenatal depression are IPV, unintended pregnancy, being unmarried, less stable social situation, or having lower social support [107]. Suicidal ideation is most likely to present and be sustained among WLWH experiencing IPV [72]. Gay men living with HIV are reported to have a poor recovery from depressive and anxiety symptoms one year after diagnosis [100]. Suicidality remains common in MSM who have significant associations between lower general self-efficacy and depression or anxiety [104]. Within this population, major depression and internalized stigma were highly correlated [102]. High rates of depressive symptoms among newly diagnosed MSM suggest there is a need to address HIV-related coping among newly diagnosed individuals with depression [117]. Transgender women have twice the odds of significant depression compared to MSM [97]. Prisoners with perceived stigma due to HIV status are more likely to be depressed [108]. One-third of migrants living with HIV report experiencing psychological distress [109]. Screening and treatment for CMHD disorders will be essential in improving HIV care in vulnerable populations.

### Factors Associated with CMHD in PLWH

PLWH who are vulnerable to CMHD frequently face significant individual, structural, social, and biological challenges to accessing and adhering to ART [2]. These factors may be sociodemographic, local environmental factors, social structures, individual factors, and HIV stigma [2]. Depression in PLWH is significantly associated with lower social capital, unemployment, and low food security [119, 120, 123]. In addition, greater functional limitations, poor coping strategies, low community support, internalized HIV stigma, poor

**Table 1** Summary of CMHD literature 2018–2020

Type of study	CMHD literature 2018–2020						
	CMHD treatment studies	CMHD impact on HIV disease progression	CMHD impact on adherence	CMHD prevalence in PLWH	CMHD in vulnerable groups living with HIV	Social factors associated CMHD in PLWH	Other
Region <sup>a</sup>	3/9/2/7/0	1/9/2/2/0	3/9/0/4/0	14/8/4/10/1	8/8/1/11/0	1/6/0/5/0	8/11/2/4/0
Total number of studies	18	12	19	39	29	12	26
N HIV+ sample <sup>b</sup>	2895	6570	39,861	106,898	9965	9308	16,978
HIV+ mean age (SD) <sup>c</sup>	41.4 (8.7)	41.3 (7.6)	41.0 (9.7)	39.0 (9.5)	24.5 (11.5)	37.3 (6.7)	--
Gender (N)							
Female	2678	2275	4469	32,773	6909	7347	7462
Male	3726	4999	8602	809,396	3584	2708	15,209
Transgender	3	0	157	420	41	0	17
Other	0	0	0	3	0	0	0
ARV status	Eleven studies included participants who were all on ARVs. Eight studies did not report the ARV status of the participants	Three studies did not report ARV status at all and three studies reported including participants who were all on ARVs	Only two studies reported including participants that were all on ARVs. All other studies had varying degrees of ARV adherence within their samples	The majority of studies did not report the participants ARV status (13 studies) and 8 studies reported that all of the participants included in the analysis were on ARVs	Twelve studies did not report participant ARV status. Seven studies reported that all included participants were on ARVs	Five studies did not report participant ARV status. Five studies included participants who were all on ARVs	Five studies did not report participant ARV status. Only 4 studies included studies with all participants being on ARVs
CMHD x ARVs <sup>d</sup>	Findings are inconsistent. One study reported no change in adherence as a function of CMHD. Another study reported that adherence improved when CMHD improved	Increased depressive symptoms were associated with worse ART adherence	Overall depression was associated with poor adherence. Some inconsistencies in other findings regarding duration on Arv and efavirenz	Overall, being of ARVs was associated with better MH outcomes	Not being on ARVs associated with poorer MH outcomes	Being virally suppressed was a protective factor against MH problems. Negative associations between ARVs and CMHD	Depression was associated with poor adherence and missed medical appointments. One study found no association between CMHD and ARVs

Table 1 (continued)

Type of study		CMHD impact on HIV disease progression	CMHD impact on adherence	CMHD prevalence in PLWH	CMHD in vulnerable groups living with HIV	Social factors associated CMHD in PLWH	Other
CMHD treatment studies	All studies (18/18) investigated behavioral or psychosocial interventions. Only two integrated/collaborative care studies included psychopharmacology treatments. The majority of studies (15/18 or 83%) found an improvement in mental health symptoms after the intervention	Studies investigated the association of CMHD on CD4 cell count, viral load, inflammatory markers, HbA1C, D-dimer, cognitive decline, and symptomatic HIV	Only three studies found no association between CMHD and adherence. Thirteen studies found a significant inverse association between CMHD and adherence, such that poor mental health was strongly associated with poor adherence. Some studies found that when mental health improved, so too did adherence	The majority of studies found a significant increased risk of CMHD in PLWH. Depression and anxiety disorders are common co-morbid conditions. Lifetime and past week suicidal ideation was reported in 21–31% of PLWH	In all of the vulnerable groups, PLWH were at higher risk of CMHD. Vulnerable groups studied include: perinatal WLWH, low-income WLWH, survivors of sexual assault, transgender and gender-nonconforming people, gay and bisexual men, MSM, prisoners, and migrants	PLWH who are vulnerable to CMHD frequently face significant individual, structural, social, and biological challenges to accessing and adhering to ART. These factors may be sociodemographic, local environmental factors, social structures, individual factors, and HIV	In all except one, studies found that HIV was associated with negative MH-associated outcomes. For example, poorer resilience, developmental trajectories, negative life events, cognitive impairment, and common mental health problems

Notes: a: Region in the studies took place were classified as Asia/USA/Europe/SSA (sub-Saharan Africa)/other. b: Total number for HIV-infected participants included in all studies included in a specific category. c: Mean age and standard deviation for all studies that reported this information in a specific category. d: A description of overall findings for studies that reported an association between CMHD and ARV's or ARV adherence. Age standard deviation for all studies that reported this information in a specific category. Full texts were unavailable for 3 studies and were thus not extracted here

self-esteem, poor resilience, and substance use are factors associated with CMHD in PLWH [126, 128–130]. PLWH who reported negative life events that included financial problems, AIDS diagnosis, discrimination, conflict with partner, conflict with family members, and problems with childcare were at a higher risk of depression [61]. Individuals with higher chronic stress have a higher risk of mental health problems [48]. The most frequent stressors experienced by PLWH at diagnosis were confidentiality (93.2%), risk of infecting others (86.9%), distressing emotions (86.3%), physical functions (83.9%), and disclosure concerns (83.7%). The events that were rated as most frequent 1 year after diagnosis were confidentiality (77.6%), disclosures concerns (73.2%), risk of infecting others (71.5%), physical functions (71.2%), and distressing emotions (67.3%) [48].

### **The Impact of CMHD on Adherence to Antiretroviral Therapy**

Depressive symptoms are associated with subsequent viral non-suppression through its association with self-efficacy and ART adherence [77]. Sustained viral suppression is more likely among PLWH with no depression and good self-efficacy [85]. There is also an association with higher stigma, increased levels of anxiety, sexual assault, IPV, recreational drug use, and depression with subsequent poor ART adherence [50, 72, 73, 79]. PLWH with depression and without disclosure of their HIV status to others are also more susceptible to poor adherence [86]. In addition, adherence to ART, symptoms of poor physical health, and depression are strongly associated with functional limitations/disability in PLWH [92].

### **The Impact of CMHD on HIV Disease Progression**

There is evidence that CMHD and stressful life events can negatively impact HIV disease progression, including decreases in CD4 cell counts, increases in viral load, and increase the risk for clinical decline and mortality [163]. Evidence presented in this review include depression predicted by glucose, hemoglobin A1c, and inflammation in PLWH [133]. Among PLWH, greater somatic depressive symptoms were associated with higher sCD14 and D-dimer after adjustment for demographics and potential confounders [164]. Findings also suggest that immune activation might be involved in depression risk among PLWH [165]. PLWH were found to have lower CSF homovanillic acid (HVA) which significantly correlated with higher depression scores and higher neuroinflammation [166]. Cortisol concentrations and inflammatory cytokines are higher in depressed PLWH and related to poorer learning and memory [167]. There is reliable evidence that depression is associated with neurocognitive

impairment among PLWH and in the cognitive domains of processing speed, executive function, learning and memory, and motor function [168]. More research is warranted to investigate biological and behavioral mediators of these psychoimmune relationships and the types of interventions that might mitigate the negative health impact of depression [163] in PLWH.

### **Psychosocial Interventions and Psychopharmacology Treatment Studies**

All treatment or intervention studies for CMHDs in PLWH investigated behavioral or psychosocial interventions, with most studies reporting improvement in mental health symptoms. The interventions ranged from cognitive-behavioral therapy (CBT) (4 studies) [147, 150, 159, 169]; group support/psychotherapy (2 studies) [96, 148]; interpersonal psychotherapy (IPT) (2 studies) [156, 159]; problem-solving therapy (1 study); mindfulness-based stress reduction (1 study) [157] to behavioral activation (1 study) [155]; fitness, lifestyle, and education (1 study) [149]; and anxiety management (1 study) [162]. Online interventions included guided online self-help for depression in 2 studies [147, 153] and a WeChat-based intervention for suicidal ideation, as well as telephone-based administered therapies in 2 studies [156, 159]. It seems given the wide range of successful treatments that the common thread to these interventions is providing PLWH with much-needed support, social connections, and positive therapeutic relationships. Interventions delivered by lay health workers, community home based carers, and nurses were only investigated in 4 studies [74, 148, 160, 161], which is concerning given the limited numbers of psychiatrists, psychologists, and other mental health professionals working in low- and middle-income countries (LMICs), where HIV is endemic such as SSA. Several systematic reviews have supported the use of task shifting for mental health focused on specific populations, such as with PLWH [170]. In addition, few studies investigated the integration of mental health services with HIV treatment services [132, 151]. These studies were the only interventions reporting use of antidepressants for moderate-severe depression in addition to psychosocial interventions. Mental and physical health are interconnected, and early detection can lead to improved treatment outcomes and increase cost-effectiveness for the healthcare systems [170]. While the evidence base for mental health treatment or interventions among PLWH is encouraging, the majority of research on mental health treatment or interventions for PLWH has been conducted in high-income countries rather than LMICs, which is a mismatch to the global burden of HIV [2].

## Conclusion

Despite the significant challenges that CMHDs present to successful HIV treatment and outcomes, there are many mental health treatments and interventions which can improve outcomes in PLWH and opportunities to task-shift and integrate mental health care with HIV care. Online and telephonic interventions are effective and worth exploring due to the impact of COVID-19 on face-to-face service delivery. However, many of the most at-risk population in LMICs are also the most likely to have difficulties accessing the Internet and adequate cell phone reception. Finally, as WLWH have a higher burden of CMHD compared to women without HIV, and men living with HIV, it is concerning that across all included studies, only 19.17% WLWH were included. Although women comprise half of people living with HIV, they continue to be under-represented in clinical studies. Factors such as pregnancy, breastfeeding, poor socioeconomic conditions, sex inequality, and low education could be negatively affecting WLWH's participation. All mental health research studies should be actively engaged to achieve progress toward satisfactory sex balance and meaningful sex- and gender-based analysis in research. Trials should be designed with this goal in mind, including recruitment quotas and context-specific planning.

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## Declarations

**Conflicts of Interest** No conflicts of interest.

**Human and Animal Rights and Informed Consent** The study is in compliance with the University of Cape Town's Human research and ethics council. The study team conducted the current study by accessing published data only and did not access any individual patient data.

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