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Prevalence of depressive disorder in the adult population of Latin America: a systematic review and meta-analysis

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Summary

Background Depressive disorder is one of the leading causes of disability worldwide; however its prevalence and association with inequality and crime is poorly characterised in Latin America. This study aimed to: *i*. systematically review population-based studies of prevalence of ICD/DSM depressive disorder in Latin America, *ii*. report pooled regional, country, and sex-specific prevalence estimates, and *iii*. test its association with four country-level development indicators: human development (HDI), income (Gini) and gender inequality (GII), and intentional homicide rate (IHR).

Methods We conducted a systematic review and meta-analysis of population-based studies reporting primary data on the prevalence of ICD/DSM depressive disorder in Latin America from 1990 to 2023, irrespective of language. We searched PubMed, PsycINFO, Cochrane Library, SciELO (regional database), LILAC (regional database), and available grey literature. Study quality was assessed using JBI's critical appraisal tools. We generated pooled estimates using random-effects meta-analysis; heterogeneity was assessed using the I^2 statistic. Meta-regression analyses were used to test associations of depression prevalence with indicators of inequality and human development. The study was registered with PROSPERO (CRD42019143054).

Findings Using data from 40 studies in Latin America, lifetime, 12-month, and current prevalence of ICD/DSM depressive disorder were calculated at 12.58% (95% CI 11.00%–14.16%); 5.30% (4.55–6.06%), and 3.12% (2.22–4.03), respectively. Heterogeneity was high across lifetime, 12-month, and current prevalence, sex, and countries. 12-month and current prevalence was associated with higher Gini and GII, 12-month prevalence with lower HDI, and current prevalence with higher IHR.

Interpretation We found a high prevalence of ICD/DSM depressive disorders in Latin America, and a statistically significant association with inequality and development indicators. The high heterogeneity found across prevalence periods and the major gaps in country representation underscore the need to escalate efforts to improve mental health access and research capabilities in Latin America. Systematic, comparable prevalence estimates would inform more effective decision-making in the region.

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Keywords: Depression; Depressive disorder; Prevalence; Latin America; Systematic review; Meta-analysis; Global mental health

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Research in context

Evidence before this study

The epidemiology of depressive disorder is well-known in high-income countries. However, it is insufficiently understood in low- and middle-income countries, and particularly in Latin America, a region characterised by large income and gender inequalities, and violence. To fill this gap, we conducted a systematic review and meta-analysis of the prevalence of ICD/DSM depressive disorder in the general adult population (≥15 years) of Latin America in four electronic databases from 1990 to 2023, and tested its association with four country-level development indicators: human development (HDI), income (Gini) and gender inequality (GII), and intentional homicide rate (IHR). We summarise available data from 40 studies meeting our eligibility criteria, report pooled prevalence estimates of ICD/DSM depressive disorder in the region and conclude about the association between overall prevalence and HDI, Gini, GII and IHR.

Added value of this study

With a focus on Latin America, this article provides: *i*. a systematic review of the prevalence of ICD/DSM depressive disorder; *ii*. meta-analysis providing regional, country, and sex-specific lifetime, 12-month, and current estimates; and *iii*. association between the prevalence of ICD/DSM depressive disorder and HDI, Gini, GII, and IHR, providing systematic, comparable evidence of structural factors related to depression in middle-income countries. We found partial evidence of a higher prevalence of depression in the region compared to global estimates, with women consistently showing a higher prevalence across countries and studies. We also found a strong positive association between Gini and prevalence of ICD/DSM depressive disorder and provide evidence of the adverse association of low HDI, high GII, and IHR with ICD/DSM depressive disorder in the region, over a thirty-year period. Last, our review highlights the lack of population-based mental health research in many countries in the region.

Implications of all the available evidence

The availability of population-representative prevalence estimates for ICD/DSM depressive disorder in Latin America is essential for evidence-based decision-making in the region, including policy, funding, and research priorities. The high prevalence of depression reveals the region's need for better access to high-quality care, particularly for women, and for more population-based mental health research. Studies from unrepresented Latin American countries will enable policymakers to understand and more effectively address the mental health needs of their populations, track health progress, improve resource allocation, and contribute to a more comprehensive view of the region's mental health epidemiology. Last, consistent with previous studies in the Global North, we found that the prevalence of depression was associated with structural factors related to inequality, violence, and human development.

Introduction

Depressive disorders are the most common psychiatric condition in modern society,[1] one of the leading causes of disability worldwide, and a major contributor to the global burden of disease.[2] The COVID-19 pandemic has exacerbated the problem, with the most affected areas experiencing the greatest prevalence increase.[3]

Major Depressive Disorder (MDD), according to the International Classification of Diseases (ICD-10), is a complex mental health condition characterised by persistent low mood, loss of interest or pleasure in activities, reduced energy, changes in appetite or weight, disturbed sleep patterns, difficulty concentrating, feelings of worthlessness or guilt, and recurrent thoughts of death or suicide. The prevalence of MDD is associated with several factors,[1,4–15] healthcare disparities,[16] societal norms,[5,17,18] and other factors such as objective or perceived crime, including interpersonal violence and property crime[19,20] Prevalence of MDD is elevated in conflict-affected populations[20] and has been positively associated with an area's gender inequality,[18] income,[5,6] and income inequality.[7] However, and some studies have only observed an association of income and income distribution in men but not women.[5] Population levels of human development, as measured by the human development index (composite measure of life expectancy, education, and per capita income), have also been hypothesized to be associated with prevalence of MDD. However, the available evidence is inconsistent, and the direction of the association seems to differ between developing and developed countries.[21] Analyses of the Global Burden of Disease (GBD) data showed a positive association between human development and MDD prevalence.[21,22] In contrast, a recent global systematic review of 64 studies[23] concluded that medium human development levels were associated with a higher prevalence of depression, relative to low or high human development. Moreover, no clear trends were observed in the World Health Survey.[24]

Understanding the prevalence, impact, and underlying factors of MDD is essential for its effective management and prevention. However, most research has been conducted in high-income countries,[19,21,24,25] resulting in a significant gap in knowledge regarding depression, specifically in Latin America (LATAM), a region composed almost entirely of upper-middle-income countries. While studies in high-income countries provide valuable insights into the understanding of depression, the experiences, cultural contexts, and socioeconomic factors in Latin America may differ

substantially, including a high level of income inequality,[26] gender disparities, violence,[27] fragmented and underfunded[28–30] health systems, rapidly increasing urbanization, and significant demographic changes including south-to-south migration and an increase in the proportion of elderly individuals in the population.

Government expenditures on mental health in LATAM are low (Supplementary p 35). Mental health research is limited,[31] as suggested by global studies, generated primarily by a small group of countries.[32] Despite efforts to advance epidemiological mental health data in the region, and participation of some countries in large adult epidemiological studies (e.g., World Health Organisation-World Mental Health Survey Consortium (WHO-WMHS)[6,33,34]; 10/66 Dementia Research Group Study), scarce research funding, high variability of methodological approaches, language barriers, competing needs, and a need to build capacity in the limited local research community[35] have resulted in a major gap in mental health research.

Most primary studies of depression prevalence in LATAM have largely been conducted in urban areas, usually using self-reported tools that vary widely in quality and results, limiting their generalizability.[36] The region's prevalence of Major Depressive Disorder (MDD) or depressive episodes in the community defined according to the 10th Revision of the International Classification of Diseases (ICD-10) or the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria and assessed using structured clinical interviews (hereafter: ICD/DSM depressive disorder) has only been described through limited evidence syntheses[36,37] and a review of seven Brazilian studies.[38]

Conclusions about the rate of ICD/DSM depressive disorder in LATAM versus other world regions are often drawn from four sources: *i.* cross-national comparisons of studies participating in the WHO-WMHS[6,33,34] which report prevalence of DSM-IV MDD assessed using the Composite International Diagnostic Interview (CIDI), *ii.* the 10/66 population-based dementia research studies[14,15] which report prevalence of DSM-IV and ICD-10 depressive disorder/episode in older adults in ten low- and middle-income countries (LMICs), seven of which are located in the LATAM region, *iii.* the GBD study which estimates the health burden of depression,[2,3] and *iv.* global systematic reviews of population-representative prevalence of common mental disorders[39] or depressive disorder/symptoms.[23,40–43]

There are, however, important limitations to mapping the region using findings from these four sources: *i.* results of the WHO-WMHS are analysed within the Americas WHO region, which includes Canada and the United States of America; *ii.* 10/66 studies focus exclusively on population aged 65 years or beyond; *iii.* the GBD study and available global systematic reviews[23,40–43] mainly include sources using self-report assessment methods that tend to produce significantly higher prevalence estimates[23,43]; and *iv.* the LATAM region tends to be underrepresented in global systematic reviews.[23,42,43]

The aim of this study is to systematically appraise and synthesize the best available evidence of the prevalence of ICD/DSM depressive disorder in the general adult population (i.e., aged ≥15 years) of LATAM. Our second aim is to describe the ecological association between macro-level development, and violence indicators, and the regional pooled prevalence estimates of ICD/DSM depressive disorder. By providing systematic, up-to-date, and comparable epidemiological information on ICD/DSM depressive disorder, we hope its findings will help inform public policy, research priorities, and service planning and advance the field of psychiatric epidemiology in the Global South.

Methods

Search strategy

The apriori review protocol was registered with PROSPERO (CRD42019143054) and published[44] with minor changes. These changes involved the inclusion of an additional electronic database (LILAC) and the redefinition of the geographic area as LATAM versus LATAM and the Caribbean. Methods follow both GATHER[45] and PRISMA[46] reporting standards (Supplementary p 3).

Five electronic databases were independently searched from inception to May 2nd, 2023: PubMed, PsycINFO, Cochrane Library, SciELO, and LILAC. The boolean operator AND with three search terms was used: *i.* depressive condition; *ii.* context and population (i.e., LATAM region); and *iii.* epidemiological study design (Supplementary pp 4). No language restriction was applied. Identified citations' details were uploaded and managed using EndNote V9 (Clarivate Analytics) and later imported into Microsoft Excel. Python scripts were used to systematically eliminate identical citations, followed by a manual search of undetected duplicates (Supplementary pp 11–15).

A hand search of citations from international organisations, specialised repositories and LATAM governmental health/development agencies (Supplementary pp 29–30), and reference lists of all retained citations was conducted to detect published, ongoing or unpublished studies.

Study selection

Two independent reviewers conducted a three-stage screening and selection process. A third independent reviewer acted as arbiter in case of disagreements. Citations were considered eligible if they contained data from community surveys on prevalence of depressive disorder according to validated diagnostic criteria (i.e., ICD or

DSM) assessed using a structured clinical interview (i.e., CIDI, CIS-R or MINI), in the general population (i.e., aged 15 years) of LATAM, in the scientific or grey literature. We excluded studies conducted during the COVID-19 pandemic and studies only reporting results for older adults (i.e., aged 65 years) (Supplementary p 16).

Stage 1 screened title-only to identify citations distinctly out of topic. Stage 2 screened abstracts against inclusion criteria, classifying records as ''meeting'', ''possibly meeting'', or ''not meeting'' inclusion criteria. Stage 3 performed a full-text review using a piloted decision matrix to identify citations fully meeting inclusion criteria (Supplementary p 16).

Data extraction and management

For each selected record, two independent reviewers extracted the following information: survey name, country, location, fieldwork date(s), study design, setting, response rate, sample size, the proportion of women, participants' age range, the definition of depressive disorder, diagnostic criterion, assessment method, and period studied. Overall and sex-specific number of cases and prevalence estimates were extracted for all studies, while age-stratified estimates were extracted when available. Multiple records associated with the same study were matched. Study quality was assessed using JBI's Critical Appraisal Checklist for Studies Reporting Prevalence Data (Supplementary p 34).[47] A sensitivity analysis was conducted to determine if studies meeting eligibility criteria, but only reporting prevalence for age-specific subgroups should be excluded from the study (Supplementary pp 19, 21).

External data sources

For each selected study, information about country-level human development (Human Development Index; HDI), income distribution (Gini Index; Gini), gender inequality (Gender Inequality Index; GII), and level of interpersonal violence (Intentional Homicide Rate per 100,000; IHR) at fieldwork midpoint was extracted from external sources (Supplementary p 31).

Data synthesis and statistical analysis

A narrative synthesis of studies and results was first conducted. Overall pooled prevalence estimates for each prevalence period (lifetime, 12-months, or current) were calculated using a random-effects meta-analysis that accounted for between-study heterogeneity (Supplementary p 19).[48] Secondary outcomes were: *i.* country, *ii.* sex, *iii.* study setting, *iv.* publication status, *v.* diagnostic criterion, and *vi.* Survey interview-specific prevalence of depressive disorder, calculated by subgroup. Individual study-specific proportions with 95% exact Confidence Intervals (CI) for each study were calculated using Metaprop.[49] The Clopper-Pearson[50] CI for binomial proportion were constructed by inverting the equal-tailed test, based on the binomial distribution.[51]

Heterogeneity between studies was assessed using standard χ^2 tests and the I^2 statistic (i.e., percentage of variability in the prevalence due to heterogeneity rather than sampling error or chance, with values $\geq$75% indicating considerable heterogeneity). Publication bias was evaluated by inspecting funnel plots, Egger's test, and non-parametric trim-and-fill analyses. All analyses were performed using Stata 16.0.[52]

Pearson's correlation coefficients were computed to examine the relationship between the values of the four country-level indicators (i.e., HDI, Gini, GII, IHR) of selected studies. Meta-regression analyses were then performed to test univariate associations of all indicators with the overall 12-month and current prevalence of ICD/DSM depressive disorder. In addition, we calculated principal component analyses (PCA) of all indicators and performed meta-regressions to test the association with overall 12-month and current prevalence of ICD/DSM depressive disorder (Supplementary p 22). Random-effects models were fitted via the restricted maximum likelihood method, and weights estimated via the inverse-variance method.[53]

Role of the funding source

The funders of the study had no role in the study design, data collection, data analysis, data interpretation, or writing of the report.

Results

Study characteristics

The database search identified 23,910 citations. After removing duplicates, screening titles and abstracts, and reviewing 166 full text, 31 citations[33,34,54–82] reporting on 21 studies met inclusion criteria. 21 citations identified via other methods also met inclusion criteria: three published articles/books were available from international organisations and repositories[6,83,84] and 18 unpublished citations from government agencies[85–102] (Fig. 1; Supplementary p 20). In total, 52 citations[6,33,34,54–7071–102] corresponding to 40 studies involving 123,500 individuals from seven countries, representing about 79% of the population in the LATAM region, were included.

Table 1 presents the overall study characteristics. The selected studies were conducted between 1992 and 2019. The annual number of studies or publications did not increase over time (Supplementary p 51). Of all studies, 38 were cross-sectional, and two used longitudinal design.[62,63,68] A high concentration of studies in four LATAM countries was observed: 14 in Peru,[6,61,72,90–102] nine in Colombia,[6,64,65,73,78,86–89] eight in Brazil,[6,54–56,62,63,66–68,75,79,82] and four in Mexico.[6,54,58,60,69–71,76,77,83,84] Three studies from Chile[57,80,81,85] and single studies from Argentina[33,34] and Guatemala[74] were also included (Supplementary p 50).

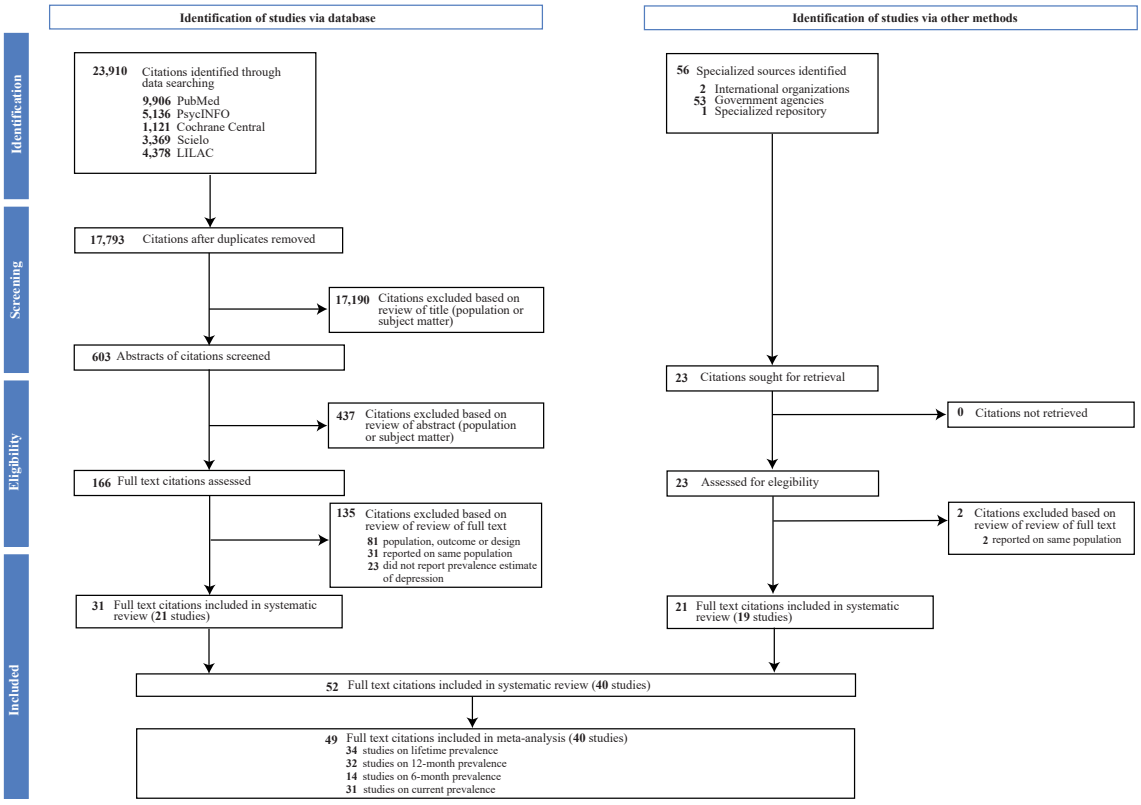

Fig. 1: Study selection and identification (PRISMA flow).

Nationally representative studies from Argentina,[33,34] Chile,[80,81,85] Colombia,[64,65,73] Guatemala,[74] Mexico,[6,69–71,77,83,84] and Peru[6,61,72] were identified. All Brazilian studies represented a city or state. Regarding setting, 25 studies were conducted in urban areas,[6,33,34,54–58,60–62,64,66–73,75,77–79,83,84,90–93,97,99–102] four in rural areas[76,95,96,98] and 11 in mixed urban-rural settings.[6,65,74,80–82,85–89,94] In terms of income category, 29 studies were conducted in countries classified as upper-middle-income at the time of their publication,[6,33,34,54–58,60,62,65–71,75–84,86–89,96–102] ten in lower-middle-income countries[61,64,72–74,90–95] and one (2.5%) in a high-income country[85] (Supplementary pp 31–32).

The median number of participants per study was 2308. The 34 studies reporting prevalence by sex[55–57,60,63–65,67,68,71,73,75–77,79–82,84,85,88–102] involved 46,537 men and 60,177 women. Seven studies did not report sex-specific estimates,[6,33,34,61,72,74,78,86,87] and one study only reported sex-stratified estimates.[67]

Thirty studies included population aged 18 or older[6,33,34,54–56,58,60,61,64,65,69–74,77–79,82,84–87,90–102] and seven included participants over the age of 15 years.[66,75,76,80,81,88,89] One study[67] focused exclusively on population aged 18 to 24, while two birth cohort studies reported the prevalence of ICD/DSM depressive disorder at ages 18,[62] 22,[63] and 30.[68] Thirty-nine studies[6,33,34,54–58,60–62,64–6668–8284–101] reported the prevalence of ICD/DSM depressive disorder in the overall population (121,940 individuals), 34 inquired about lifetime prevalence[6,33,54,55,58,61,64,65,69,73–79,81,82,85–89,91–102] (102,894 individuals), 32 about prevalence in the last 12 months[6,34,54–56,64,65,70,72,73,75,77,78,81,82,85,87–101] (101,077 individuals), 14 in last 6 months[77,80,90–102] (44,834 individuals), and 30 reported current prevalence[6,54,55,57,63,65,68,73,80,82,86,88–102] (104,645 individuals).

To diagnose depressive disorder, 18 studies used versions of the DSM diagnostic system,[6,33,34,56,61,66,67,72–75,77–81,85–89] 16 used the ICD-10[57,64,90–102] and six reported results under both classification systems.[6,54,55,58,60,62,63,68–71,82,84,85] Regarding assessment instruments, 22 studies used the CIDI,[6,33,34,54–56,58,60,61,64–66,69–81,84,85,87–89] 17 the Mini International Neuropsychiatric Interview (MINI),[62,63,67,68,86,90–102] and one used the Revised Clinical Interview Schedule (CIS-R).[57]

Prevalence of ICD/DSM depressive disorder in the general population of LATAM

The pooled overall lifetime prevalence of ICD/DSM depressive disorder was 12.58% (95% CI [11.00–14.16], 34 studies, I^2 = 98.61%, p < 0.0001), and country-specific pooled prevalence ranged from 10.26% [7.00–13.53] (8 studies I^2 = 98.69%, p < 0.0001) in Colombia to 17.38% [15.96–18.81] (5 studies, I^2 = 71.80%, p < 0.0001) in Brazil. The difference

Study characteristics													% Prevalence (95% CI) [SE][d]							
Country ID	citation(s)	Location (Survey)	Period	Outcome[a]	Design[b]	Setting[c]	Response rate	Sample size	Women %	Age range (years)	Diagnostic criteria	Interview	Overall				By sex			
													L	12 m	6 m	C	L	12 m	6 m	C
Argentina																				
Published																				
1	Cia et al. 2018[1g]; Stagnaro et al. 2018[2]	National (AMHES)[i]	2015	MDD	CS	U	77.0	3927	NA	≥18	DSM-IV	CIDI	8.7 (7.8–9.6)	3.8 (3.2–4.4)						
Brazil																				
Published																				
2	Andrade et al. 2002[3]; Andrade et al. 2003[4]	Sao Paulo (ECAS-SP)[h]	1994–1996	MDE	CS	U	62.4	1464	57.4	≥18	DSM-III-R; ICD-10	CIDI	16.8 (14.9–18.7)	7.1 (5.8–8.4)		4.5 (3.4–5.6)	F: 19.2 (16.7–21.7) M: 13.5 (10.5–16.6)	F: 9.2 (7.4–11.0) M: 4.3 (12.5–6.1)		F: 5.4 (4.0–6.8) M: 3.2 (1.6–4.8)
3	Vorcaro et al. 2001[5]	Bambuí	1996–1997	DE****	CS	M	85.3	1041	56.6	≥18	DSM-III-R; ICD-10	CIDI	15.6 (13.4–17.8)	10.0 (8.2–11.8)		8.2 (6.5–9.8)	F: 20.9 (17.6–24.2) M: 8.6 (6.0–11.2)	F: 13.8 (11.0–16.5) M: 5.1 (3.1–7.1)		F: 11.4 (8.8–13.9) M: 4.0 (2.2–5.8)
4	Andrade et al. 2012[6g]; Bromet et al. 2018[7]; Viana et al. 2012[8g]	Sao Paulo (SPMHS)[i]	2005–2007	MDD	CS	U	81.3	5037	52.8	≥18	DSM-IV	CIDI	16.9 (15.9–17.9)	9.4 (8.6–10.2)		4.2 (3.7–4.8)	F: 23.0 (21.5–24.5) M: 10.0 (8.7–11.3)	F: 13.2 [1.0] M: 5.3 [0.6]		
5	Jansen et al. 2013[9f]	Pelotas	2007–2008	DE	CS	U	NR	1560	56.4	18–24	DSM-IV	MINI								F: 12.9 M: 6.2
6	Ribeiro et al. 2013[10g]	Rio de Janeiro	2007–2008	MDD	CS	U	80.5	1208	56.6	15–75	DSM-IV	CIDI	17.4 (15.0–19.8)	6.0 (4.5–7.5)			F: 22.5 (21.4–28.5) M: 10.8 (8.8–15.0)	F: 8.8 (6.4–11.7) M: 2.4 (0.9–3.9)		
7	Jaen-Varas et al. 2016[11g] Ribeiro et al. 2013[10g]	Sao Paulo	2007–2008	MDD	CS	U	84.5	2536	56.8	15–75	DSM-IV	CIDI	19.9 (17.0–20.8)	8.2 (6.9–9.5)			F: 24.2 (21.5–27.0) M: 11.6 (9.1–14.0)	F: 11.7 (9.7–13.5) M: 3.4 (2.0–4.7)		
8	Gallo et al.[12e]; Gomes et al. 2019[13f]	Pelotas (PBCS1993)	2011–2012 (18 y) 2015 (22 y)	MDD	L (birth cohort)	U	70.8 (18 y); 72.1 (22 y)	3715 (18 y); 3781 (22 y)	52.6 (18 y); 53.4 (22 y)	18 and 22	DSM-IV/ ICD-10 (18 y); DSM-5 (22 y)	MINI				6.8 (18 y) 2.9 (22 y)				F: 10 (18 y) M: 3.3 (18 y) F: 4.2 (22 y) M: 1.4 (22 y)
9	Loret de Mola et al. 2016[14f]	Pelotas (PBCS1982)	2012–2013	MDE	L (birth cohort)	U	68.1	3542	52.0	30	DSM-IV/ ICD-10	MINI				7.9				F: 11.3 M: 4.2

(Table 1 continues on next page)

Study characteristics													% Prevalence (95% CI) [SE][d]							
Country ID citation(s)		Location (Survey)	Period	Outcome[a]	Design[b]	Setting[c]	Response rate	Sample size	Women %	Age range (years)	Diagnostic criteria	Interview	Overall				By sex			
													L	12 m	6 m	C	L	12 m	6 m	C
(Continued from previous page)																				
Chile																				
Published																				
10	Vicente et al. 2004[15] Vicente et al. 2006[16]	National (CPPS)[h]	1992–1999	MDE	CS	M	90.3	2978	51.2	≥15	DSM-III-R	CIDI	9.2 (8.2–10.2)	5.7 (4.9–6.5)	4.7 (4.0–5.5)	3.4 (2.8–4.1)	F: 11.5 (10.0–13.0) M: 6.8 (5.4–8.2)	F: 7.3 (6.3–8.8) M: 3.7 (2.7–4.7)	F: 6.2 (5.1–7.4) M: 3.0 (2.1–4.0)	F: 4.5 (3.5–5.5) M: 2 .3 (1.5–3.1)
11	Araya et al. 2001[17]	Santiago (SMHS)	1996–1998	DE	CS	U	90.0	3870	39.7	16–64	ICD-10	CIS-R				5.5 (4.5–6.7)				F: 8.0 (6.5–9.8) M: 2.7 (1.4–5.1)
Unpublished																				
12	MINSAL 2018[18g]	National (ENS2016)	2016–2017	MDE	CS	M	90.2	3403	64.0	≥18	DSM-IV	CIDI	11.1 (9.0–13.6)	6.2 (4.5–8.4)			F: 16.8 (13.3–21.0) M: 5.1 (3.4–7.5)	F: 10.1 (7.1–14.1) M: 2.1 (1.1–4.2)		
Colombia																				
Published																				
13	Gomez-Restrepo et al. 2004[19g]	National (HHSRS)	2000–2001	DE**	CS	U	93.0	6116	59.7	≥18	ICD-10	CIDI		10.0 (9.2–10.7)		8.5 (7.8–9.2)		F: 12 (11–13) M: 6.2 (5.1–7.2)		F: 10.2 (9.2–11.1) M: 5.3 (4.4–6.3)
14	Posada-Villa et al. 2004[20]	National (NSMH2003)[i]	2003	MDD	CS	U	87.7	4544	56.2	18–65	DSM-IV	CIDI	12.1 (11.2–13.1)	5.6 (4.9–6.3)		1.9 (1.5–2.3)	F: 14.9 (13.5–16.3) M: 8.6 (7.4–9.8)	F: 7.3 (6.3–8.3) M: 3.5 (2.7–4.3)		F: 2.8 (2.2–3.4) M: 0.7 (0.3–1.1)
15	Bromet et al. 2018[7]	Medellín (MMHHS)[i]	2011–2012	MDD	CS	M	97.2	3261	61.3	19–65	DSM-IV	CIDI	9.9 (8.9–10.9)	3.8 (3.1–4.5)		1.4 (1.0–1.8)				
16	Torres de Galvis et al. 2014[21]	Itagüi (MHPSI)	2012	MD or dysthymia	CS	U	NR	642	55.5	19–65	DSM-IV	CIDI	9.2	2.9						
17	Gomez-Restrepo et al. 2016[22]	National (NSMH2015)[i]	2015	MDD or dysthymia	CS	M	NR	10,870	59.7	≥18	DSM-IV	CIDI	4.3 (3.7–5.0)	1.6 (1.3–1.9)		0.5 (0.3–0.7)	F: 5.4 (4.6–6.4) M: 3.2 (2.4-4.2)	F: 2.3 (1.8–2.9) M: 0.9 (0.6–1.3)		F: 0.8 (0.5–1.3) M: 0.2 (0.1–0.4)
Unpublished																				
18	Dirección Territorial Caldas[23]	Caldas	2009	MD**	CS	M	NR	1269	49.0	≥18	DSM-IV	MINI	19.5 (18.4–20.6)			9.7 (8.9–10.5)				
19	Torres de Galvis et al. 2018[24g]	Envigado[i]	2017	MDD	CS	M	NR	2072	53.3	15–65	DSM-IV	CIDI	6.4 (5.4–7.5)	2.4 (1.8–3.1)		0.9 (0.5–1.3)	F: 7.3 (5.8–8.9) M: 5.4 (4.0–6.8)	F: 2.9 (1.9–3.9) M: 1.9 (1.0–2.7)		F: 0.9 (0.4–1.5) M: 0.8 (0.2–1.4)
20	Torres de Galvis et al. 2018[25g]	Sabaneta[i]	2018	MDD	CS	M	NR	608	53.6	15–65	DSM-IV	CIDI	7.5 (5.4–9.5)	2.7 (1.4–4.0)		1.3 (0.4–2.2)	F: 11.0 (7.6–14.4) M: 3.4 (1.3–5.5)	F: 3.5 (1.5–5.5) M: 1.7 (0.2–3.3)		F: 2.5 (0.8–4.1) M: 0.0

(Table 1 continues on next page)

Study characteristics													% Prevalence (95% CI) [SE][d]							
Country ID	citation(s)	Location (Survey)	Period	Outcome[a]	Design[b]	Setting[c]	Response rate	Sample size	Women %	Age range (years)	Diagnostic criteria	Interview	Overall				By sex			
													L	12 m	6 m	C	L	12 m	6 m	C
(Continued from previous page)																				
21	Torres de Galvis et al. 2020[26g]	Medellin[i]	2019	MDD	CS	M	NR	2304	52.9	19–65	DSM-IV	CIDI	13.5	5.4						
Guatemala																				
Published																				
22	Puac-Polanco et al. 2004[27]	National (GNMHS)	2009	MDD	CS	M	87.3	1452	52.7	18–65	DSM-IV	CIDI	4.2 (3.2–5.3)							
Mexico																				
Published																				
23	Andrade et al. 2003[4]; Caraveo-Anduaga et al. 1999[28e,g]; Caraveo-Anduaga et al. 1999[29]; Caraveo-Anduaga et al. 2002[30]	Mexico City (EPM)[h]	1995	MDE; MD or dysthymia	CS	U	92.0	1734	56.8	18–54	DSM-III-R; ICD-10	CIDI	7.9	4.5 (3.5–5.5)		2.2 (1.5–2.9)	F: 10.0 (6.5–13.6) M: 5.5 (3.1–7.9)			
24	Salgado de Snyder et al. 1999[31]	Jalisco	1996–1997	MD or dysthymia	CS	R	NR	945	53.2	15–89	ICD-10	CIDI	6.2				F: 9.1 M: 2.9			
25	Slone et al. 2006[32]	National	1999–2001	MDD	CS	U	79.0; 82.0; 76.0; 70.0	2509	63.9	18–92	DSM-IV	CIDI	12.8 (11.4–14.2)	6.1 (5.1–7.1)	4.6 (3.8–5.4)		F: 15.9 (13.9–17.9) M: 9.0 (7.2–10.8)	F: 7.6 (6.2–9.0) M: 4.3 (3.1–5.5)	F: 5.7 (4.5–6.9) M:3.3 (2.2–4.4)	

(Table 1 continues on next page)

Study characteristics													% Prevalence (95% CI) [SE][d]							
Country ID	citation(s)	Location (Survey)	Period	Outcome[a]	Design[b]	Setting[c]	Response rate	Sample size	Women %	Age range (years)	Diagnostic criteria	Interview	Overall				By sex			
													L	12 m	6 m	C	L	12 m	6 m	C
(Continued from previous page)																				
26	Bromet et al. 2018[7]; Medina-Mora et al. 2003[33]; Medina-Mora et al. 2005[34]; Medina–Mora et al. 2007[35g]; Medina-Mora et al. 2008[36]; Kessler et al. 2010[37e,g]	National (M-NCS)[i]	2001–2002	MDD, MDE	CS	U	76.6	5826	52.4	18–65	DSM-IV ICD-10	CIDI	7.2 (6.5–7.9)	3.7 (3.2–4.2)		1.6 [0.2]	F: 9.7 (8.1–11.3) M: 4.6 (3.4–5.8)	F: 4.7 (3.6–5.9) M: 2.3 (1.4–3.2)		F: 0.5 [0.1] M: 0.2 [0.1]
Peru																				
Published																				
27	Bromet et al. 2018[7]; Fiestas et al. 2014[38g]; Piazza et al. 2014[39]	National (EMSMP)[i]	2004–2005	MDD	CS	U	90.2	3930	51.6	18–65	DSM-IV	CIDI	6.4 (5.6–7.2)	2.7 (2.3–3.1)		0.7 (0.4–1.0)				
Unpublished																				
28	NIMH, 2002[40]	Metropol. Lima	2002	DE*	CS	U	82.4	2077	59.7	≥18	ICD-10	MINI	18.2 (16.2–20.4)		9.5 (8.2–11.1)	6.6 (5.6–7.9)	F: 22.6 M: 13.5		F: 13.3 M: 5.6	F: 10.1 M: 3.0
29	NIMH, 2003[41]	Sierra	2003	DE*	CS	U	91.9	3895	51.4	≥18	ICD-10	MINI	16.2 (14.5–18.1)	7.2 (6.2–8.3)	5.8 (5.0–6.8)	3.5 (2.9–4.2)	F: 19.5 M: 12.8	F: 8.7 M: 5.7	F: 6.8 M: 4.8	F: 4.1 M: 2.8
30	NIMH, 2005[42]	Amazon	2004	DE*	CS	U	92.2	3909	53.2	≥18	ICD-10	MINI	21.4 (19.5–23.6)	8.2 (7.1–9.4)	5.8 (4.8–6.8)	2.1 (1.6–2.9)	F: 28.4 M: 13.5	F: 11.6 M: 4.2	F: 8.1 M: 3.1	F: 2.9 M: 1.2
31	NIMH, 2006[43]	Fronteras	2005	DE*	CS	U	92.5	5857	51.5	≥18	ICD-10	MINI	17.1 (15.6–18.6)	6.9 (6.0–7.9)	5.5 (4.7–6.4)	2.9 (2.3–2.5)	F: 21.8 M: 12.2	F: 9.1 M: 4.5	F: 7.3 M: 3.6	F: 3.7 M: 1.9
32	NIMH, 2007[44]	Costa	2006	DE*	CS	M	93.9	6555	50.1	≥18	ICD-10	MINI	14.1 (12.5–15.8)	5.8 (4.9–6.8)	4.5 (3.7–5.4)	1.5 (1.1–2.1)	F: 20.1 M: 8.0	F: 8.9 M: 2.7	F: 7.2 M: 1.7	F: 2.6 M: 0.4
33	NIMH, 2008[45]	Rural Lima	2007	DE*	CS	R	96.5	2536	49.3	≥18	ICD-10	MINI	15.8 (13.0–19.0)	4.0 (2.8–5.7)	3.0 (2.1–4.2)	1.5 (0.9–2.6)	F: 22.6 M: 9.1	F: 5.4 M: 2.6	F: 4.4 M: 1.6	F: 2.4 M: 0.7
34	NIMH, 2009[46]	Rural Sierra	2008	DE*	CS	R	94.8	3031	49.3	≥18	ICD-10	MINI	14.6 (12.7–16.7)	3.3 (2.5–4.2)	2.8 (2.1–3.7)	1.3 (0.8–2.0)	F: 16.9 M: 12.3	F: 3.8 M: 2.7	F: 3.3 M: 2.3	F: 1.3 M: 1.2
35	NIMH, 2012[47]	Rural Amazon	2009	DE*	CS	R	99.9	2331	47.2	≥18	ICD-10	MINI	14.2 (12.1–16.7)	4.1 (3.1–5.3)	2.8 (2.0–3.8)	0.6 (0.4–1.0)	F: 18.7 M: 10.2	F: 5.5 M: 2.9	F: 3.6 M: 2.1	F: 0.8 M: 0.4
36	NIMH, 2011[48]	Abancay	2010	DE*	CS	U	98.6	1746	52.6	≥18	ICD-10	MINI	14.8 (12.6–17.4)	3.9 (3.0–5.0)	2.5 (1.9–3.3)	0.8 (0.5–1.4)	F: 20.9 M: 8.1	F: 6.0 (4.5–7.8) M: 1.7 (1.0.2.9)	F: 4.6 M: 0.7	F: 1.3 (0.7–2.4) M: 0.3 (0.1–1.2)

(Table 1 continues on next page)

Study characteristics													% Prevalence (95% CI) [SE][d]							
Country ID citation(s)		Location (Survey)	Period	Outcome[a]	Design[b]	Setting[c]	Response rate	Sample size	Women %	Age range (years)	Diagnostic criteria	Interview	Overall				By sex			
													L	12 m	6 m	C	L	12 m	6 m	C
(Continued from previous page)																				
37	NIMH, 2013[49]	Metropol. Lima (R)	2012	DE*	CS	U	98.6	4445	52.0	≥18	ICD-10	MINI	14.5	5.3	3.9	2.5	F: 18.2 M: 10.4	F: 7.3 M: 3.1	F: 5.3 M: 2.4	F: 3.3 M: 1.6
38	NIMH, 2016[50]	Huánuco	2013	DE*	CS	U	94.7	1496	62.0	≥18	ICD-10	MINI	10.5	3.9	3.3	1.9	F: 16.1 M: 5.2	F: 6.6 M: 1.3	F: 5.8 M: 1.1	F: 3.3 M: 0.6
39	NIMH, 2016[51]	Cerro de Pasco	2013	DE*	CS	U	85.6	1469	66.4	≥18	ICD-10	MINI	14.4	4.9	2.9	2.0	F: 17.4 M: 10.4	F: 6.5 M: 2.8	F: 4.2 M: 1.2	F: 3.3 M: 0.4
40	NIMH, 2019[52]	Abancay (R)	2016	DE*	CS	U	92.6	1724	56.3	≥18	ICD-10	MINI		5.3 (4.0–6.9)		2.8 (1.9–4.1)		F: 7.8 (5.7–10.6) M: 2.6 (1.6–4.2)		F: 4.2 (2.7–6.6) M: 1.2 (0.6–2.5)

Studies are ordered alphabetically by country, then by publication status and then by year of survey. Abbreviations: AMHES (Argentina Mental Health Epidemiologic Survey); CIDI (Composite International Diagnostic Interview); CIS-R (Revised Clinical Interview Schedule); CPPS (Chile Psychiatric Prevalence Study); ECAS-SP (Epidemiologic Catchment Area Study in the city of Sao Paulo); EMSMP (Encuesta Mundial de Salud Mental en el Peru); ENS2016 (Encuesta Nacional de Salud 2016); EPM (Epidemiology of Psychiatric Comorbidity Project); GNMHS (Guatemala National Mental Health Survey); HHSRS (Health and Health System Responsiveness Survey); NSMH (Colombian National Study of Mental Health); M-NCS (Mexico National Comorbidity Survey); MHPSI (Mental Health Population Study Itagüí); MINI (Mini International Neuropsychiatric Interview); MMHHS (Medellín Mental Health Household Study); NIMH (National Institute of Mental Health Peru); NR (Not Reported); PBCS1982 (Pelotas Birth Cohort Study 1982); PBCS1993 (Pelotas Birth Cohort Study 1993); SMHS (Santiago Mental Disorders Survey); SPMHS (Sao Paulo Megacity Mental Health Survey). [a]MD (Major Depression); MD**(Mild, moderate or severe major depression); MDD (Major Depressive Disorder); MDE (Major Depressive Episode); DE (Depressive Episode); DE* (Moderate or severe depressive episode); DE** (Mild, moderate or severe depressive episode); DE**** (Single or recurrent mild, moderate or severe depressive episode). [b]Cross-sectional (CS); Longitudinal (L). [c]Mixed (M); Rural (R); Urban (U). [d]Lifetime (L); 12 months (12 m); 6 months (6 m); Current-period prevalence from 1-month to 1-week or point prevalence (C). [e]Citation not included in meta-analysis. [f]Citation only reporting age-specific prevalence estimates. [g]Citation reporting age-stratified estimates. [h]International Consortium of Psychiatric Epidemiology (ICPE) Surveys. [i]WHO World Mental Health Survey (WHO-WMHS) Consortium.

Table 1: **Characteristics of 40 studies included in the systematic review and meta-analysis.**

between countries was significant (Q_b (6) = 252.04; p < 0.0001; Fig. 2).

The pooled overall twelve-month ICD/DSM prevalence was 5.30% [4.55–6.06%] (32 studies, I^2 = 97.25%, p < 0.0001), country-specific pooled prevalence ranged from 4.30% [2.42–6.19] (8 studies I^2 = 98.54%, p < 0.0001) in Colombia to 8.11% [6.72–9.51] (5 studies I^2 = 85.21%, p < 0.0001) in Brazil, and the between-country difference was also significant (Q_b (5) = 45.69; p < 0.0001; Fig. 3).

The pooled current prevalence of ICD/DSM depressive disorder was 3.12% [2.22–4.03] (30 studies I^2 = 99.25%, p < 0.0001), and pooled country-specific prevalence ranged from 2.15% [1.38–2.91] (14 studies I^2 = 97.65%, p < 0.0001), in Peru to 5.48% [3.43–7.53] (5 studies I^2 = 97.05%, p < 0.0001), in Brazil, with significant between-country differences (Q_b (4) = 16.89; p < 0.0001; Fig. 4).

Lifetime, 12-month, and current prevalence of ICD/DSM depressive disorder was higher among women than men; 17.20% (15.02–19.37) *vs* 8.63% (7.37–9.90) for lifetime; 7.70% (6.51–8.88) *vs* 3.19% (2.65–3.72) for 12-months; and 4.49% (3.11–5.87) *vs* 1.76% (1.15–2.36) for current (Supplementary pp 53–55). Prevalence was also higher in urban versus rural settings for 12-month (5.77% [4.81–6.73] *vs* 3.75% [3.22–4.28]) and current (3.59% [2.47–4.72] *vs* 1.1% [0.56–1.65]) prevalence, but not for lifetime (Supplementary p 37). Estimates by age group were not pooled due to the large variety of age groups available, and visual inspection of results did not show a clear pattern (Supplementary pp 57–58). Evidence that publication status, diagnostic criterion or clinical interview used were associated with variations in the prevalence of ICD/DSM depressive disorder was only observed for lifetime but not for 12-month, or current prevalence (all p ≥ 0.18) (Supplementary pp 37–39).

Heterogeneity was high across prevalence periods (overall: I^2 ≥ 97.25% (Figs. 2–4); sex-specific: I^2 > 90.53% (Supplementary pp 53–55)). Heterogeneity within countries was also generally high (I^2 > 71.80%) except for current and 12-month prevalence in Mexico and Chile, respectively. The visual inspection of funnel plots showed asymmetry for lifetime, 12-month and current prevalence (Supplementary p 56), and Egger's regression tests suggest small-study effects for lifetime (p = 0.012), 12-month (p = 0.028), and current prevalence (p < 0.0001). Non-parametric trim-and-fill analysis of publication bias did not impute any study (Supplementary p 43).

Ecological association between macro-level indicators and prevalence of ICD/DSM depressive disorder in LATAM

HDI was negatively associated with the 12-month prevalence of ICD/DSM depressive disorder (β = −21.92 [95% CI −37.51 to −6.32], p = 0.0059, Fig. 5a), but not with the

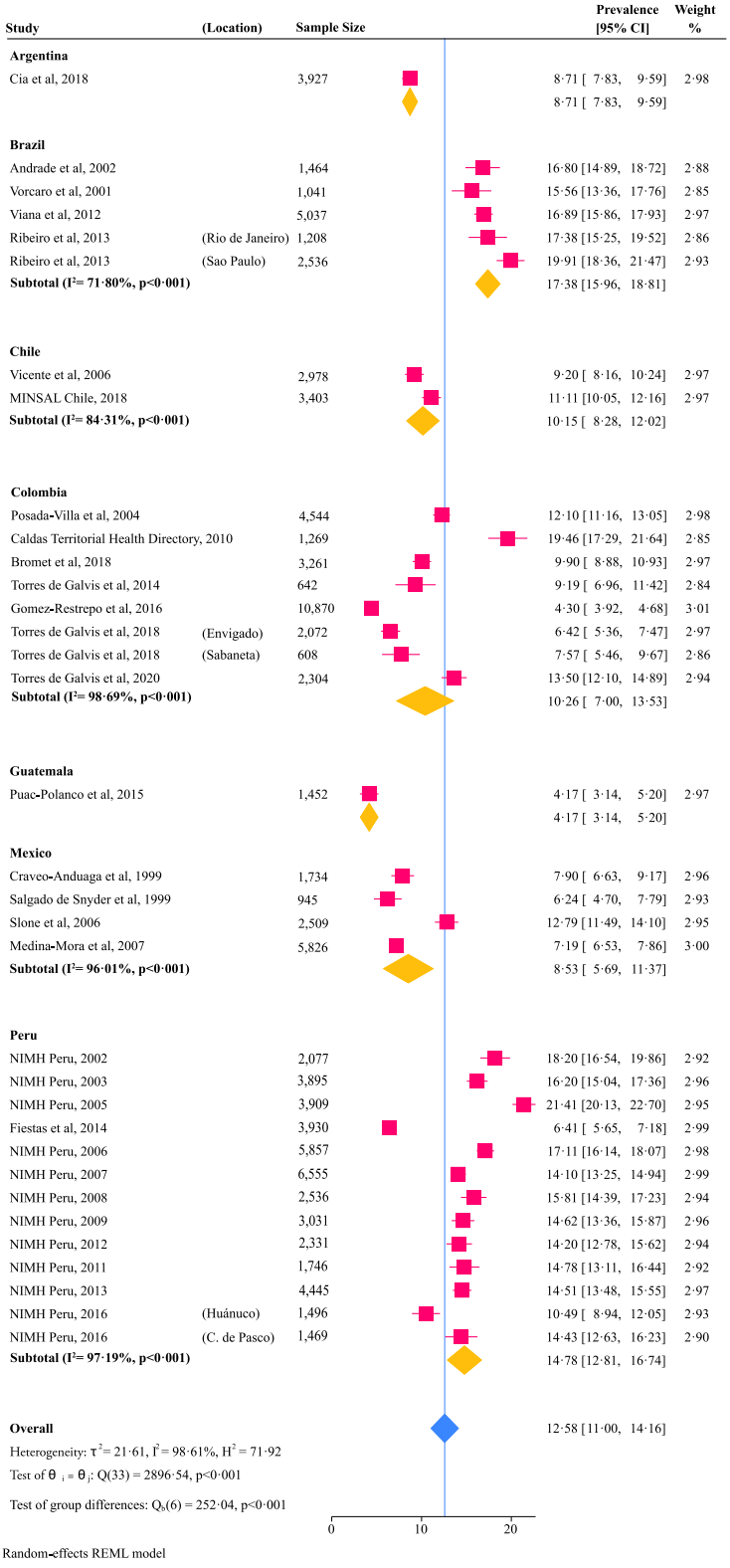

Fig. 2: Lifetime prevalence of ICD/DSM depressive disorder in Latin America by country.

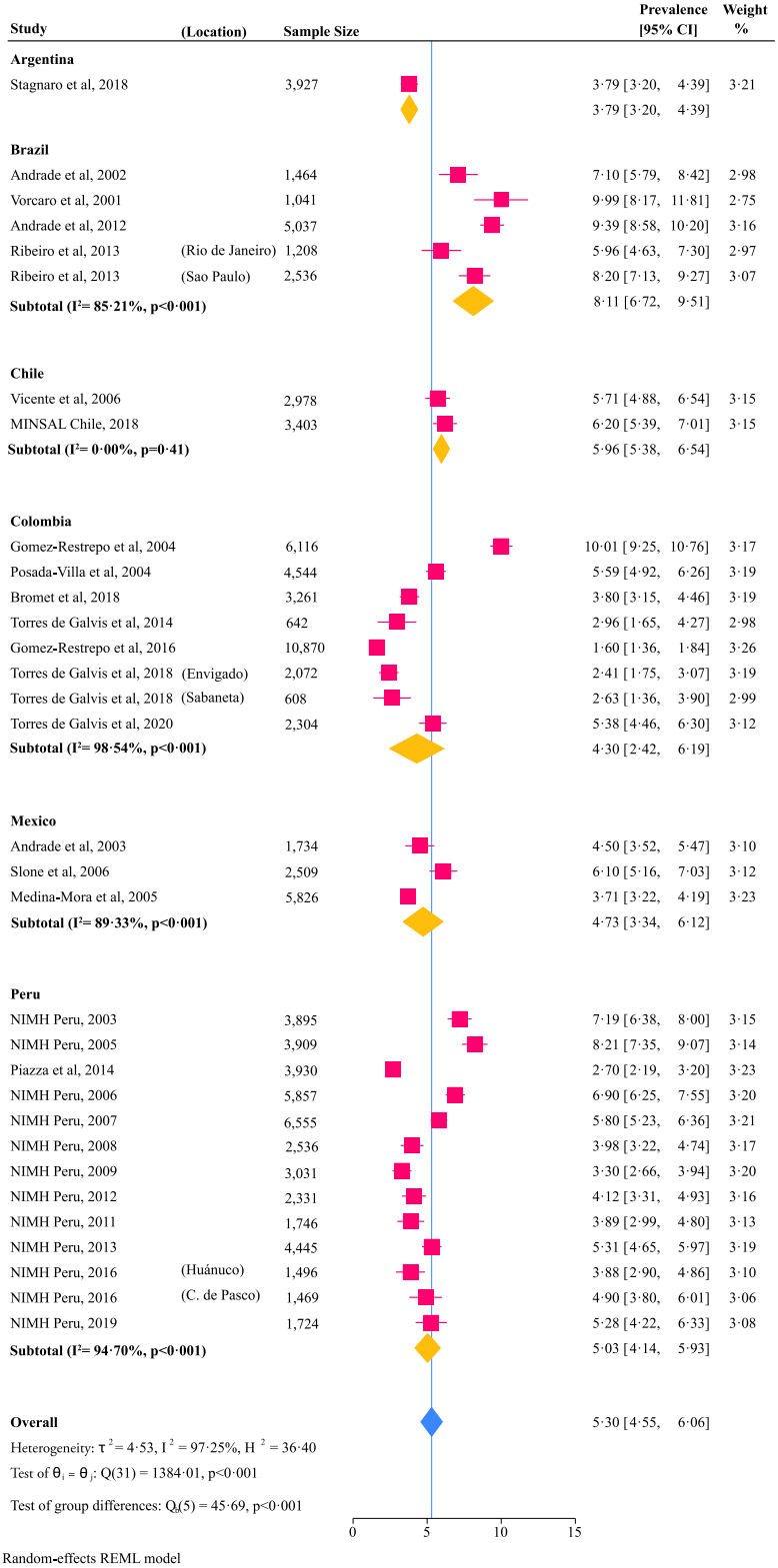

Fig. 3: 12-month prevalence of ICD/DSM depressive disorder in Latin America by country.

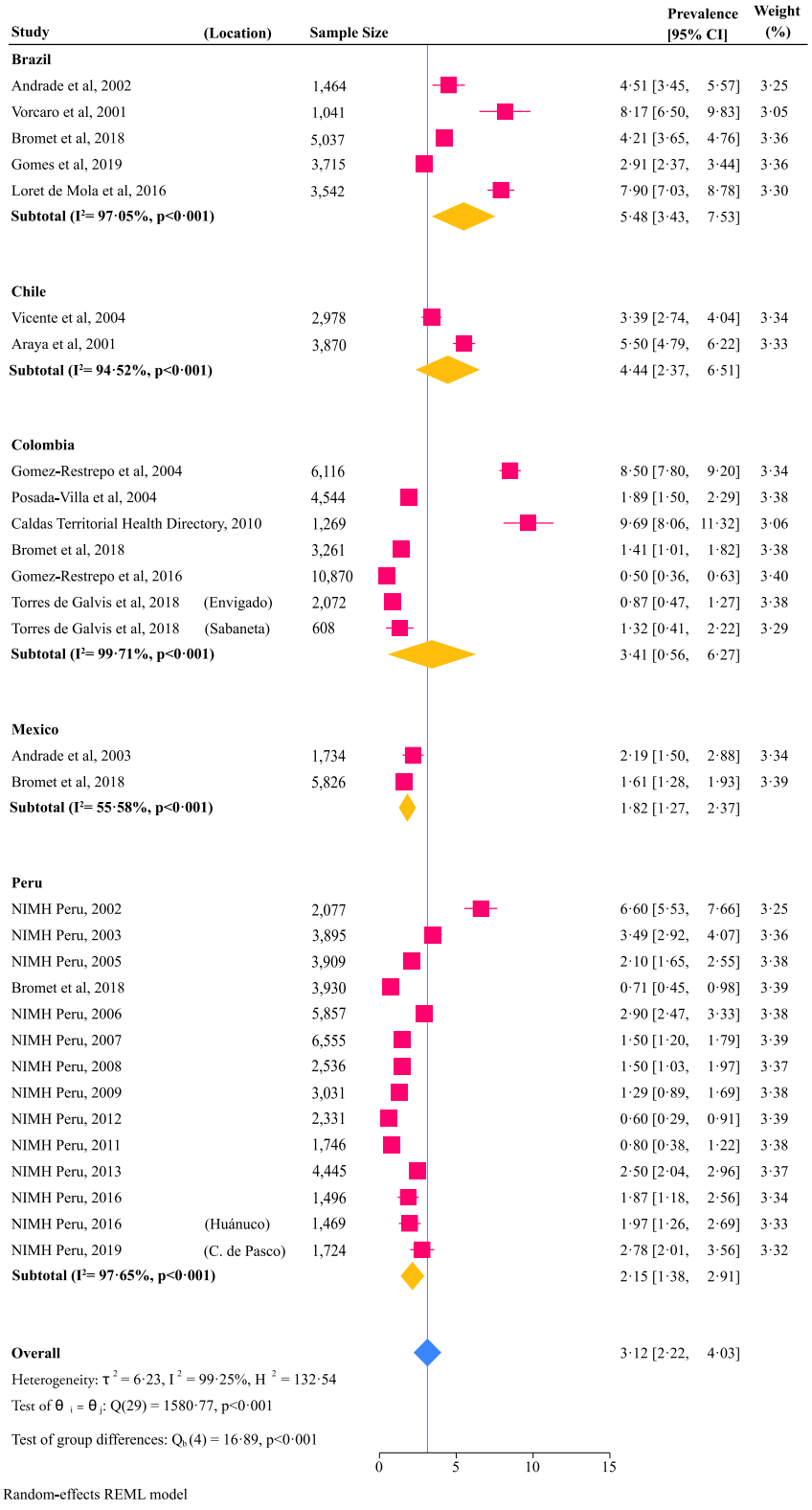

Fig. 4: Current prevalence of ICD/DSM depressive disorder in Latin America by country.

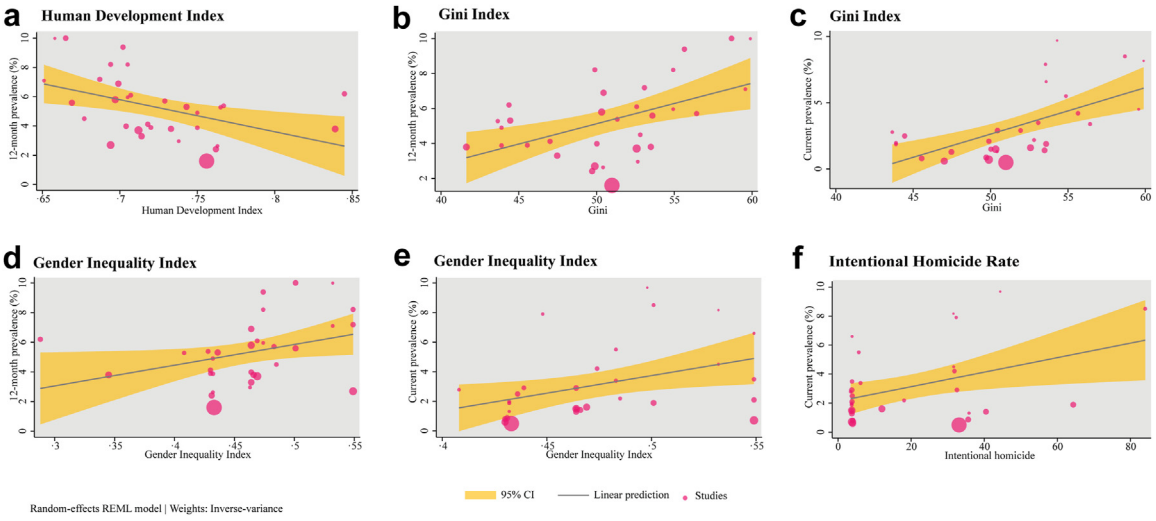

Fig. 5: Univariate analyses of prevalence of ICD/DSM depressive disorder as modulated by macro-level indicators.

current prevalence. Positive associations between prevalence of ICD/DSM depressive disorder and Gini and GII were observed in both prevalence periods. Higher Gini values were associated with higher 12-month (β = 0.23 [0.09–0.37], $p < 0.0001$, Fig. 5b) and current prevalence (β = 0.35 [0.19–0.51], $p < 0.0001$, Fig. 5c), and higher GII with higher 12-month (β = 13.98 [0.56–27.40], $p = 0.041$, Fig. 5d), and current prevalence (β = 23.71, [3.47–43.95], $p = 0.022$, Fig. 5e). IHR was only associated with current but not 12-month ICD/DSM depressive disorder (β = 0.05 [0.01–0.09], $p = 0.016$, Fig. 5f) (Supplementary p 45).

The principal component of ecological indicators for 12-months prevalence, which accounted for 69% of the variance, was significantly associated with 12-month prevalence of ICD/DSM depressive disorder (β = 0.71 [0.24–1.19], $p = 0.0030$; see Supplementary pp 46–47). For current prevalence, the principal component accounted for the 62% of the variance and was significantly associated (β = 0.89 [0.39–1.40], p = 0.00056, for details see Supplementary p 48).

Discussion

The present review provides an up-to-date and comprehensive synthesis of the regional, country, and sex-specific prevalence of ICD/DSM depressive disorder among adults in the community in LATAM prior to the COVID-19 pandemic. Using data from 40 studies, we found that between 1992 and 2019, one out of eight people in LATAM met ICD/DSM criteria for depressive disorder throughout their lifetime, while one out of twenty and one out of thirty-three did in the 12 months and one month prior to assessment, respectively.

According to GBD estimates, regions of LATAM rank among the highest in aggregates of mental disorder,[2] and previous systematic reviews have highlighted the higher prevalence of depression in South America compared to other regions of the world.[23,43] In the present study, we found partial evidence to support that prevalence of ICD/DSM depressive disorder in LATAM is higher than global estimates.

Our lifetime prevalence of depressive disorder (12.58%) falls within the confidence interval of the global lifetime prevalence reported in a systematic review of 13 studies in 8 countries by Lim et al. (10.8% [95% CI: 7.8–14.8])[23] However, it is worth noting that higher income is often associated with a higher prevalence of MDD,[6] and that the countries in Lim et al.'s review were notably richer than LATAM countries.

Our 12-month prevalence (5.30%) is similar to global 12-month MDD estimates reported in the World Health Survey[24] (4.9% [3.6–6.2]) and in a systematic review of 47 studies by Ferrari et al. (3.7% [2.7–5.0]).[103] It falls within the confidence intervals of global estimates of 12-month prevalence among adults (Lim et al.[23]: 7.2% [4.8–10.6]) and adolescents (Shorey et al.[25] 8.0% [5.0–12.0]) based on data from 9 to 8 studies, respectively. However, the World Health Survey and the Ferrari et al.'s and Lim et al.'s reviews did not exclude studies using self-report scales, unstructured interviews, and the CIDI short version, which may overestimate major depression by two to three times[23,43,104] and the Shorey et al. review only included studies conducted in high-income countries, which in the WHO-WMHS presented higher prevalence of 12-month MDD relative to the low-income countries.[6]

Our current prevalence of 3.12% is lower than the global current estimates of MDD and depression among adults (Ferrari et al.[43]: 4.7% [3.7–5.5]; Baxter et al.[41]: 4.0% [3.7–4.2]); Lim et al.[23] (12.9% [11.0–15.1]) and adolescents (Shorey et al.[25]: 8.0% [2.0–13.0]) reported in available systematic reviews. It is also lower than the

estimated current prevalence of ICD-10 depressive episode in LATAM reported in the 10/66 study (5.4%).[15] However, direct comparisons with these reviews are complicated as the adult reviews mainly include studies using symptom-based self-report measures,[41,43] which tend to largely overestimate prevalence and the adolescent review focused on the age group presenting the highest prevalence of MDD in the WHO-WMHS when only analysing high-income countries. A comparison with the regional estimate from the 10/66 study is also complicated as it only studies the population aged 65 years or more and evidence from the WHO-WMHS suggests that in LMICs, the prevalence of MDD is highest in the oldest age cohort (i.e., 60+ years).[6]

Taken together, the evidence suggests that using the same inclusion criteria and assessment methods and adjusting for income, our estimates for ICD/DSM depressive disorder in LATAM may be higher than global estimates from systematic reviews, but more mental health research in the region would allow a more definite conclusion.

When comparing our results to findings from the WHO-WMHS,[6] the most comparable cross-national study available which produced global lifetime (10.6%), 12-month (4.5%), and 1-month (1.5%) prevalence estimates of MDD as well as lifetime (9.2%), 12-month (4.6%), and 1-month (2.0%) prevalence estimates for upper middle-income countries, our estimates for LATAM also appear elevated. However, it is noteworthy that in our subgroup analyses, estimates of lifetime prevalence for studies using DSM-IV (11.0%) and the CIDI (10.6%) were significantly lower than for studies using ICD-10 (14.5%) and the MINI (15.8%), and closer to WHO-WMHS[6] global lifetime estimates. This highlights the importance of considering these methodological features when interpreting differences in lifetime prevalence.

The results underscore the importance of heterogeneity. Our study revealed substantial heterogeneity across different prevalence period as well as variations based on sex, country, diagnostic criterion, and clinical interview category. Considering that only studies which defined depressive disorder according to a structured clinical diagnostic interview were included, the observed between-study variations may partially reflect true heterogeneity across studies settings in LATAM.[36] However, several factors may affect the prevalence of depressive disorder.[1,4]

Socioeconomic characteristics,[5–10] such as income, income inequality, education, and unemployment opportunities, have been identified as significant factors affecting the prevalence of depressive disorders. Disparities in the healthcare system, including limited availability and quality of mental health services and professionals, as well as underfunding and fragmented health systems, can impede timely and effective prevention and treatment efforts.[16] Societal factors, such as cultural norms and beliefs that stigmatize mental health reporting and symptoms, interpersonal violence and crime,[8,19,20,105] age,[11–15] and gender norms,[5,17,18] including gender inequalities and barriers to healthcare and mental health services, may also play a crucial role. Additionally, other factors such as urbanization or migration[11,106,107] may result in social isolation, increased, discrimination, or differential access to healthcare services, which can impact the prevalence of depressive disorders within the population. Regrettably, due to data limitations, we were unable to systematically test most of these factors, with the exception of the increased prevalence of depressive disorders in urban, relative to rural catchment areas, which is consistent with findings from Peru and Mexico in the 10/66 study.[14] Addressing these knowledge gaps would enable the development of targeted interventions and strategies to understand and effectively manage the heterogeneity in depressive disorder prevalence."

Our overall results show that levels of HDI, Gini, and GII strongly relate to the 12-month and current prevalence of ICD/DSM depressive disorder in the region as do IHR levels with the current prevalence. These findings are consistent with evidence from ecological studies primarily conducted in high-income countries,[18,21] and systematic reviews[7,19] with few LATAM countries included. Our finding of a positive association between current prevalence of depressive disorder and context levels of intentional homicide are also consistent with the elevated prevalence of depression observed in conflict settings.[20] They shed light on the importance that changes in human development, income, and gender inequality, and intentional homicide rates in LATAM possibly had on the overall prevalence of depressive disorder between 1992 and 2019.

Differences between our findings and previous research not reporting association[24] or reporting a reversed pattern[22] of association between HDI and prevalence of ICD/DSM depressive disorder shed light on a specific human development pattern observed for 12-month prevalence of ICD/DSM depressive disorder in a thirty-year period in LATAM that may be masked in global cross sectional analyses. It is important to note these differences may also be partly explained by methodological differences in design, case definition and assessment method. The prevalence may be smaller when using a narrower definition of depressive disorder (i.e., according to a classification system and assessed using a clinical interview).

The results of the present study fill a key knowledge gap about the prevalence of ICD/DSM depressive disorder in a highly populous and understudied region of the world, a region where the mental health of its populations has been notably impacted by the COVID-19 pandemic. Combining a comprehensive search strategy, clear inclusion criteria, critical appraisal of studies

and the use advanced meta-analytic techniques, our study provides ICD/DSM depressive disorder prevalence estimates for LATAM using data from a larger number of studies than previously systematized, allowing for systematic comparisons within and outside the region. The analytic strategy to predict prevalence based on country-level data also provides evidence of the adverse association of low human development, high income and gender inequality, and IHR with ICD/DSM depressive disorder. The results also underscore the stronger association between Gini and prevalence of ICD/DSM depressive disorder in the region, compared to the other macro-level development and violence indicators assessed.

This study has several limitations. First, the heterogeneity across meta-analyses was high despite the effort invested in the methodological homogeneity of included studies and the strict inclusion criteria. Second, the absence of data from 13 LATAM countries (representing 21% of the region's population) limits the generalizability of our findings to the whole Central America subregion and the LATAM region in general. Unrepresented countries of LATAM have, on average, lower levels of income, expenditure on mental health, human development (i.e., HDI), income inequality (i.e., Gini), and violence (i.e., IHR) and higher gender inequality (i.e., GII) than represented countries, highlighting existing regional differences (Supplementary pp 35, 52). Third, most studies in our review were conducted in urban settings, which may affect the generalizability of the results. Compared to urban communities, rural communities may be systematically different in characteristics that affect the prevalence of depressive disorder, including limited access to mental health services, lower socioeconomic resources, agricultural or labour-related stressors, social isolation, and different social norms. Incorporating rural communities or marginalized populations into research studies may provide a more accurate characterization of depression in the region. Finally, human development, inequality and violence were measured at an aggregate level, so the study's results cannot be used for causal relationships and should be carefully interpreted at the individual level, to avoid ecological fallacies.

From a public health perspective, limitations in the number and geographic spread of population-representative depressive disorders prevalence studies in LATAM demonstrate the need for mental health research capacity building in the region. Research-generated information about the rates of mental disorders in LATAM is crucial for governments to establish the health needs of the population, define research priorities, improve health policies, track health progress, and assess the impact of public health interventions targeted at improving population mental health.

Contributors

AE and PBJ conceived and designed the project. PBJ and EAU provided supervision to AE. AE designed the regional grey literature search, carried out the database searches and the screening process, prepared data for analyses, provided supervision to DA and research assistants, drafted the manuscript, administrated the project, and acquired the funding. DA carried out the grey literature search, provided methodological guidance and supervision to research assistants, quality scored all citations, produced figures and contributed to the original manuscript. JPRM carried out statistical analyses. EAU, RT, and NAC contributed to the interpretation of the data for the manuscript. PBJ and AE resolved conflicts regarding the inclusion of studies. All authors reviewed the study findings, critically revised the manuscript at all stages, and approved the final version before submission.

AE and DA accessed and verified the data and AE was responsible for the decision to submit the manuscript.

Data sharing statement

The study protocol is publicly available at PROSPERO, CRD42019143054. The data used for this meta-analysis will be made available on request to the corresponding author.

Editor note

The Lancet Group takes a neutral position with respect to territorial claims in published maps and institutional affiliations.

Declaration of interests

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Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.lana.2023.100587.

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