BMJ Open

How do migrants living with HIV adhere to the HIV care process in high-income countries? A systematic review

Jeanne Goupil de Bouillé ,[1] Clément Pascal,[2] Baptiste Voyer,[3] Jérémy Zeggagh,[3] Yousra Kherabi,[3] Vincent de Andrade,[4] Lou Macaux,[3] Héloïse Delagreverie,[3] Rémi Gagnayre,[4] Olivier Bouchaud,[3] Nicolas Vignier[3]

To cite: Goupil de Bouillé J, Pascal C, Voyer B, *et al*. How do migrants living with HIV adhere to the HIV care process in high-income countries? A systematic review. *BMJ Open* 2025;**15**:e093620. doi:10.1136/bmjopen-2024-093620

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2024-093620).

Received 11 September 2024
Accepted 03 April 2025

[1]APHP, Bobigny, France
[2]CHOG, Saint-Laurent-du-Maroni, France
[3]AP-HP, Paris, France
[4]Université Sorbonne Paris Nord, Villetaneuse, France

Correspondence to
Dr Jeanne Goupil de Bouillé; jeanne.goupil@aphp.fr

ABSTRACT

Background In high-income countries (HICs), migrants living with HIV (MLHIV) are more likely than other HIV subpopulations to encounter problems which hamper their adherence to the care process; these include social and administrative insecurity, discrimination and psychological distress.

Objective This systematic review aimed to determine the specific features of adherence to the HIV care process among MLHIV in HIC.

Method Three researchers independently selected studies from a search for papers focusing on empirical studies on MLHIV's adherence to the care process in HIC, published between 1 January 2010 and 1 November 2024 in the following databases: MEDLINE, Embase, CINAHL, PsycINFO and Google Scholar. The three dimensions evaluated for adherence to the care process were adherence to treatment, retention in care and virological response. HICs were characterised according to the World Bank's definition.

Results Of 601 studies screened, 69 were included (26 (38%) analysing treatment adherence 44 (64%) 44 (64%) retention in care and 34 (48%) virological response). In 49 (71%) of these studies, MLHIV from sub-Saharan Africa accounted for the majority of persons included. MLHIV were mainly categorised according to their geographical region of origin. Only one study considered the reasons for migration. Of 52 statistically significant associations, only five found that being a migrant (vs being a non-migrant) was associated with a better HIV care process. Moreover, several individual (sociodemographic, clinical and psychological), and structural (care system organisation and political) factors associated with difficulties in adhering to the HIV care process were identified.

Discussion MLHIV living in HIC had poorer adherence to the HIV care process for all three dimensions studied (ie, treatment adherence, retention in care and virological response). Research studies categorise MLHIV according to their geographical origin. However, this type of categorisation does not adequately capture social inequalities in health. To overcome this, studies must instead categorise MLHIV according to various intersecting factors, including, among other things, their reason for migrating, the length of time living in the destination country and violence experienced during their migratory journey.

PROSPERO registration number CRD42021253280.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This review provides a complete perspective of three dimensions (treatment adherence, retention in care and virological response) of adherence to the care process.
⇒ We studied the association between being a migrant living with HIV in high-income country and determinants of impaired and good adherence to the care process.
⇒ Bias was limited as much as possible by double-screening articles and assessing article quality.
⇒ Estimates for associations in the results are difficult to interpret because of the large heterogeneity in the reference and migrant groups.
⇒ This systematic review highlights the need to diversify the categorisation of migrants in research studies on HIV's adherence to the care process in order to better understand social inequalities in health.

INTRODUCTION

In 2020, globally, there were an estimated 281 million international migrants, representing 3.6% of the world's population; this figure is expected to rise in the coming years.[1] Migrants are particularly exposed to social and administrative insecurity, discrimination and psychological distress.[2] Often, the factors involved are intersectional. For example, a lack of housing and not having a residence permit intersect with greater vulnerability to sexual violence and an increased risk of HIV infection.[3] In addition, international migrants may have less access to healthcare and HIV prevention services. Moreover, those with HIV face greater difficulties in adhering to the care process.[4–6]

HIV prevalence is higher in low-income countries, especially in sub-Saharan Africa.[7] In Europe, the 2022 European Centre for Disease Control and Prevention (ECDC) report showed that 11 103 diagnoses were reported among people originating from outside of the reporting country. People coming from sub-Saharan

Africa accounted for an additional 13.9% of diagnoses with known region of origin (2781).[8] Migrants living with HIV (MLHIV), therefore, constitute a key HIV population in high-income countries (HICs).[3 9 10] The new United Nations AIDS Immuno Deficiency Syndrome Global AIDS Strategy focuses on addressing inequalities that drive the HIV pandemic.[11] Accordingly, in order to develop appropriate care, data collection and analysis regarding social inequalities is an essential first step. Research highlights that MLHIV require tailored HIV care because of social vulnerabilities, language barriers and different cultural contexts.[12] Although several systematic reviews have looked at barriers and facilitators in the HIV care process for MLHIV living in HIC, all have focused on the issue of HIV screening.[13–15] None investigated the specific purpose of the care process or the importance of the sociopolitical setting.

In this context, we performed a systematic review to determine the specific features of adherence to the HIV care process among MLHIV living in HIC. We defined adherence to the HIV care process in terms of three dimensions: adherence to treatment, retention in care, and, indirectly, virological response. Each of these three dimensions was studied along with its positive and negative counterparts: treatment adherence/non-adherence, retention in care/loss to follow-up, virological suppression/virological failure.

METHOD

In order to be as exhaustive as possible in terms of the existing literature, we carried out a mixed-methods systematic review[16] which addressed two related questions:

PICO question 1:

1. Do different categories of MLHIV have different levels of adherence to the HIV care process in HIC?
   - Population: People living with HIV in HIC.
   - Comparator: People living with HIV born in HIC (ie, non-migrants).
   - Intervention or exposure: Being a migrant.
   - Outcomes: Adherence to the HIV care process.

PICO Question 2:

2. What are the barriers and facilitators to adherence to the HIV care process among MLHIV living in HIC?
   - Population: MLHIV living in HIC.
   - Comparator: None.
   - Intervention or exposure: Adherence to the HIV care process.
   - Outcomes: Barriers and facilitators to adherence to the HIV care process.

Intervention models for adherence to the HIV care process were not included in the analysis but are detailed in the online supplemental appendix (S1).

Population

For the present review, the term migrant was defined as a person born in a country not included as an HIC in our study. We chose to consider articles focusing on MLHIV living in the following HICs: the USA, Canada, all countries in Europe, Australia, Israel and Japan. All are classified as HIC according to the World Bank Definition.[17] Our review focused on both documented and undocumented migrants.

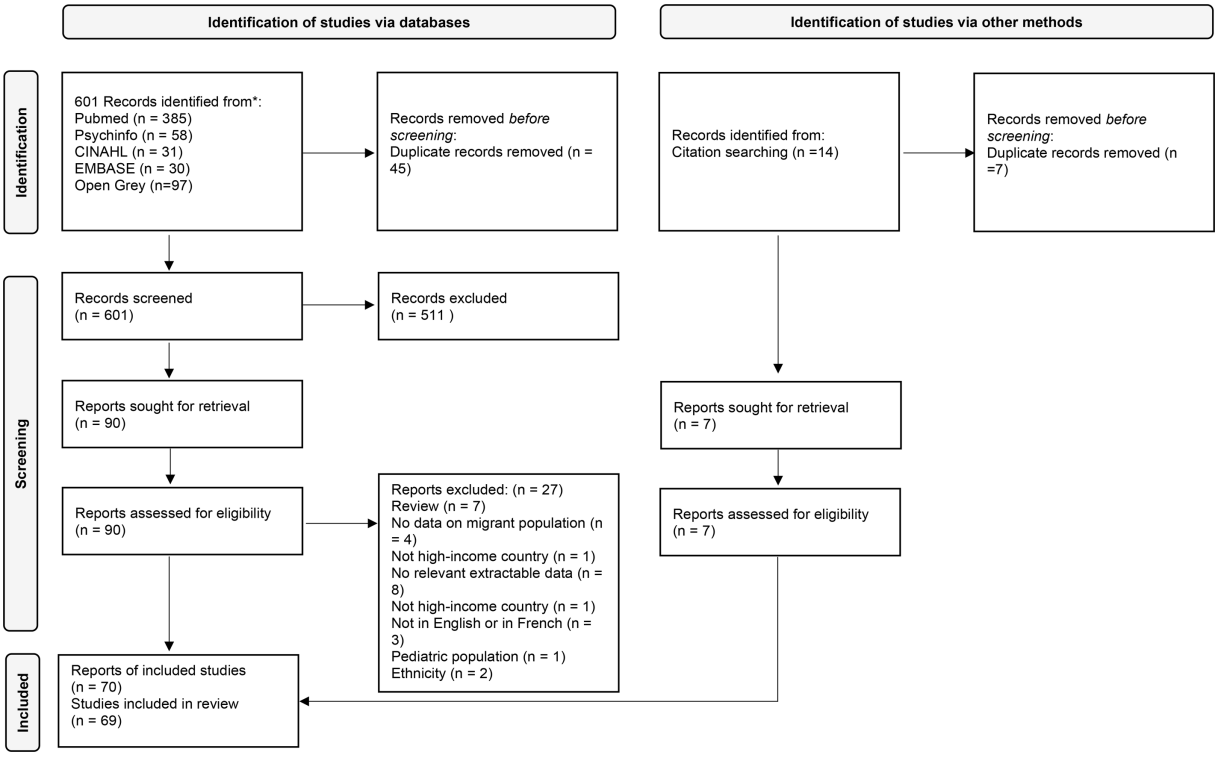


Figure 1 Systematic reviews flow diagram of studies on migration and HIV care pathway.

Table 1 Description of studies on migration and HIV care pathways included in the systematic review

		N=69	%
Study design	Cohort study (five cohorts on mandatory reporting data)	47	68
	Cross-sectional epidemiological study	11	16
	Qualitative study	11	16
Place where study was performed	Europe	40	58
	USA	20	29
	Australia	2	3
	Canada	4	6
	Other	3	4
Place of origin	Africa	49	71
	Caribbean	24	35
	Southeast Asia	14	20
	South America/Central America	30	43
	Not specified	27	39
Administrative status	Undocumented only	3	4
	Documented only	1	1
	Undocumented and documented	6	9
	Not specified	59	86
PICO questions	PICO question 1: Categories of MLHIV and their adherence to the HIV care process in HIC	38	41
	PICO question 2: Among migrants, study of the factors associated with adherence to care process	28	55
	These two subjects	3	4
Adherence to care process	Adherence to HIV treatment	26	38
	Virological response	34	48
	Retention in care/loss to follow-up	44	64
Number of participants (median, IQR)	Quantitative studies	987 (235–6591)	
	Qualitative studies	40 (23–47)	

HIC, high-income country; MLHIV, migrants living with HIV.

Inclusion criteria

We included papers on empirical studies focusing on the three dimensions of adherence to HIV care process in MLHIV living in HIC as outlined above (ie, treatment adherence, retention in care and virological response). For the quantitative component, we included cross-sectional studies, longitudinal studies and intervention studies reporting baseline data.

For the qualitative component, we included studies that used (1) qualitative research designs (eg, ethnography, grounded theory approach), (2) qualitative data collection methods (eg, focus groups, individual interviews, observations) and (3) qualitative data analysis methods (eg, thematic analysis, framework analysis).

Exclusion criteria

Commentary and editorial studies, case reports and studies focusing on racial statistics without specifying migratory background, as well as studies exploring child populations, were all excluded. Studies on migrants who had become citizens of their new country of residence were also excluded.

Study eligibility

All quantitative and qualitative studies in inpatient and outpatient settings were eligible for inclusion.

Search strategy

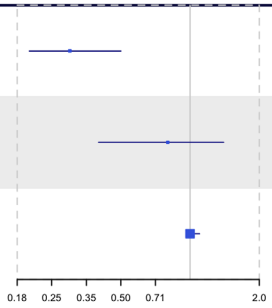
We performed a search on four peer-reviewed literature databases (MEDLINE, Embase, CINAHL and PsycINFO) through PubMed using the following comprehensive research equation ((*"HIV"[MH] OR "HIV"[TIAB]) AND ("Treatment Failure"[MH] OR "Treatment Failure"[TIAB] OR "treatment refusal"[MH] OR "treatment refusal" [TIAB] OR "treatment adherence and compliance" [MH] OR "treatment compliance" [TIAB] OR "treatment adherence" [TIAB] OR "Retention in care" [MH] OR "Retention in care" [TIAB] OR "Treatment outcome" [MH] OR "Treatment outcome" [TIAB] OR "Lost-to follow up" [MH] OR "Lost-to follow up" [TIAB] OR "Continuity of Patient Care"[MH] OR "Continuity of Patient Care" [TIAB]) AND ("transients and migrants"[MH] OR transient* [TIAB] OR migrant*[TIAB] OR "refugee*" [MH] OR "refugee*" [TIAB] OR "emigrants and immigrants » [MH] OR «emigrants »[TIAB] OR "immigrant*" [TIAB] OR « emigration and immigration »[MH] OR "emigration"[TIAB] OR "immigration" [TIAB] OR "asylum seeker*" OR "asylum seeker*"[TIAB]*)). The research equation was developed in collaboration with specialists in infectious diseases and a documentary researcher from a public health laboratory. Grey literature was explored using Google Scholar in order to minimise loss of relevant resources. The online supplemental appendix provides the complete research equation for the various databases.

Additional relevant papers, including reviews, were identified by manually searching the reference sections of publications included after full-text screening. Conference abstracts where a full report of the relevant study was available were considered.

We limited searches to articles in French and English language, as these are the two languages the three evaluators (CP, JGdB and JZ) were most familiar with. Furthermore, in order to find a good balance between studies reflecting the current sociopolitical context and not being too restrictive, we limited our search to studies

A

Study	Mig. group	N mig.	Ref. group	N ref.	OR	RR
Keiser,2012	Single mig.	444	Older gay M.	1568	0.3[0.2-0.5]	
Keiser,2012	Mig. W. in partnership	406	Older gay M.	1568	0.8[0.4-1.4]	
Ross,2017	Undocumented immig.status	173	Documented immig.status	7378		1.0[1.0-1.1]



B

Study	Mig. group	N mig.	Ref. group	N ref.	OR	IR
Sumari-de Boer,2011	Immigrant origin	112	Indigenous dutch	89	2.2 [1.2-4.2]	
Roux,2018	SSA women	418	SSA immigrant : No	2101	1.9[1.2-3.0]	
Roux,2018	SSA male	249	SSA immigrant : No	2101	0.5 [0.2-1.1]	
Castelan-UNA,2023*	Africa	19	Native	35	1.0 [0.3-3.4]	
	Suriname and Na	9	Netherlands	35	0.4[0.0-4.4]	
	Europe	10	Netherlands	35	0.9 [0.2-4.0]	
	Other	6	Netherlands	35	3.6[0.4-34.7]	
Castelan-INA,2023*	Africa	19	Netherlands	35	2.7[0.5-13.9]	
	Suriname and Na	9	Netherlands	35	9.7 [1.4-68.8]	
	Europe	10	Netherlands	35	0.9 [0.1-9.5]	
Krankowska,2024	Migrants	7	Migrant: no	155	3.3[0.3-33.3]	
Saracino, 2016	Migrants	1175	Dutch	4598		1.2[1.0-1.3]

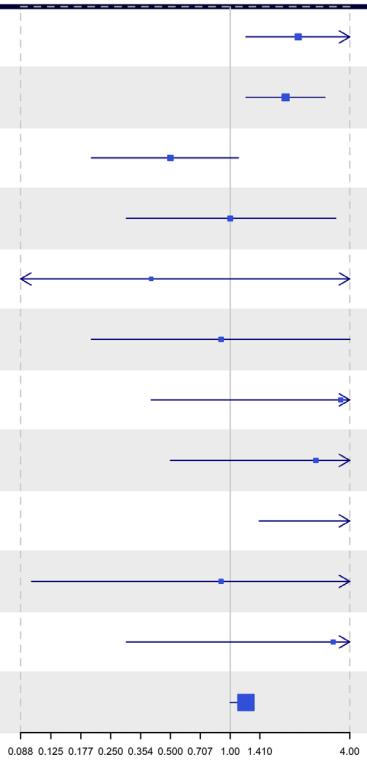


Figure 2 Adherence (A) and non-adherence (B) to antiretroviral therapy among migrants and non-migrants LWH in the high-income countries (adjusted OR, adjusted incidence ratio (IR), adjusted relative risk (RR) and 95% CI). Figures have been rounded off to the decimal point. *Unadjusted. IR, incidence ratio; LWH, living with HIV; M, men, Mig., migrants; Ref, reference; RR, relative risk; SSA, sub-Saharan Africa; W, women.

published between 1 January 2010 and 1 November 2024. The review protocol is registered in PROSPERO, number CRD42021253280.

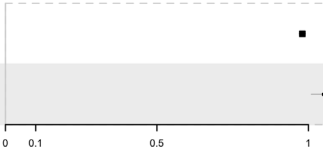
Data screening and extraction

All records were imported into Covidence systematic review software (Veritas Health Innovation) and duplicates were removed. The results are reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines for systematic reviews.[18] Two researchers (CP and JGdB) screened titles and abstracts independently. Screened references were selected for full-text review if the title or abstract suggested that the document might contain relevant information. One researcher (JGdB) screened 100% of the references. Another (YK) screened 80% of them, while a third (JZ) screened the remaining 20%. Disagreements were resolved by a fourth researcher (NV).

JGdB used a dedicated form on Covidence to extract the following summary data: study type, place where study was performed, study aim, study definition of a migrant,

A

Study	Migr. group	N migr.	Ref. group	N ref.	RR
Gebreegziabher,2020	Foreign born	359	US born	876	0.98 [0.97-1.01]
Ross,2017	Undocumented immigr.status	173	Documented immigr. status	7378	1.05 [0.99-1.10]



B

Study	Mig. group	N mig.	Ref.group	N ref.	OR	HR	IR
Van Beckhoven,2015	SSA	3242	Belgian	4210	1.5[1.2-1.9]		
Tariq,2016	SSA born W.	845	White UK born W.	726	2.2[1.5-3.1]		
Cyrus,2017	Bahamas	265	Non-hispanic whites	14249	3.1[2.4-4.1]		
	Haïti	4491	Non-hispanic whites	14249	1.5[1.4-1.7]		
	Jamaïca	701	Non-hispanic whites	14249	1.1[0.9-1.3]		
	Trinidad and Tobago	70	Non-hispanic whites	14249	2.3[1.4-3.8]		
	Other caribbean	122	Non-hispanic whites	14249	1.9[1.3-1.8]		
Sheehan,2017	Puerto Rico	1153	Born in US latinos	4276	1.0[0.9-1.2]		
	Mexico	842	Born in US latinos	4276	2.0[1.7-2.4]		
	Cuba	2618	Born in US latinos	4276	0.5[0.4-0.6]		
	Central America	1284	Born in US latinos	4276	1.3[1.2-1.5]		
	South America	1933	Born in US latinos	4276	1.1[1.0-1.3]		
Parisey,2019	NA origin	285	France origin	550	1.2[0.6-2.1]		
Teira,2019	Immig.	1956	No-immig.	12767	1.7[1.5-2.0]		
Gagliardini,2024	Mig.	297	No-Mig.	1517	1.8[1.5-2.2]		
Thierfelder,2011	SSA W.	728	NW regions W.	1256		1.6[1.3-2.0]	
	Southern Europe W.	104	NW regions W.	1256		1.4[1.0-2.0]	
	LAC W.	117	NW regions W.	1256		1.5[1.0-2.1]	
	Southeastern Asia W.	151	NW regions W.	1256		0.8[0.5-1.3]	
	EE /Central Asia W.	48	NW regions W.	1256		1.0[0.5-1.9]	
	NA/ Middel East W.	24	NW regions W.	1256		0.4[0.1-1.8]	
	SSA M.	375	NW regions M.	4027		2.8[2.3-3.5]	
	Southern Europe M.	518	NW regions M.	4027		1.3[1.1-1.7]	
	LAC M.	189	NW regions M.	4027		1.8[1.3-2.5]	
	Southerstern asia M.	100	NW regions M.	4027		1.3[0.8-2.0]	
	EE/ Central asia M.	1126	NW regions M.	4027		1.7[1.2-2.5]	
	NA/Middle east M.	77	NW regions M.	4027		1.8[1.2-2.7]	
Keiser,2012	Single migr.	444	Older gay M.	1568		1.8 [1.0-3.1]	
	Mig. W.in partnership	406	Older gay M.	1568		1.0[0.5-1.9]	
Fournier,2019	Born in SSA	1916	Born in France	1824		0.7[0.6-0.9]	
Thomadakis,2024	Mig	119	No-Mig.	982		2.0[1.5-2.6]	
Kinoshita,2018	Non-japanese	78	Japanese	473			3.6[1.8-7.6]

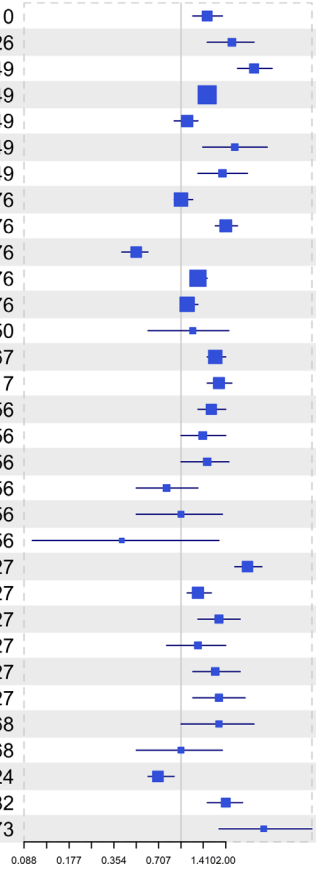


Figure 3 Retention in care (A) and lost to follow-up (B) for migrants living in high-income country (adjusted HR, adjusted incidence ratio (IR), adjusted OR, adjusted relative risk (RR)). Figures have been rounded off to the decimal point except for retention in care. EE, Eastern Europe; Immig, immigrants; IR, incidence ratio; LAC, Latin America Caribbean; M, men, NA, Nord Africa; Mig, migrants; NWR, North-Western Region; MSM, men who have sex with men; Ref, reference; SSA, sub-Saharan Africa; SE, Southern Europe; W, women.

study population's administrative status (ie, documented vs undocumented), country of birth, study's definition of adherence to care process, study period, inclusion criteria and the number of participants. The quality of the studies included was assessed by BV using the validated Mixed Methods Appraisal Tool (MMAT).[19]

Data analysis

Quantitative measures of the association between migration and adherence to care process were assessed by odds ratio (OR), relative risk, hazard ratio (HR) or incidence rate ratio according to the design of the relevant study.

Our findings are summarised descriptively. Results are presented in forest plots. All analyses were performed using the meta package in R (V.4.1.2).

RESULTS

Figure 1 shows the study selection process. 601 unique references were screened based on title and abstract. Inter-reviewer agreement for title and abstract screening was 85%. Inter-rater reliability (Cohen's κ) was 0.55.

Of these 601 references, 511 were excluded because they were off-topic. Accordingly, 90 articles were selected

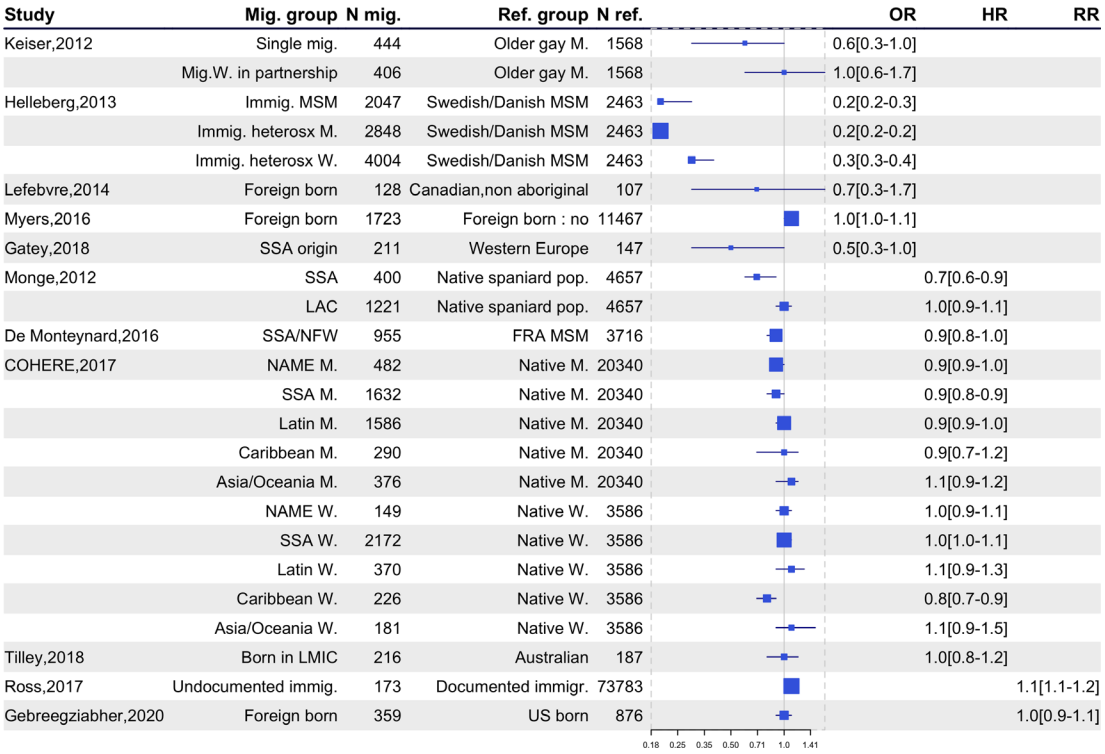


Figure 4 HIV virological suppression for migrants and non-migrants LWH in high-income countries (adjusted OR, adjusted HR, adjusted relative risk (RR), 95% CI). Figures have been rounded off to the decimal point. FRA, French natives; LAC, Latin America Caribbean; LMICs, low-income and middle-income countries; LWH, living with HIV; M, men; NAME, North Africa and the Middle East; NFW, non-French West Indies; Mig, migrants; NWR, North-Western Region; MSM, men who have sex with men; Pop., population; Ref., reference; SSA, sub-Saharan Africa; W, women.

for full-text assessment. Seven articles identified by citation searching were also eligible. After reading the full texts, 70 manuscripts were eligible. Of these, two (one abstract[20] and an original article[21]) focused on the same study and were secondarily excluded. Accordingly, a total of 69 studies were included in the review.

Table 1 summarises the characteristics of included studies; 59 (86%) used quantitative data, 10 qualitative data (14%), 40 (49%) were conducted in Europe and 49 (71%) included migrants from sub-Saharan Africa. Only 10 (14%) provided information on migrants' administrative status. Retention in care/loss to follow-up was the main variable studied in terms of adherence to the care process (n=44 (64%)). Only five (7%) studies proposed intervention models to deal with patients lost to follow-up[22–26] (online supplemental appendix S1). All 69 studies are presented in online supplemental appendix S2 with the following information: study type, place where study was performed, study aim, study definition of a migrant, study population's administrative status, place of origin, study's definition of adherence to care process, study period, inclusion criteria and number of participants. The MMAT study quality assessment is presented in online supplemental appendix S3.

Quantitative studies

Figures 2–5 illustrate adherence and difficulties in the care process among migrants and non-MLHIV in HIC according to several variables and measures of association in the 23 quantitative studies included (figure 2A treatment adherence, figure 2B treatment non-adherence, figure 3A retention in care, figure 3B loss to follow-up, figure 4 virological suppression, figure 5 virological failure). We extracted a total of 89 measures of association. We extracted a total of 89 measures of association. Of these, 52 were statistically significant; more specifically, two out of the three associations found for treatment adherence were significant, as were 3 out of the 12 for non-adherence to treatment, 2 out of 2 for retention in care, 20 out of 32 for loss to follow-up, 13 out of 23 for virological suppression and 12 out of 17 for virological failure.

Of these 52 statistically significant associations, all but five found an association between migration background and poor adherence to the care process.

In the 59 quantitative studies included, MLHIV were categorised according to geographical origin in 21, gender in 5, marital status in 2, administrative status in 1 and sexual orientation in 1. In eight studies, the migrant group was studied without further categorisation.

With regard to geographical origin, MLHIV from sub-Saharan Africa were the population most likely to encounter difficulties in adhering to the HIV care process. Of the 11 significant associations found for sub-Saharan Africa, 10 highlighted difficulties with the 3 dimensions we studied (ie, treatment adherence, retention in care and virological response); the remaining association

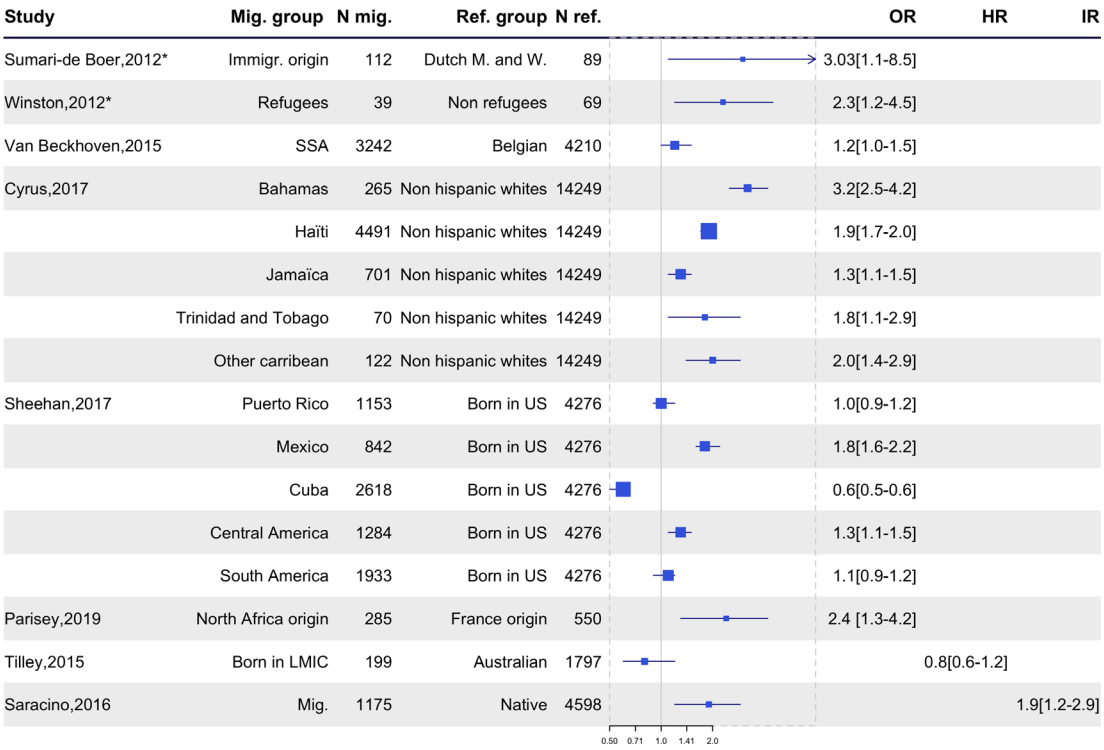


Figure 5 HIV virological failure for migrants living in high-income country (adjusted OR, HR, incidence ratio (IR)). *Unadjusted OR. Figures have been rounded off to the decimal point. LMIC, low-income and middle-income countries; M, men; Mig, migrants; M/NM LWH, migrants and non-migrants living with HIV; Ref., reference; SSA, sub-Saharan Africa; W, women.

found less loss to follow-up among these patients in a centre where peer educators were practising.[27]

Among all 59 quantitative studies, only one investigated the potential association between migrant administrative status and adherence to the HIV care process and found a positive association for all three studied dimensions. Moreover, only one study looked at the men who have sex with men (MSM) migrant subgroup. Virological suppression (defined as a viral load <500 copies/mL at the last measurement) was less common in this group than among native MSM (adjusted OR 0.23 (95% CI 0.19 to 0.29)).[28]

Quantitative and qualitative studies

Table 2 groups together the 59 quantitative and 10 qualitative studies which identified barriers and facilitators to adherence to the HIV care process among MLHIV in HIC. We classed these barriers and facilitators into five categories as follows: sociodemographic, clinical, psychological, care system organisation and migration policy. Barriers to adherence to the care process were more frequently studied than facilitators.

Data from the quantitative studies tended to be descriptive, whereas the data from the qualitative studies tended to be explanatory.

Sociodemographic factors

In quantitative studies, male gender,[20 21 29 30] low socioeconomic status[31] and being single[32 33] were identified as barriers. In qualitative studies, food insecurity,[34 35] stigmatisation[34–37] and family rejection[34 35] were barriers.

Only one study studied the reason for migration as a potential determinant; it found that migration for health reasons was a facilitator while migration for economic reasons was a barrier.[36]

Clinical factors

In quantitative studies, a low quality of life score was a barrier while in qualitative studies, the absence of symptoms was a barrier.[23 36]

Psychological factors

Depression and anxiety (barriers) were mainly studied in qualitative studies. Psychological support was a facilitator in qualitative studies.[22 34 35 38 38–40]

Healthcare organisation

Quantitative studies mainly focused on the care pathway,[31] while qualitative studies focused on the skills healthcare staff needed to improve adherence.[22 26 29 35 36 41 42] Both study designs found that providing culturally sensitive care,[22 26 29] implementing actions that foster links between healthcare workers and migrants, and the level of adaptation of the healthcare system to migrants' characteristics were all facilitators. In particular, the use of community health mediators,[35] interpreters,[36] bicultural staff[29] and bilingual staff[41] seemed to be particularly effective.

Migration and health policies

Quantitative studies focused solely on the legal status of patients,[43] while qualitative studies looked at migrants' fears of the relevant country's national immigration and

Table 2 Factors associated with adherence to the HIV care process in MLHIV in high-income countries; quantitative and qualitative studies

	Quantitative		Qualitative	
Factors associated with	**Poor adherence to the HIV care process**	**Good adherence to the HIV care process**	**Poor adherence to the HIV care process**	**Good adherence to the HIV care process**
	Socio-demographic			
Sex	Male[20 21 29 30]	Age (per 10-year increase)[21]		
Family	Being single[32 33]		Rejection by family[34 35]	Family support[34]; psychological motivation: to see one's children grow up[34]
Migration	Country of origin: Caribbean-born black, Bahamians, Haitians and Trinidadians and Tobagonians,[29] South America[68]	Country of origin: Cuba or Puerto Rico compared with Latino born in mainland USA[31]	Migration for economic reasons[36]	Migration for medical reasons[36]
Employment	Unemployment[21 23 30]			Employment[35 36]
Place of residence	Unstable housing, living with others,[32 33] living in neighbourhoods with few migrants,[31] urban environment[29]			
Socioeconomic status	Low socioeconomic status[31]		Cost of care if no money is sent to family[44]; unmet vital needs, especially food insecurity[34 35]	
Education	Low education attainment[69]			
Socio-cultural	No HIV disclosure[32 33]; perception of stigmatisation[40 69]; religion[70]	Peer support[59]; social support[42]; religiosity[42 71]	Little social support[34]; perceived stigmatisation[34–37]; cultural conception of masculinity[34]; social taboos against homosexuality[34]	Peer support,[35] social support[35]; HIV disclosure[36]; religiosity[34]
Clinical				
Symptoms	Low physical quality of life[23]	Managing and coping with HIV care[42]; Pre-treatment CD 4 count (per 100 cells/mm^3 more)[20]	Asymptomatic HIV disease[36]	Having HIV-related symptoms[42]; Managing and coping with HIV care[42]
HIV transmission mode	Not intravenous drug, MSM, heterosexual, unknown,[29] fear of transmission[71]			Fear of transmission[34]
Treatment	Boosted PI-based regimen[20]; negative perception of treatment effectiveness[32 33 69]; negative perception of treatment toxicity[32]			
Drugs	Alcohol consumption[38]; drug user[20 21 38 70]		Alcohol consumption[34]; drug user[34(p 201)]	
Time period	Travel period[30]; extension of stay during travel[30 37]; travelling during the Ramadan period while respecting fasting[30]; year of HIV diagnosis (2000–2004)[29]			
	Psychological			

Continued

Table 2 Continued

	Quantitative		Qualitative	
Factors associated with	**Poor adherence to the HIV care process**	**Good adherence to the HIV care process**	**Poor adherence to the HIV care process**	**Good adherence to the HIV care process**
	Low mental quality of life[23]; depressive symptoms[22 38 39]; anxiety[38]; higher external (social* and fatalistic†) health LOC[66]	Psychological support[38]; no association between depression and ART adherence[39]	Depressive symptoms[34 35 40]; anxiety[34 35 40]; post-traumatic syndrome disorder[34]	Psychological support[36 59]
	Healthcare organisation			
Staff composition		Interpreters[41]	No translators[34]	Social support[26]; mediators[26 35]; community health worker[35]; interpreters,[36]
Staff skills		Bicultural staff[29]; bilingual staff[41]; good relationship between doctors and healthcare personnel[42]		Bilingual staff[26]; cultural competency of the staff[22 26]; staff able to provide expert information[26 35 36]; Non-judgemental staff[22]; medical-legal partnership[22]; good relationship between doctors and healthcare personnel[26 35]; staff that empower patients[26]
Care pathway	Place of HIV diagnosis (blood bank, hospital, HIV case management, screening facility)[31]	Time from HIV diagnosis to linkage to care was shortest in 2010–2020[72]		To connect patients to primary care[26]
Intervention	Directly administered antiretroviral therapies are not feasible interventions (since 2020); group medical appointments are not feasible interventions[59]; direct monthly supply of ART[24]		Fear that by going to a medical appointment, one will lose their job[36 44]	Go to patient's home[22]
Flexibility		Appointment time keeping[42]		Flexible hours for consultation[22 36]
Institutional discrimination	Experience of refusal of care was[73] more frequent among: (1) those who migrated because of threats in their native country (2) undocumented migrants without social insurance		Discrimination in healthcare settings[40]; administrative difficulties in obtaining documents to enter the care system[44]	Transnational intervention[25]
	Migration and health policy			
Administrative status	Undocumented[68 73]	Undocumented[43]	Undocumented[35]; fear of national immigration policy[22 34 35]; living with fear of deportation[34 44]; work restrictions for undocumented migrants[44]; difficulties getting required paperwork in order[44]; lack of awareness of one's rights[35]	
Cost of treatment				Free treatment[35]

*Social external locus of control represents a subject's belief in the power of other people's (eg, health professionals' or other respected persons' such as older family members) power to determine the subject's health status.
†Fatalistic external locus of control represents a subject's belief in the influence of luck and fate on their health status.
-, references; ART, antiretroviral therapy; LOC, locus of control; MLHIV, migrants living with HIV; MSM, men who have sex with men; PI, Protease inhibitor.

deportation policies,[22 34 35] work restrictions,[44] difficulties getting paperwork in order[44] and migrants' lack of awareness of their rights and legal status.[35] Undocumented status was a barrier in three studies and a facilitator in just one study.

Access to free treatment was found to be a facilitator for retention in care in one qualitative study.

DISCUSSION

Our mixed-methods systematic review provides a general, multidimensional insight into adherence to the HIV care process in MLHIV living in HIC. Globally, we found that most of this population has less than optimal adherence to all three dimensions of the care process we studied (ie, adherence to treatment/non-adherence to treatment, retention in care/lost to follow-up and virological suppression/virological failure).

84% of the studies we included were quantitative and therefore their results were mainly descriptive. However, adherence to the care process is a complex cognitive-emotional process, and qualitative studies provide a more in-depth exploration of the mechanisms of these processes.[45] Future research on adherence to the care process would benefit from using this methodology. No mixed-methods studies were identified, despite the fact that this research approach combines the robustness of quantitative and qualitative studies.[46 47] Overall, our results highlight the compartmentalisation of research disciplines.

Of the 58 quantitative studies included, only 11 looked at all three dimensions. Adherence to treatment was the least studied dimension, but also probably the most difficult to measure. Self-reported questionnaires are subject to social conformity bias, while measuring drug dosages and random pill counts are processes that require a certain logistic complexity.[48] Virological response and retention in care are variables that are part of routine care and simpler to collect.

Studying individual risk factors and categorising migrants

Our review found that no migrant category was more likely than another to have poor adherence to the HIV care process. The quantitative studies we included primarily classified patients based mainly on geographical origin; however, such a simple categorisation does not take into account different intersecting social and cultural determinants that can influence adherence, including (possibly traumatic) life events during the migratory journey, level of health literacy, educational level, social precariousness, loneliness, administrative insecurity, social representations of the healthcare system and health and living conditions in the host country. All these factors may impact adherence much more than geographical origin. One could hypothesise that these elements could be decisive in the cognitive process of adherence to treatment.[36] Migrants are an extremely heterogeneous group, in cultural, social or psychological dimensions, making it difficult to define and categorise them.[49 50]

Risk factors at the level of care system organisation and policy

In the majority of studies (ie, both quantitative and qualitative) included, the evaluation of health interventions was based in the hospital setting; few studies evaluated the impact of migration and health policies on MPHIV's adherence to the care process. One review identified national policies for delivering tuberculosis, HIV and hepatitis B and C virus infection services for refugees and migrants among member states of the WHO European Region.[51] In terms of HIV, only 15 national policy documents and guidelines for refugees were identified. The articles included highlight the considerable heterogeneity in the implementation of policies and recommendations advocated by the WHO and ECDC. In some countries (eg, Angola, Azerbaijan, Israel), migrants must present a negative HIV test result in order to obtain a work permit.[52] However, our review found no study examining the impact of this policy on documented or undocumented MLHIV's adherence to the care process. Our review highlights the importance of assessing the impact of public policies on MLHIV's health and the need to support the public health facilitators identified at the beginning of our discussion section to compensate for the social inequities experienced by migrants.

Facilitators for adherence to the HIV care process

Three quantitative studies (two in the USA and one in France) found that migrants were more likely than non-migrants to adhere to the care process in terms of the virological response and retention in care dimensions.[27 31 53] This result merits particular attention. For example, one of the two studies from the USA concerned the Ryan White HIV AIDS programme which provides treatment and related services to people who do not have adequate health insurance. In that study, data from the Centers for Disease Control and Prevention in the USA showed that sustained virological suppression was achieved by 68% of people in the Ryan White HIV AIDS programme, compared with 58% of those not in the programme.[54] The French single-site study found similar results, with migrants having better adherence to the care process. This can be explained in part by France's healthcare policy which guarantees 100% universal access without advance payment for precarious documented and undocumented patients,[27] and by the involvement of peer educators. Other studies in France have shown that free healthcare would seem to be a necessary but insufficient criterion for adherence to care in migrants.[55–58]

With regard to the second PICO research question, our review identified other facilitators of adherence to the HIV care process in migrants including community health workers,[26 35 36 41] home visits,[22] the intervention of interpreters,[36 41] psychological support for depressive disorders,[26 36 59] flexible consultation hours,[22 36] free

treatment for persons with financial difficulties[35] and residence permits.[22 34 35]

All these facilitators highlight how healthcare organisations and health policies can tackle the barriers MLHIV face and empower them to become actors in their own care trajectory. Our study advocates the development of patient education, health mediation and psychological support, among other actions, and their integration into health policies. In order to understand adherence to the care process in a research perspective, more studies on little-studied topics—such as migrants' administrative status, their migratory journey and healthcare interventions—need to be conducted.

Missing data in the literature and research topics to be developed

We found that there is a great lack of data on MLHIV's adherence to the care process in the literature for specific factors including their administrative status, their migration history, their level of literacy, therapeutic education programmes targeting them, tailored interventions carried out by peer educators and evaluations of public health interventions at the individual, hospital and political levels. We look at these different elements in greater detail below.

Migrants' administrative status may generate anxiety and consequently impact adherence to HIV treatment.[60] Socioeconomic data must be systematically collected for a more holistic approach to care.[61] Surprisingly, one study found that having undocumented status was associated with good adherence to the HIV care process for all three adherence dimensions we explored. It was carried out at the Montefiore Medical Center in New York, a clinic funded by the Ryan White HIV AIDS programme, where patients benefit from MEDICAID social security coverage and free treatment through the AIDS Drug Assistance Programme. The authors cited these two measures, fewer drug users in the MLHIV population and the presence of peer educators, to explain this result.[62]

Migration history was not examined in any quantitative study, and in only one qualitative study. The latter examined the reason for migration. Migration history is a complex question that covers a number of different parameters including the reason for migration, duration of the migratory journey, the mode of transport taken, physical and sexual violence during the journey and psychotrauma in the broadest sense. All these parameters can impact adherence to the HIV care process, just as premigration psychotrauma has already demonstrated its influence on risky sexual behaviour.[63] Taking these different factors into account as part of a holistic approach to treatment adherence seems necessary.

No study assessed interventions carried out by peer educators, particularly on health education. Furthermore, patients' level of health literacy was never specified, despite the recognised direct link between health literacy and adherence to the care process.[64] A systematic review of health literacy interventions for people living with HIV was conducted and found six articles on literacy interventions for people living with HIV, with no specific reference to the issue of migration.[65] The majority of these interventions were designed to improve HIV treatment adherence as well as HIV knowledge and treatment-related skills, with one study focusing on e-Health literacy. In our review, more studies examined the barriers to adherence to the HIV care process than the facilitators. For example, only three studies[36 38 39] reported psychological support (a facilitator), whereas psychological vulnerabilities (a barrier) were studied in eight studies.[22 23 34 35 38–40 66] Moreover, only five studies evaluated intervention models as their primary objective.[22 24 36 44 59] All these results highlight a gap in the scientific validation of public health interventions. Yet such a validation would appear to be the necessary first step in convincing public decision-makers of the importance of these interventions with a view to obtaining funding for them.

Study strengths and limitations

To our knowledge, only a small number of other reviews[5 14 43 67] have addressed the issue of MLHIV adherence to the care process in HIC. Of these, only one used a systematic review methodology; that review focused on the barriers in the cascade of care. However, it did not address our PICO research question on the categorisation of migrants and its implication in the context of research. By making an exhaustive analysis of three dimensions to adherence to the HIV care process, our review provides a comprehensive picture: it studies both the association between migratory origin and difficulties in the care pathway and highlights the determinants of impaired and better adherence to the HIV care process among MLHIV.

Our review has several limitations. First, although the screening process for titles and abstracts was carried out by two different people, data and quality assessment of articles were extracted by a single person. Second, in quantitative studies, the duration of migration was not extracted if it was not one of the variables used to categorise migrants. Third, our estimates for associations are difficult to interpret due to the heterogeneity of the reference and migrant groups. Studies on the care pathways of MLHIV are by nature heterogeneous. Indeed, in the literature, the categorisation of migrant groups is mainly determined according to geographical origin (sometimes geographical origin and gender or sexual orientation), something which differs greatly depending on where the studies are carried out: most often South America for studies from the USA, and sub-Saharan Africa for studies in Europe. As mentioned above, there can be significant differences in people with the same geographical origin, and this review is limited by the lack of published work on using a more comprehensive range of determinants than simply geographical origin. Finally, only English and French-language papers were included.

Conclusions

MLHIV living in HIC would appear to have poor adherence to the HIV care process (studied here in terms of three dimensions: based on treatment adherence, retention in care and virological response). MLHIV are a heterogeneous group mostly characterised in the literature by their geographical origin. This variable is too general, as it does not distinguish cultural and sociological determinants. In the MLHIV population, many barriers have been identified at the clinical, psychological and socioeconomic levels, as well as in terms of the organisation of the healthcare system and a country's immigration and health policy. However, many facilitators have also been identified, such as community health mediation, psychological support, the help of interpreters and free access to care. To improve care of MLHIV living in HIC, more studies aiming at understanding patients' experiences, particularly with regard to a person's migration history (eg, the reason for migrating, migration-related events) are needed. Moreover, future studies should integrate socioeconomic and cultural determinants, and more concrete assessments of health policies and their applications.

Contributors JGdB is the guarantor. NV, OB, RG and JGdB designed the study. JGdB managed the data collection. Data screening and extraction was performed by JGdB, CP, BV, YK, JZ, BV and NV. JGdB performed the forest plots. JGdB drafted the first versions of the manuscript. NV, OB, LM, HD, RM and NV reviewed the final manuscript. All authors read and approved the final manuscript.

Funding ARS Agence Régionale de Santé, Ile de France.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing not applicable as no datasets generated and/or analysed for this study.

ORCID iD

Jeanne Goupil de Bouillé http://orcid.org/0000-0002-3013-9850

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