Interventions to ensure access to and continuity of HIV care for international migrants: an evidence synthesis

Alena Kamenshchikova, PhD[1], Charlotte M.M. Peters, MSc*.[2], Christiana Nöstlinger, PhD[3], Brian Rice, PhD[4], Prof Nathan Ford, PhD[5], Giovanni Ravasi. MScPH.[6], Prof Fiona Burns, PhD[7], Prof Milosz Parczewski, MD[8], Prof Christian J.P.A. Hoebe, PhD[9], Nicole Dukers, PhD[10], Farah Seedat, PhD[11], Antons Mozalevskis, MD[6], Linda-Gail Bekker, PhD[12], Jean Berchmans Tugirimana, MSc[13], Weiming Tang, PhD[14], Gifty Marley, PhD[14], Denis Onyango, MPH[15], Monica C. Thormann Peynado, MD[16], Teymur Noori, MSc[17, 18], Sally Hargreaves, PhD[11]

*Shared first authorship

[1] Department of Health, Ethics and Society, Department of Social Medicine and Department of Medical Microbiology, Infectious Diseases and Infection Prevention, Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, the Netherlands. ORCID https://orcid.org/0000-0002-7745-9819.

[2] Department of Social Medicine, Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, the Netherlands; Department of Sexual Health, Infectious Diseases and Environmental Health, Living Lab Public Health Mosa, South Limburg Public Health Service (GGD South Limburg), the Netherlands. ORCID https://orcid.org/0000-0001-8032-7481

[3] Department of Public Health, Institute of Tropical Medicine, Antwerp, Belgium

[4] School of Medicine and Population Health, University of Sheffield, Sheffield, England

[5] Global HIV, Hepatitis, and Sexually Transmitted Infections Programmes, World Health Organization, Geneva, Switzerland; Centre for Infectious Disease Epidemiology and Research, School of Public Health, University of Cape Town, Cape Town, South Africa

[6] Global HIV, Hepatitis, and Sexually Transmitted Infections Programmes, World Health Organization, Geneva, Switzerland

[7] Institute for Global Health, University College London, London, UK. ORCID iD: 0000-0002-9105-2441

[8] Department of Infectious, Tropical Diseases and Acquired Immunedeficiency, Pomeranian Medical University in Szczecin, Poland

[9] Department of Social Medicine and Department of Medical Microbiology, Infectious Diseases and Infection Prevention, School of Public Health and Primary Care (CAPHRI), Maastricht University/Maastricht UMC+ (MUMC+), Maastricht, the Netherlands; Department of Sexual Health, Infectious Diseases and Environmental Health, Living Lab Public Health Mosa, South Limburg Public Health Service (GGD South Limburg), the Netherlands. ORCID Iconhttps://orcid.org/0000-0003-1815-0974

[10] Department of Sexual Health, Infectious Diseases and Environmental Health, Living Lab Public Health Mosa, South Limburg Public Health Service (GGD South Limburg), the Netherlands; Department of Health Promotion, Care and Public Health Research Institute (CAPHRI), Maastricht University, Maastricht, the Netherlands, ORCID https://orcid.org/0000-0003-4896-758X

[11] The Migrant Health Research Group, Institute for Infection and Immunity, St George's University of London, UK

[12] The Desmond Tutu HIV Centre, University of Cape Town, South Africa

[13] Rwanda Network of People Living with HIV/AIDS (RRP+), Kigali, Rwanda

[14] University of North Carolina Project-China, Guangzhou, China

[15] Africa Advocacy Foundation, UK

[16] STD, HIV and Hepatitis National Program, Ministry of Health, Dominican Republic

[17] European Centre for Disease Prevention and Control STI, Blood-Borne Viruses and TB, Stockholm, Sweden

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Corresponding author: Alena Kamenshchikova, Maastricht University, the Netherlands. a.kamenshchikova@maastrichtuniversity.nl

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Summary

International migrants face a considerable HIV burden, especially migrants belonging to key populations. However, continuity of access to HIV care for this group is often challenged along the migration route. The aim of this research is to synthesise available evidence on the existing interventions aiming to strengthen community and health systems to ensure the continuity of HIV care for international migrants. A systematic global literature search of PubMed was established from 1989 until 2003 focusing on different stages of HIV care continuum regardless of the geographical region. A review of the literature was conducted using a thematic approach. Globally, legal regulations can restrict access to HIV care and fuel fear of deportation among undocumented migrants. The intersection of HIV and migration-related stigma creates further challenges to get uninterrupted access to HIV care along the migration route. Different promising interventions were identified, including provision of HIV care regardless of migration status, utilisation of mHealth, mobile units and community-led initiatives to bring HIV care to migrants, as well as utilisation of participatory and co-creation methods to develop tailored and sustainable HIV-related interventions with migrant communities. Improving access to the continuity of HIV care for migrants requires a shift towards intersectional policies rooted in co-creation approaches to address the underlying multiple and mutually reinforcing inequalities.

Introduction

International migrants, whilst hugely diverse, are globally recognised as being vulnerable to HIV. Yet despite this they continue to have suboptimal access to HIV care in comparison to local-born communities[1-3]. This includes reduced access to diagnosis, linkage to care and antiretroviral treatment (ART) leading to lower testing coverage, lower viral suppression rate, and increased mortality[4]. For instance, 48% of all HIV- diagnosed cases in the European Union/European Economic Area (EU/EEA) in 2022 were among migrants[5] who face multiple obstacles when accessing HIV care[6]. Research from border areas around the world that are characterised by frequent mobility, such as between Zimbabwe and South Africa[7], Mexico and the US[8], countries of Central Asia and the Russian Federation[9], and Thailand and Myanmar[10] have highlighted the higher likelihood of HIV acquisition and transmission among highly mobile communities, such as labour migrants. The same studies elaborate that these mobile communities face legal, economic, social, and cultural barriers that prevent access to HIV

care[7,8,9,10]. The definition of HIV care in this article includes continuous access to HIV services, including testing, diagnosis, linkage to care and treatment, and viral suppression. When relevant, individual aspects of HIV care are specified.

While migration in itself is not an HIV risk factor, it can intensify existing structural inequalities that position people as vulnerable for acquiring HIV and reduce their access to HIV care as well as prevention programmes[11]. Such structural inequalities are aggravated due to the intersection of both HIV and migration-related stigma and discrimination as well as other multi-layered factors such as socio-economic inequalities, racialised background and gender. For example, research among migrant sex workers documented multiple layers of stigma, violence, coercion into unprotected sex and discrimination[12,13]. Being undocumented has been reported to intensify HIV risk factors among migrants both in transit[14,15] and destination countries[16] increasing the risks of violence and exploitation. Further, an elevated risk of late HIV diagnosis and associated risk of advances HIV disease has been connected with structural barriers to timely HIV testing, including poverty and restricted access to care based on migration status[17,18]. These intersections between the diverse social, cultural, gender and ethnic characteristics of migrants and the contexts in which they live not only influence HIV acquisition and access to HIV care, but also aggravate these outcomes synergistically.

The article is informed by intersectionality theory to highlight how social categories, such as racialised background, gender and sexual identity, do not exist separately but create overlapping and interdependent systems of discrimination and social exclusion[19]. Research on HIV shows the importance of studying HIV-related stigma not only as a self-standing phenomenon but rather as intersecting with racism, sexism, homophobia, and transphobia to highlight the scope of different vulnerabilities experienced by people living with HIV[20]. In addition, in the context of migration, migration status may intersect with other social categories such as sexual identity adding an additional layer of vulnerability that may shape people's exposure to health risks as well as their access to healthcare in a synergistic and multiplicative way[21]. Approaching questions related to HIV care and migration through the prism of intersectionality allows us to draw attention to the structural and systemic factors that shape health inequalities.

Migration is a common phenomenon and will remain an important health determinant when attempting to successfully strengthen health systems, including the continuity of HIV care[11,22]. Against this background, the objectives of this article are to answer two questions: 1) How to

ensure continuity of HIV care for migrants at the global level? 2) What type of interventions are required at both the health system and community level to ensure that diverse migrant populations have equitable and uninterrupted access to HIV care?

We conducted a narrative review to synthesise available evidence on access to and continuity of HIV care among international migrants globally, and to review existing strategies for designing and strengthening health interventions aiming to improve health systems to ensure migrants' access to HIV care in non-emergency contexts (see Table 1). This review focused on migrants who are not aware of their HIV status but are either infected or are vulnerable to acquiring HIV, and migrants who know their positive status and require linkage and adherence to HIV treatment. For the definition of a migrant, we adopted the International Organisation for Migration (IOM) definition of international migrants as any persons who changed their place of usual residence and moved "across an international border to a country of which they are not nationals", excluding movements for "recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimages"[23]. Specifically, we focused on non-emergency/acute international migration, which we defined as cross-border non-humanitarian migration, such as labour migration and family reunion, including documented and undocumented people (for the review on continuity of HIV care for migrants in emergency contexts please see the article by Cortés et al in this series).

While the HIV care cascade framework – from HIV testing to viral suppression – has been widely used to assess the continuity of care, in this review we analysed the findings thematically by recognising that a linear depiction of HIV care does not capture the complex cycle of entry and re-entry into care that has been commonly reported, specifically for mobile populaitons[24-26]. Below, we first outline the challenges related to access and continuity of HIV care that migrants face along their migration trajectory; next, we focus on the role and impact of migration status on access to and continuity of HIV care; and we finalise with a synthesis of interventions and recommendations for strengthening policy, health systems and community engagement to improve the continuity of and access to HIV care for migrants.

Table 1. Search strategy and selection criteria

This narrative review is based on a systematic search and a review of the literature using thematic approach. The search strategy included the core concepts of HIV, migrants, phases of the HIV care continuum and access to care. The search period in PubMed was established until August 18th 2023. The start of the search period was not identified to capture all the available literature, with the oldest record retrieved from 1989.

The following search terms were used: ("HIV"[Mesh] OR "human immunodeficiency virus" OR "hiv" OR "aids") AND ("transient*" OR "migrant*" OR "refugee*" OR "asylum seeker*" OR "immigrant*" OR "foreigner*" OR "third-country national*" OR "overseas born") AND ("HIV Testing"[Mesh] OR "HIV Infections/prevention and control"[Mesh] OR "continuum" OR "link*" OR "testing" OR "diagnos*" OR "retention" OR "viral suppression" OR "ART") AND ("access" OR "accessibility" OR "Health Services Accessibility"[Mesh]). Articles were included if they 1) had a full-text available in the English language, 2) were a peer-reviewed primary or secondary research article, 3) discussed at least one phase of the HIV care continuum for migrants regardless of the geographical region. Articles were excluded if they were commentaries, opinion pieces, and preprints; if they exclusively discussed internal migration; if they exclusively focus on emergency/acute migration. Through search strategy, we identified 558 records and after abstract screening 214 records were eligible for full-text screening. Finally, 134 articles were included in this review, published between 1998 and 2023. Grey literature, including reports from the international health organisations such as ECDC, WHO, ILO, UNAIDS and UNHCR were added to fill emerging gaps in the literature. Further, four additional non-migrant specific peer-reviewed papers were added to contextualise some of the result findings, including papers on HIV-related stigma and opt-out HIV-testing.

Challenges in accessing HIV care along the migration trajectory

The migration trajectory, including a pre-migration period in departure countries and transition periods before arriving at destination countries, presents HIV-related risks for migrants. During this trajectory, migrants are likely to face different risk-inducing social, physical, political and economic environments. Migrants' departure countries may contribute to their overall determinants of HIV, including specific vulnerabilities, practices around safer sex and healthcare seeking. For instance, migrants arriving from countries with a patriarchal culture

where sex is considered a taboo, such as Afghanistan, have been reported to experience a high burden of gender-related stigma associated with a high likelihood of acquiring HIV and delayed testing[27].

Experiences and familiarity with healthcare systems in departure countries may also shape migrants' practices around seeking HIV care in transition or destination countries. It has been reported that migrants who have a possibility to visit their departure countries, such as seasonal labour migrants, prefer to access healthcare systems there due to lower costs and familiarity[28]. In addition, for some migrants, such as undocumented migrants, this may be the only practical opportunity to access HIV care[13,29]. For example, undocumented labour migrants from Malawi in South Africa[28], and from Tajikistan in Russia[30] tend to get HIV testing when returning to their departure countries mainly due to fear of detention and deportation in the destination countries. Moreover, both documented and undocumented labour migrants, when knowing their HIV-positive status, have been reported to access ART treatment from their departure countries either through their social networks who send ART by couriers or by obtaining several months of supplies before leaving for work to another country[28]. While supporting access to HIV care for some, these practices also create risks for delayed HIV diagnoses or treatment interruption during migration[28].

Challenges related to accessing HIV care during the transition stage are significant points of concern, specifically in the context of forced displacement. Although the present review focuses on non-acute migration, it is important to highlight that some migrants have to reside in refugee facilities in transition countries for long periods which may significantly delay their access to HIV care[14,31,32].

Upon arrival in destination countries, access to HIV care for migrants may be delayed. The reviewed literature distinguished challenges in accessing HIV care for migrants with unknown HIV status for whom HIV testing is a crucial initial step where they should be either linked to further HIV treatment or to prevention, and migrants who already know their HIV status for whom re-testing and accessing ART is a priority. Engaging different migrant populations in HIV testing programmes can be challenging due to their diverse, often traumatising, experiences with healthcare systems and multi-faceted experiences related to migration trajectories. For instance, research in the US[33] reported that some married migrant women with African background experience delays in HIV testing due to fear of a negative reaction from

their spouses, as well as stigma from healthcare providers highlighting the need for migrant- and gender-sensitive HIV testing programmes.

In some countries, HIV testing policies may facilitate migrants' access to HIV care, including for undocumented populations, for instance by providing free-of-charge and anonymous HIV testing with follow-up non-discriminatory linkage to care, as has been reported by a Swiss study among newly arrived asylum seekers[34]. At the same time, obligatory requirements for HIV testing of migrants can be rooted in discriminatory and stigmatising policies. For instance, despite the Joint United Nations Programme on HIV/AIDS (UNAIDS)[35] recommendation against obligatory HIV testing of migrants, Canada requires such testing as part of the migration process with migrants reporting not being provided informed consent or pre-and post-test counselling[36]. Similarly, HIV testing is required in Australia for anyone 15 years and older applying for residency, and it can be a reason for rejecting the application[37].

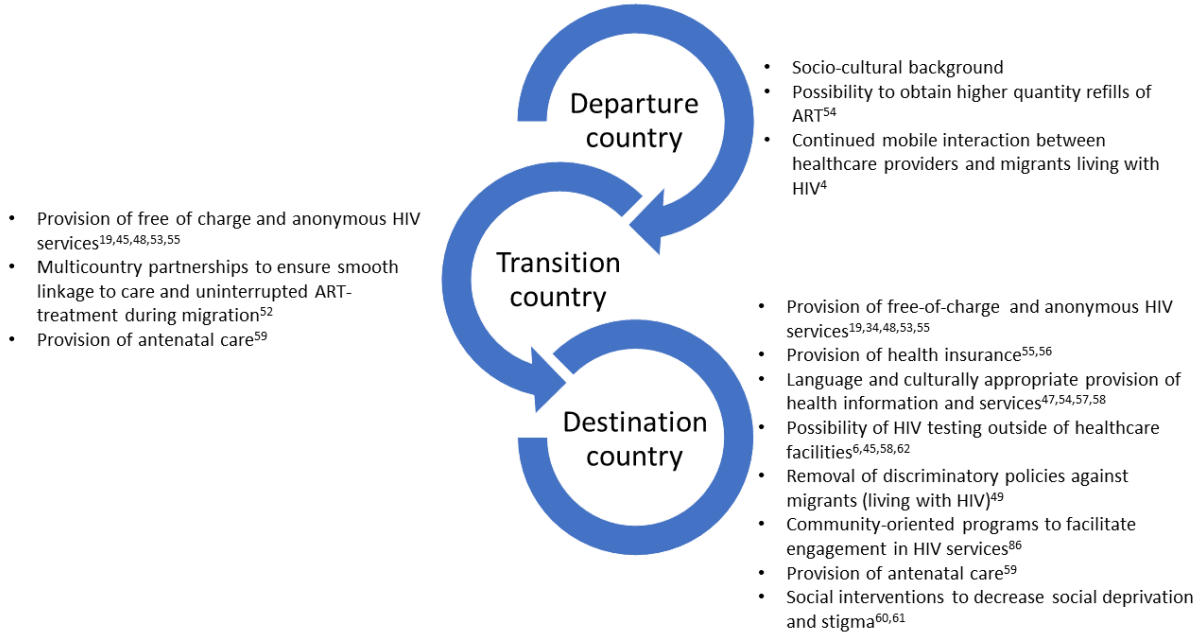
For migrants with a known positive HIV status, linkage to necessary re-testing and treatment along the migration trajectory is paramount to prevent treatment interruptions for those who previously were on ART, and to prevent delay in starting ART. However, multiple challenges have been reported that may hinder a migrant's access to HIV care in destination countries. Specifically, migrants living with HIV have been reported to experience fear of involuntary disclosure of their HIV-status[6,38,39], fear of stigmatisation from their communities[6,40] and social isolation related to HIV-stigma[6,39,41]. For example, testimonies by migrants[36] and refugees[40] living in Canada highlight their experiences of fear of and actual stigmatisation from healthcare professionals, as well as from immigration authorities that become exacerbated in cases with pre-existing discrimination related to migrants' ethnicity, sexual orientation, and place of residence. Stigma and discrimination are essential when attempting to unpack barriers to HIV care. According to the 2022 report by the European Centre for Disease Prevention and Control (ECDC)[3] as well as other research[42-44], HIV-related stigma is a major barrier to accessing HIV care for all people living with HIV worldwide; however, migrants living with HIV, experience a double burden of stigma related to the intersection between HIV and migration[6,45].

Linkage to care for migrants living with HIV is further complicated by the entangled interplay of health system barriers, including migrants' limited familiarity with the healthcare system in a destination country[4,33], legal restrictions, and high treatment costs[6,46]. Many healthcare systems around the world are not equipped to respond effectively to migrants' needs due to a lack of migrant-specific policies, lack of cultural and language facilitators, as well as a lack of

cultural and migrant-sensitive training for healthcare providers[4,19,47,48]. Therefore, distrust, fear and stigmatising practices by healthcare professionals towards migrants have been reported in research from countries as different as Canada[36,40], US[33], Austria[13], Russia[49], the Netherlands[50] and South Africa[28,51].

While the included studies highlighted some facilitators (see Figure 1)[4,6,19,34,45,47-49,52-62] that may help to link migrants to HIV care, depending on who is migrating, when and how will significantly determine their access to HIV care along the migration trajectory.

Figure 1. Facilitators in accessing HIV care along the migration route[1].



The role of migrants' documentation status in accessing HIV care

Across different countries, undocumented migrants have been reported to experience substantial barriers when accessing HIV care, with countries either providing HIV testing services without further access to treatment or not allowing any forms of HIV care. For instance, research from South Africa highlighted that undocumented migrants have access to emergency services only[51] and cannot access further treatment[63]. In the US, undocumented migrants do not have access to health insurance and must pay directly for their own healthcare,

[1] The figure presents a simplified image of the migration trajectory. We acknowledge that migration pathways can be numerous and complex.

including HIV care[41]. A review from the EU/EEA showed that only half of EU countries provide free and anonymous HIV testing to undocumented migrants, and 13 out of 29 EU/EEA countries reported a lack of further access to ART treatment for those migrants[64].

Legal regulations impact individuals' day to day experiences with undocumented migrants across the world reporting to feel fear in relation to potential detention and deportation[6,16,19,33]. For instance, in Russia, manual labour migrants are required to present a negative HIV test to obtain an annual work permit[30,65]. However, the fear of potentially positive test results, which might lead to deportation, was reported to force many labour migrants to remain undocumented thus delaying HIV care[30,65]. Two studies from France[60,61] highlighted how social deprivation shaped through discriminatory policies rather than migration in itself is a crucial barrier to undocumented migrants' access to HIV care.

The intersection of labour migration and healthcare regulations often force people into situations where they cannot access care due to lack of official employment and they cannot apply for official employment due to fear that a positive HIV result will lead to deportation. In South Korea, migrant sex workers are required to undergo HIV testing as part of their application for an "entertainment visa"; however, they are not provided with pre-and post-testing counselling, and will be denied a visa, and thus HIV treatment, if they test HIV-positive[66]. Despite international organisations, including the United Nations High Commissioner for Refugees (UNHCR) and the International Labour Organization (ILO), requiring proper healthcare for migrants regardless of their HIV-status (see Table 2), employers in different countries often do not regard this as part of their duty[52]. For instance, temporary migrant farmworkers from Mexico and the Caribbean in Canada have been reported to experience difficulties in mediating their healthcare access with their employers as they were not provided with any information regarding the healthcare system and healthcare coverage. In addition, they were often not allowed to take time off to visit a healthcare institution, including sexual health clinics for HIV testing[67].

Although some countries provide undocumented migrants with a right to full or partial healthcare, this right does not always translate to the availability and accessibility of care. Research from the UK[68], the Netherlands[69], and South Africa[51] demonstrates that even though all migrants have a right to basic healthcare services, such as HIV testing, this right is often not ensured, partly due to the lack of knowledge among healthcare providers, including their right to register with a general practitioner[70]. In addition, intersecting vulnerabilities, such as being

undocumented, female and/or working in the sex industry may result in heightened barriers and multiple stigmas further reducing access to services[13,71]. For example, undocumented migrant female sex workers from Mexico in the US belong to the least insured communities and cannot access either HIV care or information regarding HIV prevention[72].

While in some countries documented migrants have a right to access healthcare, they may still face barriers to access HIV care. For example, although Colombia provided a 10-year temporary protection statute for Venezuelan people, including access to healthcare services, intersecting structural vulnerabilities including high unemployment, low income, and low food security have been reported to remain crucial barriers for accessing HIV care[73]. In South Africa, documented migrants reportedly faced verbal abuse and discrimination in healthcare settings and were denied access to treatment even if they had the right to it, or were charged higher fees[51].

Table 2. International declarations and policies[2] for the provision of HIV care[3] to migrants

Source	Migrants	Type	Health service
PREVENTION			
United Nations High Commissioner for Refugees[74]	Refugees, asylum seekers, internally displaced persons (IDPs), returnees, asylum-seekers and stateless people	Recommendation	Provision of short-term antiretroviral (ARV) interventions such the post-exposure prophylaxis (PEP) and prevention of mother-to-child transmission (PMTCT) are recommended to be made available for refugees. These interventions are perceived as essential.
FOLLOW UP AND TREATMENT			
United Nations High Commissioner for Refugees[74]	Refugees, asylum seekers, internally displaced persons (IDPs),	Recommendation	For refugees who had been on ART in their country of origin prior to flight, every effort should be made to secure prompt continuation of treatment. For refugees, who did not receive ART prior to their flight, at a minimum, ART should be provided when such treatment is

[2] Policies referred to in articles identified through the narrative literature review
[3] No international policies were identified for the topics of HIV testing and health promotion information

	returnees, and stateless people		available to surrounding populations. Whenever possible, the host government should pay the cost of ART for refugees by including them in their national programmes and funding proposals.
OVERALL CARE			
International law: International Covenant on Economic, Social and Cultural Rights (ICESCR)[75]; United Nations 1951 Convention Relating to the Status of Refugees[76]	Refugees and asylum seekers	Law	International human rights law and refugee law assert the right of everyone to enjoy the highest attainable standard of physical and mental health without discrimination of any kind. Host country governments are obliged to provide refugees "the same treatment with respect to public relief and assistance as it accorded to their nationals", including the provision of prevention, treatment and control of diseases and medical services.
European Union Dublin Declaration[77]	Migrants	Recommendation	The Dublin Declaration recognises migrants as an important sub-population that are most vulnerable to an HIV/AIDS infection.
International Labour Organisation[78]	Migrant workers	Recommendation	ILO's code of practice aims to guarantee a decent workplace and proper healthcare for workers regardless of their HIV/AIDS status. The code provides guidelines for workplace policies on HIV/AIDS with regards to "(a) prevention of HIV/AIDS; (b) management and mitigation of the impact of HIV/AIDS on the world of work; (c) care and support of workers infected and affected by HIV/AIDS; (d) elimination of stigma and discrimination on the basis of real or perceived HIV status".

Interventions to strengthen policy, community and health systems

To improve the continuity of HIV care for migrants, targeted interventions at the policy, health system, and community levels are necessary. They should reflect the heterogeneity of migrant groups regarding their legal status, sub-populations' vulnerabilities, and underlying social determinants. Below, we summarise interventions that the reviewed literature reported to be relevant and promising.

On a policy level, universal health coverage, regardless of migrants' legal status, with a human rights framework at its core was highlighted as an essential intervention[6]. Moreover, separation of health from migration policies, including access to all aspects of HIV care as well as prevention, is crucial to avoid fears of detention and deportation, which were reported by multiple studies[19,34,79,80].

Health system strengthening interventions were recommended to focus on migrant-aware responses to HIV care[54,57]. Specifically, cross-border corporations across countries' health systems were suggested to be essential to ensure a smooth transition and necessary re-linkage to HIV care. Highly mobile migrants face challenges accessing treatment due to difficulties in having to identify new sites to access HIV treatment and overcoming administrative processes to collect and refill their medication supplies, positioning them at risk of treatment interruption[4]. To address this, the development of cross-border agreements between neighbouring countries[52], including health passports[54] and centralised HIV databases[4] were potential approaches to allow for continuity in accessing health information for migrants and ease their access to ART and re-linkage to care.

Several studies made specific recommendations grounded in their findings to improve the continuity of ART treatment access for highly mobile labour migrants living with HIV[54,81]. For example, suggestions were made to engage with employment agencies working with migrants to ensure that migrants were provided with all relevant information regarding the healthcare systems in destination countries[54]. A study from South Africa and Namibia provided a good practice example where labour migrants were linked to HIV care through their employer and were able to continuously access ART for a year after leaving the company[81]. This example shows the important role that employers of migrant workers can play in their (re)linkage to HIV care, although this approach may be difficult to implement in settings where a positive HIV test can lead to legal challenges. Another intervention to ensure the continuity of ART treatment access for labour migrants was the possibility to obtain an extended supply of ART they can carry with them from departure to destination countries[54].

To tackle the HIV-related stigma that creates barriers to HIV testing, several studies investigated the possibility of integrating HIV testing with other health system services – an approach that applies to migrants and non-migrants alike. For instance, research from the US with African and Caribbean migrants showed higher HIV testing rates when the testing was offered in a bundle with the testing for hypertension and diabetes[82]. Integration of HIV testing

with cervical cancer screening and other contraceptive counselling programmes has been suggested in Sweden to improve access to HIV testing among migrant women[83]. Migrant women in Canada preferred combining HIV testing with antenatal screening as it was perceived as a non-targeted strategy[70]. Further, a combination of HIV testing with antenatal screening was proven successful in Europe in increasing HIV testing and diagnosing migrant women at earlier stages[18]. Opt-out HIV testing in general practices, emergency rooms and (migration) detention centres was shown a promising intervention to increase the accessibility and acceptability of testing[68,84,85]. In this context, it is crucial that HIV testing is voluntary and inclusive to avoid stigmatisation and targeting of migrants as a risk group. However, these interventions may be insufficient to ensure access to testing and follow-up care for certain groups of migrants, such as undocumented migrants in countries where they have no access to healthcare systems[72].

For those migrants who have access to the healthcare system, healthcare facilities with multilingual and multicultural staff, including reception staff, trained in migrants' rights and culturally competent communication played a crucial role in retaining migrants in HIV care[58]. Research from Australia showed that a cultural competency framework can be used in the training of healthcare professionals to improve their trust-building capacity with diverse migrants and establish partnerships with most affected migrant communities[47]. In this context, cultural and peer-mediators were suggested as important tools to improve communication and trust-building between healthcare staff and migrants[86,87]. In Israel, trained HIV adherence counsellors from Ethiopia were successfully employed as cultural mediators to assist Ethiopian migrants[88]. Similar interventions were positively reported from Switzerland for sub-Saharan African migrants[89].

To further improve communication between healthcare professionals and migrants, as well as to ensure the continuity of HIV care for highly mobile migrants like circular labour migrants, mobile health (mHealth) interventions have been suggested as an effective and efficient tool[4,90]. The use of mHealth can vary from text-messaging to improve ART adherence[4] to health promotion and information messaging regarding the HIV and possibilities of HIV care[90].

Apart from developing health systems interventions, community strengthening plays an important role in facilitating access to HIV care[38,91,92]. In this context, community strengthening refers to both community engagement strategies to develop and deliver best-

suited HIV interventions for migrants, and community outreach programmes to disseminate those strategies for improving access to HIV care.

Community engagement interventions include the development of participatory programs to work with diverse migrant groups co-creating appropriate interventions. For instance, participatory methodologies were used to co-create a social marketing campaign promoting HIV testing and prevention that would attune to specific migrant groups, such as foreign-born Latinos in the US, with a particular focus on men who have sex with men (MSM)[93-95]. Although this campaign did now show statistically significant associations with uptake of HIV testing, it did present researchers with an opportunity to link high-incidence migrant populations with HIV prevention services[93]. Another participatory-based marketing campaign from the US was aimed to engage with young Latino MSM who do not identify as gay and resulted in the co-creation of a fictional cartoon peer model promoting HIV testing and safe-sex practices in a culturally sensitive manner[96]. This campaign was reported to improve safe-sex practices.

Different forms of community outreach strategies were reported promising. For instance, the use of mobile HIV testing units outside of the healthcare system in places like barber shops, social clubs, street corners, saunas and gay pride events was shown to be a helpful instrument across different countries to engage with MSM migrants[70]. Research from France with sub-Saharan African migrants showed that the mobile units working in community settings can help reaching to different migrants that might not seek HIV testing themselves, including heterosexual men, unemployed people, as well as recently arrived migrants who have been in the country for no more than 5 years[62]. Apart from utilising mobile units, the inclusion of HIV care within the already existing locally-based health centres, such as local clinics with which people have pre-established and trustful relations was reported a promising strategy in the US[58].

Table 3 summarises outreach experiences regarding interventions for improving the continuity of HIV care for migrants as described by professionals from different parts of the world.

Table 3. Experiences from the field.
These are short summaries of how HIV care for migrant communities is organised in different parts of the world as conveyed *by professionals directly involved in HIV care provision.*

Case 1. Experiences from Poland
Since 2014 increasing migration of Ukrainian citizens to Poland was observed, usually for labour and economic status purposes exceeding one million people. This influenced HIV epidemiology in the country resulting in the change in the molecular patterns related to HIV

with notable rise in the introductions of A6 variant (typical for Ukraine)[97]. Ukrainian refugees living with HIV have full and unrestricted access to all healthcare services in Poland, including antiretroviral, STI, HCV, and HBV treatment. Furthermore, system-funded access to all medical services including free-of-charge antiretroviral medications purchased centrally and distributed free-of-charge to all treated people living with HIV, with three monthly stocks is provided to all migrating patients. If needed, optimization of antiretroviral treatment in line with antiretroviral treatment availability in Poland and the EU is also performed. Targeted information campaigns in Ukrainian enabled migrants to identify centres providing HIV care[98]. Clinical follow-up including relevant laboratory diagnostics, treatment of comorbidities and often psychological support is coordinated by HIV treatment centres, with current virologic suppression rates exceeding 90% (for a viral load threshold of 50 copies/ml). Even though there is usually no formal employment of the translator, most HIV medical centres employ Ukrainian-speaking personnel who provide language support if needed. Currently 69.7% of new diagnoses in this population are classified as late, including 40% presenting with AIDS defining conditions[99]. Therefore, implementation of targeted testing preferably based on home tests is needed. Lastly, only 25% of people living with HIV exhibit protective levels of hepatitis B surface antibodies (anti-HBs), hence the need to provide migrant targeted free HBV vaccination, which is still not in place in Poland.

Case 2. Experiences from China

China's international migrant population seeking better economic opportunities and affordable education increased from 593,832 in 2010 to 845,697 in 2020, complicating the country's public health[100]. Migrants in China are unlikely to utilise facility-based healthcare services, including HIV testing, due to language, the cost of healthcare, and the fear of HIV-related stigma barriers[101-104] (ref). To alleviate testing barriers and expand testing programs, the Chinese government officially encouraged HIV self-testing (HIVST) scale-up as part of the "Thirteenth Five-Year Plan" to help decentralise HIV testing services[105]. Consequently, more Chinese cities have adopted HIVST, which offers confidential and anonymous testing and is deemed convenient by many groups of people[106-108], to make HIV testing more accessible to migrant populations. A cross-sectional study showed that 61.8% of international migrants in China had never heard of STI/HIV, reinforcing the governments' recognised need for improved education as part of HIV interventions[101,109]. The Guangdong Provincial Dermatology Hospital worked with informal leaders of migrant communities in Guangzhou to conduct a needs assessment among international migrants residing in the region. This resulted in relevant health education materials promoting health services utilisation and STI/HIV prevention, which the community leaders then disseminated[101,103]. Furthermore, China's rapidly growing e-commerce has been important in decentralising and promoting HIVST uptake among international migrants by harnessing the widespread use of smartphones and digital health[110]. E-commerce platforms in China (like Taobao) offer HIVST kits at 1.6~5 USD per kit with free 24-48-hour home delivery and online assistance during or after testing[111]. Moreover, built-in multilingual translation functions in China-manufactured phones and apps further ease the e-commerce use by migrants. Thus, decentralising HIV services, improving community engagement, and leveraging digital health have been pillars in China’s response to the need for improved access to HIV testing services among its international migrants.

Case 3. Experiences from the Dominican Republic

In 2019 Pepfar started, together with the National Response, the Index program in Enhanced Peer Outreach Approach (EPOA), which focuses on reaching, testing, and treating Haitian migrants designated as a priority population in the Dominican Republic. The costs of HIV care are fully covered by the government, regardless of immigration status. EPOA is a voucher-based system in which HIV-positive people give vouchers to their sexual partners. These vouchers invite the recipients to the health centre for "a check-up", without mentioning HIV testing.
EPOA has three modalities: 1) The counsellor or another healthcare provider calls or visits the partner(s) of the index case (IC) and recommends that they be tested for HIV. The counsellor will say that the contact is initiated due to random selection from a Ministry of Health program. 2) The IC and the counsellor cooperate to refer couples to health facilities. They agree on a timeframe within which the IC (e.g. within 7 days) will invite couples. If the IC does not invite them within the agreed time, the counsellor will contact the couples. However, if at any time the IC indicates that they do not want to be contacted, especially in potential cases where violence may occur, the counsellor must maintain the confidentiality, safety, and security of the IC. 3) The IC directly encourages their biological partner(s) and children to come to the centre for testing or to meet with a counsellor in the community for screening.
From 2020 to date, the EPOA has resulted among HIV-positive Haitian migrants into a 2.2-fold increase of new HIV-positive migrants receiving treatment, a 4.8-fold increase of active HIV-positive migrants receiving treatment, a 5-fold of HIV-positive migrants who have had at least one viral load test and a 5.6-fold increase of migrants on treatment with viral suppression.

Discussion

Although migrants are considered a vulnerable population for HIV acquisition, they experience significant intersecting barriers to accessing HIV care along the entire migration trajectory, including in departure, transition and destination countries. Migration in itself is not a risk factor for HIV acquisition, but rather migrants' previous compounded experiences with different healthcare systems and HIV care, as well as stigmatising experiences related to their social and migration status, ethnicity and gender may determine their access and practices around HIV care during and after migration. Further, these practices are significantly shaped through restrictive policies and health systems infrastructures that delineate who can have access to HIV care, as well as the scope of this care (e.g. access to HIV testing only).

Our review demonstrates the differences in accessing HIV care that people with documented and undocumented migration status face. Despite the UN[75] and UNHCR[74] calling for non-discriminatory access to the whole continuum of HIV care for migrants, undocumented migrants still do not have access to HIV care in certain countries. Migrants' intersecting vulnerabilities at the individual level become entangled with policies around both healthcare and migration in destination countries. The studies included clearly showed how this may result

in forcing some migrants to remain undocumented - for instance, when HIV-negative testing is required for visa purposes, specifically for labour visa. It also shows how it reduces migrants' individual agency and health seeking behaviour due to fear of stigma and potential deportation.

To improve equitable access to the continuity of HIV care for migrants, intersectoral interventions at the policy, health systems and community levels are required. Providing universal health coverage regardless of migration status is essential if countries are to abide by international recommendations and reach the Sustainable Development Goals. Although we acknowledge that provision of care for migrant communities can be economically challenging for countries hosting high number of migrants, it is important to highlight the need for inclusive health in all policies that stretch beyond the healthcare sector and across borders to ensure the continuity of HIV care. Offering voluntary HIV testing outside of healthcare settings or together with non-HIV related screenings may help reaching different migrant communities and decrease HIV-related stigma. Development of cross-border corporations between departure and destination countries to ensure an uninterrupted access to HIV health information of migrants and access to ART is another important aspect of HIV care continuity. To tackle both HIV and migration related stigma, specifically stigma within the healthcare settings, implementation of migrant-sensitive and culturally competent training for health professionals as well as organisation of peer support programs are promising interventions, which can be supported through the use of mHealth interventions. However, for these different interventions to be successful, community engagement and outreach programmes are crucial. Use of participatory methodologies rooted in co-creation may help developing community sensitive outreach programmes for both HIV prevention and testing as well as addressing complexities of community level stigma around HIV. This requires recognizing communities and their expertise as equal partners in research and implementation, and it requires adequate resourcing.

Several potential system and research gaps were identified in this review. First, more granular and disaggregated data pertaining to the challenges faced by and needs of migrant populations is needed. Intersectionality and gender-based analyses are required to map and address the challenges of highly heterogeneous migrant communities with particular attention to people who belong to more than one key population, such as belonging to both sexual- and ethnic minority groups. Second, further research is needed into the different aspects of accessing HIV care, including re-testing and re-linkage to HIV care along the migration trajectory. Most of the research included in this review focused on HIV testing and linkage to care with limited elaboration on the needs and challenges of migrants who need to re-enter care. Third, further

research is needed on the continuous access to HIV care for migrants in low- and middle-income countries. Fourth, more insights are needed into lived experiences of migrants living with HIV and their access to HIV care across borders to truly understand how multiple forms of inequality shape HIV risk and access to HIV care. In particular, more research with participatory approaches, including evidence on co-created interventions, for working with migrant communities to develop HIV care engagement and outreach programmes is important. Fifth, reflecting the important role of labour migration, intersectoral research across healthcare, migration and economy is needed to further understand and assess the relations between the increasing need for labour migration in many countries, those countries' economic growth, and migrants' healthcare and human rights.

In conclusion, improving access to the continuity of HIV care for migrants requires a shift towards intersectional interventions addressing the underlying multiple and mutually reinforcing inequalities. This will not only improve migrants' individual health but contribute to reducing the global HIV epidemic and ensuring we reach the Sustainable Development Goal of Ending AIDS by 2030.

Key messages

- International migrants face significant and intersecting barriers to accessing continuous HIV care along the migration route, including departure, transition, and destination countries.
- Experiences with different healthcare systems, stigma related to migration status, HIV, racialized background and gender as well as policies and health systems infrastructures shape migrants' access to HIV care.
- Undocumented migrants are particularly disadvantaged when accessing HIV care due to discriminatory policies in some countries, leading to stigma and fear of deportation.
- Universal health coverage, regardless of migration status, is essential to ensure equitable access to HIV care and reach the Sustainable Development Goals.
- Healthcare interventions aiming to strengthen community and health systems have to take into account intersectional vulnerabilities that determine individual's HIV care access.
- Voluntary HIV testing outside healthcare settings and cross-border cooperation can improve access to continuous HIV care and reduce stigma.
- Training health professionals in migrant-sensitive and culturally competent care and implementing peer support programs at both community and health system level can enhance access to HIV care for migrants.
- Community engagement, outreach programs, and participatory methodologies focused on co-production and co-development of tailored interventions are crucial for effective HIV prevention and care strategies.
- More granular and disaggregated data rooted in intersectional approaches is needed to address the diverse challenges faced by migrant populations and to inform effective policies and interventions.

Contributions

AK and CMMP developed a study design, conducted literature search, data analysis and interpretation, wrote the first version of the text, edited the final version. TN, SH developed a study design, data interpretation, writing and editing of the final text. CN, BR, NF, GR, FB, CJPAH, FS, ND, AM, LGB, JBT, DO contributed to data interpretation, writing and editing the final text. MP, WT, MG, MCT contributed to data interpretation, writing and editing the final text, writing individual case studies for the manuscript.

Declaration of interests

We declare no competing interests.

References

1. UNESCO/UNAIDS. Migrant populations and HIV/AIDS; The development and implementation of programmes: theory, methodology and practice. Geneva, Switzerland: UNESCO/UNAIDS, 2000.
2. UNAIDS. Migrants; The Gap Report 2014. Geneva, Switserland: UNAIDS, 2014.
3. ECDC. HIV and migrants. Monitoring implementation of the Dublin Declaration on partnership to fight HIV/AIDS in Europe and Central Asia: 2022 progress report. Stockholm, 2023.
4. Tanser F, Bärnighausen T, Vandormael A, Dobra A. HIV treatment cascade in migrants and mobile populations. *Current Opinion in HIV and AIDS* 2015; **10**(6): 430-8.
5. ECDC. HIV/AIDS surveillance in Europe 2023 – 2022 data. Stockholm: European Centre for Disease Prevention and Control/WHO Regional Office for Europe 2023.
6. Nöstlinger C, Cosaert T, Van Landeghem E, et al. HIV among migrants in precarious circumstances in the EU and European Economic Area. *The Lancet HIV* 2022.
7. Correa-Agudelo E, Kim H-Y, Musuka GN, Mukandavire Z, Akullian A, Cuadros DF. Associated health and social determinants of mobile populations across HIV epidemic gradients in Southern Africa. *Journal of Migration and Health* 2021; **3**: 100038.
8. Magis-Rodriguez C, Brouwer KC, Morales S, et al. HIV prevalence and correlates of receptive needle sharing among injection drug users in the Mexican-US border city of Tijuana. *Journal of psychoactive drugs* 2005; **37**(3): 333-9.
9. Amirkhanian YA, Kuznetsova AV, Kelly JA, et al. Male labor migrants in Russia: HIV risk behavior levels, contextual factors, and prevention needs. *Journal of Immigrant and Minority Health* 2011; **13**: 919-28.
10. Tschirhart N, Thi SS, Swe LL, Nosten F, Foster AM. Treating the invisible: Gaps and opportunities for enhanced TB control along the Thailand-Myanmar border. *BMC health services research* 2017; **17**(1): 1-11.
11. IOM. Migration: A Social Determinant of the Health of Migrants Geneva, Switzerland International Organization for Migration (IOM), 2006.
12. Sou J, Shannon K, Li J, et al. Structural determinants of inconsistent condom use with clients among migrant sex workers: findings of longitudinal research in an urban Canadian setting. *Sexually transmitted diseases* 2015; **42**(6): 312-6.
13. McBride B, Janushev T. Criminalisation, health, and labour rights among im/migrant sex workers globally. In: Goldenberg SM, Morgan Thomas R, Forbes A, Baral S, eds. Sex

Work, Health, and Human Rights: Global Inequities, Challenges, and Opportunities for Action. Cham, Switzerland: Springer; 2021: 153-71.

14. Stephen H, Roberts B. A case study of the provision of antiretroviral therapy for refugees in Tanzania. *Medicine Conflict and Survival* 2009; **25**(2): 134-47.

15. Correa-Salazar C, Braverman-Bronstein A, Bilal U, et al. The impact of social violence on HIV risk for women in Colombia: A concurrent mixed methods study. *PLOS global public health* 2023; **3**(2): e0001571.

16. Ornelas IJ, Yamanis TJ, Ruiz RA. The health of undocumented Latinx immigrants: what we know and future directions. *Annual Review of Public Health* 2020; **41**: 289.

17. Gogishvili M, Huang TT-K, Costa SA, et al. Late HIV diagnosis among immigrants in Spain vs. native-born Spaniards, 2010–15. *European Journal of Public Health* 2021; **31**(6): 1123-8.

18. Fakoya I, Álvarez-Del Arco D, Monge S, et al. HIV testing history and access to treatment among migrants living with HIV in Europe. *Journal of the International AIDS Society* 2018; **21**: e25123.

19. Ghasemi E, Rajabi F, Majdzadeh R, Vedadhir A, Negarandeh R. Aspects influencing Access to HIV/AIDS Services among afghan Immigrants in Iran: a qualitative study. *International Journal of Community Based Nursing and Midwifery* 2022; **10**(3): 172.

20. Logie CH, James L, Tharao W, Loutfy MR. HIV, gender, race, sexual orientation, and sex work: a qualitative study of intersectional stigma experienced by HIV-positive women in Ontario, Canada. *PLoS medicine* 2011; **8**(11): e1001124.

21. Viruell-Fuentes EA, Miranda PY, Abdulrahim S. More than culture: structural racism, intersectionality theory, and immigrant health. *Social science & medicine* 2012; **75**(12): 2099-106.

22. Migali S, Natale F, Tintori G, et al. International migration drivers; A quantitative assessment of the structural factors shaping migration. Luxembourg: Publications Office of the European Union, 2018.

23. IOM. Key Migration Terms. 2023. https://www.iom.int/key-migration-terms (accessed December 19 2023).

24. Ehrenkranz P, Rosen S, Boulle A, et al. The revolving door of HIV care: Revising the service delivery cascade to achieve the UNAIDS 95-95-95 goals. *PLoS medicine* 2021; **18**(5): e1003651.

25. Drew RS, Rice B, Rüütel K, et al. HIV continuum of care in Europe and Central Asia. *HIV medicine* 2017; **18**(7): 490-9.

26. Mugglin C, Kläger D, Gueler A, Vanobberghen F, Rice B, Egger M. The HIV care cascade in sub-Saharan Africa: systematic review of published criteria and definitions. *African Journal of Reproduction and Gynaecological Endoscopy* 2021; **24**(7): e25761.

27. Ghasemi E, Rajabi F, Negarandeh R, Vedadhir A, Majdzadeh R. HIV, migration, gender, and drug addiction: A qualitative study of intersectional stigma towards Afghan immigrants in Iran. *Health & Social Care in the Community* 2022; **30**(5): e1917-e25.

28. Masebo W. Accessing ART in Malawi while living in South Africa–a thematic analysis of qualitative data from undocumented Malawian migrants. *Global Public Health* 2019; **14**(5): 621-35.

29. Burns F, Fenton K. Access to HIV care among migrant Africans in Britain. What are the issues? *Psychology, health & medicine* 2006; **11**(1): 117-25.

30. Bromberg DJ, Tate MM, Alaei K, Karimov S, Saidi D, Alaei A. Association between time spent in the Russian Federation and late presentation for HIV among Tajikistani migrants. *BMC Public Health* 2020; **20**(1): 1-10.

31. Whelan A, Blogg J. 'Halfway people': Refugee views of reproductive health services. *Global public health* 2007; **2**(4): 373-94.

32. O'Laughlin KN, Rouhani SA, Faustin ZM, Ware NC. Testing experiences of HIV positive refugees in Nakivale Refugee Settlement in Uganda: informing interventions to encourage priority shifting. *Conflict and health* 2013; **7**: 1-9.

33. Elmileik E, Turnbull I. Impact of HIV/AIDS on African-born Women Living in the United States: a Systematic Review. *Journal of Racial and Ethnic Health Disparities* 2023; **10**(2): 680-707.

34. Cochand L, Masserey E, Bodenmann P, Troillet N. Assessment of voluntary HIV screening for asylum seekers in two Swiss cantons. *Swiss medical weekly* 2019; **149**(0708): w20020-w.

35. UNAIDS/UNDP. Still not welcome: HIV-related travel restrictions: Joint United Nations Programme on HIV/AIDS, 2019.

36. Odhiambo AJ, Forman L, Nelson LE, O'Campo P, Grace D. Unmasking legislative constraints: an institutional ethnography of linkage and engagement in HIV healthcare for African, Caribbean, and black people in Ontario, Canada. *PLOS Global Public Health* 2022; **2**(9): e0000714.

37. Körner H. 'If I had my residency I wouldn't worry': Negotiating migration and HIV in Sydney, Australia. *Ethnicity and Health* 2007; **12**(3): 205-25.

38. Ross J, Cunningham CO, Hanna DB. HIV outcomes among migrants from low-and middle-income countries living in high-income countries: a review of recent evidence. *Current opinion in infectious diseases* 2018; **31**(1): 25.

39. Ziersch A, Walsh M, Baak M, Rowley G, Oudih E, Mwanri L. "It is not an acceptable disease": A qualitative study of HIV-related stigma and discrimination and impacts on health and wellbeing for people from ethnically diverse backgrounds in Australia. *BMC Public Health* 2021; **21**(1): 1-15.

40. Donnelly LR, Bailey L, Jessani A, Postnikoff J, Kerston P, Brondani M. Stigma experiences in marginalized people living with HIV seeking health services and resources in Canada. *Journal of the Association of Nurses in AIDS Care* 2016; **27**(6): 768-83.

41. Ross J, Akiyama MJ, Slawek D, et al. Undocumented African immigrants' experiences of HIV testing and linkage to care. *AIDS patient care and STDs* 2019; **33**(7): 336-41.

42. Babel RA, Wang P, Alessi EJ, Raymond HF, Wei C. Stigma, HIV risk, and access to HIV prevention and treatment services among men who have sex with men (MSM) in the United States: a scoping review. *AIDS and Behavior* 2021: 1-31.

43. Neuman M, Obermeyer CM, Group MS. Experiences of stigma, discrimination, care and support among people living with HIV: a four country study. *AIDS and Behavior* 2013; **17**: 1796-808.

44. Nyblade L, Stangl A, Weiss E, Ashburn K. Combating HIV stigma in health care settings: what works? *Journal of the international AIDS Society* 2009; **12**: 1-7.

45. Blondell SJ, Kitter B, Griffin MP, Durham J. Barriers and facilitators to HIV testing in migrants in high-income countries: a systematic review. *AIDS and Behavior* 2015; **19**: 2012-24.

46. Adedimeji AA, Asibon A, O'Connor G, et al. Increasing HIV testing among African immigrants in Ireland: challenges and opportunities. *Journal of immigrant and minority health* 2015; **17**: 89-95.

47. McMahon T, Moreton RJ, Luisi BN. Guarding against emerging epidemics: addressing HIV and AIDS among culturally and linguistically diverse communities in NSW. *New South Wales public health bulletin* 2010; **21**(4): 83-5.

48. Mehdiyar M, Andersson R, Hjelm K, Povlsen L. HIV-positive migrants' encounters with the Swedish health care system. *Global health action* 2016; **9**(1): 31753.

49. Bromberg DJ, Tate MM, Alaei A, et al. "Who are You and What are You Doing Here?": Social Capital and Barriers to Movement along the HIV Care Cascade among Tajikistani Migrants with HIV to Russia. *AIDS and Behavior* 2021; **25**: 3115-27.

50. Tokar A, Osborne J, Hengeveld R, Lazarus JV, Broerse JE. 'I don't want anyone to know': experiences of obtaining access to HIV testing by Eastern European, non-European Union sex workers in Amsterdam, the Netherlands. *PLoS One* 2020; **15**(7): e0234551.

51. Gruchy Td, Vearey J. "Left behind": why implementing migration-aware responses to HIV for migrant farm workers is a priority for South Africa. *African Journal of AIDS Research* 2020; **19**(1): 57-68.

52. Suphanchaimat R, Sommanustweechai A, Khitdee C, et al. HIV/AIDS health care challenges for cross-country migrants in low-and middle-income countries: a scoping review. *HIV/AIDS-Research and Palliative Care* 2014: 19-38.

53. Ndumbi P, Del Romero J, Pulido F, et al. Barriers to health care services for migrants living with HIV in Spain. *The European Journal of Public Health* 2018; **28**(3): 451-7.

54. Faturiyele I, Karletsos D, Ntene-Sealiete K, et al. Access to HIV care and treatment for migrants between Lesotho and South Africa: a mixed methods study. *BMC public health* 2018; **18**: 1-10.

55. Vignier N, Desgrees Du Lou A, Pannetier J, et al. Social and structural factors and engagement in HIV care of sub-Saharan African migrants diagnosed with HIV in the Paris region. *AIDS care* 2019; **31**(7): 897-907.

56. Demeke HB, Luo Q, Beer L, Weiser J. Antiretroviral prescription, retention in care and viral suppression by place of birth among adults with diagnosed HIV in the United States—2015–2017, medical monitoring project. *AIDS care* 2021; **33**(1): 86-91.

57. Fauk NK, Gesesew HA, Seran AL, Raymond C, Tahir R, Ward PR. Barriers to Accessing HIV Care Services in Host Low and Middle Income Countries: Views and Experiences of Indonesian Male Ex-Migrant Workers Living with HIV. *International Journal of Environmental Research and Public Health* 2022; **19**(21): 14377.

58. Arnold EA, Fuller SM, Martinez O, Lechuga J, Steward WT. Documenting best practices for maintaining access to HIV prevention, care and treatment in an era of shifting immigration policy and discourse. *PloS one* 2020; **15**(2): e0229291.

59. Favarato G, Bailey H, Burns F, Prieto L, Soriano-Arandes A, Thorne C. Migrant women living with HIV in Europe: are they facing inequalities in the prevention of mother-to-child-transmission of HIV? The European Pregnancy and Paediatric HIV Cohort Collaboration (EPPICC) study group in EuroCoord. *The European Journal of Public Health* 2018; **28**(1): 55-60.

60. Raho-Moussa M, Guiguet M, Michaud C, et al. Respective roles of migration and social deprivation for virological non-suppression in HIV-infected adults on antiretroviral therapy in France. *PloS one* 2019; **14**(3): e0213019.

61. Abgrall S R-MS, Seng R, Ghislain M, Matheron S, Pialoux G,, Goujard C ML. ANRS CO9-COPANA study: Elevated risk of viral rebound on ART in migrants living in France; Role of socioeconomic factors. *Antiviral therapy* 2019; **24**(7): 541-52.

62. Gosselin A, Coulibaly K, Ravalihasy A, et al. Finding the missing link: when community-based outreach in public space is key to engage migrants in health prevention programmes in Paris, France. *J Epidemiol Community Health* 2020; **74**(8): 668-75.

63. Vearey J. Migration, access to ART, and survivalist livelihood strategies in Johannesburg. *African Journal of AIDS Research* 2008; **7**(3): 361-74.

64. Deblonde J, Sasse A, Del Amo J, et al. Restricted access to antiretroviral treatment for undocumented migrants: a bottle neck to control the HIV epidemic in the EU/EEA. *BMC Public Health* 2015; **15**: 1-13.

65. Bakunina N, Gil A, Polushkin V, et al. Health of refugees and migrants from former Soviet Union countries in the Russian Federation: a narrative review. *International Journal for Equity in Health* 2020; **19**: 1-14.

66. Keralis JM. At the nexus: How HIV-related immigration policies affect foreign nationals and citizens in South Korea. *Health and Human Rights* 2017; **19**(2): 123.

67. Narushima M, McLaughlin J, Barrett-Greene J. Needs, risks, and context in sexual health among temporary foreign migrant farmworkers in Canada: a pilot study with Mexican and Caribbean workers. *Journal of Immigrant and Minority Health* 2016; **18**: 374-81.

68. Roche R, Simmons R, Crawshaw AF, et al. What do primary care staff know and do about blood borne virus testing and care for migrant patients? A national survey. *BMC Public Health* 2021; **21**: 1-23.

69. Bil JP, Zuure FR, Alvarez-del Arco D, et al. Disparities in access to and use of HIV-related health services in the Netherlands by migrant status and sexual orientation: a cross-sectional study among people recently diagnosed with HIV infection. *BMC Infectious Diseases* 2019; **19**: 1-13.

70. Alvarez-del Arco D, Monge S, Azcoaga A, et al. HIV testing and counselling for migrant populations living in high-income countries: a systematic review. *The European Journal of Public Health* 2013; **23**(6): 1039-45.

71. McBride B, Shannon K, Strathdee SA, Goldenberg SM. Structural determinants of HIV/STI prevalence, HIV/STI/sexual and reproductive health access, and condom use among immigrant sex workers globally. *AIDS* 2021; **35**(9): 1461-77.

72. Ojeda VD, Burgos JL, Rangel AG, Lozada R, Vera A. U.S. drug use and migration experiences of Mexican female sex workers who are injection drug users. *J Health Care Poor Underserved* 2012; **23**(4): 1733-49.

73. Wirtz AL, Guillén JR, Stevenson M, et al. HIV infection and engagement in the care continuum among migrants and refugees from Venezuela in Colombia: a cross-sectional, biobehavioural survey. *The Lancet HIV* 2023.

74. UNHCR. Antiretroviral medication policy for refugees. Geneva, Switzerland: United Nations High Commissioner for Refugees, 2007.

75. UN. International Covenant on Economic, Social, and Cultural Rights (ICESCR) In: Nations U, editor. Geneva, Switzerland: United Nations; 1966.

76. UN. 1951 Convention Relating to the Status of Refugees. In: Nations U, editor. Geneva, Switzerland: United Nations; 1951.

77. EU. Dublin Declaration on Partnership to fight HIV/AIDS in Europe and Central Asia. In: Union E, editor. Dublin: Irish EU Presidency; 2004.

78. ILO. Code of Practice on HIV/AIDS and the World of Work. Geneva, Switzerland: International Labour Organisation (ILO), 2001.

79. Fakoya I, Reynolds R, Caswell G, Shiripinda I. Barriers to HIV testing for migrant black Africans in Western Europe. *HIV medicine* 2008; **9**: 23-5.

80. Shakya P, Sawada T, Zhang H, Kitajima T. Factors associated with access to HIV testing among international students in Japanese language schools in Tokyo. *PloS one* 2020; **15**(7): e0235659.

81. Tansey E, Borland R, West H. Southern Africa ports as spaces of HIV vulnerability: case studies from South Africa and Namibia. *International Maritime Health* 2010; **62**(4): 233-40.

82. Kwakwa HA, Wahome R, Goines DS, et al. Engaging African and Caribbean immigrants in HIV testing and care in a large US city: lessons learned from the African diaspora health initiative. *Journal of Immigrant and Minority Health* 2017; **19**: 818-24.

83. Åkerman E, Essen B, Westerling R, Larsson E. Healthcare-seeking behaviour in relation to sexual and reproductive health among Thai-born women in Sweden: a qualitative study. *Culture, health & sexuality* 2017; **19**(2): 194-207.

84. Martinez-Donate AP, Rangel MG, Rhoads N, et al. Identifying opportunities to increase HIV testing among mexican migrants: a call to step up efforts in health care and detention settings. *PLoS One* 2015; **10**(4): e0123631.

85. The Lancet HIV. Opt-out HIV testing in the UK. *The Lancet HIV* 2023; **10**(6): e351.

86. Morin SF, Carrillo H, Steward WT, Maiorana A, Trautwein M, Gómez CA. Policy perspectives on public health for Mexican migrants in California. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 2004; **37**: S252-S9.

87. Lee JJ, Robles G, Leyva Vera CA, et al. A Peer-Based Intervention to Increase HIV and Sexually Transmitted Infection Testing Among Latinx Immigrant Sexual Minority Men in the US Pacific Northwest: Pilot Randomized Controlled Trial Conducted During the COVID-19 Pandemic. *JMIR Formative Research* 2023; **7**: e45871.

88. Elinav H, Pops KO, Shasha D, et al. HIV/AIDS profile and realities at a regional antiretroviral therapy clinic in Jerusalem: 12 years analysis. *Scandinavian Journal of Infectious Diseases* 2012; **44**(1): 65-9.

89. Thierfelder C, Weber R, Elzi L, et al. Participation, characteristics and retention rates of HIV-positive immigrants in the Swiss HIV Cohort Study. *HIV medicine* 2012; **13**(2): 118-26.

90. Evans C, Turner K, Suggs L, Occa A, Juma A, Blake H. Developing a mHealth intervention to promote uptake of HIV testing among African communities in the UK: a qualitative study. *BMC Public Health* 2016; **16**: 1-16.

91. Rouhani SA, O'Laughlin KN, Faustin ZM, Tsai AC, Kasozi J, Ware NC. The role of social support on HIV testing and treatment adherence: A qualitative study of HIV-infected refugees in southwestern Uganda. *Global public health* 2017; **12**(8): 1051-64.

92. Krentz H, Gill MJ. The five-year impact of an evolving global epidemic, changing migration patterns, and policy changes in a regional Canadian HIV population. *Health Policy* 2009; **90**(2-3): 296-302.

93. Shah HS, Grieb SMD, Flores-Miller A, et al. Sólo Se Vive Una Vez: evaluation of a social marketing campaign promoting HIV screening and prevention for immigrant Latinxs. *AIDS and Behavior* 2021: 1-10.

94. Grieb SMD, Velez M, Corty EW, et al. HIV-related stigma among Spanish-speaking Latinos in an emerging immigrant city following the Solo Se Vive Una Vez social marketing campaign. *PloS one* 2022; **17**(10): e0274888.

95. Shah HS, Dolwick Grieb SM, Flores-Miller A, Greenbaum A, Castellanos-Aguirre J, Page KR. Sólo Se Vive Una Vez: The implementation and reach of an HIV screening campaign for Latinx immigrants. *AIDS Education and Prevention* 2020; **32**(3): 229-42.

96. Solorio R, Norton-Shelpuk P, Forehand M, et al. Tu Amigo Pepe: evaluation of a multi-media marketing campaign that targets young Latino immigrant MSM with HIV testing messages. *AIDS and Behavior* 2016; **20**: 1973-88.

97. Serwin K, Chaillon A, Scheibe K, et al. Circulation of human immunodeficiency virus 1 A6 variant in the eastern border of the European Union—dynamics of the virus transmissions between Poland and Ukraine. *Clinical Infectious Diseases* 2023; **76**(10): 1716-24.

98. Zdrowia. KCDAAM. Онлайн-консультація. n.d. https://aids.gov.pl/poradnia_internetowa_ukr/?cn-reloaded=1 (accessed December 19 2023).

99. M. Parczewski ES, I. Cielniak, M. Bociąga Jasik, M. Lara, M. Leszczyszyn-Pynka, M. Witak-Jędra, A. Szymczak, B. Szetela, E. Mularska, A. Witor, P. Jakubowski, M. Hlebowicz, B. Rozpłochowski, A. Olczak, W. Łojewski, E. Jabłonowska, K. Scheibe, P. Ząbek. Clinical characteristics and antiretroviral treatment efficacy among newly diagnosed migrants and refugees from Ukraine. European Aids Conference (EACS) 2023. Warsaw, Poland; 2023.

100. Statistics NBo. Tabulation on the 2010 Population Census of the People's Republic of China 2010. 2011. http://www.stats.gov.cn/tjsj/pcsj/rkpc/6rp/indexch.htm. (accessed October 23 2023).

101. Zhou Y, Cheng F, Xu J. Vulnerability to HIV Infection Among International Immigrants in China: Cross-sectional Web-Based Survey. *JMIR Public Health and Surveillance* 2023; **9**: e35713.

102. Hasan M, Li X, Valentino W, Ray A. Barriers to Healthcare Access for International Students in China. *Mymensingh Medical Journal: MMJ* 2017; **26**(1): 184-93.

103. Adebayo KO. Health Challenges in Everyday Life of Nigerians in Guangzhou City, China. *Journal of International Migration and Integration* 2023: 1-21.

104. Julien J, Wang X, Meng H, Qian Z, Wang D, Zhang X. The influence of transaction process with doctors on patient satisfaction, self-rating anxiety and self-efficacy among international students in China. *Frontiers in Public Health* 2021; **9**: 737278.

105. Council S. China's 13th Five-Year Plan for the Containment and Prevention of HIV/AIDS. . Beijing: State Council, 2017.

106. O'Byrne P, Musten A, Ho N. HIV self-testing in the real world is acceptable for many: post-test participant feedback from the GetaKit study in Ottawa, Canada. *Journal of Research in Nursing* 2022; **27**(8): 757-64.

107. Njau B, Damian DJ, Abdullahi L, Boulle A, Mathews C. The effects of HIV self-testing on the uptake of HIV testing, linkage to antiretroviral treatment and social harms among adults in Africa: a systematic review and meta-analysis. *PloS one* 2021; **16**(1): e0245498.

108. Zhang Y, Wiseman V, Applegate TL, et al. Preferences for HIV testing services and HIV self-testing distribution among migrant gay, bisexual, and other men who have sex with men in Australia. *Frontiers in Medicine* 2022; **9**: 839479.

109. State Council PsRoC. China rolls out plan for controlling HIV transmission. 2019. http://english.www.gov.cn/statecouncil/ministries/201910/15/content_WS5da524c4c6d0bcf8c4c15194.html. (accessed October 26 2023).

110. Ma Y. Retail e-commerce sales in China 2020-2026. 2023. https://www.statista.com/statistics/289734/china-retail-ecommerce-sales/ (accessed October 23 2023).

111. Lv Y, Zhu Q, Xu C, et al. Spatiotemporal analysis of online purchase of HIV self-testing kits in China, 2015-2017: longitudinal observational study. *JMIR Public Health and Surveillance* 2022; **8**(9): e37922.