World Health Organization

Ensuring the integration of refugees and migrants in immunization policies, planning and service delivery globally

Global Evidence Review on Health and Migration (GEHM) series

The GEHM series is an evidence-informed normative product of the WHO Health and Migration Programme to inform policy-makers on migration-related public health priorities. These reviews aim to respond to policy questions identified as priorities by summarizing the best available evidence worldwide and proposing policy considerations. By addressing data gaps on the health status of refugees and migrants, the GEHM series aims to support evidence-informed policy-making and targeted interventions that are impactful and make a difference in the lives of these populations.

World Health Organization

Ensuring the integration of refugees and migrants in immunization policies, planning and service delivery globally

Ensuring the integration of refugees and migrants in immunization policies, planning and service delivery globally

(Global Evidence Review on Health and Migration (GEHM) series)

ISBN 978-92-4-005184-3 (electronic version)
ISBN 978-92-4-005185-0 (print version)

Suggested citation. Ensuring the integration of refugees and migrants in immunization policies, planning and service delivery globally. Geneva: World Health Organization; 2022 (Global Evidence Review on Health and Migration (GEHM) series). Licence: CC BY-NC-SA 3.0 IGO.

Cataloguing-in-Publication (CIP) data. CIP data are available at http://apps.who.int/iris.

Contents

Foreword

Vaccination is arguably the most powerful public health intervention in history. It is also a powerful marker of inequity: those who miss out on vaccines – such as refugees and migrants – also miss out on many other essential health services.

WHO's Immunization Agenda 2030 sets out a clear vision to make vaccines available to all, no matter their legal status or where they live, with a particular focus on marginalized groups and those who are otherwise left behind. That makes equitable vaccination of refugees and migrants a priority for WHO.

In this third Global Evidence Review on Health and Migration, we survey immunization services for refugees and migrants. The findings are troubling, but not surprising: many refugees and migrants cannot access health services, including vaccination, and face discrimination and social exclusion.

Many countries still do not specify a clear policy on refugees' and migrants' entitlement to vaccination, and even when they do, there are often gaps in implementation. As a result, far too many refugee and migrant populations globally are under-immunized, especially those who lack legal status. These inequities have been exacerbated by the COVID-19 pandemic.

This evidence review identifies context-specific drivers of under-immunization and vaccine hesitancy in refugee and migrant populations, and documents good practices and policy considerations to help to fully integrate refugees and migrants into national immunization plans, regardless of their legal status, age or gender.

In 2019, the World Health Assembly committed to a global action plan promoting the health of refugees and migrants. This follows the Global Compact on Refugees (2018) and the Global Compact for Safe, Orderly and Regular Migration (2018). Yet these global frameworks by themselves are not enough. Too often, many countries do not comply with them, nor follow evidence-based advice.

Supporting all countries to make progress towards universal health coverage has been my top priority as Director-General. Everyone, no matter where they live or their legal status, should enjoy the right to health, and access to quality health services, including immunization.

To meet the health needs of refugee and migrant populations, cooperation and collaboration between countries and sectors is essential. An inclusive approach that respects human rights for all must guide public health policy and practice. The Global Evidence Review on Health and Migration is an important contribution towards accountability to our commitments as a global community.

Health for all means all – including refugees and migrants.

Dr Tedros Adhanom Ghebreyesus

Director-General
World Health Organization

Preface

Vaccination is a vitally important aspect of global health and an absolute requirement to achieve universal health coverage. In August 2020 the Seventy-third World Health Assembly endorsed Immunization Agenda 2030: a Global Strategy to Leave No One Behind in resolution WHA73. The Agenda defines global goals for immunization coverage, but these cannot be achieved unless refugees and migrants are included in global and national vaccination programmes – the current numbers of refugees and migrants worldwide make this an absolute requirement. Yet the evidence suggests inadequate vaccination uptake among this usually disadvantaged population, with lower immunization rates and higher burdens of vaccine-preventable diseases compared with host populations, particularly for irregular migrants. The drivers of underimmunization in refugees and migrants are complex and context dependent but may include lack of awareness and physical access to immunization services, as well as vaccine hesitancy.

This third Global Evidence Review on Health and Migration (GEHM) aims to provide an overview of vaccination policies and practices for refugees and migrants, and to compile global and national evidence on the inclusion of refugees and migrants in national immunization policies, implementation of these policies, and the barriers faced by refugees and migrants in accessing vaccines. It also identifies facilitators and policy considerations based on good practices for strengthening the delivery of immunization services, with the overall aim of improving global vaccine coverage.

The GEHM found that inclusion of refugees and migrants in national immunization policies and immunization programmes is highly variable. Discrepancies may be associated with legal status, age and the context in which refugees and migrants live. Furthermore, even where more-inclusive policies exist, there are often gaps in implementation

The COVID-19 pandemic has disrupted routine immunization services, accentuated pre-existent vulnerabilities and increased inequities for refugees and migrant populations. It has highlighted policy-level barriers and shortfalls in immunization delivery but has also created new opportunities and innovations to ensure that more-inclusive policy-making and vaccine services continue beyond the pandemic.

The primary policy consideration is to ensure universal and equitable access to vaccines for refugees and migrants regardless of migrant status, age or gender, equal to that of nationals. This will require countries to adapt their immunization policies to specifically cover all refugees and migrants in routine and catch-up

immunization, mass vaccination campaigns and pandemic response plans such as for COVID-19. This includes irregular migrants and those housed in closed settings (including camps, detention centres, reception centres, resettlement centres or labour compounds).

To achieve these vaccination goals, renewed focus is now needed on health system strengthening globally for vaccination across the whole life course in mobile populations, alongside strengthening of national vaccine capacity in general where this is required. Achieving this will require comprehensive national health policies and supporting legislative and financial frameworks that promote the right to health. Such health systems are an integrating force in society and, accordingly, must be sensitive to the needs of migrants, their languages and their unique health problems. To achieve these goals, well-trained, culturally sensitive and competent health workforces are needed.

It is hoped that this GEHM will both help refugees and migrants everywhere to access vital immunizations more easily, and also contribute to the wider global vaccination goals within WHO's Immunization Agenda 2030.

Dr Katherine O'Brien
Director
Department of Immunization, Vaccines and Biologicals

Dr Santino Severoni
Director
Health and Migration Programme

Acknowledgements

Contributors

Technical development, review and publication coordination

Technical conceptualization and coordination of the publication processes were provided by the WHO Health and Migration Programme (PHM; Office of the Deputy Director-General, WHO headquarters, Geneva) under the strategic lead and supervision of Santino Severoni, Director, with support to the production by Rifat Hossain and coordination and consolidation by Rimu Byadya and Palmira Immordino (PHM). As for other GEHMs in the series, PHM collaborated with other WHO departments: with the Department of Immunization, Vaccines and Biologicals, Director Katherine O'Brien, for this publication.

Document production

The document was written and researched by Sally Hargreaves, Alison F Crawshaw and Anna Deal on behalf of the Migrant Health Research Group, Institute for Infection and Immunity, St George's, University of London, London, United Kingdom.

It was reviewed by Manuel Carballo, Executive Director, International Centre for Migration Health and Development, Geneva, Switzerland and Nadia Charania, Co-Director, Migrant and Refugee Health Research Centre, School of Public Health and Interdisciplinary Studies, Auckland University of Technology, Australia.

The document was shared with and revised by the International Organization for Migration, the United Nations Children's Fund and the Office of the United Nations High Commissioner for Refugees.

We thank Veronica Cornacchione, Cetin Dikmen and Alexandra Ladak (PHM) for support in the production and dissemination of the publication.

The PHM gratefully acknowledges the generous financial support from the Ministry of Health of Canada.

Editorial team

Health and Migration Programme

Santino Severoni, Rifat Hossain, Palmira Immordino, Kanokporn Kaojaroen, Mohammad Darwish, Rimu Byadya

Immunization, Vaccines and Biologicals

Katherine O'Brien, William Augusto Perea Caro

Interdivisional Working Group

With the overall objective of strengthening normative research and evidence and gathering works of the PHM, an Interdivisional Working Group has been established to support the overall production of the Global Evidence Review series. Representatives from Science and Data Divisions in the Interdivisional Working Group (focal points listed below) have kindly agreed to support this initiative from normative, methodological, research and data perspectives, and to advise technical staff from PHM and other relevant programme areas as appropriate in various stages of development of the Global Evidence Review series.

Health and Migration Programme

Rifat Hossain, Palmira Immordino

Department of Quality Assurance Norms and Standards, Science Division

Rokho Kim, Lisa Askie, Pura Maria Solon

Department of Research for Health, Science Division

Anna Laura Ross

Department of Data Analytics, Division of Data Analytics and Delivery for Impact

Ahmadreza Hosseinpoor, Katherine Kirkby

Abbreviations and acronyms

DTP	diphtheria–tetanus–pertussis combined vaccine
DTP3	third dose of the diphtheria–tetanus–pertussis combined vaccine
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EU	European Union
GEHM	Global Evidence Review on Health and Migration (series)
HICs	high-income countries
HPV	human papillomavirus
IA2030	Immunization Agenda 2030
IDP	internally displaced person
IOM	International Organization for Migration
LMICs	low- and middle-income countries
MCV	measles-containing vaccine
MCV2	second dose of the measles-containing vaccine
MMR	measles–mumps–rubella
NDVP	national deployment and vaccination plan
NGO	nongovernmental organization
polio	poliomyelitis
SAGE	Strategic Advisory Group of Experts on Immunization
UNHCR	Office of the United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
VPD	vaccine-preventable disease

Executive summary

WHO prioritizes the protection and promotion of refugees' and migrants' health within the context of ensuring access to health-care services for all, including immunization programmes. Globally, refugees and migrants should have non-discriminatory and equitable access to immunization programmes, free from financial, linguistic, cultural, administrative or bureaucratic barriers. For this, specific initiatives may be needed to reach out to these groups, including for COVID-19 vaccination. Access to health care – which includes immunization services – is a permanent legal obligation under international law for States that have signed the relevant international treaties. The full inclusion of refugees and migrants in immunization plans and implementation of these plans are critical if countries are to meet the ambitious targets to increase coverage of routine vaccines set out in WHO's Immunization Agenda 2030: a Global Strategy to Leave No One Behind (IA2030), and are aligned with the overall objective of universal health coverage. Evidence is inconclusive on whether these populations experience overall lower immunization rates and higher vaccine-preventable disease (VPD) burdens compared with host populations. Undoubtedly, some refugee and migrant populations are underimmunized, and the drivers of underimmunization and vaccine hesitancy in refugee and migrant populations are likely to be complex and highly context dependent. Furthermore, the COVID-19 pandemic has disrupted routine immunization services and supplemental immunization activities for the general population, and it is expected to have worsened pre-existing vulnerabilities and increased inequities for refugees and migrant populations.

This Global Evidence Review on Health and Migration (GEHM) focuses on policy and practice regarding the inclusion of refugees and migrants in immunization systems globally, including during the COVID-19 pandemic. It synthesizes the best available evidence and practices to inform policy and programme development and presents policy considerations to help to address inequities in immunization for refugees and migrants.

Searches of academic and grey literature published between 1 January 2010 and 31 October 2021, with no restrictions on language or geographical scope, identified 210 relevant articles for inclusion in a scoping review. The umbrella term "refugees and migrants" was used to cover the diverse groups of people on the move. The review synthesized evidence on the integration of refugees and

migrants into national immunization policies and implementation of these policies; the barriers faced in accessing vaccines; facilitators and good practices for strengthening the delivery of immunization services and improving global vaccine coverage; and the specific impact of the COVID-19 pandemic on immunization services for mobile populations globally.

This GEHM identified specific and unique barriers for refugees and migrants, including those related to awareness of and physical access to immunization services, that strongly influence vaccine uptake and motivation to vaccinate, especially for irregular migrants. National immunization policies on the inclusion of refugees and migrants in immunization programmes were highly variable across countries, with discrepancies in access based on legal status, age and setting. Many countries lack explicit policies or have unclear policies on migrants' and, in some cases, refugees' rights to vaccination. Those with more-inclusive policies often had gaps in implementation. Specific case studies are also included on the implementation of immunization and other approaches to increase vaccine uptake and confidence in refugee and migrant populations by providing culturally competent care that is sensitive to the needs of these populations. As well as initiatives to dramatically decrease the number of zero-dose children globally, renewed focus is now needed on catch-up vaccination delivery across the life course in these mobile populations, to ensure that child, adolescent and adult refugees and migrants are included in catch-up planning and delivery for missed vaccines and missed doses where needed and to offer them any additional vaccines needed to align them with the host country vaccine schedule.

Despite highlighting policy-level barriers and shortfalls in immunization delivery mechanisms for these refugees and migrants, the COVID-19 pandemic has also created opportunities for more-inclusive vaccine service delivery and policy-making, including by the removal of policies that exclude irregular migrants from registering for and accessing free health care and vaccines. This momentum should be seized upon, with countries supported to ensure that these more-inclusive policies and practices are continued beyond the pandemic.

Policy considerations

The following policy considerations are based on the review results:

- ensure universal and equitable access to vaccines for all refugees and migrants regardless of migrant status, age and gender by:
  - adapting immunization policies to specifically include refugees and migrants (including irregular migrants and those housed in closed settings) in routine and catch-up immunization, mass vaccination campaigns and pandemic response plans;
  - permanently adopting the inclusive policies developed during COVID-19 pandemic, including those targeting irregular migrants for COVID-19 health care and vaccine access;
  - addressing barriers to immunization services through communication and engagement strategies to increase vaccine uptake, build trust and tackle vaccine hesitancy (including in primary caregivers of child migrants) and through community participation in developing innovative, tailored delivery mechanisms;
  - developing communication strategies that reduce vaccine information inequities, (including translating information materials into relevant languages and providing qualified interpreters and health navigators) and specifically counter misinformation and disinformation; assessing the influence of social media as a major source of vaccine misinformation (especially in marginalized populations); and exploring opportunities to share accurate and reliable information through social media;
  - ensuring that routine immunizations are free of charge at the point of delivery; and
  - improving integration between immunization and other health programmes to strengthen primary health care and attain equity goals;
- strengthen health systems to provide catch-up vaccination in mobile populations across the life course and ensure adequate resources for these activities by:
  - ensuring that national policies and immunization programmes includes plans and processes to deliver catch-up vaccinations to refugees and migrants of all ages, including targeted catch-up for children, adolescents and adults in line with the host country vaccine schedule throughout the migration journey;

- strengthening national vaccine capacity in general where needed;
- promoting equitable vaccine uptake through improving accessibility and the outreach capacity of immunization services and primary care providers;
- providing cross-border service delivery and vaccination records (type and dose number) that can travel with individuals throughout their migration journey; and
- strengthening patient–provider interactions by training health workers on competencies to provide people-centred and cultural sensitive services to refugee and migrants and educating primary health-care providers and vaccinators about barriers to immunization services and the sociocultural perspectives of refugees and migrants; and

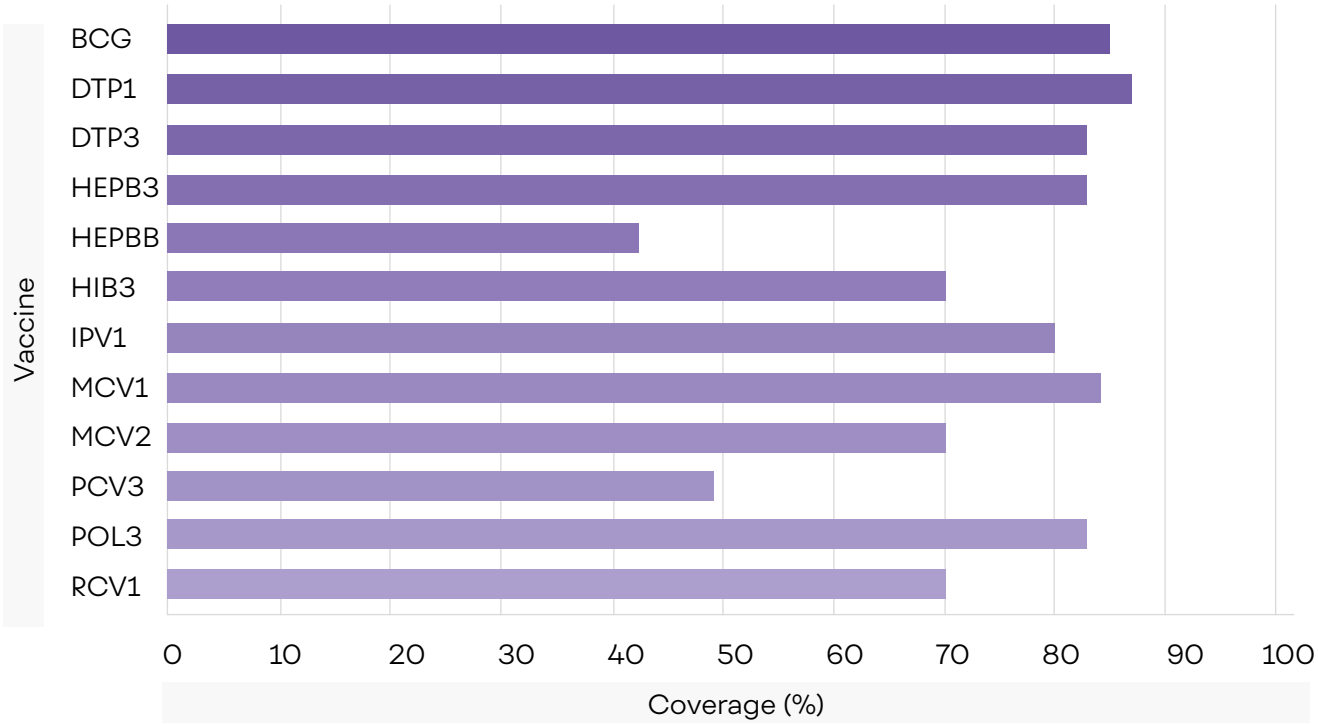
- strengthen data collection to monitor immunization coverage and service delivery gaps in refugee and migrant populations by:
  - providing financial support for national data collection and analysis (disaggregated by migrant status and gender) to identify the barriers and facilitators to immunization services;
  - establishing or upgrading immunization information systems to capture vaccination coverage data for refugees and migrants, and derive lessons from experiences, document processes and outcomes, and share information;
  - performing robust, large-scale studies to identify the drivers of underimmunization and vaccine hesitancy.

1. Introduction

1.1 Background

Immunization is one of the world's most cost-effective global health interventions, saving millions of lives globally and making more than 20 life-threatening diseases now preventable *(1)*. Vaccines will undoubtedly play a critical role in achieving the Triple Billion Targets of WHO's Thirteenth General Programme of Work 2019–2023 *(2)*, universal health coverage and the United Nations' Sustainable Development Goal 3 *(3)* by reducing poverty and VPD morbidity and mortality *(4,5)*. Although significant progress has been made in reducing VPD incidence globally, significant challenges remain, with global coverage for key routine immunizations still falling below optimal levels (Fig. 1). Consequently, VPDs are still responsible for a high number of deaths globally, with a disproportionate impact on regions such as sub-Saharan Africa *(8)*. In 2020, 23 million children missed out on essential vaccines, of whom more than 60% live in just 10 countries (Angola, Brazil, Democratic Republic of the Congo, Ethiopia, India, Indonesia, Nigeria, Pakistan, Philippines and Mexico) *(9)*; of these, 17 million are categorized as zero-dose children (that is, have not received any vaccines at all). The COVID-19 pandemic has resulted in major disruptions to immunization services globally by severely limiting access to life-saving vaccines, including mass immunization campaigns and vaccine supply chains *(10)*; this is thought to have resulted in an additional 3.7 million children missing vital vaccines since 2019 *(6)*. Table 1 shows the number VPD-related deaths in children aged under 5 years in 2017 by WHO region.

Fig. 1. WHO/United Nations Children's Fund estimates of global immunization coverage, 2020



BCG: Bacillus Calmette–Guérin (tuberculosis); DTP1: first dose of the diphtheria–tetanus–pertussis combined vaccine; DTP3: third dose of the diphtheria–tetanus–pertussis combined vaccine; HEPB3: third dose of the hepatitis B vaccine; HEPBB: birth dose of hepatitis B vaccine; HIB3: third dose of the *Haemophilus influenzae* type b vaccine; IPV1: first dose of the inactivated poliomyelitis vaccine; MCV1: first dose of the measles-containing vaccine; MCV3: third dose of the measles-containing vaccine; PCV: third dose of the pneumococcal vaccine; POL3: third dose of the poliomyelitis-containing vaccine; RCV1: first dose of the rubella-containing vaccine.

Source: data from the United Nations Children's Fund, 2021 (*6*) and WHO, 2022 (*7*).

Table 1. VPD-related deaths in children aged under 5 years by WHO region, 2017

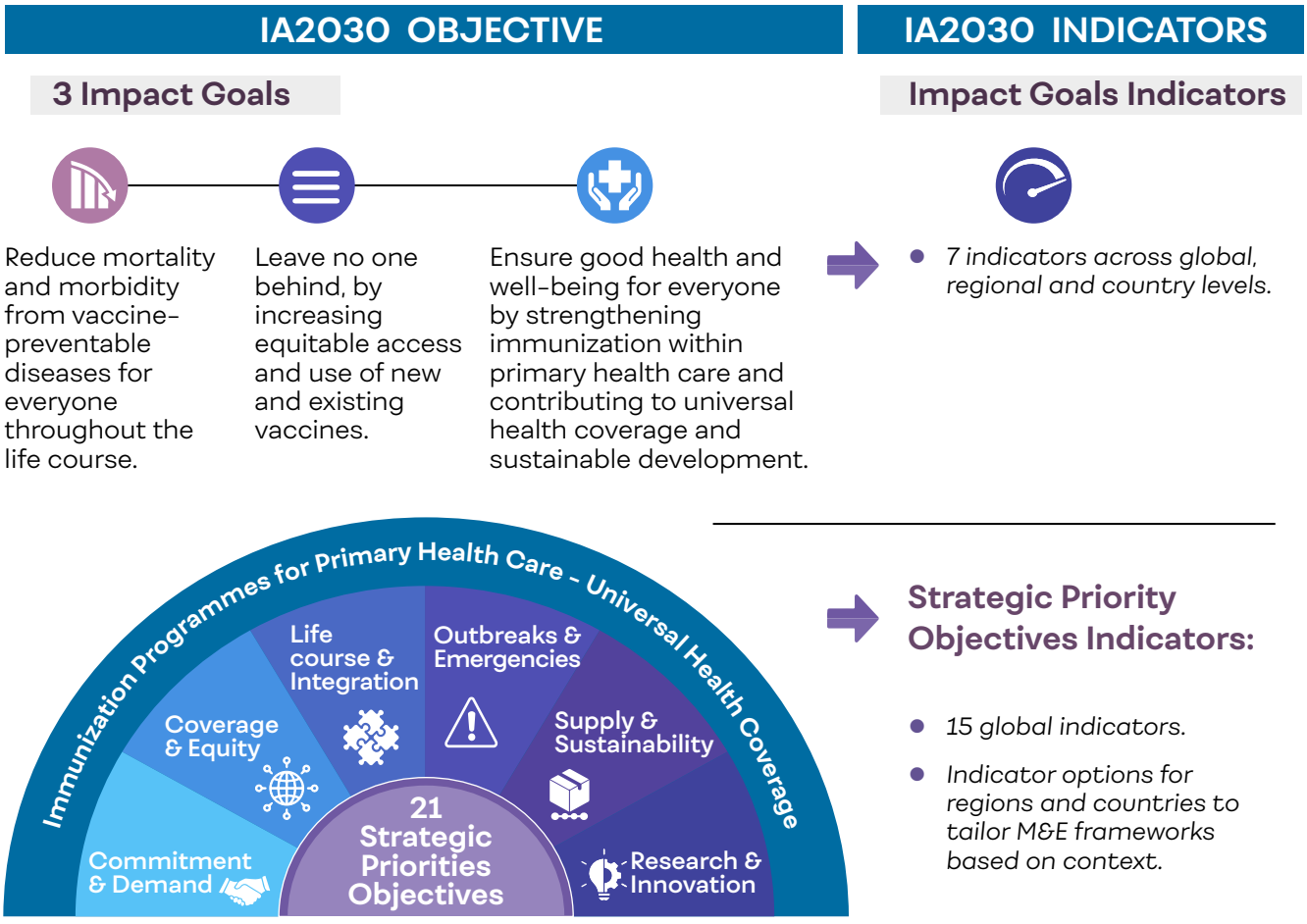
Cause of death	Number of deaths by WHO region						
	(WHO) Global	Africa	Americas	Eastern Mediterranean	Europe	South-East Asia	Western Pacific
Acute lower respiratory infections[a]	808 694	426 186	21 396	124 496	9 168	186 966	40 482
Diarrhoeal diseases[a]	440 521	235 606	7 644	66 728	3 034	112 523	14 986
Measles	91 650	43 382	0	20 525	37	26 659	1 046
Meningitis/ encephalitis	129 780	71 751	2 573	22 114	1 262	28 048	4 032
Tetanus	31 259	14 544	156	10 438	64	5 667	389

[a]Partly preventable by vaccination.

Source: data from the WHO, 2022 (*11*).

In August 2020 the Seventy-third World Health Assembly endorsed IA2030 (*9*) in decision WHA73(9) (*12*). IA2030 defines what needs to happen next to drive improvements in global immunization coverage and presents a vision of "a world where everyone, everywhere, at every age fully benefits from vaccines for good health and well-being". It defines strategic priorities to ensure that immunization is accessible by all people, contributes to universal health coverage and sustainable development, and sets new and ambitious targets. These include increasing global vaccine coverage to 90% for human papillomavirus (HPV), the diphtheria–tetanus–pertussis combined vaccine (DTP), third dose (DTP3), the measles-containing vaccine (MCV) second dose (MCV2) and the third dose of the pneumococcal vaccine by 2030, and delivering a 50% reduction in the number of zero-dose children, with the aim of averting 50 million deaths. To achieve this, an increased emphasis is needed on equity and vulnerable populations, along with a stronger focus on immunization across the life course to promote well-being for all at all ages (Fig. 2, Table 2).

Fig. 2. IA2030: goals, objective and indicators



M&E: monitoring and evaluation.
Source: reproduced from WHO, 2021 (*13*).

Table 2. Impact goals and strategic priority indicators as defined in IA2030

Goals/priorities	Indicator
Impact goals	
Prevent disease	1.1. Number of future deaths averted through immunization
	1.2. Number and % of countries achieving endorsed regional or global VPD control, elimination and eradication targets
	1.3. Number of large or disruptive VPD outbreaks
Promote equity	2.1. Number of zero-dose children
	2.2. Introduction of new or under-utilized vaccines in low- and middle-income countries
Build strong immunization programmes	3.1. Vaccination coverage across the life course (DTP3, MCV2, PCV3, HPVc)
	3.2. UHC Index of Service Coverage
Strategic priorities	
Immunization Programmes for PHC/UHC	1.1. Proportion of countries with evidence of adopted mechanism for monitoring, evaluation and action at the national and subnational levels
	1.2. Density of physicians, nurses and midwives per 10 000 population
	1.3. Proportion of countries with on-time reporting from 90% of districts for suspected cases of all priority VPDs included in national surveillance
	1.4. Proportion of time with full availability of DTPcv and MCV at service delivery level (mean across countries)
	1.5. Proportion of countries with at least one documented individual serious AEFI case safely reported per million total population
Commitment and demand	2.1. Proportion of countries with legislation in place that is supportive of immunization as a public good
	2.2. Proportion of countries that have implemented behavioural or social strategies (i.e. demand generation strategies) to address undervaccination

Table 2. contd

Goal	Indicator
Coverage and equity	3.1. DTP3, MCV1 and MCV2 coverage in the 20% of districts with lowest coverage (mean across countries)
Life course and integration	4.1. Breadth of protection (mean coverage for all WHO-recommended vaccine antigens, by country)
Outbreaks and emergencies	5.1. Proportion of polio, measles, meningococcus, yellow fever cholera and Ebola outbreaks with timely detection and response
Supply and sustainability	6.1. Level of health of the vaccine market, disaggregated by vaccine antigens and country topology
	6.2. Proportion of countries whose domestic government and donor expenditure on PHC increased or remained stable
	6.3. Proportion of countries whose share of national immunization schedule vaccine expenditure funded by domestic government resources increased
Research and innovation	7.1. Proportion of countries with a immunization research agenda
	7.2. Progress towards global research and development targets

AEFI: adverse event following immunization; DTPcv: DTP-containing vaccine; HPVc: HPV complete series; MCV1: first dose of measles-containing vaccine; PCV3: third dose of pneumococcal conjugate vaccine; PHC: primary health care; UHC: universal health coverage.

Source: WHO, 2021 (*13*).

The global extent of underimmunization of refugee and migrant populations specifically is poorly defined. The process of migration and displacement has been identified as adversely affecting vaccination uptake (14,15). Data suggest that adult, adolescents and child refugees and migrants as a group are underimmunized for routine vaccines in several contexts (*8,16,17*) and may have a higher burden of VPDs compared with host populations (*18–20*). For example, a study into the vaccination status of migrants arriving in Denmark found that 33% of children and adolescents were not vaccinated in accordance with Danish guidelines (*17*). The highest levels of underimmunization were in those aged 12–17 years, with catch-up vaccines required mainly for DTP, inactivated poliomyelitis (polio) vaccine and Haemophilus influenzae type b vaccine. In China, a large proportion of rural-to-urban migrant children had delayed age-appropriate vaccination (*21*). Refugees and migrants have been involved in VPD outbreaks because of being underimmunized, with settings such as refugee camps, mass displacement settings and immigration detention centres found to be extremely conducive to VPD outbreaks owing to overcrowded living conditions and lack of access to mainstream immunization systems (22). A 2014 investigation by the Lebanese Ministry of Public Health into a hepatitis A outbreak in Lebanon reported a sharp rise in the number of reported hepatitis A virus infections following the Syrian crisis and influx of refugees,

mostly among Syrian refugees and in settlement areas (in the Beqaa and North governorates) (*23*). VPDs commonly encountered in humanitarian emergencies include measles, polio and, depending on geographical location, cholera, diphtheria, hepatitis A, meningococcal meningitis and yellow fever (*19*). In Bangladesh, a major diphtheria outbreak occurred in November 2017 among Rohingya refugees residing in Cox's Bazar, resulting in around 8000 cases and marking the first major resurgence of diphtheria in the country in the post-universal vaccination era (since the 1980s) (*24*). Refugees and migrants experience multiple barriers (both specific and general) to immunization systems during transit and on arrival in the host country, which may influence their motivation to vaccinate and vaccine uptake. Local health-care and immunization programmes could do more to address the drivers of underimmunization and vaccine hesitancy in refugees and migrants, including language and health literacy barriers; lack of knowledge about the benefits of immunization; misconceptions about vaccination effects; discrimination or racism; real, restricted or perceived lack of entitlement to free vaccinations; low trust in health systems; cultural barriers; and being unable to afford the direct or indirect costs (Deal et al. Defining drivers of under-immunization and vaccine hesitancy in refugee and migrant populations to support strategies to strengthen uptake of COVID-19 vaccines: a global evidence review. St George's, University of London and WHO, unpublished data, 2022) (*8,25,26*). Data on vaccination uptake and drivers of underimmunization are often lacking in these populations. There may also be important differences between refugees and migrants residing in high-, low- and middle-income settings or specific humanitarian contexts, or between refugees and migrants living in the community compared with those living in closed settings such as transit camps, reception centres and detention centres.

The COVID-19 pandemic has starkly highlighted weaknesses in immunization programmes globally and specifically underlined the extent to which refugees and migrants may be excluded from and/or face unique barriers to accessing vaccination and health systems in countries in which they reside (*26–28*). The limited available datasets suggest that vaccine uptake, and intent to vaccinate for COVID-19, are low in some migrant nationality groups (*27,29–34*). This suggests that greater focus must be placed on exploring and assessing the determinants of access to immunization services among refugees and migrants and on identifying solutions, lessons learned and good practices to increasing vaccine uptake in these populations. At policy level, the evidence shows that refugees and migrants were initially excluded from national plans for COVID-19 vaccine roll-out in some countries (*35,36*), although the situation later improved considerably. The United Nations High Commissioner for Refugees (UNHCR) reported that, in 2021, 162 countries included refugees in their national COVID-19 vaccine plan (*37*). By the end of 2021, 4.79 million vaccine doses were distributed to refugees and other forcibly displaced people in 66 countries, with 72 other countries confirming that they had started. However, little is known about the situation of other groups such as irregular migrants.

IA2030 highlights the need to ensure access to immunization services for "marginalized populations such as displaced people and migrants and those affected by conflict,

political instability and natural disasters", alongside understanding and addressing the causes of low vaccine uptake in order to increase the demand for immunization services, and new approaches to reach older age groups. This aligns with (i) the Global Compact on Refugees, which outlines the commitments of States and relevant stakeholders to enhance the quality of national health systems to facilitate access by refugees and host communities, including support for immunization services (*38*), and the Global Compact for Safe, Orderly and Regular Migration (adopted by the United Nations General Assembly in December 2018) (*39*), in which States have committed to "provide access to basic services for migrants", including health care (objective 15), aligned with Sustainable Development Goal 3.8 on health to provide "access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all" (*3*). A total of 49 African countries have signed the Addis Declaration on Immunization to ensure that everyone in Africa – regardless of who they are and where they live – receives the benefits of full immunization (*40*). In its Immunization Roadmap 2018–2030, the United Nations Children's Fund (UNICEF) called for immunization strategies to be tailored to reach unvaccinated children (especially those in rural, remote communities, those affected by conflict and insecurity, and those residing in urban slums) and outlined a series of changes needed to achieve its objectives (*41*). WHO's core work and directions under the Thirteenth General Programme of Work 2019–2023 (*2*) and targets for universal health coverage will specifically address the need to leave no one behind by taking a human rights-based, gender-responsive approach to addressing needs and reaching out to the most vulnerable, including refugees and migrants and, in particular, those in irregular situations, who are a priority group for WHO.

Therefore, this GEHM is intended to collate the available global evidence on existing policies on inclusion of refugees and migrants in vaccine national plans (and their implementation) in order to support policy-makers and planners to improve vaccine coverage for routine and COVID-19 vaccination in these groups. It also assessed the global evidence on specific barriers and facilitators for refugees and migrants to immunization services, and explored the extent to which the COVID-19 pandemic has compromised immunization service delivery for refugees and migrants.

Refugees and migrants include diverse groups such as asylum seekers, internally displaced people (IDPs) internal rural-to-urban migrants, stateless people and irregular migrants, as well as labour migrants and international students. Lack of international consensus on the definition for migration or for particular types of migrant has led to major shortfalls in data collection and in understanding and addressing the needs and experiences of these diverse populations. Box 1 summarizes some commonly used definitions. This report uses the umbrella term "refugees and migrants" for all migrant groups, unless otherwise specified (for example, when a dataset refers to a specific type of migrant or refugee). The report defined vaccine hesitancy according to the WHO Strategic Advisory Group of Experts on Immunization (SAGE) Working Group on Vaccine Hesitancy as "the delay in acceptance or refusal of vaccination despite availability of vaccination services" (*47*). Box 2 summarizes the global data on refugees and migrants.

Box 1. Definitions

Asylum seeker. An individual who is seeking international protection. In countries with individualized procedures, an asylum seeker is someone whose claim has not yet been finally decided on by the country in which he or she has submitted it. Not every asylum seeker will ultimately be recognized as a refugee, but every recognized refugee is initially an asylum seeker (42).

Internally displaced person. Someone who is forced to leave their home but who remains within their country's borders (43).

Migrant. There is no universally accepted definition of migrant. For the purpose of collecting data on migration, the United Nations Department of Economic and Social Affairs defines an international migrant as "any person who changes his or her country of usual residence" (44). It includes any people who are moving or have moved across an international border, regardless of legal status, duration of the stay abroad and causes for migration.

Migrant in an irregular situation. A person who moves or has moved across an international border and is not authorized to enter or to stay in a State pursuant to the law of that State and to international agreements to which that State is a party (42).

Refugee. Under international law and UNHCR's mandate, refugees are people outside their countries of origin who are in need of international protection because of feared persecution, or a serious threat to their life, physical integrity or freedom in their country of origin as a result of persecution, armed conflict, violence or serious public disorder (45,46).

In the report, the term "refugees and migrants" is used to refer to all migrants defined above (asylum seekers, IDPs, stateless, irregular migrants, international migrants), unless otherwise specified. Where a dataset has report on a specific type of migrant or a refugee, we have used their terminology when describing the dataset. We have used the SAGE Working Group on Vaccine Hesitancy definition of vaccine hesitancy as "the delay in acceptance or refusal of vaccination despite availability of vaccination services" (47).

Box 2. Global data on refugees and migrants

In 2019 international migrants numbered 272 million globally (3.5% of the world's population), of which 52% were male and 74% were of working age (20–64 years).

In 2020 the global refugee population was 26.4 million, the highest on record. Of these, 20.7 million were under the mandate of UNHCR and 5.7 million were under the mandate of the United Nations Relief and Works Agency for Palestine Refugees in the Near East; 41% overall were under 18 years of age. In 2020, for the fifth consecutive year, Türkiye hosted the greatest number of refugees worldwide (3.7 million), mainly Syrians (>3.6 million).

In 2021 the number of people who were internally displaced owing to violence and conflict reached 41.3 million, the highest number recorded by the Internal Displacement Monitoring Centre since it began in 1998; most were in the Syrian Arab Republic (6.1 million), followed by Colombia (5.8 million) and the Democratic Republic of the Congo (3.1 million). In 2020 the global number of stateless people was 4.2 million, with most living in Bangladesh (around 906 000), followed by Côte d'Ivoire (692 000) and Myanmar (620 000).

Migration patterns vary from region to region. Whereas most international migrants born in Africa, Asia and Europe reside in countries within their region of birth, most of those from Latin America and the Caribbean and from North America reside in countries outside their region of birth. For international migrants from Oceania in 2019, similar numbers were living within (intraregional migrants) and outside the region. More than half of all international migrants (141 million) live in Europe and North America. In 2019 the top 20 destinations for international migrants were the United States of America, Germany, Saudi Arabia, Russian Federation, United Kingdom, United Arab Emirates, France, Canada, Australia, Italy, Spain, Türkiye, India, Ukraine, South Africa, Kazakhstan, Thailand, Malaysia, Jordan and Pakistan.

Displacement remains a major feature in some regions. In 2019 the Syrian Arab Republic was the country of origin and Türkiye the host country for the largest number of refugees globally, at 6.7 million and 3.7 million, respectively. Canada became the largest refugee resettlement country in 2018, with more refugees resettled there than in the United States. In 2018 the Philippines hosted the largest number of newly displaced people because of disaster (3.8 million). By mid-2019, around 4 million Venezuelans had left their country. In 2018 the Bolivarian Republic of Venezuela was the largest source country for asylum seekers (>340 000).

For more information, see the IOM Global Migration Data Analysis Centre (48). *Source*: data from International Organization for Migration, 2019 (49) and UNHCR, 2020 (50).

1.2 Policy questions

This GEHM aims to answer the question: "What is the available evidence on refugees' and migrants' access to immunization services in policy and practice, and what are the barriers and facilitators to increasing uptake of vaccines and improving coverage?"

To address this question, the following types of evidence were collected and synthesized from the academic and grey literature:

- existing policies on the integration of refugees and migrants into national vaccination plans (including for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections and resulting COVID-19) and the implementation of these plans;
- barriers for refugees and migrants in accessing immunization services;
- good practices or case studies on the provision of immunization services for refugees and migrants; and
- evidence on disruption of immunization services for refugees and migrants due to COVID-19.

This publication is mainly targeted to policy-makers, planners, international and national agencies, nongovernmental organizations (NGOs) and other implementers tasked with designing and delivering routine immunization services and/or involved in the immediate COVID-19 vaccine response. In addition to supporting future evidence-informed policy-making and the development of targeted interventions to ensure that refugee and migrant populations can be better protected from VPDs, its findings are of immediate relevance to the global COVID-19 vaccine response.

1.3 Methodology

A scoping review was carried out in October 2021 of peer-reviewed literature published between 1 January 2000 and 31 October 2021 and of grey literature published between 1 January 2010 and 31 October 2021, with no restrictions

[1] *Note that all data are therefore from publications published prior to the Ukraine emergency.*

on language or geographical scope.[1] This allowed evidence to be collected on routine immunization and COVID-19 vaccination for refugee and migrant populations in all WHO regions. Particular attention was given to obtaining representative geographical coverage for all regions, as well as for countries with large refugee and migrant populations. The annex contains full details of the search strategy and inclusion and exclusion criteria.

The scoping review yielded 5446 articles after removal of duplicates, of which 5236 were excluded based on title/abstract screening. After full-text screening, 210 articles were included in the scoping review: 126 academic publications (books, book chapters, journal articles); 65 reports, working papers, databases, statements and guidelines of governmental and NGOs; and 19 press releases, news articles and websites. Of these, 185 are directly cited in this GEHM *(4,6,8,10,14,17–19,21,22,25–27,29,31,32,35–37,45,51–215)*.

Case studies highlighting good practices of implementing immunization initiatives in refugee and migrant populations in camp, humanitarian and community settings from the identified articles are included in section 2.3.

2. Results

2.1 Existing policies integrating refugees and migrants into national vaccination plans, and implementation

2.1.1 Policies pertaining to routine immunization

2.1.1.1 Policies and programmes targeting refugees and asylum seekers

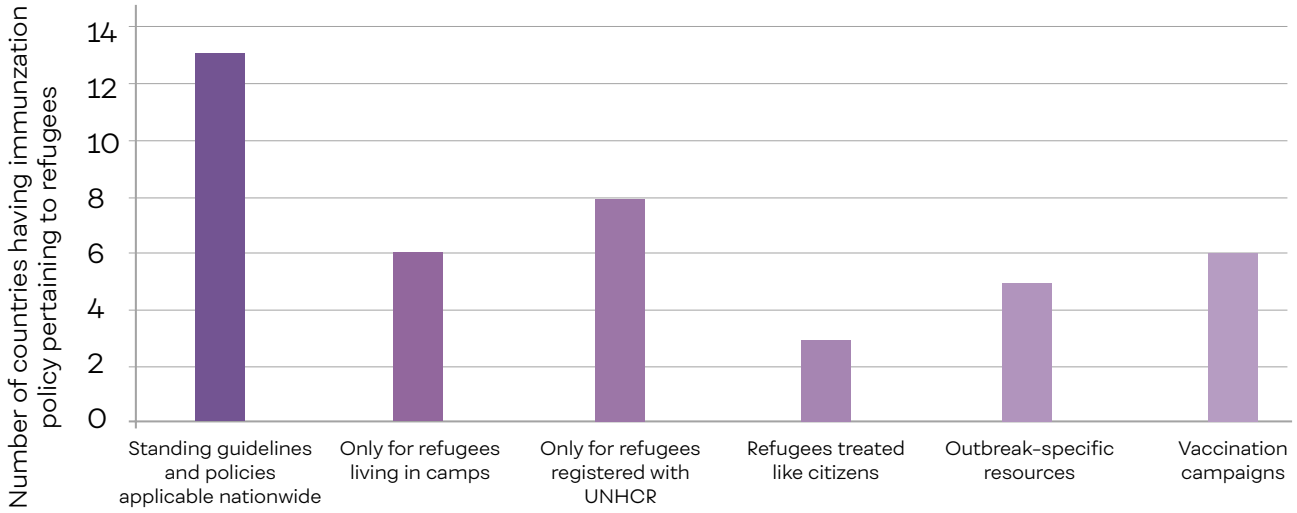
WHO–UNHCR–UNICEF guidance states that on arrival to a host country, refugees and asylum seekers should have non-discriminatory and equitable access to health-care services, including vaccines, irrespective of their legal status (*51*). Data on the inclusion of refugees in routine immunization policies and guidelines in 20 low- and middle-income countries (LMICs)[2] and 20 high-income countries (HICs)[3] with a high proportion of refugees revealed a wide range of approaches (*52*). Of the LMICs, 13 specified routine immunization policies and guidelines applicable nationwide for refugees, with six providing immunization only to refugees only living in camps (Fig. 3). Of the HICs, 14 included refugees in their national routine immunization programmes, with six national immunization plans having specific guidelines for refugees (Fig. 4). HICs differed according to where they offered immunization (pre-arrival, on arrival or within the community, that is through the same services used as the general population), whether children and older refugees were included, whether refugees were charged fees, and the availability of national guidelines to guide practice. In addition to heterogeneity among policies related to immunizing refugee populations, refugees' immunization needs were notably excluded in the immunization policies and guidelines of HICs (*51*). Moreover, as most refugees live in LMICs, which already face a myriad of health-care system challenges, global cooperation and support from HICs is imperative to improve global routine vaccination coverage (*51*).

---

[2] *Cameroon, Chad, the Democratic Republic of the Congo, Djibouti, Iran (Islamic Republic of), Iraq, Jordan, Kenya, Lebanon, Liberia, Mauritania, Montenegro, Nauru, Pakistan, Rwanda, Sudan, Syrian Arab Republic, Türkiye, Uganda and Yemen.*

[3] *Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Israel, Italy, Liechtenstein, Luxembourg, Malta, Netherlands, Norway, Panama, Sweden, Switzerland, United Kingdom.*

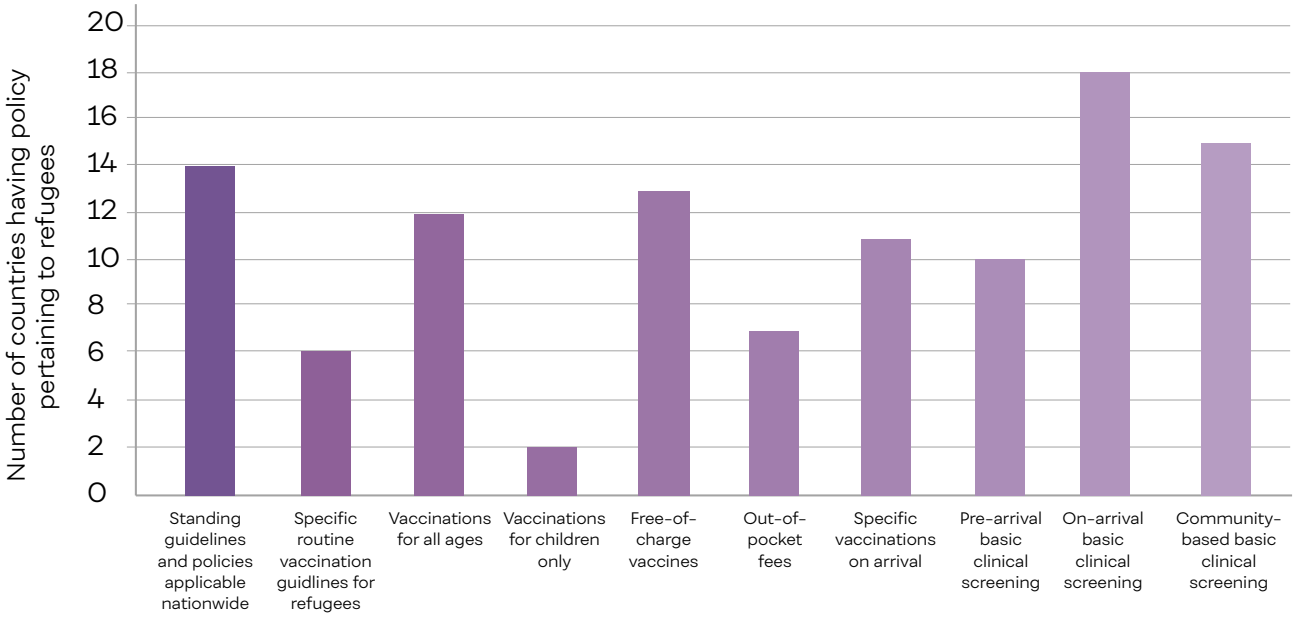
Fig. 3. Features of routine immunization policies and guidelines pertaining to refugees in 20 LMICs with the highest number of refugees per 1000 residents



Notes: refugees were defined according to the UNHCR (*48*) and the International Organization for Migration (*49*).

Source: based on data from Elharake, 2021 (*52*).

Fig. 4. Features of routine immunization policies and guidelines pertaining to refugees in 20 HICs with the highest number of refugees per 1000 residents



Notes: refugees were defined according to the UNHCR (*48*) and the International Organization for Migration (*49*).

Source: based on data from Elharake, 2021 (*52*).

Several receiving countries (including the Australia, Canada, Japan, Malaysia, New Zealand, United Kingdom and the United States) have official resettlement schemes for refugees and migrants that include immunization as part of the formal pre-departure health assessments. The International Organization for Migration (IOM) carries out these assessments, which are standardized and designed to facilitate early integration, promote individual health and public health, and ensure that countries can link individuals with appropriate health and social services on arrival to the host country according to need (53–55). For example, the United Kingdom pre-entry health assessment protocol recommends that all refugees should be immunized according to the United Kingdom immunization schedule (where feasible): at minimum, one dose of MCV plus one dose of oral polio vaccine should be administered to all refugees aged over 9 months and hepatitis B vaccine to specific risk groups (54). The IOM Australia programme offers vaccines for 18 VPDs: diphtheria, *Haemophilus influenzae* type b infection, hepatitis A, hepatitis B, influenza, Japanese encephalitis, measles, meningitis, mumps, pertussis, polio, rotavirus infection, rubella, *Streptococcus pneumoniae*, tetanus, tuberculosis, varicella and yellow fever (55). According to IOM, approximately 408 500 doses of vaccine were given to more than 100 000 migrants in 12 receiving countries in 2017 (55), although actual the coverage rates achieved by these programmes vary due to differing technical agreements and the availability of specific vaccines in low-resource settings. The United States programme, which has a contractual obligation to vaccinate, typically achieves coverage rates of over 90% among incoming refugees for key vaccines including DTP, measles and polio. Rates in the United Kingdom programme are much lower for some routine vaccines, although incoming refugees (and, indeed, all migrants) are, in principle, entitled to receive free-of-charge catch-up vaccination as part of the National Health Service after arrival (56,57).

2.1.1.2 Policies targeting migrants

Across the Middle East and North Africa, policies on migrant access to health care vary and are often contingent on specific conditions (58,59). Although Pakistan has no specific migrant- or refugee-sensitive health policies, Afghan refugees are reportedly entitled to access host communities' health services without discrimination, and routine and polio vaccination campaigns are carried out by provincial health authorities in refugee settings. In many north African nations (including Egypt, Iraq, Jordan, Lebanon and Tunisia), health care including vaccination can be accessed regardless of migrant status under national legislation, but these policies are not always implemented. In practice, engagement of refugees and migrants with health-care services is low owing to fear, language and financial barriers, and discrimination, particularly among irregular migrants.

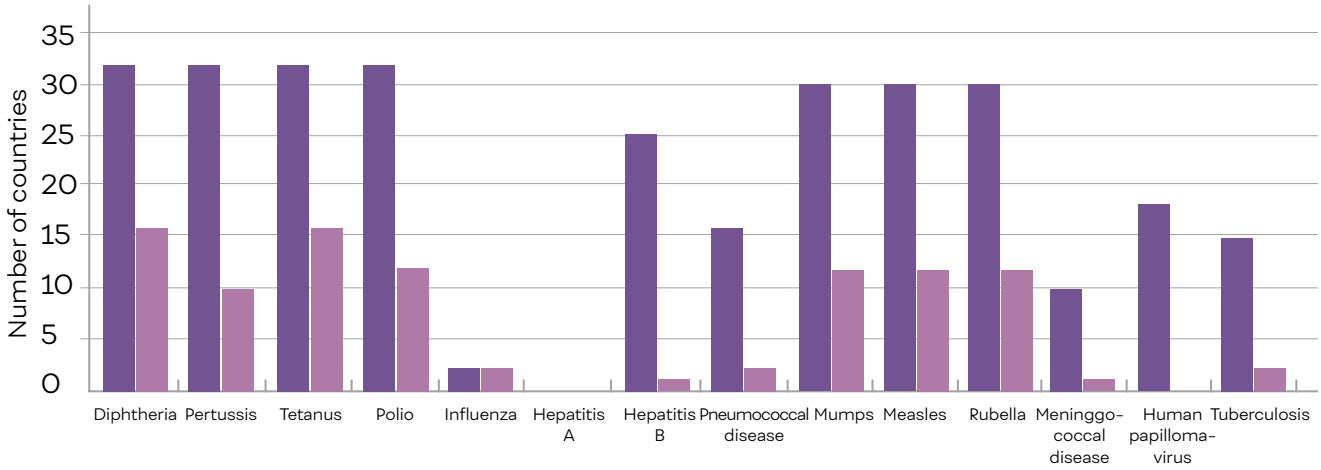
In Egypt, interviewed NGO workers have reported migrants being refused services in public hospitals, whereas in Morocco migrants face financial barriers and discussions are ongoing to include refugees, migrants and asylum seekers in state health insurance schemes. Irregular migrants, or those without a residence permit or health insurance, have restricted access in some countries, including Qatar and Tunisia *(58)*. These factors mean that migrants often cannot access adequate health care or vaccinations, with NGOs being left to bridge this gap. In Thailand, universal health coverage is achieved through a voluntary migrant health insurance scheme funded by an annual premium paid by workers, which provides access to public health-care facilities regardless of migrant status *(60)*. However, in other Member States of the WHO South-East Asia Region limited political will to extend health-care subsidies and services to foreigners, including refugees and migrants, may be exacerbated by exclusionary policies that limit access for migrants to essential medicines *(61,62)*.

WHO's new European Immunization Agenda 2030 specifically calls for States to identify and offer vaccination to all people who have missed vaccinations and ensure all groups have equitable access to immunization services *(63)*. Recent European Centre for Disease Prevention and Control (ECDC) guidelines call on European Union (EU)/European Economic Area (EEA) countries to offer vaccination against measles, mumps and rubella (MMR) to all migrant children and adolescents, as well as to adults without immunization records; adult migrants should also be given a primary series of diphtheria, tetanus and polio vaccines *(64)*. A recent systematic review suggested that specific policies and subsequent guidelines should also be developed to cover hepatitis A, measles and varicella vaccines for migrants, particularly those in camp and detention settings in HICs *(22)*. A 2017 report summarized immunization policies in the WHO European Region, including case studies from Greece, Italy, the Russian Federation, Türkiye and central Asia *(4)*. It found that although 42 WHO European Member States have a comprehensive national immunization plan, only 11 (Germany, Greece, Italy, Latvia, Netherlands, Portugal, Romania, Slovakia, Tajikistan, United Kingdom (England) and Uzbekistan) include recommendations for the immunization of migrants.

A survey of 29 EU/EEA countries reported that 28 had national policies to target migrants, with policies generally in line with international recommendations; however, policies specifically targeting adults were less common and were often contingent on certain conditions *(65)*. Offering catch-up vaccination to bring refugees and migrants with uncertain immunization status (including older adolescents and adults) into line with national guidelines is considered good practice but is implemented by few countries *(4,66)*. A comparative policy analysis across 32 European countries found that only 18 (56.3%) recommended that individuals with missing vaccination records should be

considered unvaccinated and vaccines re-administered (67). In six countries (18.8%), policies on migrant vaccination focused on vaccinating only during outbreaks; and in 10 countries (31.3%), policies focused on priority vaccinations (the polio vaccine was most commonly administered), with notable heterogeneity in the vaccines recommended to adults, adolescents and children. Fig. 5 summarizes the findings of a 2017 expert survey on the vaccinations offered to child and adult migrants in 32 European countries (68).

Fig. 5. Specific vaccinations administered to adult and child migrants by country: approaches identified across Europe, 2017



Note: data from 32 countries.

Source: reproduced from Hargreaves et al., 2018 (60).

A 2015–2016 survey of 15 non-EU countries and areas in the Mediterranean and Black Sea regions[4] found limited information on vaccination policies targeting migrants across the Mediterranean migration system (69). Most of the countries and areas had policies in place for immunizing newly arrived migrants; however, they varied depending on health system organization, geographical area, neighbouring countries, migration flows, and patterns of migration. The study found that four countries (Albania, Armenia, Israel and the Republic of Moldova) offered all of the vaccinations included in their national immunization plans to newly arrived migrant children. Georgia offered polio vaccines to people arriving from Afghanistan, Nigeria, Pakistan and the Syrian Arab Republic; North Macedonia offered polio and MMR vaccines; and Serbia offered polio, MMR and DTP vaccines. All countries and areas had a national immunization plan and most had a consolidated childhood immunization programme, although the schedule and number of doses varied. Some countries also offered vaccinations to adolescent and adult

[4] *Albania, Algeria, Armenia, Bosnia and Herzegovina, Egypt, Georgia, Israel, Jordan, Kosovo (in accordance with Security Council resolution 1244 (1999)), North Macedonia, Republic of Moldova, Serbia, Tunisia, Ukraine, and occupied Palestinian territory, including east Jerusalem.*

migrants, with priority given to polio, measles and rubella as per WHO–UNHCR–UNICEF guidelines *(51)*. Only half of the countries and areas surveyed included adults as a target group for immunization.

The Russian Federation has established bilateral agreements to provide health services for migrants in response to increasing labour migration and constraints on universal health care access. For example, labour migrants from Tajikistan to the Russian Federation are required to present a health certificate containing proof of immunization. However, lack of a system for certifying these documents means that the agreements may be poorly implemented in practice *(4,70)*. A report highlighted that in Kazakhstan foreigners and stateless people are included in the system of compulsory medical insurance, which includes preventive vaccination, and pay the same fees as Kazakh citizens (WHO Regional Office for Europe, Health of migrants in the Russian Federation. World report: regional review, unpublished, 2021). In Kyrgyzstan, foreigners are also subject to compulsory medical insurance. Economic migrants from Armenia, Belarus, Kazakhstan and Kyrgyzstan and who are staying the Russian Federation on legal grounds are entitled to social security (including medical insurance) through the Treaty on the Eurasian Economic Union (WHO Regional Office for Europe, Health of migrants in the Russian Federation. World report: regional review, unpublished, 2021) *(216)*.

A 2021 report on access to vaccination in the Americas highlighted the lack of vaccination schemes for international migrants in the Commonwealth Caribbean (Cabieses et al. Health of international migrants, refugees, and mobile populations in the Americas: a scoping literature review, Universidad del Desarrollo, Santiago, Chile, unpublished data 5 August 2021).

2.1.2 Policies pertaining to COVID-19 immunization

Box 3 summarizes the policy responses to ensure equitable access to COVID-19 vaccines globally and prioritization of refugees and migrants. In response to the COVID-19 pandemic, at least 153 States globally have adopted COVID-19 vaccination strategies that include refugees *(79)*. However, a WHO systematic international policy analysis in February–March 2021 of 104 national deployment and vaccination plans (NDVPs) submitted to the COVAX Facility *(71)* found that most did not explicitly include migrants (72%); just over half explicitly included refugees and asylum seekers (53% of 64 countries that have more than 500 refugees); and only 17% explicitly included irregular migrants *(36)*. More recent UNHCR data show that the situation has considerably improved, with 162 countries now including refugees in their national COVID-19 vaccine plan *(37)*; however, little is known about inclusion of irregular migrants. A 2021 report noted that few African vaccine programmes explicitly state whether refugees, asylum seekers and other migrant groups (including cross-border and internal migrants) will receive COVID-19 vaccines *(80)*. It also noted that IDPs in Nigeria may be at risk of being excluded from vaccine plans.

Box 3. Policy responses to ensure equitable access to COVID-19 vaccines

The COVAX Facility was launched in September 2020 with the goal to ensure fair and equitable access to COVID-19 vaccines for every country (71), and the initial aim to make vaccines available as quickly as possible to at least 20% of the populations of all 190 participating countries or territories to enable them to target their most high-risk and vulnerable groups (71). The WHO SAGE values framework for the allocation and prioritization of COVID-19 vaccination (72) is aligned with the principles of equitable access and fair allocation of COVID-19 vaccines developed for the COVAX Facility and offers guidance globally on the allocation and prioritization of populations to receive COVID-19 vaccines. UNHCR has advocated for the inclusion of refugees, IDPs and stateless populations in national vaccination programmes (79) and use of the COVAX humanitarian buffer (73) to ensure that people in areas that are inaccessible to governments, such as conflict settings, are not left behind.

SAGE has identified low-income migrant workers, irregular migrants and other refugee and migrant populations who are unable to physically distance, including those living in camps and camp-like settings, as priority groups for the allocation of COVID-19 vaccination globally (74). IOM has called on States to ensure that all migrants, including undocumented migrants, are included in national vaccine deployment plans. The Council of Europe's Committee on Bioethics published a statement calling for equitable access to vaccination during the current COVID-19 pandemic and all future pandemics, based on Article 3 of its Convention on Human Rights and Biomedicine (75). The Council of Europe has also called for access to vaccination services to be tailored to the needs of people in vulnerable situations who have difficulties in accessing health services. It suggested active engagement with 11 target groups, including low-income migrant workers and people without residence or with insecure legal status, to ensure the inclusive development and implementation of vaccination programmes (76). ECDC has classified migrants as potential target groups for vaccination campaigns in overcrowded settings (such as reception centres, crowded housing and homeless shelters) and calls for consideration of these populations when deciding upon priorities for vaccination (27,77,78).

In general, evidence is limited evidence on the inclusion of refugees and migrants in pandemic preparedness plans. A 2018 study on the inclusion of migrants in pandemic influenza preparedness plans (including immunization) in 21 LMICs in the Asia–Pacific region found that only three countries (Maldives, Papua New Guinea and Thailand) identified at least one migrant group within their respective plans, although most countries (*n* = 18) specified health control measures along their borders, such as point-of-entry screening strategies for inbound travellers.

Several countries have adopted innovative and more-inclusive measures to enable access to COVID-19 vaccination for refugee and migrant populations, including their specific inclusion in national plans and through regularization programmes for irregular migrants (summarized in Box 4).

Box 4. More-inclusive policies on immunization access, as developed during the COVID-19 pandemic

In the early phases of the pandemic, various policy changes were documented to improve access to free health care for irregular migrants with COVID-19 in many countries (including Albania, Canada, Chile, Colombia, Nepal, Peru, Republic of Korea, Saudi Arabia, Türkiye, the United Arab Emirates (82) and various European countries), as summarized in a previous GEHM report (83). Policy shifts focused on ensuring that irregular migrants have free-of-charge access to emergency health services related to COVID-19. Many of these more-inclusive policies are assumed to still be in place in all these countries to facilitate the inclusion of refugees and migrants into subsequent vaccination initiatives for COVID-19.

Other countries have made specific changes in policy that are intended to include irregular migrants and other migrant groups in their COVID-19 vaccine response.

- In Turkmenistan, the national COVID-19 vaccination plan includes refugees and stateless people, and undocumented stateless people have been included in invitations for vaccination since March 2021 (84).
- Lebanon also includes stateless people in its national COVID-19 vaccination plan and, after advocacy efforts, has added a statelessness option to enable stateless people to register on its online registration platform (84).
- In Kuwait, all members of the population have access to medical services linked to COVID-19 in principle, including individuals who are not regularized and/or do not hold an identification card (84).
- In Senegal, refugees have been included in the national COVID-19 vaccination campaign from the outset, and in the Central African Republic,

Box 4. contd

UNHCR has advocated for the inclusion of refugees in national plans for the COVID-19 vaccine roll-out (*80*).

- In Peru, authorities have opened the vaccination registry for migrants, regardless of their status (*85*).
- In Colombia, the Government has facilitated a policy shift to ensure the regularization of undocumented migrants from Venezuela and is providing the COVID-19 vaccine to them (*85*).
- In Trinidad and Tobago, the Government has stated that migrants have access to vaccines that are available to all residents in the country (*85*).
- Jordan was one of the first countries to provide free-of-charge and equitable access to COVID-19 vaccines for Iraqi and Syrian refugees, as well as to migrants (since January 2020) (*86*).
- Uganda specifically includes its 1.4 million refugees in the national COVID-19 vaccination programme (*87*).
- In the United States, migrant farmworkers have been prioritized for COVID-19 vaccination in California (*88*). The United States Centers for Disease Control and Prevention has created a guide to vaccinating workers to help state jurisdictions first to identify and quantify subpopulations of workers and then to create a specific vaccination plan that addresses the unique challenges and best practices of providing vaccines to migrant/migratory and seasonal food and agriculture workers (*89*).
- In France, foreigners or homeless people can be vaccinated for COVID-19 even if they do not have a social security or identification number, with vaccine available free of charge.
- The United Kingdom has a specific initiative encouraging irregular migrants and other unregistered groups to register with primary care services and the national vaccination programme; this includes publishing guidance that specifically states that no immigration checks and no fees will apply to non-entitled migrants.
- In Portugal, the Government granted temporary residence to migrants and asylum seekers who had pending applications for residence permits in March 2020, then again in November 2020, with the declared purpose to guarantee equal access for these groups to health services and vaccinations.
- Dutch and Spanish Governments have guaranteed irregular migrants equal access to the vaccination as for the other population groups (*27,83,90*).
- Rwanda has from the outset included refugee camps in its COVID-19 vaccine roll-out plans and has explicitly and proactively included refugees and other migrants in these plans (*80*).

How policies are being implemented in practice is less clear, particularly for irregular or stateless migrants (*84*). In central and western Africa, policies and practice on access to COVID-19 vaccines remains inconsistent. Eligibility for COVID-19 vaccination for refugees and migrants varies by country and specific factors such as age and displacement/migration and employment status. In South Africa, migrants (particularly irregular migrants) face barriers to accessing health care and, so far, evidence is scarce of programmes to ensure the inclusion of migrant populations in priority groups for COVID-19 vaccination (*80*). The plans of Indian Ocean islands (which have an abundance of migrant workers) to include migrants in their vaccine roll-out are also unclear. A 2021 paper exploring refugees, migrants and the COVID-19 vaccine roll-out in Africa identified large variations in policies and practices across the continent, with few countries making explicit their plans for including migrants in the roll-out (*80*). In February 2021 the indications were that more than half of the countries in the Middle East and north Africa would be including refugees and other people of concern in national COVID-19 vaccination programmes (*91*). By April 2021 most countries in eastern Africa and the Horn of Africa had submitted their NDVP to the COVAX Facility and started phase 1 of the roll-out; however, governments and the Africa Centres for Disease Control and Prevention are still working to overcome the shortage of vaccines and improve the effectiveness of cold-chain processes (92).

According to UNHCR, 4.79 million vaccine doses had been distributed to refugees and other forcibly displaced people in 66 countries by the end of 2021, and 72 other countries had started the process (*37*). In HICs with good coverage and availability of vaccines, emerging data show particularly low COVID-19 vaccine uptake rates in migrants, including people from north Africa, Iraq and Somalia (*27,32*). For example, a 2021 Norwegian review of vaccination coverage based on country of birth found that the vaccination rate for those aged over 75 years was highest for people born in Norway (over 90%) and lowest for those born in Iraq (51%) and Somalia (34%) (*93*). Similar trends were observed in those aged 65–74 years.

2.2 Barriers for refugee and migrants in accessing immunization services

This section summarizes the range of barriers for refugee and migrant populations in accessing immunizations in the host country. A 2021 systematic review of 26 EU/EEA countries, Switzerland and the United Kingdom identified 23 determinants of undervaccination in migrants, including geographical origin (statistically significant for 25 countries; 96%), in particular African/eastern European origin; recent migration; refugee or asylum-seeker status; higher income; parental education level; lack of health-care contact in the past year; and lower language

skills (25). Other key barriers include administrative and policy barriers, such as policies restricting entitlement to access mainstream services; vaccine availability and logistic barriers, particularly in LMICs and humanitarian contexts; individual and social processes, including low levels of trust in institutions and cultural, social and religious norms and beliefs; practical factors relating to access, language, information and communication; and financial barriers.

2.2.1 Administrative and policy barriers

Policies restricting entitlement to access mainstream health systems, or other administrative or legal barriers, often present a physical barrier to immunization services for refugee and migrant populations globally, and have been well documented for COVID-19 vaccines (summarized in section 2.1). Refugees and migrants living in closed settings (including camps, reception and detention centres, and formal and informal settlements) often do not have access to mainstream health systems (94). Instead, health-care provision by private services, United Nations agencies (for example, IOM or UNHCR) or NGOs presents a potential physical barrier to full national immunization programmes. Where vaccinations for refugees and migrants are provided by NGOs (such as when national policies are exclusive or absent), the delivery of vaccination campaigns may be hampered by administrative issues arising between governments or other actors and the implementing partners. For example, following mass displacement in Mingkaman (South Sudan), Médecins Sans Frontières was unable to implement their full package of priority vaccines because it could not obtain authorization from the Ministry of Health (95). This highlights the need for cooperation between all partners, including governments and stakeholders, to successfully implement vaccination campaigns. In the WHO African Region, issues exist around access to vaccines, including among the Somali population in Kenya (including measles, rubella, polio and diphtheria vaccines) (96), and contextually appropriate programme responses are needed (80). In China, refugees from the Democratic People's Republic of Korea have limited health-care access owing to their legal status, and children born to these refugees have significantly lower immunization rates compared with Chinese or other migrant children (97).

Even in countries where refugees and migrants can legally access free vaccines, other immigration, health-care or employment policies may restrict access in practice. Evidence from a wide range of settings suggests that migrants – particularly irregular migrants – are likely to have fears about immigration checks or data sharing with authorities when presenting for vaccination (29,98–100). For example, the Red Cross Red Crescent Global Migration Lab has emphasized that lack of documentation and fear of arrest, detention or deportation are preventing access to COVID-19 vaccination in practice for migrants globally (101). In Lebanon, reluctance to register through the Government-managed platform

may be preventing access to COVID-19 vaccination despite eligibility, regardless of nationality (*102*). In Colombia, it is uncertain whether irregular migrants from Venezuela will be able to access COVID-19 vaccines in practice because of the complex registration requirements (*103*). On the other hand, two studies from Qatar found that migrants were less reluctant to accept a vaccine compared with Qatari nationals. A possible explanation is that because residency status is linked to their employment contracts, migrants might be more likely to accept Government/employer policy (*104,105*).

2.2.2 Availability of vaccines and logistics

The availability of vaccines and logistics of bringing them to refugee, migrant and mobile populations – and indeed, to the general population – can be a major barrier to access in some settings, particularly in LMICs and humanitarian contexts. A 2019 study into the impact of conflict on immunization coverage across 16 countries (mainly African) found that tense security conditions, along with damaged health infrastructure and depleted human resources, contribute to infrequent outreach services and delays in new vaccine introductions and immunization campaigns (*106*). In turn, these factors contribute to subnational pockets of low coverage and disease outbreaks in areas affected by conflict. In the Syrian Arab Republic, protracted disruption of health services since 2014 (*107,108*) means that cohorts of children under 5 years of age may now be underimmunized or unvaccinated (*109*). In sub-Saharan Africa, physical barriers creating longer travel times to health services are significant challenges to providing immunization services, and interventions are needed to improve vaccine security (including the re-design of immunization supply chains) (*8*). Major barriers to delivering vaccination campaigns in conflict are limited access to target populations because of active combat, as well as logistic constraints affecting vaccine storage and lack of trained health workers (*110*). For example, cold chain capacity, complexity in vaccine transportation and inaccurate population registration were identified as specific logistic barriers to delivering an oral cholera vaccine campaign in South Sudan (*111*). Although logistic barriers may be more salient in low-income and humanitarian settings, they may also apply in high- or middle-income settings: a 2017 review cited a lack of financial and human resources, in particular cultural mediators and/or interpreters, as a barrier to the effective implementation of national immunization policies in the WHO European Region (*4*). A systematic review of VPD outbreaks among refugees and IDPs in humanitarian emergencies highlighted that growing insecurity (such as increasing number of targeted attacks on health workers) and the destruction of cold chain and infrastructure for transportation of supplies are creating new challenges in providing immunization in conflict settings (*19*). In the context of the COVID-19 vaccine roll-out, IOM found that lack of host government-run vaccination campaigns, population mobility and a greater focus on other issues are logistic barriers for migrants in conflict or crises settings (*35*). In some Member States of the WHO South-East Asia

Region (such as Indonesia, Myanmar and Thailand), insufficient financing of health care for refugees and migrants was identified as the most significant barrier, leading to inadequate health services and inadequate health promotion (or lack of training among community health workers to ensure adequate health promotion) for these groups *(61)*.

Polio is an important health issue for migrants in the WHO African Region (particularly those in hard-to-access border areas and seasonal migration routes) and, therefore, greater access to immunization services is needed. This could be achieved by combining polio vaccination with other health interventions (for example, cross-border vaccination, including permanent vaccination at transit points and market days), alongside increased surveillance of migrant and nomadic populations *(80,112,113)*. Lack of access to vaccination is a key issue for forcibly displaced populations and refugees in the Horn of Africa *(114)*.

High population movement, both across and within borders, is a logistic barrier to vaccination that is extremely pertinent among many refugee and migrant groups. An analysis of the United Kingdom's pre-arrival vaccination programme for formally resettled refugees identified over-vaccination with polio vaccines, particularly among children; contributory factors were population movement and a lack of coordination of vaccination records between vaccination sites (57). During campaigns for routine childhood vaccines in Greek refugee camps, population mobility was overcome by door-to-door visits by NGO staff to actively record vaccination status within 2 weeks of each vaccination intervention *(115)*. In a mass oral cholera vaccine campaign in refugee and IDP camps in South Sudan, increased population movement from the camp to other locations within the country was a barrier to the uptake and coordination of the campaign *(114)*. Vaccination cards were eventually identified as the best method to identify those who had received vaccine dose(s) and, thus, avoid over-vaccination *(111)*. Many countries rely on vaccination cards to identify the vaccination needs of refugees and migrants, but often these are unavailable or lost during migration and displacement, and caregivers may not recall which vaccines have been given. In addition, many unaccompanied migrant children will not know whether they have been vaccinated or be able to produce documentation. A survey of 30 EU/EEA countries found that 28 checked the immunization status of child and adolescent migrants either verbally or by checking records or immunization cards (65). However, reliance on checking vaccination cards where these are not available may lead to over-immunization (giving additional vaccine doses when the full course has already been administered but not recorded) or underimmunization (refusing to provide vaccination because of unknown immunization status).

In some countries, specific vaccinations may not be included in national immunization schedules or campaigns, have limited availability, or may simply be unavailable. For example, in the context of COVID-19, a 2021 analysis found

that G20 countries[5] have received 15 times more doses per capita than low-income countries, with African countries in particular largely left without access to COVID-19 vaccines *(116)*. In contexts where availability of vaccines is severely limited, refugee and migrant populations are likely to be considered a low priority.

2.2.3 Individual-level barriers, including trust and cultural, religious and social norms and beliefs

Trust in immunization and health services and service providers, as well as in the wider governance and health-care system of the host country, can be major factors in the perception and subsequent uptake of vaccination by migrant populations *(26,100,117,118)*. In the United Kingdom, widespread distrust by refugees and migrants of the health-care system and barriers to registering for primary care are potential deterrents for irregular migrants, despite Government guidance stating that vaccines are available free of charge, and without immigration checks *(29,119)*.

In some cases, migrants' expectations may be based on knowledge gained and experiences in their home country *(120)*. For example, lack of trust in vaccines in the country of origin, the influence of factors from the country of origin or diaspora media (that is, media from the country of origin of the migrant population) can influence vaccine confidence in some refugee and migrant groups *(121–124)*. In a United Kingdom study of measles vaccination in Romanian women, decreased vaccination was linked to a distrust in health-care services that were partly rooted in their negative experiences of health care in both Romania and the United Kingdom *(125)*.

Distrust of vaccination or the wider health system can also take root after arrival in the host country, potentially due to social exclusion *(26)* or precarity in resettlement *(126)*, both of which are reported to reduce vaccine confidence *(124)*. For example, a United States study showed that among Karen refugees (from Myanmar) the perception of vaccine safety decreased with increasing time spent in United States *(127)*. Another study from Norway found lower measles coverage in children born to mothers who had lived in Norway for more than six years compared with those born to mothers who had lived in Norway for less than two years, with an overall decline in coverage between 2000 and 2016 *(128)*. Structural racism in the host country and historical events can act as general barriers to vaccination in migrant communities *(80,124,126,129,217)*. For example, migrants reported fears that certain ethnic groups or communities would be used as guinea pigs in the COVID-19 vaccine roll-out *(29,117,125,129)*.

---

[4] *Members of the G20: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, the Russian Federation, Saudi Arabia, South Africa, Türkiye, United Kingdom, United States and the European Union.*

In some settings, there is significant public trepidation and reluctance to use health services delivered by foreign agencies, as found in a systematic review on delivering infectious disease interventions to women and children in conflict settings *(110)*. A 2021 report stated that fears that hidden agendas of developed countries are behind vaccination campaigns are circulating in African countries, including among migrant groups *(80)*, with similar concerns reported from other regions *(130,131)*.

Confidence in vaccines (such as concerns about safety and side-effects) is often cited as a key factor influencing vaccination intent among refugees and migrants *(29,31,100,124,131,132)*, as well as in the general population. A study of 1037 Syrian refugees in Lebanon found that COVID-19 vaccine refusal was significantly associated with negative perceptions about vaccine safety *(31)*. In Qatar, where 90% of the population are migrants, a survey found that 40.1% of people would not get the vaccine or were unsure, with most citing concerns about the vaccine's safety and longer-term side-effects *(104)*. A study of routine vaccination of Rohingya refugees in Bangladesh reported that key personal barriers were fear of side-effects, preference for traditional treatment and concerns about the ulterior motives of white humanitarian workers *(131)*. Complacency about the personal need for vaccination has also been reported in refugee and migrant communities, including for HPV and COVID-19 vaccines *(31,132)*. A study exploring underimmunization in internal urban-to-rural migrant children in China identified the strongest predictor of a of child's immunization status was the primary caregiver's awareness of the importance of vaccination: this was a key factor linked to incomplete, invalid or delayed vaccination in children *(133)*.

It is also important to recognize that concerns about safety and general hesitancy may be influenced by specifical cultural factors, including knowledge and attitudes towards disease prevention and vaccination and beliefs about the introduction of foreign substances into the body. These concerns highlight the need for better cultural competency within health-care services and systems and for recognizing cultural differences in the development of interventions for migrant populations. In a Canadian qualitative interview study, health-care workers felt that communication barriers and an inability to address cultural or religious concerns restricted their ability to inform refugee and migrant patients about HPV vaccines *(134)*. Low knowledge in health-care professionals of migrant health needs and health-care eligibility may prevent migrants from being offered or given vaccinations, regardless of their entitlement in policy, and language barriers or lack of empathy or cultural competency in health-care workers may lead to distrust, confusion or low motivation to present for vaccination in migrants *(134,135)*.

Religious or cultural norms or expectations in migrant groups, particularly when these differ from the norms in the host country, may affect the perceived acceptability of vaccines and, subsequently, vaccination uptake *(131,132,136)*. A study in Italy found

that migrant workers are more likely than non-immigration workers to cite religious belief as a reason to not vaccinate *(136)*. Similarly, an Australian study found that in Lebanese migrants' religious values around health played a major part in vaccination decision-making *(137)*. For example, Muslim communities may have concerns that vaccinations may contain pork *(138)*; therefore, this is a crucial factor to be addressed in health communications, particularly in contexts where vaccinations are seen as being provided by external or non-Muslim actors.

2.2.4 Logistic barriers and accessibility of vaccinations

Lack of proactivity by health-care systems in providing convenient access points or bringing vaccination services to refugees and migrants may restrict vaccination uptake by refugees and migrants. For these populations, attending distant vaccination services may be costly in terms of time and loss of income *(118,139)*. A study of migrant parents in the Netherlands identified distance and transportation as important factors influencing decisions to vaccinate their children *(140)*. The cost of vaccination and other factors may influence where migrants choose to get vaccinated. For example, a United Kingdom study reported that Polish migrants often choose to return home for cheaper vaccines (for example for chickenpox) or for routine vaccines after the birth of a child *(65)*, which has numerous practical implications for service providers tasked with ensuring their local population is immunized. In China, migrants are not entitled to be reimbursed for basic services such as childhood vaccinations *(141)*.

A survey-based study found that only a quarter of Syrian refugee children in Jordan and less than 15% of refugees in Lebanon were fully immunized through routine vaccination services, with 35% of respondents in Jordan and 40% in Lebanon reporting difficulties in accessing vaccination for their children *(142)*. A study from China found that migrant children whose mothers had a job were almost three times more likely to be unvaccinated than those with a non-working mother *(21)*. For the children of working migrant mothers, insufficient utilization of other preventive and primary care such as screening, acute illness visits and well-child care visits suggested that the needs of this population should be considered in initiatives to increase vaccine coverage, for example by extending the office hours of health facilities *(21)*. Similarly, a study of children born to migrant mothers in Ethiopia found that distance to a health centre was linked to underimmunization *(14)*. A mass polio vaccine campaign in Kenyan refugee camps reported that 56 of 107 unvaccinated people (52%) lacked vaccination because they did not know where to get vaccinated or were unaware of the campaign *(143)*. Motivational barriers, such as fear of side-effects or pain from injection, were relatively unimportant (affecting only 11 people; 10%). More recently, the IOM and others have identified technical issues in some migrant populations that may create barriers, such as a lack of Internet and/or the technology needed to register for COVID-19 vaccination or to access health services more broadly *(144)*.

Trust in the available access points may also be an important barrier to vaccine uptake, particularly for irregular migrants, who may fear immigration checks (*29,145*). To overcome this barrier, access points in safe and trusted locations, such as local community centres, places of worship, pharmacies or NGO-run clinics, should be provided to maximize uptake in migrant populations.

2.2.5 Information and communication barriers

Key factors in the motivation to vaccinate are an individual's awareness of and access to information, which are often dependent on health, language and digital literacy. Refugee and migrant populations were found to be excluded from accessing information because of poor digital literacy or lack of technology (*29,129*), language barriers (*29,65,121,124,129,134,146–148*), low reading/written literacy (*125,149,150*), poor doctor–patient communication (*132,134,151,152*), lack of interpreting services (*125,149*), or information not being provided in an accessible and acceptable format (*121,129,131,134,151,153*). For example, some Moroccan, Turkish and Somali populations said that they placed more value on oral information and that the written format of the information they received was not appropriate (*154,155*). A United Kingdom study reported that health visitors felt that translated leaflets were not sufficient because many migrants struggle with literacy (*150*). A United States study found that Korean migrants often did not receive or understand health information disseminated through traditional media such as television advertisements or radio (*156*). Such findings highlight the importance of tailored information campaigns based on local evidence and informed by or co-designed with local actors (*29,80,121,131,132,147,151,157*). In Australia, refugees and migrants from Ethiopia, Kenya, Somalia and South Sudan reported that their reduced access to immunization was specifically due to language barriers (*158*). They suggested that the barriers could be addressed through the implementation of reminder systems and by better dissemination of immunization information through community organizations. Language barriers and lack of access to interpreters among refugee and migrant groups were also identified (*118,134,147,148,159*). To overcome these barriers, vaccination campaigns are recommended to provide information in multiple languages, and in written and other formats.

A 2021 report of the root causes of low vaccination coverage and underimmunization in sub-Saharan Africa found that key issues were a lack of knowledge about the benefits of immunization and a prevalence of misconceptions about vaccination effects among caregivers and community leaders, particularly in underprivileged groups such as migrant and refugee communities (*8*).

A systematic review of perceptions about HPV vaccination among migrants found that their attitudes often improved once information was given (*160*). Low awareness about a vaccine or VPD was also a key barrier to vaccination (*151*). In contrast, in the absence of translated or accessible information, some evidence showed that migrants

may turn to alternative and unregulated information sources, such as the Internet, social media, friends and family *(29,123,117,161,162)*. In the context of the COVID-19 pandemic, humanitarian organizations have highlighted concerns about high levels of misinformation about COVID-19 vaccines among migrants, including via social media communication channels (Box 5). The Red Cross reported that this likely to be linked to language barriers and limited access to reliable public health information *(101)*.

Box 5. Social media and immunization

Misinformation and disinformation on vaccines can spread rapidly through social media and may strongly influence vaccine confidence at the individual and community levels. This is particularly the case in communities where distrust already exists and/or access to robust public health information may be more limited, such as refugee and migrant communities *(29,124,129,144)*. Data suggest that refugees and migrants make high use of social media as a source of public health information. For example, a survey of 334 Venezuelan refugees and migrants living in Poland found that Facebook and WhatsApp are the two primary information channels used to access information about COVID-19 *(161)*. In a study of Ukrainian migrants in Poland, all participants reported difficulty finding information about the COVID-19 vaccination from trusted sources, relying instead on unregulated sources such as Google searches and social media (Facebook specifically) *(163)*.

A 2022 systematic review including evidence from six countries (China, Jordan, Qatar, Türkiye the United Kingdom and the United States) found consistent use of a range of social media platforms (including Facebook, Instagram, WeChat, WhatsApp, Twitter and YouTube) for COVID-19 information by some migrant and ethnic minority populations *(164)*. Use of these platforms may stem from difficulty in accessing COVID-19 information in their native languages or from trusted sources. Positive and negative associations with social media use were reported: some evidence suggested that social media use and circulating misinformation may be associated with lower participation in preventive health measures, including vaccine intent and uptake. These findings are likely to be relevant to multiple population groups. In Qatar, a 2021 study on migrants and nationals found that social media and misinformation are associated with negative attitudes towards COVID-19 and vaccination *(104)*. To address these challenges, greater emphasis is needed on exploring opportunities to share and transmit accurate information to highly mobile populations via social media-based communication channels.

2.2.6 Financial barriers

Economic barriers and vaccine affordability (in terms of direct and indirect costs) are barriers to vaccination in certain settings. In many countries and settings, including HICs, migrants are required to pay the direct costs of vaccination, sometimes dependent on their migrant status *(68)*. Within the ongoing COVID-19 vaccine roll-out, the IOM identified a lack of clarity on whether a fee is charged to people who are not enrolled in national health insurance schemes, which may result from having undocumented or non-citizen status *(35)*. Indirect costs, such as travel costs and loss of wages from taking time off work, may also be a key barrier for some groups, particularly those with precarious migrant status or working in low-skilled jobs.

A study across Greece and the Netherlands found that asylum seekers became less likely to accept vaccination as costs increased *(165)*. In a Canadian study of HPV vaccination, health-care providers recommended publicly funding vaccination as a key facilitator to maximize uptake among migrants *(134)*. Similarly, a qualitative study in the United States found that most of the migrants interviewed responded positively when asked about HPV vaccine intent provided the vaccine was affordable. Lack of clarity about the charges for vaccination and/or health care may also discourage migrants from seeking vaccination *(125)*. A migrant health insurance scheme in Thailand allows access to public health services regardless of migrant status; however, migrants must pay for the insurance themselves and, as of 2016, only 33.7% of migrant workers had opted in *(60)*.

2.2.7 Summary of barriers in accessing immunization services

Table 3 summarizes the barriers to vaccination in refugee and migrant populations identified in this scoping review. There is also a potential role of gender in vaccine hesitancy, confidence, acceptability and access, which will affect vaccination uptake although the effect varies with the vaccine and the situation (Box 6).

Table 3. Barriers to vaccines in refugees and migrants

Type of barrier	Description
Legal, administrative, and technical barriers	• Lack of legal and/or free entitlement to health care or vaccination • Resource and capacity constraints, e.g. lack of vaccine availability, limited human resources (trained health-care workers), and cold chain limitations or other logistic constraints • Lack of proactivity or authorization from government, health-care systems or other actors to provide vaccination campaigns to refugee and migrant groups, or prioritization of nationals in contexts of low vaccine availability • High population movement and lack of cross-border policies for sharing of vaccination data and records • Blanket approaches, e.g. vaccination reminders sent via letter/text message are unsuitable for mobile populations
Barriers relating to accessibility on an individual level	• Language, literacy and communication barriers • Distrust of health system/authorities, sense of alienation and disempowerment • Specific provider-level barriers, e.g. health professionals lack specific knowledge of refugee and migrant entitlements, catch-up vaccination guidelines and culturally competent care, and missed opportunities to vaccinate • Lack of information or practical support from health-care workers when desired • Lack of individual vaccination documentation/cards in contexts with a "no card, no vaccine" policy • Inconvenient, inaccessible or untrusted access points • Fear of data sharing with immigration authorities or documentation checks at vaccination sites
Barriers relating to financial and non-financial affordability and convenience	• Fee charged for vaccination • Indirect costs, e.g. cost of travelling to vaccination appointment, time lost from work • Competing priorities

Table 3. contd

Type of barrier	Description
Barriers relating to knowledge, information and awareness	• Lack of information available in relevant formats, languages or broadcasted through appropriate channels • Low knowledge about the disease or the benefits of vaccination • Lack of awareness of the vaccination availability/eligibility or the location of access points • Personal health stewardship, e.g. knowing own medical/vaccination history • Circulating misinformation (e.g. about the vaccine or its availability), particularly where this is not addressed by official information in appropriate languages/formats
Barriers relating to personal, social, cultural and religious beliefs and norms and acceptability of vaccines	• Worries about vaccine safety and side-effects, especially for new vaccines • Cultural, religious, and social barriers, e.g. stigma around specific vaccines, vaccination being unpopular or uncommon in country of origin, religious or cultural values surrounding health care • Distrust of health system/authorities, sense of alienation and disempowerment, and structural racism • Misinformation, disinformation or lack of information in appropriate formats or languages • Low perception of disease risk or importance of vaccination • Vaccination not recommended by physicians • Current or historical issues around health care or vaccination can reduce trust in health-care recommendations (*217,218*).

Box 6. Integrating gender perspectives in vaccination strategies

WHO has highlighted the importance of addressing gender-related vaccine hesitancy, confidence, acceptability and access, and that failure to do so may be detrimental to the success of vaccination campaigns (*166*). A 2011 systematic review of factors associated with uptake of influenza vaccination of the general population and health professionals concluded that men were more likely to get vaccinations than women and that, in some countries, women were more likely to express fears about the efficacy and safety (*167*). WHO suggest that in settings where there is a gender gap in education (for example some refugee and migrant communities), women may have limited access to accurate vaccine information, resulting in lower vaccine confidence (*166*). This may also deter them from getting their children vaccinated. Women are likely to have specific concerns or requirements around routine or mass vaccination depending on their religious or cultural values or on education and health literacy levels (see Case study 1).

In the context of the COVID-19 vaccine roll-out, fears about adverse effects on female fertility have reduced vaccine confidence among women in some communities (*168,169*). However, other studies have found that men were more likely not to vaccinate or to have low confidence in vaccines. For example, working-aged men were at greatest risk for remaining unvaccinated in oral cholera vaccine campaigns in refugee camps in Iraq (*170*) and Thailand (*171*). This was probably because vaccination hours coinciding with the working day for men, whereas women mostly remained at home in the camp. A 2021 global survey of 19 countries on the potential acceptance of COVID-19 vaccination found that men were less likely than women to accept vaccines in general (*172*). In contrast, a 2022 systematic review of determinants of undervaccination in migrants in Europe did not find a strong overall association with gender (seven out of 10 studies found no association) (*25*). A 2018 study found that asylum-seeking girls were more likely to be undervaccinated than asylum-seeking boys (*17*). However, a 2021 study found a faster decline in MMR vaccination coverage rates over time for Somali boys than girls, and suggested that this may reflect intentional gender-based MMR refusal owing to a fear of autism by parents (which is more prevalent in boys in the Somali community) (*128*). Overall, gender appears to have a variable impact as a barrier to vaccination in refugee and migrant communities. Therefore, a better understanding of how gender affects vaccine confidence, intent and uptake among refugee and migrant groups, and its impact on child immunization coverage is urgently needed.

2.3 Good practices in implementing immunization initiatives for refugees and migrants

It is increasingly acknowledged that a one-size-fits-all approach to immunization will not sufficiently increase coverage to meet global targets and that standard approaches must be adapted to the diverse contexts and needs that exist worldwide. The review identified a wide range of facilitators of vaccine uptake in refugee and migrant populations (Fig. 6).

Fig. 6. Facilitators of immunization in refugees and migrants identified in the evidencea

Administrative and policy
- Legal access to primary care and vaccination irrespective of immigration status
- Close collaboration between government and implementing partners to ensure no administrative barriers prevent reach
- Firewalls to protect against data sharing with immigration authorities
- Accessible routes to residency status or citizenship, where this is required for access to primary health care
- Mandates, e.g. mandatory workplace vaccination
- Vaccination-on-arrival strategy

Availability of vaccines and logistics
- COVAX-like initiatives to ensure equitable distribution of vaccines globally
- Creation of specific catch-up vaccination initiatives, e.g. on-arrival health screening and vaccination for asylum seekers, mass vaccination campaigns
- In-depth coordination of logistics (e.g. cold chain requirements, health-care worker training) prior to vaccination campaign
- Vaccination cards to aid logistics of giving multiple doses in setting with high population movement

Trust and social processes
- Cultural competent and migrant-sensitive care, e.g, inclusive services and policies, training for health-care workers on migrant health and vaccination needs
- Positive social norms and normalization of vaccinations, e.g. encouraging those recently vaccinated to share on social media
- Culturally tailored and community-based interventions, e.g. face-to-face communication, community advocates
- Increased funding for and collaboration with NGOs or other groups already providing health and social care to migrants locally

Technical issues and accessibility of acess points
- Convenient access points, e.g. walk-in or mobile clinics, workplace-based vaccination, flexible appointments and opening hours, based on research/ engagement to identify community-specific access barriers
- Flexibility in registration for health care and/or vaccination, e.g. provision for those without access to the Internet
- Provider recommendation
- Information campaigns and engagement to ensure target community is aware of access points available to them

Fig. 6. contd

Economic and cost

- Cost offsetting, e.g. free vaccination, insurance cover
- Provision of multiple access points that minimize travel expenses
- Monetary benefits/persuaders
- Clear, tailored information campaigns to ensure communities are aware of how much vaccination costs or that it is free

Information, misinformation and hesitancy

- Tailored health promotion and education programmes in relevant languages, to increase awareness of vaccination benefits
- Ensure information campaigns are tailored to different cultural and religious values – "one size doesn't fit all"
- Extensive research into information channels used by specific communities, which should be harnessed to increase information reach
- Directly counter misinformation known to be circulating

Strategies employing sociobehavioural and participatory approaches are effective in increasing vaccination demand, addressing gaps in coverage and strengthening immunization programmes. WHO has emphasized a need for more participatory research into the determinants of health in refugee and migrant populations in general (*109*). In Europe, the ECDC has highlighted that vaccination initiatives should understand and to take account of the needs and perspectives of refugees and migrants (*64*).

In principle, multiple opportunities for vaccination may exist throughout the displacement and migration trajectory in variable settings. In acute humanitarian emergencies requiring rapid, evidence-informed decision-making, WHO offers a framework for vaccinating refugees and migrants that involves epidemiological risk assessments and consideration of vaccine characteristics and contextual factors in a three-step process of decision-making (*173*). The ECDC has suggested specific catch-up vaccinations for newly arrived migrants in Europe and consideration of specific implementation issues (*64*). These include advising against serology testing and are in favour of recognizing the unique needs of newly arrived migrants when offering vaccination (such as delays to presentation), taking steps to reduce drop-out from care, and recognizing concomitant issues that may compromise the ability or urgency of newly arrived migrants to seek preventive health care or may increase their risk of contracting infectious diseases (for example, housing, employment, mental health issues). For asylum seekers at an Italian reception centre, the participation rate was higher when vaccination was offered upon arrival rather than by appointment at the reference health centre (*174*). A campaign along the Thai–Myanmar border was successful in enrolling migrant schoolchildren to a school-based immunization programme, achieving immunization rates of 92.3% for Bacillus Calmette-Guérin (tuberculosis vaccine), 85.3% for the third dose of the oral polio vaccine, 63.8% for DTP3, 72.2% for the

third dose of the hepatitis B vaccine and 90.9% for the measles vaccine (*175*). Special adaptation of services for migrants, such as bundling primary care services, may also help to prevent further barriers to vaccination, diagnosis and care (*64*). Where possible, national immunization programmes should take a life-course approach, in which immunization is seen as a strategy to prevent disease and maximize health, regardless of age, instead of restricting it to childhood; this approach would have benefits at the individual, population and socioeconomic levels (*176*). Canadian guidance recommends repeating vaccinations in new migrants whose vaccination status is doubtful, for example if their immunization records are missing or difficult to interpret (*177*).

Tailored and targeted interventions have also been shown to improve vaccination uptake in refugee and migrant populations. These include door-to-door vaccination initiatives, mobile vaccination teams, media and health promotion campaigns, social mobilization activities, patient reminder letters, culturally and linguistically tailored community outreach and engagement, and strengthened partnership working and coordination (*4,18,147,178*). In Kenya, a mobility-competent polio vaccination programme has been developed (*112*). Some strategies aimed at promoting vaccination among Asian migrants have successfully used community or lay health workers (*179*). Similar innovative approaches to rolling out COVID-19 vaccination for refugees and migrants have been noted, including the use of mobile medical teams to reach and vaccinate irregular migrants (*119*). The Collective Service for Risk Communication and Community Engagement has produced interim guidance on delivering COVID-19 vaccines to refugees, migrants and IDPs, which suggests that multiple communication strategies will be needed to address the different motivations and social and cultural practices influencing vaccine acceptance, alongside strong community engagement (*180*).

At macro level, cooperation within and across borders is needed to facilitate the generation and sharing of health information (such as vaccination records and coverage data) and align national immunization guidelines and programmes to control VPDs in mobile populations (*4,65,147,180*). For example, in Australia a whole-of-life national immunization register has been developed with the capacity to identify at-risk groups such as refugees and migrants, following stakeholder recommendations (*181*). In another approach, a study on Syrian refugees in Jordan described the development of the CImA children immunization app as a low-cost digital solution to provide evidence-based vaccine information to parents and record vaccination history, with promising results achieved following initial implementation in the Zaatari refugee camp (*182*).

Case studies 1–5 (blue boxes) describe good practices of implementing immunization initiatives in refugee and migrant populations in camp settings) and Case studies 6–12 (yellow boxes) highlight good practices of implementing immunization initiatives in refugee and migrant populations in community settings.

Case study 1. Engaging with faith leaders to address vaccination barriers in Rohingya refugees in Bangladesh

A qualitative study of Rohingya refugees in the Cox's Bazar camp in Bangladesh found that lack of sensitivity to cultural gender norms in the vaccination procedures (specifically, a lack of female health-care workers to vaccinate women and girls – it is religiously unacceptable for male vaccinators to vaccinate Rohingya women) and fears that vaccination by white humanitarian workers would cause the refugees to become Christian were major barriers in a measles and diphtheria vaccination campaign *(131)*. Interviews and focus group discussions revealed that local leaders (in particular, religious leaders) were trusted sources of information. Subsequently, engagement with religious leaders and faith-based messaging were successfully used to improve vaccine coverage in the camp.

Case study 2. Facilitators of vaccine access and uptake during a cholera outbreak response in Iraq

As part of the response to the 2015 cholera outbreak in Iraq, the Iraqi Ministry of Health achieved an overall coverage of 87% (95% confidence interval, 85–89) for two-dose oral cholera vaccine for people living in IDP and refugee camps via a combined door-to-door and fixed-post strategy *(170)*. Vaccine coverage of the adult male population was maximized by extending evening work hours for vaccinators and including additional vaccination sites at camp entrances and nearby markets. Other facilitators were the use of electronic tablets for data collection combined with global positioning system tracking to remotely review data quality, record household visits, and spatially track and give instant feedback to vaccination teams.

Case study 3. Using multimedia campaigns to reach caregivers of Somali refugee children for mass polio vaccination in Kenya

In response to the 2013 polio outbreak in Kenya, the Kenyan Ministry of Health initiated a mass polio vaccine campaign targeting children in Somali refugee camps and surrounding communities near the Somali–Kenyan border. A household survey revealed that for the 1009 caregivers who were aware of the campaign and recalled the recent polio outbreak,

Case study 3. contd

the most common sources of information were announcements public address system or megaphone announcements (76%), a visit by a social mobilizer (47%) or health-care worker (43%), and radio (36%) (*143*). Facilitators included strong commitment from the Ministry of Health and coordination among implementing partners to develop comprehensive operational plans and allocate resources quickly; the flexibility to move temporary fixed vaccination sites in response to caregiver demands to make vaccines available closer to their homes; comprehensive pre-campaign planning of cold chain requirements; and appropriate staff training.

Case study 4. Improving coordination and engagement in complex settings in Greece

In 2017 the Greek Ministry of Health's PHILOS – Emergency Health Response to Refugee Crisis programme took over coordination of vaccination for refugee children in Greece, which had previously been performed mostly by NGOs (*115*). The programme's new coordinated approach included setting standard operating procedures for identifying vaccination needs at camps, door-to-door visits to families, information campaigns supported by cultural mediators, and promoting the use of designated vaccination records for children. Written information was provided in a range of languages. The programme achieved cooperation between a range of actors and showed that a coordinated approach to vaccination can be implemented in a complex setting.

Case study 5. Countering COVID-19 misinformation through a radio campaign in Kenya

In Kenya, COVID-19 vaccine hesitancy within both the Government and national population has compromised vaccine uptake by refugees and migrants (*80*). This issue is compounded by COVID-19 misinformation spread through social media and by word of mouth in refugee camps, including rumours that international aid agencies are creating the virus to make money. A radio host from the Dadaab refugee camp, known locally as the Corona Guy, has successfully used his radio station to directly combat misinformation circulating in the camp by creating a dialogue with other camp residents.

Case study 6. Delivering mass catch-up vaccination campaigns to Syrian refugee children in Türkiye

The Government of Türkiye and partner organizations have conducted a mass vaccination campaign to provide missing doses of MMR and polio vaccines to 400 000 refugee and migrant children *(180)*. The vaccines were delivered door to door to households and in health centres in areas with large refugee populations by trained Syrian refugee doctors and nurses in order to bridge language gaps and help to build trust. Information was also disseminated via live radio broadcasts and to mosques and local health centres.

Case study 7. Involving migrant communities in the design of an immunization programme in Thailand

A qualitative study exploring barriers to immunization among children of migrant workers from Myanmar living in Tak Province (Thailand) found that an important facilitator was to involve migrant parents in developing the local immunization programme *(183)*. Input from the parents highlighted barriers of distance, necessity of work and fear of arrest. After adjustment to address these barriers, the programme was implemented in schools run specifically for migrant children by NGOs. The research team addressed parental fears of fever by providing them with paracetamol and dosage instructions, and trained parents and teachers on the benefits and side-effects of immunization. By establishing strong relationships with teachers, the team was also able to follow up children who dropped out of school before completing their immunization schedule.

Case study 8. Improving access to COVID-19 information via social media channels and trusted messengers for migrants in north Africa

The Mixed Migration Centre in north Africa explored refugees' and migrants' access to information on COVID-19 in Libya and Tunisia, highlighting the prevalent use of online platforms and social media as a key source of information for these populations *(184)*. The Mixed Migration Centre recommends systematic sharing of information on COVID-19

Case study 8. contd

via online communities and raising awareness about COVID-19 through campaigns that translate information materials into local languages. These efforts should take account of the different information channels used by refugees and migrants and the high levels of trust placed in community leaders and mobilizers.

Case study 9. Establishing a prioritization policy for COVID-19 vaccine roll-out in Rwanda

Rwanda established a tiered prioritization list for COVID-19 vaccination roll-out, with refugees included in the highest-risk group, along with front-line health-care workers, the elderly, teachers, prisoners and those with underlying chronic health conditions *(80)*. Effective roll-out of the vaccine was credited to early planning and national coordination by the Government of Rwanda, which brought together State and non-State actors before a COVID-19 vaccine became available, and an inclusive national health system that ensured that refugees in camps were included from the outset.

Case study 10. Reaching socially disadvantaged groups through mobile outreach teams in Belgium

In 2014 mobile vaccination teams were launched in Flanders (Belgium) to provide free vaccination services and promote vaccine literacy among socially disadvantaged people, including Roma, victims of trafficking and homeless people, with a focus on children *(185)*. Children were identified by the School Health Service or the Flanders Agency for Child and Family, and those who could not access medical care were provided free-of-charge services. Vaccination data were recorded in a centralized system and made available to all other vaccination services. Since 2016, all asylum seekers in Belgium have been offered catch-up vaccinations at the time of their asylum application *(109)*.

Case study 11. Using community-based participatory research to co-design a novel vaccine educational programme for Somali migrants in the United States

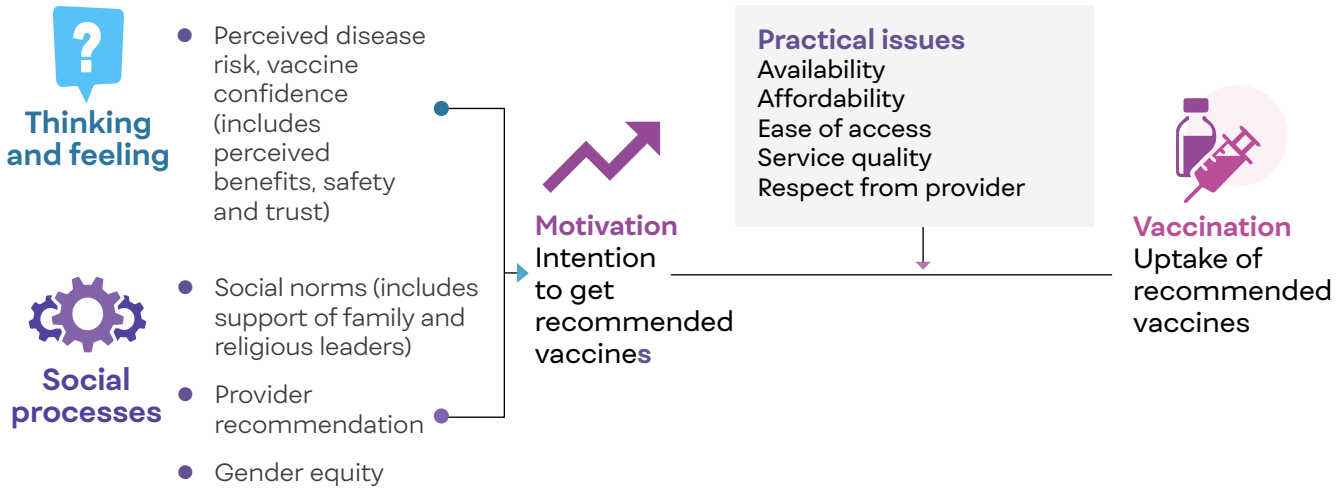
Community-based participatory research methods were used to co-design a virtual reality education programme to improve vaccine acceptance in a Somali refugee population in the United States *(186)*. Focus group discussions, interviews and surveys with Somali community members and expert advisors were used to generate the educational content. Co-design approaches with community input were used to develop the virtual reality storyline and ensure that the programme was culturally and linguistically sensitive, with sufficient flexibility for use with groups of differing levels of health literacy and technology literacy.

Case study 12. Applying the WHO Tailoring Immunization Programmes approach to tailor immunization services to an Orthodox Jewish community in the United Kingdom

In response to suboptimal immunization coverage and persistent outbreaks of VPDs in the Charedi Orthodox Jewish community in north London (United Kingdom), Public Health England implemented WHO's Tailoring Immunizations Programme methodology *(219)* to make recommendations for tailored immunization services for the Charedi community. The approach included a literature review, stakeholder and partner meetings, epidemiological analyses, a service evaluation and a community questionnaire *(187)*. The research highlighted the importance of birth order and family size in a mother's decision to get children vaccinated. Mothers' concerns about difficulties in accessing immunization services, lack of child-friendly facilities, lack of time, and vaccine safety led to underimmunization, along with their preference for natural infection (the belief that natural illnesses are better for children). Recommendations were developed focused on the needs of the mothers/parents, and included opening weekend clinics, using vaccinators from the community, a strong communication campaign and providing cultural awareness training for health-care staff.

WHO acknowledges that addressing underimmunization requires understanding its determinants and developing tailored, evidence-based strategies to improve uptake, as well as monitoring their impact and sustainability. To support programmes and partners to strengthen immunization programmes and address the challenge of undervaccination, WHO established in 2018 an expert working group, called Measuring Behavioural and Social Drivers of Vaccination, to develop standardized tools and implementational guidance on the systematic assessment of behavioural and social factors affecting vaccination uptake. The working group has already established a conceptual model of the behavioural and social drivers of vaccine uptake, based on an appraisal of the existing theoretical models in the literature, which has four domains: (i) thinking and feeling, (ii) social processes, (iii) motivation (or hesitancy) and (iv) practical factors (Fig. 7) *(190)*. The WHO expert working group is working to develop globally standardized tools for health policy-makers and planners to measure and monitor the drivers of underimmunization in real time, and in 2021 published a toolkit for COVID-19 *(188)*. Complementing this work, the WHO Tailoring Immunization Programmes framework provides a practical approach to identifying barriers and motivators to vaccination in specific populations and developing targeted, tailored interventions to increase vaccination coverage *(219)*. These frameworks and tools offer evidence-informed implementational guidance for defining and addressing barriers to vaccination in specific populations. From an implementational perspective, sufficient emphasis must be given to designing and implementing effective strategies and interventions to increase uptake, and to monitoring their impact, in order to achieve long-term improvements to vaccination programmes *(191)*. Box 7 summarizes the key good practices for implementing immunization programmes for refugees and migrants identified in the review.

Fig.7. The behavioural and social drivers of COVID-19 vaccination



Source: reproduced from WHO, 2021 *(188)*, and based on the increasing vaccination model of Dube et al., 2018 *(189)*.

Box 7. Good practices in implementing immunization in refugees and migrants

- Deliver immunization services for refugees and migrants as part of mainstream health services.
- Develop a risk communication and community engagement strategy, ensure clear and accessible communication from official sources, and distribute information through a range of preferred communication channels in the language of target groups, tailored formats and trusted messengers, as identified by communities. Specifically monitor and address misinformation and disinformation that is circulating locally.
- Promote culturally competent practice through providing education and training for health-care professionals and administrative staff, providing interpreters and translated resources in primary care, implementing migrant-sensitive guidelines and services, and restructuring systems and services to make them more inclusive, accessible and affordable.
- Engage and carry out research with community leaders and stakeholders prior to undertaking vaccination campaigns in order to identify contextual factors and barriers specific to the setting and then develop a targeted approach using convenient locations.
- Establish ongoing community engagement platforms, rather than one-time social mobilization activities, in refugee camps and other humanitarian settings to increase trust in vaccination services at local level.
- Ensure that refugees and migrants living in closed settings (e.g. camps, detention centres, prisons and reception centres) have full access to a full range of routine and catch-up immunization services, including COVID-19 vaccines, as other migrant and host populations.
- Make routine immunizations free at the point of delivery. Consider the use of targeted, cash-based interventions where opportunity costs are a major financial barrier.
- Build confidence in vaccination and vaccine development through use of transparent processes and including refugees and migrants in vaccine trials, recognition their research contributions and equipping them with knowledge of their entitlements.

Box 7. contd

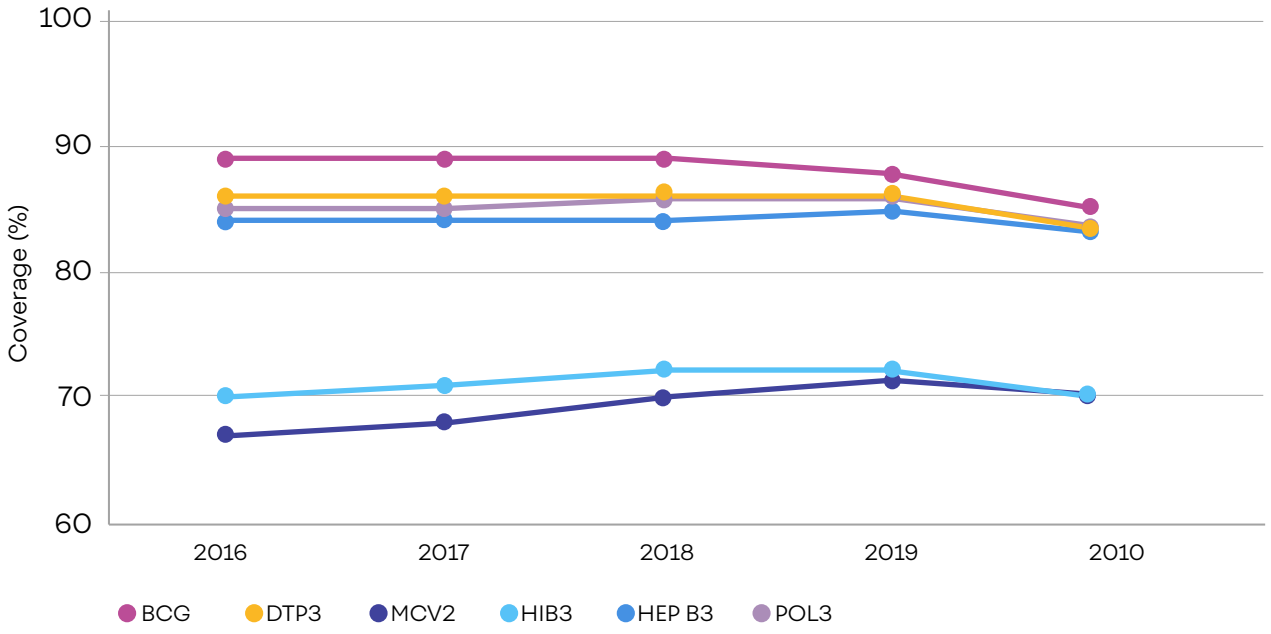
- Use local health-care workers to deliver vaccination campaigns, where possible, to improve communication, build trust and to reduce fears.
- Take a life course approach in which immunization is seen as a strategy to prevent diseases and maximize health over the lifetime, regardless of age. Bring new and settled refugees and migrants up to date with recommended vaccines and missed doses through catch-up vaccination initiatives.
- Use mass vaccination campaigns, mobile vaccination clinics and innovative and migrant-friendly approaches to address existing immunization gaps and reach communities that cannot or do not engage with mainstream services (e.g. through door-to-door visits and mobile outreach services). Establish monitoring systems, promote partnership and collaborative working, and leverage existing networks (e.g. grass-roots organizations, places of worship and schools).
- Adequately recognize and reimburse stakeholders and community members for their time and expertise when working in partnership.
- Specifically engage with primary caregivers, as the key decision-makers in childhood immunization, to seek their views and improve their knowledge on VPDs and the importance of immunization.
- Incentivise better data recording on migration and ethnicity for vaccine uptake and coverage in health information systems (including on arrival) to avoid redundant investigations and establish vaccination records for new refugees and migrants. Provide priority vaccinations to new arrivals at border crossing points, especially during mass influxes.
- Facilitate prompt engagement with health services, including immunization services, for refugees and migrants on arrival in an equitable and non-discriminatory manner, regardless of their visa status.
- Develop procedures to keep track of migrants' immunization data within and between countries and promote cooperation among public health authorities of different countries to facilitate cross-border immunization initiatives and sharing of data.

2.4 Disruption of immunization services for refugees and migrants due to COVID-19

2.4.1 Global disruption of immunization programmes 2020–2021

In 2020 the COVID-19 pandemic resulted in marked disruption to childhood immunization programmes globally: the vaccination gap increased by more than 8 million compared with global estimates for the year and coverage for all key vaccines was lower than in previous years (Fig. 8) *(192)*. The pandemic also disrupted the ability of countries to collect routine health and vaccination data, and some of the reduction in global coverage may be due to stalled surveillance and data collection.

Fig. 8. Global immunization coverage for key vaccines, 2016–2020



BCG: Bacillus Calmette-Guérin (tuberculosis); HEPB3: third dose of the hepatitis B vaccine; HIB3: third dose of the *Haemophilus influenzae* type B vaccine; POL3: third dose of the polio-containing vaccine.

Source: data from UNICEF, 2021 *(6)*.

Disruption to immunization services, even for short periods, increases both the number of susceptible individuals and risk of VPD outbreaks *(10)*. In a global survey conducted by WHO, UNICEF and GAVI, three quarters of the 82 responding countries reported experiencing COVID-19-related disruptions to their immunization programmes since May 2020, with at least 30 measles vaccination campaigns at risk of being cancelled *(193)*. Data for 2021 suggest that 60 life-saving mass immunization campaigns are currently postponed in 50 countries, putting around 228 million people – mostly children – at risk of diseases such as measles, polio and yellow fever *(194)*. Médecins Sans Frontières has highlighted the detrimental impact of the pandemic on the delivery of measles vaccines and the ability of health systems to tackle ongoing measles outbreaks in the Central African Republic, Chad and the Democratic Republic of Congo *(195)*. However, the pandemic has not disrupted all vaccination systems: for example, provisional United Kingdom data show an increase in influenza vaccine uptake in health-care workers (from 74.3% uptake in 2019–2020 to 76.8% in 2020–2021) *(196)*.

2.4.2 Impact on global refugee and migrant populations

Although data are limited, the COVID-19 pandemic will undoubtedly have disrupted specific services for refugees and migrants, given the known constraints it has placed on health systems and services, particularly in low-resource settings *(197)*. Other effects of the pandemic include disruption to vaccine supply chains *(197)*, suspension of mass vaccination campaigns and exacerbation of existing health-care barriers faced by marginalized populations *(198)*. Sudden drops in immunization coverage were also reported in previous conflict or crisis situations, such as pandemics *(106)*, and those living in deprived areas are often most affected by consequent health service disruptions *(199)*.

As a result of the COVID-19 pandemic, many health-care and vaccination systems have moved towards tele- or e-health alternatives, and have reduced opening hours or have closed completely. In the United Kingdom, increased digitalization and virtual consultations (via telephone, video and online forms) in primary care as a result of the pandemic have amplified existing inequalities in access to health care for many migrants who lack of digital literacy and access to technology, and these are compounded by language barriers *(144,200)*. Reduced consultations also limit opportunities for health-care providers to appropriately address vaccine questions and concerns and reinforce trust *(201)*. This may disproportionately affect migrant groups with pre-existing distrust in vaccinations (Deal et al. Defining drivers of under-immunization and vaccine hesitancy in refugee and migrant populations to support strategies to strengthen uptake of COVID-19 vaccines: a global evidence review. St George's, University of London and WHO

unpublished data, 2022) *(26,144)*, those who mainly rely on verbal information from health-care workers for vaccination information *(29,134,202,203)* or those requiring extra consultation time because of language barriers *(26,134,203)*.

2.4.3 Strategies to maintain immunization services during disruption

WHO has stated that maintaining routine immunization services for refugees and migrants throughout the COVID-19 pandemic is crucial to ensure protection from VPDs and so that missed immunization doses (as a result of COVID-19 containment measures) can be offered as quickly as possible *(178)*. Data generated using a benefit–risk assessment model showed that, in the African context, for each excess death attributable to coronavirus infection acquired during a routine visit to a vaccination clinic, 84 deaths from other VPDs (95% confidence interval: 14–267) in children could be prevented by maintaining routine childhood immunization (high-impact scenario) *(204,205)*. Therefore, maintaining routine immunization services during a pandemic is essential to prevent excess morbidity and mortality due to VPDs, particularly in vulnerable groups.

A report by the United Kingdom's Academy of Medical Sciences recommended implementing measures to allow primary care to focus on delivering clinical care, including vaccination programmes, by pausing non-emergency, non-clinical work, such as inspections or other non-essential administrative work *(206)*. The Lebanese Ministry of Public Health has advocated for increasing the resilience of the national health system (defined as the capacity to absorb internal or external shocks). It argued that during the Syrian refugee crisis, the integration of refugees into the Lebanese national health system (facilitated by a non-camp policy for housing refugees) and excess hospital, human resource and technological capacity prior to the refugee influx into the country helped to minimize the disruption to key health service delivery *(207)*.

WHO recommendations are to closely monitor the disruption to services and to carry out comparative assessments of the short- and medium-term public health risks of immediately implementing or delaying a mass vaccination campaign versus the potential increase in COVID-19 transmission triggered by the campaign *(10)*. Since the risk–benefit ratio will vary by setting, it is essential that specific risk assessments are carried out for those in more vulnerable situations, such as refugees and migrants, and particularly those living in refugee camps or detention settings. Mobile vaccination clinics, combined health-care services (such as antenatal care and vaccination programmes) and mass vaccination campaigns

should be considered to address the potential decrease in immunity for refugees and migrants specifically *(178)*. The United States Centers for Disease Control and Prevention have produced a guide for planning and implementing mobile vaccination campaigns *(208)*. Mobile vaccination campaigns to deliver COVID-19 vaccination to marginalized groups (such as irregular migrants, refugee or migrant worker populations) in London *(209)* and Paris *(210)* are models of good practice that could be adopted globally for catching up routine vaccinations of refugees and migrants.

WHO has also highlighted the importance of increasing efforts to track and vaccinate at the earliest opportunity individuals who have missed vaccine doses due to pandemic-related disruption *(10)*. This is likely to be particularly challenging in refugee and migrant groups because they are often missed or marginalized by health and vaccination systems. A study in Jordan and Lebanon noted that, although household surveys may be the most reliable way of assessing immunization status, such surveys are limited by information bias (absent or unreadable vaccination cards or recall bias) and lack of sampling frames *(142)*. The study recommended that research into the validity of recall-based methods should be conducted among mobile populations *(142)*. WHO recommendations include removing policies that might limit catch-up efforts, such as restrictions on age or target group, and considering the periodic intensification of routine immunization services to ensure rapid catch-up for children and adolescents who have missed vaccine doses in the previous two years *(10)*. In some refugee and migrant populations, this may require major effects to counter an increased sense of alienation, distrust or exclusion from health services due to the pandemic *(29,124)*, including via increased focus on sustainable outreach and co-design of vaccination campaigns with the target community *(147)*.

Although the COVID-19 pandemic has been characterized by major disruption to health and vaccination services, significant lessons can be learned from the associated changes in health-care delivery. The design and implementation of catch-up campaigns and strategies to identify those who have missed COVID-19 vaccine doses should be used to inform the design of catch-up vaccination campaigns for refugees and migrants who may have missed vaccine doses for VPDs during childhood. The increased inclusivity shown in many settings during the COVID-19 vaccine roll-out (in terms of eligibility to vaccination; section 2.1.2) must be extended to ensure that all refugee and migrant populations can access catch-up campaigns following COVID-19-related disruption to routine vaccination services.

3. Discussion

3.1 Strengthening the integration of refugees and migrants into immunization policy

Refugee and migrant populations are considered to be underimmunized groups globally, with a range of key risk factors and vulnerabilities for underimmunization. Migration and displacement comprise two of several processes that may influence low immunization uptake, particularly by children. Therefore, WHO recommends that refugees and migrants globally should have non-discriminatory and equitable access to immunization programmes, free from financial, linguistic, cultural, administrative or bureaucratic barriers, with specific initiatives put in place to reach these groups and ensure they are included, including for COVID-19 vaccination. The full inclusion of refugees and migrants in vaccination systems is critical if countries are to meet the ambitious targets to increase coverage for routine vaccines set out by IA2030 and aligned with universal health coverage objectives (9).

Access to health care – which includes immunization services – is a permanent legal obligation under international law for States that have signed the relevant international treaties, along with clear obligations to increase vaccine coverage (Box 8). Most recently, States have committed under the Global Compact for Safe, Orderly and Regular Migration (39) and Global Compact on Refugees (38) to ensure safe access to basic services for all refugees and migrants, regardless of their legal status.

Box 8. International law related to access to immunization services for refugees and migrants

The right to health is enshrined in a significant number of legally binding treaties, as well the WHO Constitution (Preamble) (220). These international treaties include the International Covenant on Economic, Social and Cultural Rights (art. 12) (221), the International Convention on the Elimination of All Forms of Racial Discrimination (art. 5(e)(iv)) (222), the Convention on the Elimination of All Forms of Discrimination against Women (arts. 11(1)(f) and 12) (223), the Convention on the Rights of the

Box 8. contd

Child (art. 24) (224), the Convention Relating to the Status of Refugees (art. 24(1)(b)) (225) and the International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families (arts. 25(1)(a) and 28) (226).

More recently, States have reinforced their obligations towards migrants by having committed under the Global Compact for Safe, Orderly and Regular Migration to ensuring safe access to basic services for all migrants regardless of their legal status (objective 15) (39). The basic services include an affordable and non-discriminatory health-care system with reduced communication barriers and culturally sensitive ways of delivery.

The Global Compact on Refugees outlines the commitments of States and relevant stakeholders to enhance the quality of national health systems in order to facilitate access by refugees and host communities, including providing support to immunization services (38).

As stated by the Committee on Economic, Social and Cultural Rights in General Comment No 14: The Right to the Highest Attainable Standard of Health (art. 12), "every human being is entitled to the enjoyment of the highest attainable standard of health conducive to living a life in dignity" (227). Like any other human right, the right to health presupposes the existence of a three-fold duty of the State: obligations to respect, protect and fulfil. States are under an obligation to provide for equal realization of the right to enjoy the highest attainable level of health to all people in a non-discriminatory manner (227). However, the definition of the right to health, as explained in this General Comment, is not legally binding for Member States. Hence, approaches to the right to health may vary in national legislation. The Committee stressed that States are bound to refrain from denying or limiting equal access to asylum seekers and irregular migrants and abstain from discriminatory policies and it also highlighted the existing joint and individual responsibility of the State to cooperate in providing relief and assistance to refugees in times of emergency (227).

Box 8. contd

According to this international normative framework, all refugees, migrants and asylum seekers should benefit from the right to health in the host State. The State's obligations are not dependent on the legal status of an individual and should be performed in a non-discriminatory, barrier-free manner ensuring the highest attainable level of health. In the context of COVID-19, all refugees, migrants and asylum seekers, therefore, have the right to access all relevant health-care services, such as testing, diagnostics, care and treatment, referral and the COVID-19 vaccination once it becomes available (228).

This normative framework has been operationalized through a number of practical recommendations adopted by several United Nations bodies, including WHO, the Inter-Agency Standing Committee and the United Nations Network on Migration (229).

***Source*: WHO, 2021 (83).**

Despite these obligations, this GEHM found that immunization policies are highly variable in countries and regions regarding the inclusion of refugees and migrants. The findings suggest that most countries do not specify a clear policy on refugee and migrant entitlement to vaccination. Discrepancies in access were found between different refugee and migrant populations, with gaps between the more-inclusive policies and their implementation in practice. Indeed, the ability to access routine immunization often depends on policies that include or exclude refugees and migrants based on their legal status, age and the context in which they live. For example, irregular migrants may be excluded from accessing immunization systems as part of their more general lack of entitlement to mainstream health services or they may be charged for immunizations, whereas other migrant groups are included. Refugees and migrants residing in closed camps and detention centres or labour migrant compounds may experience physical barriers to immunization services, and general health-care provision in these closed settings is often not part of the country's mainstream health and immunization systems. As well as an urgent need to ensure that the 17 million zero-dose children are reached with life-saving immunizations and lessen this gap

going forward, the evidence highlighted a need for renewed focus on catch-up vaccination in displaced and mobile populations across the life course. Particular gaps were identified in the provision of catch-up vaccines to older refugees and migrants (adolescents and adults); policies and planning are needed to ensure they have opportunities to receive vaccinations they may have missed as children, with subsequent boosters, and additional vaccines to align them with the host country's immunization schedule.

WHO recommends that all immunization programmes globally should have a catch-up vaccination policy and schedule in place to close existing immunization gaps, otherwise these will increase as refugee and migrant populations increase in age *(9,211)*. WHO has made clear statements that those who arrive "late" should not be denied vaccinations and that it is almost always "better to vaccinate late than never". Although upper age limits apply for the administration of a few vaccines, for most VPDs, providing vaccines late will still protect against morbidity and mortality; therefore, older migrants should not be overlooked. Specific guidance is available to assist national immunization programmes to establish a catch-up schedule as an essential component of a well-functioning immunization programme *(211)*. This would ensure that individuals who miss routine vaccines for whatever reason can be identified and vaccinated as soon as possible. Comprehensive guidelines pertaining to children, adolescents and adults on the development of country-specific schedules are available from WHO *(212)*. This GEHM highlighted a lack of clarity in many HICs on what to offer older refugees and migrants in terms of catch-up vaccines on arrival. Lack of vaccination records and/or other information on what vaccines they have received in the past means that catch-up vaccination for this group may not be considered by front-line clinicians. Specific guidance is now available on what vaccines to offer all newly arrived refugees and migrants *(64)*, with the ECDC calling for States to actively identify individuals (including refugees and migrants) who have missed vaccinations. This would also benefit older refugees and migrants in displacement settings, camps and other closed settings and help to prevent outbreaks of communicable disease, in accordance with Sphere standards *(213)*.

In addition to providing year-round continuous catch-up vaccination to refugees and migrants via routine immunization services, better consideration must be given to planning and implementing additional large-scale specialized efforts to identify and seek out groups who have missed vaccination following a significant period of interruption or reduction in services. The available guidance on what to consider in humanitarian emergencies *(173,211)* provides a transparent, evidence-based and rigorous methodology for deciding on vaccination options, including in refugee and IDP camps. This should involve a clear and consistent approach to (i) assessing VPD epidemiology and risk in the local population, (ii) selecting vaccines

and which characteristics to consider and (iii) understanding the local contextual constraints that will influence effective and timely decision-making. National legal systems should guide the implementation of vaccination programmes; however, they frequently do not accommodate humanitarian emergencies. In instances where national legislative frameworks are absent or dysfunctional, international human rights law dictates a duty of care to protect those in need of assistance *(215)*. In these settings, implementation should ideally be guided by legitimate international health guidelines and frameworks *(173,211)*.

More specifically, the IOM, UNHCR, WHO and others have called for refugees and migrants (including those in conflict settings) to have the same access to the COVID-19 vaccination as any other individuals, and for States to ensure these groups are not left behind *(36)*. WHO's SAGE has released two key documents – the WHO SAGE values framework for the allocation and prioritization of COVID-19 vaccination *(72)* and the WHO SAGE roadmap for prioritizing population groups for vaccines against COVID-19 *(74)* – to facilitate the development of national strategies for the allocation of COVID-19 vaccines and the prioritization of populations to receive these. SAGE has identified low-income migrant workers, irregular migrants and those unable to physically distance, including people living in camps and camp-like settings, as priority groups for the allocation of COVID-19 vaccination globally *(74)*.

However, when vaccine supplies are limited, countries are likely to prioritize their own populations ahead of refugees and migrants. WHO data reveal large discrepancies between policy and practice in including migrants in NDVPs and COVID-19 vaccination campaigns at the global and regional levels, with particularly low inclusion levels for irregular migrants in both policy and practice *(36)*. Despite recent improvements, migrant coverage in NDVPs is far from universal, and irregular migrants are still often excluded. Despite policy shifts in several countries to ensure more-inclusive access for irregular migrants to free health care for COVID-19 and to free and anonymous access to COVID-19 vaccines (Box 4), the extent to which these changes have improved COVID-19 vaccine equity for refugees and migrants is unclear. Although the pandemic led to major global disruption of immunization services, the COVID-19 vaccine roll-out has presented new opportunities and innovations in service delivery and policy-making to better include refugees and migrants, particularly irregular migrants; it is vital that this momentum is seized upon to ensure that good practices continue beyond the pandemic. This aligns with the aim of WHO and others to "building back better" as we move into the next phase of the pandemic response and better consider health system strengthening *(214)*.

3.2 Addressing barriers and facilitators to more effective service delivery for refugees and migrants

This GEHM identified the key drivers of underimmunization pertaining to a wide range of routine vaccines in refugee and migrant populations and found that they are complex and highly context dependent. Some barriers unique to refugees and migrants relate to awareness and physical access to immunization systems and these strongly influence vaccine uptake and motivation to vaccinate. Acceptability of vaccination in refugees and migrants is often deeply rooted in the social and historical context and influenced by personal risk perception.

The key barriers to immunization faced by refugees and migrant are physical: lack of access to the national immunization system may result from restrictive policies around access to health care or from other administrative or legal barriers. The situation is worse for irregular migrants, other precarious migrants and migrants housed in closed settings (camps, detention centres, labour compounds), who are often specifically excluded from mainstream health care and immunization services or are charged fees for health care and vaccines. Some migrant groups may receive some vaccines after arrival, whereas others do not, depending on their legal status, age or places of residence. Greater emphasis is needed on ensuring that all countries have more-inclusive policies and that these policies are meaningfully put into practice so that refugees and migrants are sought out, engaged with and encouraged to vaccinate fully. Box 8 describes State obligations on the right to health for refugees and migrants, as aligned with international laws. The WHO Regional Office for Europe identified three critical elements to ensure high levels of vaccination coverage among refugees and migrants *(109)*:

- provision of appropriate vaccination services to newly arrived refugees and migrants;
- delivery of immunization services for refugees and migrants as part of mainstream health services; and
- provision of targeted and culturally appropriate immunization services to reach refugees and migrants.

Vaccine availability and the logistics of bringing vaccines to mobile populations can be major barriers to access in some settings, particularly in LMICs and humanitarian settings. Their high mobility, both within countries and across borders, is a key logistic barrier to delivering all doses of key vaccines to some refugee and migrant groups. To date, focus has been lacking on cross-border issues related to immunization. Efforts are needed to promote cooperation among public health authorities in different countries to facilitate cross-border

immunization initiatives, develop procedures to track migrant immunization data within and between countries and share data at regional level. For example, the EU is currently discussing the feasibility of developing a common vaccination card for its citizens that takes into account potentially different national vaccination schedules and is interoperable with the immunization information systems of all Member States. However, care is needed to ensure that lack of access to such initiatives (including COVID-19 vaccination certificates) does not represent a barrier to mobility and/or lead to discrimination, particularly among refugees and migrants.

This report highlights the importance of social processes influencing vaccination motivation in some refugee and migrant populations, with some of these processes unique to particular refugee and migrant populations. Although concerns about vaccination or misinformation may travel with refugees and migrants from their home countries or circulate in the diaspora media or social groups, the review found that long-term migrants are more likely to be hesitant towards vaccination. This suggests that hesitancy might develop in the host country in response to precarity, structural inequalities or social exclusion. Vaccine misinformation and disinformation can spread rapidly via social media or word of mouth and may strongly influence vaccine confidence at the individual and community levels. This is particularly likely in refugee and migrant communities where distrust already exists and/or access to more robust public health information is more limited. WHO and others have highlighted the challenge of the infodemic (misinformation and disinformation pandemic) in the COVID-19 context, calling for universal access to credible health information and efforts to tackle this, particularly in high-risk groups *(230)*. Specific misinformation should be directly addressed in those communities where it is known to be circulating, using sympathetic and transparent messaging in a range of formats and languages, and by engaging local community stakeholders to co-produce and co-deliver messages and facilitate dialogue. In 2021 the International Federation of Red Cross and Red Crescent Societies developed a set of resources to tackle rumours and misinformation circulating in communities: it comprises an information pack on effectively listening and responding to communities around COVID-19 and feedback mechanisms, including a survey to gain data on individual perceptions of COVID-19 vaccination and barriers to access in specific communities *(231)*. There is an urgent need for robust research on the influence of circulating misinformation and disinformation on social media platforms and the impact of information from other sources (for example the diaspora media) on vaccine motivation on refugees and migrants.

Specific case studies on the implementation of immunization and approaches to increase vaccine uptake and confidence in refugee and migrant populations highlighted the value of promoting strong community engagement and building trust, developing tailored and targeted interventions, effective communication, convenient access points and removal of fees, and educating health-care

providers to provide culturally competent and migrant-sensitive care. The guiding principles of IA2030 are that immunization services should be people centred, data guided, country owned and partnership based (9). However, solutions and strategies are not necessarily generalizable between countries, regions, or refugee and migrant groups, and few are robustly tested to explore their effectiveness on actually increasing vaccine uptake. It is important to address this gap by tackling shortfalls in data and research in low-income and humanitarian settings.

The COVID-19 pandemic has highlighted policy-level barriers and shortfalls in immunization delivery mechanisms for refugees and migrants worldwide and a critical lack of data on immunization coverage and uptake rates for these groups, with very few countries collecting vaccine datasets disaggregated by migrant status (232). However, some barriers for refugees and migrants have been removed in the COVID-19 vaccine response, including policies that exclude irregular migrants from registering and accessing free vaccines, and facilitators established, including innovative outreach and engagement models and new strategies to increase motivation to vaccinate (214).

3.3 Limitations of this review

This GEHM has a limited scope owing to a lack of data from refugee and migrant populations on vaccine coverage, policies, and barriers and facilitators to strengthening uptake from LMICs – for routine vaccines as well as for COVID-19 vaccines. Therefore, it is not fully representative of the global picture of immunization policies, planning and service delivery. In addition, specific categories of migrants (asylum seekers and undocumented migrants) were not well represented in datasets. Efforts to obtain this information included collating and drawing on grey literature (as well as academic literature) through targeted searches of key websites and searching for data from specific countries with high numbers of refugees and migrants.

3.4 Policy considerations

This GEHM examined a wide range of global evidence on immunization policies, planning and service delivery for refugees and migrants from peer-reviewed articles, policy documents and grey literature. Policy considerations based on the findings of the scoping review (including examples of good practices) are as follows.

Ensure universal and equitable access to vaccines for all refugees and migrants by:

- adapting national, regional and global immunization policies to specifically include all refugees and migrants (including irregular migrants and those living in closed settings such as camps and detention centres), in routine immunization, catch-up immunization, mass vaccination and pandemic response plans, including for COVID-19;
- permanently adopting the inclusive policies developed during COVID-19 (including those targeting irregular migrants for COVID-19 health care and vaccine access) to ensure that these continue beyond the pandemic;
- ensuring that routine immunizations are free of charge at the point of delivery;
- addressing the physical, social and personal barriers to immunization services and factors influencing motivation to vaccinate (including in primary caregivers of migrant children);
- developing participatory approaches and communication and engagement strategies to strengthen vaccine uptake, build trust and tackle vaccine hesitancy, and to develop innovative migrant-friendly delivery mechanisms, tailored approaches and local solutions;
- engaging with communities in vaccination planning and implementation and through educational outreach on the benefits of vaccination and when/where to get vaccinated;
- developing communication strategies that reduce vaccine information inequities (including using translating resources into relevant languages), ensure the availability of qualified interpreters and health navigators, and specifically counter misinformation and disinformation; and
- improving integration between immunization and other health programmes in order to strengthen primary health care and attain equity goals.

Strengthen health systems and ensure adequate resourcing for catch-up vaccination across the life course in mobile populations by:

- ensuring that all national immunization programmes include a catch-up vaccination policy and schedule for mobile populations aligned with the national vaccine schedule, and establishing plans and processes for delivering catch-up vaccination services;
- placing more focus on catching up older refugees and migrants (adolescents and adults) to catch them up with missed vaccines and missed doses, and to offer them any additional vaccines to align them with the host country vaccine schedule;

- providing opportunities to offer immunization services to refugees and migrants along the entire migration journey, including in closed settings (camps and detention centres, reception centres, labour compounds), on arrival and after settlement;
- promoting equitable vaccine uptake among refugees and migrants of all age groups by enhancing the accessibility and outreach capacity of immunization services and primary care providers;
- developing systems to provide cross-border service delivery, record the vaccinations (types and dose number) received by individuals, and ensure that immunization records travel with individuals throughout their migration journey; and
- strengthening patient–provider interactions through training health workers on competencies to provide people-centred and cultural sensitive services to refugee and migrants and educating primary health-care providers and vaccinators about the general and specific barriers to immunization services and the sociocultural perspectives of refugees and migrants.

Strengthen data collection to monitor immunization coverage and service delivery gaps for refugee and migrant populations by:

- renewing efforts and ensuring financial support to collect and analyse national data (disaggregated by migrant status and gender) on vaccination barriers and vaccine hesitancy and their impact on vaccination uptake and coverage in refugee and migrant populations;
- establishing or upgrading immunization information systems to capture vaccination coverage data for refugees and migrants;
- ensuring that processes are in place for continuous data assessment, drawing lessons from experiences, documenting processes and outcomes, and improving information sharing;
- performing robust, large-scale studies to understand the drivers of underimmunization and vaccine hesitancy in diverse refugee and migrant populations, and identify workable solutions (specifically for use in LMICs and humanitarian contexts);
- generating evidence on the drivers of underimmunization and vaccine hesitancy in diverse refugee and migrant populations specifically in LMICs and in humanitarian contexts globally; and
- assessing the influence of social media as a major new source of vaccine misinformation for marginalized populations with less access to public health messaging, and exploring opportunities to share accurate and reliable information with highly mobile populations through social media.

4. Conclusions

This GEHM identified numerous barriers to immunization systems and services globally for refugees and migrants and proposed three key areas for policy consideration. These are to (i) ensure universal and equitable access to vaccines for all refugees and migrants; (ii) strengthen health systems and ensure adequate resourcing for catch-up vaccination across the life course in mobile populations, and (iii) strengthen data collection to monitor immunization coverage and service delivery gaps for vaccination of refugees and migrants.

WHO, international organizations, national authorities and key partner agencies urgently need to work together to embed these policy considerations into future planning, in order to uphold the human right to immunization for all refugees and migrants and enable countries to move towards meeting the ambitious immunization coverage targets set out in IA2030. Guiding principles from IA2030 include ensuring that immunization services are people centred, data guided, country owned and partnership based. A key challenge will be to ensure that the rapid shift in approach adopted in many contexts during the COVID-19 vaccine roll-out to ensure the inclusion of hard-to-reach groups, including refugees and migrants, is carried forward for all routine immunizations and that important lessons are learned and embedded in routine immunization programmes. This GEHM highlights the wide variation in approaches of different countries and different regions with respect to addressing the health and immunization needs of refugees and migrants, and the need for a more integrated approach to specific public health approaches for refugees and migrants.

References[5]

1. Vaccines and diseases. Geneva: World Health Organization; 2019 (https://www.who.int/health-topics/vaccines-and-immunization#tab=tab_1).
2. Thirteenth General Programme of Work, 2019–2023. Geneva: World Health Organization; 2018 (https://apps.who.int/iris/handle/10665/279451).
3. Sustainable Development Goals [website]. New York: United Nations; 2015 (https://sdgs.un.org/goals).
4. De Vito E, Parente P, de Waure C, Poscia A, Ricciardi W. A review of evidence on equitable delivery, access and utilization of immunization services for migrants and refugees in the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2017 (Health Evidence Network (HEN) synthesis report 53; https://apps.who.int/iris/handle/10665/326288).
5. Chang AY, Riumallo-Herl C, Perales NA, Clark S, Clark A, Constenla D et al. The equity impact vaccines may have on averting deaths and medical impoverishment in developing countries. Health Aff (Millwood). 2018;37(2):316–24. doi: 10.1377/hlthaff.2017.0861.
6. Immunization data. July 2021. New York: United Nations Children's Fund; 2021 (https://data.unicef.org/resources/dataset/immunization/).
7. WHO immunization data portal [database]. Geneva: World Health Organization; 2022 (https://immunizationdata.who.int/).
8. Root causes of low vaccination coverage and under-immunisation in sub-Saharan Africa: a consensus study report. Pretoria: Academy of Science of South Africa; 2021 (https://research.assaf.org.za/handle/20.500.11911/189).
9. Maintaining essential health services: operational guidance for the COVID-19 context: interim guidance, 1 June 2020. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/332240).
10. Number of deaths in children aged <5 years, by cause. In: The Global Health Observatory [website]. Geneva: World Health Organization; 2022 (https://www.who.int/data/gho/data/indicators/indicator-details/GHO/number-of-deaths).
11. Immunization Agenda 2030: a global strategy to leave no one behind. Geneva: World Health Organization; 2020 (https://www.who.int/teams/immunization-vaccines-and-biologicals/strategies/ia2030).

[5] *All references were accessed on 21 April 2022.*

12. Seventy-third World Health Assembly: Geneva, 18–19 May (de minimis)‍ and 9–14 November (resumed) 2020: resolutions and decisions, annexes. Geneva: World Health Organization; 2020 (WHA73/2020/REC/1; https://apps.who.int/iris/handle/10665/345951).

13. Implementing the Immunization Agenda 2030: a framework for action through coordinated planning, monitoring & evaluation, ownership & accountability, and communications & advocacy. Geneva: World Health Organization; 2021 (https://www.who.int/publications/m/item/implementing-the-immunization-agenda-2030).

14. Kiros G-E, White MJ. Migration, community context, and child immunization in Ethiopia. Soc Sci Med. 2004;59(12):2603–16. doi: 10.1016/j.socscimed.2004.04.009.

15. Antai D. Migration and child immunization in Nigeria: individual- and community-level contexts. BMC Public Health. 2010;10:116. doi: 10.1186/1471-2458-10-116.

16. Mipatrini D, Stefanelli P, Severoni S, Rezza G. Vaccinations in migrants and refugees: a challenge for European health systems. A systematic review of current scientific evidence. Pathog Glob Health. 2017;111(2):59–68. doi: 10.1080/20477724.2017.1281374.

17. Nakken CS, Skovdal M, Nellums LB, Friedland JS, Hargreaves S, Norredam M. Vaccination status and needs of asylum-seeking children in Denmark: a retrospective data analysis. Public Health. 2018;158:110–16. doi: 10.1016/j.puhe.2018.02.018.

18. Charania NA, Gaze N, Kung JY, Brooks S. Vaccine-preventable diseases and immunisation coverage among migrants and non-migrants worldwide: a scoping review of published literature, 2006 to 2016. Vaccine. 2019;37(20):2661–9. doi: 10.1016/j.vaccine.2019.04.001.

19. Lam E, McCarthy A, Brennan M. Vaccine-preventable diseases in humanitarian emergencies among refugee and interally-displaced populations. Hum Vaccin Immunother. 2015;11(11):2627–36. doi: 10.1080/21645515.2015.1096457.

20. Ng E, Sanmartin C, Elien-Massenat D, Manuel DG. Vaccine-preventable disease-related hospitalization among immigrant and refugees to Canada: study of linked population-based databases. Vaccine. 2016;34(37):4437–42. doi: 10.1016/j.vaccine.2016.06.079.

21. Hu Y, Li Q, Luo S, Lou L, Qi X, Xie S. Timeliness vaccination of measles containing vaccine and barriers to vaccination among migrant children in East China. PLOS One. 2013;8(8):e73264. doi: 10.1371/journal.pone.0073264.

22. Deal A, Halliday R, Crawshaw AF, Hayward SE, Burnard A, Rustage K et al. Migration and outbreaks of vaccine-preventable diseases in Europe: a systematic review. Lancet Infect Dis. 2021;21(12):e387–98. doi: 10.1016/S1473-3099(21)00193-6.

23. Bizri AR, Fares J, Musharrafieh U. Infectious diseases in the era of refugees: hepatitis A outbreak in Lebanon. Avicenna J Med. 2018;8(04):147–52. doi: 10.4103/ajm.AJM_130_18.

24. Alam N, Kenny B, Maguire J, McEwen S, Sheel M, Tolosa M. Field epidemiology in action: an Australian perspective of epidemic response to the Rohingya health emergencies in Cox's Bazar, Bangladesh. Global Biosecurity. 2019;1(1). doi: 10.31646/gbio.14.

25. Crawshaw AF, Farah Y, Deal A, Rustage K, Hayward SE, Carter J et al. Defining the determinants of under-vaccination in migrant populations in Europe to improve routine and COVID-19 vaccine uptake: a systematic review. Lancet Infect Dis. 2022;S1473-3099(22)00066-4. doi: 10.1016/S1473-3099(22)00066-4.

26. Tankwanchi AS, Bowman B, Garrison M, Larson H, Wiysonge CS. Vaccine hesitancy in migrant communities: a rapid review of latest evidence. Curr Opin Immunol. 2021;71:62–8. doi: 10.1016/j.coi.2021.05.009.

27. Reducing COVID-19 transmission and strengthening vaccine uptake among migrant populations in the EU/EEA. Stockholm: European Centre for Disease Prevention and Control; 2021 (https://www.ecdc.europa.eu/en/publications-data/covid-19-migrants-reducing-transmission-and-strengthening-vaccine-uptake).

28. Red Cross Red Crescent Global Migration Lab. Locked down and left out? Why access to basic services for migrants is critical to our COVID-19 response and recovery. Melbourne: Australian Red Cross; 2021 (https://www.ifrc.org/document/locked-down-left-out).

29. Deal A, Hayward SE, Huda M, Knights F, Crawshaw AF, Carter J et al. Strategies and action points to ensure equitable uptake of COVID-19 vaccinations: a national qualitative interview study to explore the views of undocumented migrants, asylum seekers, and refugees. J Migr Health. 2021;4:100050. doi: 10.1016/j.jmh.2021.100050.

30. Survey on the beliefs of the vulnerable population regarding the COVID-19 vaccine. A case study of the Hellenic Red Cross. Athens: Hellenic Red Cross; 2021 (https://www.accmr.gr/attachments/article/1061/CEA%20Case%20study%20Covid-19%20Vaccination-EN.pdf).

31. Salibi N, Abdulrahim S, El Haddad M, Bassil S, El Khoury Z, Ghattas H et al. COVID-19 vaccine acceptance in older Syrian refugees: preliminary findings from an ongoing study. Prev Med Rep. 2021;24:101606. doi: 10.1016/j.pmedr.2021.101606.

32. Hargreaves S, Hayward SE, Noori T, McKee M, Kumar B. COVID-19: counting migrants in. Lancet. 2021;398(10296):211–12. doi: 10.1016/S0140-6736(21)01339-8.

33. West H, Lawton A, Hossain S, Mustafa AHMG, Razzaque A, Kuhn R. COVID-19 vaccine hesitancy among temporary foreign workers from Bangladesh. Health Syst Reform. 2021;7(1): e1991550. doi: 10.1080/23288604.2021.1991550.

34. Perez-Brumer A, Hill D, Andrade-Romo Z, Solari K, Adams E, Logie C et al. Vaccines for all? A rapid scoping review of COVID-19 vaccine access for Venezuelan migrants in Latin America. J Migr Health. 2021;7;4:100072. doi: 10.1016/j.jmh.2021.100072.

35. Migrant inclusion in COVID-19 vaccination campaigns. Geneva: International Organization for Migration; 2021 (https://www.iom.int/sites/g/files/tmzbdl486/files/our_work/DMM/Migration-Health/iom-vaccine-inclusion-mapping-17-may-2021-global.pdf).

36. COVID-19 immunization in refugees and migrants: principles and key considerations: interim guidance, 31 August 2021. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/344793).

37. UNHCR COVID-19 vaccine access report 2021. Geneva: Office of the United Nations High Commissioner for Refugees; 2022 (https://www.unhcr.org/uk/protection/operations/623b18244/unhcr-covid-19-vaccine-access-report-2021.html).

38. Global compact on refugees. New York: United Nations High Commissioner for Refugees; 2018 (https://www.unhcr.org/5c658aed4.pdf).

39. Global compact for safe, orderly and regular migration. New York: United Nations; 2018 (https://refugeesmigrants.un.org/sites/default/files/180713_agreed_outcome_global_compact_for_migration.pdf).

40. Declaration on "Universal access to immunization as a cornerstone for health and development in Africa". Brazzaville: WHO Regional Office for Africa; 2016 (https://www.afro.who.int/publications/declaration-universal-access-immunization-cornerstone-health-and-development-africa).

41. UNICEF immunisation roadmap 2018–2030. New York: United Nations Children's Fund; 2018 (https://www.unicef.org/sites/default/files/2019-01/UNICEF_Immunization_Roadmap_2018.pdf).

42. Glossary on migration. Geneva: International Organization for Migration; 2019 (https://www.iom.int/glossary-migration-2019#).

43. Internally displaced people. Geneva: Office of the United Nations High Commissioner for Refugees; 2021 (https://www.unhcr.org/en-us/internally-displaced-people.html).

44. Recommendations on statistics of international migration, revision 1. New York: United Nations Department of Economic and Social Affairs; 1998 (https://unstats.un.org/unsd/publication/seriesm/seriesm_58rev1e.pdf).

45. OAU convention governing the specific aspects of refugee problems in Africa. Geneva: Office of the United Nations High Commissioner for Refugees; 1969 (https://www.unhcr.org/uk/about-us/background/45dc1a682/oau-convention-governing-specific-aspects-refugee-problems-africa-adopted.html).

46. Convention and protocol relating to the status of refugees. Geneva: Office of the United Nations High Commissioner for Refugees; 1951 (https://www.unhcr.org/uk/protection/basic/3b66c2aa10/convention-protocol-relating-status-refugees.html).

47. MacDonald NE, SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: definition, scope and determinants. Vaccine. 2015;33(34):4161–4. doi: 10.1016/j.vaccine.2015.04.036.

48. Migration data portal [database]. Berlin: International Organization for Migration's Global Migration Data Analysis Centre;2022 (http://migrationdataportal.org).

49. World migration report 2020. Geneva: International Organization for Migration; 2019 (https://publications.iom.int/system/files/pdf/wmr_2020.pdf).

50. Global trends: forced displacement in 2020. Geneva: Office of the United Nations High Commissioner for Refugees; 2020 (https://www.unhcr.org/60b638e37/unhcr-global-trends-2020).

51. WHO-UNHCR-UNICEF joint technical guidance: general principles of vaccination of refugees, asylum-seekers and migrants in the WHO European Region. In: Health topics [website]. Copenhagen: WHO Regional Office for Europe; 2015 (https://www.euro.who.int/en/health-topics/health-determinants/migration-and-health/news/news/2015/11/who,-unicef-and-unhcr-call-for-equitable-access-to-vaccines-for-refugees-and-migrants/who-unhcr-unicef-joint-technical-guidance-general-principles-of-vaccination-of-refugees,-asylum-seekers-and-migrants-in-the-who-european-region).

52. Elharake JA. Global routine immunization policies for refugees [thesis]. New Haven (CT): Yale University; 2021 (https://elischolar.library.yale.edu/cgi/viewcontent.cgi?article=2033&context=ysphtdl).

53. Handbook for health professionals: health assessment of refugees and migrants in the EU/EEA. Luxembourg: Publications Office of the European Union; 2015 (https://ec.europa.eu/health/system/files/2016-11/handbook_healthprofessionals_en_0.pdf).

54. Home Office, Public Health England, International Organization for Migration. Health protocol: pre-entry health assessments for UK-bound refugees. London: Home Office; 2020 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/892799/Badged_HA_protocol_IOM_HO_PHE_-_June_2020.odt.pdf).

55. Migration health annual report 2017. Geneva: International Organization for Migration; 2018 (https://publications.iom.int/system/files/pdf/mhd_ar2017.pdf).

56. Mitchell T, Dalal W, Klosovsky A, Yen C, Phares C, Burkhardt M et al. An immunization program for US-bound refugees: development, challenges, and opportunities 2012–present. Vaccine. 2021;39(1):68–77. doi: 10.1016/j.vaccine.2020.10.047.

57. Deal A, Hayward SE, Crawshaw AF Goldsmith LP, Hui C, Dalal W et al. The immunisation status of UK-bound refugees, January 2018 – October 2019: a retrospective, population-based cross-sectional study. Lancet Public Health. (in press).

58. Knoll A, Teevan C. Protecting migrants and refugees in North Africa: challenges and opportunities for reform. Maastricht: European Centre for Development Policy Management; 2020 (https://ecdpm.org/publications/protecting-migrants-refugees-in-north-africa-challenges-opportunities-reform/).

59. Health of refugees and migrants: practices in addressing the health needs of refugees and migrants. Cairo: WHO Regional Office for the Eastern Mediterranean; 2018 (https://www.who.int/publications/i/item/health-of-refugees-and-migrants---practices-in-addressing-the-health-needs-of-refugees-and-migrants-who-eastern-mediterranean-region).

60. Tangcharoensathien V, Thwin AA, Patcharanarumol W. Implementing health insurance for migrants, Thailand. Bull World Health Organ. 2017;95(2):146. doi: 10.2471/BLT.16.179606.

61. Legido-Quigley H, Leh Hoon Chuah F, Howard N. Southeast Asian health system challenges and responses to the "Andaman Sea refugee crisis": a qualitative study of health-sector perspectives from Indonesia, Malaysia, Myanmar, and Thailand. PLOS Med. 2020;17(11):e1003143. doi: 10.1371/journal.pmed.1003143.

62. Pocock NS, Chan Z, Loganathan T, Suphanchaimat R, Kosiyaporn H, Allotey P et al. Moving towards culturally competent health systems for migrants? Applying systems thinking in a qualitative study in Malaysia and Thailand. PLOS One. 2020;15(4):e0231154. doi: 10.1371/journal.pone.0231154.

63. European Immunization Agenda 2030. Copenhagen: WHO Regional Office for Europe; 2021 (https://apps.who.int/iris/handle/10665/348002).

64. Public health guidance on screening and vaccination for infectious diseases in newly arrived migrants within the EU/EEA. Stockholm: European Centre for Disease Prevention and Control; 2018 (https://www.ecdc.europa.eu/en/publications-data/public-health-guidance-screening-and-vaccination-infectious-diseases-newly).

65. Giambi C, Del Manso M, Marchetti G, Olsson K, Adel Ali K, Declich S et al. Immunisation of migrants in EU/EEA countries: policies and practices. Vaccine. 2019;37(36):5439–51. doi: 10.1016/j.vaccine.2019.06.068.

66. Giambi C, Del Manso M, Dalla Zuanna T, Riccardo F, Bella A, Caporali MG et al. National immunization strategies targeting migrants in six European countries. Vaccine. 2019;37(32):4610–17. doi: 10.1016/j.vaccine.2018.01.060.

67. Ravensbergen SJ, Nellums LB, Hargreaves S, Stienstra Y, Friedland JS on behalf of the ESGITM Working Group on Vaccination in Migrants. National approaches to the vaccination of recently arrived migrants in Europe: a comparative policy analysis across 32 European countries. Trav Med Infect Dis. 2018;27:33–8. doi: 10.1016/j.tmaid.2018.10.011.

68. Hargreaves S, Nellums LB, Ravensbergen SJ, Friedland JS, Stienstra Y, on behalf of the ESGITM Working Group on Vaccination in Migrants. Divergent approaches in the vaccination of recently arrived migrants to Europe: a survey of national experts from 32 countries, 2017. Euro Surveill. 2018;23(41):1700772. doi: 10.2807/1560-7917.ES.2018.23.41.1700772.

69. Giambi C, Del Manso M, Dente MG, Napoli C, Montano-Remacha C, Riccardo F et al. Immunization strategies targeting newly arrived migrants in non-EU countries of the Mediterranean Basin and Black Sea. Int J Environ Res Public Health. 2017;14(5):459. doi: 10.3390/ijerph14050459.

70. Cook LJ. Constraints on universal health care in the Russian Federation: inequality, informality and the failures of mandatory health insurance reforms. In: Yi I, editor. London: Palgrave Macmillan; 2017.

71. COVAX explained. Geneva: GAVI; 2020 (https://www.gavi.org/vaccineswork/covax-explained).

72. WHO SAGE values framework for the allocation and prioritization of COVID-19 vaccination. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/334299).

73. The COVAX humanitarian buffer explained. Geneva: GAVI; 2021 (https://www.gavi.org/vaccineswork/covax-humanitarian-buffer-explained).

74. WHO SAGE roadmap for prioritizing uses of COVID-19 vaccines: an approach to optimize the global impact of COVID-19 vaccines, based on public health goals, global and national equity, and vaccine access and coverage scenarios. Latest update: 21 January 2022. Geneva: World Health Organization; 2022 (https://apps.who.int/iris/handle/10665/351138).

75. Convention for the protection of human rights and dignity of the human being with regard to the application of biology and medicine: convention on human rights and biomedicine. Strasbourg: Council of Europe; 1997 (European Treaty Series No. 164; https://rm.coe.int/168007cf98).

76. Committee on Bioethics calls for equitable access to COVID-19 vaccination. Brussels: European Commission; 2021 (https://ec.europa.eu/migrant-integration/news/committee-bioethics-calls-equitable-access-covid-19-vaccination_en).

77. COVID-19-vaccination and prioritisation strategies in the EU/EEA. Stockholm: European Centre for Disease Prevention and Control; 2020 (https://www.ecdc.europa.eu/en/publications-data/covid-19-vaccination-and-prioritisation-strategies-eueea).

78. Key aspects regarding the introduction and prioritisation of COVID-19 vaccination in the EU/EEA and the UK. Stockholm: European Centre for Disease Prevention and Control; 2020 (https://www.ecdc.europa.eu/en/publications-data/key-aspects-regarding-introduction-and-prioritisation-covid-19-vaccination).

79. UNHCR calls for equitable access to COVID-19 vaccines for refugees [press release]. Geneva: Office of the United Nations High Commissioner for Refugees; 2021 (https://www.unhcr.org/uk/news/press/2021/4/606d56564/unhcr-calls-equitable-access-covid-19-vaccines-refugees.html).

80. Walker R, Maple N, Vearey J. Migrants and the COVID-19 vaccine roll-out in Africa: hesitancy and exclusion. Johannesburg: African Centre for Migration & Society, University of the Witwatersrand; 2021 (https://www.mahpsa.org/wp-content/uploads/2021/06/MiCoSA-Migrants-the-Covid-19-vaccine-OccasionalPaper-June2021.pdf).

81. Wickramage K, Gostin LO, Friedman E, Prakongsai P, Suphanchaimat R, Hui C et al. Missing: where are the migrants in pandemic influenza preparedness plans? Health Hum Rights. 2018;20(1):251–8. PMID: 30008567.

82. Alsharif F. Undocumented migrants in Saudi Arabia: COVID‐19 and amnesty reforms. Int Migr. 2021 (Epub ahead of print). doi: 10.1111/imig.12838.

83. Refugees and migrants in times of COVID-19: mapping trends of public health and migration policies and practices. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/341843).

84. The impact of COVID-19 on stateless populations: policy recommendations and good practices on vaccine access and civil registration. Geneva: Office of the United Nations High Commissioner for Refugees; 2021 (https://www.refworld.org/docid/60b8d6d84.html).

85. Arceta D. COVID-19 vaccines for displaced people in Latin America and the Caribbean [blog]. Refugees International. 9 August 2021 (https://www.refugeesinternational.org/reports/2021/8/9/covid-19nbspvaccines-fornbspdisplacednbsppeoplenbspin-latin-america-and-the-caribbeannbsp).

86. Bellizzi S, Aidyralieva C, Alsawhala L, Al-Shaikh A, Santoro A, Profili MC. Vaccination for SARS-CoV-2 of migrants and refugees, Jordan. Bull World Health Organ. 2021; 99(9):611. doi: 10.2471/BLT.21.285591.

87. Refugees included in Uganda's COVID-19 vaccine drive. Geneva: GAVI; 2021 (https://www.gavi.org/vaccineswork/refugees-included-ugandas-covid-19-vaccine-drive).

88. Thomas CM, Liebman AK, Galván A, Kirsch JD, Stauffer WM. Ensuring COVID-19 vaccines for migrant and immigrant farmworkers. Am J Trop Med Hyg. 2021;104(6):1963–5. doi: 10.4269/ajtmh.21-0199.

89. Workplace vaccination program [website]. Atlanta (GA): Centers for Disease Control and Prevention; 2021 (https://www.cdc.gov/coronavirus/2019-ncov/vaccines/recommendations/essentialworker/workplace-vaccination-program.html).

90. Armocida B, Formenti B, Missoni E, D'Apice C, Marchese V, Calvi M et al. Challenges in the equitable access to COVID-19 vaccines for migrant populations in Europe. Lancet Reg Health Eur. 2021;6:100147. doi: 10.1016/j.lanepe.2021.100147.

91. Regional Bureau for the Middle East and North Africa: COVID-19 vaccinations, update #1 (7 February 2021). Geneva: Office of the United Nations High Commissioner for Refugees; 2021 (https://data2.unhcr.org/es/search?type=news&sv_id=0&geo_id=748&sort=titleSort&direction=asc&page=2&export=1).

92. COVID-19 strategic response and recovery plan 2021 [website]. Geneva: International Organization for Migration Office for East & Horn of Africa; 2021 (https://eastandhornofafrica.iom.int/resources/covid-19-strategic-response-and-recovery-plan-2021).

93. Koronavaksinasjonsprogrammet. Notat: koronavaksinasjon og fødeland [Coronavirus vaccination programme. Note: coronavirus vaccination and country of birth]. Oslo: Folkehelseinstituttet; 2021 (https://www.fhi.no/contentassets/3596efb4a1064c9f9c7c9e3f68ec481f/notat-_koronavaksinasjon-og-fodeland.pdf) (in Norwegian).

94. Van Hout M-C, Lungu-Byrne C, Germain J. Migrant health situation when detained in European immigration detention centres: a synthesis of extant qualitative literature. Int J Prisoner Health. 2020;16(3):221–36. doi: 10.1108/IJPH-12-2019-0074.

95. Rull M, Masson S, Peyraud N, Simonelli MA, Ventura A, Dorion C et al. The new WHO decision-making framework on vaccine use in acute humanitarian emergencies: MSF experience in Minkaman, South Sudan. Confl Health. 2018;12:11. doi: 10.1186/s13031-018-0147-z.

96. Masters NB, Wagner AL, Carlson BF, Muuo SW, Mutua MK, Boulton ML. Childhood vaccination in Kenya: socioeconomic determinants and disparities among the Somali ethnic community. Int J Public Health. 2019;64(3):313–22. doi: 10.1007/s00038-018-1187-2.

97. Chung HJ, Han SH, Kim H, Finkelstein JL. Childhood immunizations in China: disparities in health care access in children born to North Korean refugees. BMC Int Health Hum Rights. 2016;16(1):1–12. doi: 10.1186/s12914–016–0085-z.

98. Artiga S, Ndugga N, Pham O. Immigrant access to COVID-19 vaccines: key issues to consider. 13 January 2021. San Francisco (CA): Kaiser Family Foundation; 2021 (https://www.kff.org/racial-equity-and-health-policy/issue-brief/immigrant-access-to-covid-19-vaccines-key-issues-to-consider/).

99. Diaz AA, Celedón JC. COVID-19 vaccination: helping the Latinx community to come forward. EClinicalMedicine. 2021;35:100860. doi: 10.1016/j.eclinm.2021.100860.

100. Godoy-Ramirez K, Byström E, Lindstrand A, Butler R, Ascher H, Kulane A. Exploring childhood immunization among undocumented migrants in Sweden-following qualitative study and the World Health Organization's guide to tailoring immunization Programmes (TIP). Public Health. 2019;171:97–105. doi: 10.1016/j.puhe.2019.04.008.

101. Red Cross Red Crescent Global Migration Lab. Sight unseen: a vision for effective access to COVID-19 vaccines for migrants. An addendum to the Red Cross Red Crescent Global Migration Lab report: Locked down and left out? Why access to basic services for migrants is critical to our COVID-19 response and recovery. Melbourne: Australian Red Cross; 2021 (https://www.ifrc.org/media/49011).

102. Lebanon: refugees, migrants left behind in vaccine rollout. New York: Human Rights Watch; 2021 (https://www.hrw.org/news/2021/04/06/lebanon-refugees-migrants-left-behind-vaccine-rollout).

103. Vaccines may elude Venezuelan migrants in Colombia. The New Humanitarian. 10 March 2021 (https://www.thenewhumanitarian.org/news-feature/2021/3/10/covid-19-vaccines-may-elude-venezuelan-migrants-in-colombia).

104. Alabdulla M, Reagu SM, Al-Khal A, Elzain M, Jones RM. COVID-19 vaccine hesitancy and attitudes in Qatar: a national cross-sectional survey of a migrant-majority population. Influenza Other Respir Viruses. 2021;15(3):361–70. doi: 10.1111/irv.12847.

105. Khaled SM, Petcu C, Bader L, Amro I, Al-Hamadi AMHA, Al Assi M et al. Prevalence and potential determinants of COVID-19 vaccine hesitancy and resistance in Qatar: results from a nationally representative survey of Qatari nationals and migrants between December 2020 and January 2021. Vaccines. 2021;9(5):471. doi: 10.3390/vaccines9050471.

106. Grundy J, Biggs BA. The impact of conflict on immunisation coverage in 16 countries. Int J Health Policy Manag. 2019;8(4):211–21. doi: 10.15171/ijhpm.2018.127.

107. Global trends: forced displacement in 2017. Geneva: Office of the United Nations High Commissioner for Refugees; 2017 (http://www.unhcr.org/statistics/unhcrstats/5b27be547/unhcr-global-trends-2017.html).

108. Global trends in forced displacement in 2020. Geneva: Office of the United Nations High Commissioner for Refugees; 2020 (https://www.unhcr.org/statistics/unhcrstats/60b638e37/global-trends-forced-displacement-2020.html).

109. Delivery of immunization services for refugees and migrants: technical guidance. Copenhagen: WHO Regional Office for Europe; 2019 (https://apps.who.int/iris/handle/10665/326924).

110. Meteke S, Stefopulos M, Als D, Gaffey M, Kamali M, Siddiqui FJ et al. Delivering infectious disease interventions to women and children in conflict settings: a systematic review. BMJ Glob Health. 2020;5(suppl 1):e001967. doi: 10.1136/bmjgh-2019-001967.

111. Oral cholera vaccine campaign among internally displaced persons in South Sudan. Wkly Epidemiol Rec. 2014;89(20):214–20. Geneva: World Health Organization; 2014 (https://apps.who.int/iris/handle/10665/242214).

112. Harvey B, Dalal W, Amin F, McIntyre E, Ward S, Merrill RD et al. Planning and implementing a targeted polio vaccination campaign for Somali mobile populations in northeastern Kenya based on migration and settlement patterns. Ethn Health. 2020;1–16. doi: 10.1080/13557858.2020.1838455.

113. Okiror S, Toure B, Davis B, Hydarov R, Ram B, Nwogu C et al. Lessons learnt from interregional and interagency collaboration in polio outbreak response in the Horn of Africa. J Immunol Sci. 2021;Special Issue(2):40–7. doi: 10.29245/2578-3009/2021/S2.1112.

114. Lindvall K, Kinsman J, Abraha A, Dalmar A, Abdullahi MF, Godefay H et al. Health status and health care needs of drought-related migrants in the Horn of Africa: a qualitative investigation. Int J Environ Res Public Health. 2020;17(16):5917. doi: 10.3390/ijerph17165917.

115. Mellou K, Silvestros C, Saranti-Papasaranti E, Koustenis A, Pavlopoulou ID, Georgakopoulou T et al. Increasing childhood vaccination coverage of the refugee and migrant population in Greece through the European programme PHILOS, April 2017 to April 2018. Euro Surveill. 2019;24(27):1800326. doi: 10.2807/1560-7917.ES.2019.24.27.1800326.

116. G20 members have received 15 times more COVID-19 vaccine doses per capita than sub-Saharan African countries [press release]. 27 October 2021. New York: United Nations Children's Fund 2021 (https://www.unicef.org/press-releases/g20-members-have-received-15-times-more-covid-19-vaccine-doses-capita-sub-saharan).

117. Sim J, Ulanika A, Katikireddi S, Gorman D. "Out of two bad choices, I took the slightly better one": vaccination dilemmas for Scottish and Polish migrant women during the H1N1 influenza pandemic. Public Health. 2011;125(8):505–11. doi: 10.1016/j.puhe.2011.05.005.

118. Thomas CM, Osterholm MT, Stauffer WM. Critical considerations for COVID-19 vaccination of refugees, immigrants, and migrants. Am J Trop Med Hyg. 2021;104(2):433–5. doi: 10.4269/ajtmh.20-1614.

119. The COVID-19 vaccines and undocumented migrants: what are European countries doing? (Last updated July 2021). Brussels: Platform for International Cooperation on Undocumented Migrants; 2021 (https://picum.org/covid-19-vaccines-undocumented-migrants-europe/).

120. Bell S, Edelstein M, Zatonski M, Ramsay M, Mounier-Jack S. "I don't think anybody explained to me how it works": qualitative study exploring vaccination and primary health service access and uptake amongst Polish and Romanian communities in England. BMJ Open. 2019;9(7)e028228. doi: 10.1136/bmjopen-2018-028228.

121. Ganczak M, Bielecki K, Drozd-Dąbrowska M, Topczewska K, Biesiada D, Molas-Biesiada A et al. Vaccination concerns, beliefs and practices among Ukrainian migrants in Poland: a qualitative study. BMC Public Health. 2021;21(1):93. doi: 10.1186/s12889-020-10105-9.

122. Gorman D, Bielecki K, Larson H, Willocks L, Craig J, Pollock K. Comparing vaccination hesitancy in Polish migrant parents who accept or refuse nasal flu vaccination for their children. Vaccine. 2020;38(13):2795–9. doi: 10.1016/j.vaccine.2020.02.028.

123. Gorman DR, Bielecki K, Willocks LJ, Pollock KG. A qualitative study of vaccination behaviour amongst female Polish migrants in Edinburgh, Scotland. Vaccine. 2019;37(20):2741–7. doi: 10.1016/j.vaccine.2019.03.073.

124. Lockyer B, Islam S, Rahman A, Dickerson J, Pickett K, Sheldon T et al. Understanding COVID-19 misinformation and vaccine hesitancy in context: findings from a qualitative study involving citizens in Bradford, UK. Health Expect. 2021;24(4):1158–67. doi: 10.1111/hex.13240.

125. Bell S, Saliba V, Ramsay M, Mounier-Jack S. What have we learnt from measles outbreaks in 3 English cities? A qualitative exploration of factors influencing vaccination uptake in Romanian and Roma Romanian communities. BMC Public Health. 2020;20(1):381. doi: 10.1186/s12889-020-8454-x.

126. Campeau KL. Vaccine barriers, vaccine refusals: situated vaccine decision-making in the wake of the 2017 Minnesota measles outbreak. Rhetor Health Med. 2019;2(2):176–207. doi: 10.5744/rhm.2019.1007.

127. Truman T, Higham R, Chernenko A, Ahmmad Z, Pye M, Sin K et al. Beliefs and experiences about immunization among refugees resettled in the United States from the Thailand-Myanmar (Burma) border. Int J Health Promot Educ. 2020:59(4):226–35. doi: 10.1080/14635240.2020.1747518.

128. Jenness SM, Aavitsland P, White RA, Winje BA. Measles vaccine coverage among children born to Somali immigrants in Norway. BMC Public Health. 2021;21(1):668. doi: 10.1186/s12889-021-10694-z.

129. Gehlbach D, Vazquez E, Ortiz G, Li E, Sanchez CB, Rodriguez S et al. COVID-19 testing and vaccine hesitancy in Latinx farm-working communities in the Eastern Coachella Valley. Res Sq. 2021;rs.3.rs-587686. doi: 10.21203/rs.3.rs-587686/v1.

130. Mupandawana ET, Cross R. Attitudes towards human papillomavirus vaccination among African parents in a city in the north of England: a qualitative study. Reprod Health. 2016;13(1):97. doi: 10.1186/s12978-016-0209-x.

131. Jalloh MF, Bennett SD, Alam D, Kouta P, Lourenço D, Alamgir M et al. Rapid behavioral assessment of barriers and opportunities to improve vaccination coverage among displaced Rohingyas in Bangladesh, January 2018. Vaccine. 2019;37(6):833–8. doi: 10.1016/j.vaccine.2018.12.042.

132. Dailey PM, Krieger JL. Communication and US–Somali immigrant human papillomavirus (HPV) vaccine decision-making. J Cancer Educ. 2017;32(3):516–21. doi: 10.1007/s13187-015-0959-0.

133. Sun M, Ma R, Zeng Y, Luo F, Zhang J, Hou W. Immunization status and risk factors of migrant children in densely populated areas of Beijing, China. Vaccine. 2010;28(5):1264–74. doi: 10.1016/j.vaccine.2009.11.015.

134. Rubens-Augustson T, Wilson LA, Murphy MS, Jardine C, Pottie K, Hui C et al. Healthcare provider perspectives on the uptake of the human papillomavirus vaccine among newcomers to Canada: a qualitative study. Hum Vaccin Immunother. 2019;15(7–8):1697–707. doi: 10.1080/21645515.2018.1539604.

135. Mahimbo A, Seale H, Smith M, Heywood A. Challenges in immunisation service delivery for refugees in Australia: a health system perspective. Vaccine. 2017;35(38):5148–55. doi: 10.1016/j.vaccine.2017.08.002.

136. Ricco M, Cattani S, Veronesi L, Colucci ME. Knowledge, attitudes, beliefs and practices of construction workers towards tetanus vaccine in northern Italy. Ind Health. 2016;54(6):554–63. doi: 10.2486/indhealth.2015-0249.

137. Brooke D, Omeri A. Beliefs about childhood immunisation among Lebanese Muslim immigrants in Australia. J Transcult Nurs. 1999;10(3):229–36. doi: 10.1177/104365969901000314.

138. Tomlinson N, Redwood S. Health beliefs about preschool immunisations: an exploration of the views of Somali women resident in the UK. Divers Equal Health Care. 2013;10(2):101–13.

139. Chauhan B. Quality improvement project: understanding and improving health outcomes for unaccompanied asylum seeking children (UASC) in Harrow. Adopt Foster. 2019;43(2):225–30. doi: 10.1177/0308575919854580.

140. Harmsen IA, Bos, H, Ruiter RAC, Paulussen TGW, Kok G, de Melker HE et al. Vaccination decision-making of immigrant parents in the Netherlands; a focus group study. BMC Public Health. 2015;15:1229. doi: 10.1186/s12889–015–2572-x.

141. Health of refugees and migrants: regional situation analysis, practices, experiences, lessons learned and ways forward. Manila: WHO Regional Office for the Western Pacific; 2018 (https://www.who.int/publications/i/item/health-of-refugees-and-migrants---who-western-pacific-region-(2018)).

142. Roberton T, Weiss W, Jordan Health Access Study Team, Lebanon Health Access Study Team, Doocy S. Challenges in estimating vaccine coverage in refugee and displaced populations: results from household surveys in Jordan and Lebanon. Vaccines 2017;5(3):22. doi: 10.3390/vaccines5030022.

143. Sheikh MA, Makokha F, Hussein AM, Mohamed G, Mach O, Humayun K et al. Combined use of inactivated and oral poliovirus vaccines in refugee camps and surrounding communities – Kenya, December 2013. MMWR Morb Mortal Wkly Rep. 2014;63(11):237–41. PMID: 24647400.

144. Knights F, Carter J, Deal A, Crawshaw AF, Hayward SE, Jones L et al. Impact of COVID-19 on migrants' access to primary care and implications for vaccine roll-out: a national qualitative study. Br J Gen Pract. 2021;71(709):e583–95. doi: 10.3399/BJGP.2021.0028.

145. Zehireva S, Balakrishna A, Broucek C, Guevara E, Shah R, Khalil D et al. Immigrants' health in Illinois: medical distrust – COVID-19 vaccines. Lisle (IL): Benedictine University; 2021 (IPHA Policy Brief No. 2: https://ipha.com/content/uploads/IPHA%20Policy%20Briefs-%20Immigrants'%20Health.pdf).

146. Chadenier GMC, Colzani E, Faccini M, Borriello CR, Bonazzi C. Assessment of the first HPV vaccination campaign in two northern Italian health districts. Vaccine. 2011;29(26):4405–8. doi: 10.1016/j.vaccine.2011.04.007.

147. Rowland-Pomp M, Hargreaves S, Goldsmith LP, Deal A, Hayward SE, Crawshaw A et al. The impact of social media and misinformation on migrant and ethnic minorities populations and their response to the COVID-19 pandemic: a systematic review. PROSPERO 2021: CRD42021259190 (https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42021259190).

148. Grandahl M, Tyden T, Gottvall M, Westerling R, Oscarsson M. Immigrant women's experiences and views on the prevention of cervical cancer: a qualitative study. Health Expect. 2015;18(3):344–54. doi: 10.1111/hex.12034.

149. Jackson C, Bedford H, Cheater FM, Condon L, Emslie C, Ireland L et al. Needles, jabs and jags: a qualitative exploration of barriers and facilitators to child and adult immunisation uptake among gypsies, travellers and Roma. BMC Public Health. 2017;17(1):254. doi: 10.1186/s12889-017-4178-y.

150. Redsell SA, Bedford H, Siriwardena AN, Collier J, Atkinson P. Health visitors' perception of their role in the universal childhood immunisation programme and their communication strategies with parents. Prim Health Care Res Dev. 2010;11(1):51–60. doi:10.1017/S1463423609990284.

151. Aragones A, Genoff M, Gonzalez C, Shuk E, Gany F. HPV vaccine and Latino immigrant parents: if they offer it, we will get it. J Immigr Minor Health. 2016;18(5):1060–5. doi: 10.1007/s10903-015-0225-x.

152. Jama A, Ali M, Lindstrand A, Butler R, Kulane A. Perspectives on the measles, mumps and rubella vaccination among Somali mothers in Stockholm. Int J Environ Res Public Health. 2018;15(11):2428. doi: 10.3390/ijerph15112428.

153. Abdi I, Murphy B, Seale H. Evaluating the health literacy demand and cultural appropriateness of online immunisation information available to refugee and migrant communities in Australia. Vaccine. 2020;38(41):6410–17. doi: 10.1016/j.vaccine.2020.07.071.

154. Harmsen IA, Bos H, Ruiter RAC, Paulussen TGW, Kok G, de Melker HE et al. Vaccination decision-making of immigrant parents in the Netherlands; a focus group study. BMC Public Health. 2015;15:1229. doi: 10.1186/s12889-015-2572-x.

155. Salad J, Verdonk P, de Boer F, Abma TA. "A Somali girl is Muslim and does not have premarital sex. Is vaccination really necessary?" A qualitative study into the perceptions of Somali women in the Netherlands about the prevention of cervical cancer. Int J Equity Health. 2015;14(1):68. doi: 10.1186/s12939-015-0198-3.

156. Kim K, Kim B, Choi E, Song Y, Han H-R. Knowledge, perceptions, and decision making about human papillomavirus vaccination among Korean American women: a focus group study. Womens Health Issues. 2015;25(2):112–19. doi: 10.1016/j.whi.2014.11.005.

157. Marek E, D'Cruz G, Katz Z, Szilard I, Berenyi K, Feiszt Z. Improving asylum seekers' health awareness in a Hungarian refugee reception centre. Health Prom Int. 2019;34(5):e36–46. doi: 10.1093/heapro/day066.

158. Abdi I, Menzies R, Seale H. Barriers and facilitators of immunisation in refugees and migrants in Australia: an east-African case study. Vaccine. 2019;37(44):6724–9. doi: 10.1016/j.vaccine.2019.09.025.

159. Harmsen IA, Bos H, Ruiter RA, Paulussen TG, Kok G, De Melker HE et al. Vaccination decision-making of immigrant parents in the Netherlands; a focus group study. BMC Public Health. 2015;15(1):1229. doi: 10.1186/s12889-015-2572-x.

160. Netfa F, Tashani M, Booy R, King C, Rashid H, Skinner SR. Knowledge, attitudes and perceptions of immigrant parents towards human papillomavirus (HPV) vaccination: a systematic review. Trop Med Infect Dis. 2020;5(2):58. doi: 10.3390/tropicalmed5020058.

161. Ganczak M, Bielecki K, Drozd-Dabrowska M, Topczewska K, Biesiada D, Molas-Biesiada A et al. Vaccination concerns, beliefs and practices among Ukrainian migrants in Poland: a qualitative study. BMC Public Health. 2021;21(1):93. doi: 10.1186/s12889-020-10105-9.

162. Bielecki K, Craig J, Willocks LJ, Pollock KG, Gorman DR. Impact of an influenza information pamphlet on vaccination uptake among Polish pupils in Edinburgh, Scotland and the role of social media in parental decision making. BMC Public Health. 2020;20(1):1381. doi: 10.1186/s12889-020-09481-z.

163. U-Report Uniendo Voces regional poll report. Boa Vista: Inter-Agency Coordination Platform;2021 (https://www.r4v.info/es/documents/details/86112).

164. Goldsmith LP, Rowland-Pomp M, Hanson K, Deal A, Crawshaw AF, Hayward SE et al. The use of social media platforms by migrant and ethnic minority populations during the COVID-19 pandemic: a systematic review. medRxiv preprint. 2022. doi: 10.1101/2022.02.07.22270579.

165. Louka C, Chandler E, Ranchor AV, Broer H, Pournaras S, Ravensbergen SJ et al. Asylum seekers' perspectives on vaccination and screening policies after their arrival in Greece and the Netherlands. PLOS One. 2019;14(12):e0226948. doi: 10.1371/journal.pone.0226948.

166. Heidari S, Goodman T. Critical sex and gender considerations for equitable research, development and delivery of COVID-19 vaccines: background paper. Geneva: World Health Organization; 2021 (https://www.who.int/publications/m/item/critical-sex-and-gender-considerations-for-equitable-research-development-and-delivery-of-covid-19-vaccines).

167. Bish A, Yardley L, Nicoll A, Michie S. Factors associated with uptake of vaccination against pandemic influenza: a systematic review. Vaccine. 2011;29(38):6472–84. doi: 10.1016/j.vaccine.2011.06.107.

168. Hillson K, Clemens SC, Madhi SA, Voysey M, Pollard AJ, Minassian AM et al. Fertility rates and birth outcomes after ChAdOx1 nCoV-19 (AZD1222) vaccination. Lancet. 2021;398(10312):1683–4. doi: 10.1016/S0140-6736(21)02282-0.

169. Why fewer women are getting vaccines in militarised Kashmir. The New Humanitarian. 23 June 2021 (https://www.thenewhumanitarian.org/news-feature/2021/6/23/why-fewer-women-are-getting-vaccines-in-militarised-kashmir).

170. Lam E, Al-Tamimi W, Russell SP, Butt MO, Blanton C, Musani AS et al. Oral cholera vaccine coverage during an outbreak and humanitarian crisis, Iraq, 2015. Emerg Infect Dis. 2017;23(1):38–45. doi: 10.3201/eid2301.160881.

171. Phares CR, Date K, Travers P, Deglise C, Wongjindanon N, Ortega L et al. Mass vaccination with a two-dose oral cholera vaccine in a long-standing refugee camp, Thailand. Vaccine. 2016;34(1):128–33. doi: 10.1016/j.vaccine.2015.10.112.

172. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K et al. A global survey of potential acceptance of a COVID-19 vaccine. Nat Med. 2021;27(2):225–8. doi: 10.1038/s41591-020-1124-9.

173. Vaccination in acute humanitarian emergencies: a framework for decision making. Geneva: World Health Organization; 2017 (https://apps.who.int/iris/handle/10665/255575).

174. Vita S, Sinopoli MT, Fontanelli Sulekova L, Morucci L, Lopalco M, Spaziante M et al. Vaccination campaign strategies in recently arrived migrants: experience of an Italian reception centre. J Infect Dev Ctries. 2019;13(12):1159–64. doi: 10.3855/jidc.11815.

175. Kaji A, Parker DM, Chu CS, Thayatkawin W, Suelaor J, Charatrueangrongkun R et al. Immunization coverage in migrant school children along the Thailand-Myanmar border. J Immigr Minor Health. 2016;18(5):1038–45. doi: 10.1007/s10903-015-0294-x.

176. International Federation of Pharmaceutical Manufacturers & Associations, The Health Policy Partnership. Implementing a life course approach to immunization: lessons learned from international best practice in policy and programming. London: The Health Policy Partnership; 2019 (https://www.ifpma.org/wp-content/uploads/2019/08/IFPMA_HPP_Life_Course_Immunization_Full_Report.pdf).

177. Immunization of persons new to Canada. Ottawa: Government of Canada; 2022 (https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-10-immunization-persons-new-canada.html).

178. Bartovic J, Datta SS, Severoni S, D'Anna V. Ensuring equitable access to vaccines for refugees and migrants during the COVID-19 pandemic. Bull World Health Organ. 2021;99(1):3-3-A. doi: 10.2471/BLT.20.267690.

179. Juon H-S, Strong C, Kim F, Park E, Lee S. Lay health worker intervention improved compliance with hepatitis b vaccination in Asian Americans: randomized controlled trial. PLoS One 2016;11(9):e0162683. doi: 10.1371/journal.pone.0162683.

180. Guidance on COVID-19 vaccines for marginalised populations: interim guidance. Geneva: Collective Service for Risk Communication and Community Engagement: 2021 (https://communityengagementhub.org/wp-content/uploads/sites/2/2021/09/2021_09_20_Guidance-on-COVID19-Vaccines-for-Marginalized-Populations_FINAL-MASTER.pdf).

181. Kpozehouen E, Heywood AE, Kay M, Smith M, Paudel P, Sheikh M et al. Improving access to immunisation for migrants and refugees: recommendations from a stakeholder workshop. Aust N Z J Public Health. 2017;41(2):118–20. doi: 10.1111/1753-6405.12602

182. El-Khatib Z, El-Halabi S, Khdeir MA, Khader YS. Children Immunization App (CImA), low-cost digital solution for supporting Syrian refugees in Zaatari Camp in Jordan: general description. Stud Health Technol Inform. 2020;271:117–20. doi: 10.3233/SHTI200086.

183. Canavati S, Plugge E, Suwanjatuporn S, Sombatrungjaroen S, Nosten F. Barriers to immunization among children of migrant workers from Myanmar living in Tak province, Thailand. Bull World Health Organ. 2011;89(7):528–31. doi: 10.2471/BLT.10.084244.

184. Access to information on COVID-19 in Libya and Tunisia. Geneva: Mixed Migration Centre; 2020 (https://mixedmigration.org/resource/4mi-snapshot-access-to-information-on-covid-19-in-libya-and-tunisia/).

185. van de Mieroop E. Mobile vaccination team in Flanders, Belgium [presentation]. Antwerp: Provincial Institute for Hygiene; 2016 (https://www.vhpb.org/files/html/Meetings_and_publications/Presentations/LJUBL511.pdf).

186. Streuli S, Ibrahim N, Mohamed A, Sharma M, Esmailian M, Sezan I et al. Development of a culturally and linguistically sensitive virtual reality educational platform to improve vaccine acceptance within a refugee population: the SHIFA community engagement-public health innovation programme. BMJ Open. 2021;11(9):e051184. doi: 10.1136/bmjopen-2021-051184.

187. Tailoring immunisation programmes: Charedi community, north London. Implementation of the WHO's Tailoring Immunisation Programmes (TIP) in the Charedi Orthodox Jewish community in north east London. London: Public Health England; 2018 (https://www.gov.uk/government/publications/tailoring-immunisation-programmes-charedi-community-north-london).

188. Data for action: achieving high uptake of COVID-19 vaccines: interim guidance, 1 April 2021. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/340645).

189. Brewer NT, Chapman GB, Rothman AJ, Leask J, Kempe A. Increasing vaccination: putting psychological science into action. Psychol Sci Public Interest. 2017;18(3):149–207. doi: 10.1177/1529100618760521.

190. Development of tools to measure behavioural and social drivers (BeSD) of vaccination: progress report. Geneva: World Health Organization; 2020 (https://cdn.who.int/media/docs/default-source/immunization/besd_progress_report_june2020.pdf?sfvrsn=10a67e75_3).

191. Dube E, Leask J, Wolff B, Hickler B, Balaban V, Hosein E et al. The WHO Tailoring Immunization Programmes (TIP) approach: review of implementation to date. Vaccine. 2018;36(11):1509–15. doi: 10.1016/j.vaccine.2017.12.012.

192. Causey K, Fullman N, Sorensen RJD, Galles NC, Zheng P, Aravkin A et al. Estimating global and regional disruptions to routine childhood vaccine coverage during the COVID-19 pandemic in 2020: a modelling study. Lancet. 2021;398(10299):522–34. doi: 10.1016/S0140-6736(21)01337-4.

193. WHO and UNICEF warn of a decline in vaccinations during COVID-19 [press release]. 15 July 2020. Geneva: World Health Organization; 2020 (https://www.who.int/news/item/15-07-2020-who-and-unicef-warn-of-a-decline-in-vaccinations-during-covid-19).

194. Immunization services begin slow recovery from COVID-19 disruptions, though millions of children remain at risk from deadly diseases – WHO, UNICEF, GAVI [press release]. Geneva: World Health Organization; 2021 (https://www.who.int/news/item/26-04-2021-immunization-services-begin-slow-recovery-from-covid-19-disruptions-though-millions-of-children-remain-at-risk-from-deadly-diseases-who-unicef-gavi).

195. Measles: in the shadow of COVID-19. Geneva: Médecins Sans Frontières; 2020 (https://msf.org.uk/article/measles-shadow-covid-19).

196. Seasonal flu vaccine uptake in GP patients: monthly data, 2020 to 2021. London: Public Health England; 2021 (https://www.gov.uk/government/statistics/seasonal-flu-vaccine-uptake-in-gp-patients-monthly-data-2020-to-2021).

197. At least 80 million children under one at risk of diseases such as diphtheria, measles and polio as COVID-19 disrupts routine vaccination efforts, warn GAVI, WHO and UNICEF. Geneva: World Health Organization; 2020 (https://www.who.int/news/item/22-05-2020-at-least-80-million-children-under-one-at-risk-of-diseases-such-as-diphtheria-measles-and-polio-as-covid-19-disrupts-routine-vaccination-efforts-warn-gavi-who-and-unicef).

198. Chandir S, Siddiqi DA. Inequalities in COVID-19 disruption of routine immunisations and returning to pre-COVID immunisation rates. Lancet Reg Health West Pac. 2021;10:100156. doi: 10.1016/j.lanwpc.2021.100156.

199. Moreno-Montoya J, Ballesteros SM, Rojas Sotelo JC, Bocanegra Cervera CL, Barrera-Lopez P, De la Hoz-Valle JA. Impact of the COVID-19 pandemic on routine childhood immunisation in Colombia. Arch Dis Child. 2021107(3):e4. doi: 10.1136/archdischild-2021-321792.

200. Gershlick B, Fisher R. A worrying cycle of pressure for GPs in deprived areas. London: The Health Foundation; 2019 (https://www.health.org.uk/news-and-comment/blogs/a-worrying-cycle-of-pressure-for-gps-in-deprived-areas).

201. Kaufman J, Attwell K, Collaboration on Social Science, Immunisation (COSSI) Working Group. Maintaining routine vaccination during the COVID-19 pandemic. Med J Aust. 2021;214(2):93–93-e1. doi: 10.5694/mja2.50919.

202. McGeown H, Moore J, Heffernan C. Embedding commissioner visits to general practices to improve childhood immunisations. Br J Healthc Manag. 2019;25(1):16–21. doi: 10.12968/bjhc.2019.25.1.16.

203. Wang J, Zhu J, Bai Y, Wang X, Che Y, Liu J. Vaccination rates and determinants of nine recommended vaccines among migrants in China: a nationwide cross-sectional study. Hum Vaccin Immunother. 2021;17(12):5205–13. doi: 10.1080/21645515.2021.1981088.

204. Modelling the health impacts of disruptions to essential health services during COVID-19. Geneva: World Health Organization; 2021 (https://www.who.int/publications/i/item/9789240027695).

205. Abbas K, Procter SR, van Zandvoort K, Clark A, Funk S, Mengistu T et al. Routine childhood immunisation during the COVID-19 pandemic in Africa: a benefit–risk analysis of health benefits versus excess risk of SARS-CoV-2 infection. Lancet Glob Health. 2020;8(10):e1264–72. doi: 10.1016/S2214-109X(20)30308-9.

206. COVID-19: preparing for the future. Looking ahead to winter 2021/22 and beyond. London: The Academy of Medical Sciences; 2021 (https://acmedsci.ac.uk/file-download/4747802).

207. Ammar W, Kdouh O, Hammoud R, Hamadeh R, Harb H, Ammar Z et al. Health system resilience: Lebanon and the Syrian refugee crisis. J Glob Health. 2016;6(2):020704. doi: 10.7189/jogh.06.020704.

208. Guidance for planning vaccination clinics held at satellite, temporary, or off-site locations. Atlanta (GA): Centers for Disease Control and Prevention; 2020 (https://www.cdc.gov/vaccines/hcp/admin/mass-clinic-activities/index.html).

209. Coronavirus vaccination bus: making it easier for you to access your vaccine. London: City of Westminster; 2021 (https://www.westminster.gov.uk/vaccine-bus).

210. Courtois M. MSF launches vaccination campaign in Île-de-France. InfoMigrants. 16 June 2021 (https://www.infomigrants.net/en/post/32960/msf-launches-vaccination-campaign-in-iledefrance).

211. Leave no one behind. Guidance for planning and implementing catch-up vaccination. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/340749).

212. WHO recommendations for routine immunization: summary tables. Geneva: World Health Organization; 2022 (https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/who-recommendations-for-routine-immunization---summary-tables).

213. The Sphere handbook: humanitarian charter and minimum standards in humanitarian response. Geneva: Sphere; 2018 (https://spherestandards.org/wp-content/uploads/Sphere-Handbook-2018-EN.pdf).

214. Declish S, Dente MG, Tosti ME, De Ponte G, Marchetti G, Tavoschi L et al. Vaccinations for migrants and refugees before and after COVID-19. Rome: Instituto Superiore di Sanità; 2021 (https://www.t20italy.org/wp-content/uploads/2021/09/TF10_PB06_LM02-1.pdf).

215. Resolution UNGA 217 A (III). Universal declaration of human rights. New York: United Nations; 1948 (https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_217(III).pdf).

216. Treaty on the Eurasian Economic Union. Moscow: Eurasian Economic Union; 2015 (https://www.wto.org/english/thewto_e/acc_e/kaz_e/wtacckaz85_leg_1.pdf).

217. The Tuskegee timeline [website]. Atlanta (GA): Centers for Disease Control and Prevention; 2021 (https://www.cdc.gov/tuskegee/timeline.htm).

218. Lasco G, Y DG. Communicating COVID-19 vaccines: lessons from the dengue vaccine controversy in the Philippines. BMJ Glob Health. 2021;6(3):e005422. doi: 10.1136/bmjgh-2021-005422.

219. TIP: tailoring immunization programmes. Copenhagen: WHO Regional Office for Europe; 2019 (https://apps.who.int/iris/handle/10665/329448).

220. WHO remains firmly committed to the principles set out in the preamble to the Constitution. In: Constitution [website]. Geneva: World Health Organization; 2021 (https://www.who.int/about/governance/constitution).

221. International covenant on economic, social and cultural rights. Geneva: Office of the High Commissioner for Human Rights; 1966 (United Nations General Assembly resolution 2200A (XXI); https://www.ohchr.org/en/professionalinterest/pages/cescr.aspx).

222. International convention on the elimination of all forms of racial discrimination. Geneva: Office of the High Commissioner for Human Rights; 1965 (United Nations General Assembly resolution 2106 (XX); https://www.ohchr.org/en/instruments-mechanisms/instruments/international-convention-elimination-all-forms-racial).

223. Convention on the elimination of all forms of discrimination against women. Geneva: Office of the High Commissioner for Human Rights; 1979 (United Nations General Assembly resolution 34/180; https://www.ohchr.org/sites/default/files/Documents/ProfessionalInterest/cedaw.pdf).

224. Convention on the rights of the child. Geneva: Office of the High Commissioner for Human Rights; 1989 (United Nations General Assembly resolution 44/25; https://www.ohchr.org/en/professionalinterest/pages/crc.aspx).

225. Convention and protocol relating to the status of refugees. Geneva: Office of the United Nations High Commissioner for Refugees; 1951 (United Nations General Assembly Art. 1(A)(2); http://www.unhcr.org/3b66c2aa10.pdf).

226. International convention on the protection of the rights of all migrant workers and members of their families. Geneva: Office of the High Commissioner for Human Rights; 1990 (United Nations General Assembly resolution 45/158; https://www.ohchr.org/en/professionalinterest/pages/cmw.aspx).

227. CESCR general comment no. 14: the right to the highest attainable standard of health (Art. 12 of the Covenant). New York: United Nations Committee on Economic, Social and Cultural Rights; 2000 (https://digitallibrary.un.org/record/425041?ln=en).

228. UN Network on Migration, Working Group on Access to Services. Enhancing access to services for migrants in the context of COVID-19 preparedness, prevention, and response and beyond. Geneva: World Health Organization, UN Habitat; 2020 (https://unhabitat.org/sites/default/files/2020/06/final_network_wg_policy_brief_covid-19_and_access_to_services.pdf).

229. Interim guidance on scaling-up COVID-19 outbreak in readiness and response operations in camps and camp-like settings. Geneva: InterAgency Standing Committee; 2020 (https://interagencystandingcommittee.org/other/interim-guidance-scaling-covid-19-outbreak-readiness-and-response-operations-camps-and-camp).

230. Managing the COVID-19 infodemic: promoting health behaviours and mitigating the harm from misinformation and disinformation. Joint statement by WHO, UN, UNICEF, UNESCO, UNAIDS, ITU, UN Global Pulse, and IFRC. Geneva: World Health Organization; 2020 (https://www.who.int/news/item/23-09-2020-managing-the-covid-19-infodemic-promoting-healthy-behaviours-and-mitigating-the-harm-from-misinformation-and-disinformation).

231. COVID-19 community feedback package. In: CommunityEngagement [website]. London: British Red Cross; 2021 (https://communityengagementhub.org/resource/ifrc-covid-19-community-feedback-package/).

232. Melshior M, Desgrées du Loû A, Gosselin A, Datta GD, Carabali M, Merckx J et al. Migrant status, ethnicity and COVID-19: more accurate European data are greatly needed. Clin Microbiol Infect. 2021;27(2):160–62. doi: 10.1016/j.cmi.2020.10.014.

Annex: Search strategy

Databases and websites

A scoping review was carried out in October 2021 of peer-reviewed and grey literature, with no restrictions on language or geographical scope.[6]

Searches were performed of public databases for peer-reviewed documents published between 1 January 2000 and 31 October 2021: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Health Services Research, MEDLINE, PsycInfo, Scopus, Web of Science and the WHO COVID-19 Database. The last is a multilingual resource of all the global literature (peer-reviewed literature, pre-prints and grey literature) pertaining to COVID-19 (*1*) that is daily updated by searches of multiple sources of published literature (Africa Wide Information (Ebsco), ASM Journals, Biomed Central, British Medical Journal, CAB Abstracts, CDC reports, Cell Press, Chinese Centre for Disease Control and Prevention, CINAHL, Clinical Trials, Embase, Global Health, J-Stage, JAMA Network, Mary Ann Liebert, MDPI, Morbidity and Mortality Weekly Report, New England Journal of Medicine, Oxford Academic Journals, PLOS, ProQuest Central, PsycInfo, PubMed, Sage Publications, Science Direct, Scopus, Springer Link, Taylor and Francis Online, The Lancet, Web of Science and Wiley Online Journals) and pre-print literature (bioRxiv, chemRxiv, medRxiv and SSRN).

Searches were performed of grey literature published between 1 January 2010 and 31 October 2021 using Google and Google Scholar. Sources of relevant literature included websites of ministries of health and ministries of foreign affairs/immigration in key countries and websites of international organizations and NGOs (ECDC, International Federation of Red Cross and Red Crescent Societies, International Labour Organization, IOM, Médecins du Monde, Médecins Sans Frontières, ReliefWeb, The Collective Service for Risk Communication and Community Engagement, UNHCR, UNICEF, WHO), research institutes, research networks and other literature sources (OpenSIGLE and CABI).

Reference lists were hand-searched to identify additional relevant documents. All records were imported into EndNote and duplicates were deleted. Title/abstract and full-text screening were independently carried out by three researchers using Rayyan QCRI.

[6] *Note that the searches were conducted are prior to the 2022 Ukraine emergency.*

Search terms

A search strategy was developed for academic and grey literature that combined free text terms and subject headings related to (migration) AND (vaccination) AND (determinants). Table A1.1 shows examples of the search terms used.

Table A1.1. Search strategy: examples of keywords and MeSH terms

Theme	Keywords	MeSH terms[a]
Refugees and migrants	migrant* OR immigrant* OR emigrant* OR foreign-born OR "foreign born" OR foreign-origin OR "foreign origin" OR foreign* OR "asylum seek*" OR asylum-seek* OR asylee* OR refugee* non-citizen* OR citizenship OR nationality OR undocumented OR non-resident* OR expat* OR newcomer* OR new-comer* OR irregular OR IDP OR "internally displaced" OR "internally-displaced"	Exp Transients and Migrants/ Exp Emigrants and Immigrants/ Exp Refugees/
Vaccination	vaccin* or immunis* or immuniz*	Exp Vaccination/ Exp Mass Vaccination/ Exp Anti-Vaccination Movement/ Exp Vaccination Refusal/ Exp Vaccination Coverage/ Exp Immunization/ Exp COVID-19/ Exp COVID-19 Vaccines/
Determinants	(uptake or demand or coverage or utiliz* or utiliz*) OR (barrier* or enabl* or facilitat* or motivat* or obstacle* or determinant* or factor* or reason* or challenge*) OR (accept* or comply or complian* or adher* or readiness or intent* or willing*) OR (avoid* or refus* or hesita* or renounc* or reject* or deny or deni* or delay*) OR (confiden* or trust* or fear* or wary or wariness or doubt* or sceptic* or concern* or complacen*) OR (attitude* or perception* or perspective* or view* or belief*) OR (practice* or behavio?r*) OR (decision or decision-making) OR (aware* or knowledge* or inform* or understand*) OR (access* or cost* or afford* or navigat* or availab* or equit*) (polic* or implementat* or guideline* OR strateg* OR recommend* OR program*)	Exp Health Knowledge, Attitudes, Practice/ Exp Health Services Accessibility/ Exp Vaccination Refusal/ Exp Immunization Programs Exp Delivery of Health Care
Year	Limit [no.] to yr="2000 – 2021"	2021–2000

[a] MeSH terms were unique to each database.

Study selection

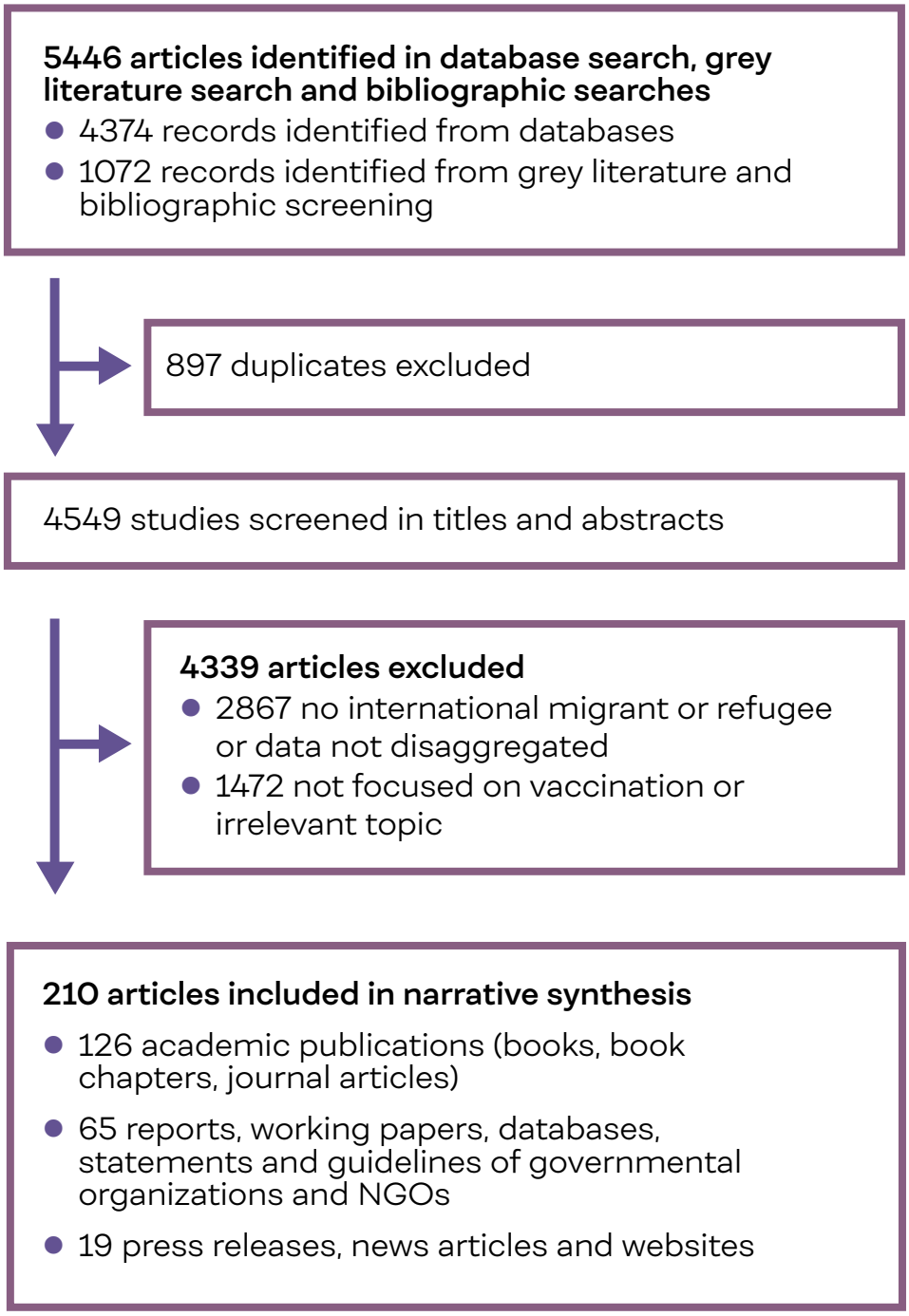
Inclusion and exclusion criteria were developed using a PICOS (population, intervention, control, outcome, study design) framework (Table A1.2 and Fig. A1.1). Articles published outside the specified date range or containing non-disaggregated migrant population data were excluded.

Table A1.2. Inclusion and exclusion criteria, as developed using the PICOS framework

PICOS term	Inclusion criteria	Exclusion criteria
Population	• Child, adolescent and adult migrants (foreign born) globally, including refugees, asylum seekers, irregular and migrants and IDPs • Health-care professionals working with these populations	Migrant status not defined by country/region of birth or not defined Data not disaggregated between migrants and non-migrants
Intervention	• Immunization (access and uptake)	All other interventions
Control	• No comparator or control was selected)	No comparator or control was selected
Outcome	• Policies and practice on the inclusion of refugee and migrant populations in immunization services • Barriers and facilitators to vaccine uptake and access in refugee and migrant populations and access to immunization services • Disruption of immunization services due to COVID-19	Defined outcomes not met
Study design	• Primary and secondary research • Qualitative and quantitative data • Policy document, report, guideline, opinion piece, commentary or review article • Published in any language	None

Fig. A1.1. outlines the selection of studies.

Fig. A1.1. outlines the selection of studies



Data extraction

Articles not written in languages spoken by the research team (English, French or Spanish) were first translated into English using Google Translate.

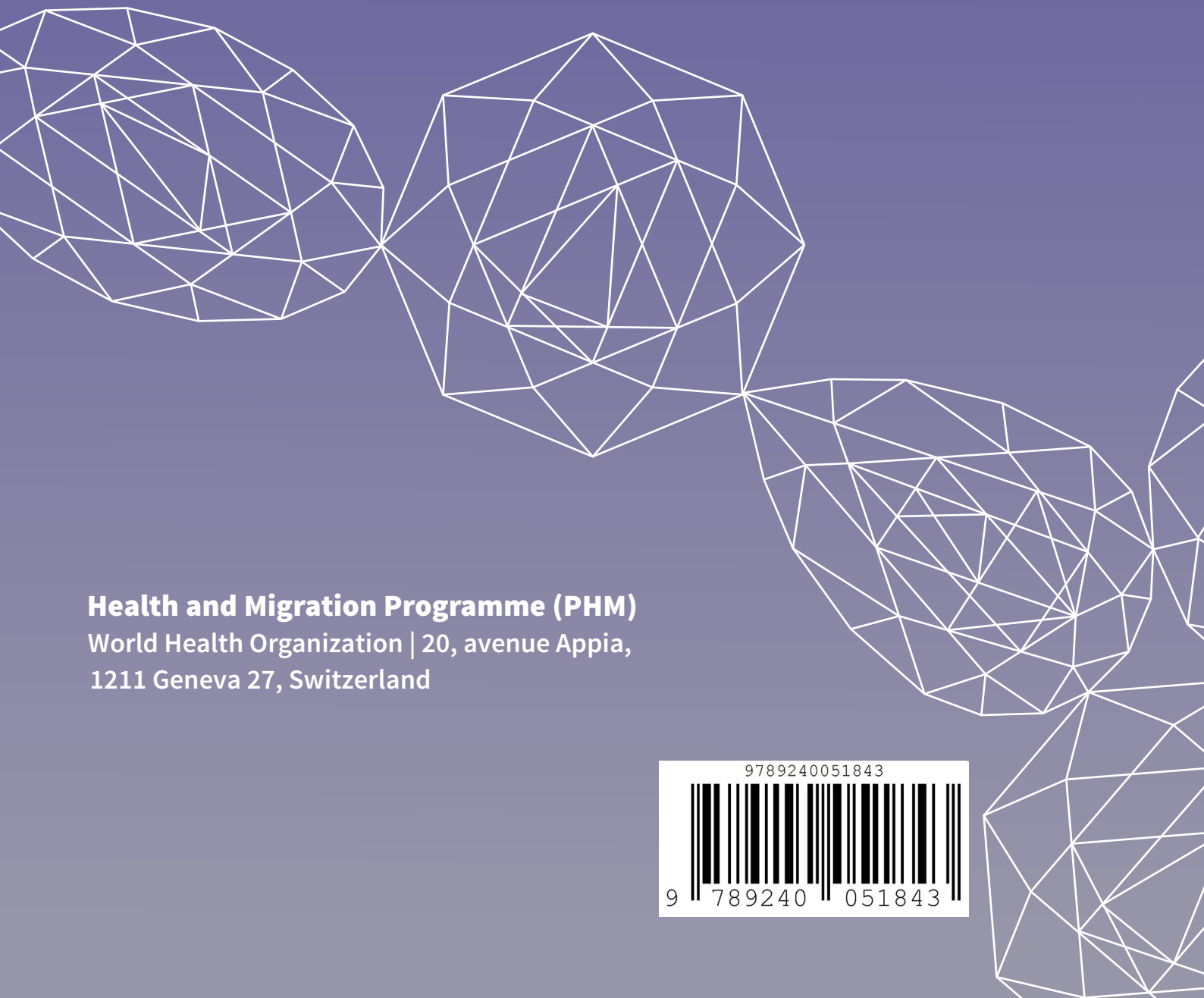
Data were extracted independently by three researchers using a customized form (with samples cross-checked for consistency) and analysed thematically. Data categories were: author(s) and year of publication of study; study setting and location; type of evidence (report, peer-reviewed study, policy brief, etc.); vaccine(s) studied; number of participants (where relevant); migrant demographics (country of origin, type of migrant, age group (e.g. children, adolescents, adults[7]) and gender); barriers and facilitators to immunization, existing policies on integration of refugees and migrants into national vaccination plans and access to services; recommended strategies, solutions and good practices/case studies to strengthen uptake of vaccines; and evidence of the disruption of immunization services due to COVID-19. Discrepancies at any stage were resolved by consensus.

Reference

1. COVID-19: global literature on coronavirus disease [database]. Geneva: World Health Organization; 2022 (https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/, accessed 14 May 2022).

[7] *Age groups were defined as follows: children, 0–9 years; adolescents 10–19 years; and adults, over 19 years.*

Health and Migration Programme (PHM)
World Health Organization | 20, avenue Appia,
1211 Geneva 27, Switzerland



9789240051843