Global report on infection prevention and control

2024

World Health Organization

Global report on infection prevention and control

2024

World Health Organization

Global report on infection prevention and control 2024

ISBN 978-92-4-010398-6 (electronic version)
ISBN 978-92-4-010399-3 (print version)

Suggested citation. Global report on infection prevention and control 2024. Geneva: World Health Organization; 2024. Licence: CC BY-NC-SA 3.0 IGO.

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

Contents

Foreword

Health care-associated infections (HAIs) affect patients and health systems every day, causing immense suffering, driving higher health-care costs and hampering efforts to achieve high-quality care for all. HAIs are often difficult to treat, are the major driver of antimicrobial resistance (AMR) and cause premature deaths and disability.

The COVID-19 pandemic, as well as outbreaks of Ebola, Marburg and mpox are the most dramatic demonstrations of how pathogens can spread rapidly and be amplified in health care settings. But HAIs are a daily threat in every hospital and clinic, not only during epidemics and pandemics.

Lack of water, sanitation and hygiene (WASH) in health care settings not only affects the application of infection prevention and control (IPC) best practices but also equity and dignity among both those providing and receiving care.

However, there is strong evidence that a large proportion of these infections could be prevented with IPC measures and basic WASH services, with a high return on investment.

This second global report on IPC provides updated evidence on the harm caused to patients and health workers by HAIs and AMR, and presents an updated global analysis of the implementation of IPC programmes at the national and health care facility levels across all WHO regions.

The emerging picture is that HAIs continue to be among the most frequent adverse events in health service delivery, with the highest burden in low- and middle-income countries. Significant gaps and challenges remain, particularly in countries with limited resources, and some disinvestments from IPC and WASH have been noted as the COVID-19 pandemic has waned.

On a positive note, based on key priorities and directions indicated in the 2022 report and the response to the COVID-19 pandemic, many countries have strengthened IPC programmes and the implementation of best practices. At the 77th World Health Assembly, WHO Member States adopted the first global strategy, action plan and monitoring framework on IPC, and established an accountability mechanism to track progress towards agreed targets up to 2030.

WHO is supporting countries to achieve the 2030 targets, in collaboration with international and national partners and stakeholders. These joint efforts will make health systems safer and contribute to other major global health priorities. Strong IPC is essential for strong health systems and quality care, in emergencies and as part of every country's journey towards universal health coverage.

Dr Tedros Adhanom Ghebreyesus
Director-General
World Health Organization

Acknowledgements

The World Health Organization (WHO) gratefully acknowledges the many individuals and organizations who contributed to the development of this report.

The development of the report was coordinated by the Department of Integrated Health Services (IHS), Universal Health Coverage and Life Course Division of the WHO. Benedetta Allegranzi (Department of IHS) coordinated the overall development process and was a co-writer of the document. Peter Bischoff (infection prevention and control (IPC) consultant, Department of IHS) co-led the writing of the document together with Benedetta Allegranzi.

Sara Tomczyk (WHO Collaborating Centre, Robert Koch Institute, Berlin, Germany) and Annika Meinen (WHO Collaborating Centre, Robert Koch Institute, Berlin, Germany) carried out the statistical analyses for part of the data presented in this report.

The following WHO staff and consultants provided input for Chapters 2, 3, 4, and 5 of the report: Anand Balachandran (Department of Surveillance, Prevention and Control, Antimicrobial Resistance Division); Yolanda Bayugo (Country Capacity Assessment and Planning, WHO Health Emergencies); Landry Cihambanya (WHO Regional Office for Africa, Brazzaville, Congo); Ana Paula Coutinho Rehse (WHO Regional Office for Europe, Copenhagen, Denmark); Shanlong Ding (Country Capacity Assessment and Planning, WHO Health Emergencies); Sergey Eremin (Department of Surveillance, Prevention and Control, Antimicrobial Resistance Division); Nikhil Prakash Gupta (Department of IHS); Iman Heweidy (WHO Regional Office for the Eastern Mediterranean, Cairo, Egypt); Richard Johnston (Department of Environment, Climate Change and Health, Healthier Populations Division); Zhao Li (WHO Regional Office for the Western Pacific, Manila, Philippines); Babacar Ndoye (IPC consultant, WHO Regional Office for Africa, Brazzaville, Congo); Pravarsha Prakash (Department of Surveillance, Prevention and Control, Antimicrobial Resistance Division); Pilar Ramon-Pardo (WHO Regional Office for the Americas, Washington, DC, United States of America); Giovanni Satta (Department of IHS); Aparna Singh Shah (WHO Regional Office for South-East Asia, New Delhi, India).

WHO particularly acknowledges the written contribution to and approval of the country examples by the following individuals: Faisal Mohammed Alsheddi (General Directorate of IPC, Ministry of Health, Riyadh, Saudi Arabia); Nadeen Mahmoud Burhan (General Directorate of IPC, Ministry of Health, Riyadh, Saudi Arabia); Tochi Okwor (Nigeria Centre for Disease Control, Abuja, Nigeria).

WHO extends its gratitude to the following external reviewers of this report: Anucha Apisarnthanarak (Thammasat University Hospital, Khlong Nueng, Thailand); Alessandro Cassini (Cantonal Service of Public Health, Geneva, Switzerland); Shaheen Methar (University of Stellenbosch and Infection Control Africa Network, Cape Town, South Africa); Tochi Okwor (Nigeria Centre for Disease Control, Abuja, Nigeria); Mauro Orsini (Ministry of Health, Santiago, Chile); Diamantis Plachouras (European Centre for Disease Prevention and Control, Stockholm, Sweden).

All external experts mentioned completed a declaration of interest form in accordance with the WHO declaration of interests' policy for experts. No potential conflicts were identified.

Acknowledgements of financial and other support

Core funds from WHO headquarters and the WHO Hub for Pandemic and Epidemic Intelligence (Berlin, Germany) supported the development and publication of the report.

Funding support from the Universal Health Coverage (UHC) Partnership, which includes contributions from Belgium, Canada, the European Union, Germany, France, Ireland, Japan, Luxembourg, the United Kingdom, and WHO, were also used for this report.

Abbreviations and acronyms

AIDS	acquired immunodeficiency syndrome
AMR	antimicrobial resistance
aOR	adjusted odds ratio
BSI	bloodstream infection(s)
CAUTI	catheter-associated urinary tract infection
CC MR	core components' minimum requirements
CDC	United States Centers for Disease Control and Prevention
CI	confidence interval
CLABSI	central line-associated bloodstream infection(s)
CRO	carbapenem-resistant organisms (carbapenem-resistant Enterobacterales and/or *Acinetobacter baumannii* and/or *Pseudomonas aeruginosa*)
CRE	carbapenem-resistant Enterobacterales
DALYs	disability-adjusted life years
EARS-Net	European Antimicrobial Resistance Surveillance Network
ECDC	European Centre for Disease Control and Prevention
EU/EEA	European Union and European Economic Area
FAO	Food and Agriculture Organization of the United Nations
GAP	global action plan
GATHER	Guidelines for Accurate and Transparent Health Estimates Reporting
GLAAS	(United Nations) Global Analysis and Assessment of Sanitation and Drinking Water survey
GLASS	Global Antimicrobial Resistance and Use Surveillance System
HAI	health care-associated infection
HAI-Net	Healthcare-associated Infections Surveillance Network
HHSAF	Hand Hygiene Self-Assessment Framework
HIC	high-income country
HIV	human immunodeficiency virus

ICU	intensive care unit
IHR	International Health Regulations
IPC	infection prevention and control
IPCAF	IPC Assessment Framework
IQR	interquartile range
JEE	Joint External Evaluation (tool)
JMP	WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene
LIC	low-income country
LMIC	low- and middle-income country
MDR	multidrug-resistant
MDRO	multidrug-resistant organisms
MF	monitoring framework
MMIS	multimodal improvement strategy(ies)
MRSA	meticillin-resistant *Staphylococcus aureus*
MSSA	meticillin-susceptible *Staphylococcus aureus*
OECD	Organisation for Economic Co-operation and Development
OIE	World Organisation for Animal Health
OR	odds ratio
PAHO	Pan American Health Organization
PPE	personal protective equipment
SDGs	Sustainable Development Goals
SOP	standard operating protocols
SPAR	States Party Self-assessment annual reporting (tool)
SSI	surgical site infection
TrACSS	Tracking AMR Country Self-assessment Survey
UI	uncertainty interval
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund

VAE	ventilator-associated events
WASH	water, sanitation and hygiene
WASH FIT	Water and Sanitation for Health Facility Improvement Tool
WHO	World Health Organization

Glossary

Antimicrobial resistance (AMR) and use: AMR threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi. AMR occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections harder to treat and increasing the risk of disease spread, severe illness and death. As a result, the medicines become ineffective and infections persist in the body, increasing the risk of spread to others. Antimicrobials - including antibiotics, antivirals, antifungals and antiparasitics - are medicines used to prevent and treat infections in humans, animals and plants. Microorganisms that develop antimicrobial resistance are sometimes referred to as "superbugs" *(1)*.

Country designations: WHO Member States are grouped into four income groups (low, lower- middle, upper-middle and high) according to the World Bank's analytical classification of economies calculated using the World Bank Atlas method and based on the gross national income (GNI) per capita of each country. For the 2022 fiscal year, low-income countries (LICs) are defined as those with a gross national income (GNI) per capita of $1045 or less in 2020; lower-middle-income countries are those with a GNI per capita between $1046 and $4095; upper-middle-income countries are those with a GNI per capita between $4096 and $12 695; and high-income countries (HICs) are those with a GNI per capita of $12 696 or more. We use low- and middle-income countries (LMICs) to refer to a grouping of the first three income levels (i.e., low-income, lower-middle-income and upper-middle-income countries) *(2)*.

Disability-adjusted life years (DALYs): One DALY represents the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost due to premature mortality (YLLs) and the years lived with a disability (YLDs) due to prevalent cases of the disease or health condition in a population *(3)*.

Hand hygiene: A general term referring to any action of hand cleansing, that is, the action of performing hand hygiene for the purpose of physically or mechanically removing dirt, organic material, and/or microorganisms *(4)*.

Health care-associated infection (also referred to as "nosocomial" or "hospital-acquired infection"): an infection acquired by a patient during the process of care (including preventive, diagnostic and treatment services) in a hospital or other health care facility, which was not present or incubating at the time of admission; HAIs can also appear after discharge. HAIs are also acquired by health workers during health care delivery, and by visitors *(5)*.

Infection prevention and control (IPC) minimum requirements: IPC standards that should be in place at both national and health facility level to provide minimum protection and safety to patients, health care workers and visitors, based on the WHO core components for IPC programmes. The existence of these requirements constitutes the initial starting point for building additional critical elements of the IPC core components according to a stepwise approach based on assessments of the local situation *(6)*.

IPC committee: A multidisciplinary group with interested stakeholders across the facility, which interacts with and advises the IPC team. For example, the IPC committee could include senior facility leadership; senior clinical staff; leads of other relevant complementary areas, such as biosafety, pharmacy, microbiology or clinical laboratory, waste management, water, sanitation and hygiene services and quality and safety, where in place *(6)*.

IPC professional: Health care professional (medical doctor, nurse, or other health-related professional) who has completed a certified postgraduate IPC training course, or a nationally or internationally recognized postgraduate course on IPC, or another core discipline including IPC as a core part of the curriculum as well as IPC practical and clinical training *(7)*.

IPC link person: Nurse or doctor (or other health professional) in a ward or within the facility (for example, staff working in clinical services such as intensive care unit or maternal and neonatal care, or water, sanitation and hygiene or occupational health professionals) who has been trained in IPC and links to an IPC focal point/team at a higher level in the organization (for example, IPC focal point/team at the facility or district level). IPC is not the primary assignment of this professional but, among others, he/she may undertake tasks in support to IPC, including for example supporting implementation of IPC practices; providing mentorship to colleagues; monitoring activities; and alerting on possible infectious risks *(7)*.

IPC focal point: IPC professional (according to the above definition) appointed to be in charge of IPC at the national, sub-national or facility/organization level *(7)*.

Multimodal improvement strategy: A multimodal strategy comprises several components or elements (three or more, usually five) implemented in an integrated way with the aim of improving an outcome and changing behaviour. It includes tools, such as bundles and checklists, developed by multidisciplinary teams that take into account local conditions. The five most common elements include: (i) system change (availability of the appropriate infrastructure and supplies to enable infection prevention and control good practices); (ii) education and training of health care workers and key players (for example, managers); (iii) monitoring infrastructures, practices, processes, outcomes and providing data feedback; (iv) reminders in the workplace/communications; and (v) culture change within the establishment or the strengthening of a safety climate *(6)*.

Personal protective equipment (PPE): Equipment and/or clothing worn by personnel to provide a barrier against biological agents, thereby minimizing the likelihood of exposure. PPE includes, but is not limited to, laboratory coats, gowns, full-body suits, gloves, protective footwear, safety glasses, safety goggles, masks and respirators *(8)*.

Point of care: The place where three elements come together: the patient, the health care worker and care or treatment involving contact with the patient or his/her surroundings (within the patient zone) *(4)*.

Primary health care facilities: Facilities that provide outpatient services, family planning, antenatal care, maternal, newborn and child health services (including delivery), for example, health centres, health posts and small district hospitals *(9)*.

Secondary-level hospitals/health care facilities: Highly differentiated by its function with 5 to 10 clinical specialties; size ranges from 200 to 800 beds; often referred to as a provincial or district hospital *(6)*.

Tertiary-level hospitals/health care facilities: Highly specialized staff and technical equipment, for example, cardiology, intensive care unit and specialized imaging units; clinical services highly differentiated by function; may have teaching activities; size ranges from 300 to 1500 beds; often referred to as a teaching or university or regional hospital *(10)*.

Universal health coverage (UHC): UHC means that all individuals and communities receive the health services they need without suffering financial hardship. It includes the full spectrum of essential, quality health services, from health promotion to prevention, treatment, rehabilitation, and palliative care across the life course *(11)*.

References for the glossary

1. Antimicrobial resistance [website]. Geneva: World Health Organization; 2022 (https://www.who.int/health-topics/antimicrobial-resistance, accessed 10 October 2024)
2. World Bank Country and Lending Groups [website]. Washington (DC): World Bank; 2022 (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups, accessed 10 October 2024)
3. The Global Health Observatory. Disability-adjusted life years (DALYs). In: Indicator metadata registry list. Geneva: World Health Organization; 2015 (https://www.who.int/data/gho/indicator-metadata-registry/imr-details/158, accessed 10 October 2024).
4. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009 (https://www.who.int/publications/i/item/9789241597906, accessed 10 October 2024).
5. Adapted from Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. Geneva: World Health Organization; 2016 (https://www.who.int/publications/i/item/9789241549929, accessed 10 October 2024).
6. Minimum requirements for infection prevention and control programmes. Geneva: World Health Organization; 2019 (https://apps.who.int/iris/handle/10665/330080, accessed 10 October 2024).
7. Core competencies for infection prevention and control professionals. Geneva: World Health Organization; 2020. (https://iris.who.int/bitstream/handle/10665/335821/9789240011656-eng.pdf, accessed 10 October 2024).
8. Personal protective equipment. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/rest/bitstreams/1323440/retrieve, accessed 10 October 2024).
9. Water and sanitation for health facility improvement tool (WASH FIT). Geneva: World Health Organization; 2017 (https://apps.who.int/iris/bitstream/handle/10665/254910/9789241511698-eng.pdf?sequence=1&isAllowed=y, accessed 10 October 2024).
10. Alleyne G, Breman JG, Claeson M, Evans DB, Jamison DT, Jha P, Measham AR, Mills A, Musgrove P, editors. Disease control priorities in developing countries, second edition (English). Washington, D.C. : World Bank Group; 2006 (http://documents.worldbank.org/curated/en/632721468313531105/Disease-control-priorities-in-developing-countries-second-edition, accessed 24 November 2024).
11. Universal health coverage (UHC) [website]. Geneva: World Health Organization; 2021 (https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc), accessed 10 October 2024).

A vaccinator washes her hands before administering vaccines to the public at the launch of a vaccine campaign in Isinya, Kenya.
© WHO / Billy Miaron

Executive summary

Executive summary

1. Purpose, target audience and methods

Over the last decade, major outbreaks such as those due to the Ebola and Marburg virus diseases, the COVID-19 pandemic and, more recently, monkeypox viral disease (mpox), have demonstrated how epidemic-prone pathogens can spread rapidly through health care settings. These events have exposed the gaps in infection prevention and control (IPC) programmes that exist, irrespective of the resources available or the national income level.

Furthermore, every day across all health care systems worldwide, patients and health workers are affected by infections acquired during health care delivery, including those caused by antimicrobial-resistant microorganisms.

IPC is a clinical and public health specialty, and a set of measures based on a practical, evidence-based approach. The aim of IPC is to prevent patients, health workers and visitors to health care facilities from being harmed by avoidable infections acquired during the provision of health care services *(1)*.

> IPC occupies a unique position in the field of patient and health worker safety and quality of care as it is universally relevant to every health worker and patient at every care interaction.

This Executive summary provides a synthesis of the 2024 World Health Organization (WHO) *Global report on infection prevention and control.* Notably, it highlights the burden of health care-associated infections (HAIs) and antimicrobial resistance (AMR) and the related harm to both patients and health workers in care settings. It presents also an updated global situation analysis of the implementation of IPC programmes at the national and health care facility levels, including a focus on the WHO regions. Finally, it highlights recent landmark political and implementation documents, which indicate directions, actions, indicators and targets for countries and the international IPC community to help them to progress in the implementation and improvement of IPC.

The report and its Executive summary are primarily aimed at those in charge of making decisions and formulating policies in the field of IPC at national, subnational and facility levels. This includes policy-makers, senior managers, administrators who are managing health budgets, and IPC focal points at national (ministry of health, public health institutes, etc.), subnational and health care facility levels.

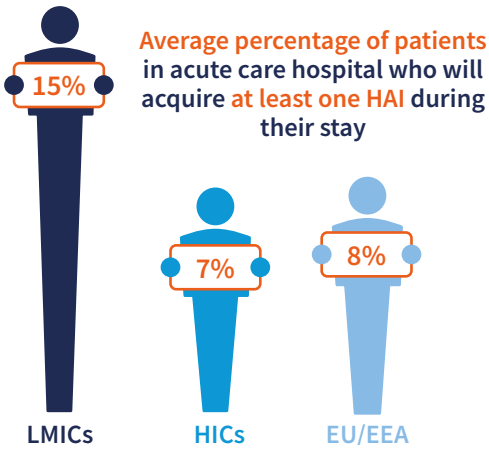
The report is the result of a cross-cutting and multidisciplinary effort involving staff at WHO headquarters and in regional offices, as well as key partners in the field of IPC. It includes information and data from many sources, including the scientific literature, WHO global databases, WHO surveys using standardized tools, as well as WHO publications and reports published by other institutions. It also includes a compilation of data and information providing overviews of IPC at the global and regional levels and by country income level, with examples of IPC implementation at both country and facility level.

2. The problem of unsafe care resulting from HAIs and AMR

HAIs are among the most frequent adverse events occurring in the context of health service delivery. These infections, many of which are caused by multidrug-resistant organisms, harm patients, visitors and health workers and place a significant burden on health systems, including the associated increased costs *(2)*.

On average, out of every 100 patients in acute- care hospitals, seven patients in high-income countries (HICs) and 15 patients in low- and middle-income countries (LMICs) will acquire at least one HAI during their hospital stay *(3, 4)* (Fig. 1). The most recent multi-country point prevalence survey conducted in 2022–2023 in 28 countries of the European Union and European Economic Area (EU/EEA) and three Western Balkan countries/territories estimated that eight out of every 100 patients had acquired at least one HAI during their hospital stay in acute care hospitals *(5)* (Fig 1). The prevalence of HAIs varies, depending on the study methods and the local situation. However, in most studies, HAI frequency is significantly higher in LMICs than in HICs *(2, 3, 4, 6)*.

Fig. 1. Average global percentage of patients with at least one HAI in acute care hospitals, 2022–2023.



Abbreviations: HAI, health care-associated infection; LMICs, low- and middle-income countries; HICs, high-income countries; EU/EEA, European Union/European Economic Area.
Source: *(3, 4, 5)*.

Almost up to one third (30%) of patients in intensive care can be affected by HAIs, with an incidence that is two to 20 times higher in LMICs than in HICs, in particular among neonates *(2, 7)*. Approximately one in four (23.6%) of all hospital-treated sepsis cases are health care-associated and this increases to almost one half (48.7%) of all cases of sepsis with organ dysfunction treated in adult intensive care units (ICUs) *(6, 8)*.

Based on data from 2022–2023, the European Centre for Disease Prevention and Control (ECDC) estimated that 4.8 million episodes of HAIs occur every year in patients admitted to acute care hospitals in EEA countries *(5)*.

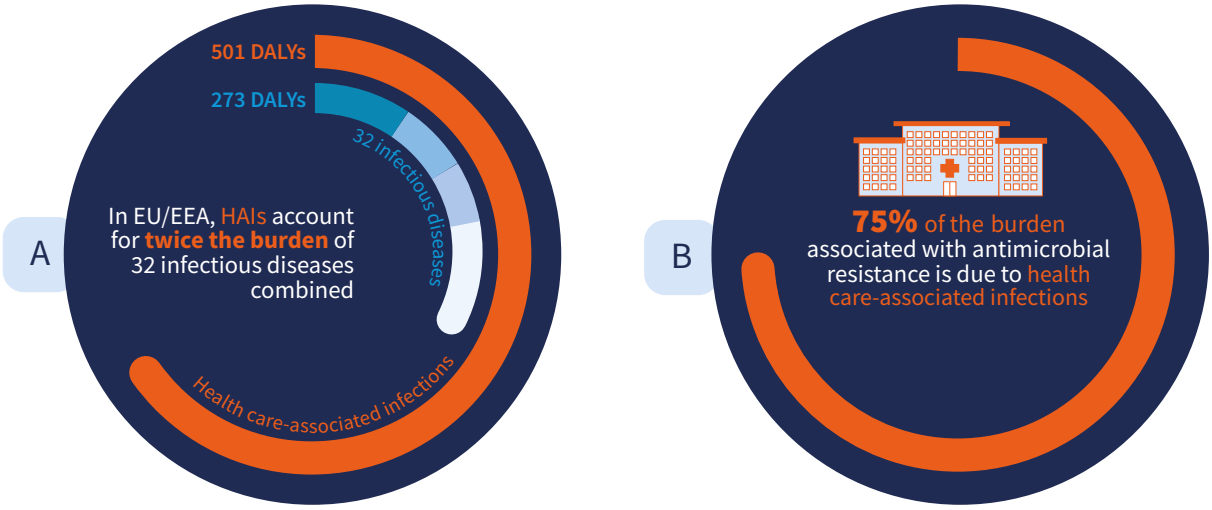
The global number of HAIs resistant to antibiotics was estimated to be 136 million annually *(9)*.

The consequences of HAIs and AMR are severe, leading to prolonged hospital stays, long-term complications, disability and premature death. They also impose significant social and psychological burdens on patients, families and communities. For health systems, the burden translates into added overload and extra costs *(2)*, (WHO, unpublished data). A pooled analysis revealed that health care-associated sepsis has a staggering impact on patient outcomes, with one in four affected individuals dying (24.4%). This figure rises dramatically to over one half (52.3%) when patients are treated in an ICU *(6, 8)*.

Globally, according to the Organization for Economic Co-operation and Development (OECD) and WHO, nearly 3.5 million people can lose their lives due to HAIs every year up to 2050. This corresponds to 4.4 times the number of global deaths in 2021 due to human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) and sexually transmitted diseases combined (WHO/OECD unpublished data).

In EU/EEA countries, the burden of the six most frequent HAIs in terms of disability-adjusted life years (DALYs)[1] was twice the burden of 32 other infectious diseases combined *(10)* (Fig. 2A). Furthermore, it was estimated that 75% of the burden associated with AMR in terms of disabilities and premature mortality was due to HAIs *(11)* (Fig. 2B).

Fig. 2. Burden of the six most frequent HAIs compared to 32 other infectious diseases in the EU/EEA (A); burden of AMR associated with HAIs (B)



Abbreviations: DALYs, disability-adjusted life years; HAIs, health care-associated infections; EU/EEA, European Union/European Economic Area; AMR, antimicrobial resistance.
Source: *(10, 11)*.

Mortality among patients infected with resistant microorganisms is at least two to three times higher than among those infected with sensitive microorganisms *(4, 12-17)*.

According to recent WHO and OECD estimates[2], globally, IPC interventions implemented in health care facilities using MMIS, with national coordination could potentially avert 821 000 deaths per year up to 2050 (WHO/OECD unpublished data).

Estimates suggested that improving IPC programmes in LMIC health care settings could prevent at least 337 000 AMR-associated deaths per year *(18)*.

Investment in AMR initiatives are estimated to avert up to 200 000 deaths annually in Africa, including 90 000 deaths among children under five years of age *(19)*.

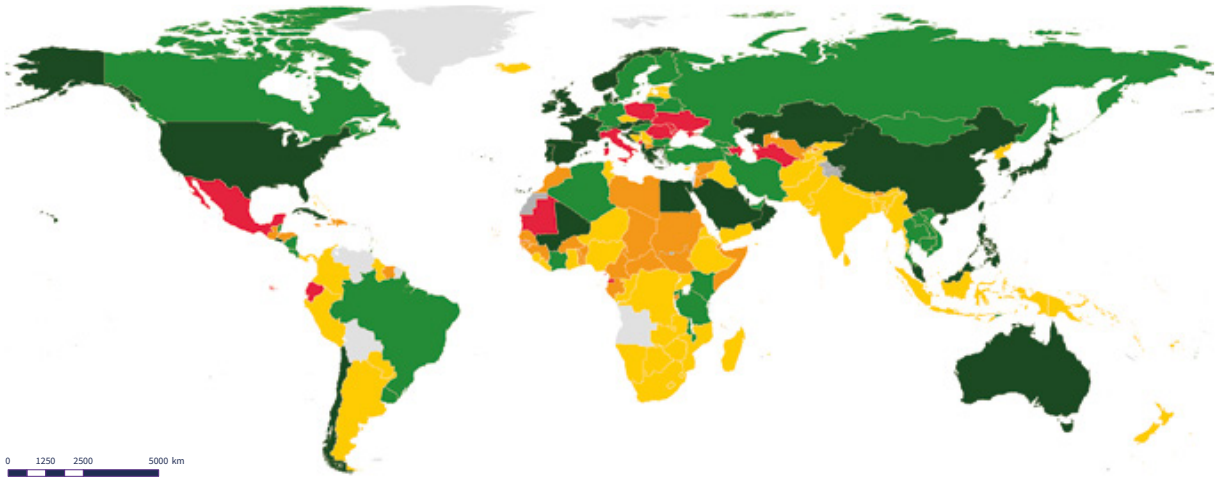
[1] DALYs: years of life lost due to premature mortality and years lived with a disability resulting from a condition.
[2] For these calculations a modified version of the OECD Strategic Public Health Planning for infectious diseases model was used. OECD; 2023 (http://oecdpublichealthexplorer.org/amr-doc/).

3. Situation analysis of the implementation of IPC around the world

3.1 IPC implementation at national level

In 2023–2024, according to the system established to monitor the status of country progress towards the implementation of the AMR global action plan (the Tracking AMR Country Self-assessment Survey [TrACSS]), 9% of countries did not yet have an IPC programme or plan (Fig. 3, level A). Only 39% of countries had IPC programmes fully implemented nationwide (Fig. 3, levels D and E), with some being monitored for their effectiveness (Fig. 3, level E) *(20)*.

Fig. 3. Country/area map of the 2024 TrACSS results according to levels A to E (indicator 3.5)



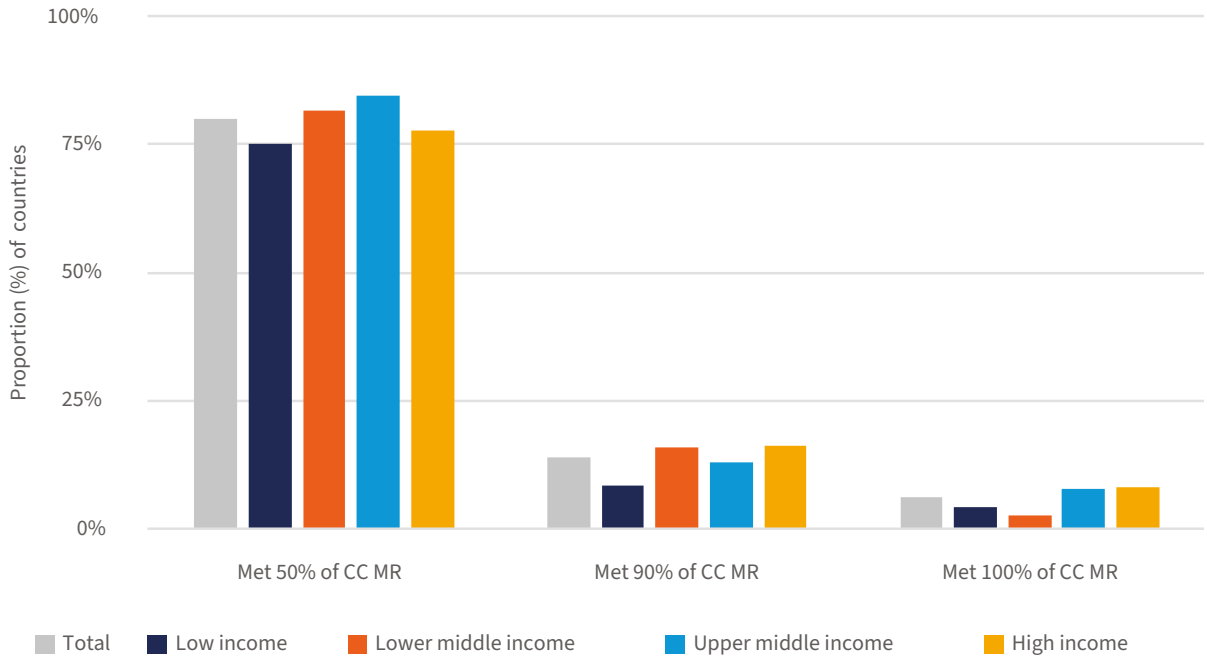
- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.
- Data not available
- Not applicable

Abbreviations: TrACSS, Tracking AMR Country Self-Assessment Survey; IPC, infection prevention and control.
Map creation date: 04 October 2024.
Map production: WHO Geographic Information Systems (GIS) Centre for Health, Department of Data and Analytics (DNA) within the Division of Data, Analytics and Delivery for Impact (DDI).
Source: *(20)*.

The results of a detailed global survey on the minimum requirements for national IPC programmes carried out by WHO in 2023–2024 showed that an active national IPC programme (that is, a functioning programme with an annual workplan and budget) existed in 71.3% (107 of 150) of countries (WHO, unpublished data).

Only 6% (9 of 150) of countries met all the WHO minimum requirements and 14% (21 of 150) met 90% at the national level (WHO, unpublished data) (Fig. 4).

Fig. 4. Proportion of countries meeting IPC minimum requirements by World Bank income level, 2023–2024



Abbreviations: CC MR: core components' minimum requirements.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

This survey showed areas of advanced implementation and gaps for further improvement in national IPC programmes. Significant discrepancies were observed across income levels, with HICs generally reporting better implementation, but gaps remaining in budget allocation, training, HAI surveillance and monitoring systems, especially in LICs.

High level of implementation

- Guideline development: approximately 9 out of 10 countries (90.7% [136 of 150]) have mandates to produce guidelines for preventing HAIs. Among these, 88% of countries (132 of 150) reported to use evidence-based, scientific knowledge in the development of IPC guidelines and 82% (123 of 150) actively addressed guideline adaptation to local conditions.
- Multimodal improvement strategies (MMIS): approximately 7 out of 10 countries (71.3% [107 of 150]) have trained IPC focal points and 75.3% (113 of 150) promote multimodal strategies. HICs show high implementation, with 72.9% (35 of 49) having trained IPC focal points and 83.3% (40 of 49) promoting MMIS.

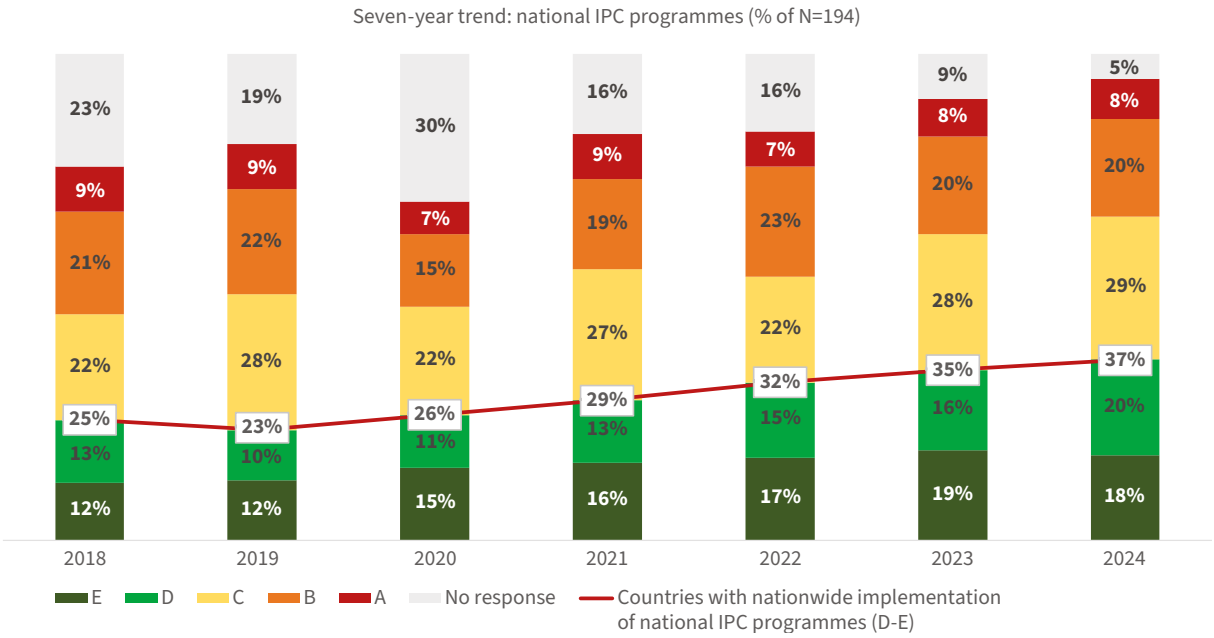
Gaps needing improvement

- Budget allocation: fewer than one half (44% [66 of 150]) of countries have a dedicated IPC budget and only 33% in LICs (8 of 24).
- Training and education: while in more than 8 out of 10 countries (81.3% [122 of 150]) the national IPC programme provides content for IPC training, only 38% (57 of 150) have a national IPC curriculum, indicating a need for broader training programmes.
- HAI surveillance: just over one half (53.3% [80 of 150]) of countries have a multidisciplinary technical group for HAI surveillance, but LICs lag notably, with only 25% (6 of 24) having established such a group.
- Monitoring and evaluation: slightly more than one half (51.3% [77 of 150]) of countries have a strategic plan and system for IPC monitoring, with HICs leading at 58.3% (28 of 49) and lower proportions in LICs (45.8% [11 of 24]).

Striking differences in the implementation of IPC at national level were observed across World Bank country income levels across all surveys and data sets mentioned in this report, with low- and lower middle-income countries, significantly less advanced than other income levels (Fig. 4).

A review of data from TrACSS *(20)* over the past seven-year period (2018–2024) showed slow progress in IPC globally. However, a steady increase in the proportion of countries implementing national IPC programmes nationwide (levels D-E) was observed between 2020 (26%) and 2024 (37%) (Fig. 5, solid red line).

Fig. 5. IPC programme levels according to TrACSS results, 2018–2024



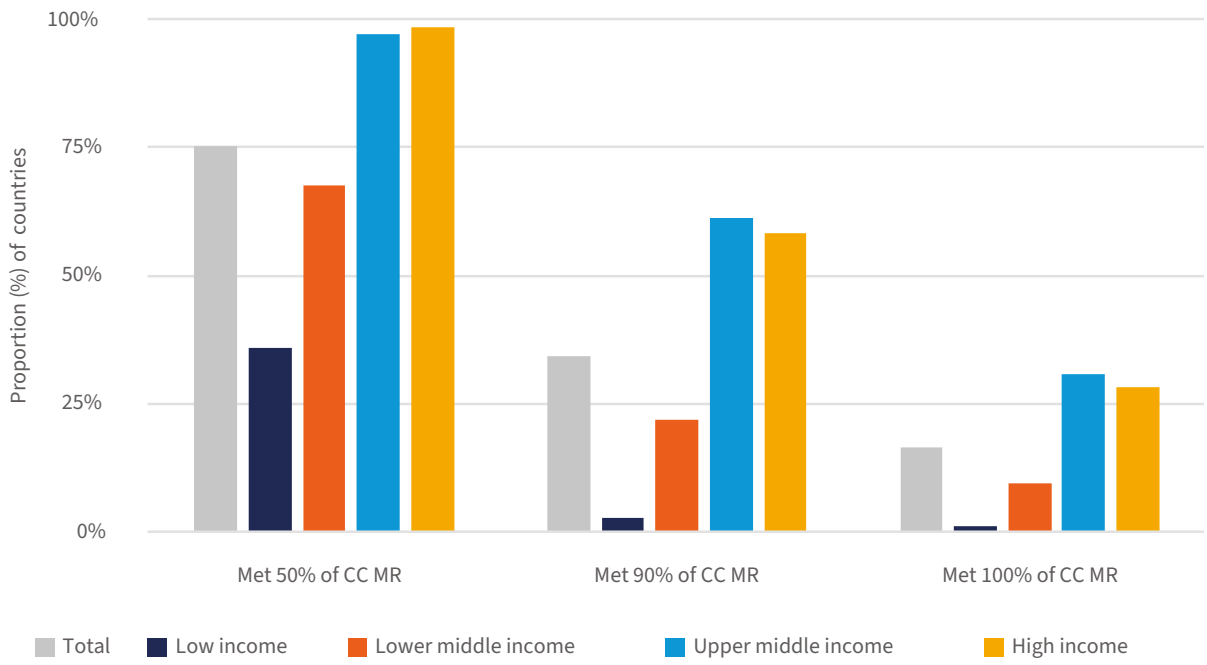
Numbers are percentages of countries (N=194) reporting levels A to E for that survey year.
Abbreviations: IPC, infection prevention and control; TrACSS, Tracking AMR Country Self-assessment Survey.
Source: *(20)*.

3.2 IPC implementation at health care facility level

In the WHO global survey conducted in 2023–2024, only 15.8% of 5537 participating health care facilities met all WHO IPC minimum requirements, but 34% met 90% (WHO, unpublished data) (Fig. 6).

Notable differences in the level of implementation of IPC programmes were observed according to the country income level (Fig. 6). Overall, among primary, secondary and tertiary care facilities, 75.5% of facilities met at least 50% of the IPC minimum requirements, while 15.8% fulfilled all of them. In LICs, only 35.7% of facilities met at least 50% of requirements, and a mere 0.6% met all of them. In contrast, HICs showed a much higher rate of meeting the requirements, with 98.8% meeting at least 50% and 27.9% fulfilling all requirements (WHO, unpublished data).

Fig. 6. Proportion of facilities meeting IPC minimum requirements by World Bank income level, 2023–2024



Abbreviations: CC MR: core components' minimum requirements.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

HICs were more advanced in the implementation of all IPC core components, while LICs had a notably limited implementation of IPC guidelines, training and education, monitoring, audit, feedback and HAI surveillance (WHO, unpublished data).

Even where IPC programmes exist, they are often not able to function appropriately and sustainably in an enabling environment. In 2019, IPC programmes existed in almost all secondary and tertiary health care facilities *(21)*. However, particularly in LMICs, the facilities lacked full-time IPC professionals, an allocated IPC budget, routine microbiological laboratory support, and appropriate workload, staffing and bed occupancy.

This is still the case with respect to overall scores on the implementation of IPC minimum requirements in 2023–2024, highlighting the ongoing disparity in IPC programme effectiveness and resource availability between different income levels. In particular, this is evident regarding human and financial resources dedicated to IPC. Conversely, the median scores for HAI surveillance and IPC monitoring were very high in tertiary and secondary health care facilities. However, the WHO minimum requirements for HAI surveillance are not demanding as they cover only having a strategic plan and not a system for HAI surveillance.

Despite the surge in response to the COVID-19 pandemic, not all essential IPC human resources, supplies and products are available in 2023–2024. For example, a lack or limited availability of personal protective equipment was reported in four WHO pulse surveys on the continuity of essentiaal health services during the COVID-19 pandemic *(22-25)*. In these surveys, conducted in 2020 and repeated until the first quarter of 2023, up to 65% of countries cited the lack of IPC supplies and a poor application of best practices as major reasons for the disruption of essential health services *(26)*. As a sign of recovery of the health systems in the fourth survey round in 2023, only 24% (23 of 93 countries) reported disruption to their in-country supply chain system, a decrease from almost 50% in the fourth quarter of 2021 *(25)*.

In the 2023–2024 WHO global survey on IPC minimum requirements, 65.6% of primary facilities, 75.4% of secondary facilities, and 83.2% of tertiary facilities reported having sufficient personal protective equipment, with significant differences across income levels (WHO, unpublished data).

The 2024 report by the WHO/United Nations Children's Fund (UNICEF) Joint Monitoring Programme (JMP) for Water Supply, Sanitation and Hygiene provided a striking picture (2022 data; *(27)*): 1.7 billion people were using health care facilities that lack basic water services and 697 million were using facilities with unimproved toilets or no toilets.

Yet, implementing water, sanitation and hygiene (WASH) services in health care facilities across the 46 least-developed countries would require a relatively modest investments (US$ 6.5 to US$ 9.6 billion until 2030) *(28)*.

In the 2023–2024 WHO global survey, 74.7%, 83.3% and 85.4% of primary, secondary and tertiary care facilities, respectively, reported having continuously available water services, with HICs always reporting 100% availability and significant differences with other income levels.

Appropriate hand hygiene can save lives. Such hand hygiene practices prevent infections, generate economic savings and are therefore a minimum requirement for IPC in all health care facilities.

In 2019, the WHO global survey on hand hygiene programmes in 3206 health care facilities in 90 countries showed an intermediate implementation level (350 of 500 points) overall, with significant differences according to the income level of participating countries ("advanced" in HICs and "basic" in LICs), showing a disparity between hand hygiene practice implementation in resource-rich and resource-poor settings *(29)*.

The 2024 JMP report revealed that globally, about two out of five (43%) health care facilities lacked hand hygiene services (either soap and water or alcohol-based handrubs) at the point of care or at toilets *(27)*.

This translated to 3.4 billion people using health care facilities that lacked basic hygiene services (hand hygiene facilities at points of care and toilets).

However, in the facilities included in the WHO 2023–2024 global survey, 75.2%, 81% and 84.2% of primary, secondary, and tertiary health care facilities, respectively, reported having functioning hand hygiene stations at all points of care, with significant differences between HICs and LICs (WHO, unpublished data). This difference with JMP data may depend on the differences in the study sample and the fact that facilities participated in the WHO global survey on IPC on a voluntary basis and might be more advanced in IPC than others.

3.3 IPC implementation at the regional level

Since the COVID-19 pandemic, countries have demonstrated recognition of the critical role played by IPC during public health emergencies and a strong commitment to sustain IPC policies and practices.

Overall, the strengthening of IPC programmes and implementation of best IPC practices have accelerated across all regions. However, significant gaps and challenges still remain, especially regarding those elements of IPC programmes that require investments and long-term sustainability.

All WHO regional and country offices have been using a uniform approach to support countries in capacity building and progressing IPC action. This relies on joint assessments of the status of IPC programmes and IPC interventions with local authorities and partners, plan development, including impact and sustainability evaluations using a quality improvement cycle and a step-wise approach, as well as MMIS.

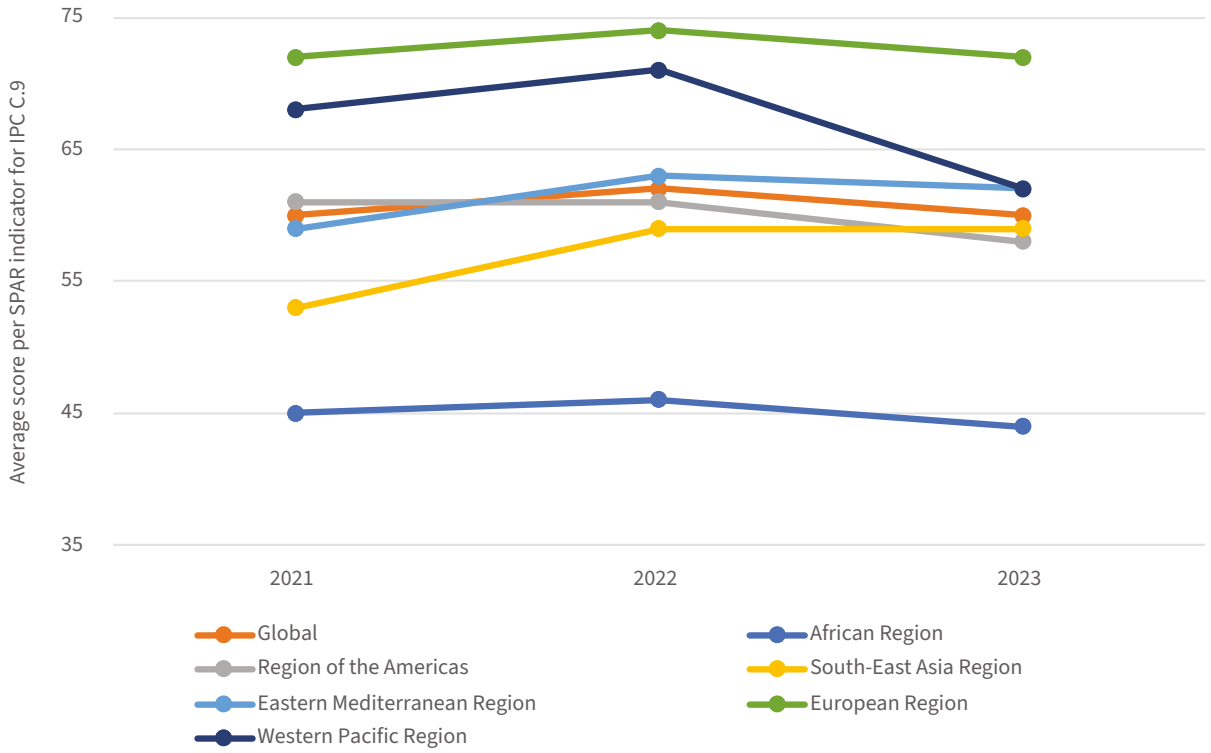
The 2023–2024 WHO global survey on IPC minimum requirements at the national level revealed some differences across WHO regions in the implementation of IPC core components (WHO, unpublished data).

- Improvements were reported by countries, particularly in the following areas: having an appointed IPC-trained national focal point; updating and further developing evidence-based, national IPC guidelines according to international standards; local adaptation of guidelines and implementation through standard operating procedures; and establishing hand hygiene compliance as a key national indicator.
- Some significant gaps remained across WHO regions in the implementation of IPC core components. In particular, securing dedicated budgets, ensuring operational IPC programmes at national and facility levels, evaluation of training effectiveness, the use of results for targeted improvements in IPC, and the improvement of HAI surveillance and monitoring systems.

These gaps were particularly evident in the African Region, especially concerning financial and human resources and national strategic plans for HAI surveillance and IPC monitoring. Although the overall scores were higher, a similar situation was reported in the Eastern Mediterranean Region regarding the gaps. The Region of the Americas reported remarkable improvements in several core components compared to data collected in 2021–2022, but only very rare availability of a curriculum for IPC in-service training. The most frequent gaps in the South-East Asia Region were a lack of a dedicated budget, an in-service training curriculum for IPC, and strategic plans for HAI surveillance. In the Western Pacific and European Regions, strong improvements were recently achieved. However, gaps still exist in the minimum requirements related to training in the Western Pacific Region, and a lack of active national IPC programmes with a dedicated budget and national guidelines in the European region.

In 2023, the global average for IPC capacity assessed through the States Parties Self-assessment annual reporting (SPAR) tool remained at the same level as in previous years. However, among the WHO regions, the South-East Asia Region reported an increase in capacity level over the years while the Western Pacific Region reported a decrease. Overall, the European Region showed the highest and the African Region the lowest capacity levels *(30)* (Fig. 7).

Fig. 7. Average score per SPAR indicator for IPC (C.9) globally and per WHO region, 2021–2023



Abbreviations: IPC, infection prevention and control; SPAR: State Party self-assessment annual reporting (tool).
Source: *(30).*

4. The way forward

The report provides a situation analysis of the status of IPC programmes worldwide and highlights that although some progress has been made, several gaps in implementation still exist. Furthermore, some improvements achieved during the COVID-19 pandemic may have been recently lost, due to disinvestment from IPC and WASH and reallocation of resources and funds to other areas. Significant and striking differences emerge in IPC capacity and progress between LICs and LMICs and other income levels across all data sets on IPC indicators at the national and facility level.

The 2022 edition of the report *(2)* highlighted the call for action made by the WHO Global IPC Network since 2017 *(31)* and indicated key priorities and directions. Based on these and lessons learned during the COVID-19 pandemic, Member States have made unprecedented steps forward in the past two years in recognizing and elevating the importance of IPC in the global and national health agenda.

A resolution focusing on IPC as a critical priority across the continuum of the health system was adopted at the 75th World Health Assembly *(32)* in 2022, requesting the development of a global strategy, action plan and monitoring framework on IPC.

One year later, the first ever WHO global strategy *(33)* was approved by all Member States and served as the backbone of the 2024–2030 WHO global action plan and monitoring framework (GAP/MF) *(34)* adopted by all countries at the 77th World Health Assembly in May 2024 *(35)*.

The strategy is underpinned by an ambitious, yet inspirational vision.

> By 2030, everyone accessing or providing health care is safe from associated infections.

Eight strategic directions are indicated in the WHO global strategy as being critical to achieve improvement in IPC (Fig. 8). The GAP/MF describes actions, indicators and targets to achieve the effective implementation of these strategic directions and to track and report progress over time between 2024 and 2030 at the global, national, subnational and facility level. The GAP/MF primarily targets those responsible for developing plans and implementing action on IPC at the national and health care facility level and is aimed at guiding and supporting them.

Within the WHO MF, eight targets have been prioritized to be achieved at national level and four at facility level (Table 1). These targets can mostly be monitored using existing monitoring systems.

> The achievement of the WHO IPC minimum requirements should be an urgent priority for all countries and health care facilities in order to provide minimum protection and safety to patients, health and care workers, as well as families and visitors to facilities, and achieve targets for AMR reduction.

Fig. 8. Strategic directions as the overall guiding framework of the WHO global strategy and action plan on IPC.

Source: *(33)*.

Table 1. Core targets of the IPC MF at the global and national level

Eight core targets at global[a] level
1. Increase of proportion of countries with a costed and approved national action plan and monitoring framework on IPC.
2. Increase of proportion of countries with legislation/regulations to address IPC.
3. Increase of proportion of countries having an identified protected and dedicated budget allocated to the national IPC programme and action plan.
4. Increase of proportion of countries meeting all WHO IPC minimum requirements for IPC programmes at national level (through WHO global IPC portal).
5. Increase of proportion of countries with national IPC programmes at levels 4 or 5 according to SPAR C.9.1 and levels D and E in TrACSS.
6. Increase of the proportion of countries with (1) basic water, (2) sanitation, (3) hygiene, and (4) waste services in all health care facilities.
7. Increase of proportion of countries that have achieved their national targets on reducing HAIs.
8. Increase of proportion of countries with a national HAI surveillance system.

Four core targets at national[b] level
1. Increase of proportion of facilities meeting all WHO IPC minimum requirements for IPC programmes.
2. Increase in the proportion of facilities with a dedicated and sufficient funding for WASH services and activities.
3. Increase of proportion of facilities providing training to all frontline clinical and cleaning staff upon employment and annually and to managers upon employment.
4. Increase of proportion of tertiary/secondary health care facilities having an HAI and related AMR surveillance system.

Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control; MF, monitoring framework; SPAR, States Party Self-assessment annual reporting tool; TrACSS, Tripartite AMR Country Self-assessment Survey; WASH, water, sanitation and hygiene; AMR, antimicrobial resistance.
[a] Reflecting progress at national level.
[b] Reflecting progress at facility level.
Source: *(34)*.

Significant investments are required by all countries to achieve these targets and resource mobilization is also needed for stakeholders supporting them. However, compelling data demonstrate that a high return can derive from investments in IPC, both in terms of lives saved and economic gains *(2, 18, 28)*, (WHO, unpublished data).

WHO, at the global, regional and country levels, is at the forefront to support all countries in this endeavour. Action and investment by other international key players, donors and nongovernmental organizations will also make a huge difference both at the global level and for countries and facilities, in particular where resources and expertise are limited.

References

1. Core competencies for infection prevention and control professionals. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/335821, accessed 8 November 2024).
2. Global report on infection prevention and control. Geneva: World Health Organization; 2022 (https://www.who.int/publications/i/item/9789240051164, accessed 8 November 2024).
3. Allegranzi B, Bagheri Nejad S, Combescure C, Graafmans W, Attar H, Donaldson L, Pittet D. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. Lancet. 2011;377:228-41. doi: 10.1016/s0140-6736(10)61458-4.
4. Report on the burden of endemic health care-associated infection worldwide. Geneva: World Health Organization; 2011 (https://apps.who.int/iris/handle/10665/80135, accessed 8 November 2024).
5. Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals. Stockholm: European Centre for Disease Prevention and Control; 2024 (https://www.ecdc.europa.eu/en/publications-data/PPS-HAI-AMR-acute-care-europe-2022-2023, accessed 8 November 2024).
6. Global report on the epidemiology and burden of sepsis: current evidence, identifying gaps and future directions. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/334216, accessed 8 November 2024).
7. Fleischmann-Struzek C, Goldfarb DM, Schlattmann P, Schlapbach LJ, Reinhart K, Kissoon N. The global burden of paediatric and neonatal sepsis: a systematic review. Lancet Respir Med. 2018;6:223-30. doi: 10.1016/S2213-2600(18)30063-8.
8. Markwart R, Saito H, Harder T, Tomczyk S, Cassini A, Fleischmann-Struzek C et al. Epidemiology and burden of sepsis acquired in hospitals and intensive care units: a systematic review and meta-analysis. Intensive Care Med. 2020;46:1536-51. doi. 10.1007/s00134-020-06106-2.
9. Balasubramanian R, Van Boeckel TP, Carmeli Y, Cosgrove S, Laxminarayan R. Global incidence in hospital-associated infections resistant to antibiotics: An analysis of point prevalence surveys from 99 countries. PLOS Med. 2023;20:e1004178. doi: 10.1371/journal.pmed.1004178.
10. Cassini A, Plachouras D, Eckmanns T, Abu Sin M, Blank HP, Ducomble T et al. Burden of six healthcare-associated infections on European population health: estimating incidence-based disability-adjusted life years through a population prevalence-based modelling study. PLoS Med. 2016;13:e1002150. doi: 10.1371/journal.pmed.1002150.
11. Cassini A, Högberg LD, Plachouras D, Quattrocchi A, Hoxha A, Simonsen GS et al. Attributable deaths and disability-adjusted life-years caused by infections with antibiotic-resistant bacteria in the EU and the European Economic Area in 2015: a population-level modelling analysis. Lancet Infect Dis. 2019;19:56-66. doi: 10.1016/s1473-3099(18)30605-4.
12. Laxminarayan R, Duse A, Wattal C, Zaidi AK, Wertheim HF, Sumpradit N et al. Antibiotic resistance-the need for global solutions. Lancet Infect Dis. 2013;13:1057-98. doi: 10.1016/S1473-3099(13)70318-9.
13. Antimicrobial resistance: global report on surveillance. Geneva: World Health Organization; 2014 (https://apps.who.int/iris/handle/10665/112642, accessed 7 November 2024).
14. Rapid risk assessment: carbapenem-resistant Enterobacteriaceae – 8 April 2016. Stockholm: European Centre for Disease Prevention and Control; 2016.
15. Lemos EV, de la Hoz FP, Einarson TR, McGhan WF, Quevedo E, Castañeda C et al. Carbapenem resistance and mortality in patients with *Acinetobacter baumannii* infection: systematic review and meta-analysis. Clin Microbiol Infect. 2014;20:416-23. doi: 10.1111/1469-0691.12363.
16. Stewardson AJ, Marimuthu K, Sengupta S, Allignol A, El-Bouseary M, Carvalho MJ et al. Effect of carbapenem resistance on outcomes of bloodstream infection caused by Enterobacteriaceae in low-income and middle-income countries (PANORAMA): a multinational prospective cohort study. Lancet Infect Dis. 2019;19:601-10. doi: 10.1016/s1473-3099(18)30792-8.

17. Zhang Y, Chen XL, Huang AW, Liu SL, Liu WJ, Zhang N et al. Mortality attributable to carbapenem-resistant Pseudomonas aeruginosa bacteremia: a meta-analysis of cohort studies. Emerg Microbes Infect. 2016;5:e27. doi: 10.1038/emi.2016.22.
18. Lewnard JA, Charani E, Gleason A, Hsu LY, Khan WA, Karkey A et al. Burden of bacterial antimicrobial resistance in low-income and middle-income countries avertible by existing interventions: an evidence review and modelling analysis. Lancet. 2024;403:2439-54. doi: 10.1016/s0140-6736(24)00862-6.
19. Voicing African priorities on the active pandemic: African Union AMR landmark report. Addis Ababa: Africa Centres for Disease Control and Prevention; 2024 (https://africacdc.org/download/african-union-amr-landmark-report-voicing-african-priorities-on-the-active-pandemic/, accessed 7 November 2024).
20. Food and Agriculture Organization of the United Nations (FAO)/United Nations Environment Programme (UNEP)/WHO/World Organisation for Animal Health (WOAH). Global Database for the Tracking Antimicrobial Resistance (AMR) Country Self-assessment Survey (TrACSS). Geneva: World Health Organization; 2024 (http://amrcountryprogress.org/, accessed 8 November 2024).
21. Tomczyk S, Twyman A, de Kraker MEA, Coutinho Rehse AP, Tartari E, Toledo JP et al. The first WHO global survey on infection prevention and control in health-care facilities. Lancet Infect Dis. 2022;22:845-56. doi: 10.1016/S1473-3099(21)00809-4.
22. Pulse survey on continuity of essential health services during the COVID-19 pandemic: interim report, 27 August 2020. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/334048, accessed 8 November 2024).
23. Second round of the national pulse survey on continuity of essential health services during the COVID-19 pandemic: January-March 2021: interim report, 22 April 2021. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/340937, accessed 8 November 2024).
24. Third round of the global pulse survey on continuity of essential health services during the COVID-19 pandemic. Interim report, 07 February 2022. Geneva: World Health Organization; 2022 (https://iris.who.int/bitstream/handle/10665/351527/WHO-2019-nCoV-EHS-continuity-survey-2022.1-eng.pdf?sequence=1, accessed 8 November 2024).
25. Fourth round of the global pulse survey on continuity of essential health services during the COVID-19 pandemic: November 2022–January 2023: interim report, 01 May 2023. Geneva: World Health Organization; 2023 (https://iris.who.int/handle/10665/367352, accessed 8 November 2024).
26. Rivas-Morello B, Horemans D, Viswanathan K, Taylor C, Blanchard A, Karamagi H et al. Assessing capacities and resilience of health services during the COVID-19 pandemic: Lessons learned from use of rapid key informant surveys. Front Public Health. 2023;11:1102507. doi: 10.3389/fpubh.2023.1102507.
27. WASH in health care facilities 2023 data update: special focus on primary health care. Geneva: World Health Organization and the United Nations Children's Fund (UNICEF); 2024. Licence: CC BY-NC-SA 3.0 IGO (https://washdata.org/reports/jmp-2024-wash-hcf , accessed 8 November 2024).
28. Chaitkin M, McCormick S, Torreano J, Amongin I, Gaya S, Hanssen O et al. Estimating the cost of achieving universal basic wash standards in health care facilities in the 46 least developed countries: a modelling study. Lancet Glob Health. 2022;10:e840-e49. doi: 10.1016/S2214-109X(22)00099-7.
29. de Kraker MEA, Tartari E, Tomczyk S, Twyman A, Francioli L, Cassini A et al. Implementation of hand hygiene in health-care facilities: results from the WHO Hand Hygiene Self-Assessment Framework global survey 2019. Lancet Infect Dis. 2022;22:835-84. doi: 10.1016/S1473-3099(21)00618-6.
30. International Health Regulations (2005): States Party Self-assessment annual reporting tool, 2nd edition. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/350218, accessed 8 November 2024).
31. Allegranzi B, Kilpatrick C, Storr J, Kelley E, Park BJ, Donaldson L. Global infection prevention and control priorities 2018-22: a call for action. Lancet Glob Health. 2017;5:e1178-e80. doi: 10.1016/s2214-109x(17)30427-8.

32. Resolution WHA75.13. Global strategy on infection prevention and control. In: Seventy-fifth World Health Assembly, Geneva, 22–28 May 2022. Resolutions and decisions, annexes. Geneva: World Health Organization; 2022 (https://apps.who.int/gb/ebwha/pdf_files/WHA75/A75_ACONF5-en.pdf, accessed 8 November 2024).
33. Global strategy on infection prevention and control. Geneva: World Health Organization; 2023 (https://iris.who.int/handle/10665/376751, accessed 8 November 2024).
34. Global action plan and monitoring framework on infection prevention and control (IPC), 2024–2030. Geneva: World Health Organization; 2024 (https://www.who.int/teams/integrated-health-services/infection-prevention-control/draft-global-action-plan-and-monitoring-framework-on-ipc#cms, accessed 8 November 2024).
35. Decision WHA77(9). Global action plan and monitoring framework on infection prevention and control. Seventy-seventh World Health Assembly, 27 May – 1 June 2024. Geneva: World Health Organization; 2024 (https://apps.who.int/gb/ebwha/pdf_files/WHA77/A77_(9)-en.pdf, accessed 8 November 2024).

Nurses and their trainer gather after a training session at a primary healthcare centre in Tajikistan. © WHO / Lindsay Mackenzie

Chapter 1.

Introduction, methods
and target audience

Chapter 1. Introduction, methods and target audience

1.1 What is infection prevention and control?

Infection prevention and control (IPC) is a clinical and public health specialty and a set of measures, based on a practical, evidence-based approach. The aim of IPC is to prevent patients, health workers and visitors to health care facilities from being harmed by avoidable infections acquired during the provision of health care services, including those caused by antimicrobial-resistant pathogens and spreading through outbreaks *(1)*.

Effective IPC interventions provide timely, efficient and compassionate interventions integrated within clinical pathways.

> IPC occupies a unique position in the field of patient and health workers' safety and quality of care as it is universally relevant to every health worker and patient at every health care interaction.

IPC is based on a scientific approach grounded in infectious diseases, epidemiology, social and implementation science, engineering, and health system strengthening. Therefore, all persons involved in the IPC programme at the national, subnational (regional) and facility level must be competent, with the required knowledge, skills and attitudes to be able to practice clinical duties safely and ethically and promote the necessary multidisciplinary interactions *(1)*.

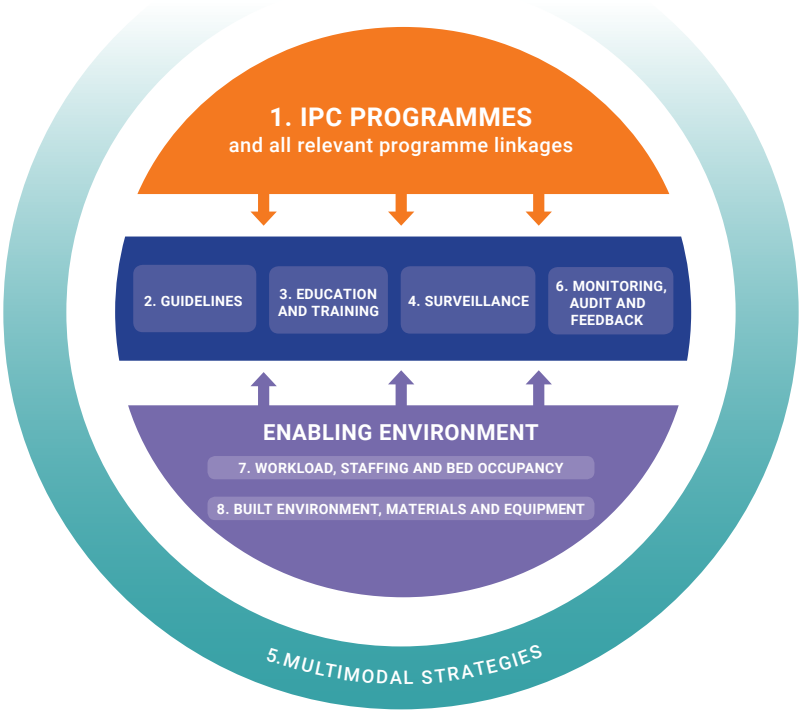
IPC is a proven and cost-effective approach to prevent the transmission of infectious hazards, but applying it requires programmatic, institutional, financial and knowledge support. Effective IPC requires constant and sustained action at all levels of the health system, ranging from policy-makers to facility managers, health workers and other relevant stakeholders, as well as all those who access health services, and their family members.

Moreover, IPC is a cornerstone of health system resiliency and preparedness. The COVID-19 pandemic and other large-scale public health emergencies demonstrated not only the importance of protecting health workers and patients through IPC, but also the central role of health care facilities in the control of emerging infectious diseases and protecting communities.

In 2016, the World Health Organization (WHO) issued comprehensive, evidence-based and consensus-based guidelines on the core components for effective IPC programmes, including 11 recommendations and three good practice statements *(2)*. Six core components are recommended at the national and facility levels *(2, 3)*, with two additional core components specific to the facility level *(2, 4)* (Fig. 1.1).

Recognizing that the fulfilment of all IPC core components takes time and that countries may be at different stages of progress with different capacities, available opportunities and resources, WHO established a set of international IPC minimum standards by developing minimum requirements for IPC programmes in 2019 *(5)*. These were directly derived from the IPC core components through a consensus-building process involving IPC stakeholders, experts and field implementers from around the world.

Fig. 1.1. The WHO core components of IPC programmes at the national and facility level



Source: *(3)*.

The minimum requirements represent the starting point for undertaking the journey to build strong and effective IPC programmes at the national, subnational and facility levels (Fig. 1.2.) and should be in place in all countries and health care facilities to support further progress towards full and sustained implementation of all IPC core components *(2)* (Annex 1).

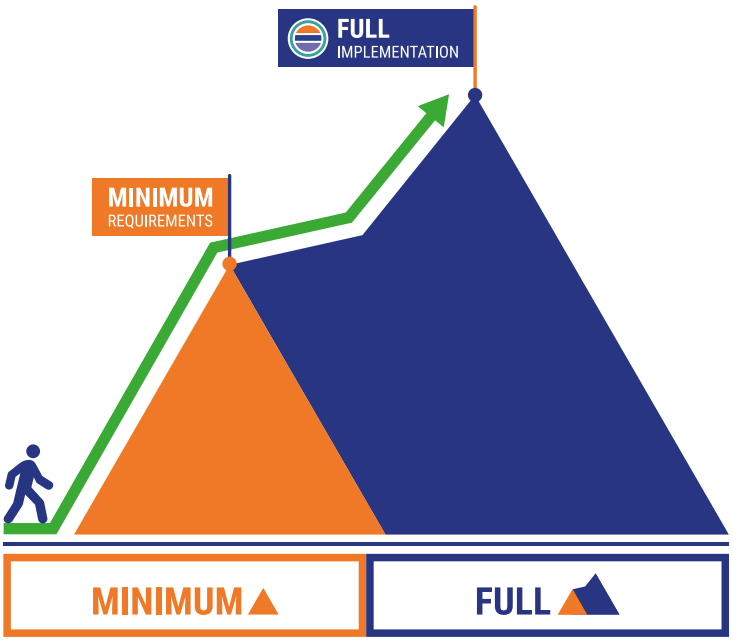
In particular for countries where IPC measures are limited or non-existent, it is critical to start by ensuring that at least minimum requirements for IPC *(5)* are in place as soon as possible, both at the national and facility level. Countries can then gradually progress to the full achievement of all requirements of the IPC core components *(2)* according to local priority plans (Annex 1).

Since May 2024, the WHO IPC core components and minimum requirements have been endorsed by all countries as the basis and targets for the actions and indicators of the 2024–2030 WHO global action plan and monitoring framework (GAP/MF) for IPC *(6)*, adopted at the 77th World Health Assembly *(7)*.

Whether applying the minimum requirements or full requirements, the implementation of the IPC core components should always be undertaken using a stepwise approach, based on a careful assessment of the status of the IPC programme and local activities and conditions.

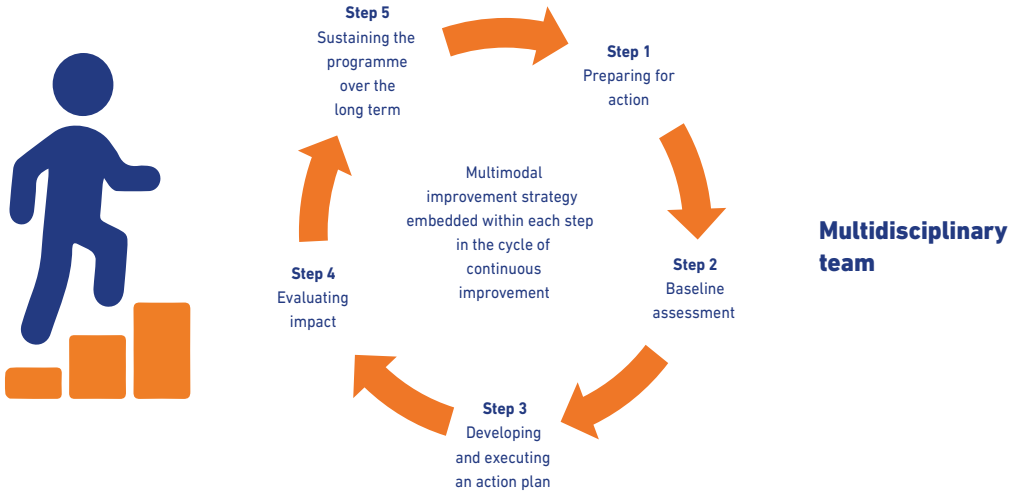
To undertake this process, WHO proposes a five-step implementation cycle *(3)* (Fig. 1.3.) to support any IPC improvement intervention or programme, based on implementation and quality improvement science.

Fig. 1.2. Minimum versus full requirements to achieve effective IPC programmes



Source: *(5)*.

Fig. 1.3. The five-step implementation cycle for IPC improvement



Source: *(8)*.

Detailed guidance on the implementation of the WHO core components and minimum requirements is provided by WHO through multiple manuals and tools, including standardized assessments tools for the national and facility levels *(3, 4, 9-15)*.

Based on compelling evidence and WHO research, especially in the field of hand hygiene, multimodal improvement strategies (MMIS) are a central pillar of both WHO core components and minimum requirements *(2, 16-23)* and are recognized as the gold standard approach to implementing IPC interventions at the point of care. In other words, the use of a MMIS is considered the best way to achieve the system and behavioural change and institutional climate that support sustainable IPC progress and, ultimately, the measurable impact that benefits patients and health workers.

1.2 Purpose and target audience of this report

This global report is an update of the previous edition issued in 2022 *(8)* and provides a snapshot of the implementation of these WHO recommendations and standards aimed at making health care settings a safe environment through best practices in IPC, including water, sanitation and hygiene (WASH) and waste management.

This report aims to provide:

- an overview of the problem of health care-associated infections (HAI) and antimicrobial resistance (AMR) associated with health care delivery and a global situation analysis of the implementation of IPC policies at national and facility level, including WASH;
- a deep-dive into the current level of IPC implementation and suggestions for priority actions accordingly for each WHO region.
- strategic directions, actions, indicators and targets included in recent landmark political and implementation documents, for countries and the international IPC community to progress in the implementation and improvement of IPC.

Among the highest priorities for the future, the report highlights the importance of the alignment and coordination of IPC with wider efforts on WASH, AMR, health emergencies and quality and safety in order to harness the combined policy, implementation and financing efforts of key stakeholders.

Primarily, this document targets those in charge of making decisions and formulating policies in the field of IPC at the national, subnational and facility levels. These include policy-makers, senior managers, and administrators who are managing health budgets, as well as IPC focal points at national (ministry of health, public health institutes, etc.), subnational and health care facility levels.

It is also aimed at professionals with the mandate to develop and implement national action plans for combating AMR, setting national strategic directions for quality health services, promoting patient safety, and those responsible for preparing and responding to public health emergencies in the context of the International Health Regulations (IHR 2005) *(24)*.

This report should also be helpful to other stakeholders, including those responsible for the following areas: IPC and quality of care at facility level; health facility accreditation/regulations; occupational health; public health; infectious disease control and surveillance; WASH; antimicrobial stewardship programmes; clinical microbiology and environmental health interventions; as well as additional categories of health workers involved in care delivery. It also targets health leaders and technical staff in international organizations, nongovernmental organizations, donor organizations and foundations in global health, and other civil society actors.

Two country examples are included in this report with the aim to cover the national and the facility/point of care level.

The first example illustrates progress at the national level in the implementation of a comprehensive strategy to improve IPC in line with the WHO global strategy. The second describes a national and facility initiative with a demonstrated impact on HAI reduction at the point of care (Annex 3).

This report does not specifically address antimicrobial stewardship, although it plays an essential role, complementary to IPC, in the context of critical strategies to reduce AMR and requires specific interventions and approaches *(25)*.

1.3 Data sources and methodologies

This report is the result of a cross-cutting and multidisciplinary effort involving WHO headquarters and regional offices. It collates information and data from many sources, including the scientific literature, WHO global monitoring systems, national surveys and studies, and reports by other institutions. It reports assessments of IPC indicators made using WHO standardized data collection tools and systems that are completed regularly, either at the national or at the facility level, such as those monitoring national action plans for AMR and patient safety, essential health services, and preparedness for health emergencies or in response to outbreaks.

Data are also included from detailed WHO global surveys of national or facility IPC and hand hygiene programmes using standardized tools. Evaluations were performed through either self- or joint assessments led by the countries with the support of WHO and/or other stakeholders. The relevant scientific literature on the epidemiology and burden of infection in health care was identified through rapid reviews (WHO, unpublished). Results were derived from published documents or articles and from ad hoc analyses of relevant WHO unpublished data. Specific checklists were developed for unpublished data, according to the Guidelines for Accurate and Transparent Health Estimates Reporting (GATHER) best practices in reporting health estimates *(26)*.

The country examples were identified based upon published and unpublished evidence of dedicated specific efforts to develop and implement successful IPC strategies and activities. Furthermore, they were identified in agreement with the respective WHO regional and country offices and each country example was reviewed and approved by the ministry of health.

A COVID-19 patient is treated at the isolation centre in a hospital in Misrata, Libya.
© WHO / Blink Media - Nada Harib

Chapter 2.

The problem of unsafe care resulting from HAIs and AMR

Chapter 2.
The problem of unsafe care resulting from HAIs and AMR

2.1 Key messages

- HAIs, many of which are caused by multidrug-resistant organisms, harm patients, visitors and health workers and are a significant burden to health systems, including the associated increased costs. HAIs represent one of the most frequent adverse events during health care delivery.
- Epidemic-prone pathogens, such as SARS-CoV-2, can spread through health care facilities and amplify outbreaks, involving also health workers due to exposure during care delivery.
- No country or health system, regardless of the level of development, can claim to be free of HAIs. On average, out of every 100 patients in acute care hospitals, seven patients in high-income countries (HICs) and 15 patients in low- and middle-income countries (LMICs) will acquire at least one HAI during their hospital stay. The most recent multi-country point prevalence survey conducted in 2022/2023 in 28 countries of the European Union and European Economic Area (EU/EEA) and three Western Balkan countries/territories estimated that, eight out of every 100 patients had acquired at least one HAI during their hospital stay in acute care hospitals.
- According to a key review in 2005, almost up to one third (30%) of patients in intensive care can be affected by HAIs, with an incidence that can be two to 20 times higher in LMICs than in HICs. This is particularly true among neonates.
- Approximately one in four (23.6%) of all hospital-treated sepsis cases are health care-associated. Almost one half (48.7%) of all cases of sepsis with organ dysfunction treated in adult intensive care units (ICU) are hospital-acquired.
- A pooled analysis revealed that healthcare-associated sepsis has a staggering impact on patient outcomes, with one in four affected individuals dying (24.4%). This figure rises dramatically to over half (52.3%) when patients are treated in an ICU.
- According to the European Centre for Disease Control and Prevention (ECDC), in EU/EEA countries, the burden of the six most frequent HAIs in terms of disability and premature mortality accounts for twice the burden of 32 other infectious diseases under surveillance, including influenza and tuberculosis.
- Increasing resistance to antimicrobials among various pathogens are making infections harder to treat and increase the risk of death.
- The global number of hospital-associated infections resistant to antibiotics was estimated to be 136 million annually.
- In countries across the EU/EEA, the most severe antimicrobial-resistant infections, which pose the highest risk of mortality, are typically acquired during hospitalization. Indeed, it was estimated that three quarters of the burden of AMR in terms of disability and premature mortality is due to HAIs.

- Mortality rates among hospitalized patients infected with resistant microorganisms are two to three times higher compared to those infected with susceptible ones.
- In 2019, it was estimated that bacterial AMR contributed to 4.95 million deaths globally, with 1.27 million directly attributable to AMR, and the greatest burden was observed in western sub-Saharan Africa. Notably, five out of six leading AMR pathogens responsible for this burden were predominantly health care-associated.
- According to new estimates by the Organization for Economic Co-operation and Development (OECD) and WHO, nearly 3.5 million people could lose their lives due to HAIs every year up to 2050.

2.2 How frequent are infections acquired in health care?

HAIs are a consequence of not only poor quality care, but also of increasingly advanced care without proper safety programmes. They can be a deadly cause of harm and a serious threat to patient and health worker safety.

It is estimated that more than one in ten patients suffer from adverse events as a result of unsafe health care *(27)*. As much as 12% of harm is estimated to cause permanent disability or patient death and, globally, unsafe care is estimated to cause more than 3 million deaths every year *(28)*. People in LMICs are disproportionately affected, with an estimated 134 million adverse events contributing to approximately 2.6 million deaths each year in these countries as a result of unsafe health care *(29)*. In 2009, Jha and colleagues estimated that there were 117.8 and 203.1 million hospitalizations in HICs and LMICs, respectively, and an overall incidence rate of adverse events of 14.2% and 12.7%, respectively, for a total of 42.7 million adverse events worldwide *(30)*.

The 2011 Ibero-American Study of Adverse Events estimated that the incidence of adverse events in Argentina, Colombia, Costa Rica, Mexico and Peru was 20% *(31)*. Another study of adverse events in LMICs found that the adverse event rate varied by country, ranging from 2.5% to 18.4%. Some 30% of adverse events were associated with the death of the patient in 2012 *(32)*. According to a review published in 2018, HAIs were the third most frequent adverse event globally *(33)*. Surgical errors were the most frequent, accounting for 40% of all adverse events *(33)*. In the African Surgical Outcomes Study, infection was found to be the most frequent complication of surgery *(34)*. Regarding adverse events, up to 83% (with an average of 51%) were highly preventable *(33)*.

Global estimates of HAI frequency are hampered by the lack of HAI surveillance systems in many countries, especially in LMICs. These estimates also suffer from underreporting, poor data quality, and a lack of standardization of methods and protocols.

In 2010, WHO estimated that an average of seven patients acquire at least one HAI in acute care hospitals in HICs, while 15 patients acquire at least one HAI in LMICs *(35, 36)*.

Evidence from WHO *(35, 36)* and other studies, including recent ones, showed that the frequency of HAIs varies between countries and is often associated with the country income level or local economic conditions.

In 2023, a large systematic review including 400 studies from around the world estimated the overall prevalence of HAIs to be 14% (95% confidence interval [CI], 12 –15) and also provided estimates by WHO region (Fig. 2.1) *(37)*. While the estimates of this systematic review can be useful to understand the magnitude of the problem of HAIs, any comparisons between regions and countries should be made with caution as the studies included in the review and meta-analyses may have used different methods and a number of factors are known to influence the results depending on the local situation.

Primary multicentre or multi-country prevalence or incidence surveys on HAI are conducted very rarely. The ECDC has been providing solid methods and coordinating mechanisms for such studies across EU/EEA countries since more than a decade through the Healthcare-associated Infections Surveillance Network (HAI-Net) *(38)*.

The most recent European point prevalence survey was conducted in 2022/2023 in 28 EU/EEA countries and three Western Balkan countries/territories and estimated the adjusted prevalence of patients with at least one HAI at 8.0% (95% CI, 6.6–9.6) (Fig. 2.1) *(39)*.

In the previous ECDC point prevalence survey carried out in 2016 to 2017, HAI prevalence was at 6.5% (cumulative 95% CI, 5.4–7.8) *(40)*.

In 2017, ECDC calculated that 4.5 million episodes of HAIs occurred in patients admitted to acute care hospitals (a total of 8.9 million when also accounting for long-term care facilities) in EU/EEA countries *(40)*. This number has not substantially changed in recent ECDC estimates related to the period 2022–2023 *(39)*, which reported 4.8 million HAIs (infection episodes) per year, with an estimated 93 305 patients with at least one HAI on any given day in acute care hospitals in EU/EEA countries. In 2011, ECDC estimated 91 310 attributable deaths to have occurred in acute care hospitals *(41)*.

A multi-country prevalence survey of HAIs in the WHO Eastern Mediterranean Region showed a HAI prevalence of 11.2% *(42)*. The above-mentioned more recent review *(37)* included 103 studies from that region and estimated a similar overall pooled prevalence of HAIs of 12.5 % (95% CI, 9.8–15.9).

According to a systematic review published in 2015 *(43)* and the above-mentioned more recent review *(37)*, the pooled prevalence of HAIs in the WHO South-East Asia Region was estimated to be 9.0% (95% CI, 7.2–10.8) and 12.9 % (95% CI, 8.6 – 18.8), respectively.

Forty-four studies from the Western Pacific Region were included in the above-mentioned review and the pooled prevalence of HAIs in was 9.7 % (95% CI, 6.9–13.6%) *(37)*. National prevalence studies from Singapore and Australia, both in that region, showed an overall prevalence of HAIs in acute care hospitals of 11.9% (95% CI, 11.1–12.8) and 9.9% (95% CI, 8.8–11.0), respectively *(44, 45)*.

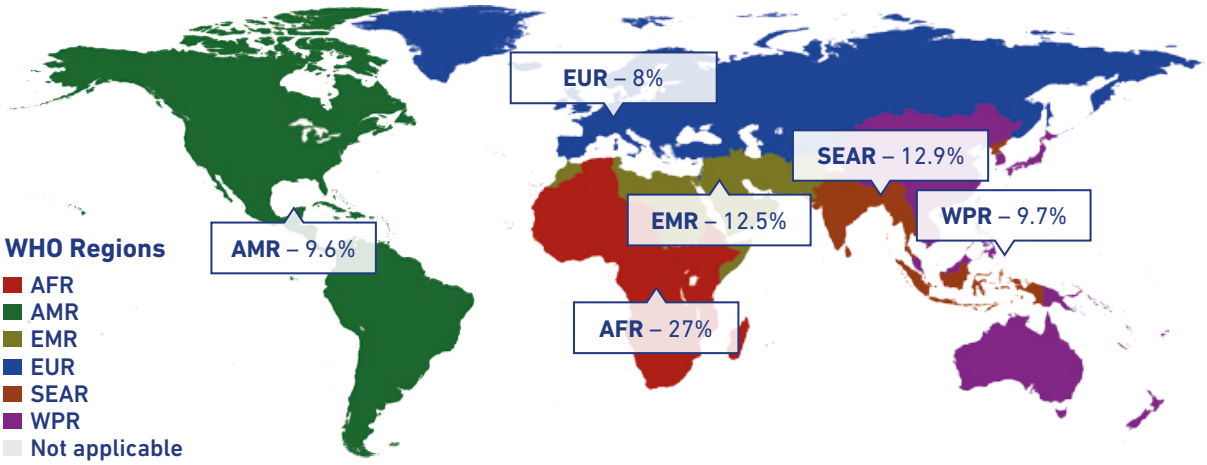
Ninety-four studies from the WHO African Region were included in the above-mentioned review, which estimated an overall prevalence of HAIs of 27% (95% CI, 22.2–32.4) *(37)*. A systematic review published in 2024 focusing on the African continent estimated a median HAI prevalence of 15%, with a variation across studies between 1.6% and 90.2 *(46)*.

Eighteen studies from the Region of the Americas were included in the above-mentioned systematic review, which estimated the overall pooled prevalence of HAIs to be 9.6 % (95% CI, 7.9 –11.7) *(37)* for this region (Fig. 2.1). HAI prevalence was found to be 3.2% across 199 hospitals in the United States of America in 2015, while the proportion of patients with HAIs was significantly lower than in 2011 (4.0%) *(47)*. The United States

Centers for Disease Control and Prevention (CDC) estimated that one in 31 hospital patients and one in 43 nursing home residents on any given day has a HAI *(48)*. A national point prevalence survey conducted in Canada showed variations from 9.9% in 2002 (95% CI, 8.4–11.5) to 11.3% in 2009 (95% CI, 9.4–13.5), and then 7.9% in 2017 (95% CI. 6.8–9.0) *(49)*.

While it is important to provide an overview of data reported in different countries and regions, any comparisons of HAI rates should be made with caution as the methods used in different studies may vary and a number of factors are known to influence the results depending on the local situation.

Fig. 2.1. Frequency of HAIs reported in different WHO regions



Abbreviations and (year of publication): AFR, African Region (2023); AMR, Region for the Americas (2023); EMR, Eastern Mediterranean Region (2023); EUR, European Region (2024); SEAR, South-East Asia Region (2023); WPR, Western Pacific Region (2023).
Source: *(37, 39)*.

The 2011 *WHO report on the burden of endemic health care-associated infection worldwide* indicated that surgical site infection (SSI) was the most frequent type of HAI reported hospital-wide in LMICs, with a significantly higher level of risk than in HICs *(36)*.

According to a systematic literature review on SSI in LMICs between 1995 and 2015, the pooled SSI incidence rate was 5.9% (95% CI, 4.8–7.1) per 100 surgical operations and 11.2 per 100 surgical patients (95% CI 9.7–12.8), with significant variations according to the type of surgical procedures (WHO, unpublished data). The incidence of SSI following caesarean section in LMICs was 11.7% (95% CI, 9.1–14.8), a much higher average rate than that reported in Europe (2.9%) *(50)*. Caesarean section is considered the single most important risk factor for maternal infection after childbirth globally *(51)*. In Africa, up to 20% of women who deliver through caesarean section get a wound infection, which affects their health and their ability to provide quality care for their newborn child *(34)*.

Similarly, SSI incidence in prosthetic orthopaedic surgery was 9.7% (95 CI, 5.3–15.3) in LMICs and 0.7% (knee prosthesis) to 1.0% (hip prosthesis) in Europe (WHO, unpublished data). ECDC recently reported a range from 0.6% in knee prosthesis surgery to 9.5% in open colon surgery (percentage of SSIs per 100 operations), or an incidence density (in-hospital SSIs per 1000 postoperative patient-days) of 0.1 (knee prosthesis) to 5.0 (open colon surgery), depending on the type of surgical procedure based on data from 12 EU Member States and one EEA country in 2018–2020 *(52)*.

A systematic review published in 2021 including 57 studies from around the world found a pooled 30-day cumulative incidence of SSI of 11% (95% CI, 10–13), meaning 11 out of 100 general surgical patients are

[1] Albania, Argentina, Australia, Benin, Cameroon, China, China, Hong Kong Special Administrative Region, Cuba, Ethiopia, France, Georgia, Germany, Ghana, Herzegovina, India, Iran, Italy, Malawi, Nepal, Nigeria, Poland, Rwanda, Saudi Arabia, South Africa, Switzerland, United Republic of Tanzania, Thailand, Tunisia, Turkey, and the United States of America.

likely to develop an infection 30 days after surgery *(53)*. Another systematic review published in 2023 and including 43 studies conducted in 29 countries[1] estimated an overall pooled global incidence of SSI of 2.5% (95% CI, 1.6–3.7) among general surgical patients. A subgroup analysis by WHO region showed differences across the regions: the African Region, pooled incidence of SSI 7.2% (95% CI, 4.3– 11.8); Region of the Americas, 3.1% (95% CI, 2.2–4.3); Eastern Mediterranean Region, 2.2% (95% CI, 1.3–4.0); European Region, 2.2% (95% CI, 1.3–4.0); South-East Asia Region, 1.2% (95% CI, 0.4–3.1); Western Pacific Region, 0.6% (95% CI, 0.2– 1.7) *(54)*. These differences might reflect a higher risk of SSI in African countries, but also different study methodologies and quality.

With respect to prevalence[2], a systematic review including studies published in Africa from 2010 to 2022 estimated an overall SSI prevalence of 18% (95% CI, 14–21) in a post hoc sensitivity analysis *(46)*. The overall prevalence of SSI estimated from 40 studies from 12 countries of the Eastern Mediterranean Region was 7.9% (95% CI, 7.1–8.8) *(55)*. The prevalence of SSI in cardiac and general surgery was 10% and 9.2%, respectively. Another systematic review including 99 studies across 39 developing countries estimated a prevalence of SSI in clean and clean-contaminated surgeries of 6% (95% CI, 5–7), which increased to 15% (95% CI, 6–27) when considering only studies that included post-discharge surveillance data *(56)*.

In EU/EEA countries and in countries of the WHO Eastern Mediterranean Region, the most frequent HAIs were respiratory tract infections, followed by urinary tract infections, SSIs and bloodstream infections (BSI) *(39, 42)*.

The toll is heavier among high-risk patients, such as those admitted to ICUs, who often acquire infections from indwelling devices such as urinary or vascular catheters or invasive mechanical ventilation. Infections associated with these devices can affect as many as 30% of patients in ICUs and their incidence in LMICs is at least triple that in HICs *(35, 36, 57)*. A large variation of the prevalence of ICU-acquired infections in adult patients was found among hospitals and countries, with pneumonia being the most common *(57)*.

Prevalence studies across income levels show a high percentage of overall HAIs among ICU patients: Canada, 12.6% (95% CI, 10.1–15.7) in 2017 *(49)*; China, 26.07% (95% CI, 23.03–29.12) in 2006-2016[3] *(58)*; Ethiopia, 25.8% (95% CI, 3.55–40.06) in 2011 and 2017[4] (study period) *(59)*; and Singapore, 37.0% (95% CI, 31.2–42.8) in 2015-2016 *(44)*. In 2022/2023, the most recent prevalence survey in 28 EU/EEA countries and three Western Balkan countries/territories estimated the prevalence for ICU patients with at least one HAI to be 20.5% compared with 6.4% for all other specialties combined *(39)*.

A multicentre study conducted from 2013 to 2018 in 664 ICUs in 133 cities of 45 countries from Latin America, Europe, Africa, the Eastern Mediterranean, South-East Asia and the Western Pacific found device-associated HAI rates to be 5.91% and 9.01/1000 bed-days. The pooled catheter-associated urinary tract infection (CAUTI) rate was 3.16/1000 urinary catheter-days, while the central line-associated BSI (CLABSI) rate was 5.30/1000 central line-days, and the ventilator-associated events (VAE) rate was even as high as 11.47/1000 mechanical ventilation-days *(60)*.

In 2019, the ECDC reported that 7.4% of patients staying in an ICU for more than two days presented with at least one HAI (pneumonia, BSI or UTI) based on data from 11 networks in 10 countries[5] from 1285 hospitals and 1659 ICUs *(61)*.

[2] It is difficult to confirm how the term "prevalence" was used in these reviews, considering that studies generally assess SSI incidence as the surveillance of SSI usually includes a postoperative follow-up period.
[3] Pooled results from a systematic review of multicentre point prevalence surveys conducted in acute care hospitals in mainland China from January 2006 to August 2016.
[4] Pooled results from two separate regional studies identified in a systematic review.
[5] Austria, Belgium, France, Germany, Hungary, Italy, Lithuania, Portugal, Spain, and the United Kingdom of Great Britain and Northern Ireland (Scotland).

Particularly in these patients, but not only among this population, infection can rapidly and frequently evolve to sepsis, a life-threatening organ dysfunction. Sepsis represents a final common pathway to death from many infectious diseases worldwide.

In a review of published studies, WHO calculated that among hospital-treated sepsis cases worldwide, approximately one in four cases (23.6%) were health care-associated *(62)*. In adult ICUs, almost half of all cases (48.7%) of sepsis with organ dysfunction treated in ICUs were hospital-acquired *(62, 63)*.

According to the pooled analyses in the above-mentioned WHO review, the incidence of health care-associated sepsis globally was 15.4 (95% CI, 9.2–25.7) cases per 1000 adult patients *(63)* and more than seven times higher among neonates (112.9 [95% CI, 64.2–191.1]) cases per 1000 neonates) *(62)*. It was also found in a pivotal review published in 2005 that newborns were at a higher risk of acquiring HAI, with infection rates in LMICs three to 20 times the rates in HICs *(64)*.

2.2.1 AMR in health care

The spread of microorganisms that are resistant to antimicrobials is a critical issue in health care settings and IPC interventions can play a substantial role in significantly reducing the spread, along with optimal diagnostic and antimicrobial stewardship.

A modelling study based on data from 474 point prevalence surveys published between 2010 and 2020 across 99 countries, coupled with country-level estimates of hospitalization rates and durations, estimated the global number of HAIs resistant to antibiotics to be 136 million (95% CI, 26–246) per year) *(65)*.

Among income groups, middle-income countries bore the highest burden of HAIs resistant to antibiotics per year (119 million [95% CI, 23–215]), with an average hospitalization rate of 6% across all middle-income countries. For low-income countries, 2 million (95% CI, 0–5) HAIs resistant to antibiotics per year were estimated, with an average hospitalization rate of 3% across countries, however, providing the least data points overall. The average hospitalization rate across all HICs was 11% with an estimated 15 million (95% CI, 4–25).

In the 2022/2023 ECDC point prevalence study in EU/EEA countries, the most frequent pathogens causing HAIs were *Escherichia coli* (12.7%), *Klebsiella* spp. (11.7%), *Enterococcus* spp. (10.0%; overall vancomycin resistance was reported in 15.6% of isolated enterococci), SARS-CoV-2 (9.5%), *Staphylococcus aureus* (9.0%), *Clostridium difficile* (8.0%), *Pseudomonas aeruginosa* (7.9%), coagulase-negative staphylococci (5.8%), *Candida* spp. (4.7%), *Proteus* spp. (3.2%), *Acinetobacter* spp. (3.2%) and *Enterobacter* spp. (3.0%) *(39)*.

In a global survey conducted by WHO in 2014, the prevalence of meticillin-resistant *S. aureus* (MRSA), *E. coli* resistant to third-generation cephalosporin, and carbapenem resistance by Enterobacterales, formerly known as Enterobacteriaceae *(66),* and *P. aeruginosa* from blood samples was significantly higher in LMICs than in HICs *(67)*. This was also documented in the results of a surveillance study conducted by the International Nosocomial Infection Control Consortium between January 2010 and December 2015 in 703 ICUs in LMICs across five continents, excluding Africa. From blood cultures, the overall resistance of *Pseudomonas* spp. to imipenem was 44.3% (compared with 26.1% in the United States of America in the same period). Resistance of *K. pneumoniae* to ceftazidime was 73.2% (versus 28.8%) and to imipenem 43.27% (versus 12.8%) *(68)*. Data

from 664 ICUs in 133 cities of 45 countries found that overall, *P. aeruginosa* was non-susceptible to imipenem in 52.7% of cases, to colistin in 10.4%, to ceftazidime in 50.0%, to ciprofloxacin in 40.28%, and to amikacin in 34.05% *(60)*. *Klebsiella* spp was non-susceptible to imipenem in 49.2% of cases, to ceftazidime in 78.0%, to ciprofloxacin in 66.3%, and to amikacin in 42.4%.

2.2.2 MRSA

The median percentage of MRSA causing BSI reported by the Global Antimicrobial Resistance and Use Surveillance System (GLASS) was 33.9% (interquartile range [IQR], 13.6–54.9) globally in 2022, but only 7.6% (IQR, 3.1–19.9) based on data provided by 21 countries with better testing coverage *(69)*.

Most LMICs presented lower testing coverage compared to HICs. In 2021, 25% of EU/EEA countries reporting data on *S. aureus* had MRSA percentages below 5%. MRSA percentages equal to or above 25% were observed in 30% of EU/EEA countries *(70)*. According to the most recent European Antimicrobial Resistance Surveillance Network (EARS-Net) report with data from EU/EEA countries, a significantly decreasing trend in the EU/EEA (excluding the United Kingdom of Great Britain and Northern Ireland) population-weighted, mean percentage of MRSA isolates, as well as in the estimated EU incidence of BSIs with MRSA, was reported during the period 2018−2022. In 2022, there was a 12.2% decrease in the estimated incidence compared to the baseline year 2019 *(71)*. In the 2022/2023 point prevalence survey in hospitals in EU/EEA countries, overall meticillin resistance was reported in 23.7% of *S. aureus* isolates *(39)*.

2.2.3 Resistance to third-generation cephalosporins

The median percentage of *E. coli* resistance to third-generation cephalosporins causing BSIs was 44.7% (IQR, 17.9–70.9) globally in 2022, but only 11.4% (IQR, 9.4–15.6) based on data provided by 21 countries with better testing coverage *(69)*.

Most LMICs presented lower testing coverage compared to HICs. Median resistance percentage for third-generation cephalosporin resistance in BSIs with *E. coli* in 2022 was observed to be lower when compared to 2018 (31.3% [2018] versus 28.4% [2022], based on data from 44 countries) *(69)*. According to data reported by EU/EEA countries to EARS-Net, a decreasing trend in the estimated incidence of BSIs with third-generation cephalosporin-resistant *E. coli* was observed from 2018 to 2022 for the EU, with a 16.8% decrease in 2022 against the baseline year 2019 *(71)*. Time series showed an overall high percentage resistance (median of >60%) to third-generation cephalosporins in *Klebsiella pneumoniae* BSIs from 2018 to 2022 *(69)*. Colonization rates with extended-spectrum cephalosporin-resistant Enterobacterales of 82% were found among hospitalized patients across[6] *(72-77)*. However, in the community, extended-spectrum cephalosporin-resistant Enterobacterales colonization was as high as 78%. The most recent prevalence data from EU/EEA countries showed third-generation cephalosporin resistance to be in 34.7% of all Enterobacterales and the highest in *K. pneumoniae* with 58.1% *(39)*.

[6] Bangladesh, India, Kenya, Botswana, Chile and Guatemala.

2.2.4 Resistance to carbapenems

A high percentage of resistance (median of >50%) to various carbapenems was shown in *Acinetobacter* spp. BSIs according to data reported globally from 2018 to 2022 *(69)*.

An increase in meropenem resistance in *E. coli* BSIs was observed over the years (median, 1.5%, IQR, 0.1–3.8 [2018] to 1.8%, IQR, 1.4–6.4 [2022] based on data from 24 countries) *(69)*. The impact of the COVID-19 pandemic on AMR in EU/EEA countries has been reported by ECDC for typical health care-associated pathogens *(78)*. For example, in 2020, carbapenem resistance in *Acinetobacter* spp. was equal to or above 50% in 55% of countries, mostly in southern and eastern Europe. On average, further data on EU/EEA countries showed more than double (+121%) the number of reported *Acinetobacter* spp. cases resistant to each of the three antimicrobial groups (carbapenems, fluoroquinolones and aminoglycosides) in 2021 compared to the average for 2018–2019. In addition, the population- weighted mean AMR percentage had increased by more than 20% for each of these groups. These findings imply that the situation with *Acinetobacter* spp. in the EU/EEA countries had deteriorated for two consecutive years. However, for 2022, the EU/EEA population-weighted mean AMR percentages in *Acinetobacter spp*. showed decreases for all antimicrobial groups under surveillance compared to 2021 *(71)*.

For *K. pneumoniae*, the percentage of cases resistant to carbapenems continued to increase and this was also observed in laboratories that continuously reported data from 2017 to 2021. In these laboratories, the percentage remained unchanged from 2017 to 2018, but increased by +8% from 2018 to 2019. The percentage of carbapenem-resistant *K. pneumoniae* cases then increased by a further 31% and 20% in 2020 and 2021, respectively *(79)*. In the 2022 report based on EARS-Net data from EU/EEA countries, almost one third of them reported carbapenem resistance percentages above 10% in *K. pneumoniae (71)*. Carbapenem-resistant *K. pneumoniae* showed the largest increase (+2.4%) in population-weighted, mean AMR percentage under EARS-Net surveillance during 2018–2022. In addition, there was a significantly increasing trend in the estimated incidence of BSIs with carbapenem-resistant *K. pneumoniae*, with a 49.7% increase in 2022 versus 2019.

The reported percentages of pathogens with AMR varied widely among countries, often with a north-to-south and west-to-east gradient. In general, the lowest percentages of AMR among pathogens were reported by countries in the north of the EU/EEA, and the highest by countries in the south and east of the EU/EEA. This applied for several combinations of bacterial species and antimicrobial properties *(79)*.

The most recent data from EU/EEA countries generated in 2022/2023 showed carbapenem resistance to be in 29.7% of *P. aeruginosa* isolates and in 82.9% of *Acinetobacter baumannii* isolates, as well as in 9.3% of all included Enterobacterales (mean of countries, 9.5% [median, 3.4%]), with the highest (25.1%) in *K. pneumoniae (39)*.

Colonization by carbapenem-resistant Enterobacterales (CRE) was reported in 37% of hospitalized patients across six countries[7] and as high as 15% in the community setting *(72-77)*.

[7] Bangladesh, India, Kenya, Botswana, Chile and Guatemala.

2.2.5 Resistance in *Candida* spp

Resistance has increased in *Candida* spp. isolates in health care settings, particularly with the emergence of *C. auris* in the last years, a species that is echinocandin- and pan-resistant and increasingly reported as the cause of outbreaks in health care settings *(80, 81)*. A total of 1812 *C. auris* cases were reported by 15 EU/EEA countries from 2013 to 2021 with the number of reported cases nearly doubling between 2020 (335 cases reported by eight countries) and 2021 (655 cases reported by 13 countries) *(82)*. Thirty-one *C. auris* isolates were identified in Canada from 2012 to 2021, mostly in Western Canada *(83)*. In the United Arab Emirates, an increasing trend of *C. auris* cases was observed, totalling 908 isolates reported from 2018–2021 *(84)*. In 2022, 2377 *C. auris* infections and 5754 cases of colonization were reported to CDC *(80)*.

2.2.6 HAIs and AMR during the COVID-19 pandemic

Evidence emerging from surveillance networks and local settings pointed to increased rates of HAIs and AMR in health care settings during the COVID-19 pandemic. A 2021 report showed significant increases in the standardized infection ratio for VAE (35% increase), central line-associated BSI (24% increase) and in hospital-onset MRSA (15% increase) in the United States of America in 2020 *(85)*. The most recent update of this national report found significant decreases in rates for VAE (19%), hospital-onset MRSA bacteremia (16%), CAUTI (12%) and CLABSI (9%) among acute care hospitals between 2021 and 2022, possibly indicating a beginning of recovery *(86)*. In a London hospital group, a very significant increase of nosocomial BSIs (both in COVID-19 and non-COVID-19 patients) was detected during 2020 compared with pre-pandemic historical trends *(87)*. In some studies, an increased risk of HAIs was observed among COVID-19 patients, in particular for BSIs and ventilator-associated pneumonias due to MDROs, compared with other critically ill patients in the ICU *(88-90)*. A systematic review of studies published during the first 18 months of the pandemic found that the proportion of COVID-19 patients with co-infection due to resistant organisms ranged from 0.2% to 100% and the pooled prevalence of co-infection with resistant bacterial and fungal organisms across all included studies was 24% (95% CI, 8–40) and 0.3% (95% CI, 0.1–0.6), respectively. MRSA, carbapenem-resistant *A. baumannii*, *K. pneumoniae*, *P. aeruginosa* and multidrug resistant *C. auris* were the most reported. There were wide variations by hospital and geographical location and substantial heterogeneity *(91)*. As already mentioned, EARS-Net data showed a significant increase in reports of BSIs caused by *Acinetobacter* spp. in participating countries of the EU/EEA during the period from 2017 to 2021, with most of the increase having occurred in 2020 and 2021 *(92)*.

2.2.7 SARS-CoV-2 spread in health care settings

SARS-CoV-2 transmission in health care facilities has been a major problem during the COVID-19 pandemic. Several studies have reported SARS-CoV-2 infections acquired in the health care setting among patients, ranging from 0% to 41% of inpatients *(93-98)*. According to a systematic review updated up to 2022, the prevalence of SARS-CoV-2 infection among health workers ranged from 0.2% to 43.3% based on polymerase chain reaction testing (57 studies), and 0.3% to 40.7% based on seroprevalence (81 studies) *(99)*. However, great variations over time and from country to country were observed and it is difficult to distinguish between community- and health care-acquired infections. The most recent update of the systematic review by Zhu and colleagues on hospital-onset SARS-CoV-2 infections (including publications up to June 2022) found that the incidence rate of definite/probable hospital-onset SARS-CoV-2 infections ranged from 0% to 83.3% in patients and 0% to 73.4% in health workers *(100)*.

In the 2022/2023 point prevalence survey in hospitals in the EU/EEA coordinated by the ECDC, SARS-CoV-2 ranked as the fourth most common microorganism identified in HAIs. Moreover, respiratory tract infections, including pneumonia and health care-associated COVID-19, represented nearly one third of all reported HAIs. COVID-19 accounted for 24.0% of reported pneumonia/lower respiratory tract infections and 7.0% of all HAIs *(39)*.

WHO estimated that between January 2020 and May 2021 there were 115 500 deaths (ranging between 80 000 and 180 000) caused by COVID-19 among health workers globally *(101)*. However, these data should be interpreted with caution as reporting of health workers' cases is hampered by significant limitations, including underreporting and variations in data quality and surveillance methods across countries and regions.

The systematic review by Chou and colleagues *(99)* on risk factors for SARS-CoV-2 among health workers was last updated by including publications up to May 2022. They found that higher infection rates in health workers were associated with unprotected exposures to COVID-19 patients. They were also a result of exposure to certain high-risk procedures, such as intubation and other aerosol-generating procedures without the use of appropriate personal protective equipment (PPE), direct patient contact, or contact with bodily secretions *(99)*. The review found no differences between professional categories, sex or age, but higher rates were associated with Black and Hispanic race/ethnicity. The availability and correct use of PPE, hand hygiene and training in IPC were associated with a decreased risk of SARS-CoV-2 infection *(99).*

Additional information on the exposure risk for SARS-CoV-2 infection among health workers was provided from a WHO global multicentre case control study conducted in 94 facilities from 21 countries between August 2020 and December 2021. The study included 2959 health workers monitored for SARS-CoV-2 serology and interviewed on their exposure risk and IPC knowledge *(102)*. The following risk factors associated with SARS-CoV-2 infection in health workers were identified through multivariate analysis *(102)*: exposure to COVID-19 patients with prolonged close contact (>15 minutes within 1 metre) (adjusted odds ratio [aOR], 1.43 [1.11–1.83]); not consistently performing hand hygiene after direct close patient contact (aOR, 2.52 [1.72–3.68]); non-adherence to PPE guidelines (aOR, 1.67 [95% CI, 1.32–2.12]).

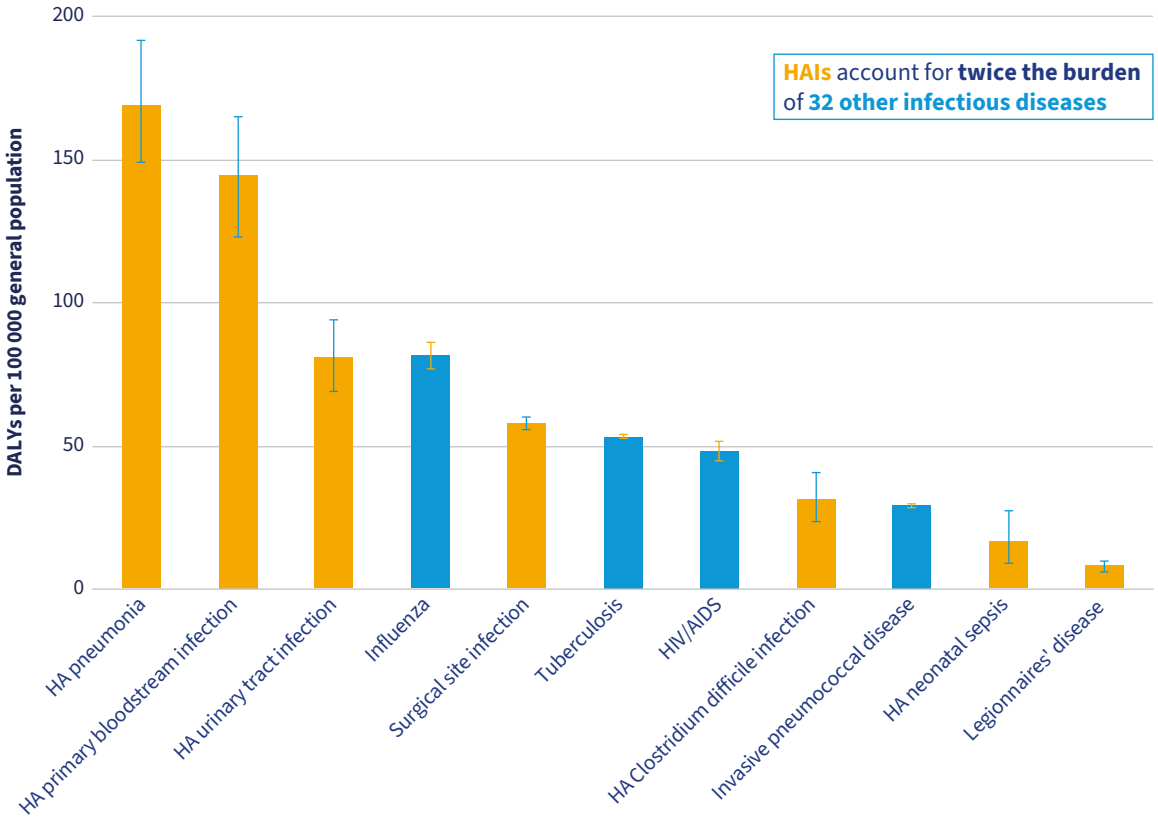
2.3 What are the consequences of HAIs and AMR for patients and health workers?

The consequences of HAIs can be diverse and very serious. They can range from requiring a prolonged stay in hospital to long-term complications and disability, to premature death, including the social and psychological repercussions resulting from suffering among patients, families and communities. For the health system, the burden translates into an additional overload and extra costs.

> As reported in the 2020 WHO global report on sepsis, mortality among patients affected by health care-associated sepsis is estimated to be 24.4%, with an increase to 52.3% among patients treated in ICUs *(62, 63)*.

According to the ECDC, the burden of the six most frequent HAIs in terms of disability and premature mortality (disability-adjusted life years [DALYs]) in EU/EAA countries accounts for twice the burden of 32 other infectious diseases under surveillance, including influenza and tuberculosis *(41)* (Fig. 2.2), leading to more than 90 000 deaths and corresponding to approximately 2.5 million DALYs.

Fig. 2.2. Comparing the burden of HAIs with other infectious diseases in European Union/European Economic Area countries, 2011–2012

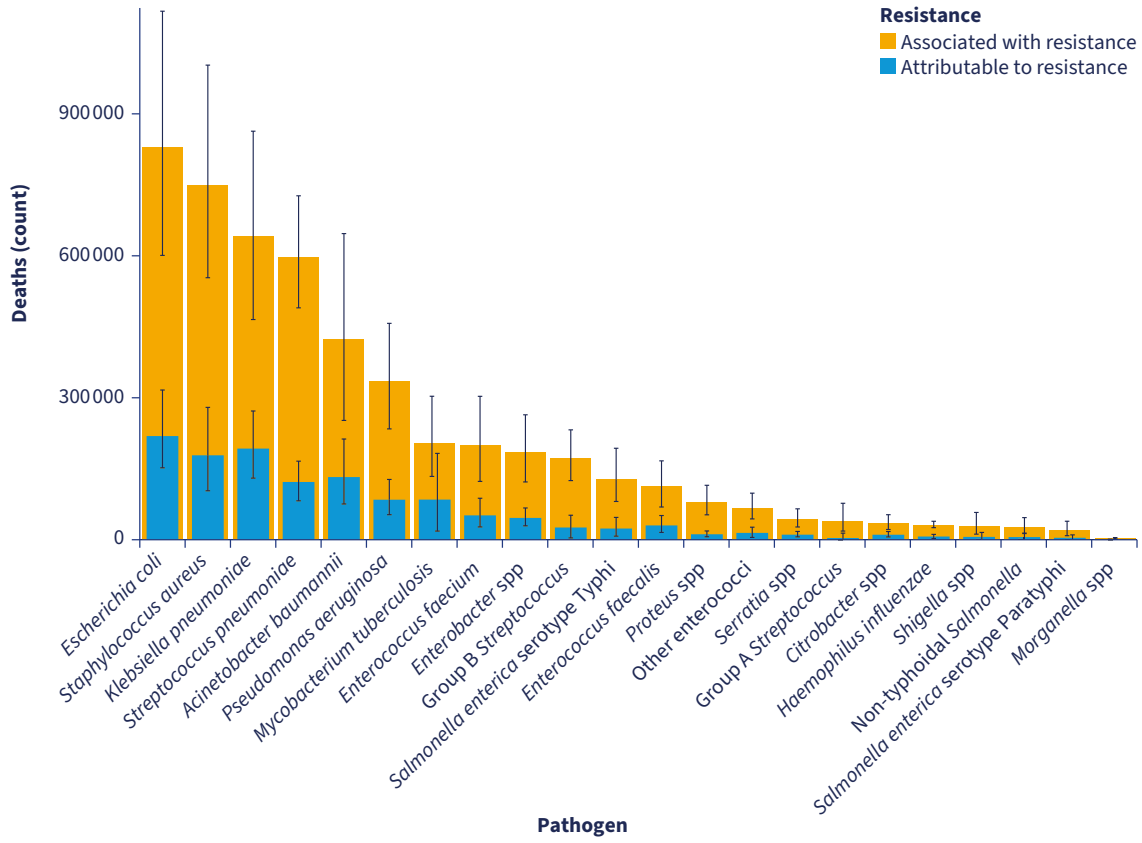


Abbreviations: DALYs, disability-adjusted life years, that is. years of life lost to due to premature mortality and years lived with a disability resulting from HAIs; HAIs, health care-associated infections; HIV/AIDS, human immunodeficiency virus/acquired immunodeficiency syndrome.
Source: *(41)*.

Each year, 7.7 million deaths are attributed to bacterial infections worldwide *(103)*. A landmark modelling study related to 2019 estimated that 4.95 million (95% uncertainty interval [UI], 3.62–6.57) deaths were associated with bacterial AMR annually, including 1.27 million (95% UI, 0.91–1.71) directly attributable to AMR globally *(104)*. Five of the six leading resistant pathogens causing deaths identified in this study are typically acquired in health care settings (Fig. 2.3). The impact on mortality is heaviest in LMICs, with the highest burden in sub-Saharan Africa.

A recent study by OECD and WHO estimated that nearly 3.5 million people globally may lose their lives every year up to 2050 due to HAIs. This corresponds to 4.4 times the global deaths attributable to HIV/AIDS and sexually transmitted diseases combined in 2021 (WHO/OECD unpublished data).

Fig. 2.3. Global deaths (counts) attributable to and associated with bacterial antimicrobial resistance by pathogen, 2019



Source: *(104)*.

The ECDC estimated that 75% of DALYs (representing disability and premature mortality) attributable to AMR in EU/EEA countries are a result of HAIs *(105, 106)*.

A study conducted from March 2004 to February 2022 including 317 ICUs of 96 hospitals in 44 cities in 9 countries[8] across Asia showed that the acquisition of CLABSI increased the risk of death by more than two-fold (aOR, 2.36; P <0.0001). VAE and CAUTI were also associated with an increased mortality risk (VAE: aOR, 1.51; P <0.0001; CAUTI: aOR, 1.04; P <0.0001) *(107)*.

A recent review and modelling study estimated that improving IPC programmes in LMIC health care settings could prevent at least 337 000 (95% CI, 250 200–465 200) AMR-associated deaths annually *(108)*. Furthermore, ensuring universal access to high-quality WASH services would prevent 247 800 (160 000–337 800) AMR-associated deaths per year.

The study estimated that 7.8% (5.6–11.0) of all AMR-associated mortality in LMICs could be prevented by improved IPC measures, and 5.7% (3.7-8.0) by improved WASH *(108)*. The African Union AMR Landmark Report estimated that investments in WASH and IPC measures could potentially avert up to 20% of AMR-associated deaths in the region annually *(109)*. Furthermore, investment in AMR initiatives are estimated to avert up to 200 000 deaths annually in Africa, including 90 000 deaths among children under five years of age *(109)*.

Finally, according to WHO and OECD recent estimates[9], globally, IPC interventions implemented in health care facilities using MMIS, with national coordination could potentially avert 821 000 deaths per year up to 2050 (WHO/OECD unpublished data).

According to ECDC estimates, between 2016 and 2020, HAIs constituted 70.9% (95% CI 68.2 – 74.0%) of cases of infections with antibiotic-resistant bacteria in EU/EAA countries *(110)*. The three most impactful antibiotic-resistant microorganisms determining 70% of the AMR burden (in DALYs, representing disability and premature mortality) are extended-spectrum beta-lactamase-producing *E. coli*, MRSA and carbapenem-resistant *P. aeruginosa (106)*.

Based on the 2019 data of the above-mentioned global modelling study, two deep-dive analyses focused on the WHO African Region and the WHO European Region, respectively *(111, 112)*. In the African Region, an estimated 1.05 million deaths (95% UI, 829 000–1 316 000) across 47 countries were associated with bacterial AMR and 250 000 deaths (192 000–325 000) were attributable to bacterial AMR *(111)*. Seven pathogens were collectively responsible for 821 000 deaths (636 000–1 051 000) and associated with AMR, with four pathogens exceeding 100 000 deaths each: *Streptococcus pneumoniae, K. pneumoniae, E. coli*, and *S. aureus*. In the WHO European region, an estimated 541 000 deaths (95% UI, 370 000–763 000) across 53 countries were associated with bacterial AMR and 133 000 deaths (95% CI, 90 100–188 000) were attributable to bacterial AMR *(112)*. Seven pathogens together were responsible for 457 491 deaths associated with AMR and 112 784 deaths attributable to AMR. In descending impact, these were *E. coli*, *S. aureus*, *K. pneumoniae*, *P. aeruginosa*, *E. faecium*, *S. pneumoniae* and *A. baumannii.*

[8] China, India, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Viet Nam.
[9] For these calculations a modified version of the OECD Strategic Public Health Planning for infectious diseases model was used. OECD; 2023 (http://oecdpublichealthexplorer.org/amr-doc/).

Infections due to MRSA and gram-negative bacteria resistant to carbapenems have been associated with significantly increased morbidity and mortality and pose a serious threat, particularly in LMICs where there may be a limited availability of antibiotics effective against these pathogens *(110, 113-116)*.

Patients with infections due to MRSA have a significant increase in all-cause mortality, attributable mortality, septic shock, post-infection length of stay and discharge to long-term care compared with patients with infections due to meticillin-susceptible *S. aureus* (MSSA) *(113)*.

ECDC has reported mortality ranging from 30% to 70% in patients with BSI caused by carbapenem-resistant Enterobacterales *(117)*. In a multinational, prospective, cohort study in LMICs, patients with BSIs caused by carbapenem-resistant Enterobacterales had a significantly increased length of hospital stays and probability of in-hospital mortality, and decreased probability of being discharged alive *(115)*. One meta-analysis found that patients with BSI resulting from carbapenem-resistant *P. aeruginosa* were 3.07 times more likely to die than those with carbapenem-susceptible *P. aeruginosa* (95% CI, 1.60–5.89) *(116)*. Another meta-analysis found a significant association between carbapenem resistance and mortality among patients infected with *A. baumannii* (aOR, 2.49; 95% CI, 1.61–3.84) *(114)*.

Between 2007 and 2015, the number of deaths attributable to infections with *K. pneumoniae* resistant to carbapenems increased six-fold, while the number of deaths attributable to infections with third-generation cephalosporin-resistant *E. coli* increased four-fold *(106)*.

Chairman of the African Union Commission meeting with the Director-General at WHO headquarters in Geneva, Switzerland, 18 November 2019. © WHO / Antoine Tardy

Chapter 3.

IPC implementation at the national level

Chapter 3.
IPC implementation at the national level

3.1 Key messages

- Several systems regularly provide data on IPC programme implementation worldwide, with WHO surveys offering detailed insights at national and facility levels.
- Across most surveys and data sets, differences in the implementation of IPC at the national level were noted across country income levels with HICs usually showing better fulfillment of IPC requirements.
- The 2021–2022 WHO survey showed that more than three-quarters (78.3% [83 of 106]) of countries had active national IPC programmes. However, fewer than half (40.6% [43 of 106]) had a dedicated budget for IPC, with significant disparities between LICs (15.4% [2 of 13]) and HICs (69.7% [23 of 33]).
- In 2023–24, 9% (16 of 186) of countries did not have an IPC programme or plan yet and only 39% (72 of 184) of countries had IPC programmes fully implemented nationwide, with some of them being monitored for their effectiveness.
- The most recent global survey on IPC minimum requirements in 2023–2024 showed areas of advanced implementation and gaps for further improvement. HICs generally report better implementation, but gaps remain in budget allocation, training, HAI surveillance and monitoring systems, especially in lower-income countries.

High level of implementation

- Guideline development: approximately 9 out of 10 countries (90.7% [136 of 150]) had mandates to produce guidelines for preventing HAIs. 88% countries (132/150) reported to use evidence-based scientific knowledge in the development of IPC guidelines and 82% (123/150) actively addressed guideline adaption to local conditions.
- Multimodal strategies: approximately 7 out of 10 countries (71.3% [107 of 150]) had trained IPC focal points and 75.3% (113 of 150) promoted multimodal strategies. HICs showed high implementation, with 72.9% (35 of 49) having trained IPC focal points and 83.3% (40 of 49) promoting multimodal strategies.

Gaps needing improvement

- Budget allocation: fewer than one half (44% [66 of 150]) of countries had a dedicated IPC budget, with LICs at only 33.3% (8 of 24).
- Training and education: while more than 8 out of 10 countries (81.3% [122 of 150]) provided IPC training content, only 38% (57 of 150) have a national IPC curriculum, indicating a need for broader training programmes.

- HAI surveillance: just over half (53.3% [80 of 150]) of countries had a multidisciplinary technical group for HAI surveillance, but LICs lag notably, with only 25% (6 of 24) having established such a group. Furthermore, in 2022, the WHO global patient safety survey reported that one half of the countries (51% [47 of 108]) had a national system for HAI surveillance, regularly producing quality-controlled data, and 35% of countries were in the process of developing such a system.
- Monitoring and evaluation: slightly more than one half (51.3% [77 of 150]) of countries had a strategic plan and system for IPC monitoring, with HICs leading at 58.3% (28 of 49) and lower proportions in LICs (45.8% [11 of 24]).

- In the 2023–2024 global survey, overall, 80% of countries (120 of 150) met at least one half of the IPC minimum requirements, while 6% (9 of 150) fulfilled all of them. Notably, 14% (21 of 150) of countries met 90% of the requirements. However, there were significant discrepancies across income levels, with HICs generally reporting a higher fulfillment of IPC minimum requirements.
- Comparisons of key indicators across global surveys over time reveals both progress and setbacks in the implementation of IPC. The COVID-19 pandemic was undoubtedly a catalyst for rapidly improving the capacity of IPC programmes. However, as the COVID-19 pandemic waned, no further improvement was seen in the implementation of most IPC core components and requirements. Some indicators even suggested a possible disinvestment in IPC, thus highlighting the challenges in sustainability.
- There is a need for targeted support to enhance IPC implementation across different income levels, addressing both progress and setbacks to achieve comprehensive and effective IPC programmes globally.
- The 2024–2030 WHO GAP/MF for IPC indicates directions, actions and targets for achieving progress, in particular with the perspective of fulfilling the WHO minimum requirements for IPC programmes at the national level by 2030.

3.2 National IPC programmes and dedicated budget

As mentioned in chapter 1, six core components (Fig. 1.1) are recommended by WHO for establishing or strengthening effective IPC programmes at the national level *(2, 3, 20, 21)*. This chapter focuses on the implementation of the core components and minimum requirements at the national level.

Having an active IPC programme at the national level is core component 1 and a minimum requirement for IPC *(2, 5)*. Since May 2024, it is also among the key actions, core indicators and targets included in the 2024–2030 WHO GAP/MF for IPC, adopted by all countries (Table 3.1) *(6, 7)*.

The main guidance related to the national IPC programme is included under strategic directions one and two within the GAP/MF, although other critical aspects of the IPC programme functions are also part of the other six strategic directions.

Table 3.1. 2024–2030 WHO GAP/MF key actions, core indicators and targets for the national level regarding political commitment and policies and active IPC programmes

Action	Indicator(s)	Target
Strategic direction #1. Political commitment and policies		
Key action #1 Develop a national action plan and monitoring framework for IPC integrate it into national health plans, outlining costs and sources of financing.	IPC national action plan and monitoring framework[a] developed, costed, validated and approved by ministry of health or other relevant national authorities within the context of national health plans.	**Core target:** increase of the proportion of countries with a costed and approved national action plan and monitoring framework for IPC to: 30% by 2026 50% by 2028 >80% by 2030
Key action #2 Establish the legal framework for IPC to mandate the implementation of IPC programmes at all levels.	Legislation/regulations in place to address IPC (including IPC professionals) in the public health regulatory framework.	**Core target:** increase of the proportion of countries with legislation/regulations for IPC to: 30% by 2026 50% by 2028 >80% by 2030
Key action #3 Develop a national financial investment case aligned with the global business case for IPC.	National financial investment case developed based on global models (by 2026).	No specific target
Key action #4 Establish a dedicated IPC budget to fund the national IPC programme and action plan.	Dedicated budget (in line with the IPC national action plan) allocated to fund the IPC national programme and action plan identified and available. Proportion of health care facilities with adequately funded and dedicated budget for IPC.	**Core target:** increase of the proportion of countries having an identified dedicated budget allocated to the national IPC programme and action plan to: 50% by 2026 75% by 2028 >90% by 2030
Key action #5 Demonstrate evidence of investment by national authorities in WASH and infrastructure services for health care waste and cleaning and staffing to ensure that all health care facilities have safely managed WASH services to enable IPC practices.	Dedicated and sufficient funding allocated at the national level for WASH services and activities.	Increase of the proportion of countries with dedicated and sufficient funding for WASH services and activities to: 40% by 2026 80% by 2028 100% by 2030
Strategic direction #2. Active IPC programmes		
Key action #1 Establish a national IPC programme and/or demonstrate evidence of improvement of IPC programmes, including WASH (namely, meet WHO minimum requirements at national and facility levels).	All WHO minimum requirements for IPC at national level (see document EB154/8 Add.1) met (to be assessed through the WHO global IPC portal)[b]. Proportion of health facilities meeting all WHO minimum requirements for IPC at facility level (to be assessed through the WHO global IPC portal). Proportion of health care facilities with basic WASH and waste services (per each indicator, to be assessed through the definitions of the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene).	**Core target:** increase of the proportion of countries meeting all WHO minimum requirements for IPC programmes at national level to: 30% by 2026 60% by 2028 >90% by 2030 **Core target:** increase of the proportion of countries with national IPC programmes at Level 4 or 5 in section C.9.1 of SPAR 9.1 and Level D or E in section 3.5 of TrACSS to: 50% by 2026 75% by 2028 >90% by 203

Action	Indicator(s)	Target
Key action #2 Support the establishment of active IPC programmes (that is, with objectives and action plan, supported by dedicated human resources and financing) at least in tertiary and secondary care facilities, and identification of an IPC link person in each primary care facility, within broader health services development.	Proportion of tertiary/ secondary care health facilities with an active IPC programme Proportion of primary care facilities with an IPC link person.	No specific target
Key action #3 Establish national targets on reducing HAIs and support the implementation of MMIS[c] to reduce HAIs in health care facilities at all levels, according to local priorities-	Proportion of countries that have a national target on reducing HAIs.	Increase of the proportion of countries that have a national target on reducing HAIs to: 50% by 2026 75% by 2028 100% by 2030 **Core target:** increase of the proportion of countries that have achieved their national targets on reducing HAIs (among those having such target) to: 30% by 2026 50% by 2028 >80% by 2030

Abbreviations: IPC, infection prevention and control; HAI, health care-associated infection; AMR, antimicrobial resistance; MMIS, multimodal implementation strategy; SPAR, States Party Self-assessment annual reporting tool; TrACSS, Tracking AMR Country Self-Assessment Survey.

[a] If the IPC national action plan and monitoring framework are part of the AMR or patient safety national action plan and monitoring framework and clearly distinguishable, detailed and fulfilling all the attributes of the indicator, this can be considered equivalent to a specific IPC national action plan and monitoring framework.

[b] WHO global IPC portal. For more information, see https://ipcportal.who.int.

[c] A multimodal strategy comprises several components or elements (three or more, usually five) implemented in an integrated way with the aim of improving an outcome (prevention of HAIs and AMR) and changing behaviour. It includes tools, such as bundles and checklists, developed by multidisciplinary teams that take into account local conditions. The five most common elements are: (i) system change (availability of the appropriate infrastructure and supplies to enable good practices in IPC); (ii) education and training of health and care workers and key players (for example, managers); (iii) monitoring infrastructures, practices, processes and outcomes and providing data feedback; (iv) reminders in the workplace/communications; and (v) cultural change within the establishment or the strengthening of a safety climate.

Source: *(6)*.

Various assessments undertaken in recent years evaluated IPC programmes and their adherence to the WHO core components' recommendations and minimum requirements.

Data in this chapter were collected through the following systems:

- the State Parties Self-Assessment Annual Report (SPAR);
- the Joint External Evaluation (JEE) tool;
- the Tracking AMR Country Self-assessment Survey (TrACSS);
- WHO global surveys o IPC.

Information about the existence of an IPC programme at the national level and its implementation at facility level is regularly provided by the International Health Regulations (IHR) monitoring and evaluation framework *(118)*. This framework *(118)* was developed to support the oversight and implementation of the IHR, that is, a country's ability to develop and maintain core public health capacities. It consists of four complementary components: one mandatory (the SPAR *(119)* tool); and three voluntary (the JEE tool *(120)*, after-action reviews, and simulation exercises) (Box 3.1).

Box 3.1. Description of the JEE and SPAR tools

- The **JEE tool** is a voluntary and external evaluation tool based on 49 indicators applied within 19 technical areas. Each technical area is given a level of capacity from 1 to 5 based on their review and available documentation for each specific technical area. Until 2021, IPC was defined as a core indicator under the AMR capacity. However, since the third version of the JEE used from 2022 onwards, IPC has become a separate capacity indicator (R4).
- The **SPAR tool** is a mandatory annual assessment based on 35 indicators across 15 IHR capacities. For each indicator, the reporting State Party is asked to select which of the five levels best describes its current status. In the SPAR tool, IPC is a stand-alone capacity indicator (C.9) since 2021.
- For both tools, each indicator is based on five cumulative levels of capacity. In order to move to the next level, all capacities described in previous levels should be in place.

The following describes the level of advancement or scoring with colour coding.

1. No capacity: attributes of a capacity are not in place.
   Score range, 0–20. Colour code, red ■.
2. Limited capacity: attributes of a capacity are in development stage (implementation has started with some attributes achieved and others commenced).
   Score range, 21–40. Colour code, orange ■.
3. Developed capacity: attributes of a capacity are in place, but sustainability has not been ensured (such as through inclusion in the operational plan of the national health sector plan with a secure funding source).
   Score range, 41–60. Colour code, yellow ■.
4. Demonstrated capacity: attributes are in place and sustainable for a few years and can be measured by the inclusion of attributes or IHR core capacities in the national health sector plan and a secure funding source.
   Score range, 61–80. Colour code: light green ■.
5. Sustainable capacity: all attributes are functional and sustainable and the country is supporting one or more other countries in their implementation. This is the highest level of the achievement of implementation of IHR core capacities.
   Score range, 81–100. Colour code: green ■.

Abbreviations: AMR, antimicrobial resistance; IHR, International Health Regulations; IPC, infection prevention and control; JEE, joint external evaluation tool; SPAR, States Party Self-assessment annual reporting tool.
Sources: (119, 120)

Both past JEE reports and the WHO IPC global survey at national level *(121)* conducted in the years 2017-2018, showed that a country's capacity for IPC seemed in large part related to its income level. Most LMICs were at level 1 or 2 ("limited or no capacity"), while HICs achieved level 3 or above ("demonstrated or sustainable capacity").

The most recent JEE reports using the third version of the JEE tool in 2022 and 2023 indicated that 27 of 34 (79%) participating countries/areas[10] were at level 1 or 2 ("limited or no capacity"), whereas seven countries were at level 3 or 4 ("developed or demonstrated capacity") for IPC.

[10] Angola, Armenia, Azerbaijan, Benin, Burundi, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Estonia, Ethiopia, Guinea, Indonesia, Iraq, Kyrgyzstan, Liberia, Mali, Mauritania, Mongolia, Nepal, Nigeria, Pakistan, Samoa, Senegal, Sierra Leone, Sri Lanka, Syria, United Republic of Tanzania, Thailand, Uganda, Yemen (Aden), Yemen (North), Zambia, and Zanzibar.

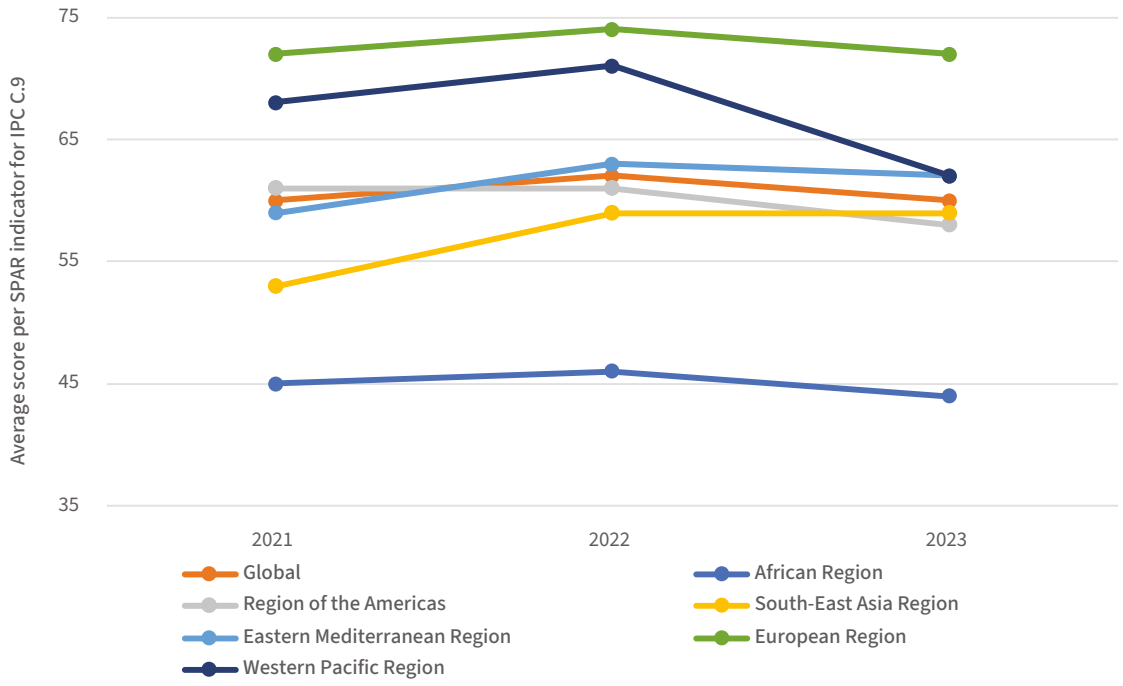
More specifically, regarding the status of the national IPC programme, 21 of 34 (62%) were at level 1 or 2, whereas the remaining countries achieved level 3 or 4 *(122)*.

However, given that enrolment of countries in JEE exercises is on a voluntary basis, the data does not show the full global scope of countries' capacities.

Similar to the JEE reports, in the three years 2018/2019/2020, the SPAR assessments *(123)* indicated that IPC capacity was significantly associated with national income levels. However, given that IPC was in the same indicator for the capacity for chemical and radiation decontamination, it is difficult to draw solid conclusions. LICs and lower-middle-income countries showed lower IPC capacity levels than upper-middle-income countries and HICs. This was also true of WHO regions, with the African Region generally showing the lowest capacity levels.

In 2023, the number of submissions was the highest for a reporting cycle since 2010 with 194 of 196 WHO States Parties submitting a SPAR report (99%). The global average for the IPC capacity in 2023 remained on the same level as previous years, averaging around 60. Among the WHO regions, the South-East Asia Region reported a slight increase in capacity level over the years from an average score of 53 in 2021 to 59 in 2022 and 2023, while the Western Pacific Region reported a decrease in capacity from 71 in 2022 to 62 in 2023. The other regions maintained the 2022 level (Fig. 3.1).

Fig. 3.1. Average score per SPAR indicator for IPC globally and per WHO region, 2021–2023



Abbreviations: IPC, infection prevention and control; SPAR: State Party self-assessment annual reporting (tool).
Source: *(119)*.

Since its inception in 2016, the quadripartite TrACSS has included a specific indicator on the status and implementation of national IPC programmes (formerly indicator 8.1 until 2021, now indicator 3.5, Box 3.2) *(124)*.

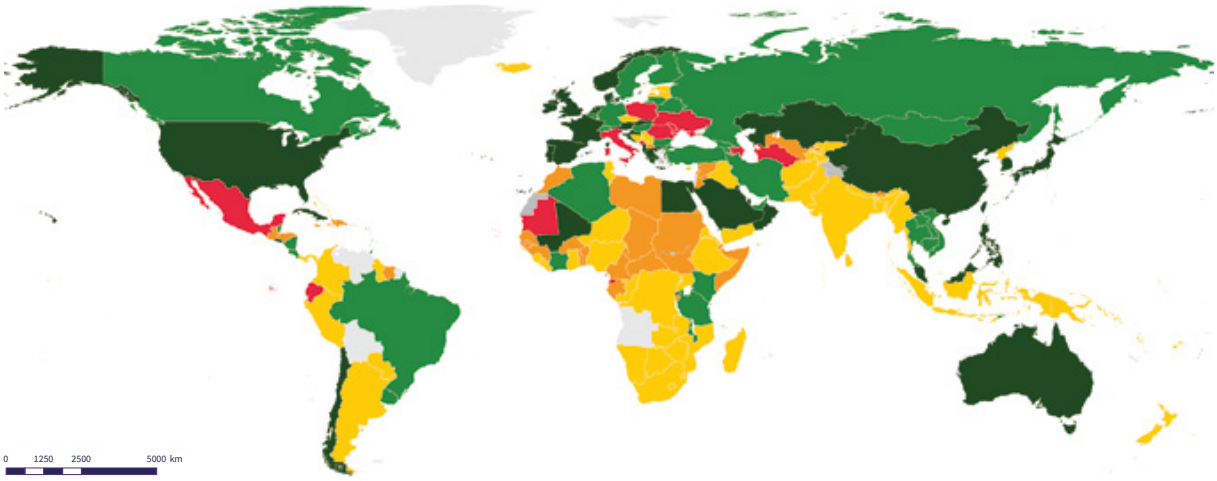
The distribution of countries across the five TrACSS levels according to the latest survey in 2024 are shown in Fig. 3.2 *(124)*. 2024 marks the year with the highest response rate in TrACSS to date, that is, 186 countries or 96% of WHO Member States.

Box 3.2. The five levels (A to E) of classification of IPC programmes in TrACSS

- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.

Abbreviations: TrACSS, Tracking AMR Country Self-Assessment Survey; IPC, infection prevention and control; WASH, water, sanitation and hygiene.
Source: *(124)*.

Fig. 3.2. Country/area map of the 2024 TrACSS results according to levels A to E (indicator 3.5)



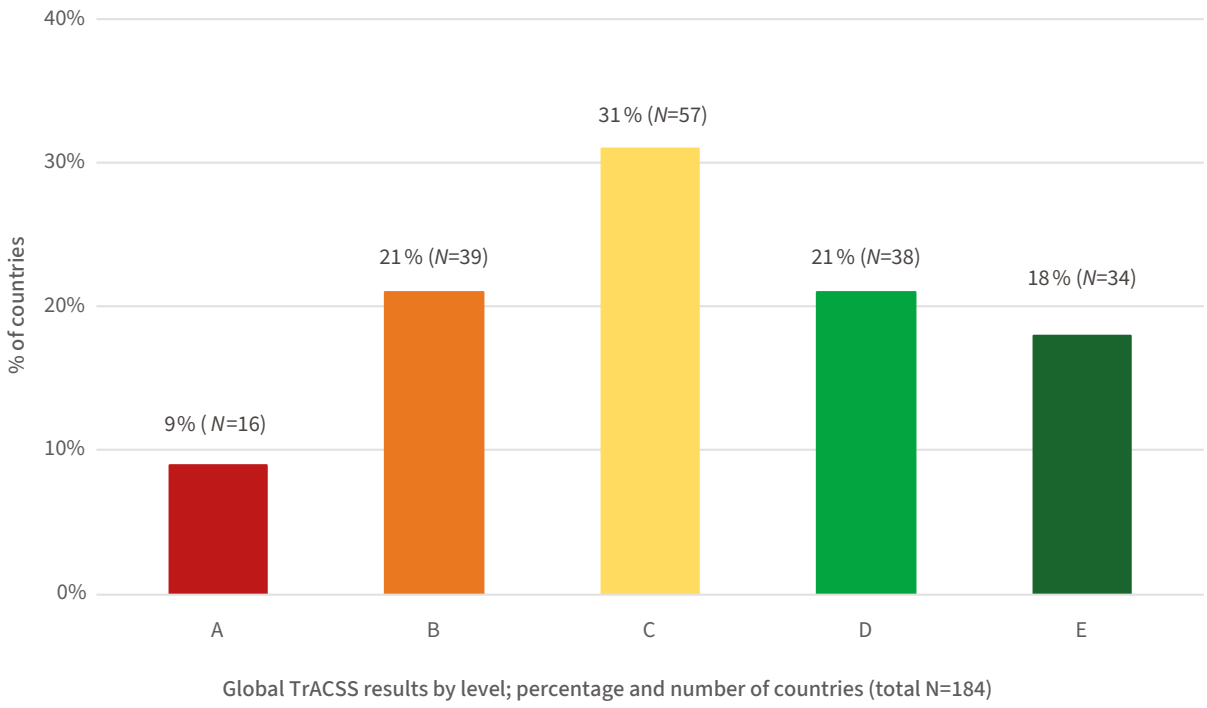
- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.
- Data not available
- Not applicable

Abbreviations: TrACSS, Tracking AMR Country Self-Assessment Survey; IPC, infection prevention and control.
Map creation date: 04 October 2024.
Map production: WHO Geographic Information Systems (GIS) Centre for Health, Department of Data and Analytics (DNA) within the Division of Data, Analytics and Delivery for Impact (DDI).
Source: *(124)*.

In 2024 (2023–2024 data), 9% of countries still did not have an IPC programme or an operational plan (Figs. 3.2 and 3.3, level A) and 52% of countries reported having national IPC programmes or plans that were not being implemented, or that were being implemented only in selected health facilities (Figs. 3.2 and 3.3, levels B and C).

Only 39% of countries reported having an IPC programme implemented nationwide (Figs. 3.2 and 3.3, levels D and E). Only 18% of responding countries had a system to monitor the effectiveness and compliance of their implemented IPC programme (Figs. 3.2 and 3.3, level E) *(124)*.

Fig. 3.3. TrACSS results for the status and implementation of national IPC programmes globally, 2024

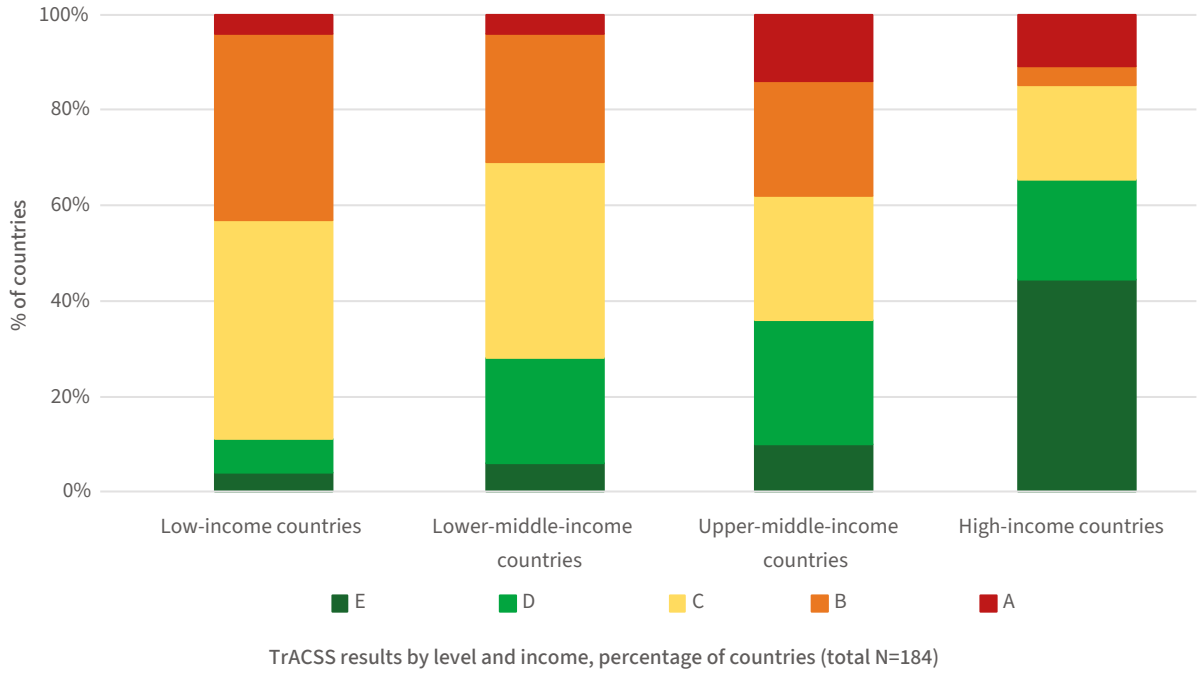


Abbreviations: TrACSS, Tracking AMR Country Self-Assessment Survey; IPC, infection prevention and control.
Source: *(124)*.

Looking at the 2024 TrACSS results from the perspective of country income levels, Fig. 3.4 shows that most countries reporting the highest level of progress in the national IPC programme (levels D and E) are upper-middle-income and high-income countries.

In particular, about four of 10 HICs have an IPC programme fully in line with the WHO core components, including their implementation and monitoring (level E), whereas less than one of 10 low-income and lower-middle-income countries have implemented an IPC programme to such a degree.

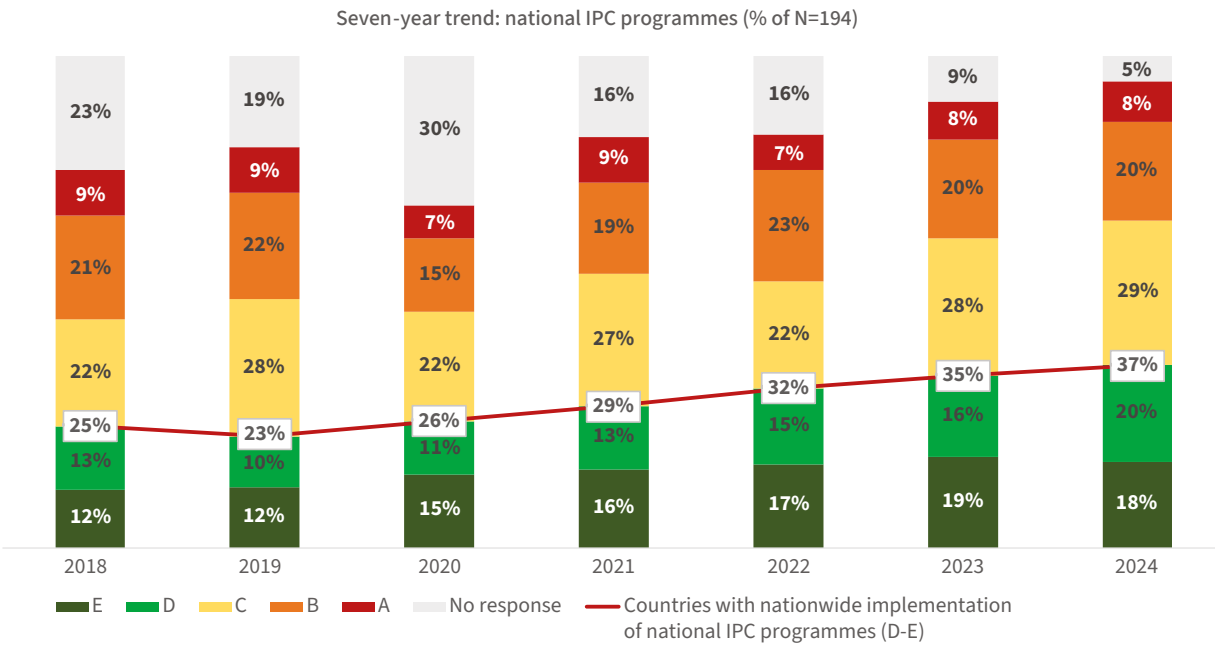
Fig. 3.4. TrACSS results (2023–2024 data) for the status and implementation of national IPC programmes by World Bank income level, 2024



Abbreviations: TrACSS, Tracking AMR Country Self-Assessment Survey; IPC, infection prevention and control.
Source: *(124)*.

Through TrACSS, it is possible to explore the temporal trends of country responses to the IPC indicator. Looking at the last seven-year period, from 2018 to 2024, when the indicator was the same, despite slow progress in IPC globally, the proportion of countries implementing national IPC programmes nationwide (levels D-E) has steadily increased between 2020 (26%) and 2024 (37%) (Fig. 3.5, solid red line).

Fig. 3.5. TrACSS results (2023–2024 data) for the status and implementation of national IPC programmes by World Bank income level, 2024



Abbreviations: TrACSS, Tracking AMR Country Self-Assessment Survey; IPC, infection prevention and control.
Numbers are percentages of countries (N=194) reporting levels A to E for that survey year.
Source: *(124)*.

The above-mentioned data from SPAR and TrACSS provide a high-level overview of the situation of national IPC programmes in recent years.

Recent analyses of the situation of implementation of the core components of IPC programmes are available from the results of two consecutive WHO global surveys on the IPC minimum requirements at the national level conducted in 2021–2022 and in 2023–2024 (Box 3.3).

Box 3.3. Methods of the 2021–2022 and 2023–2024 WHO global surveys on the IPC minimum requirements at the national level

The WHO global surveys on the IPC minimum requirements at the national level were self-assessment surveys carried out between July 2021 and January 2022 and between November 2023 and May 2024, completed by IPC national focal points or other officials at the ministry of health level. Submissions were done through the WHO global IPC portal *(125)*, a platform that supports situation analysis, tracking progress and making improvements to IPC programmes. Responses were based on the completion of the assessment tool of the minimum requirements for IPC programmes at the national level *(9)*.

Abbreviation: IPC, infection prevention and control.

In light of the WHO GAP/MF *(6)* to enable the implementation of the global strategy on IPC *(126)* through strong actions and the associated measurement of its impact, the most recent survey could act as a baseline assessment by describing the current implementation of the minimum requirements for IPC programmes.

Overall, in the 2023–2024 global survey, 80% of countries (120 of 150) met at least 50% of the IPC minimum requirements, while only 6% (9 of 150) fulfilled all of them. Of note, 14% (21 of 150) of countries met 90% of the requirements (Table 3.2). Discrepancies were evident when comparing income levels (Table 3.2; WHO, unpublished data).

Table 3.2. Proportion of countries with reported national IPC minimum requirements fulfilled across World Bank income levels, 2023–2024

Survey level	Income level	Fulfilled at least 50%	Fulfilled at least 90%	Fulfilled 100%
National	Total	120 (80%)	21 (14%)	9 (6%)
	Low-income	18 (75%)	2 (8.3%)	1 (4.2%)
	Lower-middle-income	31 (81.6%)	6 (15.8%)	1 (2.6%)
	Upper-middle-income	33 (84.6%)	5 (12.8%)	3 (7.7%)
	High-income	38 (77.6%)	8 (16.3%)	4 (8.2%)

Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

A total of 106 countries participated in the survey of IPC implementation conducted at the national level in 2021–2022 *(127)*, including 13 low-, 27 lower-middle, 33 upper-middle and 33 high-income countries. Overall, 78.3% (83 of 106) of countries reported having an active national IPC programme (defined as a functioning programme with at least one IPC trained focal point, annual work plans and budget), with no significant differences across income levels. A slightly lower proportion (63.2%; 67 of 106) had at least a national trained IPC focal point with dedicated time to support the programme. This means that 21.7% of countries either did not have an IPC programme at all, or had a programme that was not active *(127)*. Some countries may have had a national focal point, but not a programme.

The number of countries participating in the WHO global surveys on IPC minimum requirements at the national level significantly increased from 106 in 2021–2022 to 150 in 2023–2024, including 24 low-, 38 lower-middle, 39 upper-middle, and 49 high-income countries (Table 3.3; WHO, unpublished data).

Overall, 71.3% (107 of 150) of countries reported having an active national IPC programme. Upper-middle-income countries had the highest implementation at 84.6% (33 of 39), while lower-middle-income countries had the lowest at 55.3% (21 of 38).

Only 58.7% of countries (88 of 150) reported having appointed IPC focal points with dedicated time for tasks, with lower-middle-income countries showing a higher implementation rate at 65.8% (25 of 38) compared to 50% (12 of 24) in LICs (Table 3.3).

Table 3.3. Proportion of countries with reported established IPC minimum requirements by World Bank income level, 2023–2024: IPC programme and dedicated budget

Indicator	Total (N=150)	Low-income (n=24)	Lower-middle-income (n=38)	Upper-middle-income (n=39)	High-income (n=49)
Active national IPC programme exists	107 (71.3%)	18 (75%)	21 (55.3%)	33 (84.6%)	35 (72.9%)
Protected and dedicated budget allocated to IPC	66 (44%)	8 (33.3%)	15 (39.5%)	22 (56.4%)	21 (43.8%)
Appointed IPC focal points with dedicated time	88 (58.7%)	12 (50%)	25 (65.8%)	24 (61.5%)	27 (56.2%)

Abbreviation: IPC, infection prevention and control.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

Ninety-four countries participated in both the two most recent global surveys (2021–2022 and 2023–2024) on the implementation of IPC minimum requirements at the national level and some comparisons can be made. In 2021–2022, 78.7% (74 of 94) of countries reported having an active IPC programme at the national level. This decreased, but not significantly to 70.2% (66 of 94) in 2023–2024 (Fig. 3.6). The appointed IPC focal points had dedicated time for tasks in 62.8% (59 of 94) of countries in 2021–2022. This slightly decreased to 61.7% (58 of 94) in 2023–2024 (Fig. 3.6).

A comparison can also be made across the WHO global survey results from 2017–2018 *(121)* to 2021–2022 *(127)* and 2023–2024 regarding some specific key indicators for the 58 countries[11] that participated in all

[11] Includes the following countries by WHO region: Africa Region (n=16): Benin, Burkina Faso, Burundi, Cameroon, Chad, Cote D'Ivoire, Ethiopia, Ghana, Guinea, Kenya, Liberia, Malawi, Mauritania, Nigeria, Uganda and Zimbabwe. East Mediterranean Region (n=12): Afghanistan, Bahrain, Iran, Iraq, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Sudan, Tunisia, and United Arab Emirates. European Region (n=14): Bulgaria, Denmark, Finland, Georgia, Germany, Italy, Kyrgyzstan, Malta, Republic of Moldova, Netherlands, Norway, Serbia, Spain and Sweden. Region of the Americas (n=11): Argentina, Brazil, Chile, Ecuador, Jamaica, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago and the United States of America. South-East Asia Region (n=1): Thailand. Western Pacific Region (n=4): China, Malaysia, Philippines and Singapore.

three surveys. The proportion of countries having a national IPC programme increased during the first years of the COVID-19 pandemic (82.8%; 48 of 58) in 2021–2022 versus 65.5% (38 of 58) in 2017–2018, but again dropped to 69% (40/58) in 2023–2024 (WHO, unpublished data). In addition, there was a significant increase in countries having a trained IPC focal point with dedicated time to support the programme from 2017-2018 (22.4% [13 of 58]) to 62.1% (36 of 58) in 2021–2022. This was maintained in 2023–2024 with 65.5% of countries (38 of 58; WHO unpublished data), suggesting that the COVID-19 pandemic may have accelerated the pace of global IPC programme implementation on the one hand, but attention gained may have waned in these 58 countries in 2023–2024, as demonstrated by some indicators.

National IPC programmes require a sustainable and dedicated budget to enable action and planned activities.

According to the 2021–2022 WHO global survey on national IPC minimum requirements, only 40.6% of countries (43 of 106) reported that they had a protected and dedicated budget according to planned activities for IPC. Large disparities were observed across income levels, ranging from 15.4% (2 of 13) in LICs to 69.7% (23 of 33) in HICs *(127)*.

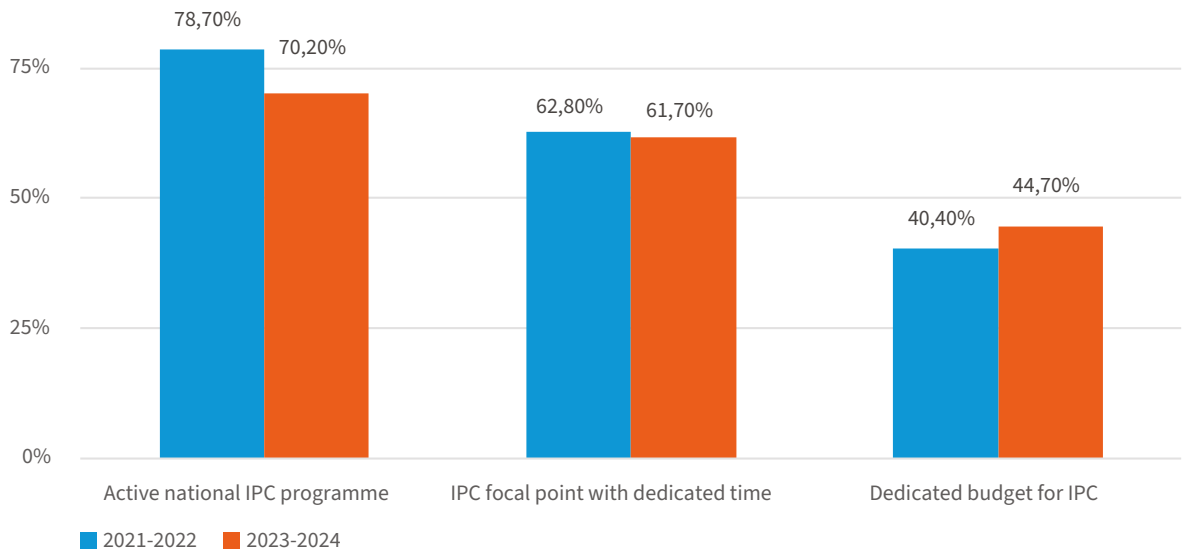
In 2023–2024, less than one half of all countries (44%; 66 of 150) had a dedicated budget, with upper-middle-income countries leading at 56.4% (22 of 39) compared to 33.3% (8/24) in LICs (Table 3.3).

Comparing only the 94 countries that participated in both surveys, the results regarding this indicator are similar (40.4% (38 of 94) of countries in 2021–2022 versus 44.7% (42 of 94) in 2023–2024 (Fig. 3.6).

However, the data from these last two surveys show an increase in the proportion of countries having a dedicated IPC budget with only 27.6% of countries (16 of 58) in 2017–2018 *(121)*. This might indicate that increased attention and prioritization was being given to IPC in the context of the COVID-19 pandemic. While these improvements are undoubtedly remarkable, they need to be sustained. Unfortunately, the proportion of countries having a dedicated IPC budget in 2023–2024 did not increase further (43.1% (25 of 58); WHO unpublished data).

It would be important to understand and support the process used in the development of budget plans for IPC, including what are the essential considerations to be made for the development of an IPC budget. Another critical consideration is how elements of the national IPC plans could be funded through other complementary programmes that may have common objectives, such as AMR, WASH, quality of care and patient safety.

Fig. 3.6. Selected comparisons among participants in both national IPC global surveys (2021–2022 and 2023–2024: N=94 countries): percentage of countries with an active IPC programme, dedicated time for IPC focal points, and a dedicated budget for IPC



Abbreviation: IPC: infection prevention and control.
Source: WHO global survey on IPC minimum requirements at the national level (WHO, unpublished data).

3.3 Implementation of IPC guidelines, and training and education

Guidelines are necessary to set standards and inform IPC training, implementation, and monitoring.

All countries should develop and make available a set of evidence-based, national IPC guidelines approved by the ministry of health to reduce the burden of HAIs and AMR *(2, 3, 5)* as part of the core components and minimum requirements for IPC programmes. Furthermore, an active role by the national IPC team to support the implementation of the best practices included in the guidelines at the point of care including health workers' training is strongly recommended.

These recommendations regarding guidelines and their implementation are reflected in the WHO IPC GAP/MF *(6)* in specific key actions and indicators under strategic direction #2 ("Active IPC programmes") for the national level (Table 3.4).

Table 3.4. 2024–2030 WHO global action plan and monitoring framework key actions, core indicators and targets: national IPC guidelines

Action	Indicator(s)	Target
Strategic direction #2. Active IPC programmes		
Key action #4 Develop national IPC guidelines, including policies for enabling environments for IPC, infrastructure, supplies and infection prevention among health and care workers at facility level, and link these guidelines with strategic principles for the control of AMR.	Evidence-based IPC guidelines and policies available at the national level.	No specific target.

Abbreviation: AMR, antimicrobial resistance; IPC, infection prevention and control.
Source: *(6)*.

Standardized and evidence-based IPC national guidelines are the critical starting point for achieving best IPC practices at the point of care, but their value is jeopardized if there are no implementation and monitoring plans and activities.

The 2021–2022 global survey on IPC minimum requirements at the national level showed that the national IPC programme had a mandate to produce IPC guidelines in 90.6% (96 of 106) of countries. In 84.9% (90 of 106) of countries, national guidelines were evidence-based and according to international/national standards. However, fewer countries stated that they engaged in actions to support implementation and local adaptation (72.6%; 77 of 106), with no significant differences across income levels *(127)*.

In 2023–2024, 90.7% (136 of 150) of countries reported that their national IPC programme had a mandate to produce guidelines for preventing and controlling HAI (Table 3.5), with minimal variations across income levels.

The development of guidelines using evidence-based scientific knowledge was reported by 88% (132 of 150) of countries, while 82% (123/150) of countries actively addressed guideline adaptation. Implementation was high across all income levels with eight to nine of 10 countries having met these requirements (Table 3.5) (WHO, unpublished data).

Table 3.5. Proportion of countries with reported established IPC minimum requirements by World Bank income level, 2023–2024: IPC guidelines

Indicator	Total (n=150)	Low-income (n=24)	Lower-middle-income (n=38)	Upper-middle-income (n=39)	High-income (n=49)
National IPC programme with mandate to produce guidelines.	136 (90.7%)	23 (95.8%)	33 (86.8%)	36 (92.3%)	44 (91.7%)
Guidelines development with the use of evidence-based scientific knowledge and international/national standards.	132 (88%)	21 (87.5%)	33 (86.8%)	35 (89.7%)	43 (89.6%)
Guideline adaptation and standardization to reflect local conditions.	123 (82%)	20 (83.3%)	30 (78.9%)	35 (89.7%)	38 (79.2%)

Abbreviation: IPC, infection prevention and control.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

In the 94 countries that participated in both surveys, no major changes were observed in the first two indicators (Fig. 3.7), whereas an increase was observed in the proportion of countries reporting that they addressed guideline adaptation to reflect local conditions (Fig. 3.7)

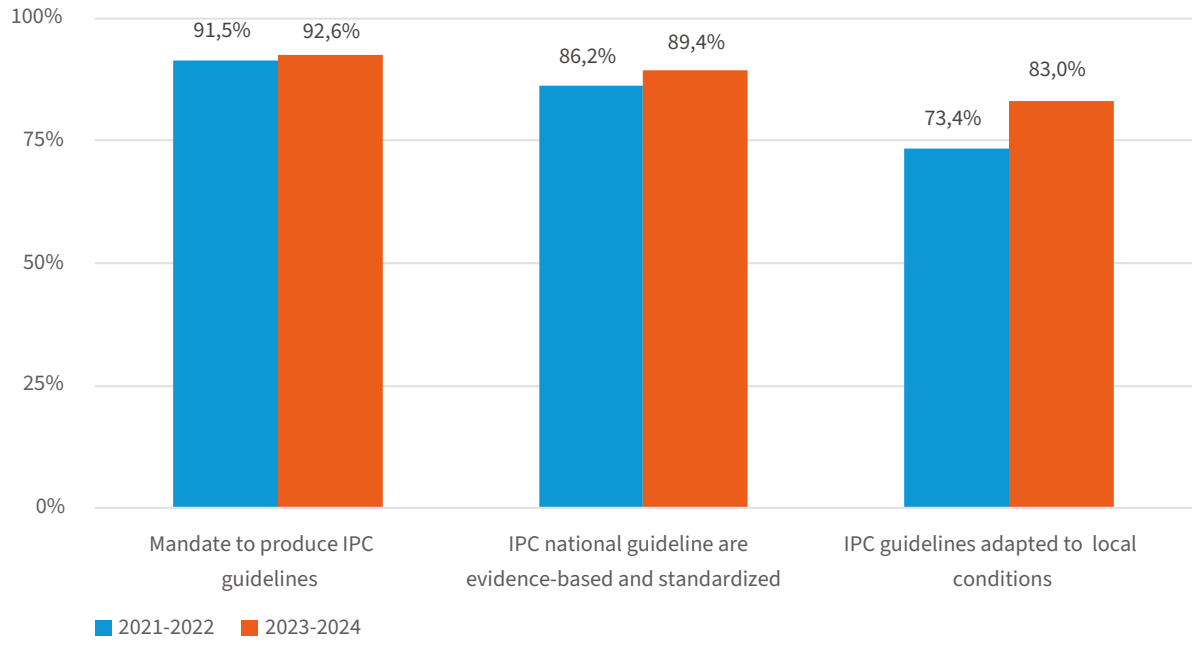
The comparison between the WHO 2017–2018 *(121)*, 2021–2022 *(127)* and 2023–2024 surveys seems to indicate increased attention by countries on the importance to have standardized, evidence-based IPC national guidelines.

The WHO recommendations on national IPC guidelines include a critical point on the need for health care workers' practical training on recommended IPC practices, coordinated by the national IPC programme or focal point *(2, 3)*.

IPC training and education are needed for effective implementation of IPC guidelines and standard operating procedures.

These recommendations and standards regarding IPC training and education are strongly emphasized for action in the WHO GAP/MF on IPC under strategic direction #4 ("Knowledge about IPC among health and care workers and career pathways for IPC professionals") for the national level (Table 3.6). At a minimum, countries should set a national policy requiring all health care workers to undergo in-service practical IPC training according to a curriculum aligned with national guidelines, and should evaluate the effectiveness of training *(5)*.

Fig. 3.7. Selected comparisons among participants in both national IPC global surveys (2021–2022 and 2023–2024: N=94 countries): percentage of countries with key IPC minimum requirements for IPC guidelines in place



Abbreviation: IPC, infection prevention and control.
Source: WHO global survey on IPC minimum requirements at the national level (WHO, unpublished data).

The data from the 2021–2022 WHO global survey on IPC minimum requirements at the national level show that, while only 39.6% of countries (42/106) reported having a national IPC curriculum for in-service training developed in alignment with national guidelines and approved by national bodies, 71.7% (76/106) and 82.1% (87/106) of countries provided guidance/recommendations and also content and support for these training activities, respectively *(127)*.

In 2023–2024, a national IPC curriculum for in-service training was available in only 38% (57/150) of countries, with no difference across income levels (Table 3.7) but l 72.7% (109/150) of countries provided guidance for in-service IPC training at the facility level (Table 3.7), without notable difference across income levels.

Table 3.6. 2024–2030 WHO global action plan and monitoring framework key actions, core indicators and targets: IPC in-service training

Action	Indicator(s)	Target
Strategic direction #4. Knowledge about IPC among health and care workers and career pathways for IPC professionals		
Key action #4 Develop a national in-service[a] curriculum on IPC (or adopt an international one) for all health and care workers, in particular frontline clinical, cleaning and management staff, and create a national (or subnational) training programme to support in-service IPC training.	1. National in-service IPC curriculum developed (by 2026). 2. National (or subnational) IPC training programme to support in-service training created (by 2028), introduced and regularly updated (by 2030). 3. Proportion of countries with a national in-service curriculum on IPC.	Increase of the proportion of countries having an IPC training programme for health and care workers to: 30% by 2026 50% by 2028 >80% by 2030
Key action #5 Mandate that all health and care workers, in particular frontline clinical, cleaning and management staff, receive education and training in standard operating procedures for IPC upon employment and regularly (for instance, annually) thereafter.	1. Legal mechanism or well-defined strategies established to mandate IPC in-service training (by 2028). 2. Proportion of facilities providing and/or requiring mandatory training for all health and care workers, in particular frontline clinical and cleaning staff, upon employment and annually thereafter, as well as for managers upon employment. 3. Proportion of facilities achieving all WHO minimum requirements for IPC training and education according to facility level. 4. Proportion of countries with a national (or subnational) IPC training programme.	**Core target:** increase of the proportion of facilities providing and/or requiring training to all frontline clinical and cleaning staff upon employment and annually and to managers upon employment to: 30% by 2026 60% by 2028 >90% by 2030

Abbreviation: IPC, infection prevention and control.
[a] In-service: training that is given to employees during the course of employment and carried out by an institution or agency. It includes orientation programmes.
Source: *(6)*.

Support for IPC training of health workers was reported by 81.3% (122/150) of countries, and by almost all low-income countries (95.8%; 23/24) (WHO, unpublished data).

These findings underline the need for countries to adopt a systematic approach for developing an IPC curriculum to improve the knowledge of front-line staff and to put in place systems for monitoring curriculum implementation. However, as mentioned above, the two most recent global surveys also revealed that the national IPC programmes need to take action to provide guidance, content and support for IPC training at the facility level.

It is also interesting to note that the indicators related to IPC guidelines and IPC training did not show significant differences across country income levels, suggesting that these activities might not strictly depend on the resources available. Conversely, indicators related to the existence of an active national IPC programme supported by a dedicated budget did vary across country income levels and indeed they are components that require intensive resources and sustainability.

Table 3.7. Proportion of countries with reported established IPC minimum requirements by World Bank income level, 2023–2024: training and education

Indicator	Total (n=150)	Low-income (n=24)	Lower-middle-income (n=38)	Upper-middle-income (n=39)	High-income (n=49)
The national IPC programme provides guidance and recommendations for in-service IPC training.	109 (72.7%)	15 (62.5%)	30 (78.9%)	28 (71.8%)	36 (75%)
The national IPC programme provides content and support for IPC training.	122 (81.3%)	23 (95.8%)	34 (89.5%)	31 (79.5%)	33 (68.8%)
A national IPC curriculum for in-service training is available.	57 (38%)	10 (41.7%)	17 (44.7%)	12 (30.8%)	17 (35.4%)
A national system and schedule of IPC curriculum monitoring and evaluation is available.	53 (35.3%)	7 (29.2%)	15 (39.5%)	15 (38.5%)	16 (33.3%)

Abbreviation: IPC, infection prevention and control.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

3.4 Documenting the progress and impact of IPC implementation: HAI surveillance and monitoring of IPC practices and feedback

Surveillance of HAI and related AMR is critical to inform and guide IPC strategies and interventions.

As a core component of IPC programmes, WHO strongly recommends that national HAI surveillance programmes and networks be established and incorporate timely data feedback mechanisms in order to monitor progress on HAI and AMR prevention *(2)*. This recommendation is strongly reinforced in the WHO IPC GAP/MF *(6)* in specific key actions and indicators under strategic direction #5 ("Data for action") for the national level (Table 3.8), including the fact that increasing the proportion of countries with a national HAI and related AMR surveillance system is one of the eight core targets of the GAP/MF (Table 3.8).

Table 3.8. 2024–2030 WHO global action plan and monitoring framework key actions, core indicators and targets: HAI surveillance

Action	Indicator(s)	Target
Strategic direction #5. Data for action		
Key action #2 Establish and/or strengthen a national surveillance system for HAIs and related AMR, including for early warning, with the ability to detect epidemic- and pandemic-prone pathogens, and for monitoring antimicrobial consumption. Ensure also that tertiary/secondary health care centres (at least referral centres) participate in national or international HAI and AMR surveillance networks.	**1.** National strategic plan for surveillance of HAIs and related AMR (with a focus on priority infections based on the local context) developed by a multidisciplinary technical group (by 2026) within the context of a broader surveillance system. **2.** National/subnational surveillance system for HAIs and related AMR (including for early warning, with the ability to detect epidemic- and pandemic-prone pathogens causing HAIs) established and supported (including financially) by governmental and national/subnational authorities (by 2028). **3.** Proportion of tertiary/secondary health care facilities participating in the national/subnational or international network for surveillance of HAIs and related AMR, if existing. **4.** Proportion of tertiary/secondary health care facilities having a surveillance system for HAIs and related AMR, including for early warning, with the ability to detect epidemic- and pandemic-prone pathogens.	**Core target:** increase of the proportion of countries with a national surveillance system for HAIs and related AMR to: 30% by 2026 50% by 2028 >80% by 2030

Abbreviations: HAIs, health care-associated infections; AMR, antimicrobial resistance.
Source: *(6)*.

Recognizing the challenges experienced in low-resource settings, WHO identified having at least a national strategic plan and a national multidisciplinary technical group for HAI surveillance, as a minimum requirement at the national level *(5)*.

In 2021-2022 only 62.3% of countries (66/106) reported having a national strategic plan for HAI surveillance. Significant differences were observed across income levels, ranging from 46.2% (n=6) to 84.8% (n=28) of LICs to HICs. Similarly, available expertise for HAI surveillance differed across income levels, with more HIC than LICs reporting an established multidisciplinary technical group for HAI surveillance at national level (90.9% [n=30] vs. 46.2% [n=6]) *(127)*.

A similar situation was seen in the 2023–2024 survey: a multidisciplinary technical group for HAI surveillance was established at the national level in only 53.3% (80/150) of countries (Table 3.9). HICs had the highest implementation at 70.8% (34/49), while LICs had the lowest at 25% (6/24). A national strategic plan for HAI surveillance was developed by half of the countries (75/150), with significant differences between HICs and low- and lower-middle-income countries (Table 3.9) (WHO, unpublished data).

Table 3.9. Proportion of countries with reported established IPC minimum requirements by World Bank income level, 2023–2024: HAI surveillance

Indicator	Total (n=150)	Low-income (n=24)	Lower-middle-income (n=38)	Upper-middle-income (n=39)	High-income (n=49)
A multidisciplinary technical group for HAI surveillance exists.	80 (53.3%)	6 (25%)	17 (44.7%)	23 (59%)	34 (70.8%)
A national strategic plan for HAI surveillance exists.	75 (50%)	4 (16.7%)	14 (36.8%)	23 (59%)	33 (68.8%)

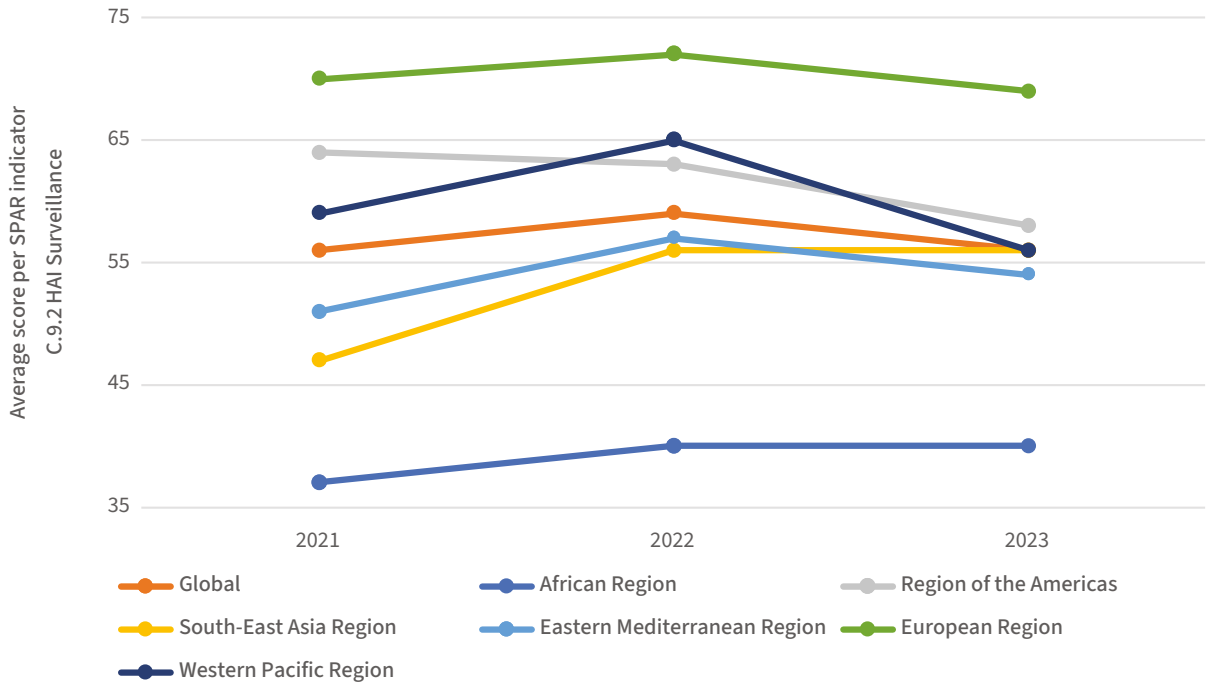
Abbreviation: IPC, infection prevention and control; HAI, health care-associated infection.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

In 2022, a WHO global patient safety survey reported that 51% of countries (47of 108) had a national system for HAI surveillance, regularly producing quality-controlled data, and 35% of countries were in the process of developing such a system *(27)*.

However, these countries were mostly HICs and upper-middle-income countries, which reflects the fact that setting up and maintaining an active and quality-controlled HAI surveillance system is highly resource-intensive. The section on IPC in the SPAR tool also includes a specific indicator on HAI surveillance capacity. Data from the last three years (Fig. 3.8) show a situation that is quite consistent with the above-mentioned results of the surveys, essentially indicating no progress in the average global score. Through these assessments, the European Region had the highest scores and the African Region the lowest.

No improvement was observed in the SPAR capacity related to HAI surveillance globally and in most regions between 2021 and 2023. The establishment of multidisciplinary technical groups for HAI surveillance and the development of national strategic plans for HAI surveillance both saw declines, with significant drops in LICs. This highlights critical gaps in HAI surveillance planning and the need for targeted support in these areas. Hand hygiene compliance monitoring and feedback also decreased in LICs, indicating less attention to this crucial aspect of IPC.

Fig. 3.8. Average score per SPAR indicator C.9.2 (HAI surveillance) globally and per WHO region, 2021–2023



Abbreviations: HAI, health care-associated infection; SPAR: State party self-assessment annual reporting (tool)
Source: *(119)*.

Another core component that is recommended by WHO as critical to inform IPC strategies and action is monitoring key indicators of IPC processes, infrastructure and practices and providing timely feedback on the results to relevant stakeholders *(2)*.

Undertaking these assessments is relatively simpler and more affordable than conducting HAI surveillance. Having not only a strategic plan and a national multidisciplinary technical group, but also a system in place for monitoring of IPC indicators are WHO minimum requirements *(5)*. Furthermore, appropriate hand hygiene monitoring with feedback is strongly recommended by WHO as a key performance indicator at the national level and as an IPC minimum requirement at the facility level *(2, 3, 5)*. Monitoring and auditing efforts should be matched by training on ways to collect the data, including an integrated system for the collection, analysis and feedback of data.

These recommendations and minimum requirements are reflected and reinforced in the GAP/MR on IPC under strategic direction #5 (“Data for action”) for the national level (Table 3.10) *(6)*.

The results of the 2021–2022 WHO global survey on IPC minimum requirements at the national level show that approximately only one half of countries (51.9%; 55 of 106) reported having a strategic plan for IPC monitoring, including an integrated system for data collection and analysis, with significant differences across country income levels (LICs, 46.2% [n=6] versus HICs, 72.7% [n=24]). Most countries (78.3%; 83 of 106) reported having a minimal set of core IPC indicators for health care facilities and 66% (70 of 106) identified hand hygiene compliance monitoring and feedback as a key national indicator, at least for reference hospitals *(127)*.

Table 3.10. 2024–2030 WHO global action plan and monitoring framework key actions, core indicators and targets: IPC monitoring and feedback

Action	Indicator(s)	Target
Strategic direction #5. Data for action		
Key action #1 Establish and/or strengthen national IPC monitoring system and ensure that health care facilities participate in the national IPC monitoring networks.	1. National strategic plan for IPC monitoring in place, including an integrated IPC monitoring system for collection, analysis and feedback of data. 2. Proportion of tertiary/ secondary-level health care facilities having an IPC monitoring system for collection, analysis and feedback of data. 3. Proportion of countries with a national IPC monitoring system (indicator for global reporting).	Increase of the proportion of countries with a national IPC monitoring system to: 30% by 2026 50% by 2028 >80% by 2030
Key action #3 Establish and/or strengthen a system for monitoring hand hygiene in health care facilities as a key national indicator.	1. Hand hygiene compliance monitoring and feedback established as a key national indicator, at the very least for reference hospitals (by 2026). 2. National programme for improving hand hygiene compliance in place (by 2026). 3. National hand hygiene monitoring system (compliance or product consumption) established and implemented (by 2028). 4. Proportion of health care facilities at all levels monitoring hand hygiene and providing data through the national system.	No specific target

Abbreviation: IPC, infection prevention and control.
Source: *(6)*.

The presence of a strategic plan and system for IPC monitoring did not change in 2023–2024, with 51.3% of countries (77 of 150) reporting them to be in place (Table 3.11).

A minimal set of core indicators for health care facilities was defined in 73.3% (110 of 150) of countries and hand hygiene compliance monitoring and feedback was identified as a key national indicator in 68% (102 of 150) of countries (Table 3.11). HICs and upper-middle income countries showed the highest implementation for all indicators, except for having a minimal set of core indicators, which was reported by a higher percentage of lower-middle income countries (WHO, unpublished data).

Among the 94 countries that participated in both surveys, no substantial improvement of these indicators for IPC monitoring and evaluation was noted between 2021–2022 and 2023–2024 (Fig. 3.9) (WHO, unpublished data).

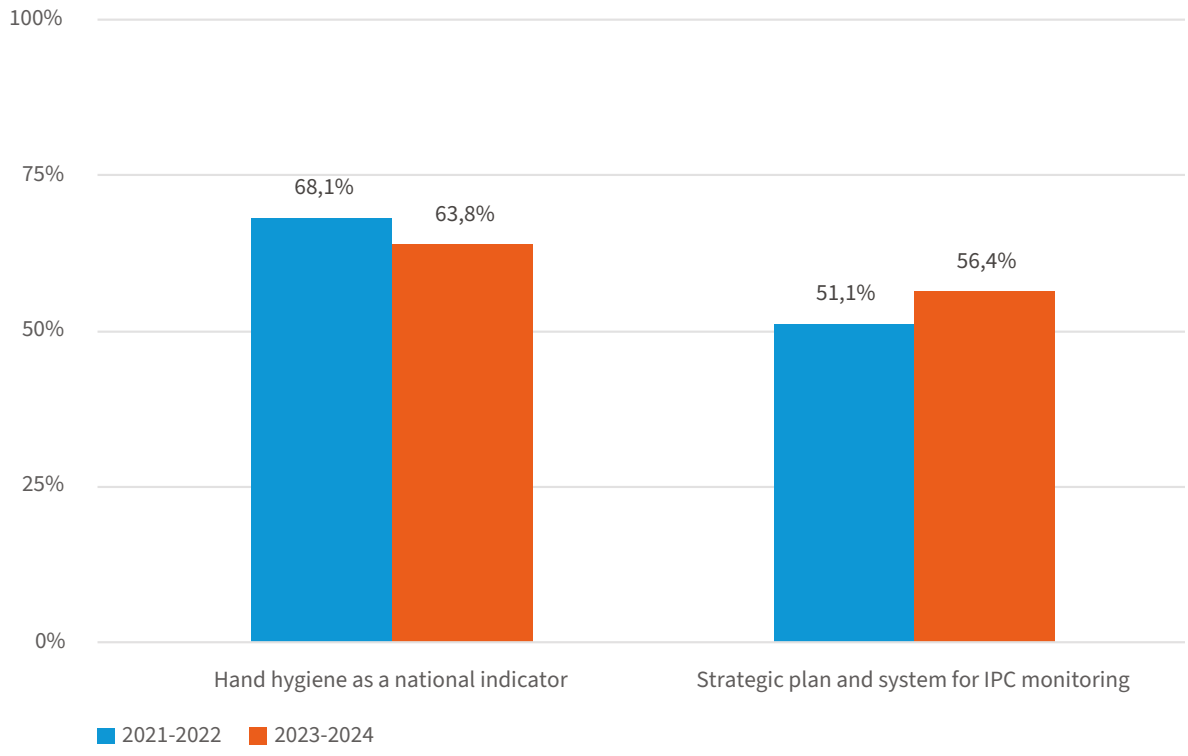
The slight reduction in the proportion of countries measuring hand hygiene compliance as a national indicator in 2023–2024 might be due to different people completing the surveys but also to a real decline of attention and capacity with the COVID-19 pandemic waning in the last couple of years.

Table 3.11. Proportion of countries with reported established IPC minimum requirements by World Bank income level, 2023–2024: monitoring and evaluation

Indicator	Total (n=150)	Low-income (n=24)	Lower-middle-income (n=38)	Upper-middle-income (n=39)	High-income (n=49)
A strategic plan for IPC monitoring is in place.	77 (51.3%)	11 (45.8%)	18 (47.4%)	19 (48.7%)	28 (58.3%)
A minimal set of core indicators is defined.	110 (73.3%)	13 (54.2%)	32 (84.2%)	27 (69.2%)	37 (77.1%)
Hand hygiene compliance monitoring and feedback as a key national indicator.	102 (68%)	12 (50%)	24 (63.2%)	28 (71.8%)	37 (77.1%)

Abbreviation: IPC, infection prevention and control.
Source: *(6)*.

Fig. 3.9. Selected comparison among participants in both national IPC global surveys (2021–2022 and 2023–2024: N=94 countries). Percentage of countries with key IPC minimum requirements for IPC monitoring and evaluation in place



Abbreviation: IPC: infection prevention and control.
Source: WHO global survey on IPC minimum requirements at the national level (WHO, unpublished data).

3.5 Adoption of the multimodal approach for IPC implementation

MMIS are the most effective way to implement IPC interventions, including hand hygiene, and achieve reduction of harm to patients due to HAIs *(2, 19-22)*.

WHO strongly recommends that MMIS should be supported and coordinated by national IPC programmes and implemented at the facility level *(2-4)*. As a minimum requirement, national focal points should be knowledgeable regarding the application of these strategies, coordinate/support their implementation, and include them in national training programmes *(5)*. Consequently, they should be used to reduce HAIs in health care facilities, according to local priorities.

These recommendations and minimum requirements are reflected and reinforced in the GAP/MR on IPC under strategic direction #2 ("Active IPC programmes") for the national level (Table 3.1).

In the past, the promotion of MMIS by the national IPC programme was not common and limited mainly to hand hygiene interventions. Indeed, in the WHO 2017–2018 global survey *(121, 127)*, only 52.3% (46 of 88; 95% CI, 41.8–62.7) of countries reported their use, with only 17.4% of LICs. In countries that participated in the WHO 2017–2018 global survey, as well as in the following ones in 2021–2022 and 2023–2024, the progressive understanding and promotion of MMIS progressively improved (53.4% versus 79.3%, versus 81%, respectively) (WHO, unpublished data).

In the 2021–2022 global survey, 70.8% (75 of 106) of responding countries reported that MMIS were included as the best implementation approach in national IPC guidelines and IPC education and training, with no differences across income levels. A similar percentage of countries stated that the national IPC focal point coordinates support for the local implementation of IPC improvement interventions (74.5%; 79 of 106) *(127)*.

In 2023–2024, 71.3% (107 of 150) of countries had a trained national IPC focal point with a knowledge of implementation science and MMIS (Table 3.12; WHO unpublished data).

Upper-middle-income countries had the highest implementation at 79.5% (31 of 39), while lower-middle-income countries had the lowest at 63.2% (24 of 38). The coordination and support of the local implementation of IPC improvement interventions were reported by 76.7% (115 of 150) of countries. LICs showed the highest proportion at 83.3% (20 of 24), followed by upper-middle-income countries at 76.9% (30 of 39), lower-middle-income countries at 76.3% (29 of 38), and HICs at 72.9% (35 of 49). MMIS were promoted within the development of IPC guidelines, education and training in 75.3% (113 of 150) of countries. HICs had the highest implementation at 83.3% (40 of 49), while LICs had the lowest at 70.8% (17 of 24) (Table 3.12; WHO unpublished data).

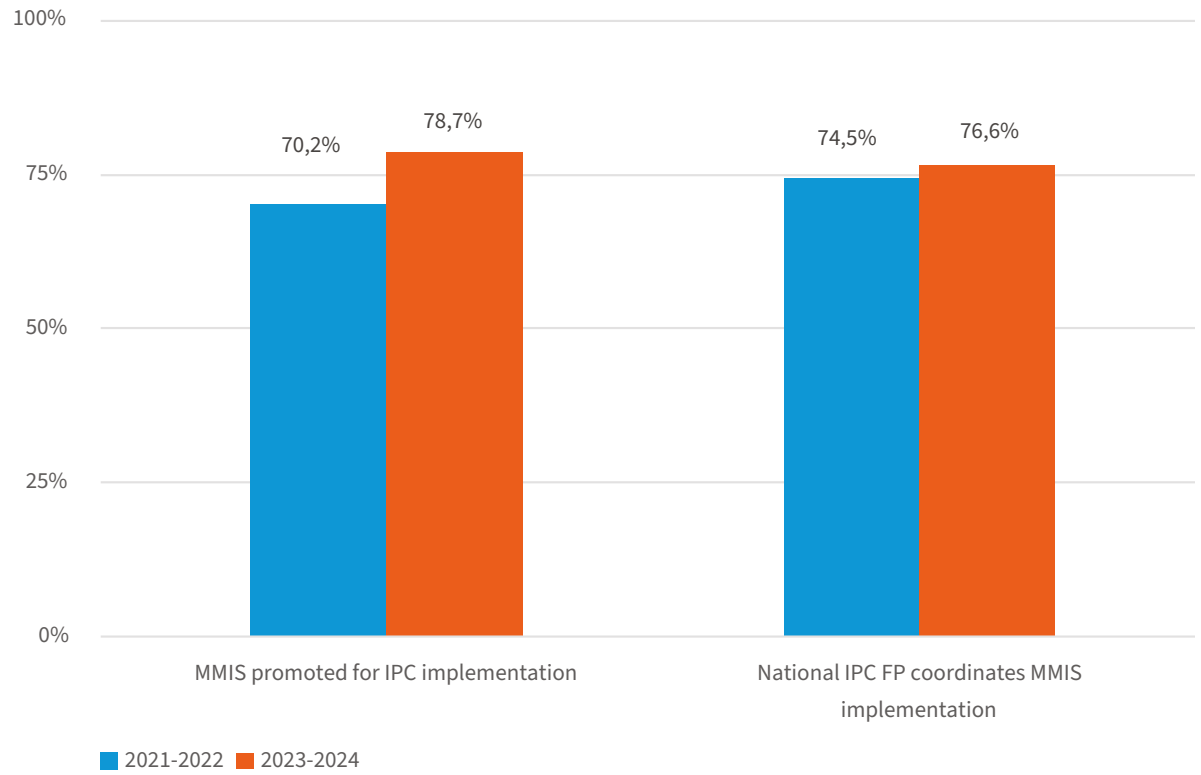
Comparing countries that participated in both surveys, indicators related to MMIS remained stable with a slight increase in the proportion of countries reporting that they promoted MMIS for the implementation of IPC interventions (Fig. 3.10).

Table 3.12. Proportion of countries with reported established IPC minimum requirements by World Bank income level, 2023–2024: monitoring and evaluation

Indicator	Total (n=150)	Low-income (n=24)	Lower-middle-income (n=38)	Upper-middle-income (n=39)	High-income (n=49)
IPC focal point with a knowledge of implementation science and MMIS.	107 (71.3%)	16 (66.7%)	24 (63.2%)	31 (79.5%)	35 (72.9%)
The national IPC focal point coordinates/supports local implementation of IPC improvement interventions.	115 (76.7%)	20 (83.3%)	29 (76.3%)	30 (76.9%)	35 (72.9%)
MMIS are promoted.	113 (75.3%)	17 (70.8%)	27 (71.1%)	28 (71.8%)	40 (83.3%)

Abbreviations: IPC, infection prevention and control; MMIS, multimodal improvement strategies.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

Fig. 3.10. Selected comparisons among participants in both national IPC global surveys (2021–2022 and 2023–2024: N=94 countries): proportion of countries with key IPC minimum requirements for MMIS in place



Abbreviations: FP, focal point; IPC, infection prevention and control; MMIS, multimodal improvement strategies.
Source: WHO global survey on IPC minimum requirements at the national level (WHO, unpublished data).

A nurse at the paediatric clinic in a hospital in Assin Fosu, Central Region, Ghana.
© WHO / Fanjan Combrink

Chapter 4.

IPC implementation at the health care facility level

Chapter 4.
IPC implementation at the health care facility level

4.1 Key messages

- Global surveys carried out by WHO in 2019 and in 2023–24 across all six WHO regions and all World Bank income levels provide a snapshot of the implementation of IPC core components in health care facilities.
- The level of implementation of IPC core components ranged from "inadequate" to "advanced", with significantly lower scores in LICs and LMICs compared with HICs. On average, LICs scored at a "basic" level of IPC implementation.
- HICs had more developed IPC in place for all core components, while lower-income countries had a notably poor implementation of IPC guidelines, training and education, monitoring, audit, feedback and HAI surveillance.
- At the facility level, IPC minimum requirements must be in place to provide at least the minimum protection and safety to patients, health workers and visitors. The 2019 survey showed that only 15.2% of participating facilities met all indicators designated as WHO IPC minimum requirements, whereas 92.9% met at least one half of these indicators. No facility in any LIC had all the IPC minimum requirements in place, and only 19.0% of tertiary specialized health care facilities in HICs had implemented all of them.
- In the 2023–2024 global survey, the percentage of participating facilities that met all the minimum requirements did not change compared to 2019 (15.8%), whereas 75.5% of facilities met at least 50% of the IPC minimum requirements. In LICs, only 35.7% of facilities met at least 50% of the requirements, and a mere 0.6% met all of them. In contrast, HICs showed a much higher ability to meet the requirements, with 98.8% meeting at least 50% and 27.9% fulfilling all requirements.
- Even where IPC programmes exist, they are often not able to function appropriately and sustainably in an enabling environment. In 2019, IPC programmes existed in almost all secondary and tertiary health care facilities. However, particularly in LMICs, the facilities lacked full-time IPC professionals, an allocated IPC budget, routine microbiological laboratory support and appropriate workload, staffing and bed occupancy.
- This is still the case with respect to overall scores on the implementation of IPC minimum requirements in 2023–2024, thus highlighting the ongoing disparity in IPC programme effectiveness and resource availability between different income levels.
- In the 2023–2024 WHO global survey, 65.6% of primary facilities, 75.4% of secondary facilities, and 83.2% of tertiary facilities reported having sufficient PPE, with significant differences across income levels.
- The 2024 report by the WHO/United Nations Children's Fund (UNICEF) Joint Monitoring Programme (JMP) for Water Supply, Sanitation and Hygiene provided a striking picture (2022

data): 1.7 billion people were using health care facilities that lack basic water services and 697 million were using facilities with unimproved toilets or no toilets.

- In the 2023–2024 WHO global survey, 74.7%, 83.3% and 85.4% of primary, secondary and tertiary care facilities, respectively, reported having continuously available water services, with HICs always reporting 100% availability and significant differences with other income levels.
- Appropriate hand hygiene practices can save lives, is effective in preventing infections, generates economic savings, and is an IPC minimum requirement in all health care facilities.
- The 2024 JMP report on WASH in health care facilities revealed that about two out of five (43%) lacked hand hygiene services (either soap and water or alcohol-based handrubs) at the point of care or at toilets. This translates to 3.4 billion people using health care facilities that lack basic hygiene services (hand hygiene facilities at points of care and toilets).
- The WHO global survey on hand hygiene programmes in health care facilities conducted in 2019 showed an intermediate implementation level (350/500 points) overall, with significant differences according to the income level of participating countries ("advanced" in HICs and "basic" in LICs), showing a disparity between hand hygiene practice implementation in resource-rich and resource-poor settings.
- In 2023–2024, 75.2%, 81% and 84.2% of primary, secondary, and tertiary health care facilities, respectively, reported having functioning hand hygiene stations at all points of care, with significant differences between HICs and LICs.
- The availability of resources seems to be an important driver in the implementation of appropriate hand hygiene. However, a sustained improvement of hand hygiene practices is possible only in an enabling organizational environment and institutional culture (the so-called "institutional safety climate"). Yet, within multimodal hand hygiene improvement strategies, the element scoring the lowest in 2019 was having an institutional safety climate for hand hygiene.

4.2 Implementation of the IPC core components

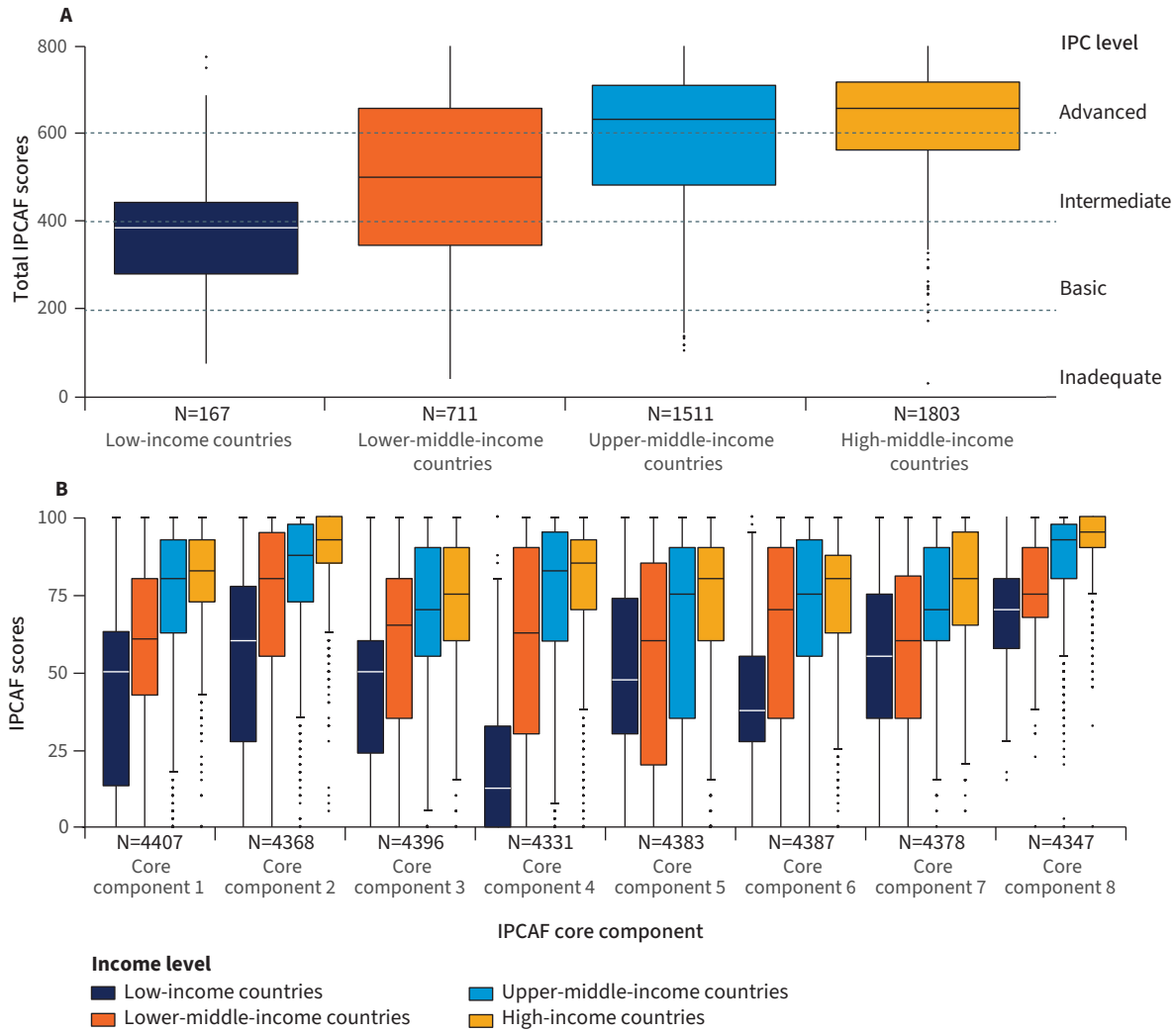
The IPC core components recommended for the national level are also critical for effective IPC in health care facilities. This is generally supported by a broader and/or stronger body of scientific evidence *(2, 20, 22)*. The first six core components are the same at facility level as those at the national level, with adaptations and differentiation according to the type of care provided (from tertiary to primary care) (see chapter 1.1). At the facility level, two additional core components are recommended by WHO which are critical to ensure that adequate staffing, infrastructure and supplies support appropriate IPC practices (see chapter 1.1). Specific IPC minimum requirements also exist to ensure the basic implementation of IPC according to the type of health care facility *(5)*.

A global survey conducted by WHO in 2019 just before the start of the COVID-19 pandemic provided a snapshot on the implementation of the IPC core components in 4440 health care facilities in 81 countries across all six WHO regions and all World Bank income levels *(8, 128)*. The survey was based on the IPC Assessment Framework (IPCAF) *(13, 128)* for acute health care facilities. IPCAF is a structured, self-administered, validated tool that assesses a detailed list of 81 indicators related to the IPC core components. It provides an overall and by-component scoring system ranging from 0 to 800 and determining facility allocation to four different levels, from "inadequate" to "advanced".

Implementation of IPC core components among the participating facilities ranged from "inadequate" to

"advanced", with a total weighted IPCAF median score of 605 (IQR, 450.4–705), corresponding to the lower range of the "advanced" level. However, as it is likely that participating facilities had a specific commitment to improving IPC, this could have led to an overestimation of the IPCAF scores. Significantly lower scores were found in LICs (385, IQR: 279.7–442.9), lower-middle-income countries (500.4; IQR, 345–657.5) and public facilities (515; IQR, 385–637.8) (Fig. 4.1). The largest differences between LICs and HICs concerned core components 4 ("HAI surveillance") and 6 ("monitoring, audit of IPC practices and feedback"), both of which require more expertise, time and investment to be implemented *(128)*. Facilities from the WHO Eastern Mediterranean Region scored the highest, closely followed by the WHO European and Western Pacific Regions. Large differences were also noted in scores within each region, indicating different levels of progress in IPC. This probably reflects once again the disparities in resources available.

Fig. 4.1. IPCAF weighted scores by income level (A) and by WHO region and core component (B), 2019



Abbreviations: IPC, infection prevention and control; IPCAF, IPC Assessment Framework.
Source: 2019 WHO global survey on IPC programmes at the facility level *(128)*.

In 2023–2024, WHO undertook a similar global survey, but based on the assessment tool of the WHO minimum requirements for IPC programmes *(5)* at the facility level, which represents a simplified version of the IPCAF tool used for the 2019 global survey. This tool is a structured, closed-formatted questionnaire, available for three levels of health care, that is, primary, secondary or tertiary care. The respective tools cover a total of 26 indicators for the primary health care facility *(10)*, 37 indicators for the secondary *(11)*, and 45 indicators for the tertiary level *(12)*.

A total of 5537 health care facilities representing 92 countries participated in the 2023–2024 WHO global survey, including 3795 primary care facilities, 1110 secondary care facilities, and 632 tertiary care facilities.

When comparing the results from the 2019 global survey (Fig. 4.1.) with the 2023–2024 survey on IPC minimum requirements, the variation of overall scores showed the same pattern across income levels (Fig. 4.2.A, B, C). The discrepancy was most prominent at the primary care level (WHO, unpublished data). Of note, comparisons between the two surveys should be interpreted with caution as the sample included in the two surveys was partially different.

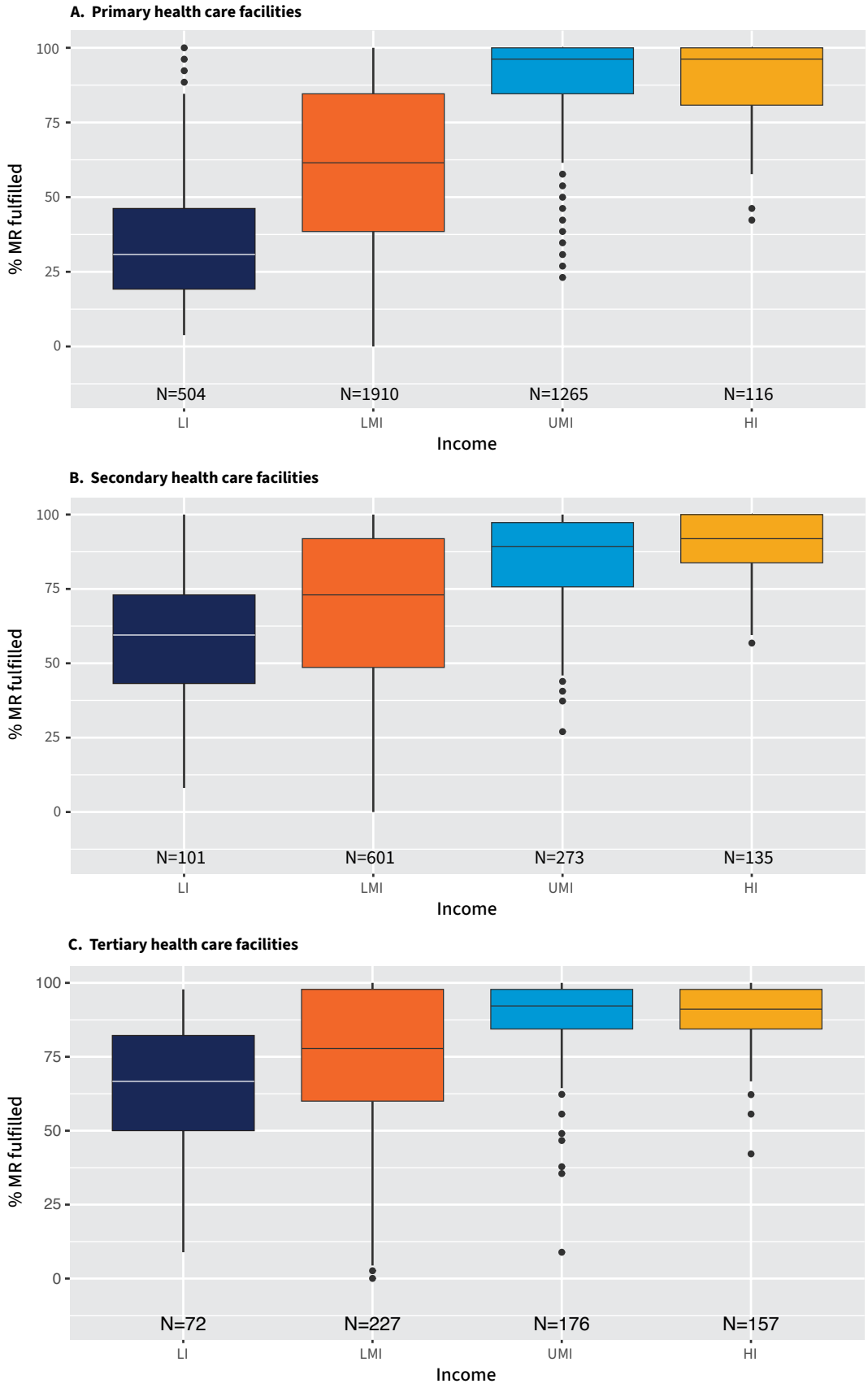
Similar to results from the 2019 global survey (Fig. 4.1), the overall scores also varied according to region, with the Africa and South-East Asia Regions consistently scoring lower than other regions across the different care levels (Fig. 4.3.A, B, C).

In 2019, the highest scores were for core components 8 (“built environment, materials and equipment for IPC”) and 2 (“IPC guidelines”) (Fig. 4.1). The lowest scores were for core components 7 (“workload, staffing and bed occupancy”) and 3 (“IPC education and training”).

In 2019, a significantly higher total IPCAF score was associated with tertiary care facilities (71.6 points higher [95% CI, 20.4–122.8]) compared with primary care facilities *(128)*. In 2023–2024, although tertiary care facilities had a higher overall median total score of 86.7 (95% CI, 71.1–97.8) for the implementation of IPC minimum requirements, primary care facilities were not far behind with a median of 76.9 (95% CI, 42.3–96.2) (WHO, unpublished data).

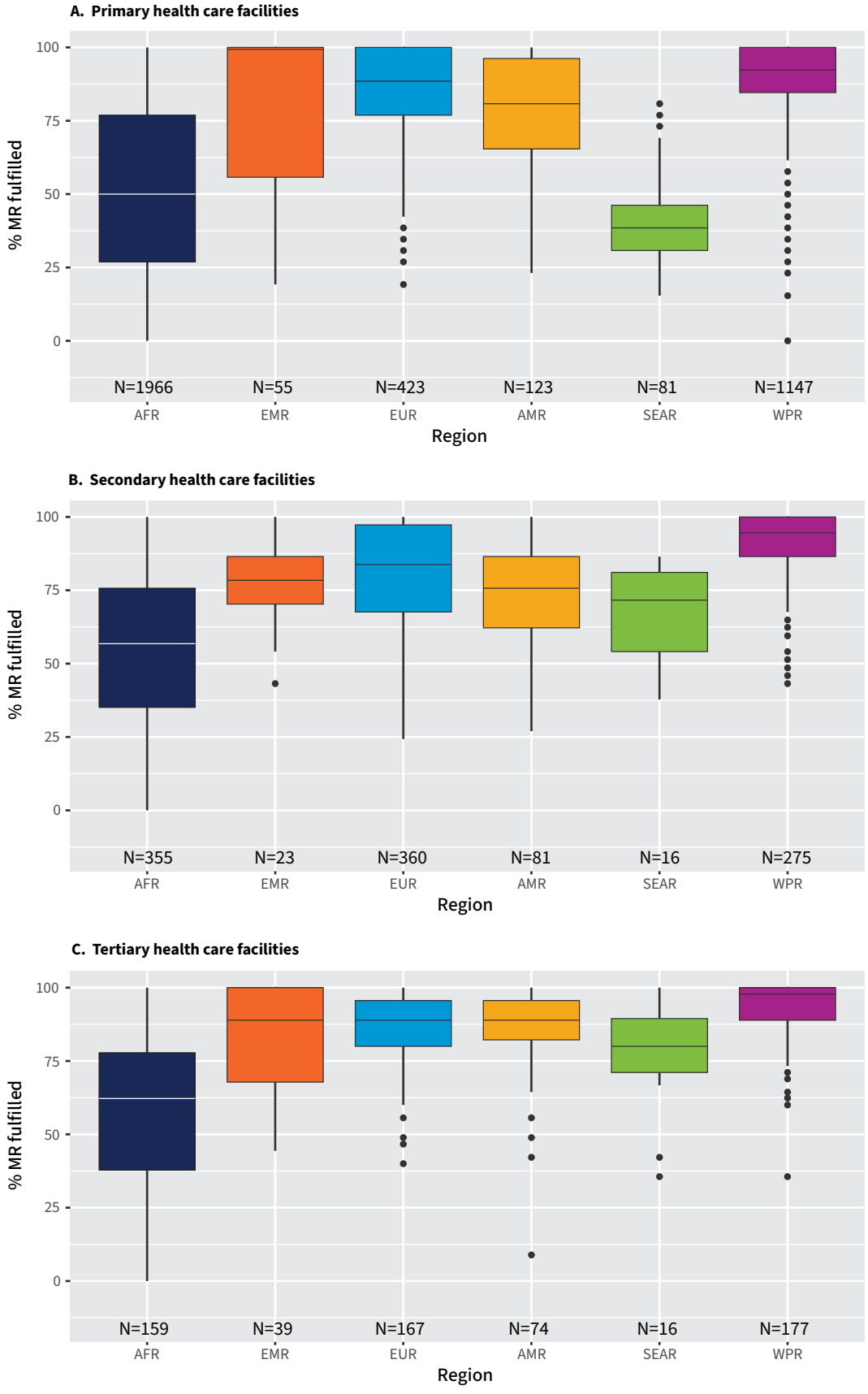
In the 2019 survey, only 15.2% of facilities met all IPC minimum requirements, with none being in LICs and with overall IPCAF scores significantly lower in LICs than in HICs *(128)*. Unfortunately, in general, results regarding the ability of health care facilities to meet the minimum requirements did not improve in the 2023–2024 global survey. However, the sample included in the two surveys was partially different.

Fig. 4.2. Average IPC minimum requirements score across primary, secondary and tertiary health care facilities by country income level, 2023–2024



Abbreviations: HI, high income, LI, low income, LMI, lower-middle income, UMI, upper-middle income; MR, minimum requirements.
Source: WHO global survey on IPC minimum requirements at the facility level, 2023–2024 (WHO, unpublished data).

Fig. 4.3. Average IPC minimum requirements' score across primary, secondary and tertiary health care facilities by WHO region, 2023–2024



Abbreviations: AFR, African Region; AMR, Region for the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; MR, minimum requirements; SEAR, South-East Asia Region; WPR, Western Pacific Region.
Source: WHO global survey on IPC minimum requirements at the facility level, 2023–2024 (WHO, unpublished data).

Overall, in 2023–2024, 75.5% of facilities met at least 50% of the IPC minimum requirements, 34% met 90% of them, while only 15.8% fulfilled all of them (Table 4.1). Discrepancies were evident when comparing income levels (WHO, unpublished data).

Table 4.1. Percentage of the IPC minimum requirements met across primary, secondary and tertiary health care facility and income levels, 2023–2024

Level of care	Income level	Met at least 50% of the MR	Met at least 90% of the MR	Met 100% of the MR
Primary	Total	2711 (71.4%)	1236 (32.6%)	617 (16.3%)
	Low income	121 (24%)	6 (1.2%)	2 (0.4%)
	Lower-middle-income	1232 (64.5%)	338 (17.7%)	146 (7.6%)
	Upper-middle-income	1246 (98.5%)	820 (64.8%)	426 (33.7%)
	High income	112 (96.6%)	72 (62.1%)	43 (37.1%)
Secondary	Total	911 (82.1%)	372 (33.5%)	159 (14.3%)
	Low income	67 (66.3%)	3 (3%)	2 (2%)
	Lower-middle-income	448 (74.5%)	163 (27.1%)	60 (10%)
	Upper-middle-income	261 (95.6%)	130 (47.6%)	62 (22.7%)
	High income	135 (100%)	76 (56.3%)	35 (25.9%)
Tertiary	Total	561 (88.8%)	277 (43.8%)	98 (15.5%)
	Low income	54 (75%)	4 (5.6%)	0 (0%)
	Lower-middle-income	180 (79.3%)	86 (37.9%)	33 (14.5%)
	Upper-middle-income	171 (97.2%)	99 (56.2%)	29 (16.5%)
	High income	156 (99.4%)	88 (56.1%)	36 (22.9%)
Primary, secondary, tertiary	Total	4183 (75.5%)	1885 (34%)	874 (15.8%)
	Low income	242 (35.7%)	13 (1.9%)	4 (0.6%)
	Lower-middle-income	1860 (67.9%)	587 (21.4%)	239 (8.7%)
	Upper-middle-income	1678 (97.9%)	1049 (61.2%)	517 (30.2%)
	High income	403 (98.8%)	236 (57.8%)	114 (27.9%)

Abbreviation: MR, minimum requirements.
Source: WHO global survey on IPC minimum requirements at the facility level, 2023–2024 (WHO, unpublished data).

The disparities noted across income levels in both surveys are of particular concern, with HICs consistently showing higher rates of meeting IPC minimum requirements and LICs struggling to meet even one half of IPC minimum requirements.

This emphasizes the need for targeted interventions and support to improve IPC practices in lower-income settings.

The WHO IPCAF is progressively being used by facilities to assess their IPC situation locally *(129, 130)*, regionally *(131-133)* or even to conduct nationwide surveys *(134-142)*. Four nationwide studies identified core component 7 ("workload and staffing levels") as a critical area for improvement, among others *(134-137)*. Some studies showed that the IPCAF can be used as a situational self-assessment tool to monitor progress over time *(139-141)*. As an example, repeated nationwide assessments in Sierra Leone helped to identify critical needs and guide action plan development and impact evaluation over time *(139)*. The nationwide follow-up assessment in German hospitals re-confirmed an already high degree of IPC implementation across all relevant areas with an improvement of the previously observed scores for workload and staffing *(141)*.

4.3 IPC programme, human resources, and the built environment

Each acute health care facility should have an active IPC programme with a dedicated, trained team or, at a minimum, a full-time focal point should be in place and supported by a dedicated budget for implementing IPC strategies and plans *(2, 4, 5)*.

At least one trained IPC link person with dedicated (part-) time should be present in each primary health care facility and supported by at least one IPC-trained health care officer at the next administrative level, for example, district *(5)*. Since May 2024, these recommendations and minimum requirements have become key actions, core indicators and targets for the facility level included in the 2024–2030 WHO GAP/MF for IPC, adopted by all countries (Table 4.2) *(6, 7)*.

Table 4.2. 2024–2030 WHO global action plan and monitoring framework key actions, core indicators and targets: political commitment and policies and active IPC programmes at the facility level

Action	Indicator(s)	Target
Strategic direction #1. Political commitment and policies		
Key action #1 Demonstrate the commitment and support of facility senior managers to IPC through an adequate dedicated budget allocation to the IPC programme and team, including funding to implement the annual action plan.	Adequate dedicated budget available for IPC (that is, to fund the IPC programme and team and the annual action plan, including equipment for IPC practices).	**Core target**: increase of the proportion of health care facilities with an adequate dedicated budget for IPC to: 30% by 2026 50% by 2028 >80% by 2030
Strategic direction #2. Active IPC programmes		
Key action #1 Establish an active IPC programme for tertiary and secondary care facilities (that is, with objectives and an annual action plan, supported by dedicated human resources and budget) and ensure that there is an IPC link person in each primary care facility, within broader health services' development.	Active IPC programme established (that is, with objectives and annual action plan, supported by dedicated human resources and adequate funding) (by 2026).	No specific target
Key action #2 Make, fund and implement IPC improvement plans in order to achieve WHO minimum requirements for IPC according to the facility level, including the availability of adequate facility infrastructure and IPC supplies.	1. WHO minimum requirements for IPC in the health care facility met according to the facility level. 2. Percentage of WHO minimum requirements for IPC met in the health care facility, according to the facility level.	**Core target:** increase of the proportion of facilities meeting all WHO minimum requirements for IPC programmes to: 30% by 2026 60% by 2028 >90% by 2030

Abbreviation: IPC, infection prevention and control.
Source: *(6)*.

The 2023–2024 survey results on IPC minimum requirements indicated that core component 1 had a median score of 100 (IQR, 50-100) for primary care facilities, 66.7 (IQR, 0-100) for secondary care facilities, and 80 (IQR, 60-100) for tertiary care facilities There were no significant differences across income levels (WHO, unpublished data).

By extrapolating the IPCAF indicators specifically related to the IPC minimum requirements, almost all secondary and tertiary health care facilities (98.4%) in 2019 reported the presence of an IPC programme. However, the functionality or activeness of such programmes greatly varied by income level, with fewer facilities in LICs than in HICs having access to a full-time IPC professional (13.8% versus 74.7%), an allocated IPC budget (15.5% versus 73.4%), and routine microbiological laboratory support (42.2% versus. 96.4%) *(128)*.

In the 2023–2024 survey, the functionality or activeness of IPC programmes still varied significantly by income level. Availability of a full-time IPC professional was reported by 59.7% of tertiary facilities in LICs compared to 84.1% in upper-middle-income countries and 70.1% in HICs. For secondary facilities, 52.5% in LICs had access to a full-time IPC professional compared to 70.7% in upper-middle-income countries and 65.9% in HICs. For primary facilities, 68.5% in LICs had a trained IPC link person compared to 81.4% in upper-middle-income countries and 85.3% in HICs (Table 4.3; WHO unpublished data).

An allocated IPC budget was reported by 29.2% of tertiary facilities in LICs compared to 63.1% in upper-middle-income countries and 61.1% in HICs. For secondary facilities, 15.8% in LICs had an allocated IPC budget compared to 54.2% in upper-middle-income countries and 60% in HICs. For primary facilities, an allocated IPC budget was not assessed as a minimum requirement (Table 4.3.; WHO unpublished data).

Routine microbiological laboratory support was only assessed for tertiary care facilities as a minimum requirement. 63.9% of tertiary care facilities in low-income countries had this compared to 90.3% in upper middle-income countries and 98.7% in high-income countries (Table 4.3; WHO unpublished data).

Table 4.3. Percentage of facilities meeting selected IPC indicators from core component 1 across different facility and income levels, 2023–2024

Core component	Indicator	Facility Level	Low income	Upper-middle-income	High income
Core component 1: IPC programme	Access to a full-time IPC professional.	Primary	68.5%	81.4%	85.3%
		Secondary	52.5%	70.7%	65.9%
		Tertiary	59.7%	84.1%	70.1%
	Allocated IPC budget.	Primary	Not assessed	Not assessed	Not assessed
		Secondary	15.8%	54.2%	60%
		Tertiary	29.2%	63.1%	61.1%
	Routine microbiological laboratory support.	Tertiary	63.9%	90.3%	98.7%

Abbreviation: IPC: infection prevention and control.
Source: WHO global survey on IPC minimum requirements at the facility level, 2023–2024 (WHO, unpublished data).

A good built environment is essential to support health workers in performing and adhering to IPC best practices and to enable safe patient care delivery and optimal quality of care.

WHO recommendations on the built environment necessary to support IPC practices are included in core component 8 and the related minimum requirements, as well as in WHO guidance documents on WASH in health care facilities *(2, 5, 143, 144)*. Another critical enabler of IPC programmes is adequate "workload, staffing and bed occupancy", that is core component 7.

In the IPCAF 2019 global survey *(128)*, core component 8 ("built environment, materials and equipment for IPC") scored the highest (90; IQR, 75–100) (Fig. 4.1). However, in the same survey, core component 7 ("workload, staffing and bed occupancy") scored the lowest (70; IQR, 50–90). No significant differences across income levels were seen for this core component. In the 2023–2024 survey, core component 8 continued to score highly across all facility levels. For primary care facilities, the median score was 81.8 (IQR, 45.5-100), 92.9 (IQR, 64.3-100) for secondary care facilities, and 92.9 (IQR, 78.6-100) for tertiary care facilities. Core component 7 still showed lower scores, with a median of 66.7 (IQR, 0-100) for primary care facilities, 85.7 (IQR, 57.1-100) for secondary care facilities, and 85.7 (IQR, 57.1-100) for tertiary care facilities (WHO, unpublished data).

In 2019, only 62.6% of all facilities with completed surveys for core component 7 ("workload, staffing and bed occupancy") had a system in place to respond to staffing needs *(128)*. In the 2023–2024 global survey, 58.3% of primary facilities reported having such systems, with HICs reporting 79.3% and 34.5% for LICs. For secondary facilities, 65.3% reported having systems in place, with HICs at 80% and LICs 47.2%. For tertiary facilities, 66.9% reported having systems in place, with HICs at 79% and LICs at 40.3% (WHO, unpublished data).

In 2019, over 80% of facilities in HICs at all care levels met all built environment minimum requirements for core component 8. However, fewer health care facilities in LICs reported that they had functioning hand hygiene stations at all points of care (24%), functioning toilets or latrines (53.6%), an energy/power supply (55.2%), continuously available water services (67.71%), and PPE (53.8%) *(128)*. These discouraging findings were reported just before the beginning of the COVID-19 pandemic. While it might have been expected that the shocking situation and high pressure to improve outbreak readiness and response would lead to a substantial improvement, this was unfortunately not the case everywhere.

In the 2023–2024 survey, the indicators on the built environment showed a significant variation across income and care levels. Indeed, 75.2%, 81% and 84.2% of primary, secondary, and tertiary health care facilities, respectively, reported having functioning hand hygiene stations at all points of care, with significant differences between HICs and LICs. (Table 4.4; WHO, unpublished data).

For continuously available water services, 74.7%, 83.3% and 85.4% of primary, secondary and tertiary care facilities, respectively, reported having them, with HICs always reporting 100% availability and significant differences with other income levels (Table 4.4; WHO, unpublished data).

Regarding functioning toilets or latrines, 62.3%, 59.4% and 65.2% of primary, secondary, and tertiary care facilities reported having them, again with significant differences across income levels (Table 4.4; WHO,

unpublished data). Availability of an energy/power supply may also have an influence on IPC practices and data related to this indicator are shown in Table 4.4.

A lack or limited availability of PPE was reported in four WHO pulse surveys on the continuity of essential health services during the COVID-19 pandemic *(145-148)*. In these surveys conducted in 2020 and repeated until the first quarter of 2023, up to 65% of countries cited the lack of IPC supplies and poor application of best practices as major reasons for the disruption of essential health services *(149)*. This highlights the impact of defective IPC implementation, not only on the capacity to respond to COVID-19 directly, but also across the health system. As a sign of recovery of health systems in the fourth survey round, only 24% (23 of 93 countries) reported disruption to their in-country supply chain system, a decrease of almost 50% from the fourth quarter of 2021 *(147)*.

In the 2023–24 WHO global survey, 65.6% of primary facilities, 75.4% of secondary facilities and 83.2% of tertiary facilities reported having sufficient PPE, with significant differences across income levels (Table 4.4; WHO, unpublished data).

Table 4.4. Percentage of facilities meeting selected IPC indicators of core components 7 and 8 across different facility and income levels, 2023–2024

Core component	Indicator	Facility level	Low income	High income
Core component 7: Workload, staffing and bed occupancy	System to respond to staffing needs.	Primary	34.5%	79.3%
		Secondary	47.2%	80%
		Tertiary	40.3%	79%
Core component 8: Built environment, materials and equipment for IPC	Functioning hand hygiene stations.	Primary	38.1%	98.3%
		Secondary	51.5%	99.3%
		Tertiary	65.3%	98.1%
	Functioning toilets or latrines.	Primary	34.9%	88.8%
		Secondary	33.7%	90.4%
		Tertiary	30.6%	80.3%
	Energy/power supply.	Primary	32.9%	99.1%
		Secondary	80.2%	98.5%
		Tertiary	76.4%	99.4%
	Continuously available water services.	Primary	49%	100%

Core component	Indicator	Facility level	Low income	High income
		Secondary	68.3%	100%
		Tertiary	73.6%	100%
	Sufficient PPE.	Primary	18.8%	100%
		Secondary	46.5%	100%
		Tertiary	45.9%	100%

Abbreviations: IPC, infection prevention and control; PPE, personal protective equipment.
Source: WHO global survey on IPC minimum requirements at the facility level, 2023–2024 (WHO, unpublished data).

Additional data on WASH in health care facilities are available from a number of sources (Box 4.1).

Box 4.1. Systems monitoring WASH indicators in health care facilities

- The WHO/UNICEF JMP *(150)* for Water Supply, Sanitation and Hygiene regularly reports on WASH services in health care facilities, schools and households.
- The WHO/UNICEF global country tracker *(151)* reports on national actions to improve WASH in health care facilities.
- The WHO-led United Nations Global Analysis and Assessment of Sanitation and Drinking Water (GLAAS) survey *(152)* analyzes the policy and financing landscape for WASH more broadly, including in health care facilities.

Abbreviations: JMP, joint monitoring programme; WASH, water, hygiene and sanitation.

For the 2024 report by the WHO/UNICEF JMP for Water Supply, Sanitation and Hygiene, data were drawn upon from almost 700 national data sources that collected WASH data from approximately 1.2 million health care facilities in 166 countries *(153)*.

In 2022, two out of five health care facilities (43%) lacked hand hygiene services at points of care or toilets, one in four (22%) lacked basic water services, and one in 11 facilities (9%) had no sanitation service *(153)*.

WASH data for water services in health care facilities *(153)* showed that:

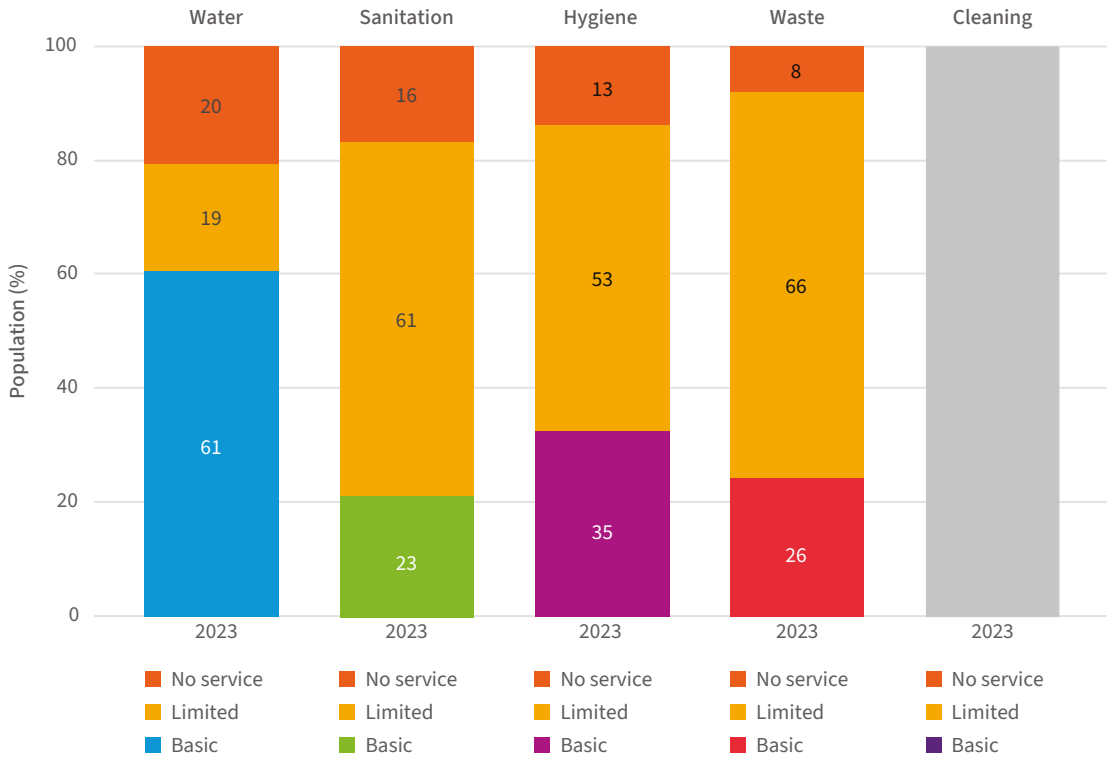
- 6.2 billion people had access to basic water services globally (78% of facilities)
- 861 million people had access to limited services, and 874 million had no service.

Regional WASH estimates for 2023 are available for the WHO African Region (not for environmental cleaning) (Fig. 4.4) and for the WHO Eastern Mediterranean Region (all five service areas) (Fig. 4.5) *(153)*.

In health care facilities in the WHO African region in 2023, 61% of people had access to basic water services, 35% had access to basic hand hygiene services, and only 23% to basic sanitation services (Fig. 4.4). The African Union AMR Landmark Report highlighted the challenges faced by African countries by stating that one in three hospitals lacks clean, safe running water, and one in eight people defecate openly due to inadequate sanitation *(109)*. In health care facilities in the Eastern Mediterranean Region, the lack of basic sanitation services similarly affected approximately three quarters of the population. However, the estimates for the percentage of people with access to basic water services and basic hand hygiene services were more favourable with 74% and 60%, respectively (Fig. 4.5).

In 2023, the situation was especially acute in the 60 countries classified as "fragile contexts" according to OECD[12], based on a combination of economic and political considerations *(153)* (Fig. 4.6). In these countries, more than one third (37%) lacked basic water services, more than one half (54%) lacked basic hygiene services, two thirds (66%) lacked basic environmental cleaning, three quarters (75%) lacked basic health care waste management, and four out of five (81%) lacked basic sanitation services.

Fig. 4.4. Coverage of WASH services in health care facilities, WHO African Region, 2023



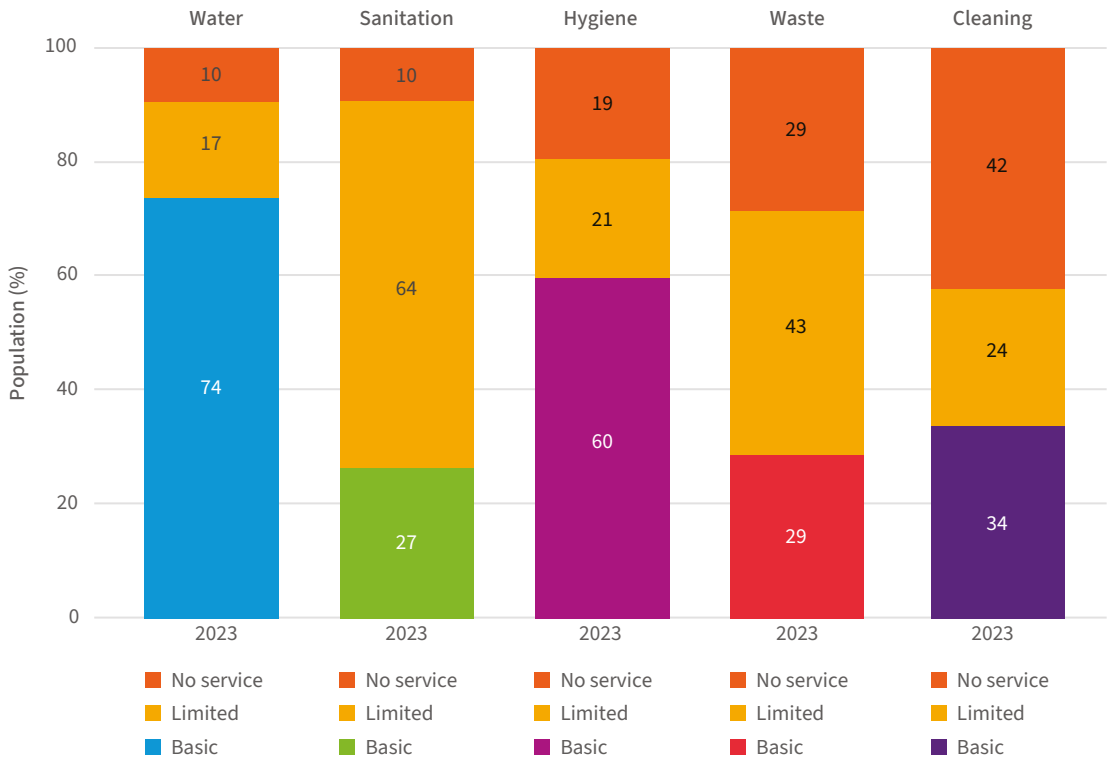
Abbreviation: WASH, water, sanitation and hygiene.
Source: *(153)*.

> These shocking data contrast with the estimated costs for achieving improvements in WASH services, which are relatively modest and potentially within the scope of existing government health budgets.

Achieving universal coverage of basic WASH services in public health facilities in the 46 least developed countries will cost US$ 6.5–9.6 billion between 2021 and 2030 *(154)*. An estimated US$ 2.9–4.8 billion is needed in total capital investments and US$ 3.6–4.8 billion is required for total operations and maintenance. Waste management accounts for the greatest share of costs (43–49%), followed by sanitation (21–28%), water (20%), and hand hygiene (10–11%). Resource needs are greatest for non-hospital facilities (94%) and for facilities in rural areas (68%). Annual operation and maintenance funding needs in 2030 are equivalent to only 4–6% of recurrent health spending by least developed countries in 2018.

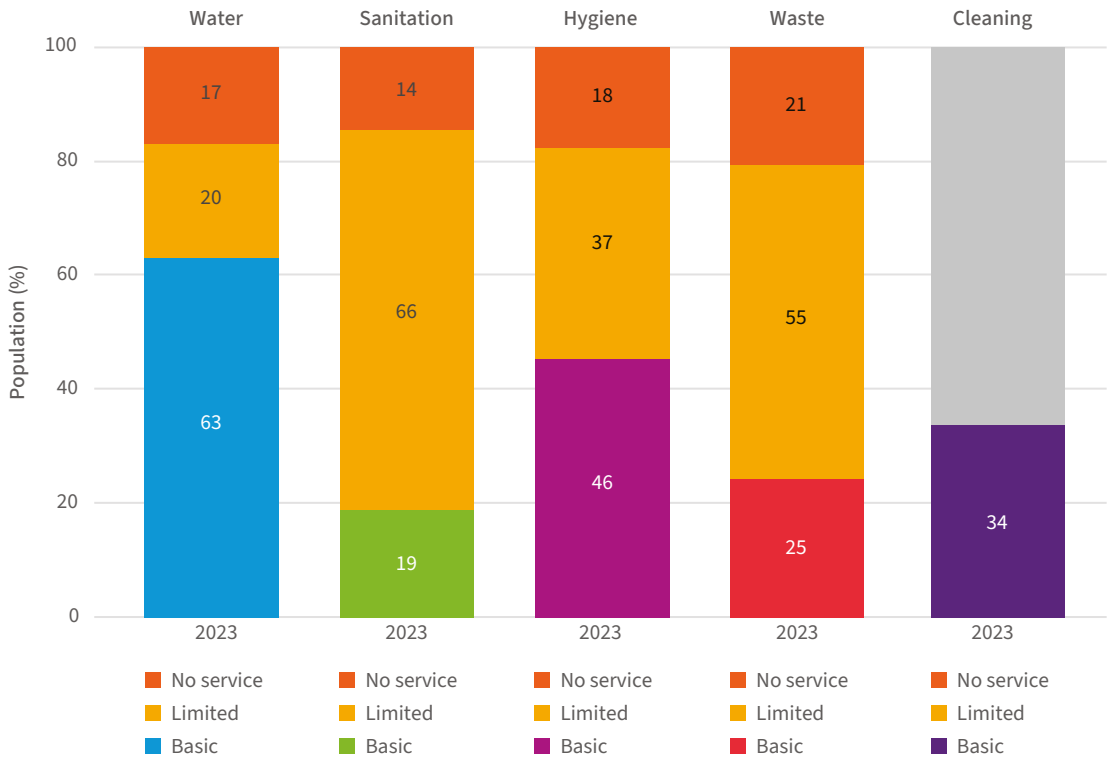
[12] States of Fragility 2022. Paris: OECD Publishing; 2022 (https://www.oecd.org/en/publications/states-of-fragility-2022_c7fedf5e-en.html).

Fig. 4.5. Coverage of WASH services in health care facilities, WHO Eastern Mediterranean Region, 2023



Abbreviation: WASH, water, sanitation and hygiene.
Source: *(153)*.

Fig. 4.6. Global coverage of WASH services in health care facilities in fragile countries[a], 2023



Abbreviation: WASH, water, sanitation and hygiene.
[a]Fragile countries according to the OECD[12].
Source: *(153)*.

4.4 Implementation of IPC guidelines, training and education

The implementation of IPC guidelines at the point of care (core component 2) to protect patients and health workers from infection requires the availability of standard operating procedures (SOPs) at the facility level, and the targeted and regular education and training of staff (core component 3) *(2, 4, 5)*.

Since May 2024, these recommendations and minimum requirements have been reflected in key actions, core indicators and targets for the facility level included in the 2024–2030 WHO GAP/MF for IPC, adopted by all countries (Table 4.5) *(6, 7)*.

Table 4.5. 2024–2030 WHO global action plan and monitoring framework key actions, core indicators and targets: IPC guidelines and SOPs and IPC education and training at the facility level

Action	Indicator(s)	Target
Strategic direction #4. Knowledge about IPC among health and care workers and career pathways for IPC professionals		
Key action #1 Make implementation plans and provide resources (human and financial) to achieve all WHO minimum requirements for IPC training and education and to progressively achieve all requirements of core component 3 on IPC education and training.	All WHO minimum requirements for IPC training and education met, according to facility level (by 2030).	Increase of the proportion of facilities providing and/or requiring training for all frontline clinical and cleaning staff upon employment and annually, as well as to managers upon employment, to: 30% by 2026 60% by 2028 >90% by 2030

Abbreviation: IPC, infection prevention and control.
Source: *(6)*.

Although the IPCAF scores for having IPC guidelines were the highest (87.5; IQR, 70–97.5) in 2019, there was a substantial difference between LICs and HICs (60 versus 92.5, respectively) (Fig. 4.1) *(128)*. When considering the IPCAF indicators related to the IPC minimum requirements for core component 2 in 2019, most facilities at all levels of care had IPC guidelines for various elements of standard and transmission-based precautions. However, more secondary and tertiary health care facilities in HICs had guidelines for the prevention of specific HAIs than in LICs.

Very high scores regarding the minimum requirements for IPC guidelines were also reported in the 2023–2024 WHO global survey with a median score of 100 (IQR, 33.3–100) for primary facilities, 100 (IQR, 75–100) for secondary facilities, and 100 (IQR, 75–100) for tertiary facilities.. However, gaps were observed for primary care facilities in LICs (median score of 0 [IQR, 0–33.3]), (WHO, unpublished data).

Although guidelines were readily available, in 2019 IPC education and training varied by income level. Fewer facilities in LICs compared with HICs offered IPC training to health workers (50.4% versus 90%, respectively), at least upon hiring, including cleaners or other health workers involved in care (39.5% versus 83.5%, respectively) *(128)*.

The 2023–2024 survey results showed that core component 3 (IPC training and edication) had a median score of 75 (IQR, 25–100) for primary facilities, 66.7 (IQR, 33.3–100) for secondary facilities, and 100 (IQR, 66.7–100) for tertiary facilities.

Significant differences in the median score across income levels were reported for primary and secondary care facilities, with the highest score in HIC and the lowest in LICs. In 2023–2024, training and education was confirmed to be the least implemented core component at the facility level in LICs (WHO, unpublished data).

4.5 Implementation of IPC monitoring, audit and feedback, and HAI surveillance

WHO recommends monitoring of IPC processes and practices and other indicators of IPC programmes, as well as conducting HAI surveillance to track the impact on patient outcomes, as core components to be implemented at the facility level *(2)*.

The minimum requirements for these critical components have variations according to the facility level (Annex 1) *(5)*. Since May 2024, these recommendations and minimum requirements have been reflected in key actions, core indicators and targets for the facility level included in the 2024–2030 WHO GAP/MF for IPC, adopted by all countries (Table 4.6) *(6, 7)*.

Table 4.6. 2024–2030 WHO global action plan and monitoring framework key actions, core indicators and targets: IPC monitoring and HAI surveillance at the facility level

Action	Indicator(s)	Target
Strategic direction #5. Data for action		
Action #1 Make implementation plans and provide resources (human and financial) to achieve all WHO minimum requirements for HAI surveillance according to the facility level and to progressively achieve all requirements of core component 4 on HAI surveillance.	Percentage of WHO minimum requirements for HAI surveillance met (only for tertiary and secondary care facilities).	**Core target:** increase the proportion of tertiary/secondary health care facilities with a surveillance system for HAIs and related AMR to: 30% by 2026 50% by 2028 >80% by 2030
Action #2 Make implementation plans and provide resources (human and financial) to achieve all WHO minimum requirements for IPC monitoring and feedback according to the facility level and to progressively achieve all requirements of core component 6 (multimodal strategies for implementing IPC activities).	Percentage of WHO minimum requirements for IPC monitoring and feedback met.	Increase the proportion of tertiary/secondary health care facilities with an IPC monitoring system to: 30% by 2026 50% by 2028 >80% by 2030

Abbreviations: IPC, infection prevention and control; HAI, health care-associated infections.
Source: *(6)*.

In the 2019 IPCAF global survey *(128)*, the weighted median scores for the core components related to monitoring, audit of IPC practices and feedback and HAI surveillance, were between 72.5 and 77.5 points (out of 100) (Fig. 4.1). However, large differences were found between LICs and HICs for both HAI surveillance (12.5 versus 85, respectively) and the audit of IPC practices and feedback (37.5 versus 80, respectively) (Fig. 4.1). HAI surveillance was part of an IPC programme in more than 90% of tertiary care facilities. However, its execution by trained personnel responsible for such activities varied by income level, with only 2.8% carried out in LICs, and as much as 99.1% carried out in HICs. A great difference was also seen in having a well-defined plan for monitoring key IPC indicators between LICs and HICs (18.4% versus 77%, respectively). More than 80% of primary, secondary and tertiary health care facilities that completed surveys reported monitoring of hand hygiene compliance and having trained personnel for such activities. However, fewer

secondary and tertiary health care facilities utilized or provided feedback to staff (58.5%) or leadership (58.3%).

The 2023–2024 WHO global survey results showed that the median scores for monitoring and the audit of IPC practices and feedback were 100 across facility care levels (IQR, 50-100 for primary and secondary; 75-100 for tertiary care) with differences across income levels for primary and secondary care facilities.

For primary and secondary health care facilities, the scores were highest in HICs (median 100; IQR 100- and 85.7-100) and lowest in LICs (median 0; IQR, 0-50 for primary facilities and median 50; IQR, 25-100 secondary). For tertiary facilities, the scores were high across income levels *(100)* with similar IQRs (WHO, unpublished data).

Median scores for HAI surveillance were 100 across tertiary (IQR, 57.1-100) and secondary (IQR, 0-100) care facilities, with discrepancies across income levels.

In both types of facilities, the scores were highest in HICs (median 100; similar IQR) and lowest in LICs (median 28.6; IQR, 0-85.7 for tertiary facilities and median 0; IQR, 0-100 for secondary) (WHO, unpublished data). HAI surveillance was not assessed in primary health care facilities as it is not a WHO minimum requirement.

4.6 Implementation of hand hygiene: global status

Practicing hand hygiene is a simple action that can save lives.

This is demonstrated by extensive evidence showing that hand hygiene is effective in reducing HAIs and AMR *(19, 155-159)*. WHO built upon this evidence and carried out further research in order to develop strong recommendations, implementation strategies and comprehensive tools to support the setting up of hand hygiene programmes, their sustainability, and monitoring (Box 4.2).

Box 4.2. Hand hygiene minimum requirements to assure the minimal safety of patients, health workers and visitors in health care facilities *(5)*

WHO recommends that health care facilities should implement multimodal strategies to achieve hand hygiene improvement as a minimum requirement for IPC. In this context, hand hygiene is also recommended in all health care facilities as a minimum requirement:

- within standard operating procedures;
- for training of all health workers;
- as an indicator for monitoring and feedback; and
- as part of the built environment necessary to provide safe and quality care.

In particular, having the materials and facilities to perform appropriate hand hygiene readily available at the point of care is part of the core components of IPC programmes. Furthermore, hand hygiene monitoring is strongly recommended as a key performance indicator at the national level.

Abbreviation: IPC, infection prevention and control.

Yet, available evidence showed that compliance with hand hygiene recommendations during health care delivery remains suboptimal around the world, with an average of 59.6% compliance levels in ICUs up to 2018 and extreme differences between HICs and LICs (64.5% versus 9.1%, respectively) *(160)*. In studies systematically reviewing different periods, the average compliance, in the absence of specific improvement interventions, was found to be 40% up to 2009 and 41% between 2014 and 2020 *(155, 161)*.

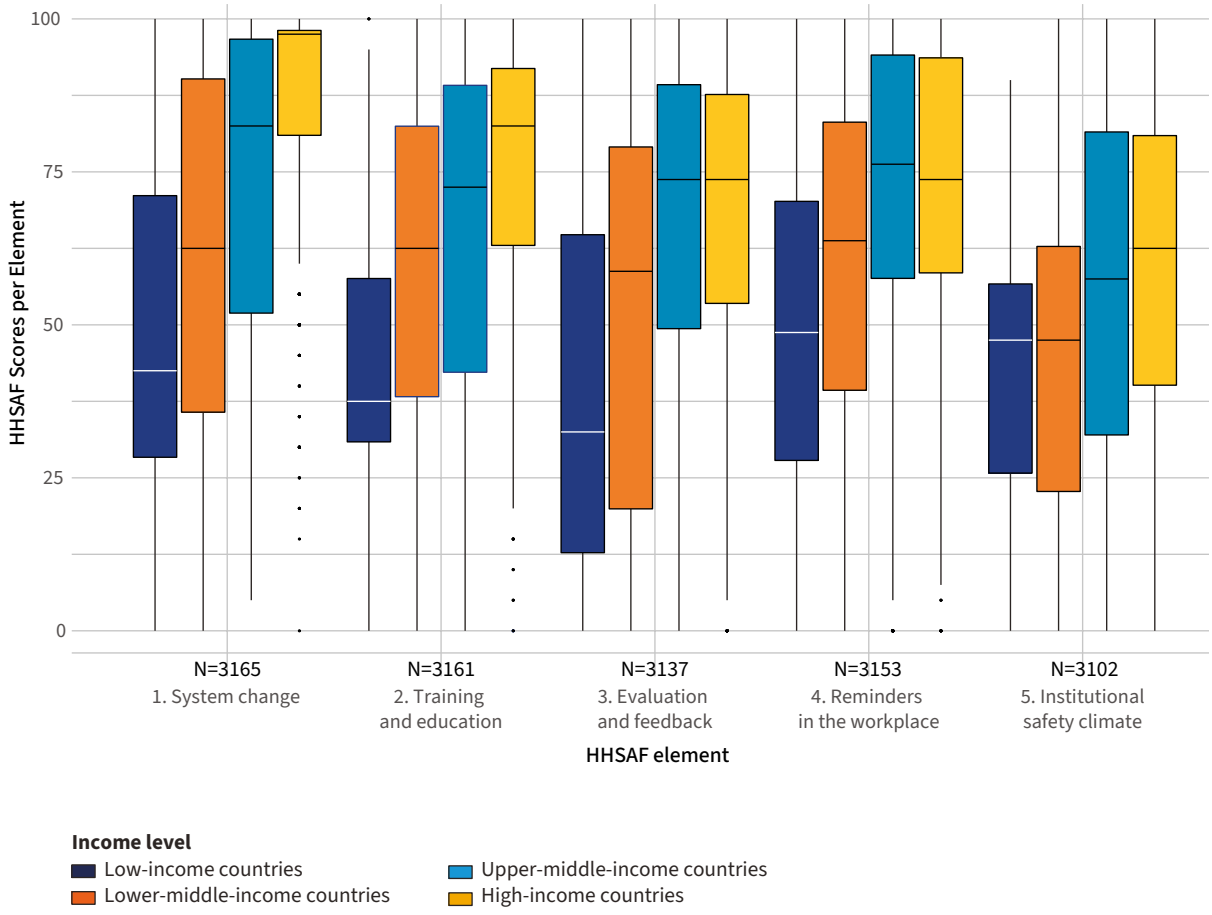
Over the last 10 years, WHO has facilitated several global surveys on hand hygiene, either using direct observation of compliance with recommended practices *(162)*, or assessing hand hygiene programmes at the facility level. Three global surveys assessing the level of progress of hand hygiene programmes in health care facilities around the world were conducted by WHO in 2010, 2015 and 2019 *(163, 164)*. A validated tool, the Hand Hygiene Self-Assessment Framework (HHSAF) *(165, 166)*, based on the WHO MMIS, was consistently used. HHSAF surveyed five elements: system change; training and education; evaluation and feedback; reminders in the workplace; and the institutional safety climate.

The 2019 survey included a representative sample of 3372 health care facilities in 109 countries *(164)*. Countries from all regions participated, with participation levels ranging from 63% (22 of 35) of countries in the Region of the Americas to 33% (9 of 27) of countries in the Western Pacific Region. More than 25% of facilities were in LMICs, a significant increase compared with earlier surveys. Slightly more than 50% of HICs and upper-middle-income countries participated, as opposed to 35% of LMICs and 28% of LICs.

The HHSAF requires respondents to assign points against specific indicators. The overall global results show hand hygiene was at an intermediate implementation level (350 of 500 points). The total HHSAF average score was associated with the country income level, showing a disparity between hand hygiene practice in

resource-rich and resource-poor settings *(164)*. There was a significant difference between HICs (which had an "advanced" level of 395 of 500 points) and LICs (with a "basic" level of 233 of 500 points). Overall, facilities achieved the highest score in implementing the infrastructure change and making supplies available to enable hand hygiene (the "system change" average score was 85 of 100) (Fig. 4.7) *(164)*.

Fig. 4.7. Weighted element-specific scores for the five elements of the HHSAF survey by World Bank income level, 2019



Abbreviation: HHSAF, Hand Hygiene Self-Assessment Framework.
Source: *(164)*.

The advanced system change implementation (indicating availability of hand hygiene facilities) found overall in facilities participating in the 2019 global survey contrasts with data reported by the 2020 WHO global progress report on WASH in health care facilities *(167)*, which revealed that one in three lacked hand hygiene facilities at the point of care. Data from 2021 reported by the global progress report on WASH in health care facilities painted an even more severe picture indicating that only one in two health care facilities globally had basic hand hygiene services (which include both hand hygiene facilities at the point of care and handwashing facilities at toilets). In the least developed countries, even two thirds of health care facilities lacked hand hygiene facilities at points of care *(168)*.

In 2022, WASH data on hand hygiene services in health care facilities *(153)* showed that:

- 4.6 billion people had access to basic hand hygiene services globally (57% of facilities);
- 2.7 billion people had access to limited services, and 698 million had no service;
- 70% of facilities had hand hygiene facilities at points of care and 68% had soap and water at toilets;
- among the 48 countries with data on basic hand hygiene services (at points of care and at toilets), 17 countries lacked basic hand hygiene services in more than one half of health care facilities.

A set of studies from African and Asian countries showed the successful use of the HHSAF as a baseline assessment tool and to monitor progress of hand hygiene practices over time *(169-173)*. Budgetary constraints and lack of managerial support hindered a successful implementation of hand hygiene practices, contributing to the spread of HAIs *(169, 173)*. Implementation of a hand hygiene MMIS yielded significant improvements in hand hygiene practices *(171, 172)*. A shift in national policy to strengthen IPC activities, further enhanced the distribution of resources and encouraged an embedded culture of appropriate hand hygiene practices in hospitals *(170)*.

A nurse prepares an IV drip for a patient at a hospital in Yunnan Province, China.
© WHO / Simon Lim

Chapter 5.

Regional focus: situation analysis, actions, gaps and challenges in the implementation of IPC

Chapter 5.
Regional focus: situation analysis, actions, gaps and challenges in the implementation of IPC

5.1 Key messages

- Since the COVID-19 pandemic, countries have demonstrated not only a recognition of the critical role played by IPC during public health emergencies, but also a strong commitment to improve IPC policies and practices. Overall, there has been an acceleration in the strengthening of IPC programmes and the implementation of best IPC practices. However, significant gaps and challenges still remain, especially regarding those elements of IPC programmes that require investments and sustainability over the long term.
- All WHO regional and country offices have been using a uniform approach to support countries in capacity building and progressing IPC action. This relies on joint assessments of the status of IPC programmes and IPC interventions with local authorities and partners, plan development, including impact and sustainability evaluations using a quality improvement cycle and a step-wise approach, as well as MMIS.
- When comparing data related to some key national indicators over time, some significant progress was achieved during the COVID-19 pandemic, whereas a stagnation was observed in 2023–2024.
- In 2023, the global average for the IPC capacity assessed through the SPAR system remained at the same level as in previous years. However, among the WHO regions, the South-East Asia Region reported an increase in capacity level over the years, while the Western Pacific Region reported a decrease. Overall, the European Region showed the highest capacity levels and the African Region the lowest.
- The 2023–2024 WHO global survey on IPC minimum requirements at the national level revealed some differences across WHO regions in the implementation of the IPC core components (WHO, unpublished data):
    - Improvements were reported by countries, particularly in the following areas: having an appointed IPC-trained national focal point; updating and further developing evidence-based national IPC guidelines according to international standards; local adaptation of guidelines and implementation through SOPs; and establishing hand hygiene compliance as a key national indicator.
    - However, some significant gaps remained across WHO regions in the implementation of the IPC core components, particularly in the following areas: securing dedicated budgets; ensuring operational IPC programmes at national and facility levels; evaluation of training effectiveness and the use of results for targeted improvements in IPC; and improving HAI surveillance and monitoring systems.

5.2 Introduction

This section of the report provides situation analyses of the implementation of the core components and minimum requirements for IPC programmes in every WHO region, highlighting the achievements and gaps according to recent assessments and inputs provided by the IPC focal points in the WHO regional offices. It also highlights common challenges encountered, as well as region-specific achievements and actions for further improvement, based on the need for strategies that are sensitive to regional contexts. By focusing on both the achievements and gaps, this section provides a comprehensive view of the state of IPC programmes across the regions, serving as a valuable resource for those involved in global health governance. For each region, the results of the latest assessments reported through TrACSS and SPAR are provided, together with detailed findings from the 2023–2024 WHO global survey on IPC. Comparisons with previous surveys are also provided, when possible. This detailed understanding of the regional landscapes of IPC programmes is crucial in devising effective, region-specific strategies to enhance global health outcomes.

5.3 Main challenges

Although the WHO recommendations on the core components for IPC programmes *(2)* are based on evidence about the effectiveness of IPC and have been agreed upon by many countries and stakeholders, the implementation of all core components requires time, expertise, resources and political support. Thus, some aspects of implementation can be challenging, mostly because IPC is not adequately prioritized or resourced at country and facility levels and local expertise is insufficient in some countries. This and other obstacles are common among many countries across all regions. One major issue repeatedly observed is the discrepancy between the reported existence of some core components, such as IPC programmes and guidelines, and the evident lack of implementation of an IPC structure and action at the point of care, including IPC monitoring and HAI surveillance. Furthermore, a lack of coordination among different programmes within the ministry of health and among partners at the country level often involves the risk of a duplication of efforts and, sometimes, a lack of alignment and harmonization resulting in conflicting messages and approaches. Finally, within the regions and the same country, wide disparities may exist in IPC and WASH infrastructures and IPC practices, making a uniform approach to improvement more difficult to implement. Table 5.1 provides an overview of common challenges and gaps in IPC in all WHO regions per core component, some of which might be more prominent in lower income countries.

Table 5.1. Common challenges and gaps in IPC in all regions by WHO core component

Core component	Challenges and current gaps
Core component 1. IPC programmes	• Competing interests/programmes and services. • Lack of financial investments in IPC. • Lack of institutionalization, leadership and weak legal frameworks. • Political instability, social unrest, conflicts and humanitarian crises. • Limited coordination of IPC with other programmes.
Core component 2. National- and facility-level IPC guidelines	• Lack of guidelines and technical documents aligned with international standards. • Developing IPC guidelines is a demanding process requiring specific expertise, coordination and support/endorsement from managers/health authorities. • Lack of templates to develop and update national and facility-level guidelines.
Core component 3. IPC education and training	• Lack of IPC experts and mentors. • Lack of standardized IPC curricula, including within pre-graduate courses (for example, medicine, nursing, midwifery) and in-service training, and for postgraduate specialization. • Lack of career pathways and development for IPC professionals.

Core component	Challenges and current gaps
Core component 4. HAI surveillance	• Lack of operational HAI surveillance strategies. • Lack of expertise, tools, and training. • Need for advocacy and awareness about HAI surveillance and its impact at each level (policy/ managers/health and care workers). • Need for high financial investment to develop or strength human resource capacities and information systems for reliable HAI surveillance. • Decision-making required for establishing a HAI surveillance network across the country.
Core component 5. Multimodal strategies for implementing IPC activities	• Work practices, behaviours and organization that do not conform to international standards. • Need for involvement of multiple stakeholders and coordination of functions and services.
Core component 6. IPC monitoring, audit and feedback	• Limited translation of monitoring plans into real activities. • Limited capacity (human resources and information systems). • Limited use of data for action.
Core component 7. Workload, staffing and bed occupancy at the facility level	• Chronic general problem of inadequate staff/patient ratio (insufficient nurses, doctors and other professionals). • Lack of human resources dedicated to IPC activities. • Occupational health policies that do not address HAIs acquired by health and care workers while on duty.
Core component 8. Built environment, materials and equipment for IPC	• Weak capacity of microbiology laboratories. • Inadequate supplies and infrastructure, including WASH and single rooms for isolation. • Procurement and distribution difficulties up to the point of care. • Costs and restricted market accessibility due to geographical, infrastructural, or regulatory barriers.

Abbreviations: HAI, health care-associated infections; IPC: infection prevention and control; LMICs: low-and middle-income countries; WASH: water, sanitation and hygiene.

5.4 African Region

5.4.1 Situation analysis

- In 2024, according to the country self-assessments through TrACSS *(124)*, 37% (versus 50% in 2023 and 42.5% in 2021) of countries in the WHO African Region either did not have an IPC programme or plan, or if they had one, it was not fully implemented (levels A + B). Only 15% (versus 13% in 2023 and 17.5% in 2021) of countries had an IPC programme supported by plans and guidelines implemented nationwide (Fig. 5.1, levels D + E).
- Countries in the Region consistently provided submissions for the SPAR reporting from 2021 to 2023 (n=47 for every cycle). The regional average score for (C.9) "IPC capacity" (around 45, level 3, meaning "developed capacity") was lower than the global average (around 61, level 4, meaning "demonstrated capacity") across the years. The average capacity score of (C.9.1) "IPC programmes"), (C.9.2) "HAI surveillance" and (C.9.3) "safe environment in health facilities" did not change substantially over time, apart from IPC programmes which had a lower score in 2023. This variation might be due to different people completing the survey over the different years, but it could also indicate a lower investment in IPC programmes recently (Table 5.2).
- Most countries reported a capacity level of 2 to 3 ("limited to developed capacity") with regards to national IPC programmes and overall IPC capacity (Fig. 5.2; Fig. 5.5). HAI surveillance was shown to

represent the least developed pillar, with many countries reporting no capacity (level 1). However, clear progress was seen over the years from 2021 to 2023 with a steady decline of countries on level 1 and a shift to limited capacity (level 2), meaning that a national strategic plan for HAI surveillance is available, but not yet implemented (Fig. 5.3). For a safe built environment in health facilities, including an appropriate infrastructure, materials and equipment for IPC, most countries positioned themselves in levels 1-2 ("no or limited capacity") to 3 ("developed capacity") (Fig. 5.4).

- In 2023, 19 countries in the Region conducted the voluntary JEE[13] in its most recent third version (one country used the previous edition in 2022) *(122)*. The average score among participant countries showed that only a few attributes of IPC were in place. However, the willingness of this large number of countries to conduct a voluntary assessment and to strengthen their capacity is remarkable. Specific recommendations to moving forward were jointly developed with the countries to guide the process of strengthening the country's capacity. These included items such as the finalization of an IPC strategic plan, implementation plan and guidelines, establishment of IPC structures with dedicated personnel at national, provincial, district and health facility levels, development of a monitoring and evaluation framework to monitor the implementation of WHO minimum requirements at facility levels and monitor compliance to IPC standards, or development of a national strategic plan on HAIs and establishment of a priority list of HAIs for monitoring as part of the routine surveillance system.
- When comparing data between previous surveys conducted in 2017–2018 and 2021–2022 during the COVID-19 pandemic, significant improvements in several areas were observed in the Region. These concerned the proportion of countries with an appointed IPC-trained national focal point, a budget dedicated to IPC and an in-service IPC curriculum, the development of a national programme or plan for HAI surveillance, use of MMIS for IPC interventions, and the establishment of hand hygiene compliance as a key national indicator *(8, 121, 127)*. Conversely, no (or only limited) improvement was observed for having an active national IPC programme, evidence-based and standardized national IPC guidelines, and IPC indicator monitoring systems.
- In the 2023–2024 global survey on IPC minimum requirements at the national level, 37 countries from the African Region participated[14] (Table 5.3; WHO unpublished data). Most countries (59.5%; 22 of 37) reported to have an active national IPC programme and the appointed IPC focal points had dedicated time for their tasks in 64.9% of countries (24 of 37). However, only 32.4% of countries (12 of 37) had an identified, protected and dedicated budget allocated to the IPC programme according to planned activity.
- The development of guidelines involved the use of evidence-based, scientific knowledge and international/national standards in 81.1% of countries (30 of 37). The IPC programme actively addressed guideline adaptation and the standardization of effective preventive practices and their implementation to reflect local conditions in 78.4% of countries (29 of 37). MMIS were promoted through their inclusion within IPC guidelines, education and training in 81.1% of countries (30 of 37). However, progress is needed to translate guidelines into implementation. For example, a national IPC curriculum for in-service training of health and care workers, developed in alignment with national IPC guidelines and approved by an appropriate national body, was available in only 48.6% of countries (18 of 37).
- A national strategic plan for HAI surveillance, developed by a multidisciplinary technical group, was present in only 24.3% of countries (9 of 37), whereas a strategic plan and system for IPC monitoring

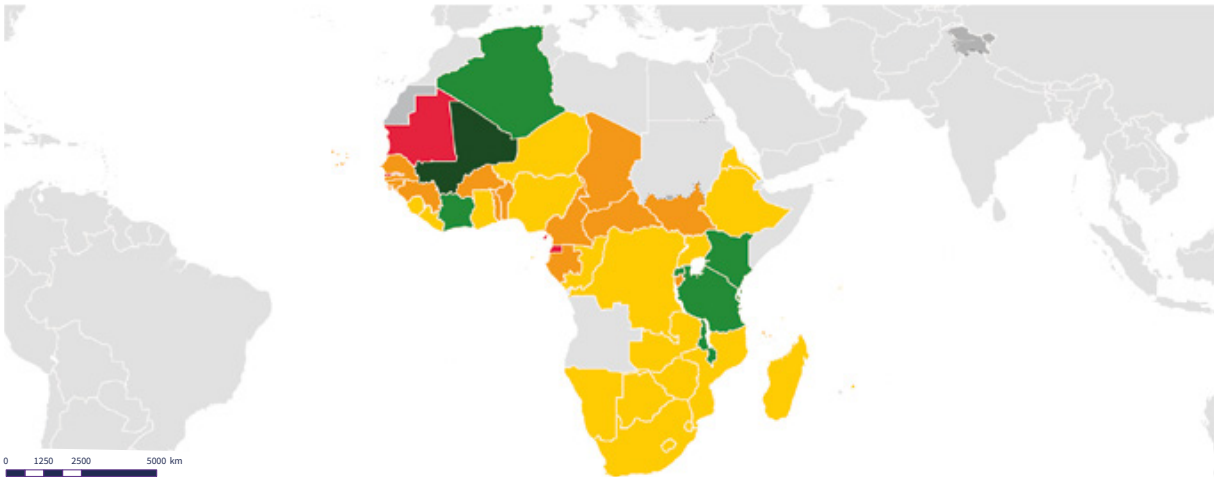
[13] Algeria, Angola, Benin, Burundi, Central African Republic, Chad, Congo, Côte d'Ivoire, Ethiopia, Guinea, Liberia, Mali, Mauritania, Nigeria, Senegal, Sierra Leone, United Republic of Tanzania, Uganda, Zambi, and Zanzibar. For more information about the JEE, please refer to https://www.who.int/emergencies/operations/international-health-regulations-monitoring-evaluation-framework/joint-external-evaluations.

[14] Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Eswatini, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Seychelles, Sierra Leone, South Africa, South Sudan, United Republic of Tanzania, Togo, Uganda, Zambia and Zimbabwe.

were available in 48.6% of countries (18 of 37). Hand hygiene compliance monitoring and feedback was identified as a key national indicator in 64.9% of countries (24 of 37).

- A comparison of the results from the two global surveys (2021–2022 and 2023–2024) on the implementation of IPC minimum requirements in the Region was possible for a subset of countries in the region (n=17[15]). It revealed that overall there was no notable improvement across the selected core indicators and the following considerations can be made.
    - **High implementation:** the development of guidelines involving evidence-based, scientific knowledge and international standards remained high at 82.4% (14 of 17) in both surveys.
    - **Improvement:** there was a slight increase in the implementation of a strategic plan for IPC monitoring from 47.1% (8 of 17) in 2021–2022 to 52.9% (9 of 17) in 2023–2024.
    - **Lower implementation and areas for improvement:** significant decreases were observed in the presence of an active IPC programme at the national level (from 70.6% to 47.1%) and hand hygiene compliance monitoring (from 70.6% to 58.8%). The development of a national strategic plan for HAI surveillance also saw a decline (from 41.2% to 29.4%), while the presence of a dedicated budget allocated to IPC activities remained at a low 29.4% (5 of 17) in both surveys.
- These surveys provide an interesting and current snapshot of IPC in the Region. However, when interpreting these results, it is important to note that the data represents only a percentage of the countries from the WHO African Region. Therefore, the trends and changes observed may not fully capture the overall regional context.

Fig. 5.1. Country/area progress in the implementation of IPC and WASH programmes in the WHO African Region, 2024



- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.
- Data not available
- Not applicable

Abbreviations: IPC, infection prevention and control; WASH, water, sanitation and hygiene.
Map creation date: 04 October 2024.
Map production: WHO Geographic Information Systems (GIS) Centre for Health, Department of Data and Analytics (DNA) within the Division of Data, Analytics and Delivery for Impact (DDI).
Source: *(124)*.

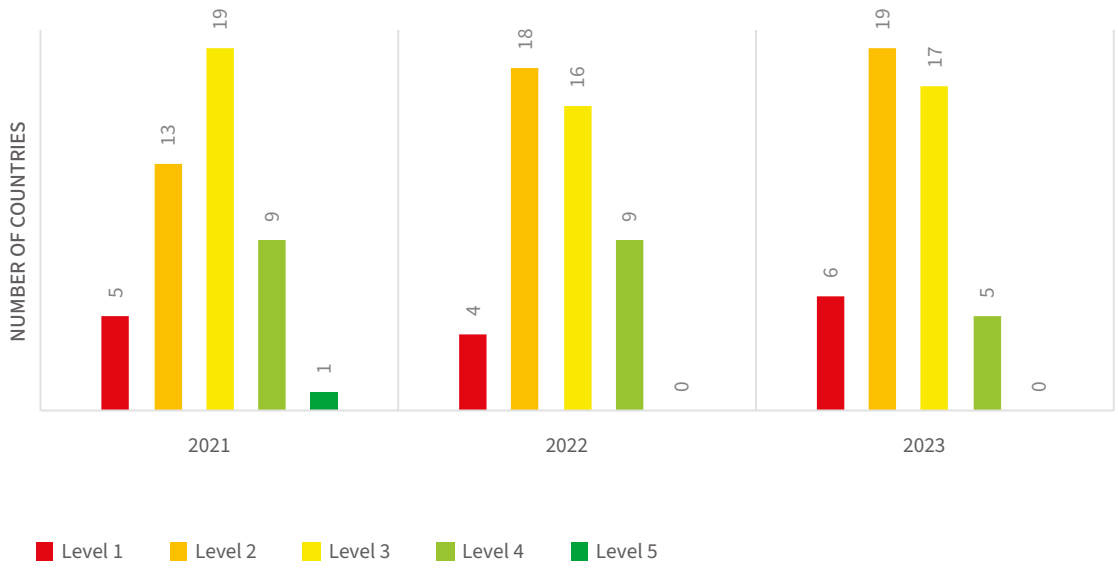
[15] Benin, Burkina Faso, Burundi, Cameroon, Chad, Côte d'Ivoire, Ethiopia, Ghana, Guinea, Kenya, Liberia, Malawi, Mauritania, Nigeria, South Africa, Uganda and Zimbabwe.

Table 5.2. Average score per SPAR indicator for IPC[a] globally and in the WHO African Region, 2021–2023

Indicator	Region	Score (average)		
		2021	2022	2023
C.9.1 IPC programmes	Global	63	64	61
	African Region	55	53	49
C.9.2 HAI surveillance	**Global**	56	59	56
	African Region	37	40	40
C.9.3 Safe environment in health facilities	Global	62	62	61
	African Region	43	44	44
C.9 Overall IPC capacity	Global	60	62	60
	African Region	45	46	44
Number of countries that provided data	African Region	47	47	47

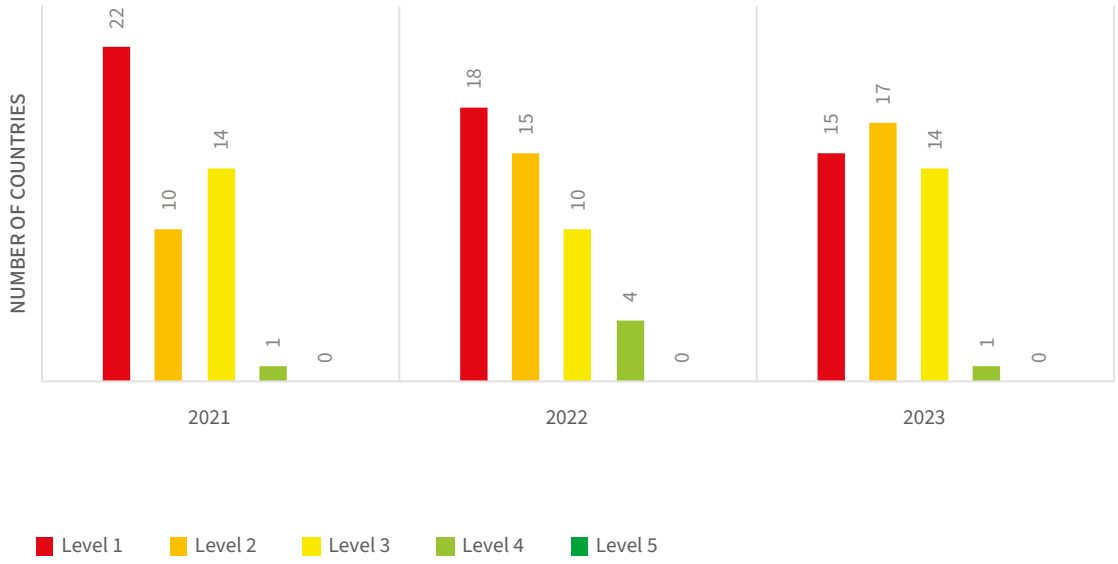
Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control.
[a] Each indicator is graded into scores and five levels, corresponding to a continuum from limited to consolidated performance in the area indicated. Strong and effective IPC programmes increase the safety of health care. They help deliver essential services by preventing and controlling outbreaks throughout the health system. It is essential initially that at least the minimum requirements for IPC are in place at both national and facility levels and then to progress gradually to achieving all requirements of WHO core components for IPC programmes. These requirements are the basis for building additional critical components of IPC programmes through a stepwise approach based on assessments of the local situation.
Source: *(119)*.

Fig. 5.2. Progress regarding the SPAR indicator C.9.1 (IPC programmes)[a] in the WHO African Region, 2021–2023



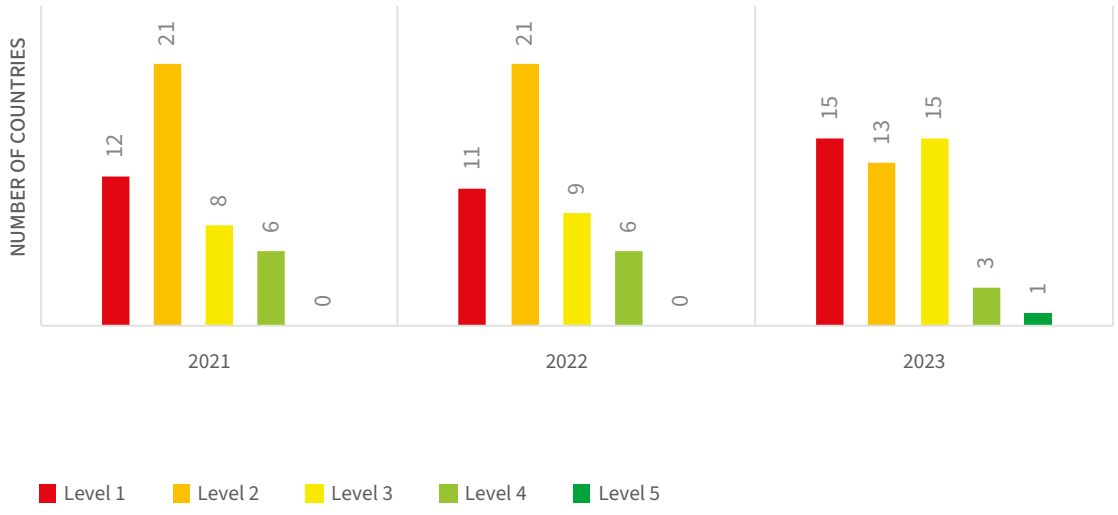
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.3. Progress regarding the SPAR indicator C.9.2 (HAI surveillance)[a] in the WHO African Region, 2021–2023



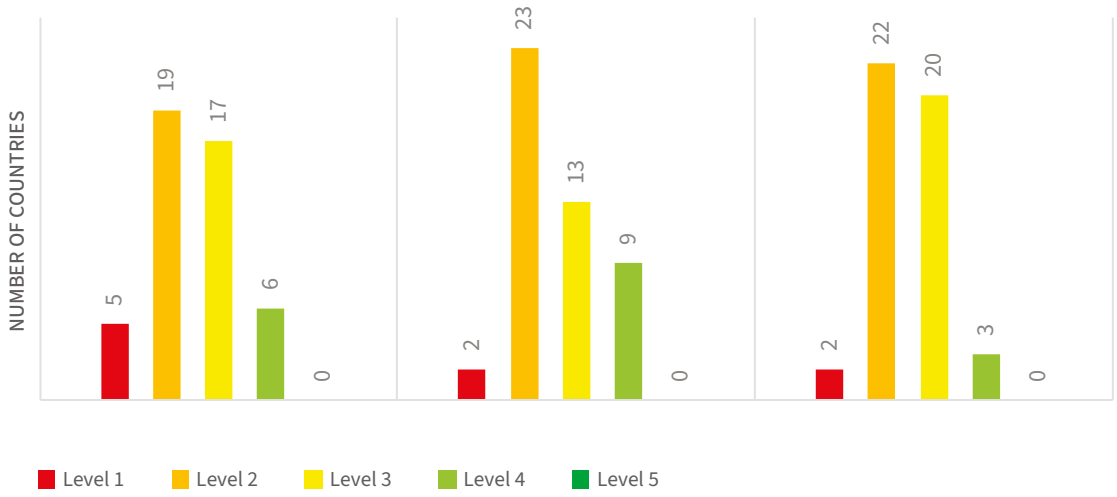
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.4. Progress regarding the SPAR indicator C.9.3 (safe environment in health facilities)[a] in the WHO African Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.5. Progress regarding the SPAR indicator C.9 (overall IPC capacity)[a] in the WHO African Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Table 5.3. Proportion of countries with selected reported IPC minimum requirements in the WHO African Region, 2023–2024

Core component[a]	Indicator	African Region (*n*=37)[b]	
		Number	%
Core component 1	Active national IPC programme.	22	59.5
	Dedicated budget allocated to the IPC programme.	12	32.4
	Appointed IPC focal points with dedicated time.	24	64.9
Core component 2	Evidence-based national IPC guidelines according to international standards.	30	81.1
	Guidelines adapted and implemented.	29	78.4
Core component 3	National IPC curriculum for in-service training.	18	48.6
Core component 4	National strategic plan for HAI surveillance.	9	24.3
Core component 5	IPC improvement interventions coordinated and supported by a national IPC focal point.	30	81.1
	MMIS promoted.	30	81.1
Core component 6	National strategic plan for IPC monitoring.	18	48.6
	Hand hygiene compliance as key national indicator.	24	64.9

Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control; MMIS, multimodal improvement survey.
[a] Core component 1: IPC programmes; core component 2: national and facility-level IPC guidelines; core component 3: IPC education and training; core component 4: HAI surveillance; core component 5: MMIS for implementing IPC activities; core component 6: IPC monitoring, audit and feedback.
[b] Number of countries from the Region enrolled in the survey.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

5.4.2 Actions

- The IPC situation in Africa remains below the global average, even if the COVID-19 pandemic represented a tremendous opportunity to advance IPC in the African Region. Indeed, the Region was able to benefit from human resources (with a team at the WHO Regional Office for Africa and national focal points in almost all countries) and financial resources for the implementation of support activities.
- However, with the pandemic now waning, these human and financial resources have decreased and this is a serious concern for sustainability.
    - The following critical actions were identified in order to allow the necessary progress towards the fulfillment of IPC minimum requirements:
        - development of national IPC legal frameworks to support the institutionalization of IPC in countries in the Region, in collaboration with the Africa Centres for Disease Control and Prevention (CDC);
        - development of national action plans or their adjustment in alignment with the WHO global action plan;
        - implementation of operational plans in countries where they exist and are up to date;
        - implementation at the country level of the recent regional curriculum for the training of all categories of health personnel;
        - a guide for the development of initial training curricula for health and care workers;
        - development of a guide for the implementation of national IPC standards in health care settings;
        - development of a guide for national HAI surveillance strategies.
- Since early 2022, the WHO African Regional Office has taken action to progress with these activities in several ways.
    - Providing technical assistance to 25 Member States[16] in the formulation of their national action plans for IPC. This support included training IPC national focal points on IPC planning processes and the core components of IPC programmes as a preparatory step for the development of national IPC action plans. It encompassed the development of a five-year strategic plan, an annual operational plan, and a monitoring and evaluation framework.
    - Development of a practical guide for the elaboration of national IPC guidelines and support to a number of countries in this process.
    - Development of an IPC in-service training guide and curricula framework, piloted in Chad, Côte d'Ivoire, Lesotho, Madagascar, Namibia, Rwanda, South Sudan and Togo.
    - Development of a template guide for the integration of IPC into undergraduate medical and health sciences' curricula, piloted in Chad, Madagascar, Rwanda, South Sudan and Togo.
    - Providing support to countries in developing a ministerial decree on IPC, according to the Africa CDC legal framework for IPC *(174)*.

[16] Benin, Botswana, Burundi, Cameroon, Chad, Comoros, Côte d'Ivoire, the Democratic Republic of the Congo, Eswatini, Ghana, Guinea, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Rwanda, Senegal, Sierra Leone, South Sudan, Togo, Uganda, Zambia and Zimbabwe.

5.5 Region of the Americas

5.5.1 Situation analysis

- In 2024, according to the country self-assessments through TrACSS *(124)*, 31% of countries in the Region of the Americas either did not have an IPC programme or plan or, if they had one, it was not fully implemented (levels A + B), similar to 2023 (30%) and 2021 (30.4%). However, 44% (versus 36.7% in 2023 and 17.4% in 2021) of countries had an IPC programme supported by plans and guidelines implemented nationwide (Fig. 5.6; levels D + E), indicating a notable improvement over recent years.
- Submissions for the SPAR reporting from countries in the Region increased from 2021 to 2023 (32 to 35, respectively). The regional average score indicating the overall (C.9) "IPC capacity" (around 60) was similar to the global average (around 61) across the years. In this Region, both the average capacity scores for (C.9.1) "IPC programmes" and (C.9.2) "HAI surveillance" slightly decreased over the years (from 61 to 57 for C.9.1 and from 64 to 58 for C.9.2, respectively), while the average capacity scores for (C.9.3) "safe environment in health facilities" remained stable at 58 (Table 5.4).
- With regard to national IPC programmes, the reported capacity for HAI surveillance and safe environment in health facilities remained quite stable from 2021 to 2023, with many countries showing a developed capacity (level 3) (Figs. 5.7–5.9). The overall IPC capacity reported by countries tended to lean towards level 3 or above, that is, "developed to demonstrated or sustainable capacity" (Fig. 5.10).
- When comparing data of the WHO global IPC surveys conducted in 2017–2018 and 2021–2022 during the COVID-19 pandemic, the Region showed significant improvements. These concerned the proportion of countries having an appointed IPC-trained national focal point, national IPC guidelines, an in-service IPC curriculum, conducting HAI surveillance, using MMIS for IPC interventions, having an IPC indicators' monitoring system and hand hygiene compliance monitoring as a key national indicator *(8, 121, 127)*. Conversely, no or only limited improvement was observed for having an active national IPC programme, a budget dedicated to IPC or evidence-based and standardized national IPC guidelines.
- In the 2023–2024 global survey on IPC minimum requirements at the national level, 20 countries from the Region of the Americas participated[17] (Table 5.5; WHO unpublished data). Most countries (85%; 17 of 20) reported to have an active national IPC programme and the appointed IPC focal points had dedicated time for their tasks in 50% of countries (10 of 20). In addition, 55% of countries (11 of 20) had an identified, protected and dedicated budget allocated to the IPC programme.
- The development of guidelines involved the use of evidence-based, scientific knowledge and international/national standards in 90% of countries (18 of 20). The IPC programme actively addressed guideline adaptation and standardization of effective preventive practices and their implementation to reflect local conditions in 80% of countries (16 of 20). MMIS were promoted through their inclusion within IPC guidelines, education and training in 80% of countries (16 of 20). However, progress is needed to translate guidelines into implementation. For example, a national IPC curriculum for in-service training of health and care workers was available in only 25% of countries (5 of 20).
- A national strategic plan for HAI surveillance, developed by a multidisciplinary technical group, was present in 75% of countries (15 of 20). A system for IPC monitoring and feedback was in place in 65% of countries (13 of 20). Hand hygiene compliance monitoring and feedback was identified as a key national indicator in 75% of countries (15 of 20).

[17] Argentina, Bahamas, Belize, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Jamaica, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, United States of America and Uruguay.

- A comparison of the results from the two global surveys (2021–2022 and 2023–2024) on the implementation of IPC minimum requirements in the Region was possible for only a subset of countries and showed both improvements and declines across selected indicators. The surveys included the same 16 countries[18] in both periods and the following considerations can be made.
    - **High implementation:** both, the proportion of countries having an active national IPC programme and developing guidelines involving evidence-based, scientific knowledge and international standards remained high at 80% to 90%.
    - **Improvement:** hand hygiene compliance monitoring and feedback increased from 62.5% (10 of 16) to 75% (12 of 16). The development of a national strategic plan for HAI surveillance also increased from 75% (12 of 16) to 81.2% (13 of 16). The promotion of MMIS increased from 62.5% (10 of 16) to 81.2% (13 of 16). The percentage of countries with appointed IPC focal points having dedicated time for the tasks increased from 56.2% (9 of 16) to 62.5% (10 of 16). The development of a national IPC curriculum for the in-service training of health and care workers slightly increased from 25% (4 of 16) to 31.2% (5 of 16).
    - **Lower implementation and areas for improvement:** although there was a slight increase in the presence of an identified, protected and dedicated budget allocated to the IPC programme (7.5% (6 of 16) to 50% (8 of 16, respectively), overall implementation remains low.
- Opportunities to strengthen and implement IPC policies and practices have been set up recently with the endorsement of the WHO sepsis strategy and action plan, aligned with the WHO IPC GAP/MF for IPC *(6)*.
- Countries in the Region are still recovering from the impact of the COVID-19 pandemic. Although many aspects of IPC progress made remain in place, others have been diluted.
- These surveys provide an interesting and current snapshot of IPC in the Region. However, when interpreting these results, it is important to note that the data represented only a percentage of the countries from the WHO Region of the Americas. Therefore, the trends and changes observed may not fully capture the overall regional context.

[18] Argentina, Belize, Brazil, Canada, Chile, Colombia, Cuba, Ecuador, Jamaica, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, United States of America and Uruguay.

Fig. 5.6. Country/area progress in the implementation of IPC and WASH programmes in the Region of the Americas, 2024

- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.
- Data not available
- Not applicable

Abbreviations: IPC, infection prevention and control; WASH, water, sanitation and hygiene.
Map creation date: 04 October 2024.
Map production: WHO Geographic Information Systems (GIS) Centre for Health, Department of Data and Analytics (DNA) within the Division of Data, Analytics and Delivery for Impact (DDI).
Source: *(124)*.

Table 5.4. Average score per SPAR indicator for IPC[a] globally and in the Region of the Americas, 2021–2023

Indicator	Region	Score (average)		
		2021	2022	2023
C.9.1 IPC programmes	Global	63	64	61
	Region of the Americas	61	61	57
C.9.2 HAI surveillance	Global	56	59	56
	Region of the Americas	64	63	58
C.9.3 Safe environment in health facilities	Global	62	62	61
	Region of the Americas	58	58	58

[a] Each indicator is graded into scores and five levels, corresponding to a continuum from limited to consolidated performance in the area indicated. Strong and effective IPC programmes increase the safety of health care. They help deliver essential services by preventing and controlling outbreaks throughout the health system. It is essential initially that at least the minimum requirements for IPC are in place at both national and facility levels, and then to progress gradually to achieving all requirements of WHO core components for IPC programmes. These requirements are the basis for building additional critical components of IPC programmes through a stepwise approach based on assessments of the local situation.

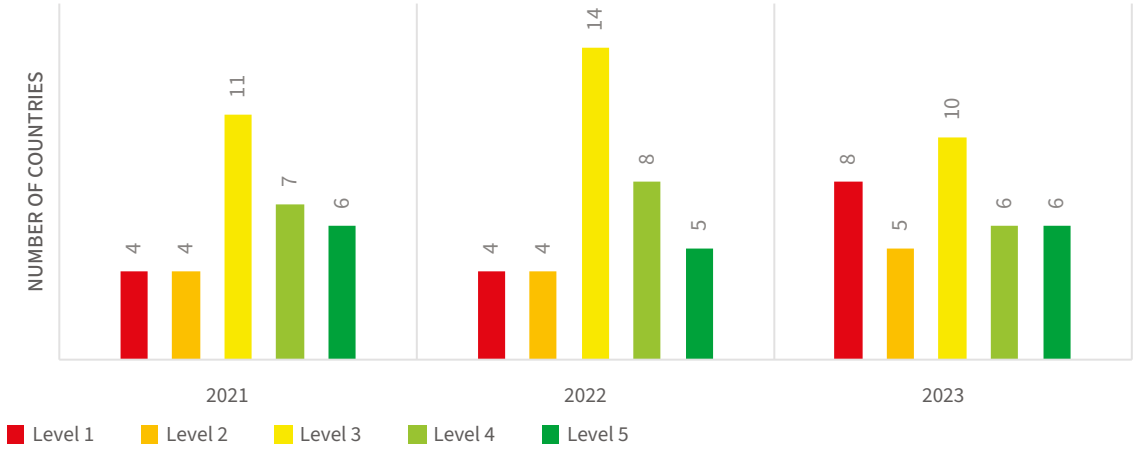
Indicator	Region	Score (average)		
		2021	2022	2023
C.9 Overall IPC capacity	Global	60	62	60
	Region of the Americas	61	61	58
Number of countries that provided data	Region of the Americas	32	35	35

Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control.
Source: *(119)*.

Fig. 5.7. Progress regarding the SPAR indicator C.9.1 (IPC programmes)[a] in the Region of the Americas, 2021–2023

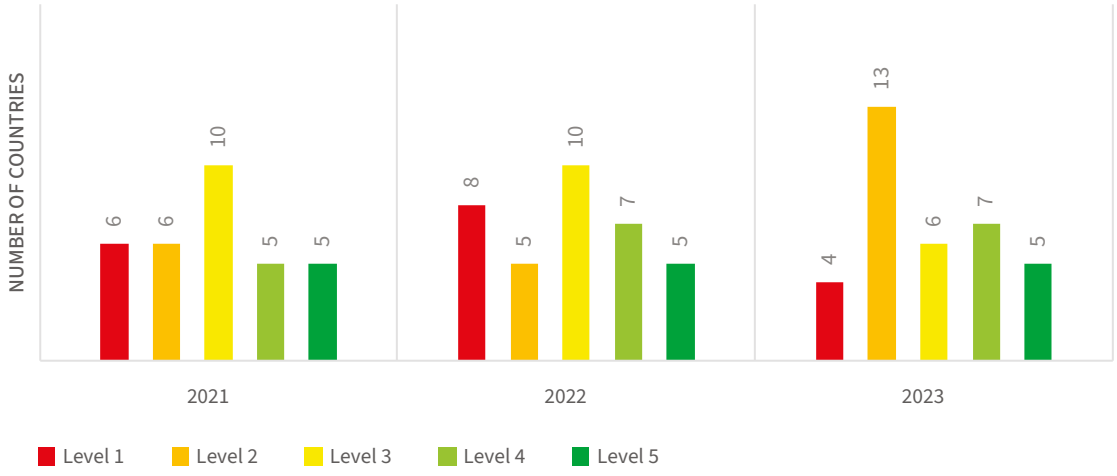
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.8. Progress regarding the SPAR indicator C.9.2 (HAI surveillance)[a] in the Region of the Americas, 2021–2023



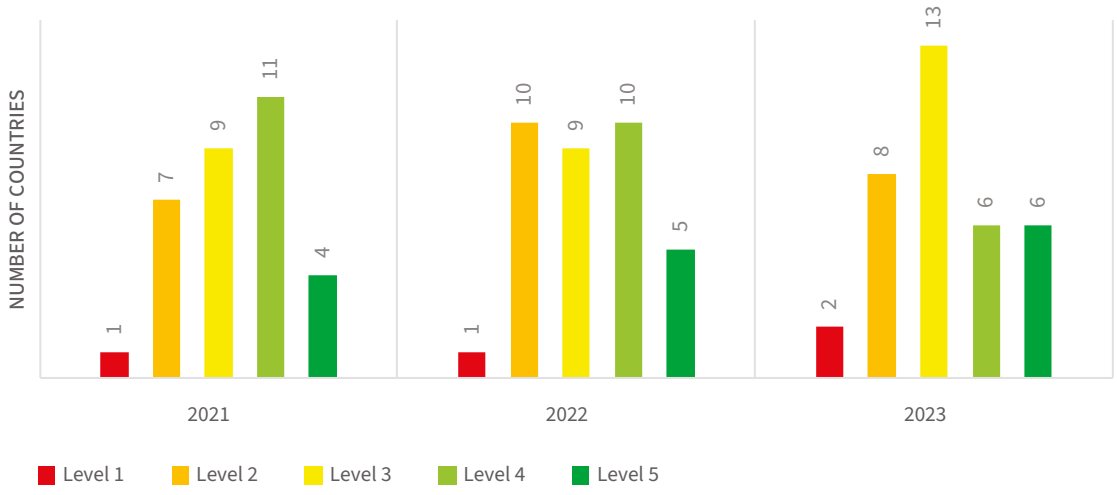
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.9. Progress regarding the SPAR indicator C.9.3 (safe environment in health facilities)[a] in the Region of the Americas, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.10. Progress regarding the SPAR indicator C.9 (overall IPC capacity)[a] in the WHO Region of the Americas, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Table 5.5. Proportion of countries with selected reported IPC minimum requirements in the Region of the Americas, 2023–2024

Core component[a]	Indicator	Region of the Americas (*n*=20)[b]	
		Number	%
Core component 1	Active national IPC programme.	17	85
	Dedicated budget allocated to the IPC programme.	11	55
	Appointed IPC focal points with dedicated time.	10	50

Core component[a]	Indicator	Region of the Americas (*n*=20)[b]	
		Number	%
Core component 2	Evidence-based national IPC guidelines according to international standards.	18	90
	Guidelines adapted and implemented.	16	80
Core component 3	National IPC curriculum for in-service training.	5	25
Core component 4	National strategic plan for HAI surveillance.	15	75
Core component 5	IPC improvement interventions coordinated and supported by national IPC focal point.	14	70
	MMIS promoted.	16	80
Core component 6	National strategic plan for IPC monitoring.	13	65
	Hand hygiene compliance as key national indicator.	15	75

Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control; MMIS, multimodal improvement strategies.
[a] Core component 1: IPC programmes; core component 2: national and facility-level IPC guidelines; core component 3: IPC education and training; core component 4: HAI surveillance; core component 5: MMIS for implementing IPC activities; core component 6: IPC monitoring, audit and feedback.
[b] Number of countries from the Region that enrolled in the survey.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

5.5.2 Actions

- Although many countries in Latin America and the Caribbean have made notable progress in strengthening IPC programmes over the past years, strengthening the implementation of active national IPC programmes across all countries remains a priority. This comprises advocating for securing dedicated budgets for IPC activities, ensuring that training curricula for health and care workers are developed and operationalized, and solidifying the commitment to producing evidence-based guidelines for infection prevention.
- Another high priority is to develop, update and implement HAI surveillance systems, especially in the Caribbean. The Pan American Health Organization (PAHO) is supporting in this area by organizing national training sessions involving multidisciplinary teams, providing the methodology and tools for standardizing data collection methods, improving data analysis capabilities, and supporting feedback mechanisms.
- The spread of carbapenem-resistant organisms in health care settings remains one of the most important threats in Latin America and the Caribbean, which is being tackled in a comprehensive manner by strengthening microbiological laboratory detection, infection prevention measures and appropriate antimicrobial treatment. The following two intervention strategies will be implemented.
    - Assessment of the capacity for detection and control of carbapenem-resistant organisms in collaboration with the CDC, supporting national and health facility capacity building using a standardized tool that provides the basis for tailored recommendations to implement detection and containment measures.
    - Effective implementation of antimicrobial stewardship programmes in strong integration with IPC programmes, which has been shown to prevent the emergence and transmission of MDROs in health care settings, particularly in ICUs.

- Strengthening networking and collaborations across the Region of the Americas will be critical to facilitate the implementation of IPC strategies in line with the WHO GAP/MF on IPC. In coordination and collaboration with partners and other key players, PAHO is developing a regional network to foster a horizontal collaboration among countries, share lessons learned and, therefore, strengthen the IPC programmes and teams of the ministries of health of Latin America and the Caribbean.
- Capacity for respiratory protection for health and care workers has been advancing through the development of training manuals *(175)*, intended for IPC professionals and health staff. Implementing these training tools and the related IPC principles has been a priority for PAHO/WHO and 238 health and care workers from 12 selected Latin American and Caribbean countries[19] were trained between 2022 and 2024.

[19] Belize, Bolivia, Colombia, Costa Rica, Dominica, Ecuador, El Salvador, Guatemala, Jamaica, Paraguay, the Bahamas, and the Turks and Caicos Islands.

5.6 South-East Asia Region

5.6.1 Situation analysis

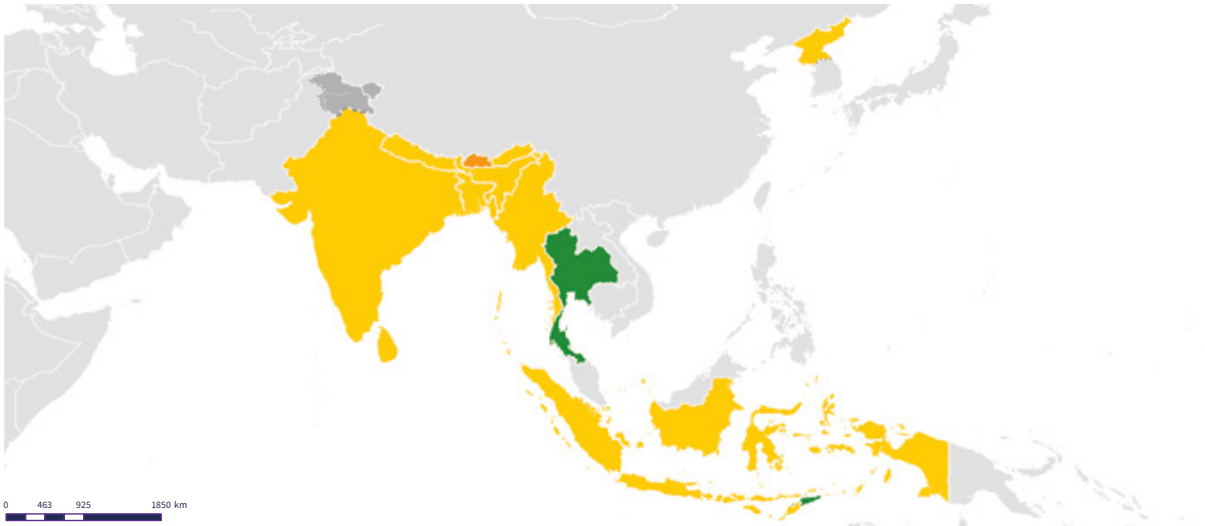
- In 2024, according to the country self-assessments through TrACSS *(124)*, 18% of countries in the WHO South-East Asia Region either did not have an IPC programme or plan or, if they had one, it was not fully implemented (levels A + B). This shows a steady improvement compared to previous years where this proportion was higher (27.3% in 2023 and 36.4% in 2021). However, while 36.4% of countries had an IPC programme supported by plans and guidelines implemented nationwide in 2023, this proportion decreased to 18% in 2024 (Fig. 5.11, levels D + E). Most countries reported having an IPC programme supported by plans and guidelines, while nationwide implementation is still being worked on (64%; Fig. 5.11, level C).
- Countries in the Region consistently provided submissions for the SPAR reporting from 2021 to 2023 (11 for every cycle). The regional average score for (C.9) "IPC capacity" increased from 53 to 59 (level 3 meaning "developed capacity"), but was slightly lower than the global average (around 61, level 4, meaning "demonstrated capacity"). The average capacity score of the Region for all sub-capacities (C.9.1, "IPC programmes"; C.9.2, "HAI surveillance"; C.9.3, "safe environment in health facilities") increased over the years and was on par with the global average for 2023 (Table 5.6).
- While the number of countries above level 3 (mostly level 4, that is, "demonstrated capacity") remained stable across the years, a clear progress was seen in countries shifting from levels 1 and 2 ("limited or no capacity") to a higher capacity from 2021 to 2023, especially for C.9.2, but also for all indicators and overall IPC capacity. Since 2022, most countries in the Region had "developed" IPC capacity (level 3) across all indicators (Figs. 5.12–5.15).
- In the 2023–2024 global survey on IPC minimum requirements at the national level, 11 countries from the Region participated[20] (Table 5.7; WHO unpublished data). Most countries (72.7%; 8 of 11) reported to have an active national IPC programme and the appointed IPC focal points had dedicated time for their tasks in 63.6% of countries (7 of 11). In addition, 54.5% of countries (6 of 11) had an identified, protected and dedicated budget allocated to the IPC programme according to planned activity.
- The development of guidelines involved the use of evidence-based, scientific knowledge and international/national standards in 90.9% of countries (10 of 11). The IPC programme actively addressed guideline adaptation and standardization of effective preventive practices and their implementation to reflect local conditions also in 90.9% of countries (10 of 11). MMIS were promoted through their inclusion within IPC guidelines, education and training in 81.8% of countries (9 of 11). However, progress is needed to translate guidelines into implementation. For example a national IPC curriculum for in-service training of health and care workers was available in only 45.5% of countries (5 of 11).
- A national strategic plan for HAI surveillance, developed by a multidisciplinary technical group, was present in only 36.4% of countries (4 of 11), similar to the availability of a strategic plan and system for IPC monitoring. Hand hygiene compliance monitoring and feedback was identified as a key national indicator in 63.6% of countries (7 of 11).
- The number of countries participating in the WHO global surveys increased substantially from 6 in 2021–2022 to 11 in 2023–2024, indicating a strong and growing commitment to IPC efforts in the region.
- However, a comparison of results from the two global surveys (2021–2022 and 2023–2024) on the implementation of IPC minimum requirements in the Region was possible for only a subset of countries and showed both improvements and declines across selected indicators. The surveys included the same 6 countries[21] in both periods and the following considerations can be made.

[20] Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste.
[21] Bangladesh, Bhutan, Indonesia, Maldives, Sri Lanka and Thailand.

- **High implementation:** the development of guidelines involving evidence-based, scientific knowledge and international standards increased from 83.3% (5 of 6) to 100% (6 of 6). The mandate of the national IPC programme to produce guidelines for preventing and controlling HAI remained stable at 100% (6 of 6) in both surveys.
- **Improvement:** the percentage of countries with appointed IPC focal points having dedicated time for the tasks increased from 50% (3 of 6) to 66.7% (4 of 6).
- **Lower implementation and gaps for improvement:** although there was an increase in the presence of a dedicated budget allocated to the IPC programme from 33.3% (2 of 6) to 50% (3 of 6), implementation can still be improved. The development of a national IPC curriculum for in-service training of health and care workers remained low at 16.7% (1 of 6) in both surveys. Less than half of the countries (33%) had a national strategic plan for HAI surveillance in 2023-2024, pointing to another area of improvement.

- When interpreting these results, it is important to note that the data represented only a percentage of the countries from the WHO South-East Asia Region. Therefore, the trends and changes observed may not fully capture the overall regional context, especially with the small number of countries included in this comparison.

Fig. 5.11. Country/area progress in the implementation of IPC and WASH programmes in the WHO South-East Asia Region, 2024



- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.
- Data not available
- Not applicable

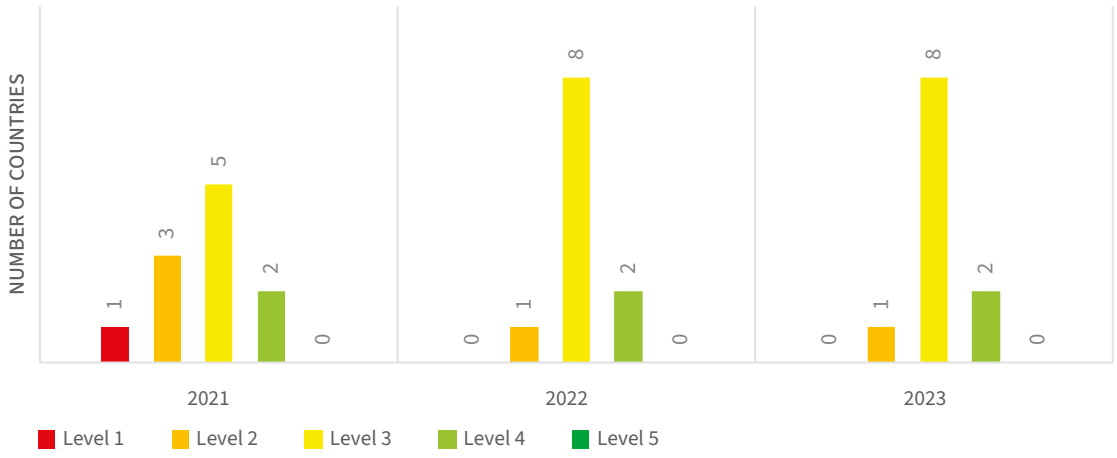
Abbreviations: IPC, infection prevention and control; WASH, water, sanitation and hygiene
Map creation date: 04 October 2024.
Map production: WHO Geographic Information Systems (GIS) Centre for Health, Department of Data and Analytics (DNA) within the Division of Data, Analytics and Delivery for Impact (DDI).
Source: *(124)*.

Table 5.6. Average score per SPAR indicator for IPC[a] globally and in the WHO South-East Asia Region, 2021–2023

Indicator	Region	Score (average)		
		2021	2022	2023
C.9.1 IPC programmes	Global	63	64	61
	South-East Asia Region	55	62	62
C.9.2 HAI surveillance	**Global**	56	59	56
	South-East Asia Region	47	56	56
C.9.3 Safe environment in health facilities	Global	62	62	61
	South-East Asia Region	56	60	60
C.9 Overall IPC capacity	Global	60	62	60
	South-East Asia Region	53	59	59
Number of countries that provided data	South-East Asia Region	11	11	11

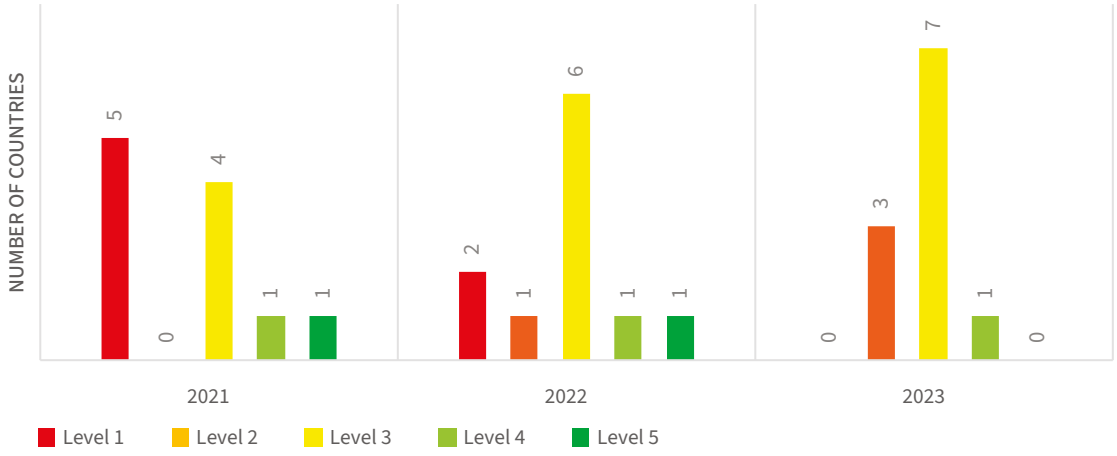
Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control.
a Each indicator is graded into scores and five levels, corresponding to a continuum from a limited to consolidated performance in the area indicated. Strong and effective IPC programmes increase the safety of health care. They help deliver essential services by preventing and controlling outbreaks throughout the health system. It is essential initially that at least the minimum requirements for IPC are in place at both national and facility levels, and then to progress gradually to achieving all requirements of WHO core components for IPC programmes. These requirements are the basis for building additional critical components of IPC programmes through a stepwise approach based on assessments of the local situation.
Source: *(119)*.

Fig. 5.12. Progress regarding the SPAR indicator C.9.1 (IPC programmes)[a] in the WHO South-East Asia Region, 2021–2023



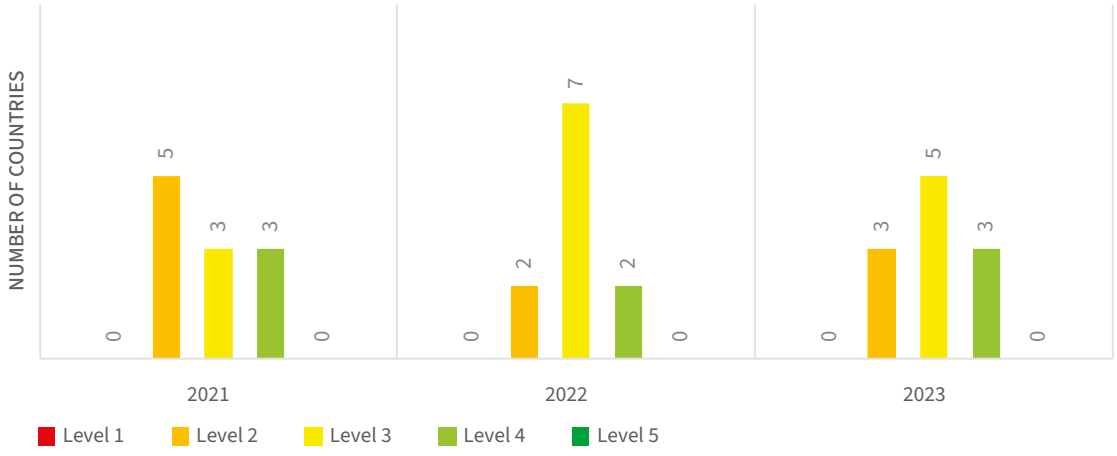
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.13. Progress regarding the SPAR indicator C.9.2 (HAI surveillance)[a] in the WHO South-East Asia Region, 2021–2023



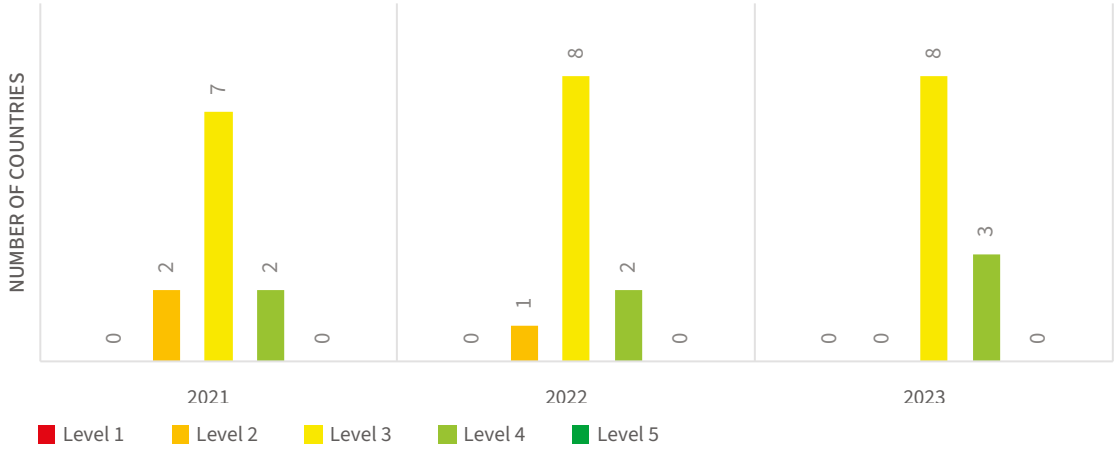
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.14. Progress regarding the SPAR indicator C.9.3 (safe environment in health facilities)[a] in the WHO South-East Asia Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.15. Progress regarding the SPAR indicator C.9 (overall IPC capacity)[a] in the South-East Asia Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Table 5.7. Proportion of countries with selected reported IPC minimum requirements in the WHO South-East Asia Region, 2023–2024

Core Component[a]	Indicator	South-East Asia Region (*n*=11)[b]	
		Number	%
Core component 1	Active national IPC programme.	8	72.7
	Dedicated budget allocated to the IPC programme.	6	54.5
	Appointed IPC focal points with dedicated time.	7	63.6
Core component 2	Evidence-based, national IPC guidelines according to international standards.	10	90.9
	Guidelines adapted and implemented.	10	90.9
Core component 3	National IPC curriculum for in-service training.	5	45.5
Core component 4	National strategic plan for HAI surveillance.	4	36.4
Core component 5	IPC improvement interventions coordinated and supported by national IPC focal point.	8	72.7
	MMIS promoted.	9	81.8
Core component 6	National strategic plan for IPC monitoring.	4	36.4
	Hand hygiene compliance as key national indicator.	7	63.6

Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control; MMIS, multimodal improvement strategies.
[a] Core component 1: IPC programmes; core component 2: national and facility-level IPC guidelines; core component 3: IPC education and training; core component 4: HAI surveillance; core component 5: MMIS for implementing IPC activities; core component 6: IPC monitoring, audit and feedback.
[b] Number of countries from the Region enrolled in the survey.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

5.6.2 Actions

Since 2022, significant strides have been made in improving IPC programmes and policies and integrating IPC into national health policies across the South-East Asia Region, with a stronger focus on incorporating IPC into broader areas, such as quality of care and patient safety.

- The following priorities for action have been identified for countries and WHO support.
    - **Strengthen and expand IPC programmes** by enhancing efforts to provide human and financial resources and fully integrating IPC into national health strategies. These include making a national IPC curriculum for in-service training available and collaborating with academic institutions and regional centres of excellence to provide tailored training programmes.
    - **Develop policy and strategic frameworks**, in particular WHO IPC national action plans aligned with the WHO 2024–2030 GAP/MF *(6)*.
    - **Enhance monitoring and reporting** by having national strategic plans, in particular for hand hygiene compliance, HAI surveillance and IPC indicators, improving monitoring systems and reporting through existing monitoring systems such as SPAR, TrACSS and the WHO IPC global portal.
    - **Focus on guideline adaptation and implementation** with the use of evidence-based guidelines

and adaptations reflecting local conditions and by including them in training and education programmes.
    - **Promote multidisciplinary collaboration** by strengthening collaboration between IPC, quality of care, patient safety, AMR, WASH and emergency preparedness sectors and initiatives, including through regional meetings and knowledge sharing, with the aim to create a more resilient and coordinated approach and enhance overall patient safety and care standards.
    - **Advocate for consistent improvements** by developing and disseminating advocacy materials and case studies to enhance awareness around IPC's role in patient safety and health systems' strengthening.
    - **Facilitate evidence-based improvements** by using evidence and data from assessments to develop targeted improvement strategies and prioritize actions in areas of lower implementation.

- To support these actions with an integrated approach, WHO has organized regional meetings, bringing together key partners in IPC, quality of care and patient safety to collaborate, share successes, identify gaps and explore areas for improvement.
- In line with the WHO 2024–2030 GAP/MF for IPC *(6)*, advocacy and awareness materials are being disseminated to support country-specific needs and to promote various IPC-related campaigns launched by WHO.
- In collaboration with academic centres of excellence in the Region, WHO is conducting IPC training programmes tailored to each country's specific needs. These efforts have supported the development of contextually relevant guidelines and action plans, thus further strengthening national IPC frameworks.
- Recognizing the multidisciplinary and cross-cutting nature of IPC, WHO has fostered a close collaboration with related areas such as AMR, public health emergencies and WASH. This coordinated approach ensures that efforts are not duplicated and resources are efficiently utilized.
- WHO is also preparing a compendium of best practices and case studies in IPC, quality of care and patient safety showcasing examples from low-resource settings where IPC measures have been successfully implemented.

5.7 Eastern Mediterranean Region[22]

5.7.1 Situation analysis

- Countries in the WHO Eastern Mediterranean Region demonstrated their commitment to strengthen IPC policies and practices through the endorsement of regional resolutions in 2010 (Infection prevention and control in health care: time for collaborative action, Regional Committee resolution EM/RC57/R.6) *(176)* and in 2017 (*Antimicrobial resistance in the Eastern Mediterranean Region*, Regional Committee resolution EM/RC64/R.5) *(177)*. This commitment was recently renewed through the 2024 "*Promoting collaborative action to accelerate the regional response to antimicrobial resistance*, Regional Committee technical paper EM/RC71/4-Rev.1" *(178)*, which was adopted to support Member States to identify, prioritize, implement and monitor key priority interventions to tackle AMR. Prevention of infections through strengthening IPC practices and improving WASH services in health care facilities and in communities is one of the action areas indicated as a high-impact intervention.
- In 2024, according to the country self-assessments recorded through TrACSS *(124)*, the number of countries in the Region that reported having an IPC programme or plan, but not fully implemented, increased with respect to the previous two years (level B; 38% versus 29.4% in 2023 versus 35% in 2022 and 42.9% in 2021). Of note, there was no country without a national IPC programme or plan available (level A). The proportion of countries that reported having an IPC programme supported by plans and guidelines implemented nationwide slightly decreased with respect to the previous year (levels D + E; 38% versus 47.1% in 2023 versus 33.3% in 2021; Fig. 5.16).
- Countries in the Region consistently provided submissions for the SPAR reporting from 2021 to 2023 (n=21 for every cycle).
- The regional average score for (C.9) "IPC capacity" increased from 59 to 62 (level 3, "developed capacity") with the global average being around 61. In this Region, the average capacity of C.9.3 ("safe environment in health facilities") increased over the years from 62 to 66, while the other capacities (C.9.1, "IPC programmes", C.9.2, "HAI surveillance") averaged a higher score in 2023 compared to 2021, but with a slight decrease from 2022. While C.9.1 and C.9.3 had higher average scores than the global average, C.9.2 was lower (Table 5.8).
- Although the overall IPC capacity of countries remained stable from 2021 to 2023 (Fig. 5.20), progress was seen in countries shifting from levels 1 and 2 ("limited or no capacity") to a higher capacity, especially for a strengthened safe environment in health care facilities (Figs. 5.17–5.19).
- Comparing data between previous surveys conducted in 2017–2018 and 2021–2022 during the COVID-19 pandemic, significant improvements were observed in the Region. These concerned the proportion of countries having a national IPC programme and an appointed IPC-trained national focal point, a budget dedicated to IPC, national IPC guidelines and a national programme/system for HAI surveillance, using multimodal strategies for IPC interventions, and having IPC monitoring and hand hygiene compliance as a key national indicator *(8, 121, 127)*. Conversely, no or limited improvement was observed in the number of countries with an in-service IPC curriculum for the training of health and care workers.
- In the 2023–2024 WHO global survey on IPC minimum requirements at the national level, 21 countries and territories from the Eastern Mediterranean Region participated[23] (Table 5.9; WHO unpublished data). Most countries (76.2%; 16 of 21) reported to have an active national IPC

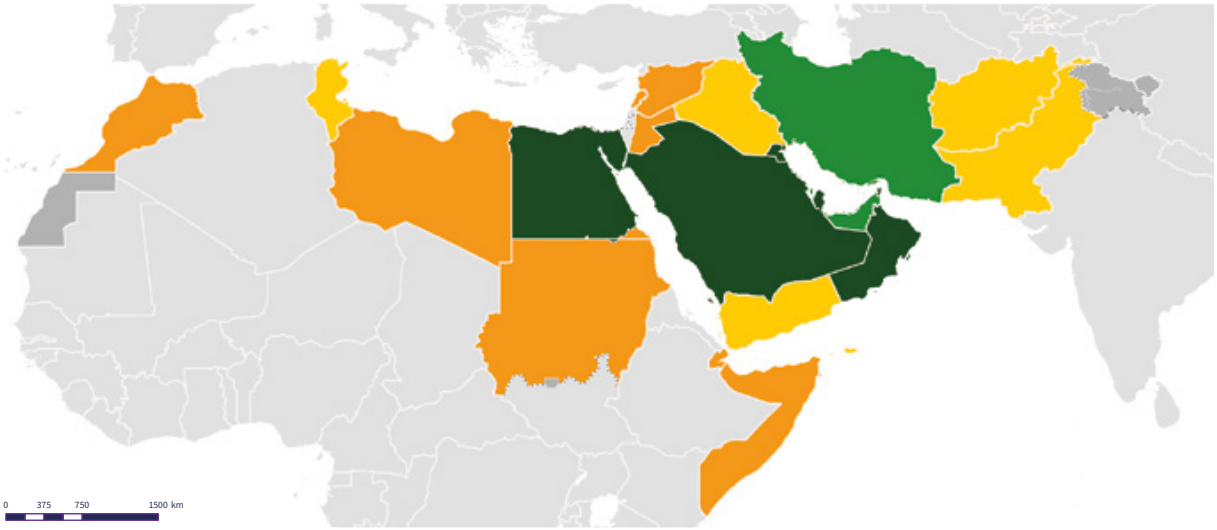
[22] Where "countries" are mentioned, these should be understood to include countries, territories and areas, and not just countries only. Use of the term "national" should be understood to refer to national or local considerations, as appropriate.
[23] Afghanistan, Bahrain, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, occupied Palestinian territory, including east Jerusalem, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.

programme and the appointed IPC focal points had dedicated time for their tasks in 66.7% of countries (14/21). However, only 38.1% of countries (8 of 21) had an identified, protected and dedicated budget allocated to the IPC programme.

- The development of guidelines involved the use of evidence-based, scientific knowledge and international/national standards in 90.5% of countries (19 of 21). The IPC programme actively addressed guideline adaptation and standardization of effective preventive practices and their implementation to reflect local conditions in 81% of countries (17og 21). Multimodal strategies were promoted through the inclusion within IPC guidelines, education and training in 61.9% of countries (13 of 21). Progress is needed to translate guidelines into implementation. For example, a national IPC curriculum for in-service training of health and care workers was available in only 47.6% of countries (10 of 21).
- A national strategic plan for HAI surveillance, developed by a multidisciplinary technical group, was present in only 38.1% of countries (8 f 21), whereas a strategic plan for IPC monitoring, including an integrated system for the collection and analysis of data, was available in 57.1% of countries (12 of 21). Hand hygiene compliance monitoring and feedback was identified as a key national indicator in 52.4% of countries (11 of 21).
- A comparison of results from the two global surveys (2021–2022 and 2023–2024) on the implementation of IPC minimum requirements in the Region showed both improvements and declines across selected indicators. The surveys included the same 21 countries and territories[24] in both periods and the following considerations can be made.
    - **High implementation:** the development of guidelines involving evidence-based, scientific knowledge and international standards increased notably from 71.4% (15 of 21) to 90.5% (19 of 21).
    - **Improvement:** the percentage of countries with appointed IPC focal points having dedicated time for the tasks increased from 61.9% (13 of 21) to 66.7% (14 of 21). The promotion of MMIS also saw a slight increase from 57.1% (12 of 21) to 61.9% (13 of 21).
    - **Lower implementation and areas for improvement:** although there was an increase in the presence of a dedicated budget allocated to IPC programmes from 28.6% (6 of 21) to 38.1% (8 of 21), it leaves much room for improvement. Notable decreases were observed in hand hygiene compliance monitoring, which dropped from 71.4% (15 of 21) in 2021–2022 to 52.4% (11 of 21) in 2023–2024. The development of a national strategic plan for HAI surveillance also saw a decline from 57.1% (12 of 21) in 2021–2022 to 38.1% (8 of 21) in 2023–2024. Additionally, overall and with a rather low implementation, the development of a national IPC curriculum for in-service training of health and care workers decreased slightly from 52.4% (11 of 21) in 2021–2022 to 47.6% (10 of 21) in 2023–2024.
- These surveys provide an interesting and current snapshot of IPC in the region as most or all countries participated. A comparison with the 2017–2018 global survey was possible for only about one half of participating countries. Thus, these comparisons may have limitations and should be interpreted with caution.

[24] Afghanistan, Bahrain, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, occupied Palestinian territory, including east Jerusalem, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.

Fig. 5.16. Country/area progress in implementation of IPC and WASH programmes in the Eastern Mediterranean Region, 2024



- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.
- Data not available
- Not applicable

Abbreviations: IPC, infection prevention and control; WASH, water, sanitation and hygiene.
Map creation date: 04 October 2024.
Map production: WHO Geographic Information Systems (GIS) Centre for Health, Department of Data and Analytics (DNA) within the Division of Data, Analytics and Delivery for Impact (DDI).
Source: *(124)*.

Table 5.8. Average score per SPAR indicator for IPC[a] globally and in the WHO Eastern Mediterranean Region, 2021–2023

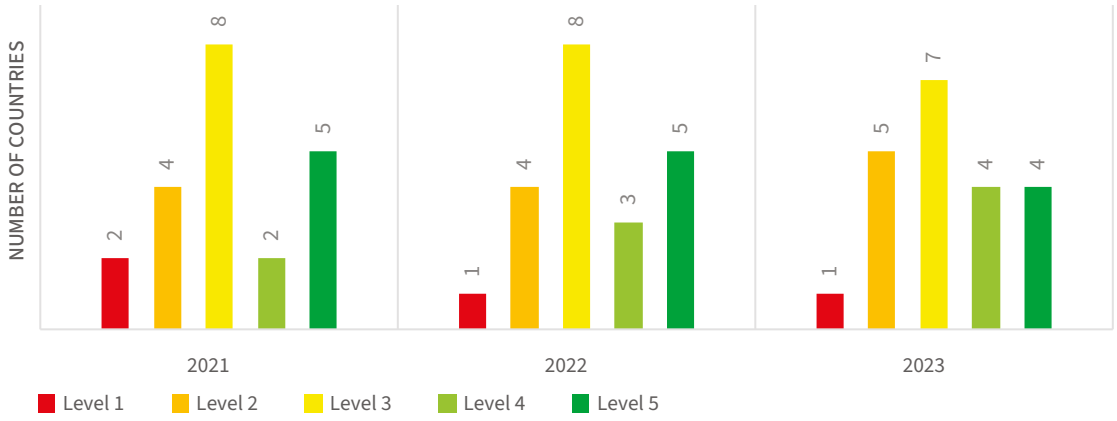
Indicator	Region	Score (average)		
		2021	2022	2023
C.9.1 IPC programmes	Global	63	64	61
	Eastern Mediterranean Region	64	67	65
C.9.2 HAI surveillance	Global	56	59	56
	Eastern Mediterranean Region	51	57	54

[a] Each indicator is graded into scores and five levels, corresponding to a continuum from limited to consolidated performance in the area indicated. Strong and effective IPC programmes increase the safety of health care. They help deliver essential services by preventing and controlling outbreaks throughout the health system. It is essential initially that at least the minimum requirements for IPC are in place at both national and facility levels and then to progress gradually to achieving all requirements of WHO core components for IPC programmes. These requirements are the basis for building additional critical components of IPC programmes through a stepwise approach based on assessments of the local situation.

Indicator	Region	Score (average)		
		2021	2022	2023
C.9.3 Safe environment in health facilities	Global	62	62	61
	Eastern Mediterranean Region	62	65	66
C.9 Overall IPC capacity	Global	60	62	60
	Eastern Mediterranean Region	59	63	62
Number of countries that provided data	Eastern Mediterranean Region	21	21	21

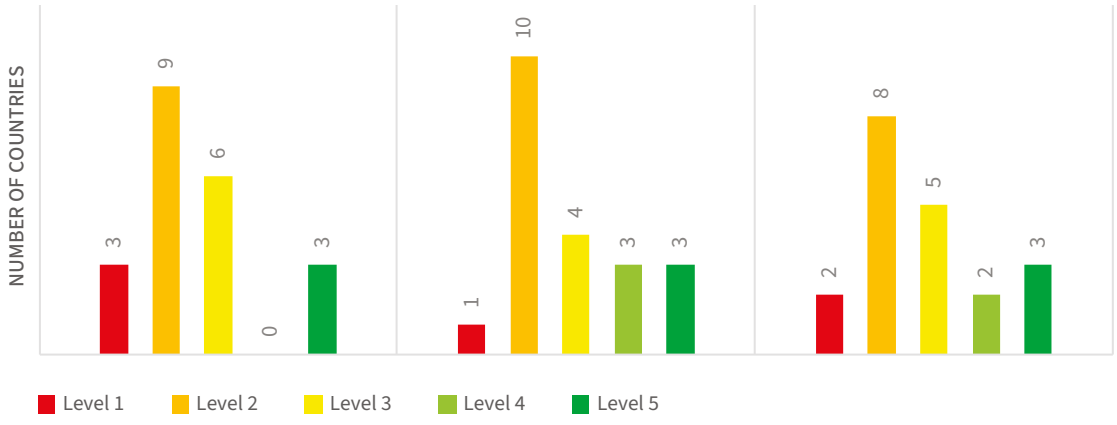
Abbreviation: HAI, health care-associated infections; IPC, infection prevention and control.
Source: *(119)*.

Fig. 5.17. Progress regarding the SPAR indicator C.9.1 (IPC programmes)[a] in the WHO Eastern Mediterranean Region, 2021–2023



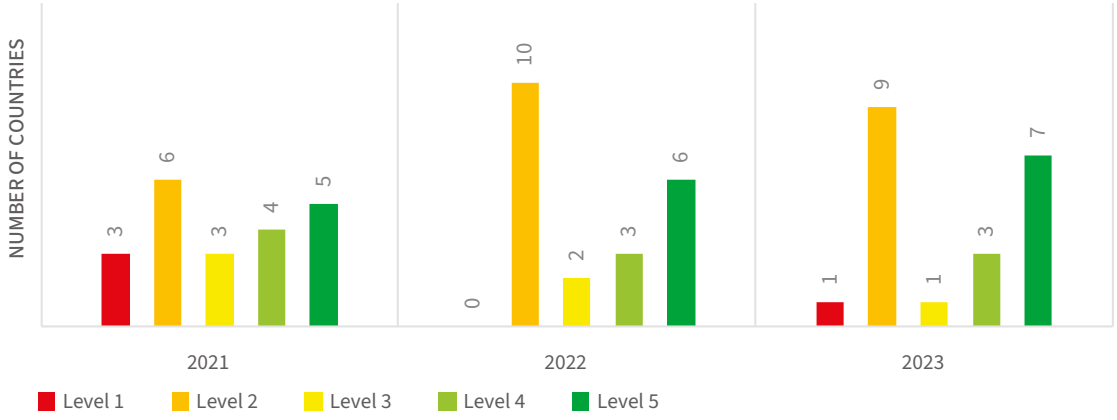
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.18. Progress regarding SPAR indicator C.9.2 (HAI surveillance)[a] in the Eastern Mediterranean Region, 2021–2023



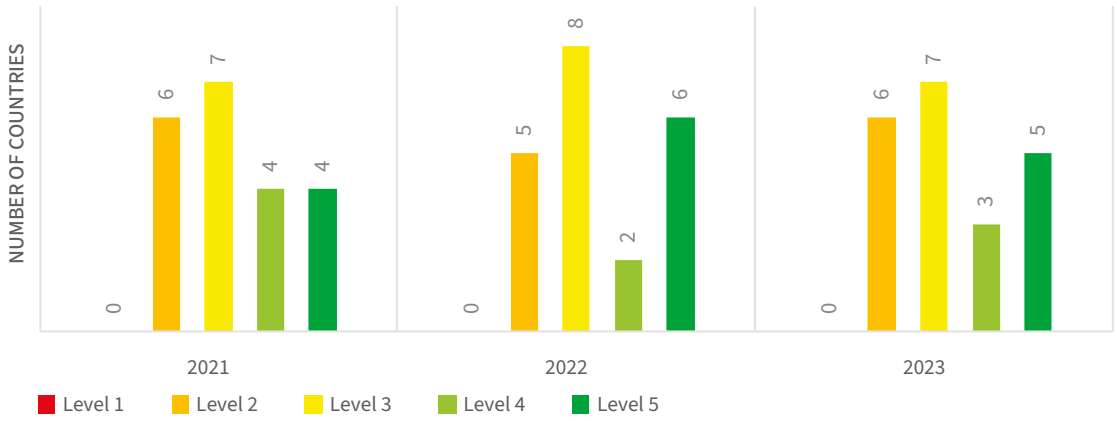
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.19. Progress regarding the SPAR indicator C.9.3 (safe environment in health facilities)[a] in the Eastern Mediterranean Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.20. Progress regarding SPAR indicator C.9 (overall IPC capacity)[a] in the Eastern Mediterranean Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Table 5.9. Proportion of countries with selected reported IPC minimum requirements in the Eastern Mediterranean Region, 2023–2024

Core component[a]	Indicator	Eastern Mediterranean Region (*n*=21)[b]	
		Number	%
Core component 1	Active national IPC programme.	16	76.2
	Dedicated budget allocated to the IPC programme.	8	38.1
	Appointed IPC focal points with dedicated time.	14	66.7
Core component 2	Evidence-based, national IPC guidelines according to international standards.	19	90.5
	Guidelines adapted and implemented.	17	81
Core component 3	National IPC curriculum for in-service training.	10	47.6

Core component[a]	Indicator	Eastern Mediterranean Region (*n*=21)[b]	
		Number	%
Core component 4	National strategic plan for HAI surveillance.	8	38.1
Core component 5	IPC improvement interventions coordinated and supported by national IPC focal point.	15	71.4
	MMIS promoted.	13	61.9
Core component 6	National strategic plan for IPC monitoring.	12	57.1
	Hand hygiene compliance as key national indicator.	11	52.4

Abbreviations: HAI, health care-associated infections; IPC: infection prevention and control; MMIS, multimodal improvement strategies.
[a] Core component 1: IPC programmes; core component 2: national and facility level IPC guidelines; core component 3: IPC education and training; core component 4: HAI surveillance; core component 5: MMIS for implementing IPC activities; core component 6: IPC monitoring, audit and feedback.
[b] Number of countries from the Region enrolled in the survey.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

5.7.2 Actions

- IPC is an area in which this Region made substantial gains during the COVID-19 pandemic. The WHO Eastern Mediterranean Regional Office has worked closely with WHO country offices and partners to support country capacity building to address the implementation of IPC practices. This included the development of technical documents and tools, provision of training and implementation of IPC principles, monitoring and evaluation of IPC programmes.
- The Region is at a critical juncture to capitalize on the momentum from the COVID-19 response. Turning temporarily scaled-up IPC capacity in countries and territories into permanent capacities, agendas and networks will strengthen health security and systems for the future.
- Significant progress has been made in developing IPC as part of national health agendas. As an example, eight of the nine countries in the Region classified as "fragile, conflict-affected and vulnerable" were able to establish an IPC unit or programme and develop national IPC guidelines, despite the numerous challenges they are facing including political instability, resource constraints and ongoing humanitarian crises.
- The integration of IPC programmes into health systems continues, maintaining links with key related areas such as AMR, WASH, public health emergencies, and patient and health care worker safety.
- At present, the highest priority for countries in the Region is to develop and execute an IPC national action plan in line with the WHO GAP/MF *(6)*, based on pre-identified country-specific priorities. This will allow to focus on some current gaps, such as the low proportion of countries with a dedicated budget for IPC, a HAI surveillance system, and an IPC curriculum for in-service training, which are all among the top core targets of the WHO GAP/MF for IPC. This important endeavour is strongly supported by the WHO Regional Office working closely in collaboration with regional and national stakeholders and partners.

5.8 European Region[25]

5.8.1 Situation analysis

- Several critical policies on AMR, including IPC as a pillar for strategies and plans, have been issued by WHO and the European Commission over the last decades *(179-182)*. Following the European Strategic Action Plan on AMR *(183)* adopted by Member States in 2011, a *Roadmap on AMR* for the WHO European Region 2023–2030 was recently adopted to support countries to identify, prioritize, implement and monitor high-impact interventions to tackle AMR *(184)*. IPC in health care facilities is one of the action areas indicated as a high-impact intervention.
- Between 2017 and 2019, 15 countries in the Region conducted the voluntary JEE[26] *(122)*. The average score among participant countries showed that attributes of IPC were in place. However, sustainability has not been ensured, for example, through inclusion in the operational plan of the national health sector with a secure funding source. Between 2021 and 2023, an additional four countries[27] conducted the voluntary JEE, while two[28] repeated it, showing limited to demonstrated capacity overall (levels 2-3). Joint development of recommendations for strengthening IPC capacity was country-specific, such as the finalization, approval and implementation of a national action plan on IPC policies with clear responsibilities and defined roles, or the development of a protocol to conduct surveillance on HAI at national level in hospitals and long-term care facilities.
- In 2024, according to the country self-assessments collected through TrACSS *(124)*, 26% (versus 22% in 2023 and 26.0% in 2021) of countries in the Region still either did not have an IPC programme or plan or, if they had one, it was not fully implemented (levels A + B). However, 56% (versus 58% in 2023 and 54.0% in 2021) of countries had an IPC programme supported by plans and guidelines implemented nationwide (Fig. 5.21, levels D + E), with most also reporting the presence of a mechanism to monitor the effectiveness of IPC programmes and compliance with recommendations. HICs in the European Region were likely to have these elements of IPC at the national level.
- Submissions for the SPAR reporting from countries in the Region slightly increased from 2021 to 2023 (n=51 to n=54). The regional average score for (C.9) "IPC capacity" (around 73) was higher than the global average (around 61) across the years. The average capacity score for all sub-capacities (C.9.1, "IPC programmes"; C.9.2, "HAI surveillance; C.9.3, "safe environment in health facilities") remained stable over the years in the Region and were consistently higher than the global average (Table 5.10).
- With regard to national overall IPC capacity, as well as every sub-capacity (IPC programmes, HAI surveillance and safe environment in health facilities), the reported capacity remained quite stable from 2021 to 2023 with most countries having demonstrated or sustained capacity (level 4 or 5). (Figs. 5.22–5.25).
- A comparison of data from the WHO global surveys on IPC conducted in 2017–2018 and 2021–2022 during the COVID-19 pandemic, showed that significant improvements were made in the European Region. These concerned the proportion of countries having an appointed IPC trained national focal point, in-service IPC curriculum, national programme for HAI surveillance, promotion of MMIS for IPC interventions, IPC monitoring, and hand hygiene compliance as a key national indicator *(8, 121, 127)*. Conversely, no or limited improvement was observed for having an active national IPC programme, IPC dedicated budget or national IPC guidelines.
- In the 2023–2024 global survey on IPC minimum requirements at the national level, 37 countries from

[25] Where "countries" are mentioned, these should be understood to include countries, territories and areas, and not just countries only. Use of the term "national" should be understood to refer to national or local considerations, as appropriate.
[26] Albania, Armenia, Belgium, Finland, Georgia, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, North Macedonia, Serbia, Slovakia, Switzerland, Turkmenistan. For more information about the JEE, please refer to: https://www.who.int/emergencies/operations/international-health-regulations-monitoring-evaluation-framework/joint-external-evaluations.
[27] Azerbaijan, Estonia, Ukraine, Uzbekistan.
[28] Armenia, Kyrgyzstan.

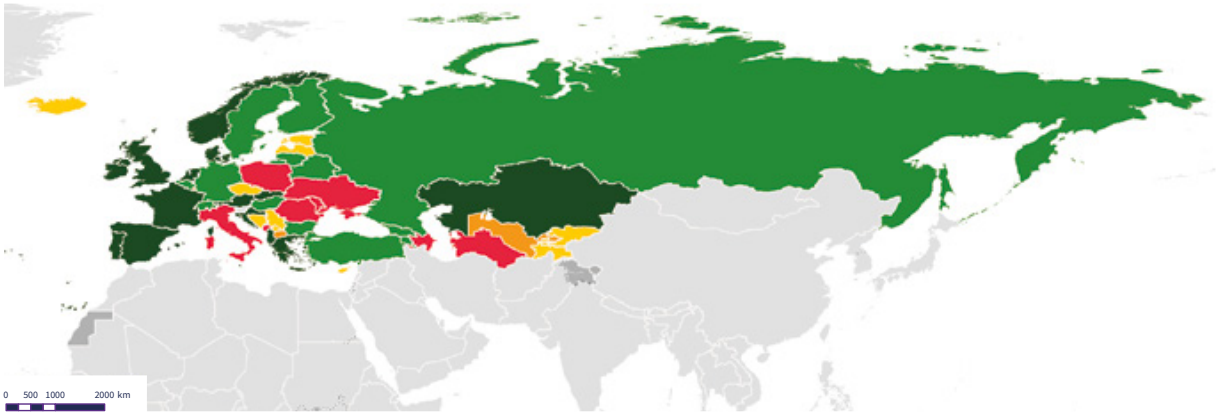
the European Region participated[29] (Table 5.11; WHO unpublished data). Approximately two thirds of countries (64.9%; 24/37) reported having an active national IPC programme, but the appointed IPC focal points had dedicated time for the tasks in less than one half of countries (43.2%; 16 of 37). Only 40.5% (15 of 37) of countries had an identified, protected and dedicated budget allocated to the IPC programme according to planned activity.

- The development of guidelines involved the use of evidence-based, scientific knowledge and international/national standards in 86.5% of countries (32 of 37). National IPC programmes actively addressed guideline adaptation and standardization of effective preventive practices and their implementation to reflect local conditions in 83.8% of countries (31 of 37). MMIS were promoted through their inclusion within IPC guidelines, education and training in 70.3% of countries (26 of 37). However, progress is needed to translate guidelines into implementation. For example, only 24.3% of countries (9 of 37) had a national IPC curriculum for in-service training of health and care workers.
- A national strategic plan for HAI surveillance, developed by a multidisciplinary technical group, was present in 70.3% of countries (26 of 37), whereas a strategic plan and system for IPC monitoring and feedback were available in only about one half of countries (51.4%; 19 of 37). Hand hygiene compliance monitoring and feedback was identified as a key national indicator in 62.2% of countries (23 of 37).
- A comparison of results from the two global surveys (2021–2022 and 2023–2024) on the implementation of IPC minimum requirements in the Region was possible for only a subset of countries and showed both improvements and declines across selected indicators. The surveys included the same 28 countries[30] in both periods and the following considerations can be made.
    - **High implementation:** The development of guidelines involving evidence-based, scientific knowledge and international standards remained high, although it slightly decreased from 92.9% (26 of 28) to 89.3% (25 of 28). The mandate of the national IPC programme to produce guidelines for preventing and controlling HAI increased from 85.7% (24 of 28) to 96.4% (27 of 28).
    - **Improvement:** there was an improvement in the implementation of a strategic plan for IPC monitoring from 42.9% (12 of 28) to 53.6% (15 of 28). The development of a national strategic plan for HAI surveillance also slightly increased from 71.4% (20 of 28) to 78.6% (22 of 28). The promotion of MMIS saw an increase from 71.4% (20 of 28) to 82.1% (23 of 28).
    - **Lower implementation and areas for improvement:** the availability of a national IPC curriculum for in-service training of health and care workers decreased notably from 46.4% (13 of 28) to 25% (7 of 28). A decrease was observed in the presence of an active IPC programme at the national level, which dropped from 78.6% (22/28) in 2021–2022 to 67.9% (19 of 28) in 2023–2024. Additionally, the percentage of countries with appointed IPC focal points having dedicated time for the tasks decreased from 64.3% (18 of 28) to 46.4% (13 of 28). The presence of an identified, protected and dedicated budget allocated to the IPC programme also decreased from 53.6% (15 of 28) to 46.4% (13 of 28).
- These surveys provide an interesting and current snapshot of IPC in the region. However, when interpreting these results, it is important to note that the data represented only a percentage of the countries from the WHO European Region. Therefore, the trends and changes observed may not fully capture the overall regional context.

[29] Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Iceland, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Norway, Poland, Republic of Moldova, Romania, Serbia, Spain, Sweden, Switzerland, Tajikistan, Ukraine, and United Kingdom of Great Britain and Northern Ireland.

[30] Albania, Armenia, Azerbaijan, Bulgaria, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Ireland, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Luxembourg, Malta, Netherlands, Norway, Republic of Moldova, Serbia, Spain, Sweden, Tajikistan, Ukraine and the United Kingdom of Great Britain and Northern Ireland.

Fig. 5.21. Country/area progress in the implementation of IPC and WASH programmes in the WHO European Region, 2024



- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.
- Data not available
- Not applicable

Abbreviations: IPC, infection prevention and control; WASH, water, sanitation and hygiene.
Map creation date: 04 October 2024.
Map production: WHO Geographic Information Systems (GIS) Centre for Health, Department of Data and Analytics (DNA) within the Division of Data, Analytics and Delivery for Impact (DDI).
Source: *(124)*.

Table 5.10. Average score per SPAR indicator for IPC[a] globally and in the WHO European Region, 2021–2023

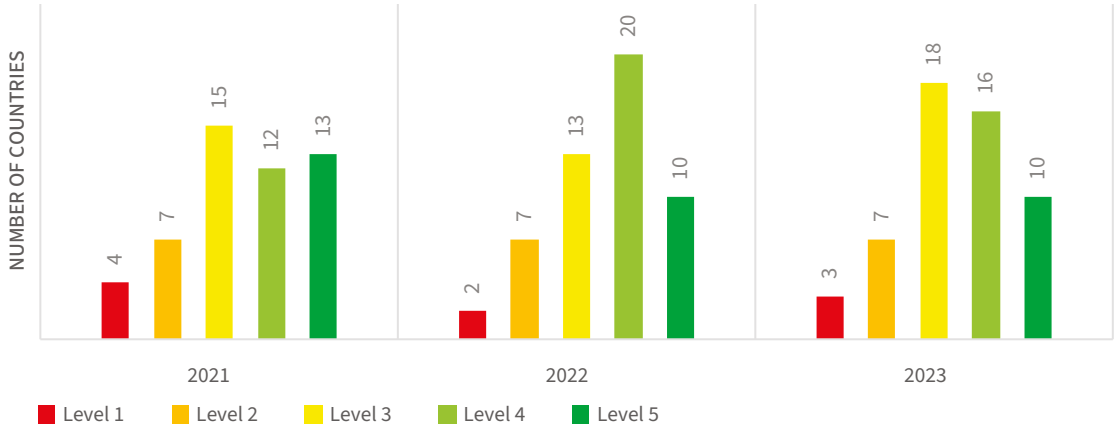
Indicator	Region	Score (average)		
		2021	2022	2023
C.9.1 IPC programmes	Global	63	64	61
	European Region	69	71	69
C.9.2 HAI surveillance	**Global**	56	59	56
	European Region	70	72	69
C.9.3 Safe environment in health facilities	Global	62	62	61
	European Region	77	77	78

[a] Each indicator is graded into scores and five levels corresponding to a continuum from limited to consolidated performance in the area indicated. Strong and effective IPC programmes increase the safety of health care. They help deliver essential services by preventing and controlling outbreaks throughout the health system. It is essential initially that at least the minimum requirements for IPC are in place at both national and facility levels, and then to progress gradually to achieving all requirements of WHO core components for IPC. programmes. These requirements are the basis for building additional critical components of IPC programmes through a stepwise approach based on assessments of the local situation.

Indicator	Region	Score (average)		
		2021	2022	2023
C.9 Overall IPC capacity	Global	60	62	60
	European Region	72	74	72
Number of countries that provided data	European Region	51	53	54

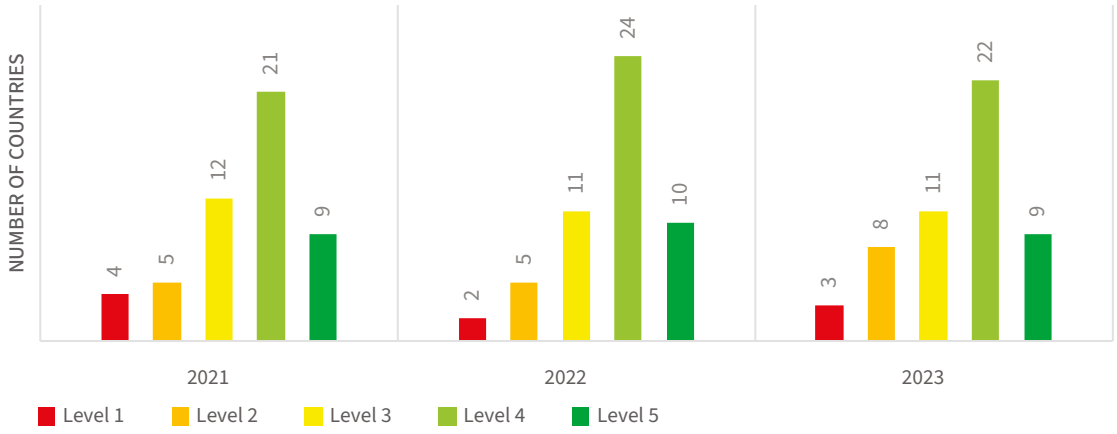
Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control.
Source: *(119)*.

Fig. 5.22. Progress regarding the SPAR indicator C.9.1 (IPC programmes)[a] in the European Region, 2021–2023



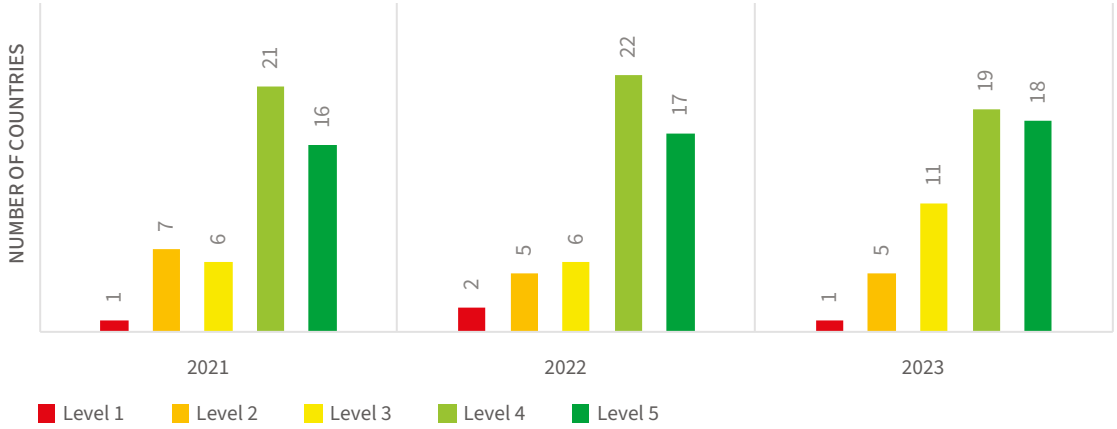
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.23. Progress regarding the SPAR indicator C.9.2 (HAI surveillance)[a] in the European Region, 2021–2023



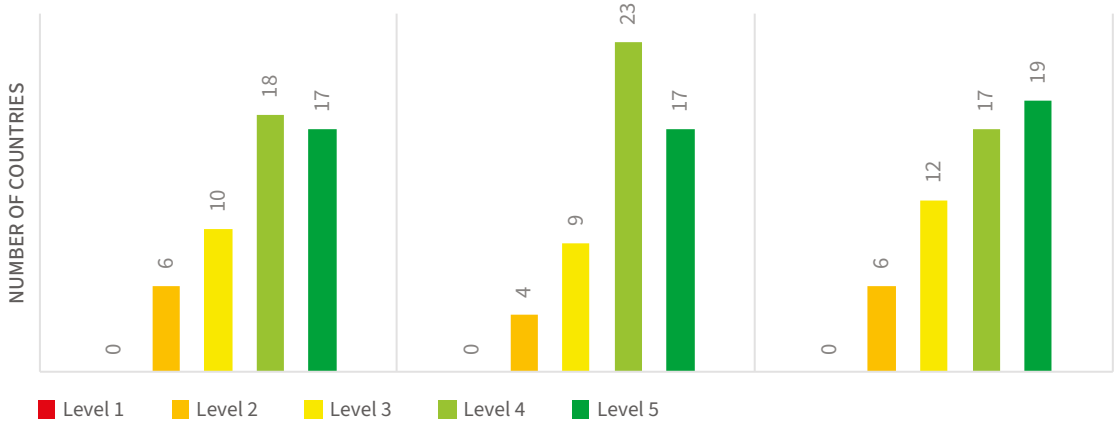
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.24. Progress regarding SPAR indicator C.9.3 (safe environment in health facilities)[a] in the European Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.25. Progress regarding SPAR indicator C.9 (overall IPC capacity)[a] in the European Region, 2012–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Table 5.11. Proportion of countries with selected reported IPC minimum requirements in the WHO European Region, 2023–2024

Core component[a]	Indicator	European Region (*n*=37)[b]	
		Number	%
Core component 1	Active national IPC programme.	24	64.9
	Dedicated budget allocated to the IPC programme.	15	40.5
	Appointed IPC focal points with dedicated time.	16	43.2
Core component 2	Evidence-based national IPC guidelines according to international standards.	32	86.5
	Guidelines adapted and implemented.	31	83.8
Core component 3	National IPC curriculum for in-service training.	9	24.3
Core component 4	National strategic plan for HAI surveillance.	26	70.3

Core component[a]	Indicator	European Region (*n*=37)[b]	
		Number	%
Core component 5	IPC improvement interventions coordinated and supported by national IPC focal point.	26	70.3
	MMIS promoted.	26	70.3
Core component 6	National strategic plan for IPC monitoring.	19	51.4
	Hand hygiene compliance as key national indicator.	23	62.2

Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control; MMIS, multimodal improvement strategies.
[a] Core component 1: IPC programmes; core component 2: national and facility-level IPC guidelines; core component 3: IPC education and training; core component 4: HAI surveillance; core component 5: MMIS for implementing IPC activities; core component 6: IPC monitoring, audit and feedback.
[b] Number of countries from the Region enrolled in the survey.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

5.8.2 Actions

- According to the priorities emerged from the results of the above mentioned surveys, the WHO Regional Office for Europe continues to support countries to implement the minimum requirements and the core components of IPC programmes through a tailored, country-focused approach, which includes:
    - **supporting IPC programmes** at regional, national, and facility levels to assess their level of implementation and help countries take the journey to develop and maintain IPC guidelines;
    - **guiding national IPC programmes** to deliver IPC training to the health workforce as one of its core functions, thus building skills and competence in support of the health workforce agenda;
    - **developing national HAI surveillance strategies** and supporting countries to undertake point prevalence surveys in collaboration with the ECDC;
    - **communicating the need for a clean and/or hygienic, well-equipped environment** that prevents and controls HAIs, as well as AMR, at every level where health care is provided, and includes all the necessary WASH infrastructure and services;
    - **strengthening collaboration** between IPC and focal points of AMR, WASH and quality of care programmes;
    - **facilitating collaboration with international stakeholders and donors** supporting IPC activities in low- resourced settings, and
    - **supporting Member States to develop and execute national action plans** in line with the WHO 2024-2030 GAP/MF on IPC *(6)* adopted at the 77th World Health Assembly *(7)*.

5.9 Western Pacific Region[31]

5.9.1 Situation analysis

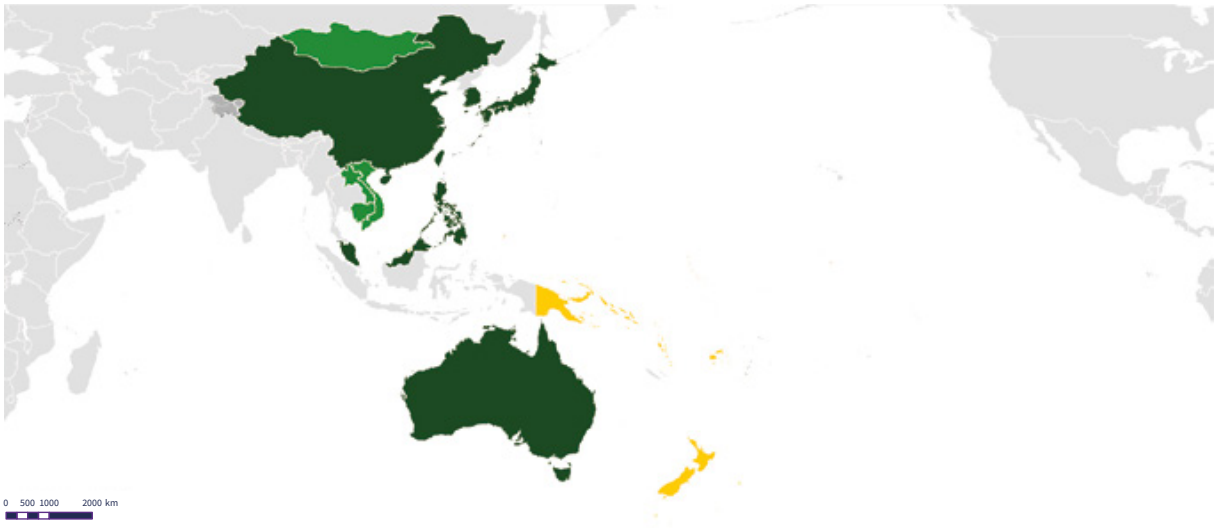
- The WHO Western Pacific Regional Office conducted a desk review in 2020–2023 to assess the status of the implementation of IPC programmes in six LMICs[32] in the Region. The findings were recently published in a regional report and revealed country-specific gaps in terms of promulgating legal provisions towards a national-level IPC strategy and policies, an insufficient translation of policy into implementation, hardly any monitoring of existing IPC programmes, and a lack of a system in place to integrate skills-based training with health worker licensing and health care facility regulations *(185)*. On the positive side, compliance monitoring with IPC practices was implemented through facility-led approaches in three countries[33], where past and ongoing facility-level auditing mechanisms, tools and projects are in place. Countries are being supported by the WHO Regional and Country Offices to critically review their current IPC programme and practices in light of the scoping review results and in alignment with the WHO 2024–2030 GAP/MF framework on IPC *(6)*.
- In 2024, according to the country self-assessments reported through TrACSS *(124)*, the proportion of countries in the Region having an IPC programme or plan, but not fully implemented, had returned to its previous level in 2021 (22% versus 13.6% in 2023 and 23.5% in 2021; level B). There was no country without a national IPC programme or plan available (level A). An increasing number of countries (52%) had an IPC programme supported by plans and guidelines implemented nationwide (versus 45.5% in 2023 and 47.1% in 2021; levels D + E; Fig. 5.26).
- Submissions for the SPAR reporting from countries in the Region increased from 2021 to 2023 (n=22 to n=26). The regional average score for (C.9) "IPC capacity" in 2023 was similar to the global average (62 versus 61), but decreased from around 70 in previous years. The average capacity score for all sub-capacities (C.9.1, "IPC programmes"; C.9.2, "HAI surveillance"; C.9.3, "safe environment in health facilities") decreased in 2023 with respect to the previous years. However, the score was on par for C.9.2 and C.9.3 with the global average, while C.9.1 was higher (Table 5.12).
- The number of countries with a demonstrated or sustained capacity (levels 4 or 5) with regard to national overall IPC capacity, as well as every sub-indicator (IPC programmes, HAI surveillance and safe environment in health facilities) remained quite stable from 2021 to 2023. HAI surveillance was reported as the least developed pillar, with countries reporting having no capacity (level 1) (Figs. 5.27–5.30).
- In the 2023–2024 global survey on IPC minimum requirements at the national level, 24 countries from the Region participated[34] (Table 5.13; WHO unpublished data). Most countries (83.3%; 20 of 24) reported to have an active national IPC programme and the appointed IPC focal points had dedicated time for their tasks in 70.8% of countries (17 of 24). 58.3% of countries (14 of 24) had an identified, protected and dedicated budget allocated to the IPC programme.
- The development of guidelines involved the use of evidence-based, scientific knowledge and international/national standards in almost all countries (95.8%; 23 of 24). The IPC programme actively addressed guideline adaptation and standardization of effective preventive practices and their implementation to reflect local conditions in 83.3% of countries (20 of 24). MMIS were promoted through their inclusion within IPC guidelines, education and training in 79.2% of countries (19 of 24), while coordination and support for IPC improvement interventions by the national IPC focal point was even reported by 91.7% of countries (22 of 24).

[31] Where "countries" are mentioned, these should be understood to include countries, territories and areas, and not just countries only. Use of the term "national" should be understood to refer to national or local considerations, as appropriate.
[32] Cambodia, Laos PDR, Papua New Guinea, Philippines, Solomon Islands and Viet Nam.
[33] Cambodia, Laos PDR, Philippines.
[34] Australia, Brunei Darussalam, Cambodia, China, Cook Islands, Japan, Laos PDR, Malaysia, Marshall Islands, Mongolia, Nauru, New Zealand, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Solomon Islands, Tonga, Tuvalu, Vanuatu, Viet Nam and Wallis and Futuna.

- A national IPC curriculum for in-service training of health and care workers was available in only 40.7% of countries (10 of 24).
- A national strategic plan for HAI surveillance, developed by a multidisciplinary technical group, was present in 54.2% of countries (13 of 24), while a strategic plan for IPC monitoring and feedback was in place in only 45.8% of countries (11 of 24). Hand hygiene compliance monitoring and feedback was identified as a key national indicator in 91.7% of countries (22 of 24).
- The results of the 2023–2024 global survey indicates a very positive engagement by countries in the Western Pacific Region towards serious improvements in IPC implementation, especially regarding active national IPC programmes and adherence to evidence-based guidelines. However, other critical areas require strengthening, such as creating local IPC expertise, delivering regular training, and improving HAI surveillance and IPC monitoring systems.
- A comparison of data between previous surveys conducted in 2017–2018 and 2021–2022 during the COVID-19 pandemic showed that significant improvements were observed in the Region. These concerned the proportion of countries having an appointed IPC trained national focal point, in-service IPC curriculum, conducting HAI surveillance and monitoring of IPC indicators *(8, 121, 127)*. Conversely, no or limited improvement was observed for having an active national IPC programme, a budget dedicated to IPC, evidence-based and standardized national IPC guidelines, the promotion of multimodal strategies for IPC interventions, and hand hygiene compliance as a key national indicator. As these comparisons could only be made based on four countries enrolled in both surveys, these comparisons should be interpreted with caution.
- The number of countries participating in the WHO global surveys increased substantially from six in 2021–2022 to 24 in 2023–2024, indicating a strong and growing commitment to IPC efforts in the Region.
- However, a comparison of the results from the two global surveys (2021-2022 and 2023-2024) on the implementation of IPC minimum requirements in the Region was possible for only a subset of countries and showed both improvements and consistent high implementation across selected indicators. The surveys included the same six countries[35] in both periods and the following considerations can be made.
    - **High implementation:** The mandate of the national IPC programme to produce guidelines, as well as the development of guidelines involving evidence-based, scientific knowledge and international standards, remained consistently high at 100% (6 of 6) in both surveys.
    - **Improvement:** The percentage of countries with appointed IPC focal points having dedicated time for the tasks increased from 83.3% (5 of 6) to 100% (6 of 6). Having an identified, protected and dedicated budget allocated to the IPC programme also increased from 66.7% (4 of 6) to 83.3% (5 of 6). The development of a national strategic plan for HAI surveillance increased from 50% (3 of 6) to 66.7% (4 of 6). The promotion of MMIS saw a significant improvement from 50% (3 of 6) to 100% (6 of 6). The implementation of a strategic plan for IPC monitoring also improved from 50% (3 of 6) to 66.7% (4 of 6).
    - **Lower implementation and areas for improvement:** The development of a national IPC curriculum for in-service training of health and care workers remained low and unchanged at 33.3% (2 of 6) in both surveys.
- When interpreting these results, it is important to note that the data represented only a percentage of the countries from the WHO Western Pacific Region. Therefore, the trends and changes observed may not fully capture the overall regional context, especially with the small number of countries included in this comparison.

[35] China, Malaysia, Philippines, Singapore, Vanuatu and Viet Nam.

Fig. 5.26. Country/area progress in the implementation of IPC and WASH programmes in the WHO Western Pacific Region, 2024



- A. No national infection prevention and control (IPC) programme or operational plan is available.
- B. A national IPC programme or operational plan is available. National IPC and water, sanitation and hygienea (WASH) and environmental health standards exist but are not fully implemented.
- C. A national IPC programme and operational plan are available and national guidelines for health care IPC are available and disseminated. Selected health facilities are implementing the guidelines, with monitoring and feedback in place.
- D. A national IPC programme available, according to the WHO IPC core components guidelines and IPC plans and guidelines implemented nationwide. All health care facilities have a functional built environment (including water and sanitation), and necessary materials and equipment to perform IPC, per national standards.
- E. IPC programmes are in place and functioning at national and health facility levels, according to the WHO IPC core components guidelines. Compliance and effectiveness are regularly evaluated and published. Plans and guidance are updated in response to monitoring.
- Data not available
- Not applicable

Abbreviations: IPC, infection prevention and control; WASH, water, sanitation and hygiene.
Map creation date: 04 October 2024.
Map production: WHO Geographic Information Systems (GIS) Centre for Health, Department of Data and Analytics (DNA) within the Division of Data, Analytics and Delivery for Impact (DDI).
Source: *(124)*.

Table 5.12. Average score per SPAR indicator for IPC[a] globally and in the WHO Western Pacific Region, 2021–2023

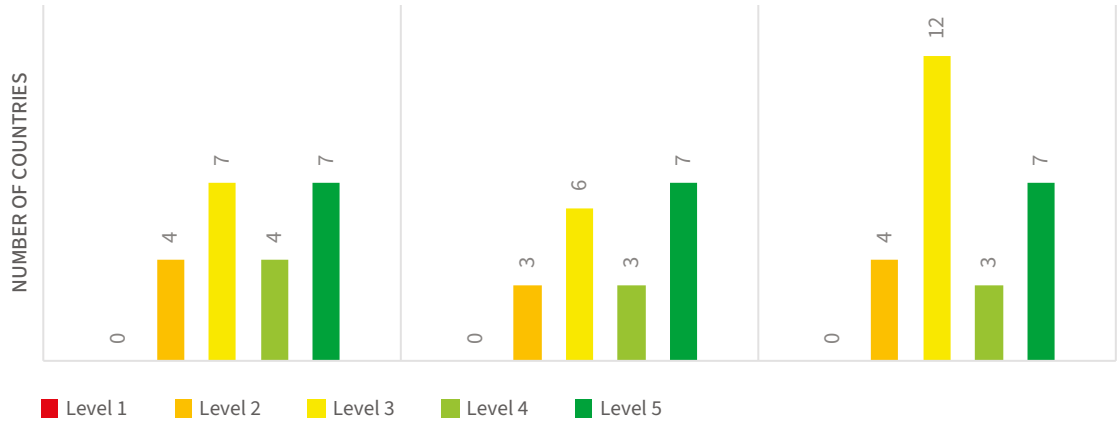
Indicator	Region	Score (average)		
		2021	2022	2023
C.9.1 IPC programmes	Global	63	64	61
	Western Pacific Region	73	75	70
C.9.2 HAI surveillance	**Global**	56	59	56
	Western Pacific Region	59	65	56

[a] Each indicator is graded into scores and five levels, corresponding to a continuum from limited to consolidated performance in the area indicated. Strong and effective IPC programmes increase the safety of health care. They help deliver essential services by preventing and controlling outbreaks throughout the health system. It is essential initially that at least the minimum requirements for IPC are in place at both national and facility levels, and then to progress gradually to achieving all requirements of WHO core components for IPC programmes. These requirements are the basis for building additional critical components of IPC programmes through a stepwise approach based on assessments of the local situation.

Indicator	Region	Score (average)		
		2021	2022	2023
C.9.3 Safe environment in health facilities	Global	62	62	61
	Western Pacific Region	71	72	61
C.9 Overall IPC capacity	Global	60	62	60
	Western Pacific Region	68	71	62
Number of countries that provided data	Western Pacific Region	22	19	26

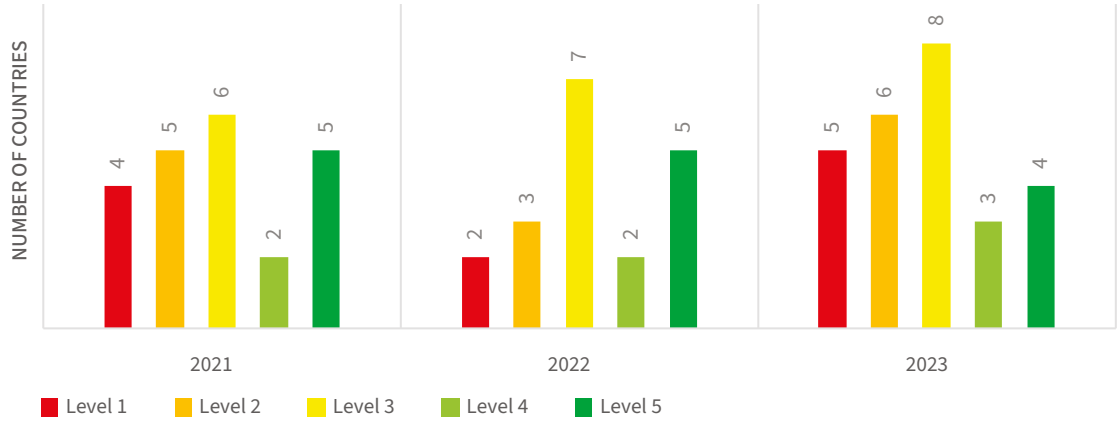
Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control.
Source: *(119)*.

Fig. 5.27. Progress concerning the SPAR indicator C.9.1 (IPC programmes)[a] in the WHO Western Pacific Region, 2021–2023



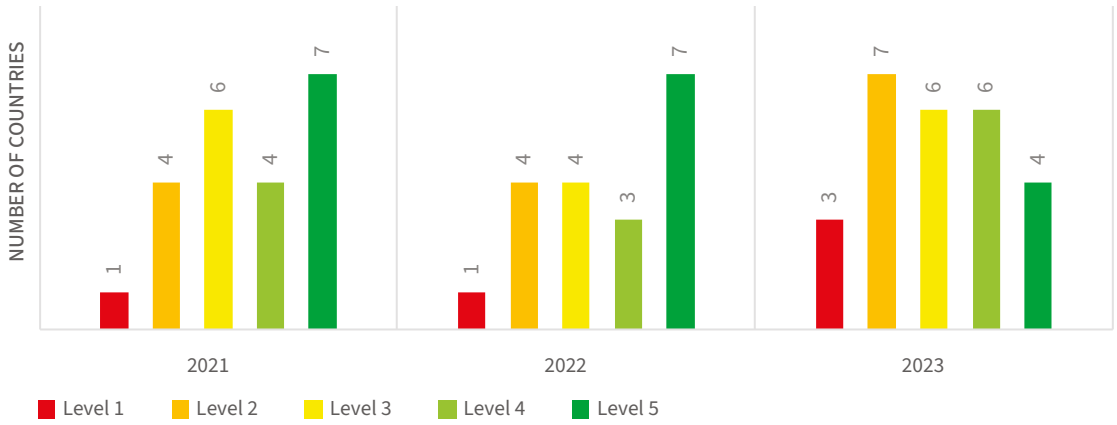
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.28. Progress concerning the SPAR indicator C.9.2 (HAI surveillance)[a] in the WHO Western Pacific Region, 2021–2023



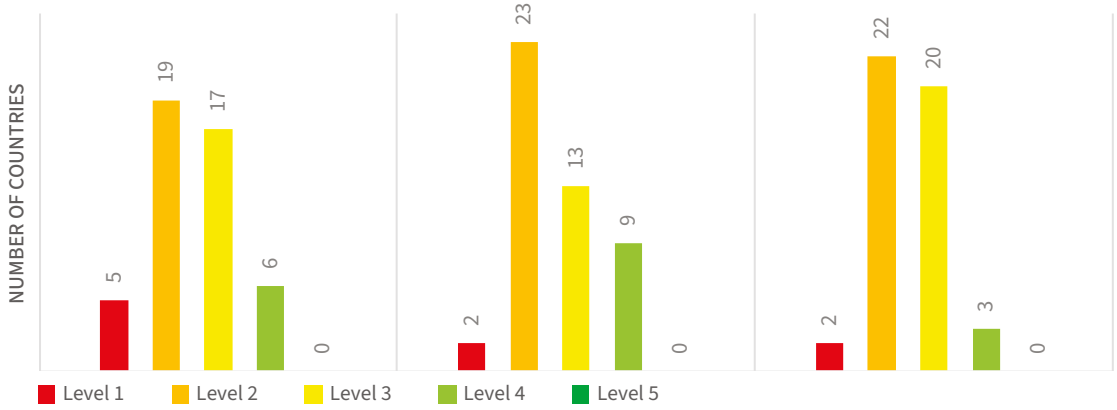
[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.29. Progress concerning the SPAR indicator C.9.3 (safe environment in health facilities)[a] in the WHO Western Pacific Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Fig. 5.30. Progress concerning the SPAR indicator C.9 (overall IPC capacity)[a] in the WHO Western Pacific Region, 2021–2023



[a] See Box 3.1 for a detailed description of capacity levels 1-5.
Source: *(119)*.

Table 5.13. Proportion of countries with selected reported IPC minimum requirements in the WHO Western Pacific Region, 2023–2024

Core component[a]	Indicator	Western Pacific Region (*n*=24)[b]	
		Number	%
Core component 1	Active national IPC programme.	20	83.3
	Dedicated budget allocated to the IPC programme.	14	58.3
	Appointed IPC focal points with dedicated time.	17	70.8
Core component 2	Evidence-based national IPC guidelines according to international standards.	23	95.8
	Guidelines adapted and implemented.	20	83.3
Core component 3	National IPC curriculum for in-service training.	10	40.7

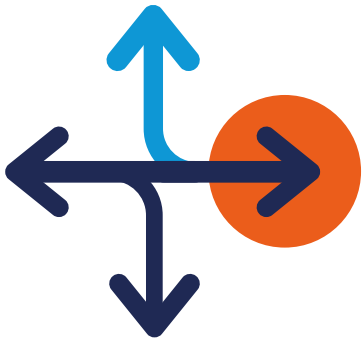
Core component[a]	Indicator	Western Pacific Region (*n*=24)[b]	
		Number	%
Core component 4	National strategic plan for HAI surveillance.	13	54.2
Core component 5	IPC improvement interventions coordinated and supported by national IPC focal point.	22	91.7
	MMIS promoted.	19	79.2
Core component 6	National strategic plan for IPC monitoring.	11	45.8
	Hand hygiene compliance as key national indicator.	22	91.7

Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control; MMIS, multimodal improvement strategies.
[a] Core component 1: IPC programmes; core component 2: national and facility-level IPC guidelines; : core component 3: IPC education and training; core component 4: HAI surveillance; core component 5: MMIS for implementing IPC activities; core component 6: IPC monitoring, audit and feedback.
[b] Number of countries from the Region enrolled in the survey.
Source: WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

5.9.2 Actions

- Since 2022, significant progress has been made in developing IPC as part of national health agendas, with stronger integration into health systems across the Western Pacific Region, strengthening links with key related areas such as WASH, maternal and child health programmes, public health emergencies, patient and health care worker safety and AMR.
- Regarding the ongoing work to establish IPC monitoring and evaluation, WHO has supported countries in implementing simulation-exercise modules to enhance in situ IPC training and assessment. These exercises have allowed facilities to assess their IPC practices in real-time, driving immediate improvements and informing mid- and long-term strategies to strengthen the quality of IPC programmes. Notably, in Solomon Islands, 30% of provincial health care facilities have undergone these assessments, with a national plan in place to scale-up coverage to 100% by 2025. Additionally, more countries in the Region, including Fiji, Cambodia and Laos PDR, have requested WHO and partners' support in introducing and scaling-up with this approach so as to strengthen IPC practices in their facilities.
- The WHO Western Pacific Regional Office is now using the findings included in the recent regional report on IPC to drive country-specific priorities *(185)*. This review has provided a clearer understanding of the barriers and enablers for IPC integration, allowing WHO to provide targeted, evidence-based support to countries as they refine their IPC strategies and plans.
- The following areas have been identified as priority for action for countries and WHO support:
    - **creating a regional initiative for IPC** together with patient safety initiatives, ensuring alignment with WHO core components for IPC programmes *(2)*, HR requirements *(118)* and the WHO 2023–2030 GAP/MF on IPC *(6)*;
    - **developing national action plans** aligned with the WHO IPC GAP/MF indicators, providing a comprehensive structure for evaluating national IPC programmes;
    - **developing robust HAI surveillance mechanisms and systems** in line with the recent WHO practical handbook *(186)* on this topic.

Nutritionist assesses 2-year-old to determine her nutritional status in a facility in United Republic of Tanzania. © WHO / Mwesuwa Ramsey



Chapter 6.

The way forward

Chapter 6.
The way forward

The 2022 WHO global report on IPC *(8)* identified several key technical and policy areas requiring action by WHO across the three levels of the organization and by international stakeholders and partners. It also indicated some priorities for countries to focus on with a certain sense of urgency, based upon the reported data on gaps in IPC implementation and the harm caused to patients and health workers due to weak or inappropriate IPC practices.

> Although, inevitably, the pace at which change is being achieved in countries varies for historical, logistical and financial reasons, significant progress has been made both at the global and national level over the past two years. However, this updated report also shows that many gaps still exist and some improvements achieved during the COVID-19 pandemic may have been recently lost due to disinvestment in IPC and WASH and a reallocation of resources and funds to other areas.

Building upon the call for action made by the WHO Global IPC Network since 2017 *(187)*, the key priorities and directions indicated in the 2022 WHO global report and the lessons learned during the COVID-19 pandemic, Member States have made unprecedented steps forward in the past two years in recognizing and elevating the importance of IPC in the global and national health agenda.

First, a resolution focusing on IPC as a critical priority across the continuum of the health system in any settings where health care is delivered was developed and adopted at the 75th World Health Assembly in 2022 *(126)*. The resolution formulated 13 recommendations for Member States and requested the WHO Secretariat to work with them to develop a global strategy, action plan and monitoring framework on IPC. During the following year, the global strategy was developed through a wide consultative process and approved at the 76th World Health Assembly. The strategy is underpinned by the following ambitious, yet inspirational vision.

> By 2030, everyone accessing or providing health care is safe from associated infections.

The WHO global strategy on IPC includes eight strategic directions (Fig. 6), which served as the backbone for the GAP/MF for IPC *(6)* (also mentioned in chapters 3 and 4). These were developed between 2023 and 2024 through another strong consultative process and adopted by all countries at the 77th World Health Assembly in May 2024 *(7)*. The GAP/MF indicates actions, indicators and targets to achieve the effective implementation of the global strategy and track progress over time at the global, national, sub-national and facility level *(6)*.

Recognizing the core role of IPC to achieve their own objectives, other programmes have also recently included strategic directions and targets on IPC in alignment with the GAP/MF in important political documents.

- In the *WHO Global Pandemic Agreement (188)* being negotiated among Member States, the

improvement of IPC measures and their rapid and effective implementation when another pandemic threat arises are mentioned several times as critical to prevent and mitigate pandemic-related risks and to ensure health systems' resilience.

- The *Political Declaration of the High-level Meeting on AMR (189)* recently agreed upon at the 2024 United Nations General Assembly indicates that priority needs to be given to effective implementation of measures to prevent and control infections in order to achieve the targets established in the 2024–2030 WHO GAP/MF. In addition, considering that most of the burden (disability and premature mortality) of AMR is due to HAIs (see chapter 2), effective IPC interventions will have a significant role in achieving the new global target to reduce the global deaths caused by drug-resistant bacterial infections by 10% by 2030.
- Finally, WHO and UNICEF recently launched the *Global Framework for Action 2024–2030* on universal WASH, waste and electricity services in all health care facilities *(190)* to achieve quality health care services. Subsequently, a *Consensus Statement* on the role of policy-makers and partners in implementing the Global Framework was issued. The fundamental idea that WASH and waste management practices are complementary to and enablers of IPC practices is fully integrated in these documents. From the political action point of view, the implementation of the GAP/MF on IPC in integration with WASH and waste management policies and interventions are strongly agreed upon as a high priority in the Global Framework and in the Consensus Statement. This demonstrates a clear understanding from countries of the complementarity of IPC and WASH and the efficiency gained in progressing them together.

Fig 6. Strategic directions as the overall guiding framework of the WHO global strategy on IPC

Abbreviations: GSIPC, global strategy for infection prevention and control; IPC, infection prevention and control.
Source: *(126)*.

> Elevating IPC in the global health and political agenda through all these documents represents a turning point in history as this area of work has never been singled out so far among the top priorities for commitment and action in such a strong way.

This represents a powerful tool for advocacy to policy- and decision-makers and for empowering IPC focal points to take the lead on the critical step of implementation of these country calls into the field setting.

The role of WHO and international/national partners and stakeholders

The GAP/MF primarily targets those responsible for developing plans and implementing action on IPC at the national and health care facility level and is aimed at guiding and supporting them.

However, WHO and international and national partners and stakeholders have a critical role on the way forward to achieving the global strategy vision and supporting the implementation of the GAP/MF.

The WHO GAP/MF *(6)* identified priority actions and indicators for these international and national key players (Annex 2) in supporting country efforts to make progress in the next years and achieve the established targets by 2030. These players can have a significant role to help advance these efforts, particularly by synergizing at country level to provide financial and technical support to implement the IPC national action plans and strategies, with special attention to address real local needs, while avoiding duplication of efforts, and maximizing collaboration and coordination.

Targets to be achieved at country level

> The way forward at country level should be driven by the key actions, core indicators and targets identified in the WHO GAP/MF to be achieved by 2030 at the national (reflected as "global" targets achieved) and facility (reflected as "national" targets achieved) levels (Table 6.1).

This MF for IPC (which also includes some additional indicators and targets) will allow regular tracking of progress with regards to the actions of the GAP at all levels and thus will provide a form of accountability. The IPC MF was developed through a thorough consensus-building process and prioritization exercise, including international expert meetings, eight global and regional online consultations with country representatives, as well as a Delphi study. A high level of agreement on the proposed IPC indicators and targets was achieved, with a total of 136 IPC indicators at global, national and facility levels in the final GAP, which mainly reflect the execution of the recommended actions.

Of 32 targets in total, eight were prioritized to be achieved at the national level and four at the facility level (Table 6.1). The great majority of these targets can be monitored using existing monitoring systems (see Supplementary annex 3 of the GAP/MF) and are referred to in chapters 3 and 4 of this report.

Table 6.1. Core targets of the IPC MF at the global and national level

Eight core targets at global[a] level
1. Increase of proportion of countries with a costed and approved national action plan and monitoring framework on IPC.

2.	Increase of proportion of countries with legislation/regulations to address IPC.
3.	Increase of proportion of countries having an identified protected and dedicated budget allocated to the national IPC programme and action plan.
4.	Increase of proportion of countries meeting all WHO IPC minimum requirements for IPC programmes at national level (through WHO global IPC portal).
5.	Increase of proportion of countries with national IPC programmes at levels 4 or 5 according to SPAR C.9.1 and levels D and E in TrACSS.
6.	Increase of the proportion of countries with (1) basic water, (2) sanitation, (3) hygiene, and (4) waste services in all health care facilities.
7.	Increase of proportion of countries that have achieved their national targets on reducing HAIs.
8.	Increase of proportion of countries with a national HAI surveillance system.
Four core targets at national[b] level	
1.	Increase of proportion of facilities meeting all WHO IPC minimum requirements for IPC programmes.
2.	Increase in the proportion of facilities with a dedicated and sufficient funding for WASH services and activities.
3.	Increase of proportion of facilities providing training to all frontline clinical and cleaning staff upon employment and annually and to managers upon employment.
4.	Increase of proportion of tertiary/secondary health care facilities having an HAI and related AMR surveillance system.

Abbreviations: HAI, health care-associated infections; IPC, infection prevention and control; MF, monitoring framework; TrACSS, Tracking AMR Country Self- Assessment Survey.
[a]Reflecting progress at national level.
[b]Reflecting progress at facility level.
Source: *(6)*.

IPC integration and coordination

In addition to achieving targets specific to IPC and WASH (Table 6.1), the coordination and alignment of the IPC programme with other complementary programmes to avoid duplications and amplify achievements is critical for success, such as those focusing on AMR, quality of care, patient safety, occupational health and health emergencies, as well as human immunodeficiency virus, tuberculosis, hepatitis, maternal/child health, surgical care and other programmes.

> While IPC is a specialized area of work that requires specific expertise and dedicated human and financial resources, it is a cross-cutting area that contributes substantially to the achievement of other programmes' objectives and benefits from active synergies with them.

This is relevant at both national and facility level. Under strategic direction #3, the WHO GAP/MF provides several examples of actions that can be undertaken to implement the coordination of IPC with different programmes.

Integration is particularly important with AMR and in the context of public health emergencies. The inclusion of IPC principles, strategies and standards within policies, national action plans and implementation projects on AMR should be ensured and the complementarity of IPC and antimicrobial stewardship interventions

should be nurtured, in particular at facility level.HAI and AMR surveillance is another important area for integration. Furthermore, IPC should be integrated and supported as a core component of the national preparedness, readiness and response plan within the context of public health emergencies and given a prominent role in outbreak prevention and control in health care facilities.

Priority areas for improvement

Chapters 3 and 4 of this report highlight not only improvements, but also document progress setbacks and confirmed gaps at both national and facility level according to data collected through several systems in 2023–2024 when compared to previous years.

> The compass for future improvement is the WHO 2023–2030 GAP/MF on IPC *(6)*.

Table 6.2 shows the most important areas for improvement and the current situation regarding the core targets to be monitored according the WHO MF. It also provides the available "baseline" data for tracking progress up to 2030 through 2026 and 2028 as indicated in the GAP/MF.

Table 6.2. Priority areas for improvement according to the most recent data available in relation to the MF core targets

Priority area	2022–2024 key data: national level	National target by 2030	2022–2024 key data: facility level	Facility target by 2030
Political commitment	44% of countries (66 of 150) have a dedicated budget for the IPC programme.	Increase of the proportion of countries with an identified dedicated budget allocated to the national IPC programme and action plan to: 50% by 2026 75% by 2028 >90% by 2030	43.1% of health care facilities (751 of 1742; secondary and tertiary) have a dedicated budget for IPC activities.	Increase of the proportion of health care facilities with an adequate dedicated budget for IPC to: 30% by 2026 50% by 2028 >80% by 2030
	No data currently exist on the proportion of countries with legislation/regulations to address IPC.	Increase of the proportion of countries with legislation/ regulations for IPC to: 30% by 2026 50% by 2028 >80% by 2030		
IPC programme	71.3% of countries (107 of 150) have an active national IPC programme. 38.7% of countries (72 of 186) at levels D and E in TrACSS indicator 3.5. 31.4% of countries (61 of 194) at levels 4 and 5 in SPAR indicator C.9.1.	Increase of the proportion of countries with national IPC programmes at Level 4 or 5 in section C9.1 of SPAR 9.1 and Level D or E in section 3.5 of TrACSS to: 50% by 2026 75% by 2028 >90% by 2030	86.7% of health care facilities (548 of 632; tertiary) have an IPC programme.	Increase of the percentage of secondary and tertiary health care facilities with an IPC programme to: 30% by 2026 60% by 2028 >90% by 2030

Priority area	2022–2024 key data: national level	National target by 2030	2022–2024 key data: facility level	Facility target by 2030
	No data currently exist on the proportion of countries that have achieved their national targets on reducing HAIs.	Increase of the proportion of countries that have achieved their national targets on reducing HAIs (among those having such targets) to: 30% by 2026 50% by 2028 >80% by 2030		
WASH to support IPC	78% and 57% of countries have basic water services and hand hygiene in all health care facilities.	Increase of the proportion of countries with basic water, sanitation, hygiene and waste services in all health care facilities to: 60 % by 2026 80% by 2028 100% by 2030	*No data exist at present regarding the percentage of* health care facilities *with dedicated and sufficient funding for WASH services and activities.*	Increase of the proportion of facilities with a dedicated and sufficient funding for WASH services and activities to: 40% by 2026 80% by 2028 100% by 2030
	3% of countries have dedicated and sufficient funding for WASH services and activities.	Increase of the proportion of countries with dedicated and sufficient funding for WASH services and activities to: 40% by 2026 80% by 2028 100% by 2030		
IPC training	38% of countries (57 of 150) have a national IPC curriculum for in-service training.	Increase of the proportion of countries having a national IPC curriculum for in-service training to: 50% by 2026 75% by 2028 >90% by 2030 Increase of the proportion of countries with an IPC training programme for health workers to: 30% by 2026 50% by 2028 >80% by 2030	61.8% of health care facilities (3421 of 5537) providing training to all frontline staff.	Increase of the proportion of facilities providing and/or requiring training to all frontline clinical and cleaning staff upon employment and annually and to managers upon employment to: 30% by 2026 60% by 2028 >90% by 2030
HAI surveillance	50% of countries (75 of 150) have a national strategic plan for HAI surveillance. 51% of countries (47/108) have a national system for HAI surveillance.	Increase of the proportion of countries with a national surveillance system for HAIs and related AMR to: 30% by 2026 50% by 2028 >80% by 2030	70.6% of health care facilities (1230 of 1742; secondary and tertiary) with a HAI surveillance system.	Increase of proportion of tertiary/secondary health care facilities having a surveillance system for HAIs and related AMR to: 30% by 2026 50% by 2028 >80% by 2030

Priority area	2022–2024 key data: national level	National target by 2030	2022–2024 key data: facility level	Facility target by 2030
	31% of countries (29/108) established national targets on reducing HAIs.	Increase of the proportion of countries with a national target on reducing HAIs to: 50% by 2026 75% by 2028 100% by 2030		
IPC monitoring	51.3% of countries (77 of 150) have an IPC monitoring national strategic plan and system.	Increase of the proportion of countries with a national IPC monitoring system to: 30% by 2026 50% by 2028 >80% by 2030	78% of health care facilities (1359 of 1742; secondary and tertiary) with an IPC monitoring system.	Increase of the proportion of tertiary/ secondary health care facilities having an IPC monitoring system to: 30% by 2026 50% by 2028 >80% by 2030
IPC interventions using MMIS	75.3% of countries (113 of 150) promote MMIS.	Increase of the proportion of countries that promote MMIS through the inclusion of the approach in the development of IPC guidelines, education and training to: 30% by 2026 50% by 2028 >80% by 2030	74% of health care facilities (4098 of 5537) using MMIS for IPC interventions.	Increase of the proportion of facilities with implemented IPC interventions based on MMIS to reduce specific HAIs according to local priorities to: 30% by 2026 50% by 2028 >80% by 2030
IPC minimum requirements	6% of countries (9 of 150) meet **all** MR.	Increase of the proportion of countries meeting all WHO minimum requirements for IPC programmes at national level to: 30% by 2026 60% by 2028 >90% by 2030	15.8% of health care facilities (874 of 5537) meet **all** minimum requirements for IPC. 34% of health care facilities (1885 of 5537) meet 90% of minimum requirements for IPC.	Increase of the proportion of facilities meeting all WHO minimum requirements for IPC programmes to: 30% by 2026 60% by 2028 >90% by 2030

Abbreviations: HAI, health care-associated infection; IPC, infection prevention and control; MMIS, multimodal improvement strategies; MR, minimum requirements (for IPC); SPAR, States Party Self-assessment annual reporting (tool); TrACSS, Tracking AMR Country Self-Assessment Survey; WASH, water, sanitation and hygiene.
Source: JMP *(150)*, SPAR *(119)*, TrACSS *(124)*, WASH *(191)*, WHO Global Patient Safety Report *(27)*, WHO global survey on IPC minimum requirements at the national level, 2023–2024 (WHO, unpublished data).

Conclusions

The data provided in this report show the need for further investments on IPC at both the national and facility levels. In many countries there is a clear dichotomy between having programmes, policies and guidelines and the lack of consistent implementation in the field, coordinated by the national and/or subnational levels and adequately supported by human and financial resources, a strong built environment, and robust monitoring and evaluation systems. Furthermore, significant and striking differences emerge in IPC capacity and progress between low- and lower-middle-income countries and other income levels across all data sets on IPC indicators at the national and facility level.

The achievement of the WHO minimum requirements *(5)* (Annex 1) should be an urgent priority for all countries and health care facilities in order to provide minimum protection and safety to patients, health workers, as well as families and visitors to facilities, and to achieve targets for AMR reduction.

Several country examples *(192)* show that nations that treat IPC and WASH capacity building and implementation as critical health priorities can make progress and protect their patients and health workforce. In this report, we provide two country examples (Annex3) showing effective approaches to achieve a powerful national IPC programme (Nigeria) and to implement at facility level a MMIS in the context of a national initiative coordinated by the ministry of health (Saudi Arabia).

Country efforts to improve IPC not only benefit their own people and health systems, but strongly contribute to the achievement of the health-related Sustainable Development Goals *(193)* and global health security. They also work towards the effective implementation of other major global health priorities, including the IHR *(24)*, AMR action plans, patient and health worker safety and integrated people-centred care. Furthermore, the overarching focus on quality essential health services as part of a primary health care-driven approach to universal health coverage is well-served by strong IPC at all levels of the health service.

Committee A meeting for the fourteenth time during the seventy-seventh World Health Assembly in Geneva, Switzerland.

References

References

1. Core competencies for infection prevention and control professionals. Geneva, World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/335821, accessed 11 November 2024).
2. Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. Geneva: World Health Organization; 2016 (https://apps.who.int/iris/handle/10665/251730, accessed 11 November 2024).
3. Interim practical manual: supporting national implementation of the WHO guidelines on core components of infection prevention and control programmes. Geneva: World Health Organization; 2017 (https://apps.who.int/iris/handle/10665/330073, accessed 11 November 2024).
4. Improving infection prevention and control at the health facility: interim practical manual supporting implementation of the WHO guidelines on core components of infection prevention and control programmes. Geneva: World Health Organization; 2018 (https://apps.who.int/iris/handle/10665/279788, accessed 11 November 2024).
5. Minimum requirements for infection prevention and control programmes. Geneva: World Health Organization; 2019 https://apps.who.int/iris/handle/10665/330080, accessed 11 November 2024).
6. Global action plan and monitoring framework on infection prevention and control (IPC), 2024-2030. Geneva: World Health Organization; 2024 (https://www.who.int/teams/integrated-health-services/infecation-prevention-control/draft-global-action-plan-and-monitoring-framework-on-ipc#cms, accessed 11 November 2024).
7. Decision WHA77(9). Global action plan and monitoring framework on infection prevention and control. Seventy-seventh World Health Assembly, 27 May–1 June 2024. Geneva: World Health Organization; 2024 (https://apps.who.int/gb/ebwha/pdf_files/WHA77/A77_(9)-en.pdf, accessed 8 November 2024).
8. Global report on infection prevention and control. Geneva: World Health Organization; 2022 (https://www.who.int/publications/i/item/9789240051164, accessed 11 November 2024).
9. Assessment tool of the minimum requirements for infection prevention and control programmes at the national level. Geneva: World Health Organization; 2021 (https://www.who.int/publications/m/item/assessment-tool-of-the-minimum-requirements-for-infection-prevention-and-control-programmes-at-the-national-level#:~:text=The%20WHO%20national%20level%20assessment,IPC%20programmes%20recommended%20by%20WHO, accessed 11 November 2024).
10. Assessment tool on infection prevention and control minimum requirements for primary health care facilities. Geneva: World Health Organization; 2023 (https://www.who.int/publications/i/item/WHO-UHL-IHS-IPC-2023.2, accessed 11 November 2024).
11. Assessment tool on infection prevention and control minimum requirements for secondary health care facilities. Geneva: World Health Organization; 2023 (https://www.who.int/publications/i/item/WHO-UHL-IHS-IPC-2023.4, accessed 11 November 2024).
12. Assessment tool on infection prevention and control minimum requirements for tertiary health care facilities. Geneva: World Health Organization; 2023 (https://www.who.int/publications/i/item/WHO-UHL-IHS-IPC-2023.5, accessed 11 November 2024).
13. Infection prevention and control assessment framework at the facility level. Geneva: World Health Organization; 2018 (https://apps.who.int/iris/handle/10665/330072, accessed 11 November 2024).
14. Strengthening infection prevention and control in primary care: a collection of existing standards, measurement and implementation resources. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/345276, accessed 11 November 2024).
15. Infection prevention and control in primary care: a toolkit of resources. Geneva: World Health Organization; 2021 (https://www.who.int/publications/i/item/9789240037304, accessed 11 November 2024).

16. WHO multimodal improvement strategy. Geneva: World Health Organization; 2021(https://cdn.who.int/media/docs/default-source/integrated-health-services-(ihs)/infection-prevention-and-control/core-components/ipc-cc-mis.pdf?sfvrsn=5e06c3d5_10&download=true, accessed 11 November 2024).
17. Allegranzi B, Aiken AM, Zeynep Kubilay N, Nthumba P, Barasa J, Okumu G et al. A multimodal infection control and patient safety intervention to reduce surgical site infections in Africa: a multicentre, before-after, cohort study. Lancet Infect Dis. 2018;18:507–15. doi: 10.1016/s1473-3099(18)30107-5.
18. Allegranzi B, Gayet-Ageron A, Damani N, Bengaly L, McLaws M-L, Moro M-L et al. Global implementation of WHO's multimodal strategy for improvement of hand hygiene: a quasi-experimental study. Lancet Infect Dis. 2013;13:843-51. doi: 10.1016/S1473-3099(13)70163-4.
19. Luangasanatip N, Hongsuwan M, Limmathurotsakul D, Lubell Y, Lee AS, Harbarth S et al. Comparative efficacy of interventions to promote hand hygiene in hospital: systematic review and network meta-analysis. BMJ. 2015;351:h3728. doi: 10.1136/bmj.h3728.
20. Storr J, Twyman A, Zingg W, Damani N, Kilpatrick C, Reilly J et al. Core components for effective infection prevention and control programmes: new WHO evidence-based recommendations. Antimicrob Resist Infect Control. 2017;6:6. doi: 10.1186/s13756-016-0149-9.
21. Price L, MacDonald J, Melone L, Howe T, Flowers P, Currie K et al. Effectiveness of national and subnational infection prevention and control interventions in high-income and upper-middle-income countries: a systematic review. Lancet Infect Dis. 2018;18:e159-e71. doi: 10.1016/S1473-3099(17)30479-6.
22. Zingg W, Holmes A, Dettenkofer M, Goetting T, Secci F, Clack L et al. Hospital organisation, management, and structure for prevention of health-care-associated infection: a systematic review and expert consensus. Lancet Infect Dis. 2015;15:212-24. doi: 10.1016/s1473-3099(14)70854-0.
23. Price L, Gozdzielewska L, Hendry K, McFarland A, Reilly J. Effectiveness of national and subnational interventions for prevention and control of health-care-associated infections in acute hospitals in high-income and upper-middle-income counties: a systematic review update. Lancet Infect Dis. 2023;23:e347-e60. doi: 10.1016/s1473-3099(23)00049-x.
24. International health regulations (2005), 2nd edition. Geneva: World Health Organization; 2008 (https://apps.who.int/iris/handle/10665/43883, accessed 11 November 2024).
25. WHO policy guidance on integrated antimicrobial stewardship activities. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/341432, accessed 11 November 2024).
26. Stevens GA, Alkema L, Black RE, Boerma JT, Collins GS, Ezzati M et al. Correction: Guidelines for Accurate and Transparent Health Estimates Reporting: the GATHER statement. PLoS Med. 2016;13:e1002116. doi: 10.1371/journal.pmed.1002116.
27. Global patient safety report 2024. Geneva: World Health Organization; 2024 (https://www.who.int/publications/i/item/9789240095458, accessed 11 November 2024).
28. Panagioti M, Khan K, Keers RN, Abuzour A, Phipps D, Kontopantelis E et al. Prevalence, severity, and nature of preventable patient harm across medical care settings: systematic review and meta-analysis. Bmj. 2019;366:l4185. doi: 10.1136/bmj.l4185.
29. National Academies of Sciences, Engineering, and Medicine. Crossing the global quality chasm: Improving health care worldwide. Washington, DC: The National Academies Press; 2018 (https://www.nap.edu/catalog/25152/crossing-the-global-quality-chasm-improving-health-care-worldwide, accessed 7 Nov 2024)
30. Jha AK, Larizgoitia I, Audera-Lopez C, Prasopa-Plaizier N, Waters H, Bates DW. The global burden of unsafe medical care: analytic modelling of observational studies. BMJ Qual Saf. 2013;22:809-15. doi: 10.1136/bmjqs-2012-001748.
31. Aranaz-Andrés JM, Aibar-Remón C, Limón-Ramírez R, Amarilla A, Restrepo FR, Urroz O et al. Prevalence of adverse events in the hospitals of five Latin American countries: results of the 'Iberoamerican Study of Adverse Events' (IBEAS). BMJ Qual Saf. 2011;20:1043-51. doi: 10.1136/bmjqs.2011.051284.

32. Wilson RM, Michel P, Olsen S, Gibberd RW, Vincent C, El-Assady R et al. Patient safety in developing countries: retrospective estimation of scale and nature of harm to patients in hospital. BMJ. 2012;344:e832. doi: 10.1136/bmj.e832.
33. Schwendimann R, Blatter C, Dhaini S, Simon M, Ausserhofer D. The occurrence, types, consequences and preventability of in-hospital adverse events – a scoping review. BMC Health Serv Res. 2018;18:521. doi: 10.1186/s12913-018-3335-z.
34. Biccard BM, Madiba TE, Kluyts HL, Munlemvo DM, Madzimbamuto FD, Basenero A et al. Perioperative patient outcomes in the African Surgical Outcomes Study: a 7-day prospective observational cohort study. Lancet. 2018;391:1589-98. doi: 10.1016/s0140-6736(18)30001-1.
35. Allegranzi B, Bagheri Nejad S, Combescure C, Graafmans W, Attar H, Donaldson L, Pittet D. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. Lancet. 2011;377:228-41. doi: 10.1016/s0140-6736(10)61458-4.
36. World Health Organization. (2011). Report on the burden of endemic health care-associated infection worldwide. Geneva: World Health Organization; 2011 (https://apps.who.int/iris/handle/10665/80135, accessed 11 November 2024).
37. Raoofi S, Pashazadeh Kan F, Rafiei S, Hosseinipalangi Z, Noorani Mejareh Z, Khani S et al. Global prevalence of nosocomial infection: A systematic review and meta-analysis. PLoS One. 2023;18:e0274248. doi: 10.1371/journal.pone.0274248.
38. Healthcare-associated Infections Surveillance Network (HAI-Net). Stockholm: European Centre for Disease Prevention and Control; 2023 (https://www.ecdc.europa.eu/en/about-us/partnerships-and-networks/disease-and-laboratory-networks/hai-net, accessed 07 November 2024).
39. Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals. Stockholm: European Centre for Disease Prevention and Control; 2024 (https://www.ecdc.europa.eu/en/publications-data/PPS-HAI-AMR-acute-care-europe-2022-2023, accessed 11 November 2024).
40. Suetens C, Latour K, Kärki T, Ricchizzi E, Kinross P, Moro ML et al. Prevalence of healthcare-associated infections, estimated incidence and composite antimicrobial resistance index in acute care hospitals and long-term care facilities: results from two European point prevalence surveys, 2016 to 2017. Euro Surveill. 2018;23:1800516. doi: doi: 10.2807/1560-7917.ES.2018.23.46.1800516.
41. Cassini A, Plachouras D, Eckmanns T, Abu Sin M, Blank HP, Ducomble T et al. Burden of six healthcare-associated Infections on European Population Health: Estimating Incidence-Based Disability-Adjusted Life Years through a population prevalence-based modelling study. PLoS Med. 2016;13:e1002150. doi: 10.1371/journal.pmed.1002150.
42. Alothman A, Al Thaqafi A, Al Ansary A, Zikri A, Fayed A, Khamis F et al. Prevalence of infections and antimicrobial use in the acute-care hospital setting in the Middle East: Results from the first point-prevalence survey in the region. Int J Infect Dis. 2020;101:249-58. doi: 10.1016/j.ijid.2020.09.1481.
43. Ling ML, Apisarnthanarak A, Madriaga G. The burden of healthcare-associated infections in Southeast Asia: a systematic literature review and meta-analysis. Clin Infect Dis. 2015;60:1690-9. doi: 10.1093/cid/civ095.
44. Cai Y, Venkatachalam I, Tee NW, Tan TY, Kurup A, Wong SY et al. Prevalence of healthcare-associated infections and antimicrobial use among adult inpatients in Singapore acute-care hospitals: results from the first national point prevalence survey. Clin Infect Dis. 2017;64:S61-s7. doi: 10.1093/cid/cix103.
45. Russo PL, Stewardson AJ, Cheng AC, Bucknall T, Mitchell BG. The prevalence of healthcare associated infections among adult inpatients at nineteen large Australian acute-care public hospitals: a point prevalence survey. Antimicrob Resist Infect Control. 2019;8:114. doi: 10.1186/s13756-019-0570-y.
46. Bunduki GK, Masoamphambe E, Fox T, Musaya J, Musicha P, Feasey N. Prevalence, risk factors, and antimicrobial resistance of endemic healthcare-associated infections in Africa: a systematic review and meta-analysis. BMC Infect Dis. 2024;24:158. doi: 10.1186/s12879-024-09038-0.
47. Magill SS, O'Leary E, Janelle SJ, Thompson DL, Dumyati G, Nadle J et al. Changes in prevalence of

health care-associated infections in U.S. hospitals. N Engl J Med. 2018;379:1732-44. doi: 10.1056/NEJMoa1801550.

48. HAI and antibiotic use prevalence surveys. Atlanta, GA: Centers for Disease Control and Prevention; 2024. (https://www.cdc.gov/healthcare-associated-infections/php/haic-eip/antibiotic-use.html?CDC_AAref_Val, accessed 11 November 2024).
49. Mitchell R, Taylor G, Rudnick W, Alexandre S, Bush K, Forrester L et al. Trends in health care-associated infections in acute care hospitals in Canada: an analysis of repeated point-prevalence surveys. CMAJ. 2019;191:E981-e8. doi: 10.1503/cmaj.190361.
50. Global guidelines for the prevention of surgical site infection, 2nd ed. Geneva: World Health Organization; 2018 (https://apps.who.int/iris/handle/10665/277399, accessed 11 November 2024).
51. van Dillen J, Zwart J, Schutte J, van Roosmalen J. Maternal sepsis: epidemiology, etiology and outcome. Curr Opin Infect Dis. 2010;23:249-54. doi: 10.1097/QCO.0b013e328339257c.
52. Healthcare-associated infections: surgical site infections. In: European Centre for Disease Prevention and Control (ECDC), editor. Annual epidemiological report for 2018-2020. Stockholm: ECDC; 2023 (https://www.ecdc.europa.eu/en/publications-data/healthcare-associated-infections-surgical-site-annual-2018-2020, accessed 11 November 2024).
53. Gillespie BM, Harbeck E, Rattray M, Liang R, Walker R, Latimer S et al. Worldwide incidence of surgical site infections in general surgical patients: a systematic review and meta-analysis of 488,594 patients. Int J Surg. 2021;95:106136. doi: 10.1016/j.ijsu.2021.106136.
54. Mengistu DA, Alemu A, Abdukadir AA, Mohammed Husen A, Ahmed F, Mohammed B, Musa I. Global incidence of surgical site infection among patients: systematic review and meta-analysis. Inquiry. 2023;60:469580231162549. doi: 10.1177/00469580231162549.
55. Maleknejad A, Dastyar N, Badakhsh M, Balouchi A, Rafiemanesh H, Al Rawajfah O et al. Surgical site infections in Eastern Mediterranean region: a systematic review and meta-analysis. Infect Dis (Lond). 2019;51:719-29. doi: 10.1080/23744235.2019.1642513.
56. Curcio D, Cane A, Fernández F, Correa J. Surgical site infection in elective clean and clean-contaminated surgeries in developing countries. Int J Infect Dis. 2019;80:34-45. doi: 10.1016/j.ijid.2018.12.013.
57. Blot S, Ruppé E, Harbarth S, Asehnoune K, Poulakou G, Luyt CE et al. Healthcare-associated infections in adult intensive care unit patients: Changes in epidemiology, diagnosis, prevention and contributions of new technologies. Intensive Crit Care Nurs. 2022;70:103227. doi: 10.1016/j.iccn.2022.103227.
58. Wang J, Liu F, Tartari E, Huang J, Harbarth S, Pittet D, Zingg W. The prevalence of healthcare-associated infections in mainland China: a systematic review and meta-analysis. Infect Control Hosp Epidemiol. 2018;39:701-9. doi: 10.1017/ice.2018.60.
59. Alemu AY, Endalamaw A, Belay DM, Mekonen DK, Birhan BM, Bayih WA. Healthcare-associated infection and its determinants in Ethiopia: A systematic review and meta-analysis. PLoS One. 2020;15:e0241073. doi: 10.1371/journal.pone.0241073.
60. Rosenthal VD, Duszynska W, Ider BE, Gurskis V, Al-Ruzzieh MA, Myatra SN et al. International Nosocomial Infection Control Consortium (INICC) report, data summary of 45 countries for 2013-2018, adult and pediatric units, device-associated module. Am J Infect Control. 2021;49:1267-74. doi: 10.1016/j.ajic.2021.04.077.
61. Annual Epidemiological Report for 2019 – Healthcare-associated infections acquired in intensive care units. In: European Centre for Disease Prevention and Control (ECDC), editor. Annual epidemiological report for 2018. Stockholm: ECDC; 2023 (https://www.ecdc.europa.eu/en/publications-data/healthcare-associated-infections-intensive-care-units-2019, accessed 11 November 2024).
62. Global report on the epidemiology and burden of sepsis: current evidence, identifying gaps and future directions. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/334216, accessed 11 November 2024).
63. Markwart R, Saito H, Harder T, Tomczyk S, Cassini A, Fleischmann-Struzek C et al. Epidemiology

and burden of sepsis acquired in hospitals and intensive care units: a systematic review and meta-analysis. Intensive Care Med. 2020;46:1536-51. doi: 10.1007/s00134-020-06106-2.

64. Zaidi AK, Huskins WC, Thaver D, Bhutta ZA, Abbas Z, Goldmann DA. Hospital-acquired neonatal infections in developing countries. Lancet. 2005;365:1175-88. doi: 10.1016/s0140-6736(05)71881-x.
65. Balasubramanian R, Van Boeckel TP, Carmeli Y, Cosgrove S, Laxminarayan R. Global incidence in hospital-associated infections resistant to antibiotics: An analysis of point prevalence surveys from 99 countries. PLoS Med. 2023;20:e1004178. doi: 10.1371/journal.pmed.1004178.
66. Adeolu M, Alnajar S, Naushad S, Gupta RS. Genome-based phylogeny and taxonomy of the 'Enterobacteriales': proposal for Enterobacterales ord. nov. divided into the families Enterobacteriaceae, Erwiniaceae fam. nov., Pectobacteriaceae fam. nov., Yersiniaceae fam. nov., Hafniaceae fam. nov., Morganellaceae fam. nov., and Budviciaceae fam. nov. Int J Syst Evol Microbiol. 2016;66:5575-99. doi: 10.1099/ijsem.0.001485.
67. Allegranzi B, Damani N, Gayet-Ageron A, Stewardson A, Wallace S, Pittet D. World Health Organization period prevalence survey on multidrug-resistant microorganisms in healthcare. 27th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), Vienna, Austria, 22-25 April 2017. E-poster no. EP049.
68. Rosenthal VD, Al-Abdely HM, El-Kholy AA, AlKhawaja SAA, Leblebicioglu H, Mehta Y et al. International Nosocomial Infection Control Consortium report, data summary of 50 countries for 2010-2015: Device-associated module. Am J Infect Control. 2016;44:1495-504. doi: 10.1016/j.ajic.2016.08.007.
69. Global antimicrobial resistance and use surveillance system (GLASS). GLASS global AMR data dashboard. Geneva: World Health Organization; 2024 (https://worldhealthorg.shinyapps.io/glass-dashboard/_w_02581937/#!/amr, accessed 11 November 2024).
70. Antimicrobial resistance surveillance in Europe 2023 - 2021 data. Stockholm: European Centre for Disease Prevention and Control and World Health Organization; 2023 (https://www.ecdc.europa.eu/en/publications-data/antimicrobial-resistance-surveillance-europe-2023-2021-data, accessed 11 November 2024).
71. Antimicrobial resistance in the EU/EEA (EARS-Net). Annual epidemiological report 2022. Stockholm: European Centre for Disease Prevention and Control; 2023 (https://www.ecdc.europa.eu/en/publications-data/surveillance-antimicrobial-resistance-europe-2022, accessed 11 November 2024).
72. Araos R, Smith RM, Styczynski A, Sánchez F, Acevedo J, Maureira L et al. High burden of intestinal colonization with antimicrobial-resistant bacteria in Chile: an Antibiotic Resistance in Communities and Hospitals (ARCH) study. Clin Infect Dis. 2023;77:S75-S81. doi: 10.1093/cid/ciad283.
73. Ramay BM, Castillo C, Grajeda L, Santos LF, Romero JC, Lopez MR et al. Colonization with antibiotic-resistant bacteria in a hospital and associated communities in Guatemala: an Antibiotic Resistance in Communities and Hospitals (ARCH) Study. Clin Infect Dis. 2023;77:S82-S8. doi: 10.1093/cid/ciad222.
74. Lautenbach E, Mosepele M, Smith RM, Styczynski A, Gross R, Cressman L et al. Risk factors for community colonization with extended-spectrum cephalosporin-resistant Enterobacterales (ESCrE) in Botswana: an Antibiotic Resistance in Communities and Hospitals (ARCH) Study. Clin Infect Dis. 2023;77:S89-S96. doi: 10.1093/cid/ciad259.
75. Omulo S, Ita T, Mugoh R, Ayodo C, Luvsansharav U, Bollinger S et al. Risk factors for colonization with extended-spectrum cephalosporin-resistant and carbapenem-resistant Enterobacterales among hospitalized patients in Kenya: an Antibiotic Resistance in Communities and Hospitals (ARCH) Study. Clin Infect Dis. 2023;77:S97-S103. doi: 10.1093/cid/ciad258.
76. Chowdhury F, Mah-E-Muneer S, Bollinger S, Sharma A, Ahmed D, Hossain K et al. Prevalence of colonization with antibiotic-resistant organisms in hospitalized and community individuals in Bangladesh, a phenotypic analysis: findings from the Antibiotic Resistance in Communities and Hospitals (ARCH) Study. Clin Infect Dis. 2023;77:S118-S24. doi: 10.1093/cid/ciad254.
77. Kumar CPG, Bhatnagar T, Sathya Narayanan G, Swathi SS, Sindhuja V, Siromany VA et al. High-level colonization with antibiotic-resistant Enterobacterales among individuals in a semi-urban setting in South India: an Antibiotic Resistance in Communities and Hospitals (ARCH) Study. Clin Infect Dis.

2023;77:S111-S7. doi: 10.1093/cid/ciad220.

78. WHO Regional Office for Europe and European Centre for Disease Prevention and Control. Surveillance of antimicrobial resistance in Europe, 2020 data. Executive summary. Copenhagen: WHO Regional Office for Europe; 2021 (https://www.ecdc.europa.eu/en/publications-data/surveillance-antimicrobial-resistance-europe-2020, accessed 11 November 2024).
79. Antimicrobial resistance in the EU/EEA (EARS-Net). Annual epidemiological report 2021. Stockholm: European Centre for Disease Prevention and Control; 2022 (https://www.ecdc.europa.eu/en/publications-data/surveillance-antimicrobial-resistance-europe-2021, accessed 11 November 2024).
80. Candida auris. Atlanta, GA: Centers for Disease Control and Prevention; 2024 (https://www.cdc.gov/candida-auris/tracking-c-auris/index.html, accessed 11 November 2024).
81. Candida auris outbreak in healthcare in northern Italy, 2019-2021. Stockholm: European Centre for Disease Prevention and Control; 2022 (https://www.ecdc.europa.eu/sites/default/files/documents/RRA-candida-auris-Feb2022.pdf, accessed 11 November 2024).
82. Kohlenberg A, Monnet DL, Plachouras D. Increasing number of cases and outbreaks caused by Candida auris in the EU/EEA, 2020 to 2021. Euro Surveill. 2022;27. doi: 10.2807/1560-7917.Es.2022.27.46.2200846.
83. Canadian Nosocomial Surveillance Program. Healthcare-associated infections and antimicrobial resistance in Canadian acute care hospitals, 2017-2021. Can Commun Dis Rep. 2023;49:235-52. doi: 10.14745/ccdr.v49i05a09.
84. Thomsen J, Abdulrazzaq NM, Oulhaj A, Nyasulu PS, Alatoom A, Denning DW et al. Emergence of highly resistant Candida auris in the United Arab Emirates: a retrospective analysis of evolving national trends. Front Public Health. 2023;11:1244358. doi: 10.3389/fpubh.2023.1244358.
85. 2020 National and State Healthcare-Associated Infections (HAI) Progress Report 2021. Atlanta, GA: Centers for Disease Control and Prevention; 2021 (https://arpsp.cdc.gov/profile/national-progress/united-states, accessed 11 November 2024).
86. National and State Healthcare-Associated Infections (HAI) Progress Report 2022. Atlanta, GA: Centers for Disease Control and Prevention (https://archive.cdc.gov/www_cdc_gov/healthcare-associated-infections/php/data/progress-report.html, accessed 11 November 2024).
87. Zhu NJ, Rawson TM, Mookerjee S, Price JR, Davies F, Otter J et al. Changing patterns of bloodstream infections in the community and acute care across 2 coronavirus disease 2019 epidemic waves: a retrospective analysis using data linkage. Clin Infect Dis. 2022; e1082-e91. doi: 10.1093/cid/ciab869.
88. Buetti N, Ruckly S, de Montmollin E, Reignier J, Terzi N, Cohen Y et al. COVID-19 increased the risk of ICU-acquired bloodstream infections: a case-cohort study from the multicentric OUTCOMEREA network. Intensive Care Med. 2021;47:180-7. doi: 10.1007/s00134-021-06346-w.
89. Grasselli G, Scaravilli V, Mangioni D, Scudeller L, Alagna L, Bartoletti M et al. Hospital-acquired infections in critically ill patients with COVID-19. Chest. 2021;160:454-65. doi: 10.1016/j.chest.2021.04.002.
90. Epidemiological Alert: Emergence and increase of new combinations of carbapenemases in Enterobacterales in Latin America and the Caribbean - 22 October 2021. Washington, DC: Pan American Health Organization/World Health Organization; 2021 (https://www.paho.org/en/documents/epidemiological-alert-emergence-and-increase-new-combinations-carbapenemases, accessed 11 November 2024).
91. Kariyawasam RM, Julien DA, Jelinski DC, Larose SL, Rennert-May E, Conly JM et al. Antimicrobial resistance (AMR) in COVID-19 patients: a systematic review and meta-analysis (November 2019–June 2021). Antimicrob Resist Infect Control. 2022;11:45. doi: 10.1186/s13756-022-01085-z.
92. Kinross P, Gagliotti C, Merk H, Plachouras D, Monnet DL, Högberg LD. Large increase in bloodstream infections with carbapenem-resistant Acinetobacter species during the first 2 years of the COVID-19 pandemic, EU/EEA, 2020 and 2021. Euro Surveill. 2022;27. doi: 10.2807/1560-7917.Es.2022.27.46.2200845.
93. Infection prevention and control during health care when coronavirus disease (COVID-19)is

suspected or confirmed: interim guidance, 12 July 2021. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/342620, accessed 11 November 2024).

94. Scientific Advisory Group for Emergencies. Public Health England and London School of Hygiene and Tropical Medicine The contribution of nosocomial infections to the first wave. London: Public Health England; 28 January 2021 (https://www.gov.uk/government/publications/phe-and-lshtm-the-contribution-of-nosocomial-infections-to-the-first-wave-28-january-2021, accessed 11 November 2024).
95. Abbas M, Zhu NJ, Mookerjee S, Bolt F, Otter JA, Holmes AH, Price JR. Hospital-onset COVID-19 infection surveillance systems: a systematic review. J Hosp Infect. 2021;115:44-50. doi: 10.1016/j.jhin.2021.05.016.
96. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. JAMA. 2020;323:1061-9. doi: 10.1001/jama.2020.1585.
97. Carter B, Collins JT, Barlow-Pay F, Rickard F, Bruce E, Verduri A et al. Nosocomial COVID-19 infection: examining the risk of mortality. The COPE-Nosocomial Study (COVID in Older PEople). J Hosp Infect. 2020;106:376-84. doi: 10.1016/j.jhin.2020.07.013.
98. Bhattacharya A, Collin SM, Stimson J, Thelwall S, Nsonwu O, Gerver S et al. Healthcare-associated COVID-19 in England: A national data linkage study. J Infect. 2021;83:565-72. doi: 10.1016/j.jinf.2021.08.039.
99. Chou R, Dana T, Buckley DI, Selph S, Fu R, Totten AM. Update Alert 11: Epidemiology of and risk factors for coronavirus infection in health care workers. Ann Intern Med. 2022;175:W83-w4. doi: 10.7326/l22-0235.
100. Zhu N, Whitfield MG, Price JR, Holmes A. Hospital-onset COVID-19 infection surveillance systems: an updated systematic review (October 09, 2024) (http://dx.doi.org/10.2139/ssrn.4981490, accessed 11 November 2024).
101. The impact of COVID-19 on health and care workers: a closer look at deaths. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/345300, accessed 11 November 2024).
102. Cassini A, Yin M, Simniceanu A, Gon G, Cowling BJ, Allegranzi B et al. Infection prevention and control risk factors for SARS-CoV-2 infection in health workers: a global, multicentre case-control study. J Hosp Infect. 2024. doi: 10.1016/j.jhin.2024.04.031.
103. Okeke IN, de Kraker MEA, Van Boeckel TP, Kumar CK, Schmitt H, Gales AC et al. The scope of the antimicrobial resistance challenge. Lancet. 2024;403:2426-38. doi: 10.1016/s0140-6736(24)00876-6.
104. Murray CJL, Ikuta KS, Sharara F, Swetschinski L, Robles Aguilar G, Gray A et al. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. Lancet. 2022;399:629-55. doi: 10.1016/S0140-6736(21)02724-0.
105. Antimicrobial resistance – Tackling the burden in the European Union. Briefing note for EU/EEA countries. Organisation for Economic Co-operation and Development (OECD) and European Centre for Disease Prevention and Control (ECDC), 2019 (https://www.oecd.org/en/publications/antimicrobial-resistance-tackling-the-burden-in-the-european-union_33cbfc1c-en.html, accessed 11 November 2024).
106. Cassini A, Högberg LD, Plachouras D, Quattrocchi A, Hoxha A, Simonsen GS et al. Attributable deaths and disability-adjusted life-years caused by infections with antibiotic-resistant bacteria in the EU and the European Economic Area in 2015: a population-level modelling analysis. Lancet Infect Dis. 2019;19:56-66. doi: 10.1016/s1473-3099(18)30605-4.
107. Rosenthal VD, Jin Z, Rodrigues C, Myatra SN, Divatia JV, Biswas SK et al. Risk factors for mortality over 18 years in 317 ICUs in 9 Asian countries: The impact of healthcare-associated infections. Infect Control Hosp Epidemiol. 2023;44:1261-6. doi: 10.1017/ice.2022.245.
108. Lewnard JA, Charani E, Gleason A, Hsu LY, Khan WA, Karkey A et al. Burden of bacterial antimicrobial resistance in low-income and middle-income countries avertible by existing interventions: an evidence review and modelling analysis. Lancet. 2024;403:2439-54. doi: 10.1016/s0140-

6736(24)00862-6.

109. Voicing African Priorities on the Active Pandemic: African Union AMR Landmark Report. Addis Ababa: Africa Centres for Disease Control and Prevention; 2024 (https://africacdc.org/download/african-union-amr-landmark-report-voicing-african-priorities-on-the-active-pandemic/, accessed 7 November 2024).
110. Assessing the health burden of infections with antibiotic-resistant bacteria in the EU/EEA, 2016-2020. Stockholm: European Centre for Disease Prevention and Control; 2022 (https://www.ecdc.europa.eu/en/publications-data/health-burden-infections-antibiotic-resistant-bacteria-2016-2020, accessed 11 November 2024).
111. Antimicrobial Resistance Collaborators. The burden of bacterial antimicrobial resistance in the WHO African region in 2019: a cross-country systematic analysis. Lancet Glob Health. 2024;12:e201-e16. doi: 10.1016/s2214-109x(23)00539-9.
112. European Antimicrobial Resistance Collaborators. The burden of bacterial antimicrobial resistance in the WHO European region in 2019: a cross-country systematic analysis. Lancet Public Health. 2022;7:e897-e913. doi: 10.1016/s2468-2667(22)00225-0.
113. Antimicrobial resistance: global report on surveillance. Geneva: World Health Organization; 2014 (https://apps.who.int/iris/handle/10665/112642, accessed 11 November 2024).
114. Lemos EV, de la Hoz FP, Einarson TR, McGhan WF, Quevedo E, Castañeda C, Kawai K. Carbapenem resistance and mortality in patients with Acinetobacter baumannii infection: systematic review and meta-analysis. Clin Microbiol Infect. 2014;20:416-23. doi: 10.1111/1469-0691.12363.
115. Stewardson AJ, Marimuthu K, Sengupta S, Allignol A, El-Bouseary M, Carvalho MJ et al. Effect of carbapenem resistance on outcomes of bloodstream infection caused by Enterobacteriaceae in low-income and middle-income countries (PANORAMA): a multinational prospective cohort study. Lancet Infect Dis. 2019;19:601-10. doi: 10.1016/s1473-3099(18)30792-8.
116. Zhang Y, Chen XL, Huang AW, Liu SL, Liu WJ, Zhang N, Lu XZ. Mortality attributable to carbapenem-resistant Pseudomonas aeruginosa bacteremia: a meta-analysis of cohort studies. Emerg Microbes Infect. 2016;5:e27. doi: 10.1038/emi.2016.22.
117. Rapid risk assessment: Carbapenem-resistant Enterobacteriaceae – 8 April 2016. Stockholm: European Centre for Disease Prevention and Control; 2016 (https://www.ecdc.europa.eu/en/publications-data/rapid-risk-assessment-carbapenem-resistant-enterobacteriaceae-14-april-2016, accessed 11 November 2024).
118. International Health Regulations (2005): IHR monitoring and evaluation framework. Geneva: World Health Organization; 2018 (https://apps.who.int/iris/handle/10665/276651, accessed 11 November 2024).
119. International health regulations (2005): State Party Self-assessment annual reporting tool, 2nd edition. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/350218; https://extranet.who.int/e-spar/, accessed 11 November 2024).
120. Joint external evaluation tool: International Health Regulations (2005)third edition. Geneva: World Health Organization; 2022 (https://www.who.int/publications/i/item/9789240051980, accessed 11 November 2024).
121. Tartari E, Tomczyk S, Pires D, Zayed B, Coutinho Rehse AP, Kariyo P et al. Implementation of the infection prevention and control core components at the national level: a global situational analysis. J Hosp Infect. 2021;108:94-103. doi: 10.1016/j.jhin.2020.11.025.
122. International Health Regulations Monitoring and Evaluation Framework. Joint External Evaluations, Mission Reports. Geneva: World Health Organization; 2024 (https://www.who.int/emergencies/operations/international-health-regulations-monitoring-evaluation-framework/joint-external-evaluations, accessed 11 November 2024).
123. Electronic IHR States Parties Self-assessment annual reporting tool. Geneva: World Health Organization; 2024 (https://extranet.who.int/e-spar/, accessed 08 November 2024).
124. Food and Agriculture Organization (FAO), United Nations Environment Programme (UNEP), World

Health Organization (WHO), World Organisation for Animal Health (WOAH). Global Database for the Tracking Antimicrobial Resistance (AMR) Country Self-assessment Survey (TrACSS). Geneva: World Health Organization; 2024 (http://amrcountryprogress.org/, accessed 11 November 2024).

125. Global IPC Portal. Geneva: World Health Organization; 2024 (https://ipcportal.who.int/, accessed 11 November 2024).
126. Global strategy on infection prevention and control. Geneva: World Health Organization; 2023 (https://www.who.int/publications/i/item/9789240080515, accessed 11 November 2024).
127. Tartari E, Tomczyk S, Twyman A, Rehse APC, Gomaa M, Talaat M et al. Evaluating national infection prevention and control minimum requirements: evidence from global cross-sectional surveys, 2017-22. Lancet Global Health. 2024;12:e1620-e8. doi: 10.1016/S2214-109X(24)00277-8.
128. Tomczyk S, Twyman A, de Kraker MEA, Coutinho Rehse AP, Tartari E, Toledo JP et al. The first WHO global survey on infection prevention and control in health-care facilities. Lancet Infect Dis. 2022;22:845-56. doi: 10.1016/S1473-3099(21)00809-4.
129. Savul S, Lalani FK, Ikram A, Khan MA, Khan MA, Ansari J. Infection prevention and control situation in public hospitals of Islamabad. J Infect Dev Ctries. 2020;14:1040-6. doi: 10.3855/jidc.12779.
130. Wood R, Tembele W, Hema A, Somé A, Kinganda-Lusamaki E, Basilubo C et al. Implementation of the WHO core components of an infection prevention and control programme in two sub-saharan African acute health-care facilities: a mixed methods study. Antimicrob Resist Infect Control. 2024;13:4. doi: 10.1186/s13756-023-01358-1.
131. Ni K, Jin D, Wu Z, Sun L, Lu Q. The status of infection prevention and control structures in Eastern China based on the IPCAF tool of the World Health Organization. Antimicrob Resist Infect Control. 2022;11:46. doi: 10.1186/s13756-022-01087-x.
132. Ehsan A, Ehsan F, Hanif H. Infection control practices in public sector hospitals of Punjab: a critical analysis. BMJ Open Qual. 2024;13. doi: 10.1136/bmjoq-2023-002380.
133. Katoch O, Katyal S, Srivastav S, Rodrigues C, Rupali P, Chakrabarti A et al. Self-reported survey on infection prevention and control structures in healthcare facilities part of a national level healthcare associated infection surveillance network in India, 2019. Am J Infect Control. 2022;50:390-5. doi: 10.1016/j.ajic.2021.09.019.
134. Aghdassi SJS, Hansen S, Bischoff P, Behnke M, Gastmeier P. A national survey on the implementation of key infection prevention and control structures in German hospitals: results from 736 hospitals conducting the WHO Infection Prevention and Control Assessment Framework (IPCAF). Antimicrob Resist Infect Control. 2019;8:73. doi: 10.1186/s13756-019-0532-4.
135. Aghdassi SJS, Grisold A, Wechsler-Fördös A, Hansen S, Bischoff P, Behnke M, Gastmeier P. Evaluating infection prevention and control programs in Austrian acute care hospitals using the WHO Infection Prevention and Control Assessment Framework. Antimicrob Resist Infect Control. 2020;9:92. doi: 10.1186/s13756-020-00761-2.
136. Azak E, Sertcelik A, Ersoz G, Celebi G, Eser F, Batirel A et al. Evaluation of the implementation of WHO infection prevention and control core components in Turkish health care facilities: results from a WHO infection prevention and control assessment framework (IPCAF)-based survey. Antimicrob Resist Infect Control. 2023;12:11. doi: 10.1186/s13756-023-01208-0.
137. Supriadi IR, Haanappel CP, Saptawati L, Widodo NH, Sitohang G, Usman Y et al. Infection prevention and control in Indonesian hospitals: identification of strengths, gaps, and challenges. Antimicrob Resist Infect Control. 2023;12:6. doi: 10.1186/s13756-023-01211-5.
138. Nomoto H, Saito H, Ishikane M, Gu Y, Ohmagari N, Pittet D et al. First nationwide survey of infection prevention and control among healthcare facilities in Japan: impact of the national regulatory system. Antimicrob Resist Infect Control. 2022;11:135. doi: 10.1186/s13756-022-01175-y.
139. Fofanah BD, Abrahamyan A, Maruta A, Kallon C, Thekkur P, Kamara IF et al. Achieving Minimum standards for infection prevention and control in Sierra Leone: urgent need for a quantum leap in progress in the COVID-19 era! Int J Environ Res Public Health. 2022;19. doi: 10.3390/ijerph19095642.
140. Ahmed A, Hossain L, Banik G, Sayeed A, Sajib MRU, Hasan MM et al. Measuring the effectiveness of an

integrated intervention package to improve the level of infection prevention and control: a multi-centre study in Bangladesh. J Hosp Infect. 2024;145:22-33. doi: 10.1016/j.jhin.2023.11.023.

141. Rüther FD, Gropmann A, Hansen S, Behnke M, Geffers C, Aghdassi SJS. Assessing infection prevention and control structures in German hospitals after the COVID-19 pandemic using the WHO infection prevention and control assessment framework (IPCAF): results from 660 hospitals and comparison with a pre-pandemic survey. Antimicrob Resist Infect Control. 2024;13:103. doi: 10.1186/s13756-024-01465-7.
142. Harun MGD, Anwar MMU, Sumon SA, Hassan MZ, Haque T, Mah EMS et al. Infection prevention and control in tertiary care hospitals of Bangladesh: results from WHO infection prevention and control assessment framework (IPCAF). Antimicrob Resist Infect Control. 2022;11:125. doi: 10.1186/s13756-022-01161-4.
143. Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the national level. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/345251, accessed 11 November 2024).
144. Water and Sanitation for Health Facility Improvement Tool (WASH FIT): a practical guide for improving quality of care through water, sanitation and hygiene in health care facilities, second edition. Geneva: World Health Organization; 2022 (https://www.who.int/publications/i/item/9789240043237, accessed 07 November 2024).
145. Second round of the national pulse survey on continuity of essential health services during the COVID-19 pandemic: January-March 2021: interim report, 22 April 2021. Geneva: World Health Organization; 2021 (https://apps.who.int/iris/handle/10665/340937, accessed 11 November 2024).
146. Pulse survey on continuity of essential health services during the COVID-19 pandemic: interim report, 27 August 2020. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/334048, accessed 11 November 2024).
147. Fourth round of the global pulse survey on continuity of essential health services during the COVID-19 pandemic: November 2022–January 2023: interim report, 1 May 2023. Geneva: World Health Organization; 2023 (https://iris.who.int/handle/10665/367352, accessed 11 November 2024).
148. Third round of the global pulse survey on continuity of essential health services during the COVID-19 pandemic: November–December 2021: interim report, 7 February 2022. Geneva: World Health Organization; 2022 (https://iris.who.int/handle/10665/351527, accessed 11 November 2024).
149. Rivas-Morello B, Horemans D, Viswanathan K, Taylor C, Blanchard A, Karamagi H et al. Assessing capacities and resilience of health services during the COVID-19 pandemic: Lessons learned from use of rapid key informant surveys. Front Public Health. 2023;11:1102507. doi: 10.3389/fpubh.2023.1102507.
150. WHO/United Nations Children's Fund (UNICEF) Joint Monitoring Programme (JMP) global data on Water Supply, Sanitation and Hygiene (WASH). Geneva: World Health Organization; 2022 (https://washdata.org/, accessed 11 November 2024).
151. WHO/UNICEF country tracker on Water Supply, Sanitation and Hygiene (WASH). Geneva: World Health Organization; 2024 (https://washinhcf.org/country-progress-tracker/, data as of April 2023; accessed 11 November 2024).
152. UN Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) - 2021/2022 cycle. Geneva: World Health Organization; 2022 (https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/monitoring-and-evidence/wash-systems-monitoring/un-water-global-analysis-and-assessment-of-sanitation-and-drinking-water/2021-2022-cycle, accessed 11 November 2024).
153. WASH in health care facilities 2023 data update: special focus on primary health care. Geneva: World Health Organization and UNICEF; 2024 (https://washdata.org/reports/jmp-2024-wash-hcf, accessed 07 November 2024).
154. Chaitkin M, McCormick S, Torreano J, Amongin I, Gaya S, Hanssen O et al. Estimating the cost of achieving universal basic water, sanitation, hygiene, and waste management services in public

health-care facilities in the 46 least-developed countries: a modelling study. Lancet Glob Health. 2022;10:e840-e49. doi: 10.1016/S2214-109X(22)00099-7.

155. Clancy C, Delungahawatta T, Dunne CP. Hand-hygiene-related clinical trials reported between 2014 and 2020: a comprehensive systematic review. J Hosp Infect. 2021;111:6-26. doi: 10.1016/j.jhin.2021.03.007.
156. Sickbert-Bennett EE, DiBiase LM, Willis TM, Wolak ES, Weber DJ, Rutala WA. Reduction of healthcare-associated infections by exceeding high compliance with hand hygiene practices. Emerg Infect Dis. 2016;22:1628-30. doi: 10.3201/eid2209.151440.
157. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009 (https://apps.who.int/iris/handle/10665/44102, accessed 11 November 2024).
158. Evidence of hand hygiene as the building block for infection prevention and control: an extract from the systematic literature reviews undertaken as the background for the WHO guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. Geneva: World Health Organization; 2017 (https://apps.who.int/iris/handle/10665/330079, accessed 11 November 2024).
159. Lotfinejad N, Peters A, Tartari E, Fankhauser-Rodriguez C, Pires D, Pittet D. Hand hygiene in health care: 20 years of ongoing advances and perspectives. Lancet Infect Dis. 2021;21:e209-e21. doi: 10.1016/S1473-3099(21)00383-2.
160. Lambe KA, Lydon S, Madden C, Vellinga A, Hehir A, Walsh M, et al. Hand hygiene compliance in the ICU: a systematic review. Crit Care Med. 2019;47:1251-7. doi: 10.1097/ccm.0000000000003868.
161. Erasmus V, Daha TJ, Brug H, Richardus JH, Behrendt MD, Vos MC, van Beeck EF. Systematic review of studies on compliance with hand hygiene guidelines in hospital care. Infect Control Hosp Epidemiol. 2010;31:283-94. doi: 10.1086/650451.
162. Hand Hygiene Moment 1 - Global Observation Survey. Geneva: World Health Organization; 2010. (https://cdn.who.int/media/docs/default-source/integrated-health-services-(ihs)/infection-prevention-and-control/ps-moment1-results-2010-en.pdf?sfvrsn=332e558f_2, accessed 11 November 2024).
163. Kilpatrick C, Tartari E, Gayet-Ageron A, Storr J, Tomczyk S, Allegranzi B et al. Global hand hygiene improvement progress: two surveys using the WHO Hand Hygiene Self-Assessment Framework. J Hosp Infect. 2018;100:202-6. doi: 10.1016/j.jhin.2018.07.036.
164. de Kraker MEA, Tartari E, Tomczyk S, Twyman A, Francioli L, Cassini A et al. Implementation of hand hygiene in health-care facilities: results from the WHO Hand Hygiene Self-Assessment Framework global survey 2019. Lancet Infect Dis. 2022; 22: 835-44. doi: 10.1016/S1473-3099(21)00618-6.
165. Stewardson AJ, Allegranzi B, Perneger TV, Attar H, Pittet D. Testing the WHO Hand Hygiene Self-Assessment Framework for usability and reliability. J Hosp Infect. 2013;83:30-5. doi: 10.1016/j.jhin.2012.05.017.
166. Hand Hygiene Self-Assessment Framework. Geneva: World Health Organization; 2010 (https://cdn.who.int/media/docs/default-source/integrated-health-services-(ihs)/hand-hygiene/monitoring/hhsa-framework-october-2010.pdf?sfvrsn=41ba0450_6, accessed 11 November 2024).
167. World Health Organization and UNICEF. Global progress report on water, sanitation and hygiene in health care facilities: fundamentals first. Geneva: World Health Organization; 2020 (https://apps.who.int/iris/handle/10665/337604, accessed 11 November 2024).
168. Progress on WASH in health care facilities 2000–2021: special focus on WASH and infection prevention and control. Geneva: World Health Organization and UNICEF; 2023. (https://www.who.int/publications/i/item/9789240058699, accessed 11 November 2024).
169. Lakoh S, Maruta A, Kallon C, Deen GF, Russell JBW, Fofanah BD et al. How well are hand hygiene practices and promotion implemented in Sierra Leone? A cross-sectional study in 13 public hospitals. Int J Environ Res Public Health. 2022;19. doi: 10.3390/ijerph19073787.
170. Choe PG, Lim J, Kim EJ, Kim JH, Shin MJ, Kim SR et al. Impact of national policy on hand hygiene promotion activities in hospitals in Korea. Antimicrob Resist Infect Control. 2020;9:157. doi: 10.1186/

s13756-020-00817-3.

171. Suzuki Y, Morino M, Morita I, Yamamoto S. The effect of a 5-year hand hygiene initiative based on the WHO multimodal hand hygiene improvement strategy: an interrupted time-series study. Antimicrob Resist Infect Control. 2020;9:75. doi: 10.1186/s13756-020-00732-7.
172. Brink AJ, Messina AP, Maslo C, Swart K, Chunnilall D, van den Bergh D. Implementing a multi-faceted framework for proprietorship of hand hygiene compliance in a network of South African hospitals: leveraging the Ubuntu philosophy. J Hosp Infect. 2020;104:404-13. doi: 10.1016/j.jhin.2019.11.004.
173. An B, Yang SJ. The evaluation of a multimodal hand hygiene improvement strategy in Cambodian hospitals. J Infect Dev Ctries. 2020;14:1047-53. doi: 10.3855/jidc.13090.
174. Infection Prevention and Control (IPC) Legal Framework, Background and Annotations. Addis Ababa: Africa Centres Of Diseases Control And Prevention; 2023 (https://africacdc.org/download/infection-prevention-and-control-ipc-legal-framework-background-and-annotations/, accessed 11 November 2024).
175. Respiratory protection program for healthcare workers. Washington, DC: Pan American Health Organization (PAHO); 2022 (https://iris.paho.org/handle/10665.2/56986, accessed 07 November 2024)
176. Infection prevention and control in health care: time for collaborative action. Cairo: WHO Regional Office for the Eastern Mediterranean; 2010 (https://apps.who.int/iris/handle/10665/122923, accessed 11 November 2024).
177. Antimicrobial resistance in the Eastern Mediterranean Region. Cairo: World Health Organization. Regional Office for the Eastern Mediterranean; 2017 (https://apps.who.int/iris/handle/10665/259648, accessed 11 November 2024).
178. Promoting collaborative action to accelerate the response to antimicrobial resistance in the Eastern Mediterranean Region. Cairo: World Health Organization, Regional Office for the Eastern Mediterranean; 2024 (https://applications.emro.who.int/docs/TP-AMR-eng.pdf?ua=1, accessed 11 November 2024)
179. Sixty-first Regional Committee for Europe: Baku, 12–15 September 2011: European strategic action plan on antibiotic resistance. Copenhagen: World Health Organization. Regional Office for Europe; 2011 (https://iris.who.int/handle/10665/335840, accessed 11 November 2024).
180. Seventy-third Regional Committee for Europe: Astana, 24–26 October 2023: Roadmap on antimicrobial resistance for the WHO European Region 2023–2030. Copenhagen: World Health Organization. Regional Office for Europe; 2023 (https://iris.who.int/bitstream/handle/10665/372503/73wd07e-AMR-Roadmap-230574.pdf?sequence=5, accessed 11 November 2024).
181. A European One Health action plan against antimicrobial resistance. Brussels: European Commission; 2023, (https://health.ec.europa.eu/document/download/353f40d1-f114-4c41-9755-c7e3f1da5378_en?filename=amr_2017_action-plan.pdf, accessed 11 November 2024).
182. European Union. Council Recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health approach 2023/C 220/01. Document 32023H0622(01). Official J Europ Union. 2023 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023H0622(01), accessed 11 November 2024).
183. Seventieth Regional Committee for Europe: virtual session, 14–15 September 2020: final report on implementation of the European Strategic Action Plan on Antibiotic Resistance. Copenhagen: World Health Organization. Regional Office for Europe; 2020 (https://apps.who.int/iris/handle/10665/333448, accessed 11 November 2024).
184. Seventy-third Regional Committee for Europe: Astana, 24–26 October 2023: Decision: Roadmap on antimicrobial resistance for the WHO European Region 2023–2030. Copenhagen: World Health Organization. Regional Office for Europe; 2023 (https://iris.who.int/handle/10665/373749, accessed 11 November 2024).
185. Infection prevention and control systems in six priority countries in the Western Pacific Region, regional report 2023. Manila: World Health Organization. Regional Office for the Western Pacific; 2023

(https://www.who.int/westernpacific/health-topics/infection-prevention-and-control#tab=tab_1, accessed 11 November 2024).

186. Surveillance of health care-associated infections at national and facility levels: practical handbook. Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/379248, accessed 11 November 2024).
187. Allegranzi B, Kilpatrick C, Storr J, Kelley E, Park BJ, Donaldson L. Global infection prevention and control priorities 2018-22: a call for action. Lancet Glob Health. 2017;5:e1178-e80. doi: 10.1016/s2214-109x(17)30427-8.
188. Revised draft of the negotiating text of the WHO Pandemic Agreement, 13 March 2024. Geneva: World Health Organization; 2024 (https://apps.who.int/gb/inb/pdf_files/inb9/A_inb9_3-en.pdf, accessed 11 November 2024).
189. Seventy-ninth United Nations General Assembly. 22–23 September 2024. Political Declaration of the High-level Meeting on Antimicrobial Resistance. New York; United Nations; 2024 (https://www.un.org/pga/wp-content/uploads/sites/108/2024/09/FINAL-Text-AMR-to-PGA.pdf, accessed 11 November 2024).
190. Universal water, sanitation, hygiene, waste and electricity services in all health care facilities to achieve quality care: global framework for action 2024–2030. Geneva: World Health Organization and UNICEF; 2024 (https://www.washinhcf.org/wp-content/uploads/2024/05/Global-framework-2024-2030.pdf, accessed 11 November 2024).
191. Water, sanitation, hygiene, waste and electricity services in health care facilities: progress on the fundamentals. Geneva: 2023 global report. Geneva: World Health Organization and UNICEF; 2023 (https://iris.who.int/handle/10665/368975, accessed 11 November 2024).
192. Country stories on infection prevention and control. Geneva: World Health Organization; 2024 (https://www.who.int/teams/integrated-health-services/infection-prevention-control/country-stories, accessed 7 Nov 2024).
193. Transforming our world: the 2030 agenda for sustainable development. New York: United Nations; 2022 (https://sdgs.un.org/publications/transforming-our-world-2030-agenda-sustainable-development-17981, accessed 11 November 2024).

Portrait of a paediatric doctor in a hospital in Yerevan, Armenia. © WHO / Nazik Armenakyan

Annex 1.

WHO Recommendations and minimum requirements for the core components of IPC programmes, at national and health care facility level

Annex 1

WHO Recommendations and minimum requirements for the core components of IPC programmes, at national and health care facility level

Table A1. Recommendations and minimum requirements for the core components of IPC programmes, at national and health care facility level

Recommendations for Core Component 1: IPC programmes	**National level** Active, stand-alone, national IPC programmes with clearly defined objectives, functions and activities should be established for the purpose of preventing HAI, promoting patient safety and combating AMR through IPC good practices. National IPC programmes should be linked with other relevant national programmes and professional organizations.	**Facility level** An IPC programme with a dedicated, trained team should be in place in each acute health care facility for the purpose of preventing HAI and combating AMR through IPC good practices.
Minimum requirements	**A functional IPC programme should be in place, including at least:** • one full-time focal point trained in IPC; and • a dedicated budget for implementing IPC strategies/plans.	**Primary care: IPC trained health care officer** • A trained IPC link person, with dedicated (part-) time in each primary health care facility • One IPC-trained health care officer at the next administrative level (for example, district) to supervise the IPC link professionals in primary health care facilities
		Secondary care: functional IPC programme • A trained IPC focal point (one full-time trained IPC Officer [nurse or doctor]) at the recommended ratio of 1:250 beds with dedicated time to carry out IPC activities in all facilities (for example, if the facility has 120 beds, one 50% full-time equivalent dedicated officer) • Dedicated budget for IPC implementation
		Tertiary care: functional IPC programme • At least one full-time trained IPC officer (nurse or doctor) with dedicated time per 250 beds • IPC programme aligned with the national programme and with a dedicated budget • Multidisciplinary committee/team • Access to microbiology laboratory

Recommendations for Core Component 2: National and facility level IPC guidelines	**National and facility level** Evidence-based guidelines should be developed and implemented for the purpose of reducing HAI and AMR. The education and training of relevant health care workers on the guideline recommendations and the monitoring of adherence with guideline recommendations should be undertaken to achieve successful implementation.	

Minimum requirements	**National IPC guidelines**
	
	• Evidence-based, ministry-approved guidelines adapted to the local context and reviewed at least every five years
		Primary care: facility-adapted standard operating procedures (SOPs) and their monitoring
		
		• Evidence-based facility-adapted SOPs based on the national IPC guidelines
		• As a minimum, the facility SOPs should include:
		  ○ hand hygiene;
		  ○ decontamination of medical devices and patient care equipment;
		  ○ environmental cleaning;
		  ○ health care waste management;
		  ○ injection safety;
		  ○ health care worker protection (for example, at least post-exposure prophylaxis, vaccinations);
		  ○ aseptic techniques;
		  ○ triage of infectious patients; and
		  ○ basic principles of standard and transmission-based precautions.
		• Routine monitoring of the implementation of at least some of the IPC guidelines/SOPs
		
		Secondary and tertiary care: all requirements as for the primary health care facility level, with additional SOPs on:
		
		• standard and transmission-based precautions (for example, detailed, specific SOPs for the prevention of airborne pathogen transmission);
		• septic technique for invasive procedures, including surgery;
		• specific SOPs to prevent the most prevalent HAIs based on the local context/epidemiology; and
		• occupational health (detailed).

Recommendations for Core Component 3: IPC education and training	**National level** The national IPC programme should support education and training of the health workforce as one of its core functions.	**Facility level** IPC education should be in place for all health care workers by using team- and task-based strategies that are participatory and include bedside and simulation training to reduce the risk of HAI and AMR.
Minimum requirements	**National training policy and curriculum** • National policy that all health care workers are trained in IPC (in-service training) • An approved IPC national curriculum aligned with national guidelines and endorsed by the appropriate body • National system and schedule of monitoring and evaluation to check on the effectiveness of IPC training and education (at least annually)	**Primary care: IPC training for all front-line clinical staff and cleaners upon hire** • All front-line clinical staff and cleaners must receive education and training on the facility IPC guidelines/SOPs upon employment. • All IPC link persons in primary care facilities and IPC officers at the district level (or other administrative level) need to receive specific IPC training. **Secondary care: IPC training for all front-line clinical staff and cleaners upon hire** • All front-line clinical staff and cleaners must receive education and training on the facility IPC guidelines/SOPs upon employment. • All IPC staff need to receive specific IPC training. **Tertiary care: IPC training for all front-line clinical staff and cleaners upon hire *and annually:*** • All front-line clinical staff and cleaners must receive education and training on the facility IPC guidelines/SOPs upon employment and annually. • All IPC staff need to receive specific IPC training.

Recommendations for Core Component 4: HAI surveillance	**National level** National HAI surveillance programmes and networks that include mechanisms for timely data feedback and with the potential to be used for benchmarking purposes should be established to reduce HAI and AMR.	**Facility level** Facility-based HAI surveillance should be performed to guide IPC interventions and detect outbreaks, including AMR surveillance, with timely feedback of results to health care workers and stakeholders and through national networks.

Minimum requirements	**IPC surveillance and a monitoring technical group**
	
	• Establishment by the national IPC focal point of a technical group for HAI surveillance and IPC monitoring that:
	  ◦ is multidisciplinary; and
	  ◦ develops a national strategic plan for HAI surveillance (with a focus on priority infections based on the local context) and IPC monitoring.
		Primary care
		
		• HAI surveillance is not required as a minimum requirement at the primary facility level, but should follow national or sub-national plans, if available (for example, detection and reporting of outbreaks affecting the community is usually included in national plans).
		
		Secondary care
		
		• HAI surveillance should follow national or subnational plans.
		
		Tertiary care: functional HAI surveillance
		
		• Active HAI surveillance should be conducted and include information on AMR:
		  ◦ enabling structures and supporting resources need to be in place (for example, dependable laboratories, medical records, trained staff), directed by an appropriate method of surveillance; and
		  ◦ the method of surveillance should be directed by the priorities/ plans of the facility and/or country.
		
		• Timely and regular feedback needs to be provided to key stakeholders in order to lead to appropriate action, in particular to the hospital administration.

Recommendations for Core Component 5: Multimodal improvement strategies for implementing IPC activities	**National level** National IPC programmes should coordinate and facilitate the implementation of IPC activities through multimodal strategies on a nationwide or subnational level.	**Facility level** IPC activities using multimodal strategies should be implemented to improve practices and reduce HAI and AMR.
Minimum requirements	**Multimodal improvement strategies for IPC interventions** • Multimodal strategies should be used to implement IPC interventions according to national guidelines/SOPs under the coordination of the national IPC focal point (or team, if existing).	**Primary care: multimodal strategies for priority IPC interventions** • Use of multimodal strategies – at the very least to implement interventions to improve hand hygiene, safe injection practices, decontamination of medical instruments and devices and environmental cleaning. **Secondary care: multimodal strategies for priority IPC interventions** • Use of multimodal strategies – at the very least to implement interventions to improve each one of the standard and transmission-based precautions, and triage. **Tertiary care: multimodal strategies for all IPC interventions** • Use of multimodal strategies to implement interventions to improve each one of the standard and transmission-based precautions, triage, and those targeted at the reduction of specific infections (for example, surgical site infections or catheter-associated infections) in high-risk areas/patient groups, in line with local priorities.

Recommendations for Core Component 6: IPC monitoring, evaluation and feedback	**National level** A national IPC monitoring and evaluation programme should be established to assess the extent to which standards are being met and activities are being performed according to the programme's goals and objectives. Hand hygiene monitoring with feedback should be considered as a key performance indicator at the national level. Presence and adequacy of national IPC policies and strategies should be monitored regularly using an integrated Governance and Policies Progress Matrix tool.	**Facility level** Regular monitoring/audit and timely feedback of health care practices according to IPC standards should be performed to prevent and control HAI and AMR at the health care facility level. Feedback should be provided to all audited persons and relevant staff. Routine monitoring of adherence to IPC standards at facility level should be done through integrated health service delivery assessments.

Minimum requirements	**IPC surveillance and a monitoring technical group**
	
	• Establishment by the national IPC focal point of a technical group for HAI surveillance and IPC monitoring that:
	  ◦ is multidisciplinary;
	  ◦ develops a national strategic plan for HAI surveillance and IPC monitoring;
	  ◦ develops an integrated system for the collection and analysis of data (for example, protocols and tools);
	  ◦ provides training at the facility level to collect and analyse these data; and
	  ◦ develops recommendations for minimum indicators (for example, hand hygiene).
		Primary care
		
		• Monitoring of IPC structural and process indicators should be put in place at primary care level, based on IPC priorities identified in the other components. This requires decisions at the national level and implementation support at the subnational level.
		
		Secondary and tertiary care
		
		• There should be a person responsible for the conduct of the periodic or continuous monitoring of selected indicators for process and structure, informed by the priorities of the facility or the country.
		• Hand hygiene is an essential process indicator to be monitored.
		• Timely and regular feedback needs to be provided to key stakeholders in order to lead to appropriate action, particularly to the hospital administration.

Recommendations for Core Component 7: Workload, staffing and bed occupancy at the facility level	**Facility level[a]** The following elements should be adhered to, in order to reduce the risk of HAI and the spread of AMR: (1) bed occupancy should not exceed the standard capacity of the facility; (2) health care worker staffing levels should be assigned according to patient workload.
Minimum requirements	**Primary care** • To reduce overcrowding: a system for patient flow, a triage system (including referral system) and a system for the management of consultations should be established according to existing guidelines, if available. • To optimize staffing levels: assess whether staffing levels are appropriate, depending on the categories identified when using WHO/national tools (national norms on patient/staff ratio), and develop an appropriate plan.

	Secondary and tertiary care
	
	• To standardize bed occupancy:
	  ◦ establish a system to manage the use of space in the facility and to establish the standard bed capacity for the facility;
	  ◦ ensure hospital administration enforcement of the system developed;
	  ◦ ensure no more than one patient per bed;
	  ◦ provide spacing at least one metre between the edges of beds; and
	  ◦ ensure overall occupancy does not exceed the designed total bed capacity of the facility.
	
	• To reduce overcrowding and optimizing staffing levels: apply the same minimum requirements as for primary health care.

Recommendations for Core Component 8: Built environment, materials and equipment for infection	**Facility level[a]** Patient care activities should be undertaken in a clean and hygienic environment that facilitates practices related to the prevention and control of HAI, as well as AMR, including all elements around WASH infrastructure and services and the availability of appropriate IPC materials and equipment. Materials and equipment to perform appropriate hand hygiene should be readily available at each point of care.
Minimum requirements	**Primary care** • Water should always be available from a source on the premises (such as a deep borehole or a treated, safely managed piped water supply) to perform basic IPC measures, including hand hygiene, environmental cleaning, laundry, decontamination of medical devices and health care waste management according to national guidelines. • A minimum of two functional, improved sanitation facilities should be available on-site, one for patients and the other for staff; both should be equipped with menstrual hygiene facilities. • Functional hand hygiene facilities should always be available at points of care/toilets and include soap, water and single-use towels (or if unavailable, clean reusable towels) or ABHR at points of care and soap, water and single-use towels (or if unavailable, clean reusable towels) within five metres of toilets. • Sufficient and appropriately labelled bins to allow for health care waste segregation should be available and used (less than five metres from point of generation); waste should be treated and disposed of safely via autoclaving, high-temperature incineration, and/or buried in a lined, protected pit. • The facility layout should allow adequate natural ventilation, decontamination of reusable medical devices, triage and space for temporary cohorting/isolation/physical separation if necessary. • Sufficient and appropriate IPC supplies and equipment (for example, mops, detergent, disinfectant, personal protective equipment and sterilization) and power/energy (for example, fuel) should be available for performing all basic IPC measures according to minimum requirements/SOPs, including all standard precautions, as applicable; lighting should be available during working hours for providing care.

Minimum requirements	**Secondary and tertiary care** • A safe and sufficient quantity of water should be available for all required IPC measures and specific medical activities, including for drinking, and piped inside the facility at all times - at a minimum to high-risk wards (for example, maternity ward, operating room/s, intensive care unit). • A minimum of two functional, improved sanitation facilities that safely contain waste available for outpatient wards should be available and one per 20 beds for inpatient wards; all should be equipped with menstrual hygiene facilities. • Functional hand hygiene facilities should always be available at points of care, toilets and service areas (for example, the decontamination unit), which include ABHR and soap, water and single-use towels (or if unavailable, clean reusable towels) at points of care and service areas, and soap, water and single-use towels (or if unavailable, clean reusable towels) within 5 metres of toilets. • Sufficient and appropriately labelled bins to allow for health care waste segregation should be available and used (less than 5 metres from point of generation) and waste should be treated and disposed of safely via autoclaving, incineration (850° to 1100°C), and/or buried in a lined, protected pit. • The facility should be designed to allow adequate ventilation (natural or mechanical, as needed) to prevent transmission of pathogens. • Sufficient and appropriate supplies and equipment and reliable power/energy should be available for performing all IPC practices, including standard and transmission-based precautions, according to minimum requirements/SOPs; reliable electricity should be available to provide lighting to clinical areas for providing continuous and safe care, at a minimum to high-risk wards (for example, maternity ward, operating room/s, intensive care unit). • The facility should have a dedicated space/area for performing the decontamination and reprocessing of medical devices (that is, a decontamination unit) according to minimum requirements/SOPs. • The facility should have adequate single isolation rooms or at least one room for cohorting patients with similar pathogens or syndromes, if the number of isolation rooms is insufficient.

[a] Core components 7 and 8 apply only to the facility level.
Abbreviations: ABHR: alcohol-based handrub; AMR: antimicrobial resistance; HAI: health care-acquired infection; IPC: infection prevention and control; SOPs: standard operating procedures; WASH: water, sanitation and hygiene.
Source: *(5)*.

Portrait of a resident doctor at the microbiology laboratory in a university teaching hospital in Nigeria. © WHO / Etinosa Yvonne

Annex 2.

Global actions and indicators for the WHO Secretariat and international and national stakeholders and partners in the context of the global action plan and monitoring framework on IPC

Annex 2

Global actions and indicators for the WHO Secretariat and international and national stakeholders and partners in the context of the global action plan and monitoring framework on IPC

Table A2.1. Strategic direction #1. Political commitment and policies

Action	Key players	Indicator(s)
Global and regional (supranational) level		
Key action #1 Achieve demonstrable high-level commitment to IPC at the global and regional level.	Leaders of the WHO Health Emergencies Programme (WHE), Universal Health and Life Course (UHL), and Antimicrobial Resistance (AMR) Divisions, IPC secretariat at WHO headquarters, Patient Safety Flagship, quality of care, AMR, occupational health, water, sanitation and hygiene (WASH); regional IPC focal points; WHO country offices. Government leaders, officials and United Nations delegations, political and health care leaders and policy-makers at ministries of health (and other relevant ministries such as water or environment and finances), and senior managers and administrators responsible for planning and budgets; global IPC network members and other key stakeholders and partners.	1. Global action plan (GAP) and monitoring framework (MF) adopted at the Seventy-seventh World Health Assembly (May 2024). 2. IPC units created in WHO regional offices and IPC focal points located in each WHO country office. 3. All the following indicators are achieved and IPC is: represented in the International Health Regulations (IHR) amendment (May 2024); addressed in the pandemic prevention, preparedness, and response accord; mentioned in the United Nations General Assembly (UNGA) resolution on WASH; included in the AMR agenda item at UNGA (September 2024); placed on the agenda for future UNGA meetings (for example, on universal health coverage (UHC), primary health care (PHC), etc.) (2030).
Key action #2 Develop the financial investment case for prioritizing IPC.	WHO IPC secretariat, international partners and relevant academic institutions.	1. Publication of the 2024 updated global report on IPC, including the financial investment for IPC based on new cost-effectiveness data from WHO/Organisation for Economic Co-operation and Development (OECD) modelling (2024). 2. New WHO cost and cost-effectiveness data/calculator tool for IPC for use by countries, developed, tested and published (2025).

Table A2.2. Strategic direction #2. Active IPC programmes

Action	Key players	Indicator(s)
Global and regional level		
Key action #1 Work across the three levels of WHO to support countries to establish or strengthen active national IPC programmes.	WHO IPC teams at headquarters; IPC focal points in WHO regional offices and country offices. Political, government and health care leaders; IPC focal points, leaders at public health and other national institutes.	1. Proportion of countries with national IPC programmes at level 4 or 5 (highest levels) according to the WHO State Party self-assessment annual reporting tool (SPAR 9.1) and level D or E in the Tripartite AMR country self-assessment survey (TrACSS 3.5). 2. Country scoring improved within section 3.5 of TrACSS and/or within section 9.1 of SPAR.
Key action #2 Demonstrate evidence of a global improvement of national IPC programmes (i.e., meet WHO minimum requirements)	WHO IPC teams at headquarters; IPC focal points in WHO regional offices and country offices. International and national stakeholders and partners. Political, government and health care leaders; IPC focal points, leaders at public health and other national institutes	1. Proportion of countries meeting all WHO IPC minimum requirements for IPC programmes at national level (through the WHO IPC global portal). 2. Proportion of countries that have a national target on reducing health care-associated infections (HAIs) (monitored by the WHO Patient Safety Flagship). 3. Proportion of countries that have achieved their national targets on reducing HAIs (based on self-assessment).
Key action #3 Support and demonstrate improvement globally in WASH and cleaning and waste services in order to enable IPC practices.	Political, government and health care leaders; IPC focal points, leaders at public health and other national institutes. WHO/United Nations Children's Fund (UNICEF), WASH and IPC leaders and teams; WASH and IPC focal points in WHO regional and country offices.	1. Basic WASH and waste services available in all health care facilities (per each indicator as monitored in the WHO/UNICEF Joint Monitoring Programme; see footnote in Strategic direction 2 for definitions).

Table A2.3. Strategic direction #3. IPC integration and coordination

Action	Key players	Indicator(s)
Global and regional level		
Key action #1 Establish mechanisms for crosscutting work/ collaborations across all programmes relevant for/ complementary to IPC[a] (as listed in the global strategy on IPC) within WHO headquarters and regional offices.	WHO - focal points/leaders and teams in the IPC programmes and other complementary programmes at WHO headquarters, as well as regional and country offices.	Global and regional taskforces established including all relevant programmes related to IPC with terms of reference and in line with WHO's 14th General Programme of Work (2026).

Action	Key players	Indicator(s)
Global and regional level		
Key action #2 Ensure that IPC principles, indicators and tools are reflected/cross-referenced in each WHO programme that is complementary to IPC.	WHO - focal points/leaders and teams in the IPC programmes and other complementary programmes at WHO headquarters, as well as regional and country offices.	**1.** Desk review and situational analysis for IPC integration within other programmes completed (2026). **2.** Key existing IPC policies, principles, indicators and tools identified, appropriately included and cross-referenced within each WHO programme complementary to IPC (2028).
Key action #3 Ensure that principles, indicators and tools of other WHO programmes complementary to IPC are reflected/cross-referenced in the IPC programme within WHO headquarters and regional offices.	WHO - focal points/leaders and teams in the IPC programmes and other complementary programmes at WHO headquarters, as well as regional and country offices.	**1.** Desk review and situational analysis of integration of other programmes within the IPC programme completed. (2026). **2.** Key existing policies, principles, indicators and tools from each WHO programme identified, appropriately included and cross-referenced within the IPC programme (2028).

[a] Programmes/areas of work complementary to IPC programmes: AMR; occupational health; patient safety; public health emergencies; quality of care; WASH and health care waste; specific infectious diseases programmes (for example., human immunodeficiency virus, tuberculosis); others.

Table A2.4. Strategic direction #4. IPC knowledge among health and care workers and career pathways for IPC professionals

Action	Key players	Indicator(s)
Global and regional level		
Key action #1 Develop international IPC standardized curricula	IPC and other focal points/leaders in WHO headquarters and regional offices; WHO Academy; education working group within the global IPC network	**1.** WHO international IPC curricula for: pre-graduate education; postgraduate education; in-service training published (2026).
Key action #2 Establish an international IPC certification and/or support and promote existing certificates	IPC and other focal points/leaders in WHO headquarters and regional offices; WHO Academy; education working group within the global IPC network	**1.** International IPC certification established and in use (2030).

Table A2.5. Strategic direction #5. Data for action

Action	Key players	Indicator(s)
Global and regional level		
Key action #1 Establish/strengthen global data collection and tracking systems for IPC monitoring (with a hand hygiene compliance monitoring system as a subset).	IPC and other leaders at WHO headquarters and regional offices. International and national stakeholders and partners.	1. Global IPC monitoring and reporting system (IPC global portal) strengthened and fully implemented (to track progress of IPC minimum requirement and core components' implementation at national and facility levels) (2026). 2. Standardized global hand hygiene compliance monitoring system established (2026). 3. Proportion of countries regularly reporting via the IPC global portal.
Key action #2 Working across the three levels of WHO, support countries to establish or strengthen national IPC monitoring systems.	WHO – IPC and leaders of other divisions and departments (for example, WASH); WHO regional and country offices. International and national stakeholders and partners. Leaders at public health and other national institutes, and in health information management systems; national IPC focal points and teams.	1. Guidance and data collection tools for IPC monitoring, taking into account country specificities, developed/reviewed in all countries (2028).
Key action #3 Support HAI surveillance capacity building in countries through the establishment of a technical working group and the development/review of guidance, standardized protocols and data collection tools (including early warning systems) for HAI surveillance within the existing national disease surveillance systems.	WHO – IPC and leaders of other divisions and departments (for example, AMR, WHE); WHO regional and country offices. International and national stakeholders and partners. Leaders in national surveillance systems and health information management systems, and at public health and other national institutes; national IPC focal points and teams; IPC committees and technical expert working groups.	1. Guidance, standardized protocols and data collection tools for priority HAIs taking into account country specificities, developed/reviewed in all countries (2028).
Key action #4 Working across the three levels of WHO, support countries to establish or strengthen national HAI surveillance systems within/ in line with existing national disease surveillance systems, including for pathogens that are antimicrobial-resistant and/or prone to epidemics and pandemics and for monitoring antimicrobial consumption.	WHO – IPC and leaders of other divisions (for example, AMR, WHE), including surveillance of other infectious diseases; WHO regional and country offices. International and national stakeholders and partners. Leaders in national surveillance systems and health information management systems, and at public health and other national institutes; national IPC focal points and teams; IPC committees and technical expert working groups.	1. Proportion of countries reporting to the WHO Global antimicrobial and use surveillance system (GLASS) with discrimination of community versus hospital origin of pathogens.

Table A2.6. Strategic direction #6. Advocacy and communications

Action	Key players	Indicator(s)
Global and regional level		
Key action #1 Develop global and regional IPC communications and advocacy strategies (as stand-alone or apart of wider strategies, for example, on AMR, patient safety or WASH), including engaging global and regional champions, addressing the importance of integrated and coordinated advocacy and communications across WHO programmes complementary to IPC, and supporting countries to develop their national advocacy and communication strategy and plans for IPC.	WHO – IPC and leaders of other divisions and departments and teams, with the support of WHO communication departments. International and national stakeholders and partners.	**1.** Global and regional IPC advocacy and communications strategies (according to Key action #1) developed (2026). **2.** Proportion of global and regional IPC advocacy champions.
Key action #2 Ensure that IPC and AMR in health care are included in efforts addressing misinformation and infodemics about medical and public health topics.	WHO – IPC and leaders of other divisions and teams, with the support of WHO communication departments. International and national stakeholders and partners.	**1.** IPC included in a global programme that is designed to manage and actively respond to misinformation and infodemics (2026).
Key action #3 Develop an IPC communications template to be implemented early in and throughout future outbreaks.	WHO – IPC and leaders of other divisions and teams, with the support of WHO communication departments.	**1.** IPC communications template for outbreaks developed (2026).

Table A2.7. Strategic direction #7. Research and development

Action	Key players	Indicator(s)
Global and regional level		
Key action #1 Develop a global IPC research agenda, as well as a research gap analysis, based on country needs, including a multisectoral and multidisciplinary approach with a focus on AMR, a public health emergency programme, WASH and low-resource settings.	WHO – IPC and other teams (for example, Research for Health, AMR, public health emergency programme, WASH) in collaboration with the global IPC network, WHO Collaborating Centres, research institutions, other stakeholders and donors.	**1.** Global IPC research agenda developed, including a summary of the current state of IPC research (best practices and methodology) and gap analysis and research questions (2026).
Key action #2 Develop guidance on methods/protocols and tools for IPC research.	WHO – IPC and other teams (for example, Research for Health, AMR, public health emergency programme, WASH), in collaboration with the global IPC network, WHO Collaborating Centres, research institutions, other stakeholders and donors.	**1.** Protocols and tools for IPC research are developed and hosted on a readily available central platform (2028).

Action	Key players	Indicator(s)
Global and regional level		
Key action #3 Engage global and national donors and grant/funding bodies for the inclusion of IPC in research calls and projects.	WHO – IPC and other leaders (for example, Integrated Health Services, UHL, Research for Health, AMR, public health emergency programme, WASH) in collaboration with the global IPC network, research institutions, other stakeholders and donors.	**1.** Proportion of annual: calls for IPC research proposals; funded research projects on IPC. Proportion of publications on IPC research per year.
Key action #4 Lead/support research in line with the IPC research priorities included in the WHO global AMR[a], IPC, patient safety research agendas.	WHO – IPC and other focal points/ leaders and teams; global IPC network, research institutions, other stakeholders and donors.	**1.** Proportion of published research results in line with the IPC research priorities included in the AMR research agenda.

[a] Global research agenda for antimicrobial resistance in human health, Geneva: World Health Organization; 2023.

Table A2.8. Strategic direction #8. Collaboration and stakeholder support

Action	Key players	Indicator(s)
Global and regional level		
Key action #1 Map partners, international organizations and societies relevant for IPC at the global and regional levels, taking a multisectoral and multidisciplinary approach.	WHO – IPC and other leaders and teams in WHO headquarters, as well as regional and country offices, in collaboration with the global IPC network and other stakeholders.	**1.** Global and regional mapping exercises performed and available (2026) and mechanisms in place for regular updates. **2.** Global collaboration agenda to support IPC developed (2028). **3.** Profile of IPC global and regional stakeholders regularly updated (for example, annually) (organizations/ societies/partners/donors/etc.) (2030).
Key action #2 Maintain and strengthen the global IPC network, including organizing international IPC meetings/ conferences to share country experiences.	WHO – IPC leaders and teams in WHO headquarters and in collaboration with regional offices.	**1.** Proportion of consultative processes of the global IPC network per year (minimum 1 per year). **2.** Proportion of WHO products developed in collaboration with the global IPC network per year. **3.** Proportion of international IPC meetings/conferences organized by WHO and/or global IPC network members per year.
Key action #3 Establish regional multi-stakeholder partnerships and networks on IPC including terms of reference and a memorandum of understanding aligned with the objectives of the global strategy and action plan on IPC and country needs.	WHO – IPC and other leaders and teams in WHO headquarters, region and country offices; the global IPC network and other stakeholders.	**1.** Proportion of regional IPC stakeholder partnerships and networks (baseline and 2030). **2.** Proportion of active members in the WHO IPC Community of Practice.

Healthcare worker disinfecting his hands during a COVID-19 training in Baku, Azerbaijan.
© WHO / Blink Media - Ehtiram Jabi

Annex 3.

Country examples of implementation and progress in achieving the WHO core components for infection prevention and control

Annex 3

Country examples of implementation and progress in achieving the WHO core components for infection[1]

Leading representatives of the University of Lagos, Nigeria Centre for Disease Control and Prevention, International Infection Control Branch of the United States Centers for Disease Control and Prevention, Dr Ameyo Stella Adadevoh Health Trust, and Orange Network infection prevention and control focal persons during the 2nd Orange Network workshop in February 2022. © NCDC comms / Musa Abdullahi

Turn Nigeria Orange: the birth of a strong IPC programme at national and facility level

Nigeria, the most populous country on the African continent, with 36 states and its Federal Capital Territory, spread across six different geopolitical zones, encompassing a total of 774 local government areas, has shown what the successful development and implementation of a national IPC programme looks like.

Key players

- Federal Ministry of Health and Social Welfare
- Nigeria Centre for Disease Control and Prevention (NCDC)
- National Primary Health Care Development Agency (NPHCDA)
- College of Medicine, University of Lagos (CMUL)
- Nigeria Society for Infection Control (NSIC)
- Dr Ameyo Stella Adadevoh Health Trust (DRASA), a national, public non-profit organization
- Key partners, namely the World Health Organization (WHO), United States Centers for Disease Control and Prevention (CDC), Infection Control Africa Network (ICAN), United States Agency for International Development (USAID), Africa Field Epidemiology Network (AFENET), APIN Public Health Initiatives (used to be "AIDS Prevention Initiative in Nigeria"), and Germany's Robert Koch Institute (RKI).

[1] Country data was provided by country counterparts and may not reflect the official WHO data.

Main steps

- **2017**: Nigeria conducted a situational analysis to create its AMR national action plan, which highlighted that a national IPC programme did not exist and was needed.
- In **2018**, the first national IPC focal point was established in NCDC, with a pivotal role in coordinating IPC activities nationwide.
- Between **2018** and **2021**, Nigeria developed and published national IPC guidelines with the support of RKI.
- In **2019**, another situational analysis was conducted to assess the current national state of IPC using the WHO IPCAT2 tool, providing a clearer picture of the challenges and areas needing improvement.
- On **5 May 2019**, in alignment with the AMR National Action Plan, Nigeria launched its Turn Nigeria Orange programme. This comprehensive initiative aimed to establish a robust national IPC programme, with strong links to other national programmes, particularly AMR. The programme's philosophy, "one nation, one plan," sought to unite stakeholders under a common goal of advancing IPC across the whole of Nigeria.
- **The National IPC Programme** was thus established, with strong links to AMR and support for health facilities.
- **State IPC focal points** were nominated in each of the states' ministries of health, as well as in the Federal Capital Territory.
- A thorough **stakeholder mapping exercise and networking efforts** were undertaken, leading to strong relationships with key partners and their alignment with the national IPC programme priorities and plans.
- **IPC expertise** was gradually built up, in part by growing numbers participating in the national IPC training programme, which equips health workers with the knowledge and skills to establish and maintain IPC programmes in their facilities. Graduates become part of a network of health champions and remain engaged in ongoing communities of practice.
- Starting in **2019**, a refined Participatory approach to learning in systems (PALS) for health care facilities was implemented, and state-level IPC focal points were trained through ad hoc workshops, as well as facility health workers, through the national IPC training programme, anchored by the Centre for Infection Control and Patient Safety (CiCaPS) at the CMUL, in collaboration with the NCDC.
- Launched in **2020**, the **Orange Network** is a key component of Nigeria's national IPC programme. It consists of public tertiary health care facilities across the country, identified to become centres of excellence in IPC. Initially, the programme focused on five of the eight WHO IPC core components, with the long-term goal of strengthening all eight. By March 2023, the Orange Network had expanded to 41 active sites, achieving the goal of having one network facility per state.

  - Membership of the Orange Network requires facilities to participate in all network activities, routinely assessing IPC practices, developing and executing annual IPC action plans, allocating budget to IPC activities, and annually monitoring and evaluating implemented activities, using WHO tools.
  - Joining the network begins with the nomination of an IPC focal point and team, and the establishment of a governance structure with an IPC committee. Focal points are then onboarded through a series of three workshops, focusing on understanding the WHO core components, multimodal hand hygiene improvement, and the feasibility of HAI surveillance across network facilities.

  - Opportunities for support and engagement naturally arise through consultations with the national programme, access to IPC webinars, supportive supervision, and peer-to-peer learning

networks. The national IPC programme also engages with chief medical directors of network facilities, to advocate for IPC support within their institutions.
    - The development cycle of the Orange Network follows a 5-step implementation strategy, including planning and stakeholder engagement, baseline assessments, work plan development, a review of routine activities, and peer learning and mentorship opportunities.

- In **2024**, the APIN Orange Network was also created for secondary health facilities and primary health care centres (PHCs), with support provided by the CDC, NCDC, AFENET, NPHCDA and Resolve To Save Lives.
- Inaugurated in **2024**, the national IPC Technical Working Group, comprised of above-mentioned key players from the Nigerian government, disease programmes, partner organizations, and academia, provides a strong platform to improve IPC coordination among stakeholders.

Key results

- Publication of the **first national IPC manual** for health facility implementation in 2021.
- **Publication of priority disease guidelines** for COVID-19, VHF, mpox and diphtheria.
- Update of the **national IPC policy** in 2022.
- 41 tertiary care facilities, 111 secondary care facilities, and 256 PHCs included in the **Orange networks and in the IPC communities of practice**, as of Q3 2024.
- Dedicated resources and budget for IPC at national and facility levels secured.
- Development of a **health care worker safety strategy**, including several tools to track and investigate health care workers' infections and monitor IPC practices.
- More than 100 IPC professionals reached advanced levels in the national IPC training programme, between 2021 and 2024.
- Significant improvements in the IPCAF scores: 83% of facilities reached **Intermediate or Advanced IPC levels** after one year (2022), up from the 41% baseline in 2021.

Success factors, accelerators and enablers

- **Advocacy and leadership buy-in**. Continuous advocacy for leader buy-in at all health system levels, with a clear vision from the Turn Nigeria Orange programme; Chief medical directors' engagement (leadership support for IPC at the policy and facility levels).
- **Partnerships and collaboration.** Building IPC capacity requires partnerships and collaboration, as demonstrated by Nigeria's strong collaborations with local and regional institutions like ICAN, CMUL, DRASA, and NSIC.
- **A realistic, achievable approach**. Setting reasonable and attainable initial goals for IPC programmes is crucial for future success, emphasizing the importance of starting small and slow, learning and then gradually scaling up.
- **Sustainable IPC workforce**. Investment in people leading and implementing IPC programmes is key to sustainability, with Nigeria prioritizing training and mentorship for a committed team of health care workers; Standardized training curriculum for in-service training of IPC professionals.
- **Leverage existing resources**. Using resources existing within the health system and outside of it. This is because strengthening IPC requires a cross-cutting approach.
- **The participatory way** of working with Orange Network of IPC focal points. Unique way of working that encourages the use of local resources to address priority IPC problems, including communication through an active WhatsApp group, engaging in site visits by peers, and more experienced members providing advice and support.

Challenges, barriers and suggestions

- Establishment of the national IPC technical working group posed a challenge. There was the need to accommodate multiple stakeholders with varying interests on a single platform for strengthening IPC. The strong political commitment and leadership of the coordinating Minister of Health and Social Welfare ensured that all stakeholders came and worked together towards a unifying One nation, One plan strategy under the stewardship of the national IPC programme coordinator.
- The following structural and legal deficiencies represented significant barriers to progress: lack of an IPC legal framework, absence of mandatory standards, limited human resources for IPC, lack of or limited infrastructure (WASH, equipment and PPE, hospital design and overcrowding), weak monitoring and evaluation at all levels, under-reporting of health care workers' exposure events, and a lack of career path for IPC professionals.
- To address these challenges, the programme is focusing on establishing an IPC legal framework that will set out regulations for IPC standard, collecting HAI surveillance and IPC practice data to improve safety. This includes establishing a national HAI surveillance system (Naija HAINet), reporting hand hygiene compliance nationally, creating a monitoring and evaluation framework, expanding the Orange Network approach, and periodically reassessing the state of IPC in the country.
- Another significant challenge is developing a **sustainable funding** approach for the IPC programme. The programme's establishment was supported by non-state actors with limited funding. To maintain and advance the programme, funding from all three tiers of Nigeria's Government will be needed. The adoption of a revised national IPC policy is a positive step towards institutionalizing IPC programmes, but a legal framework and standards for IPC will ultimately be required for sustainable change.

Tools and resources

- Presentation of the *Turn Nigeria Orange* programme: https://youtube.com/watch?v=HoFW4C0vAE4&feature=shared
- Participatory approach to learning in systems (PALS): https://nicadeipcpals.ncdc.gov.ng/

More than 1 year without CLABSI: ICU staff in participating hospital in Riyadh, Saudi Arabia, celebrates the successful implementation of the initiative's measures. © King Salman Hospital, Riyadh, Saudi Arabia.

Leading with excellence - National IPC initiative on reducing central-line bloodstream infections in Saudi Arabia

Central line-associated bloodstream infections (CLABSI) are a serious type of infection affecting patients who need a central venous catheter and are usually treated in intensive care units (ICU).

CLABSI are also an important public health issue as they often manifest with sepsis and have a significant impact on patient outcomes and increase health care costs and the length of hospitalization.

Saudi Arabia has been at the forefront of an initiative aimed at reducing CLABSI. This national initiative, led by the Ministry of Health (MoH) and supported by a number of different stakeholders, serves as an inspirational story of success in infection prevention and control (IPC), since it demonstrates the power of strategic planning, collaboration and the implementation of best practices.

Key players

- Ministry of Health: General Directorate of IPC (GDIPC), in collaboration with other relevant general directorates (GD), such as the General Administration of Medical Supplies, and GD of Nursing Affairs and of Quality and Patient Safety, and the MoH regional branches
- Other national government bodies: Public Health Authority (Weqaya) and Ministry of Defence Health Services
- General Administration of Hospitals and Adult Intensive Care Leaders and Hospital Network

Main steps

- The initiative was launched in 2022 in response to concerning CLABSI data, particularly from adult ICUs, and is still ongoing in 2024.
- The **primary objective** was to significantly reduce CLABSI rates across health care facilities (all hospitals with adult medical and surgical ICU, including MoH-associated and private facilities) through a comprehensive and strategic approach.
- In 2021, a **task force**, including all key players, was established to advise on the initiative.

- As a first step, a comprehensive **baseline assessment of CLABSI** rates was conducted across the targeted health care facilities nationwide. This assessment provided a clear picture of the current situation and highlighted areas needing urgent attention.
- A **root cause analysis** was then conducted using a fishbone assessment to identify the underlying factors contributing to high CLABSI rates.
- Based on the data and recommendations from the task force, a strategic plan for the **CLABSI Rate Reduction Strategy (CRRS)** was developed. This plan included setting a clear vision, mission, and SMART national level objectives.
- The **strategic components** of the initiative are:
    - **Governance**. At the start of the initiative, MoH regional health branches had the mandate to launch the initiative and activate all its components. Its implementation remains centrally monitored and supervised by the GDIPC.
    - **Surveillance**. A national **surveillance system** was employed to effectively monitor CLABSI rates and trends. This included a national electronic platform which was updated and maintained to provide high-quality and accurate data from all facilities, facilitating real-time monitoring of CLABSI rates and device utilization.
    - **Guidelines and implementation tools**. Evidence-based guidelines for central line insertion and maintenance were developed, along with the associated implementation tools.
    - **System change**. A plan for ensuring the availability of necessary supplies and infrastructure to implement the recommended best practices was made and regularly updated.
    - **Education and training**. Hybrid (online and on site) training programmes on CLABSI prevention were delivered by GDIPC members, coordinators from the MoH branches, and IPC staff in the hospitals for health care providers, including infection preventionists, nurses and physicians.
    - **Competition for excellence**. A ***Go Green*** competition initiative was launched, encouraging hospitals to participate in a national competition with the target of reducing CLABSI rates from 2.5 to 0.9 per 1000 central line days.
    - **Monitoring and evaluation**. Regular data analysis and reporting to all stakeholders of CLABSI rates at the national, regional and hospital levels, are still performed to track progress towards the initiative target. Each aspect of the strategy is also regularly monitored. Feedback from health care providers is gathered to identify barriers and opportunities for further improvement.

Key results

- 222 health care facilities have participated in the initiative across the country.
- **Decrease of CLABSI rates**. The average CLABSI rate significantly decreased from 2.5 per 1000 central catheter days in 2021 to 1.81 in 2022, 1.68 in 2023, and 1.28 per 1000 central catheter days in Q3 of 2024, reflecting a 48.8% reduction from the baseline. Additionally, other health care-associated infection (HAI) rates also declined, highlighting the broader effectiveness of the initiative's comprehensive IPC measures.
- Training of around 5000 health care providers, resulting in their increased knowledge of IPC practices and skills related to central line care, with an overall compliance of 98% with the central line maintenance bundle in Q4 of 2024.
- Improvement of the nationwide surveillance system in 2022 which enabled consistent data collection, analysis, benchmarking and reporting of HAI rates and trends, facilitating real-time monitoring and informed decision-making.
- Strengthening of stakeholders' collaboration in the field of IPC and intensive care, and across different general directorates in the Ministry.
- Strengthening of supply chain management process procurement with the creation of a ticketing system to notify when critical supplies were unavailable, ensuring prompt follow-up and supply availability at the hospital, cluster and regional levels.

Success factors, accelerators and enablers

- **Government support and leadership**. Strong commitment and leadership by the MoH, supported by hospital leadership and key stakeholders.
- **Strong national IPC programme and national strategy**. Solid foundation across the health care system and commitment from all hospitals and health care workers.
- **Dedicated IPC teams**. Adequate staffing and resources at all levels (national, regional and local), including active participation from infection preventionists, nurses and physicians.
- **Comprehensive IPC training**. Regular training and competency assessments increased health care workers' knowledge and skills in IPC practices. The comprehensive national training programme was initially rolled out across all hospitals and continues in those hospitals with high rates.
- **Robust surveillance system**. Enhanced system for monitoring CLABSI rates, supported by an electronic platform, enabling thorough data analysis and informed, timely decision-making.
- **Benchmarking and data-sharing**. Performance comparisons, driving continuous improvement.
- **Effective communication and collaboration**. Regular meetings and interactions (across all levels and within each level) involving multidisciplinary teams ensured alignment and commitment to the initiative's goals. Establishing a community of practice and WhatsApp group within the national Health Electronic Surveillance Network for communications and data-sharing.
- **Incentives and recognition**. Initiatives like the Go Green competition motivated hospitals to reduce CLABSI rates, fostering a culture of excellence. Winning hospitals are acknowledged during the annual forum in the presence of MoH leaders and via official MoH communication channels.
- **Necessary supplies and equipment**. Ensuring the continuous availability of hand hygiene products, central line care kits and other critical supplies.

Challenges, barriers and solutions

- One of the primary challenges was **understanding the actual problem**. This required conducting many meetings and widespread visits to define the scope of the issue, for each hospital. Tools such as fishbone assessments were used to identify the root causes of high CLABSI rates.
- **Making sure that the initiative was going in the right direction** was sometimes challenging. Making **data-driven decisions** was critical for measuring progress and informing strategy adjustments. The use of electronic systems for surveillance and communication facilitated continuous monitoring, feedback and improvement.
- **Health care workers' knowledge gaps and old behaviour patterns** posed other significant barriers. Implementing comprehensive **training programmes** was essential to tackling old behaviour patterns and increasing health care workers' knowledge and competency. Empowering **IPC champions** provided additional support and leadership with promoting correct IPC practices and encouraging adherence among peers. Likewise, encouraging **error reporting without fear** of retribution helped identify areas for improvement and fostered a culture of continuous learning and safety.
- The availability of **infrastructure and supplies** was another critical challenge. Ensuring that all health care facilities had the necessary supplies was essential for the effective implementation of IPC practices.
- **Lack of communications and different views** between health care providers and policy-makers initially represented an obstacle to the acceptance of the initiative. Building **partnerships** between health care providers and policy-makers helped create a collaborative environment. These partnerships were essential for sharing knowledge, resources and best practices.

Infection Prevention and Control Unit
Integrated Health Services
World Health Organization
20 Avenue Appia
1211 Geneva 27
Switzerland

www.who.int