

MINIMUM REQUIREMENTS for infection prevention and control programmes



The starting point for implementing the World Health Organization core components of infection prevention and control programmes at the national and health care facility level

Minimum requirements for infection prevention and control programmes
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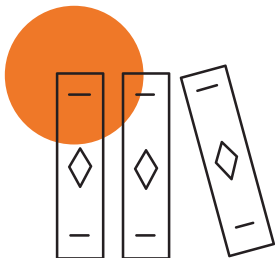
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ABBREVIATIONS AND ACRONYMS

ABHR	alcohol-based handrub
AMR	antimicrobial resistance
CDC	Centers for Disease Control and Prevention (USA)
CP	carbapenemase-producing
CPE	carbapenemase-producing Enterobacteriaceae
EQAS	external quality assurance system
HAI	health care-associated infection
HCW	health care worker
IPC	infection prevention and control
IPCAF	infection prevention and control assessment framework
IPCAT	infection prevention and control assessment tool
PPE	personal protective equipment
SOP	standard operating protocols
UNICEF	United Nations Children's Fund
USA	United States of America
WASH	water, sanitation and hygiene
WASH FIT	water, sanitation and hygiene facility improvement tool
WHO	World Health Organization



GLOSSARY OF KEY TERMS AND DEFINITIONS

Alcohol-based handrub: An alcohol-based preparation designed for application to the hands to inactivate microorganisms and/or temporarily suppress their growth. Such preparations may contain one or more types of alcohol and other active ingredients with excipients and humectants.

Source: WHO Guidelines on hand hygiene in health care. 2009 (<https://www.who.int/gpsc/5may/tools/9789241597906/en/>, accessed 29 October 2019).

Antimicrobial stewardship: A coherent set of actions which promote the responsible use of antimicrobials. This definition can be applied to actions at the individual level, as well as the national and global level, and across human health, animal health and the environment.

Source: Dyar OJ, Huttner B, Schouten J, Pulcini C. What is antimicrobial stewardship? *Clin Microbiol Infect.* 2017;23(11):793–8.

OR

The primary goal of antimicrobial stewardship is to optimize clinical outcomes while minimizing unintended consequences of antimicrobial use, including toxicity, the selection of pathogenic organisms (such as *Clostridium difficile*) and the emergence of resistance.

Source: Dellit TH, Owens RC, McGowan JE Jr, Gerding DN, Weinstein RA, Burke JP, et al. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. *Clin Infect Dis.* 2007;44(2):159–77.

Cleaners (also known as environmental cleaning staff or environmental services' technicians): individuals responsible for performing environmental cleaning in health care facilities who play a key role in maintaining a clean and/or hygienic environment that facilitates practices related to the prevention and control of HAI.

Cohorting: Grouping of patients who are colonized or infected with the same resistant organism with the aim to confine their care to one area and prevent contact with other susceptible patients (for example, all patients infected or colonized with a carbapenem-resistant Enterobacteriaceae in a specific cohort and all patients colonized with methicillin-resistant *Staphylococcus aureus* in a different cohort). Cohorts are created based on clinical diagnosis, microbiological confirmation with available epidemiology, and the mode of transmission of the infectious agent.

Cohorting is reserved for situations where there are insufficient single rooms or where the cohorting of patients colonized or infected with the same pathogen is a more efficient use of hospital rooms and resources. Dedicated equipment, toilets and staff should be used for patients within the cohorted area for the required time duration.

Sources: Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. 2007 Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings (<http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf>, accessed 29 October 2019).

WHO. Guidelines for the prevention and control of carbapenem-resistant Enterobacteriaceae, *Acinetobacter baumannii* and *Pseudomonas aeruginosa* in health care facilities. 2017 (<https://www.who.int/infection-prevention/publications/guidelines-cre/en/>, accessed 29 October 2019).

Carbapenem resistance (including carbapenemase-producing [CP]): Carbapenem resistance among Enterobacteriaceae, *Acinetobacter baumannii* and *Pseudomonas aeruginosa* may be due to a number of mechanisms. Some strains may be innately resistant to carbapenems, while others contain mobile genetic elements (for example, plasmids, transposons) that result in the production of carbapenemase enzymes (carbapenemases), which break down most beta-lactam antibiotics, including carbapenems. Frequently, CP genes are co-located with other resistance genes, which can result in cross-resistance to many other antibiotic drug classes (1-3). Thus, while carbapenem-resistant strains of these pathogens are frequently CP (CP-Enterobacteriaceae [CPE], CP-A. *baumannii*, CP-P. *aeruginosa*), they may have other carbapenem resistance mechanisms that

make them equally difficult to treat and manage clinically. Thus, the term “carbapenem-resistant Enterobacteriaceae” includes all strains that are carbapenem-resistant, including CPE. For this reason, infection prevention and control actions should focus on all strains of carbapenem-resistant Enterobacteriaceae, *A. baumannii* and *P. aeruginosa*, regardless of their resistance mechanism. Adequate infection prevention and control measures are essential in both outbreak and endemic settings. Source: WHO. Guidelines for the prevention and control of carbapenem-resistant Enterobacteriaceae, *Acinetobacter baumannii* and *Pseudomonas aeruginosa* in health care facilities. 2017 (<https://www.who.int/infection-prevention/publications/guidelines-cre/en/>, accessed 29 October 2019).

Decontamination of medical devices: Removes soil and pathogenic microorganisms from objects so they are safe to handle, subject to further processing, use or discard (see also **Reprocessing**).

Source: United States Centers for Disease Control and Prevention. Guidelines for disinfection and sterilization in healthcare facilities. 2008 (<https://www.cdc.gov/infectioncontrol/pdf/guidelines/disinfection-guidelines-H.pdf>, accessed 29 October 2019).

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.

Source: WHO guidelines on hand hygiene in health care. 2009 (<https://www.who.int/gpsc/5may/tools/9789241597906/en/>, accessed 29 October 2019).

HEALTH CARE FACILITIES' CLASSIFICATION

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.

Source: WHO. Water and sanitation for health facility improvement tool (WASH FIT). 2017 (<https://apps.who.int/iris/bitstream/handle/10665/254910/9789241511698-eng.pdf;jsessionid=0A60107AA8F5A27C5FD16B0823D3F4FA?sequence=1>, accessed 29 October 2019).

PRIMARY, SECONDARY AND TERTIARY HOSPITALS

Primary-level hospital: Few specialties—mainly internal medicine, obstetrics and gynaecology, paediatrics and general surgery, or just general practice; limited laboratory services available for general, but not specialized, pathological analysis.

Secondary-level hospital: 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*.

Tertiary-level hospital: 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*.

Source: WHO. Disease control priorities in developing countries. 2008 (<https://www.who.int/management/facility/ReferralDefinitions.pdf>, accessed 29 October 2019).

Improved sanitation facilities: Toilet facilities that hygienically separate human excreta from human contact. Examples include flush/pour flush to a piped sewer system, septic tank or pit latrine, ventilated pit latrine, pit latrine with slab or composting toilet.

Source: WHO/UNICEF. Core questions and indicators for monitoring WASH in health care facilities in the Sustainable Development Goals. 2018 (<https://apps.who.int/iris/bitstream/handle/10665/275783/9789241514545-eng.pdf?ua=1>, accessed 29 October 2019).

Improved water source: Defined by the WHO/UNICEF Fund Joint Monitoring Programme as a water source that by its nature of construction adequately protects the source from outside contamination, particularly faecal matter. Examples include: public taps or standpipes; protected dug wells; tube wells; or boreholes.

Source: WHO/UNICEF. Progress on sanitation and drinking water. 2015 update and Millennium Development Goals assessment (https://www.unicef.org/publications/index_82419.html, accessed 29 October 2019).

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.

Source: Definition used in this document and developed by the expert group.

IPC professional: Health care professional trained in a certified postgraduate IPC course or a nationally recognized course.

Source: WHO. Infection prevention and control assessment framework tool (IPCAF) (<http://www.who.int/infection-prevention/tools/core-components/en/>, accessed 29 October 2019).

IPC focal point: Professional (nurse, doctor, or other) appointed to be in charge of IPC at the national or facility level who has a specific professional background, that is, formal postgraduate training in IPC leading to the successful achievement of a certificate or diploma.

Source: WHO. IPCAF (<http://www.who.int/infection-prevention/tools/core-components/en/>, accessed 29 October 2019).

IPC link professional: Nurse or doctor in a ward or facility who has been trained in IPC (using a nationally approved in-service training package; no postgraduate certificate/diploma required) and links to an IPC focal point/team at a higher level in the organization (for example, IPC focal point/team in the facility or at the district level). IPC is not the primary assignment of this professional but, among others, he/she may undertake the following tasks: support implementation of IPC practices; provide mentorship to colleagues; undertake monitoring activities; and alert on possible infectious risks.

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.

Source: WHO. IPCAF (<http://www.who.int/infection-prevention/tools/core-components/en/>, accessed 29 October 2019).

IPC structural indicators: Appropriate clean and hygienic environment, water, sanitation and hygiene services and availability of materials and equipment for IPC, in particular for hand hygiene, including financial, human and information resources compatible with standards set out by government authorities or other bodies responsible for the control and prevention of health care-associated infections.

Source: WHO. Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. 2016 (<https://www.who.int/infection-prevention/publications/core-components/en/>, accessed 29 October 2019).

IPC process indicators: Measurement of compliance with IPC activities currently used within the facility and the presence of IPC policies, procedures and protocols. Hand hygiene is an essential process indicator to be monitored.

Source: WHO. Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. 2016 (<https://www.who.int/infection-prevention/publications/core-components/en/>, accessed 29 October 2019).

Multimodal 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.

Source: WHO. Improving infection prevention and control at the health facility. 2018 (<https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>, accessed 29 October 2019).

Negative pressure mechanical ventilation system:

A mechanical ventilation system in which the exhaust airflow rate is greater than the supply airflow rate. The room will be at a lower pressure than the surrounding areas.

Source: WHO. WHO guidelines on tuberculosis infection prevention and control. 2019 (<https://apps.who.int/iris/bitstream/handle/10665/311259/9789241550512-eng.pdf?ua=1>, accessed 29 October 2019).

Patient zone: Concept related to the 'geographical' visualization of key moments for hand hygiene. It contains the patient X and his/her immediate surroundings. This typically includes the intact skin of the patient and all inanimate surfaces that are touched by or in direct physical contact with the patient, such as the bed rails, bedside table, bed linen, infusion tubing and other medical equipment. It also contains surfaces frequently touched by health care workers while caring for the patient, such as monitors, knobs and buttons, and other 'high frequency' touch surfaces.

Source: WHO Guidelines on hand hygiene in health care. 2009 (<https://www.who.int/gpsc/5may/tools/9789241597906/en/>, accessed 29 October 2019).

Personal protective equipment: Specialized clothing or equipment worn to protect the health care worker or any other person from infection. These usually consist of standard precautions: gloves, mask and gown. If bloodborne or airborne infections, these will include face protection, goggles and mask or face shield, gloves, gown or coverall, head cover and rubber boots.

Source: WHO. Medical devices. 2014 (https://www.who.int/medical_devices/meddev_ppe/en/, accessed 29 October 2019).

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).

Source: WHO Guidelines on hand hygiene in health care. 2009 (<https://www.who.int/gpsc/5may/tools/9789241597906/en/>, accessed 29 October 2019).

Positive pressure mechanical ventilation system: A mechanical ventilation system in which the supply airflow rate is greater than the exhaust airflow rate. The room will be at a higher pressure than the surrounding areas.

Source: WHO. Natural ventilation for infection control in health-care settings. 2009 (https://www.who.int/water_sanitation_health/publications/natural_ventilation.pdf, accessed 29 October 2019).

Protocol: Detailed plan of a scientific or medical experiment, treatment or procedure.

Reprocessing of medical devices: All steps that are necessary to make a contaminated reusable medical device ready for its intended use. These steps may include cleaning, functional testing, packaging, labelling, disinfection and sterilization.

Source: WHO. Decontamination and reprocessing of medical devices for health care facilities. 2016 (<https://www.who.int/infection-prevention/en/>, accessed 29 October 2019).

Standard operating procedure: Set of step-by-step instructions compiled by an organization to help workers carry out routine operations in the most effective manner.

Standard precautions: A set of activities designed to prevent the transmission of organisms between patients/staff for the prevention of health care-associated infection. They must be applied to ALL patients who require health care, by ALL health workers in ALL health settings. They include: hand hygiene; use of personal protective equipment; handling and disposal of waste and sharps; handling and management of clean and used linen; environmental cleaning; and decontamination of equipment. Source: The Northern Ireland Regional Infection and Prevention Control Manual. Standard precautions. Updated 2015 (<https://www.niinfectioncontrolmanual.net/standard-precautions>, accessed 29 October 2019).

Transmission-based precautions: Additional measures focused on the particular mode of transmission of the microorganism and

always used in addition to standard precautions. They are grouped into categories according to the route of transmission of the infectious agent. Transmission-based precautions should be applied when caring for patients with known infection, patients who are colonized with an infectious organism, and asymptomatic patients who are suspected of/under investigation for colonization or infection with an infectious microorganism.

Source: The Northern Ireland Regional Infection and Prevention Control Manual. Transmission-based precautions. Updated 2015 (<https://www.niinfectioncontrolmanual.net/transmission-based-precautions>, accessed 29 October 2019).

Water quality: The quality of water is affected by microbial, chemical and radiological aspects, with microbial aspects constituting the principle concern for infection control in health care settings. Water in health care facilities should not present a risk to health from pathogens and should be protected from contamination inside the health care setting itself. Water for drinking, cooking, personal hygiene, medical activities, cleaning and laundry must be safe for the purpose intended. 'Safe' water is water that meets national and/or WHO water quality guidelines, including zero *Escherichia coli* or thermotolerant coliform bacteria in any 100-millilitre sample of drinking water. *Source:* WHO. Drinking water quality guidelines. 2017 (https://www.who.int/water_sanitation_health/publications/drinking-water-quality-guidelines-4-including-1st-addendum/en/, accessed 29 October 2019).

KEY TO SYMBOLS



Visual representation of the WHO core components of infection prevention and control (IPC) programmes at the national and health care facility level.



Visual representation of minimum versus full requirements of the core components to achieve effective IPC programmes.



Key people to be involved in an activity.



Process undertaken to develop the document.



How the document is structured.



Achieving the effective implementation of the IPC core components.



Content relevant for the national level.



Content relevant for the health care facility level.

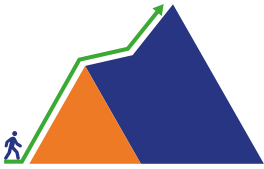
PART 1. INTRODUCTION



Why should health systems have strong infection prevention and control (IPC) programmes?

Preventing harm to patients, health workers and visitors due to infection in health care facilities is fundamental to achieve quality care, patient safety, health security and the reduction of health care-associated infections (HAIs) and antimicrobial resistance (AMR). Similarly, preventing and reducing the transmission of infectious diseases that pose global threats, such as pandemic influenza, Ebola virus disease and other viral haemorrhagic fevers, is paramount. Clean, safe care is a patient right and should also be the duty and pride of all those working in the health care sector. Supported by many stakeholders in the field of IPC, WHO has issued recommendations and specifications for effective IPC programmes. These are included in the evidence-based WHO *Guidelines on core components of IPC programmes* (1) and the approach for their implementation is presented in associated manuals for both the national and facility levels (2, 3).

IPC is a cross-cutting issue in health care. Strong, effective IPC programmes have the ability to influence the quality of care, improve patient safety and protect all those providing care in the health system. The implementation of all WHO recommendations on core components is required to build functioning programmes leading to the effective reduction of HAIs and AMR. However, fulfilment of all IPC core components takes time. For some countries, it may be a demanding journey that will need to build upon a realistic, stepwise approach. In particular for countries where IPC is limited or inexistent, it is critical to start by ensuring that at least *minimum requirements* for IPC are in place as soon as possible, both at the national and facility level, and to gradually progress to the full achievement of all requirements of the IPC core components according to local priority plans. Patients and health care workers (HCWs) need to be safe and protected at all times, no matter where and irrespective of the context. The eight core components of IPC are the 'wheels of the cart' that will ensure patients have a safe journey while in a health care facility.



What are the *minimum requirements* for IPC programmes?

1.1 PURPOSE OF THE DOCUMENT

The **purpose** of this document is to present and promote the *minimum requirements* for IPC programmes at the national and health care facility level, identified by expert consensus according to available evidence and in the context of the WHO core components.

The *minimum requirements* are defined as:

IPC standards that should be in place at the national and facility level to provide minimum protection and safety to patients, HCWs and visitors, based on the WHO core components for IPC programmes.



Who should implement the *minimum requirements* for IPC programmes?

1.2 TARGET AUDIENCE

The main target audience of this document are IPC and AMR focal points/leads, policy-makers, senior managers and other professionals with the mandate of or interested in developing or strengthening IPC programmes at the national, sub-national and facility level.

IPC teams and committees are also the critical target audience of this document. Key players in addressing each of the *minimum requirements* are also indicated in the specific chapters related to each core component.

The document could also be helpful to other stakeholders, such as those responsible for health care quality improvement, patient safety, health facility accreditation/regulation, public health, infectious disease control and surveillance, water, sanitation and hygiene (WASH), occupational

health, antimicrobial stewardship programmes, clinical microbiology and environmental health interventions, as well as additional categories of health care professionals involved in care delivery. WHO staff, partners in nongovernmental organizations and donors involved in supporting the development or implementation of IPC and WASH capacity building, AMR national action plans and, the core capacities of the International Health Regulations at country level (4), will also benefit from using this document.

Of note, IPC implementation is the responsibility of all HCWs and not the sole responsibility of the IPC teams or policy-makers. Therefore, it is important that all HCWs are made aware of the IPC *minimum requirements*. Consideration should be given to providing an active orientation on IPC *minimum requirements* (for example, pre-service training, updates within annual in-service training, etc.) to health workers, based on the different areas of work and functions.



How was this document developed?

1.3 DOCUMENT DEVELOPMENT AND STRUCTURE

A group of international experts and professionals working at national and facility levels in the field of IPC was convened by WHO, with support by the United States Centers for Disease Control and Prevention and the Africa Centre for Disease Control and Prevention. Plenary sessions were held to identify the objectives and scope of the project and to define the concept of *minimum requirements*. Working groups were formed to identify *minimum requirements* for each IPC core component at the national and the health facility levels, based on existing IPC and WASH recommendations and standards. For the purpose of this work, health facilities were categorized as primary health care facilities, secondary health care facilities (including primary and secondary hospitals) and tertiary health care facilities (tertiary hospitals). Based on proposals by the working groups, all participants expressed their opinion on the *minimum requirements* by voting. Only those identified with >70% consensus was accepted and included in this document. The cut-off of 70% was based on evidence from studies on consensus building to ensure a high consensus rate among the expert group (5-7). Mention is made of requirements with a lower level of consensus in the rationale ('why') sections of each *minimum requirements'* chapter. A second round of review of the *minimum requirements'* content and language was undertaken with the participants after the international meeting. Finally, international experts and WHO staff not participating in the meeting were asked to provide an external review and input to the final draft document.



How is this document structured?

The document includes four parts.

Part 1 is an introduction that includes sections of paramount importance to understand the remaining content of the document and the *minimum requirements* for IPC programmes.

The *minimum requirements* are summarized in **Part 2** of this document, together with the WHO evidence-based recommendations for each IPC core component (1).

Part 3 is an in-depth review exploration of each core component and its *minimum requirements* for the national and health care facility levels (Box 1).

Part 4 includes summaries of the results of a systematic review and inventory of available publications IPC minimum standards, used as the evidence basis for the development of this document.

BOX 1

STRUCTURE OF THE MINIMUM REQUIREMENTS (PART 3)

WHAT	WHO	HOW	WHY	FULL REQUIREMENTS
<i>Minimum requirements</i>	Is responsible for action	To measure progress	Rationale and additional details on the <i>minimum requirements</i>	Full core component requirements
Text of the <i>minimum requirements</i> for each IPC core component identified by expert consensus according to national and health care facility level and based on existing IPC and WASH recommendations and standards.	Identification of those who have the mandate to ensure that the <i>minimum requirements</i> are put in place and sustained or can play a role.	Indicators to be used to track implementation and progress for each <i>minimum requirement</i> are available from different WHO monitoring tools.	Explanations about the reasons for selecting the agreed <i>minimum requirements</i> (rationale) and additional details explaining their content and importance.	Comprehensive list of the actions and requirements* to achieve full implementation of each IPC core component. Note that these exist only for acute care hospitals because the WHO recommendations on IPC core components apply mainly to these facilities and not specifically to primary care facilities.

* Note that in some cases, there are no major differences compared to the *minimum requirements*.



How can the *minimum requirements* help achieve effective implementation of the IPC core components?

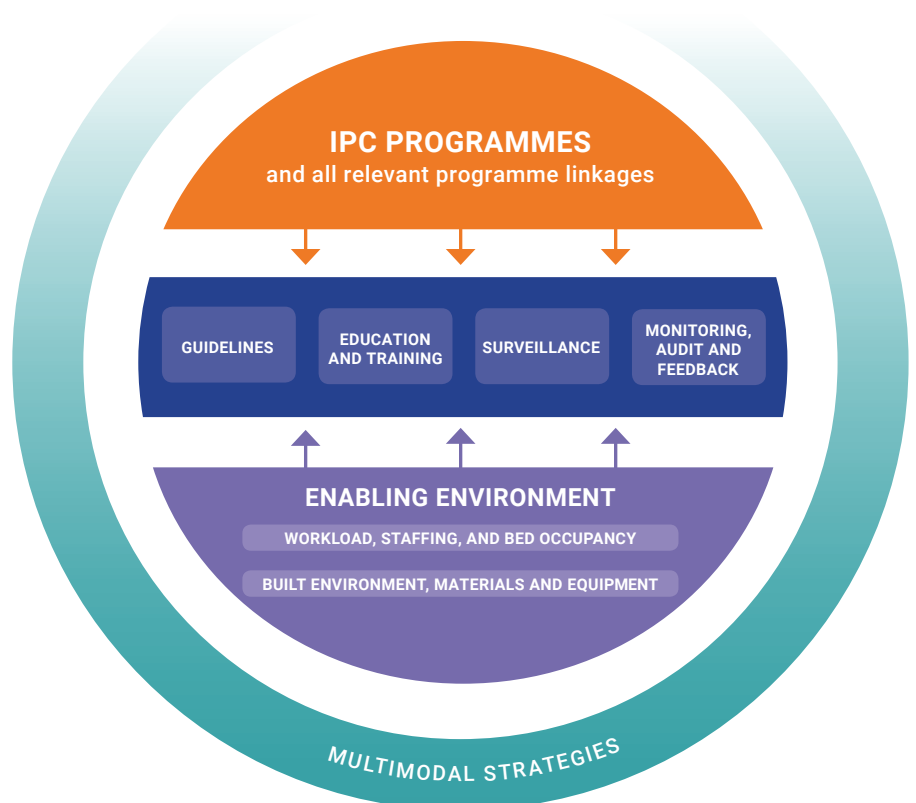
1.4 ROLE OF THE *MINIMUM REQUIREMENTS*

It is important to note that the gold standard in any country is to achieve the full implementation of all requirements of the WHO core components of IPC programmes (Fig. 1) (1).

For this reason, governments and facilities should take steps to work towards this goal, including in the context of national action plans for AMR, quality of care and health security.

Fig. 1

Visual representation of the WHO core components of IPC programmes.



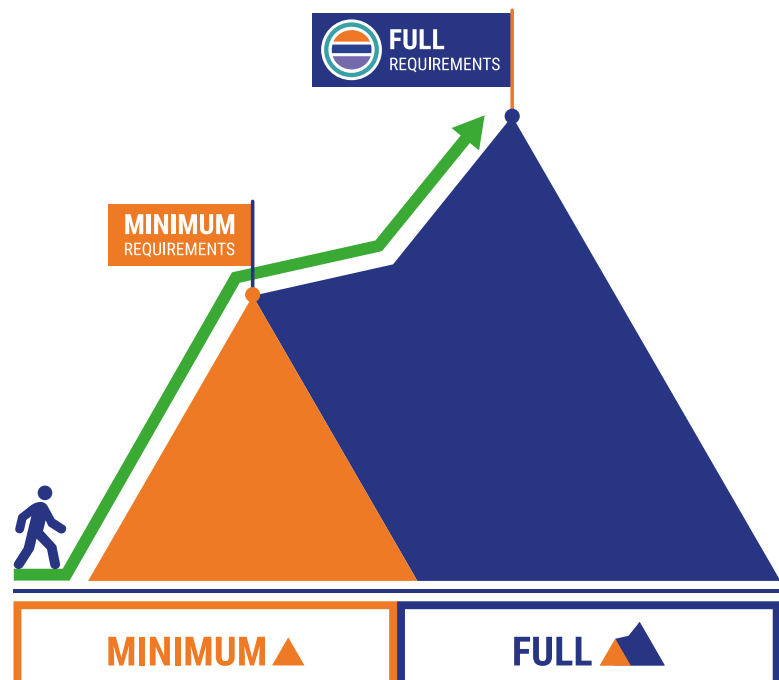
The approach to facilitate implementation of the WHO core components, together with real-life examples from countries and facilities around the world, is described in the WHO practical manuals developed for the national and facility levels (2, 3).

Anyone interested in understanding and implementing the *minimum requirements* should read the WHO Guidelines on core components of IPC programmes (1) and the manuals supporting their implementation at the national and facility levels (2, 3).

However, it is recognized that countries may be at different levels of progress, with different capacities, available opportunities and resources.

Thus, the minimum requirements represent the starting point for undertaking the journey to build strong and effective IPC programmes at the national and facility level (Fig. 2) and SHOULD be in place for all countries and health care facilities to support further progress towards full implementation of all core components.

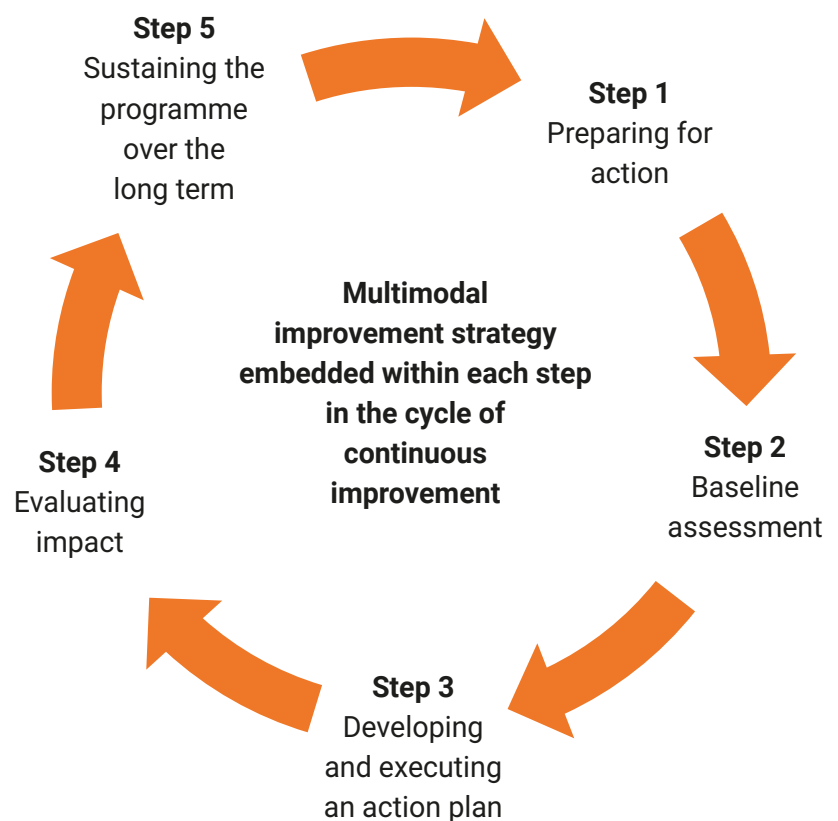
Fig. 2
Minimum versus full requirements to achieve effective IPC programmes.



Whether applying the *minimum requirements* or full requirements, the implementation of the IPC core components should always be tackled using a stepwise approach, based on a careful assessment of the status of the IPC programme and activities locally. A country or a health facility may not be able to aim at putting in place all core components or even all *minimum requirements* at the same time. Therefore, when preparing to improve IPC, it is essential to start by using standardized tools and indicators developed and validated for assessing the status of the core components at the national or health facility in any country worldwide, regardless of the geographical location and level of income. Depending on the strengths (core component requirements/features already in place) and the gaps (requirements/features not available or in place) identified through the assessment, a prioritization exercise can then help to identify which core components and minimum or full requirements need to be targeted through an improvement action plan tailored to the local context, expertise and resources available. To undertake this process, WHO proposes a five-step cycle of implementation (*Fig. 3 and Box 2*) to support any IPC improvement intervention or programme as described further in the practical manuals (2, 3, 8).

Fig. 3

The five-step cycle to IPC improvement.



BOX 2**THE FIVE-STEP CYCLE TO INFECTION PREVENTION AND CONTROL IMPROVEMENT**

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Preparing for action	Baseline assessment	Developing and executing an action plan	Assessing impact	Sustaining the programme over the long term
<p>This step aims to ensure that all of the prerequisites that need to be in place for the success of an IPC intervention or programme are considered. These include starting to think about the identification of key players and their roles and responsibilities, as well as the necessary resources (human and financial), infrastructure/s, planning and coordination of activities. Of note, the preparations made can be refined through step 3 after conducting step 2.</p>	<p>Conducting an objective baseline assessment of the current situation of the IPC core components and <i>minimum requirements</i> is critical for the identification of existing strengths and gaps. Standardized and validated assessment indicators and tools available from WHO are listed in Part 3. The national and facility level standardized tools to assess the IPC core components and WASH are described in Boxes 3-5.</p>	<p>Developing a tailor-made action plan that addresses the local reality and focuses on the priority areas for improvement identified through the baseline assessment. The development and execution of an action plan should be based upon a multimodal improvement strategy and supported by a dedicated budget.</p>	<p>Conducting a follow-up assessment using the same tools as in step 2 is crucial to determine the effectiveness of the plan and achievement of the <i>minimum requirements</i>.</p>	<p>Further review of the long term impact and acceptability of the ongoing action plan, and ensuring its sustainability, are important steps in the cycle of improvement. This allows also an evaluation of the next steps and priorities for implementation of all <i>minimum requirements</i> and the IPC core components in full.</p>

BOX 3**NATIONAL INFECTION PREVENTION AND CONTROL ASSESSMENT TOOL 2 (IPCAT2) (9)**

Type of tool and purpose	Structure	Who should complete it
<p>Standardized assessment tool designed to determine the IPC core components already in place (existing strengths) and to identify gaps or weaknesses at the national level. The main purpose of IPCAT2 is to support implementation, thereby providing a road map to guide IPC actions.</p>	<p>IPCAT2 includes six sections corresponding to the six core component recommendations targeted at the national level, with an associated scoring system.</p>	<p>The tool is intended to be used for self-assessment by the national IPC team and/or committee, but it can also be used for joint assessments with external experts or external assessments.</p>

BOX 4 FACILITY INFECTION PREVENTION AND CONTROL ASSESSMENT FRAMEWORK (IPCAF) (10)

Type of tool and purpose	Structure	Who should complete it
Validated assessment tool designed to measure the IPC situation of a health care facility and determine the core components already in place (existing strengths) and to identify gaps or weaknesses to guide action planning.	Structured, closed-formatted questionnaire with an associated scoring system, which includes eight sections corresponding to the eight core component recommendations targeted at the facility level.	The tool is meant to be completed by health care professionals responsible for organising and implementing IPC measures and who have in-depth knowledge of IPC at the facility level (IPC focal point or team or committee), but it can also be used for joint assessments with or external assessments by external experts.

BOX 5 WASH FIT (11)

Type of tool and purpose	Structure	Who should complete it
Improvement tool to be used on a continuous and regular basis to help health care facility staff and administrators prioritize and improve WASH and health care waste management infrastructures and services in facilities in low- and middle-income countries; and to inform broader district, regional and national efforts to improve quality health care. WASH FIT complements the IPCAF and provides a greater depth of information on the built environment.	WASH FIT covers four broad areas: water, sanitation (including health care waste management), hygiene (hand hygiene and environmental cleaning) and management.	The tool is meant to be used by health care facility managers and staff including the chief medical officer, the financial administrator, doctors, nurses and persons in charge of managing water and waste. Other people outside the facility may also be involved, such as local, district and regional WASH and/or public works authorities, representatives from the community, local and regional government authorities involved in implementing national quality health care, IPC and maternal, newborn and child health strategies, donors, and nongovernmental organizations (NGOs).

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PART 2. EXECUTIVE SUMMARY OF THE MINIMUM REQUIREMENTS BY CORE COMPONENT

CORE COMPONENT 1: IPC PROGRAMMES



NATIONAL LEVEL



CORE COMPONENT RECOMMENDATION

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



The panel recommends that 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.
- a dedicated budget for implementing IPC strategies/plans.

■ PRIMARY CARE:

IPC trained health care officer

- 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

- Trained IPC focal point (one full-time trained IPC Officer [nurse or doctor]) as per 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 focal point (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.

CORE COMPONENT 2: IPC GUIDELINES



NATIONAL LEVEL AND FACILITY LEVEL

CORE COMPONENT RECOMMENDATION

The panel recommends that evidence-based guidelines should be developed and implemented for the purpose of reducing HAI and AMR. The education and training of relevant HCWs on the guideline recommendations and the monitoring of adherence with guideline recommendations should be undertaken to achieve successful implementation.

NATIONAL LEVEL



FACILITY LEVEL



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.
- At 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
 - HCW protection (for example, post-exposure prophylaxis, vaccinations)
 - aseptic techniques
 - triage of infectious patients
 - 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);
- aseptic technique for invasive procedures, including surgery;
- specific SOPs to prevent the most prevalent HAIs based on the local context/epidemiology;
- occupational health (specific detailed SOP).

CORE COMPONENT 3: IPC EDUCATION AND TRAINING



NATIONAL LEVEL



CORE COMPONENT RECOMMENDATION

The national IPC programme should support education and training of the health workforce as one of its core functions.

FACILITY LEVEL



The panel recommends that IPC education should be in place for all HCWs 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 HCWs 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 hiring

- 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.

CORE COMPONENT 4: HAI SURVEILLANCE



NATIONAL LEVEL



FACILITY LEVEL



CORE COMPONENT RECOMMENDATION

The panel recommends that 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.

The panel recommends that facility-based HAI surveillance should be performed to guide IPC interventions and detect outbreaks, including AMR surveillance, with timely feedback of results to HCWs 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;
 - 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 sub-national 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;
 - 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.

CORE COMPONENT 5: MULTIMODAL STRATEGIES



NATIONAL LEVEL



CORE COMPONENT RECOMMENDATION

The panel recommends that national IPC programmes should coordinate and facilitate the implementation of IPC activities through multimodal strategies on a nationwide or sub-national level.

FACILITY LEVEL



The panel recommends that IPC activities using multimodal strategies should be implemented to improve practices and reduce HAI and AMR.

MINIMUM REQUIREMENTS

Multimodal improvement strategies for IPC interventions

- Use of multimodal strategies 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, 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.

CORE COMPONENT 6: MONITORING, AUDITING AND FEEDBACK



NATIONAL LEVEL



CORE COMPONENT RECOMMENDATION

The panel recommends that 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.

FACILITY LEVEL



The panel recommends that 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.

MINIMUM REQUIREMENTS

IPC surveillance and 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 and, for IPC indicators monitoring:
 - develops recommendations for minimum indicators (for example, hand hygiene);
 - develops an integrated system for the collection and analysis of data (for example, protocols, tools)
 - provides training at the facility level to collect and analyse these data.

■ 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 sub-national level.

■ SECONDARY AND TERTIARY CARE

- 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.

CORE COMPONENT 7: WORKLOAD, STAFFING AND BED OCCUPANCY (FACILITY LEVEL ONLY*)



FACILITY LEVEL*

CORE COMPONENT RECOMMENDATION

The panel recommends that 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) HCW staffing levels should be adequately 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:** assessment of appropriate staffing levels, depending on the categories identified when using WHO/national tools (national norms on patient/staff ratio), and development of 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;
 - hospital administration enforcement of the system developed;
 - no more than one patient per bed;
 - spacing of at least one metre between the edges of beds;
 - overall occupancy should not exceed the designed total bed capacity of the facility.
- **To reduce overcrowding and optimizing staffing levels:** same *minimum requirements* as for primary health care.

*The national health system, IPC programme and any other relevant body should coordinate and support the implementation of this core component at the facility level.

CORE COMPONENT 8: BUILT ENVIRONMENT, MATERIALS AND EQUIPMENT FOR IPC (FACILITY LEVEL ONLY*)



FACILITY LEVEL

CORE COMPONENT RECOMMENDATION

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. The panel recommends that 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 alcohol-based handrub (ABHR) at points of care 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); 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 (PPE) 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.

■ 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 national health system, IPC programme and any other relevant body should coordinate and support the implementation of this core component at the facility level.

- 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

PART 3. IN-DEPTH REVIEW OF THE MINIMUM REQUIREMENTS

CORE COMPONENT 1: IPC PROGRAMMES



WHAT (minimum requirements)

NATIONAL LEVEL



A functional IPC programme should be in place, including at least:

- one full-time focal point trained in IPC;
- a dedicated budget for implementing IPC strategies/plans.

FACILITY LEVEL



■ PRIMARY CARE

IPC-trained link person and health care officer

- 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

- Trained IPC focal point (one full-time trained IPC Officer [nurse or doctor]) as per 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 focal point (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.

WHO (is responsible for action)

NATIONAL LEVEL



- Minister of health or other assigned senior authority within the ministry of health (for example, Director General of Health Services) at national and/or state level.
- Minister of finances may also have an important role in allocating a dedicated budget for IPC.
- Leads of other programmes where links can be useful for synergistic action (for example, HAI, AMR, WASH).
- National IPC committee or technical working group, depending on the country situation as in some countries the committee exists, but there is no national IPC focal point or team to take action. Thus, the IPC committee can have a critical role in advocating for establishing a national IPC focal point.
- IPC technical partners have an important role in advocating for and supporting (also financially in some cases) the establishment of an IPC focal point (for example, WHO country office, WHO Regional Office, UNICEF, United States Centers for Disease Control and Prevention [CDC], and other organizations with competence and activities in the field of IPC).

FACILITY LEVEL



- All key players mentioned at the national level can influence and/or mandate the establishment of IPC link persons, IPC focal points and IPC committees at the health care facility level and of IPC officers at the next administrative level.
- Directors of health or health management teams (or other decision-making role) at the district or province or state level (or other administrative level depending on the country).
- At secondary and tertiary health care facility level, hospital director, medical director, chief nurse and finance office director have a critical role in the decision to establish the minimum requirements for core component 1.
- Existing IPC committee (or similar) at the facility or next administrative level.
- Local partners have an important role in advocating for and supporting (also financially in some cases) the establishment of IPC *minimum requirements* at the facility level.

HOW (to measure progress)

NATIONAL LEVEL INDICATORS (YES/NO)



- IPC assessment tool 2 (IPCAT2) – 1.1.1: an active national IPC programme exists.
- IPCAT2 – 1.1.2: an appointed infection prevention focal person in charge of the IPC programme can be identified.
- IPCAT2 – 1.1.4: the appointed infection prevention focal person has undergone training in IPC in the prevention of HAI.
- IPCAT2 – 1.1.7: there is a dedicated budget allocated to the IPC programme.

FACILITY LEVEL INDICATORS (YES/NO)



■ PRIMARY CARE

- A trained IPC link person, with dedicated time is available in each primary health care facility.
- IPC interventions included in the facility annual plan.
- A trained IPC health care officer is available at the next administrative level (for example, district) to supervise the IPC link professionals.

■ SECONDARY CARE

- Infection prevention and control assessment framework tool (IPCAF) – 1.1: an IPC programme exists.
- IPCAF – 1.3: at least one full-time trained IPC focal person (nurse or doctor) is in place per 250 beds.
- IPCAF – 1.4: the IPC focal point has dedicated time for IPC activities in all facilities regardless of the number of beds.
- IPCAF – 1.9: there is a dedicated budget specifically for the IPC programme, that is, covering IPC activities, including salaries.

■ TERTIARY CARE

- IPCAF – 1.1: an IPC programme exists.
- IPCAF – 1.3: at least one full-time trained IPC focal person (nurse or doctor) is in place per 250 beds.
- IPCAF – 1.6: there is a multidisciplinary IPC committee actively supporting the IPC team.
- IPCAF – 1.9: there is a dedicated budget specifically for the IPC programme, that is, covering IPC activities, including salaries.
- IPCAF – 1.10: the IPC programme has access to a microbiological laboratory, either present on- or off-site for routine day-to-day use.

NATIONAL LEVEL SOURCES AND RESOURCES¹

Sources

- IPCAT2 results (where available; use the autogenerated results and graphics available in the Excel file of IPCAT2); <https://www.who.int/infection-prevention/tools/core-components/en/>.
- WHO. State Party Self-assessment Annual Reporting Tool. International Health Regulations (2005). 2018; <https://www.who.int/ihr/publications/WHO-WHE-CPI-2018.16/en/>.
- WHO. Joint External Evaluation (JEE) report (where available) 2nd edition, 2018; <https://www.who.int/ihr/procedures/joint-external-evaluations/en/>.
- Food and Agriculture Organization of the United Nations; Organisation for Animal Health; WHO. Global monitoring of country progress on antimicrobial resistance (AMR): Tripartite AMR country self-assessment survey (TrACSS), version 3.0, report (where available). 2018; <https://www.who.int/antimicrobial-resistance/global-action-plan/Tripartite-antimicrobial-resistance-country-self-assessment-questionnaire-2018-EN.pdf?ua=1>.

FACILITY LEVEL SOURCES AND RESOURCES



Sources

- IPCAF results report (where available; use the template presentation); <https://www.who.int/infection-prevention/tools/core-components/IPCAF-template.pdf?ua=1>.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level. 2016; <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. 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. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.
- Twinning partnerships for improvement; <https://www.who.int/servicedeliverysafety/twinning-partnerships/en/>.

¹ Sources refers here to possible information that may be available from existing sources that can be used to extract relevant information in order to address each indicator. Resources lists available relevant implementation tools and resources.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level (2016); <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. Interim practical manual supporting national implementation of the WHO guidelines on core components of infection prevention and control programmes. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.
- Association for Professionals in Infection Control and Epidemiology (APIC). HAI cost calculator; <https://apic.org/resources/cost-calculators/>.
- European Centre for Disease Prevention and Control. Core competencies for infection control and hospital hygiene professionals in the European Union. 2013; <https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/infection-control-core-competencies.pdf>.

WHY (rationale and additional details on the *minimum requirements*)

NATIONAL LEVEL



- At least one professional (nurse or doctor) must be given the responsibility of IPC at the national level. He/she should have at least basic knowledge and training on IPC (ideally, an IPC postgraduate certificate) and some practical experience.
- Once the person is in place, having some resources (budget) is essential to operate.
- Based on this, the objectives, functions and activity plan will be developed by the IPC focal point in collaboration with other national programmes and institutions, as well as external partners.

FACILITY LEVEL



■ PRIMARY CARE

- The primary health care level is the first main point of entry of infectious pathogens to the health system and it is where IPC is usually weakest.
- It is critical to establish at least a basic level of IPC and triage in primary care (that is, the *minimum requirements*) to avoid infection and AMR spread through the health system, including health care-associated outbreaks caused by human-to-human transmission of emerging or re-emerging pathogens.
- It is important to have professionals in charge of IPC at different levels (facility and at the next administrative level) to support a programmatic approach based on coordination, supervision and accountability through monitoring and evaluation.
- The existence of an IPC programme and practices at the primary care level will contribute to patient safety and quality of care and facilitate linkages to the community and dissemination of basic prevention principles among families, as well as patient and family engagement.
- The link person should be a staff member at the primary health care facility level, trained in IPC and with dedicated time (part-time).
- In facilities with more than 10 HCWs, the IPC link person should be in charge of the following functions: advising on procurement and maintenance of equipment and consumables for IPC; monitoring and supervising IPC activities; liaising with the relevant next administrative level IPC coordinators on the implementation of IPC activities; liaising with the regular disease notification system for the reporting of unusual events.
- In facilities with less than 10 HCWs, the link person could have some of the above-mentioned functions but, overall, more support from the district officer will be needed, especially for monitoring activities.

■ SECONDARY AND TERTIARY CARE

- A comprehensive and functioning IPC programme should be in place in all acute health care facilities because evidence demonstrates a large effect on HAI reduction.
- The existence of an IPC focal point and budget are necessary conditions for building an IPC programme with objectives and plans, and the necessary premise for any IPC action.
- The number of staff needed depends on patient acuity and the complexity of care in the facility, as well as the multiple roles and responsibilities of IPC professionals.

Full core component requirements

NATIONAL LEVEL



- Active, stand-alone, national IPC programme with clearly defined objectives, functions and activities.
- Technical trained IPC team (medical and nursing professionals) with allocated time, budget and authority to make decisions.
- Strong linkages of the national IPC programmes with other relevant national programmes and professional organizations.
- Supported by at least one national external quality assurance system (EQAS) microbiological reference laboratory.
- Supported by an official multidisciplinary IPC committee.

FACILITY LEVEL



■ PRIMARY CARE

Not applicable.

■ SECONDARY AND TERTIARY CARE

- IPC programmes with clearly defined objectives based on local epidemiology and priorities according to risk assessment and functions that align with and contribute to the prevention of HAI and the spread of AMR in health care.
- Dedicated, trained professionals in every acute care facility.
- A minimum ratio of one full-time or equivalent IPC professional (nurse or doctor) per 250 beds or a higher ratio (one IPC professional per 100 beds) due to increased patient acuity and complexity, as well as the multiple roles and increasing responsibilities of the IPC professional.
- External quality control system support of the microbiological laboratory is important for an effective IPC programme.

CORE COMPONENT 2: IPC GUIDELINES



WHAT (minimum requirements)

NATIONAL LEVEL



National IPC guidelines

- Evidence-based, nationally-approved guidelines adapted to the local context and reviewed at least every five years.

FACILITY LEVEL



PRIMARY CARE

Facility-adapted SOPs and their monitoring

- Evidence-based facility-adapted SOPs based on the national IPC guidelines.
- At 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
 - HCW protection (for example, at least post-exposure prophylaxis, vaccinations)
 - aseptic techniques
 - triage of infectious patients
 - 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);
- aseptic technique for invasive procedures, including surgery;
- specific SOPs to prevent the most prevalent HAIs based on local context/epidemiology;
- occupational health (detailed).

WHO (is responsible for action)

NATIONAL LEVEL



- National IPC focal point (and IPC team or committee, if existing) as guideline development and implementation are key activities in their mandate.
- In a country where the IPC focal point/team is newly established and has limited experience/expertise, consider external IPC technical support as needed for initial guideline development/review.
- Another national responsible body (for example, the national centre for disease control, institute of public health) or an academic institution collaborating with the ministry of health may also play an important role in developing IPC guidelines/SOPs.

FACILITY LEVEL



PRIMARY CARE

- Trained IPC link person, with dedicated (part-) time and/or support from an appointed IPC person at the next administrative level.
- If the expertise at the facility and next administrative level is limited, external support should be sought.

SECONDARY AND TERTIARY CARE

- The IPC focal point is responsible for writing and adapting the SOPs, promoting their adoption and monitoring adherence. If the expertise of the IPC focal point is limited, external support should be sought.
- The development and implementation of the SOPs requires a functioning IPC programme and associated expertise to ensure that local recommended procedures refer to national or

international evidence-based guidelines and standards and are adapted to the context.

- Relevant stakeholders (for example, link nurse or doctors, leading doctors, nurses, health care facility managers, champions, quality managers) should be involved in the development and adaptation of the SOPs.
- Involvement of front-line HCWs should be considered in the development and implementation of SOPs.
- The IPC focal point should also be responsible for organizing staff training on the SOPs and for monitoring adherence to the recommended procedures, in collaboration with others who may be in charge of training and assessment at the local level.

HOW (to measure progress)

NATIONAL LEVEL INDICATORS (YES/NO)



- IPCAT2 – 2.1.1: the national IPC focal point has a mandate to work with key players to produce guidelines for the prevention and control of HAI.
- IPCAT2 – 2.1.6: the national IPC focal point actively addresses guideline adaptation to reflect local conditions.
- IPCAT2 – 2.1.3: the guidelines are reviewed at least every 5 years and updated to reflect the current evidence base.

FACILITY LEVEL INDICATORS (YES/NO)



■ PRIMARY CARE

- IPCAF – 2.2: facility-adapted SOPs are available for hand hygiene, decontamination of medical devices and patient care equipment, environmental cleaning, health care waste management, injection safety, HCW protection (for example, at least post-exposure prophylaxis, vaccinations), aseptic techniques, triage, basic principles of standard and transmission-based precautions.
- IPCAF – 2.3: The guidelines/SOPs are consistent with national/international IPC guidelines (if they exist).
- IPCAF – 2.8: Routine monitoring of the implementation of at least some of the guidelines/SOPs is undertaken.

■ SECONDARY AND TERTIARY CARE

- IPCAF – 2.2: facility-adapted SOPs/guidelines are available for hand hygiene, decontamination of medical devices and patient care equipment, environmental cleaning, health care waste management, injection safety, HCW protection (for example, at least post-exposure prophylaxis, vaccinations), aseptic technique for invasive procedures, including surgery, triage, standard and transmission-based precautions, specific SOPs to prevent the most prevalent HAIs based on local context/epidemiology, and occupational health.
- IPCAF – 2.3: the guidelines/SOPs are consistent with national/international IPC guidelines (if they exist).
- IPCAF – 2.8: routine monitoring of the implementation of at least some of the SOPs is undertaken.

NATIONAL LEVEL SOURCES AND RESOURCES



Source

- IPCAT2 results (where available; use the autogenerated results and graphics available in the Excel file of IPCAT2); <https://www.who.int/infection-prevention/tools/core-components/en/>.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level (2016); <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. Improving infection prevention and control at the health facility. Interim practical manual supporting national implementation of the WHO guidelines on core components of infection prevention and control programmes. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.

FACILITY LEVEL SOURCES AND RESOURCES



Sources

- IPCAF results report (where available; use the template presentation); <https://www.who.int/infection-prevention/tools/core-components/IPCAF-template.pdf?ua=1>.
- Primary Health Care Performance Initiative. Primary health care progression model assessment tool report (where available). 2018; <https://improvingphc.org/primary-health-care-progression-model>.

Tools and resources

- WHO Guidelines on core components of IPC programmes at the national and acute health care facility level; <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. 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. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.
- CDC IPC guidelines library; <https://www.cdc.gov/infectioncontrol/guidelines/index.html>.
 - APIC: list of IPC guidelines; <https://apic.org/Professional-Practice/Scientific-guidelines>.
 - Asia Pacific Society for Infection Control IPC guidelines; <http://apsic-apac.org/guidelines-and-resources/apsicguidelines/>.

WHY (rationale and additional details on the *minimum requirements*)

NATIONAL LEVEL



- The availability of national guidelines contributes to a reduction in the risk of HAIs and AMR, especially when implemented in combination with HCW education and training.
- The development of IPC guidelines/protocols/SOPs and related implementation strategies is a key function of the national IPC focal point (or IPC team/programme if they exist).
- National guidelines are necessary to indicate the IPC standards and measures that should be adhered to and monitored, including the appropriate training of HCWs at all levels.
- National IPC guidelines should be evidence-based (that is, based on systematic reviews of the scientific literature and other existing guidelines) and ideally refer to/adapted from international standardized guidelines, if available.
- Guideline content should be prioritized locally, based on the most frequent practices and/or types of HAI and adapted to local circumstances (for example, use of indwelling catheters and other devices, surgery and other invasive procedures). However, at a minimum, the guidelines should cover the following topics:
 - hand hygiene
 - decontamination of medical devices and patient care articles
 - environmental cleaning
 - health care waste management
 - transmission-based precautions
 - injection safety
 - HCW protection
 - aseptic techniques
 - triage
 - development and implementation of strategies for training on and dissemination of the IPC guidelines are part of the *minimum requirements*.
- Regular updates (that is, at least every 5 years) are required to ensure that the guidelines reflect current evidence and remain topical and practical to the evolution of health care delivery.

FACILITY LEVEL



■ PRIMARY CARE

- At the facility level, it is not necessary to have the expertise required to develop evidence-based guidelines. It is important to develop SOPs for the implementation and monitoring of available national or international guidelines.
- IPC link professionals at the facility level should work with the IPC focal points at the next administrative level (for example, district) to develop adapted SOPs based on the national (or international) guidelines for primary care.
- Monitoring adherence to SOP implementation is essential to evaluate its adoption and effectiveness to achieve the desired outcomes and to assist with adjustments and improvements of the implementation strategies. IPC monitoring and supervision should be assured by the health care officer in charge of IPC at the next administrative level (for example, district).
- Adaptation to local conditions should be considered for the most effective uptake and implementation.

■ SECONDARY AND TERTIARY CARE

- See all points indicated for the primary health care facility level.
- A higher level of IPC expertise is required to develop SOPs in secondary and tertiary health care facilities due to the increase in acuity and complexity of care provided.
- Facility-adapted SOPs should be prioritized locally, based on the most frequent practices and/or with practices associated with an increase in the risk of HAI and adapted to local circumstances (for example, use of indwelling catheters and other devices, surgery and other invasive procedures).

Full core component requirements

NATIONAL LEVEL



- Development of national guidelines and related implementation strategies are a function of the national IPC team or focal point and require IPC expertise. Requirements (which are under the responsibility of the national programme) for developing and implementing effective national IPC guidelines:
 - IPC expertise for development or adaptation;
 - local prioritization;
 - providing resources, infrastructures and supplies for enabling implementation;

FACILITY LEVEL



■ PRIMARY CARE

Not applicable.

■ SECONDARY AND TERTIARY CARE

No major differences to be noted compared to the *minimum requirements*.

- HCW education on recommended practices;
- monitoring implementation and adherence;
- regular updates.
- To fully accomplish core component 2, guidelines on all the following topics should be developed at the national level (either in one main guideline or in specific guidelines, as feasible and appropriate according to the local context):
 - standard precautions:
 - hand hygiene
 - use of PPE
 - sterilization and medical device decontamination
 - safe handling of linen and laundry
 - health care waste management
 - patient placement
 - respiratory hygiene and cough etiquette
 - environmental cleaning
 - injection safety
 - HCW protection, safety and post-exposure prophylaxis.
 - transmission-based precautions;
 - aseptic technique and device management for clinical procedures;
 - specific guidelines to prevent the most prevalent HAIs (for example, catheter-associated urinary tract infection, surgical site infection, central line-associated bloodstream infection, ventilator-associated pneumonia), depending on the context and complexity of care.
- Early engagement and participation of stakeholders in the development and production of guidelines is vital to ensure consensus and better buy-in.

CORE COMPONENT 3: IPC EDUCATION AND TRAINING



WHAT (minimum requirements)

NATIONAL LEVEL



National training policy and curriculum

- National policy that all HCWs 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).

FACILITY LEVEL



PRIMARY CARE

IPC training for all frontline 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 their 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 employment 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 either on-line or participate in courses.

WHO (is responsible for action)

NATIONAL LEVEL



- IPC focal point (and IPC team or committee if they exist) at the ministry of health or other national responsible body as IPC education and training are key activities in their mandate.
- Senior leads in key positions at the ministry level, including ministries of health and education.
- Local academic institutions, including universities and others with a mandate on health workforce education, have a key role in curricula development and endorsement, and in training delivery.
- It is important to include all other relevant programmes and national actors and identify key joint areas of work across education and training efforts.
- In a country where the IPC focal point/team is newly established and has limited experience/expertise, consider external IPC technical support as needed for initial IPC curriculum development and implementation.

FACILITY LEVEL



PRIMARY CARE

- Trained IPC officer at the next administrative level (for example, district) is responsible for training IPC link persons, front-line HCWs and cleaners in primary care facilities, according to a plan and strategy developed at the national level.
- IPC officers at the next administrative level (for example, district) should be trained by the national or sub-national level.
- IPC expertise is required to lead IPC training.
- If the expertise at the next administrative level is limited, external support should be sought.
- IPC link persons should provide on-the-job supervision/mentorship to HCWs and cleaners in their facility.

SECONDARY AND TERTIARY CARE

- The IPC focal point (or IPC team if it exists) is responsible for training front-line HCWs and cleaners.
- IPC expertise is required to lead IPC training.
- If the expertise of the IPC focal point is limited, external support should be sought, for example, at the regional or national level.
- In addition, non-IPC personnel with adequate skills (for example, link nurses/practitioners or champions and opinion leaders) could play a role of mentorship to refresh IPC principles and champion IPC practices at the ward level.

HOW (to measure progress)

NATIONAL LEVEL INDICATORS (YES/NO)



- IPCAT2 – 3.1.1: the national IPC programme provides guidance and recommendations for in-service training at the facility level (for example, frequency, expertise required, requirements for new employee orientation, monitoring and evaluation approaches).
- IPCAT2 – 3.1.2: the national IPC programme provides content and support for IPC training of all HCWs at the facility level.
- IPCAT2 – 3.2.5: IPC training is integrated into continuing medical, nursing and allied health professional education and training.
- IPCAT2 – 3.3.1: a national system and schedule of monitoring and evaluation is in place to check on the effectiveness of training and education, for example, at least annually.

Possible additional indicators

- National policy on HCW training developed.
- National IPC curriculum for HCWs developed, approved and endorsed by an appropriate professional society/body.

FACILITY LEVEL INDICATORS (YES/NO)



■ PRIMARY CARE

- All new front-line HCWs receive orientation education and training on IPC guidelines/SOPs.
- All new cleaning staff receive orientation education and training on IPC guidelines/SOPs.
- Specific IPC training/education is offered for IPC link professionals in primary care facilities.
- Specific IPC training/education is offered for IPC staff at the district level.

■ SECONDARY CARE

- IPCAF – 3.3: all new front-line HCWs receive orientation education and training on IPC guidelines/SOPs.
- IPCAF – 3.4: all new cleaning staff receive orientation education and training on IPC guidelines/SOPs.
- IPCAF – 3.10: specific IPC training/education is offered for IPC professionals.

■ TERTIARY CARE

- IPCAF – 3.3: all new front-line HCWs receive orientation and at least annual education and training on IPC guidelines/SOPs.
- IPCAF – 3.4: all new cleaning staff receive orientation and at least annual education and training on IPC guidelines/SOPs.
- IPCAF – 3.10: specific IPC training/education is offered for IPC professionals.

NATIONAL LEVEL SOURCES AND RESOURCES



Sources

- IPCAT2 results (where available; use the autogenerated results and graphics available in the Excel file of IPCAT2); <https://www.who.int/infection-prevention/tools/core-components/en/>.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level (2016); <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. Improving infection prevention and control at the health facility: Interim practical manual supporting national implementation of the WHO guidelines on core components of infection prevention and control programmes. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.

FACILITY LEVEL SOURCES AND RESOURCES



Source

- IPCAF results report (where available; use the template presentation); <https://www.who.int/infection-prevention/tools/core-components/IPCAF-template.pdf?ua=1>.

Tools and resources

- WHO Guidelines on core components of IPC programmes at the national and acute health care facility level (2016) for more information; <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WASH FIT; <https://apps.who.int/iris/bitstream/handle/10665/254910/9789241511698-eng.pdf?sequence=1>.
- WHO. 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. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.

WHY (rationale and additional details on the minimum requirements)

NATIONAL LEVEL



- When coupled with national IPC guidelines, training contributes to a reduction in HAI and AMR and a more skilled health workforce.
- Supporting and facilitating training at all levels should be considered an important indicator for assessing the impact of IPC programmes.

FACILITY LEVEL



■ PRIMARY CARE

- IPC education and training are critical to developing a competent and skilled workforce. At a minimum, an emphasis on a basic level of IPC and triage in primary care to avoid infection and AMR spread through the health system, including health care-associated outbreaks.

- The IPC focal point/team should be specifically trained on the use of multimodal strategies for implementing IPC interventions.
- Training and curricula content should be based on the national guidelines and SOPs and then prioritized locally, based on the most frequent practices and/or types of HAI.
- Basic concepts of multimodal strategies implementation should be included in the training of IPC link professionals and IPC staff.
- Ensuring an orientation upon employment will provide a baseline knowledge to all front-line staff and cleaners, while recognizing that ongoing educational opportunities are the gold standard.
- Patient and visitor education remains an important consideration. In particular, whenever family members assume care activities, they should receive tailored IPC training in order to protect themselves and their loved ones and thus minimize any possibility of cross-transmission. Patient and family education at the facility level can also stimulate the use of appropriate hygiene measures in the community, such as handwashing with soap.

■ SECONDARY AND TERTIARY CARE

- IPC education that involves front-line HCWs in a practical, hands-on approach and incorporates individual experiences is associated with decreased HAI and increased hand hygiene compliance.
- Three categories of human resources were identified as targets for IPC training and requiring different strategies and training content: IPC specialists; all HCWs involved in service delivery and patient care; and other personnel that support health service delivery (administrative and managerial staff, auxiliary service staff, cleaners, etc.).
- The IPC focal person/team should be specifically trained on the use of multimodal strategies for implementing IPC interventions.
- Patient and family education remains an important consideration (see above).
- In particular for tertiary care facilities, providing training refreshers annually is a minimum requirement.

Full core component requirements

NATIONAL LEVEL



- The national IPC programme should:
 - develop IPC pre- and postgraduate and in-service curricula in collaboration with local academic institutions for:
 - IPC specialists
 - all HCWs involved in service delivery and patient care
 - other personnel (administrative and managerial staff, auxiliary service staff, cleaners);
 - develop some standardized training tools to support curricula implementation, aligned with national technical guidelines and international IPC standards.
- In addition to the curricula and tool development, appropriate steps should be undertaken for the approval, adoption and roll-out of the curricula by all health faculties (for example, medicine, nursing, midwifery, dentistry, laboratory, etc.).
- Clear career pathways for IPC professionals should be established at the national level.
- Consideration should be given to the teaching methods and modalities and grounded in adult education principles. The following training methods could be included: problem-based learning; hands-on workshops; focus groups; peer-to-peer training; classroom-based simulation; and bedside training.

FACILITY LEVEL



■ PRIMARY CARE

Not applicable.

■ SECONDARY AND TERTIARY CARE

- Mandatory IPC training should be ensured for all HCWs, including those providing direct patient care (for example, doctors, nurses, nurse aides, midwives, attendants, personal support workers, etc.) and administrative and managerial staff, auxiliary service staff, and cleaners, based on their functions and facility-adapted SOPs. This includes:
 - new employee orientation
 - continuous educational opportunities for existing staff (at least annually).
- In-service training should be practical and complementary to WASH and other training areas (for example, quality improvement).
- IPC education and training should be a part of an overall health facility education strategy, including new employee orientation and the provision of continuous educational opportunities for existing staff, regardless of level and position (for example, including also senior administrative and housekeeping staff).
- IPC staff should be trained on specific IPC functions specific to the tertiary care level and in line with facility-adapted IPC SOPs. Periodic evaluations of both the effectiveness of training programmes and assessment of staff knowledge should be undertaken on a routine basis.

CORE COMPONENT 4: HAI SURVEILLANCE



WHAT (minimum requirements)

NATIONAL LEVEL



IPC surveillance and 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 (with a focus on priority infections based on the local context) and IPC monitoring.

FACILITY LEVEL



■ 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 the national plans).

■ SECONDARY CARE

- HAI surveillance should follow national or sub-national plans.

■ TERTIARY CARE

- 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.
- The method of surveillance should be directed by the priorities/plans of the facility and/or country (for example, point prevalence studies to gather a quick snapshot of the situation, or longitudinal prospective surveillance of surgical site infection if this was identified as a problem).
- Timely and regular feedback needs to be provided to key stakeholders in order to lead to appropriate action, in particular to the hospital administration.

WHO (is responsible for action)

NATIONAL LEVEL



- The national IPC lead/focal point (and IPC technical team or committee, if existing) at the ministry of health or national body responsible for IPC should take action to convene the technical group for HAI surveillance and IPC monitoring.
- Ideally, the technical group should include microbiologists, clinicians, laboratory technicians, epidemiologists, professionals working in other surveillance systems, statisticians, data managers and information technology experts, and monitoring and evaluation experts.
- Linkage to other relevant surveillance programmes should be established, in particular alignment with surveillance of AMR.

FACILITY LEVEL



■ PRIMARY AND SECONDARY CARE

- If HAI surveillance is conducted, a trained IPC link person/focal point, according to national or sub-national plans.

■ TERTIARY CARE

- The IPC focal point (or IPC team/committee if existing) is responsible for putting together a team for HAI/AMR surveillance, and then planning and conducting surveillance, and analysing, interpreting and disseminating the collected data.
- The team should be multidisciplinary, ideally including epidemiologists, statisticians, infection control, data managers and information technology experts with the appropriate capacity. At least some of this expertise should be available.
- The IPC focal point should be trained in basic epidemiology and surveillance methods.
- Linkage to other relevant surveillance programmes should be established, in particular alignment with surveillance of AMR.

HOW (to measure progress)

NATIONAL LEVEL INDICATORS (YES/NO)



- A multidisciplinary technical group for HAI surveillance is established at the national level.
- A national strategic plan for HAI surveillance (with a focus on priority infections based on the local context) is in place.
- IPCAT2 – 4.1.3: the national IPC programme (or collaborating partner) leads are designated to coordinate the national HAI surveillance programme and network.

FACILITY LEVEL INDICATORS (YES/NO)



■ PRIMARY CARE

- *Note: HAI surveillance is not required, but should follow national or sub-national plans, if available.*
- If conducted, HAI surveillance is undertaken in accordance with national plans (yes/no/not applicable).

■ SECONDARY CARE

- HAI surveillance is undertaken in accordance with national plans.

■ TERTIARY CARE

- IPCAF – 4.1: active surveillance is a defined component of the IPC programme
- IPCAF – 4.2: do you have personnel responsible for surveillance activities?
- IPCAF – 4.3: staff responsible for surveillance activities have been trained in basic epidemiology, surveillance and IPC (that is, capacity to oversee surveillance methods, data management and interpretation).
- IPCAF – 4.5: a prioritization exercise is used to determine the method of surveillance according to the local context (that is, identifying infections that are major causes of morbidity and mortality in the facility).
- IPCAF – 4.8: reliable surveillance case definitions (defined as numerator and denominator according to international definitions, for example, CDC National Healthcare Safety Network/European Centre for Disease Prevention and Control) are used or adapted through an evidence-based adaptation process and expert consultation.
- IPCAF – 4.14: timely and regular feedback (for example, quarterly/half-yearly/annually) is provided to key stakeholders in order to lead to appropriate action, in particular to the hospital administration.
- Enabling structures and supporting resources (for example, EQAS microbiological reference laboratory, medical records with sufficient clinical information to determine HAI case definitions, dedicated staff time) are in place to support HAI surveillance.
- Active surveillance is conducted for colonization or infections caused by multidrug-resistant pathogens according to the local epidemiological data.

NATIONAL LEVEL SOURCES AND RESOURCES



Source

- IPCAT2 results (where available; use the autogenerated results and graphics available in the Excel file of IPCAT2); <https://www.who.int/infection-prevention/tools/core-components/en/>.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level for more information. 2016; <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. Improving infection prevention and control at the health facility: Interim practical manual supporting national implementation of the WHO guidelines on core components of infection prevention and control programmes. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.

FACILITY LEVEL SOURCES AND RESOURCES



Source

- IPCAF results report (where available; use the template presentation); <https://www.who.int/infection-prevention/tools/core-components/IPCAF-template.pdf?ua=1>.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level for more information. 2016; <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. 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. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.

WHY (rationale and additional details on the *minimum requirements*)

NATIONAL LEVEL



- HAI surveillance is the first step (*minimum requirement*) to assess the magnitude of the burden of disease by the systematic collection of data in targeted wards/unit. As a first step, when a HAI surveillance system is not in place, a multidisciplinary technical group should develop a plan for surveillance.
- This group will have the task of identifying:
 - priorities and methods for surveillance;
 - a comprehensive surveillance plan for HAIs and IPC monitoring;
 - a centralized, national reporting mechanism;
 - a minimum set of data (outcomes, indicators or other information) for surveillance, including providing a baseline assessment;
 - roles and responsibilities for the implementation of HAI surveillance at facility level.
- Prioritization should not only be based on vertical systems (for example, human immunodeficiency virus, tuberculosis, malaria, influenza, *Salmonella* spp., etc.), but should consider essential targets of HAI prevention, for example, reduction of the number of surgical site or bloodstream infections.
- The national level could also consider the development of a policy/regulations to mandate HAI surveillance in facilities, according to the *minimum requirements* specified below.
- Surveillance of HAIs should be aligned with the priorities of the AMR national action plan.

FACILITY LEVEL



■ PRIMARY CARE

- The detection and reporting of outbreaks affecting the community to national authorities should be included in national or sub-national plans.

■ SECONDARY CARE

- Given the low level of specialized care, HAI surveillance in secondary care was not strictly considered by expert consensus as a minimum requirement; monitoring of IPC indicators was considered more important.
- Some secondary facilities may decide to conduct surveillance of relevant HAIs, such as surgical site infections, depending on the type of care delivered and the facility's capacity and prioritization of the core components.
- Reporting outbreaks in the health care facility or affecting the community to national authorities should be included in national or sub-national plans.

■ TERTIARY CARE

- HAIs and AMR are a burden in intensive care units and other highly specialized units/wards where invasive interventions carry more risks for HAIs and patients have a higher risk of death due to these infections.
- For this reason, targeted HAI surveillance is necessary at tertiary health care level.
- To ensure implementation of the national surveillance plan, a HAI surveillance team should be in place in every tertiary hospital.
- Prioritization is also the responsibility of the IPC team, and a prioritization exercise should be conducted in line with national recommendations.
- The team should develop a surveillance strategic plan according to present capacities including:
 - purpose;
 - target sample and infection outcomes;
 - identification of a national reference laboratory and quality assurance capacities;
 - development/careful adaptation of case definitions.
- Timely feedback to hospital leadership and front-line HCWs is considered as one of the most critical parts of surveillance and monitoring. Facilities should consider defining the timeliness of feedback (for example, monthly or bi-monthly).
- The IPC focal team should tailor its surveillance methodology to available resources and priorities in line with national recommendations.

Full core component requirements

NATIONAL LEVEL



- A national HAI surveillance programme and networks that include mechanisms for the timely feedback of monitoring and evaluation data feedback should be established, with the potential to be used for benchmarking purposes.
- Surveillance programmes should be supported by:
 - engaged governments and other respective authorities;
 - allocated human and financial resources;
 - microbiology and laboratory capacity (at least one national

FACILITY LEVEL



■ PRIMARY CARE

Not applicable.

■ SECONDARY AND TERTIARY CARE

- Facility-based HAI surveillance should be performed to guide IPC interventions and detect outbreaks, including AMR.
- Hospital-based infection surveillance systems should be linked to integrated public health infection surveillance systems.

- reference laboratory), with standardized definitions and laboratory methods;
- an informatics system for data collection and analysis.
- Surveillance programmes should meet the following criteria:
 - demonstrate clear objectives, a standardized set of case definitions, methods for detecting HAIs (numerators) and the exposed population (denominators), including a process for the analysis of data and reports and a method for evaluating the quality of the data;
 - establish clear regular reporting lines of HAI surveillance data from the local facility to the national level;
 - adapt international guidelines on HAI definitions at country level before implementing them;
 - include a national training programme for performing surveillance to ensure the appropriate and consistent application of national surveillance guidelines and protocols;
 - provide data to guide the development and implementation of effective control interventions.
- The surveillance programme should provide data on infections:
 - that may become epidemic in the health care facility (early detection of outbreaks);
 - commonly observed in vulnerable populations (for example, neonates, burn patients, patients in intensive care units and immunocompromised hosts);
 - that may cause severe outcomes, such as high case fatality and patient morbidity and suffering;
 - caused by resistant microorganisms with an emphasis on multidrug-resistant pathogens;
 - associated with selected invasive devices or specific procedures, such as the use of intravascular devices, indwelling urinary catheters and surgery;
 - that may affect HCWs (for example, hepatitis B and C and human immunodeficiency virus).
- Feedback of results to HCWs and stakeholders through national networks should be timely.
- Surveillance should be based on national recommendations and standard definitions and customized to the facility, according to available resources with clear objectives and strategies.
- Methods for detecting infections should be active. Different surveillance strategies could include the use of prevalence or incidence rates of HAI and AMR pathogens. A system for surveillance data quality assessment should be in place.
- Surveillance should be based on clinical and/or microbiology data and supported by laboratory capacity with EQAS
- The IPC committee and IPC team are responsible for planning and conducting HAI surveillance and analysing, interpreting and disseminating the data collected. For this reason, surveillance activities should be conducted by trained staff (ideally full-time) able to plan, collect and manage the data and convene meetings with the team, the committee and other key players.
- Surveillance should provide information for:
 - describing the status of infections associated with health care (that is, incidence and/or prevalence, type, aetiology and, ideally, data on severity and the attributable burden of disease);
 - identification of the most relevant AMR susceptibility patterns;
 - identification of high-risk populations, procedures and exposures;
 - early detection of clusters and outbreaks (that is, early warning system);
 - evaluation of the impact of interventions.

CORE COMPONENT 5: MULTIMODAL STRATEGIES



WHAT (minimum requirements)

NATIONAL LEVEL



Multimodal improvement strategies for IPC interventions

- Use of multimodal strategies to implement IPC interventions according to national guidelines/SOPs, under the coordination of the national IPC focal point (or team, if existing).

FACILITY LEVEL



■ 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 improve each item of 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 item of standard and transmission-based precautions, triage, and those targeted at the reduction of specific infections (for example, surgical site or catheter-associated infections) in high-risk areas/patient groups, according to local priorities.

WHO (is responsible for action)

NATIONAL LEVEL



- The IPC focal point (and IPC technical team or committee, if existing) at the ministry of health or national body responsible for IPC, as multimodal interventions are key activities in their mandate.
- Senior leads in key positions at the ministry level. Convincing high level senior managers and key professionals of the value of employing multimodal strategies at the national and facility level is important and dependent on effective communication and advocacy.
- Key members and teams of all other relevant programmes and national actors who will be responsible for the implementation of the IPC programme, including possible joint areas of work.
- National and local experts on implementation science, as well as those from the fields of behavioural science and communication.

FACILITY LEVEL



■ PRIMARY, SECONDARY AND TERTIARY CARE

- Trained IPC link person and IPC focal point with the support of an IPC-trained health care officer at the next administrative level are responsible for using a multimodal approach for the implementation of IPC interventions/SOPs.
- Successful multimodal strategies include the involvement of champions or role models.
- Collaboration with colleagues in quality improvement and patient safety to develop and promote multimodal strategies should be addressed.

HOW (to measure progress)

NATIONAL LEVEL INDICATORS (YES/NO)



- IPCAT2 – 5.1.1: the appointed IPC focal point is trained and competent in implementation science and multimodal behaviour change strategies.

FACILITY LEVEL INDICATORS (YES/NO)



■ PRIMARY CARE

- IPCAF – 5.1: multimodal strategies are used to implement priority IPC interventions (at the very least to improve hand

- IPCAT2 – 5.1.2: promotion of multimodal strategies through the inclusion of the approach in the development of IPC guidelines, education and training.

hygiene, safe injection practices, decontamination of medical instruments and devices and environmental cleaning).

■ SECONDARY CARE

- IPCAF – 5.1: multimodal strategies are used to implement priority IPC interventions (at the very least to implement interventions to improve standard and transmission-based precautions and triage).

■ TERTIARY CARE

- IPCAF – 5.1: multimodal strategies are used to implement all IPC interventions and to improve standard and transmission-based precautions, triage, and those targeted at the reduction of specific infections in high-risk areas/vulnerable patient groups, in line with local health priorities.

NATIONAL LEVEL SOURCES AND RESOURCES



Source

- IPCAT2 results (where available; use the autogenerated results and graphics available in the Excel file of IPCAT2); <https://www.who.int/infection-prevention/tools/core-components/en/>.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level (2016); <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. Improving infection prevention and control at the health facility: Interim practical manual supporting national implementation of the WHO guidelines on core components of infection prevention and control programmes. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.

FACILITY LEVEL SOURCES AND RESOURCES



Source

- IPCAF results report (where available; use the template presentation); <https://www.who.int/infection-prevention/tools/core-components/IPCAF-template.pdf?ua=1>.

Tools and resources

- WHO Guidelines on core components of IPC programmes at the national and acute health care facility level (2016); <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. 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. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.
- WHO multimodal improvement strategy leaflet; <https://www.who.int/infection-prevention/publications/ipc-cc-mis.pdf?ua=1>.

WHY (rationale and additional details on the *minimum requirements*)

NATIONAL LEVEL



- According to the available scientific evidence, multimodal strategies are the most effective approach to implement hand hygiene programmes and other IPC interventions (for example, to reduce central line-associated bloodstream infections and surgical site infections) in order to achieve the key elements for success that support IPC progress and, ultimately, a measurable impact that benefits patients and HCWs, such as system change, creation of an enhanced patient safety climate and HCW behavioural change.
- The IPC focal point/team should be specifically trained on the use of multimodal strategies for the implementation of IPC interventions.
- Multimodal strategies for implementing IPC interventions should be explicitly indicated in the national IPC action plans, including all 5 key elements identified by WHO as needed for each IPC intervention selected and according to the local context.
- The national IPC focal person or team should develop a national multimodal strategy framework to facilitate implementation of the prioritized IPC interventions at facility level in the context of quality improvement.

FACILITY LEVEL



■ PRIMARY CARE

- Multimodal strategies should be used for any IPC intervention at all levels of the health care system because their effectiveness is supported by strong evidence.
- However, it is recognized that multimodal strategies are complex approaches to be put in place. Thus, the interventions included in the *minimum requirements* are the priority ones among those that should be included in SOPs and training for the primary health care level (see *minimum requirements* for core components 2 and 3).

■ SECONDARY AND TERTIARY CARE

- Multimodal strategies should be used for any IPC intervention at all levels of the health care system in order to provide safe and effective health care delivery.
- Complexity of care and human resources (including in the IPC team) vary across secondary and tertiary care facilities and the scope of the *minimum requirements* may vary according to the local context.
- Specialized/complex services are provided in tertiary care facilities.
- In tertiary care facilities, there is an increased potential for transmission of infection due to prolonged hospital stay, more

complex procedures being performed and the admission of high-risk vulnerable populations.

- Compelling evidence is available on the effectiveness of multimodal strategies to reduce infections in high-risk areas/patient groups.

Full core component requirements

NATIONAL LEVEL



- It is the mandate of the national IPC programme to ensure that all IPC interventions are implemented using multimodal strategies.
- The national IPC programme should facilitate the use of multimodal strategies by ensuring that the following elements are in place to support their use:
 - expertise and necessary resources including policies, regulations and tools;
 - overall organizational culture change to achieve an enhanced patient safety climate;
 - coordination and teamwork;
 - linkages with quality improvement initiatives and health facility accreditation;
 - local adaptation.

FACILITY LEVEL



■ PRIMARY CARE

Not applicable.

■ SECONDARY AND TERTIARY CARE

- Multimodal strategies must be used for implementing any IPC intervention at all levels of the health care system.
- Overall organizational culture change is a key element to prioritize within multimodal strategies as effective IPC can be a reflector of quality care, a positive organizational culture, and an enhanced patient safety climate.
- Successful multimodal strategies include the involvement of champions or role models.
- Implementation of multimodal strategies within health care institutions needs to be linked to national quality aims and initiatives, including health care quality improvement initiatives or health facility accreditation bodies.

CORE COMPONENT 6: MONITORING, AUDIT AND FEEDBACK



WHAT (minimum requirements)

NATIONAL LEVEL



IPC surveillance and 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, tools);
 - provides training at the facility level to collect and analyse these data;
 - develops recommendations for minimum process indicators (for example, hand hygiene).

FACILITY LEVEL



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 sub-national level.

SECONDARY AND TERTIARY CARE

- 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.

WHO (is responsible for action)

NATIONAL LEVEL



- The IPC lead/focal point (and IPC technical team or committee at the ministry of health or national body responsible for IPC) should take action to convene the technical group for HAI surveillance and IPC monitoring (same group as for core component 4).
- Ideally, the technical group should include microbiologists, laboratory technicians, epidemiologists, professionals working in other surveillance systems, statisticians, data managers and information technology experts and monitoring and evaluation experts.
- Liaison should be ensured with:
 - senior leads in key positions at the ministry level;
 - team members of all other relevant programmes and national actors who are involved in the implementation and monitoring of the IPC programme, including national quality and patient safety leaders.

FACILITY LEVEL



PRIMARY, SECONDARY AND TERTIARY CARE

- Trained IPC link person/focal point/ IPC officer (or IPC committee/team if existing) are responsible for audit and feedback and should be trained in auditing technique plans.

HOW (to measure progress)

NATIONAL LEVEL INDICATORS (YES/NO)



- A multidisciplinary technical group for IPC monitoring is established at the national level.
- IPCAT2 – 6.2: A well-defined plan focusing on IPC outcomes, processes and strategies, with clear goals, targets and operational plans is in place.
- IPC indicators integrated with national monitoring systems, for example, health management information systems.

FACILITY LEVEL INDICATORS (YES/NO)



PRIMARY CARE

- IPCAF – 6.2: a well-defined monitoring plan with clear goals/ objectives, targets and activities focused on IPC structural and process indicators (including tools to collect data in a systematic way) is in place based on IPC priorities identified in the other components and, importantly, informed by decisions at the national level and implementation support at the sub-national level.

- A mechanism to train national and local auditors is in place.
- Hand hygiene compliance monitoring and feedback is identified as a minimum indicator, at the very least for reference hospitals.

NATIONAL LEVEL SOURCES AND RESOURCES



Source

- IPCAT2 results (where available; use the autogenerated results and graphics available in the Excel file of IPCAT2); <https://www.who.int/infection-prevention/tools/core-components/en/>.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level (2016); <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. Improving infection prevention and control at the health facility: Interim practical manual supporting national implementation of the WHO guidelines on core components of infection prevention and control programmes. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.
- WHO hand hygiene monitoring and feedback tools (updated in 2009); <https://www.who.int/gpsc/5may/tools/evaluation-feedback/en/>.

SECONDARY AND TERTIARY CARE

- IPCAF – 6.1: A trained person responsible for conducting periodic or continuous monitoring/audit of selected indicators for process (for example, hand hygiene) and structure is in place and informed by the priorities of the facility or country.
- Monitoring of hand hygiene compliance is undertaken using the WHO hand hygiene observation tool or equivalent.
- IPCAF – 6.4: monitoring of hand hygiene strategies is undertaken using the WHO Hand Hygiene Self-Assessment Framework Survey.
- IPCAF – 6.5: timely and regular feedback of auditing reports (for example, feedback on hand hygiene compliance data or other processes) on the state of IPC activities/performance is provided to key stakeholders, in order to lead to appropriate action, particularly to the hospital management and senior administration.

FACILITY LEVEL SOURCES AND RESOURCES



Source

- IPCAF results report (where available; use the template presentation); <https://www.who.int/infection-prevention/tools/core-components/IPCAF-template.pdf?ua=1>.

Tools and resources

- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level (2016); <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. 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. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.
- WHO hand hygiene monitoring and feedback tools (updated in 2009); <https://www.who.int/gpsc/5may/tools/evaluation-feedback/en/>.
- WHO Hand Hygiene Self-Assessment Framework; https://www.who.int/gpsc/5may/hhsa_framework/en/.

WHY (rationale and additional details on the *minimum requirements*)

NATIONAL LEVEL



- Setting up national monitoring of indicators of IPC practices, processes and infrastructures is usually more feasible than establishing HAI surveillance as a first step for gathering data to inform IPC action.
- The technical group indicated as the minimum requirement for core component 4 should be the same group responsible for core component 6.
- Monitoring IPC practices and providing feedback to concerned stakeholders are critical to achieve behaviour change or other process modifications that improve the quality of care and reduce HAIs and AMR.
- Monitoring and feedback are also aimed at engaging stakeholders, creating partnerships and developing working groups and networks.
- Consideration should be given to policies that create incentives (positive or negative) tied to indicators in order to generate buy-in from hospital administrators.
- Data from existing data sources (for example, Joint External

FACILITY LEVEL



PRIMARY CARE

- IPC monitoring is critical to identify improvement action needed and should be in line with national recommendations and priorities.
- Monitoring of indicators of IPC practices, processes and infrastructures should be feasible at the primary care level, whereas HAI surveillance is not applicable.
- Hand hygiene infrastructure (for example, hand hygiene stations at the point of care or ABHR consumption) could be considered as a first step to monitoring.
- Hand hygiene compliance monitoring according to the WHO observation method is considered the gold standard.
- In many primary care facilities, one person responsible for the monitoring of indicators should be identified and this activity requires support at the sub-national level (for example, district).
- The selection of indicators to be monitored should be driven at national level, with input at regional/sub-national level.
- Any decision should be in line with decisions on other core components.

Evaluation or Service Availability and Readiness Assessment) should be considered, particularly at the beginning when identifying priorities.

- If possible, integration with existing national health information systems and routine facility monitoring would be critical for streamlining data collection and making linkage/correlations.
- Hand hygiene (including compliance monitoring and/or infrastructure indicators) is considered a crucial indicator according to WHO recommendations. This activity should be decided upon at national level according to the highest standards to avoid any misrepresentation of compliance levels.
- Surveillance of other structure and process indicators should be considered, prioritizing those that drive action.
- Other indicators to be monitored should also provide information on IPC enablers (for example, related to WASH, availability of structures) and be considered as basic essentials for IPC.
- Data gathered through IPC monitoring should guide priority setting in the national IPC strategic plan.
- Based on all these considerations, a plan for regular monitoring at the facility level should be developed at the national level, including plans for feedback and for supervision to assist in the development and implementation of improvement plans.

■ SECONDARY AND TERTIARY CARE

- IPC monitoring is critical to identify improvement action and should be combined with HAI surveillance and in line with national recommendations and priorities.
- Principles and minimum requirements for monitoring and auditing should not change between secondary and tertiary care; more indicators might be monitored in tertiary care.
- It is important to monitor both process indicators (prone to limitations related to observation bias) and infrastructure indicators.
- Hand hygiene (including compliance monitoring and/or infrastructure indicators) is considered a crucial indicator according to WHO recommendations. This activity should be decided upon at national level and according to the highest standards to avoid any misrepresentation of compliance levels.
- Timely feedback to hospital leadership and front-line HCWs is one of the most effective parts of surveillance and monitoring. Facilities should consider defining the timeliness of feedback.

Full core component requirements

NATIONAL LEVEL



- Establishment of a national IPC monitoring and evaluation programme with goals, objectives and defined performance indicators for:
 - IPC standards
 - IPC activities
 - hand hygiene compliance monitoring and feedback (strongly recommended as a national performance indicator).
- National level monitoring and evaluation should have mechanisms in place that:
 - provide regular reports on the state of national goals (outcomes and processes) and strategies;
 - regularly monitor and evaluate the WASH services, IPC activities and structure of the health care facilities through audits or other officially recognized means;
 - promote the evaluation of the performance of local IPC programmes in a non-punitive institutional culture.

FACILITY LEVEL



■ PRIMARY CARE

Not applicable.

■ SECONDARY AND TERTIARY CARE

- Regular monitoring/auditing of practices and other indicators should be according to IPC standards and include timely feedback to:
 - all audited persons and relevant staff (individual change);
 - hospital management and senior administration (organizational change);
 - IPC team and committee (or quality of care committees).
- Monitoring extends to the evaluation of the facility IPC programme to:
 - assess if objectives are met;
 - assess if goals/objectives are accomplished;
 - assess whether the IPC activities are being performed according to requirements;
 - identify aspects that may need improvement.
- Important information that may be used for this purpose includes:
 - the results of the assessment of compliance with IPC practices;
 - other process indicators (for example, training activities);
 - dedicated time by the IPC team;
 - resource allocation.
- Monitoring should include regular assessments of staff knowledge about IPC.

CORE COMPONENT 7: WORKLOAD, STAFFING AND BED OCCUPANCY (FACILITY LEVEL ONLY*)



WHAT (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 according to existing guidelines should be established.
- **To optimize staffing levels:** assessment of appropriate staffing levels, depending on the categories seen when using WHO/national tools (national norms on patient/staff ratio), and development of an appropriate plan.

■ SECONDARY AND TERTIARY CARE

- **To standardize bed occupancy:**
 - establish a system to manage the use of space in the facility and establish the standard bed capacity for the facility;
 - hospital administration enforcement of the system developed;
 - no more than one patient per bed;
 - spacing of at least 1 metre between the edges of beds;
 - overall occupancy should not exceed the designed total bed capacity of the facility.
- **To reduce overcrowding and optimize staffing levels:** same minimum requirements as for primary health care.

WHO (is responsible for action)

■ PRIMARY, SECONDARY AND TERTIARY CARE

- Decisions regarding workload, staffing and bed occupancy are not directly within the responsibility of the IPC link person, focal point or programme, but rather lie with senior managers and directors. Nevertheless, the IPC link nurse, officer or programme should understand the evidence supporting this core component in order to be able to help influence decision-makers at the facility and ministry level, with the assistance of an IPC-trained health care officer at the next administrative level. Therefore, the development of IPC skills in negotiation and advocacy are important considerations.
- The successful implementation of this core component should be supported by a national plan for human resource development.

HOW (to measure progress)

INDICATORS (YES/NO)

■ PRIMARY CARE

- Systems are in place to reduce overcrowding (for example, a system for patient flow, a triage system including a referral system, and a system for the management of consultations) according to existing guidelines/SOPs.
- IPCAF – 7.3: appropriate staffing levels are assessed according to patient workload using national/international standards or staffing needs assessment tools and action plans developed based on results.

■ SECONDARY AND TERTIARY CARE

- IPCAF – 7.3: appropriate staffing levels are assessed according to patient workload using national/international standards or staffing needs assessment tools and action plans developed based on results.
- IPCAF – 7.4: the design of wards is in accordance with international standards regarding bed capacity.
- IPCAF – 7.5: bed occupancy in the facility is kept to one patient per bed.
- IPCAF – 7.7: adequate spacing of more than 1 metre between patient beds is ensured in the facility.
- IPCAF – 7.8: a system is in place, including clear lines of responsibility, to assess and respond when adequate bed capacity exceeds the designed total bed capacity of the facility (for example, the hospital administration/management assume responsibility).

* Facility level only. However, the national health system, IPC programme and any other relevant body should coordinate and support the implementation of this core component at the facility level.

SOURCES AND RESOURCES

Source

- IPCAF report (where available; use the template presentation); <https://www.who.int/infection-prevention/tools/core-components/IPCAF-template.pdf?ua=1>.

Tools and resources

- WHO Guidelines on core components of IPC programmes at the national and acute health care facility level. 2016; <https://www.who.int/infection-prevention/publications/core-components/en/>.
- WHO. 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. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>.
- WHO Essential environmental health standards in health care. 2008; https://www.who.int/water_sanitation_health/publications/ehs_hc/en/.
- WHO. Workload indicators of staffing need (WISN). 2015; https://www.who.int/hrh/resources/wisn_user_manual/en/.

WHY (rationale and additional details on the *minimum requirements*)

■ PRIMARY CARE

- Overcrowding and lack of triage and patient flow systems are recognized as a public health issue that can lead to disease transmission.

■ SECONDARY AND TERTIARY CARE

- Bed occupancy exceeding the standard capacity of the facility is associated with an increased risk of HAI in acute care facilities, in addition to inadequate HCW staffing levels.
- Intended capacity may vary from original designs and across facilities and countries. For these reasons, the original ward/unit design regarding bed capacity should be adhered to and in accordance with standards.
- In exceptional circumstances where bed capacity is exceeded, hospital management should act to ensure appropriate staffing levels that meet patient demand and an adequate distance between beds. These principles apply to all units and departments with inpatient beds, including emergency departments.
- The WHO *Workload Indicators of Staffing Need* method provides health managers with a systematic way to determine how many HCWs of a particular type are required to cope with the workload of a given health facility and decision making.
- It is recognized that in special circumstances, adherence to this recommendation may need to be balanced against the immediate need to provide clinical care to as many patients as possible.

Full core component requirements

■ PRIMARY CARE

Not applicable.

■ SECONDARY AND TERTIARY CARE

Same as for *minimum requirements*.

CORE COMPONENT 8: BUILT ENVIRONMENT, MATERIALS AND EQUIPMENT FOR IPC AT THE FACILITY LEVEL (FACILITY LEVEL ONLY*)



WHAT (minimum requirements)

■ PRIMARY CARE

- Water should always be available from an improved source on the premises to perform basic IPC measures, including hand hygiene, environmental cleaning, laundry, decontamination of medical devices and health care waste management.
- A minimum of two functional, improved sanitation facilities should be available on-site, one for patients and one 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 5 metres of toilets.
- Sufficient and appropriately labelled bins to allow for health care waste segregation should be available (less than 5 metres from point of generation); waste should be treated and disposed of safely via autoclaving, 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, PPE 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 (usually, 8 am-5 pm) for providing care.

■ 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 should be available for outpatient wards and one per 20 beds for inpatient wards should be available; 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 (including for needle and sharps disposal) 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 infectious 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 decontamination and reprocessing of reusable medical devices (that is, a decontamination unit) according to minimum guidelines/SOPs.
- The facility should have adequate single isolation rooms or at least one room for cohorting patients with similar pathogens, if the number of isolation rooms is insufficient.

WHO (is responsible for action)

■ PRIMARY

- Trained IPC link person/focal point (see *minimum requirements* for core component 1), as well as facility manager/in-charge and ancillary staff (for example, cleaning staff, incinerator operators).

■ SECONDARY AND TERTIARY CARE

- Trained IPC link person/focal point (see *minimum requirements* for core component 1) and district/local WASH environmental health officer.
- Facilities manager and ward or department leads/in-charge staff.
- Additionally, at the national level, the IPC lead/focal point (and IPC technical team or committee, if existing) at the ministry of health or national body responsible for IPC, as well as the national body (for example, ministry of water or ministry of the environment or ministry of rural development) and the technical team or committee responsible for WASH (if separate), should take action to convene a technical group for the implementation of IPC and WASH requirements for all health care facilities and implementation tools.
- Ideally, the technical group should include clinicians, engineers, environmental health officers and procurement managers.
- Financial manager at the facility and the next administrative level (for example, district), and the ministry of finances at the national level.

* Facility level only. However, the national health system, IPC programme and any other relevant body should coordinate and support the implementation of this core component at the facility level.

HOW (to measure progress)

INDICATORS (YES/NO)

■ PRIMARY CARE

- IPCAF – 8.1: water services available at all times and of sufficient quantity for all uses (for example, hand washing, drinking, personal hygiene, medical activities, sterilization, decontamination, cleaning and laundry).
- IPCAF – 8.3: functioning hand hygiene stations (that is, ABHR or soap and water and clean single-use towels) available at all points of care.
- IPCAF – 8.4: there are more than or equal to four toilets or improved latrines available for outpatient settings or more than or equal to one per 20 users for inpatient settings.
- Modified IPCAF – 8.5: sufficient energy/power supply available at least during working hours for all uses (for example, pumping and boiling water, sterilization and decontamination, incineration or alternative treatment technologies, electronic medical devices, general lighting of areas where health care procedures are performed to ensure safe provision of health care and lighting of toilet facilities and showers).
- IPCAF – 8.6: functioning environmental ventilation (natural or mechanical) available in patient care areas.
- IPCAF – 8.8: appropriate and well-maintained materials for cleaning (for example, detergent, mops, buckets, etc.) available.
- IPCAF – 8.9: single patient rooms or rooms for the cohorting/physical separation of patients with similar pathogens or syndrome if the number of isolation rooms is insufficient (for example, tuberculosis, measles, cholera, Ebola, severe acute respiratory syndrome).
- IPCAF – 8.10: PPE is available at all times and in sufficient quantity for all uses for all HCWs.
- IPCAF – 8.11: functional waste collection containers for non-infectious (general) waste, infectious waste and sharps waste in close proximity to all waste generation points.
- IPCAF – 8.15: a dedicated decontamination area and/or sterile supply department (either present on- or off-site and operated by a licensed decontamination management service) for the decontamination and sterilization of medical devices and other items/equipment.
- IPCAF – 8.16: sterile and disinfected equipment ready for use and reliably available.

■ SECONDARY AND TERTIARY CARE

(in addition to primary care indicators above) (from the water and sanitation for health facility improvement tool (WASH FIT):**

- Hygiene – 3.1: essential indicator 1. Functioning hand hygiene stations are available at all points of care (yes/no). Stations present, but no water and/or soap or ABHR present (yes/no).
- Hygiene – 3.2: essential indicator 2. Hand hygiene promotion materials clearly visible and understandable at key places (yes/at some places, but not all/none).
- Hygiene – 3.3: advanced indicator 1. Functioning hand hygiene stations are available in service areas (yes/stations present, but no water and/or soap or ABHR present).
- Hygiene – 3.4: advanced indicator 2. Functioning hand hygiene stations available in waste disposal area (yes/stations present, but no water and/or soap present).
- Hygiene – 3.5: advanced indicator 3. Hand hygiene compliance activities are undertaken regularly (yes/compliance activities in facility policy, but not carried out with any regularity/no compliance activities).

SOURCES AND RESOURCES

Sources

- IPCAF results report (where available; use the template presentation); <https://www.who.int/infection-prevention/tools/core-components/IPCAF-template.pdf?ua=1>.
- WASH FIT results report (where available). https://www.who.int/water_sanitation_health/publications/water-and-sanitation-for-health-facility-improvement-tool/en/.

Tools and resources

- WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene. Joint Monitoring Programme definitions of improved water/sanitation. 2019; https://www.unwater.org/publication_categories/whounicef-joint-monitoring-programme-for-water-supply-sanitation-hygiene-jmp/.
- WHO. Guidelines on sanitation and health. 2018; https://www.who.int/water_sanitation_health/publications/guidelines-on-sanitation-and-health/en/.
- WHO. Essential environmental health standards in health care. 2008; https://www.who.int/water_sanitation_health/publications/ehs_hc/en/.
- WHO. Safe management of wastes from health care. 2014; https://www.who.int/water_sanitation_health/publications/wastemanag/en/.
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- WHO. Guidelines on tuberculosis infection prevention and control. 2019 update; <https://www.who.int/tb/publications/2019/guidelines-tuberculosis-infection-prevention-2019/en/>.
- WHO. Natural ventilation for infection control in health-care settings. 2009; https://www.who.int/water_sanitation_health/publications/natural-ventilation/en/.
- WHO. Guidelines on core components of IPC programmes at the national and acute health care facility level. 2016; <https://www.who.int/infection-prevention/publications/core-components/en/>.

** NOTE: most of these indicators have three possible responses, not simply 'yes/no'.

- WHO. 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. 2018; <https://www.who.int/infection-prevention/tools/core-components/facility-manual.pdf>
- WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene. WASH in health care facilities: global baseline report. 2019; <https://www.unwater.org/publications/wash-in-health-care-facilities-global-baseline-report-2019/>.
- WHO. WASH in health care facilities: practical steps to achieve universal access to quality care. Actions and solutions. 2019; https://www.who.int/water_sanitation_health/publications/wash-in-health-care-facilities/en/.

WHY (rationale and additional details on the *minimum requirements*)

■ PRIMARY CARE

- Adequate infrastructures and availability of adequate WASH support are essential to perform any health care services and IPC activities (for example, water is absolutely critical for hand hygiene, cleaning and key services such as delivery).
- Improved water sources are those which by nature of their design and construction have the potential to protect water from external contamination (for example, microorganisms, dirt). While drinking water is not required for basic IPC measures, water from improved sources may better facilitate performing IPC measures according to guidelines/SOPs, for example, water from groundwater sources that is non-turbid can generally enable the effective preparation of disinfectant solutions for environmental cleaning and decontamination of medical devices. The chlorine concentration in all disinfectant solutions should be regularly monitored and the dose adjusted as necessary to meet chlorine concentration targets.
- Improved sanitation facilities are those designed to hygienically separate human excreta from human contact, which is critical for reducing the transmission risk from enteric pathogens and, in addition to menstrual hygiene facilities, help maintain a hygienic environment; separate toilets for patients and staff also helps to minimize indirect contact between patients and staff that may pose an infection risk.
- When there is a risk of soiling, ABHR is not a substitute for soap and water for hand hygiene after toileting or when hands are visibly soiled (for example, while assisting childbirth).
- If ABHRs are available, it is essential to have these accessible at all points of care, given the proven advantages of ABHRs over soap and water, but it is also essential that soap, water and single-use towels are available in clinical services.
- Adequate ventilation throughout the facility contributes to maintaining a hygienic environment and can be minimally accomplished via the presence of functional windows (preferably equipped with insect traps) and doors, that allow at least 6-8 air changes per hour for natural ventilation (for example, by opening opposite windows).
- Sufficient energy/power and a stand-by 'back-up' arrangement (including solar, wind, stand-by generator or others) and fuel should be available on-site for lighting clinical practices and basic IPC measures (for example, for performing decontamination of medical devices, if needed).
- If the facility performs any procedures (for example, deliveries or other basic gynaecological procedures) requiring reusable medical devices (for example, vaginal specula), at a minimum it is essential to create dedicated areas that allow proper workflow from dirty to clean for performing the decontamination and reprocessing of medical devices.
- A small space to assess patients regarding the disease/reason for accessing the facility (that is, triage), including any infectious disease transmission risk, and to allow them to be directed to different areas according to priority and type of disease can be accomplished with minimal resources.
- Adequate space for temporary cohorting/isolation can also be accomplished with minimal resources by the creation of a physical separation or barrier between suspected/infected patients and other patients, staff and visitors, and is critical for ensuring transmission-based precautions. If resources allow, a room should be designated for this function.

■ SECONDARY AND TERTIARY CARE

- It is critical for water to be available 24 hours on-site from an improved source and piped into the facility to clinical areas, *at a minimum* to high-risk wards (for example, maternity ward, operating room/s, intensive care unit), points of care and service areas (for example, sterile services department) as patients in these areas may require 24-hour clinical care where water-related IPC is critical (for example, hand hygiene, environmental cleaning, reprocessing of medical devices).
- The use of *safe water* (according to WHO drinking-water quality standard, that is, no *Escherichia coli* detectable in 100 mL and/or 0.5 mg/L free chlorine residual) for water-related IPC interventions minimizes the risk of direct and indirect exposure to water-related pathogens of enteric and environmental origin (for example, *Pseudomonas*, *Legionella*) and should be available for all clinical services; *at a minimum*, it should be provided to high-risk wards where the burden of HAI and AMR are high.
- *Sufficient quantities of water* are required to ensure that all water-related IPC interventions can be performed. This quantity varies and is dependent on the particular service or ward. To avoid any frequent service gaps/water shortages, it is required that there be sufficient on-site water storage capacity to provide services for a *minimum* of 48 hours.
- Ensuring an adequate quantity of toilets for inpatient users to prevent crowding and overuse and ensuring regular cleaning are critical to maintain a hygienic environment and minimize the transmission risk from enteric pathogens, *at a minimum* in the ratio defined previously.
- Positive mechanical ventilation is needed for clean areas such as operating rooms and clean areas in decontamination units and the sterile services department, while negative pressure ventilation may be required for isolation facilities, for example, multidrug-resistant tuberculosis (see tuberculosis references in 'resources'). The requirement for mechanical ventilation is most applicable to tertiary care facilities.
- Reliable power means that a constant (that is, 24-hour) source of power and/or back-up power is available for high-risk wards (for example, maternity ward, operating room/s, intensive care unit). Without reliable power, it is not possible to operate decontamination (sterilization) equipment and waste treatment equipment when needed, or to have lighting in clinical areas in order to provide continuous and safe care.
- Reliable power can be achieved via an on-site source of energy/power and fuel (for example, wind, solar, stand-by generator/s) to provide back-up as needed.
- Given the increased risk for HAIs and AMR at secondary and tertiary health care facilities, there should be at least one isolation room per 20-bedded ward in secondary care facilities, and 1:10 in the tertiary level *as a minimum*.
- Cohorting can be carried out in a dedicated area of a general ward. It can be done in any well-ventilated area as long as hand hygiene and transmission-based precautions are strictly adhered to.

- As improving access to WASH services and IPC materials and equipment is resource intensive, the first step (*minimum requirement*) is to establish a multidisciplinary technical group to develop standards and implementation tools.
- This group will have the task of:
 - reviewing the requirements for WASH services, environmental hygiene, and IPC materials and equipment, according to the national context;
 - developing a monitoring plan and reporting mechanism for assessing and improving WASH services and IPC materials and equipment in all health care facilities against national standards; use of existing tools (for example, WASH FIT or WHO/UNICEF JMP indicators for WASH in health care facilities) may be of help in these efforts;
 - identifying roles and responsibilities for the implementation and management of WASH services, environmental hygiene and IPC materials and equipment at the facility level at all health care facilities.
- The national level could also consider the development of a policy/regulations to mandate WASH services in facilities, according to the *minimum requirements* specified above.

Full core component requirements

■ ALL HEALTH CARE FACILITIES

- Central government and national IPC and WASH programmes should develop standards and national action plans to ensure adequate WASH services, a hygienic environment, and the availability of IPC materials and equipment in all health care facilities, including primary care.
- Ensuring an adequate hygienic environment should be the responsibility of senior facility managers and local authorities.
- To implement the full requirements of the core component 8, all health care facilities should provide the following:
 - water from an improved source located on premises with sufficient water available at all times for drinking, hand washing, food preparation, personal hygiene, medical activities, cleaning and laundry;
 - improved sanitation facilities located on premises that are functional with safe management of sewage/faecal waste, including the use of well-managed septic tanks and leach fields, disposal into functioning sewers or off-site removal, and include at least one toilet designated for women/girls to manage menstrual hygiene needs, at least one separated for staff, and at least one meeting the needs of people with limited physical disabilities; also, sanitation facilities for infants and children that are adapted for their use (with for example, smaller seats, child-sized bed pans), segregated by sex for older children, appropriately lit and accessible to people with limited mobility;
 - adequate drainage of storm and wash water to prevent vector breeding;
 - continuous access to hand hygiene facilities equipped with ABHRs and (where appropriate) with water, soap and disposable or clean towels at the point of care, within 5 metres of toilets, and other areas such as the sterile services departments, laboratories and mortuaries;
 - continuous adequate supply of sharps' containers and containers for segregating other types of health care waste and equipment to ensure that health care waste is treated and disposed of safely, including autoclaving, incineration or removal for off-site treatment;
 - continuous adequate supplies to ensure regular cleaning of examination rooms, waiting areas, surfaces and toilets;
 - continuous adequate supply of appropriate PPE for both clinical care and health care waste handling and cleaning;
 - adequate ventilation to meet comfort requirements and reduce the risk of transmission of airborne pathogens;
 - adequate power for sterilization, incineration and medical devices; sufficient energy for pumping water, sterilization and operating health care waste equipment (that is, incinerators); well-lit areas where health care procedures are performed and in toilet facilities, including at night.
- The IPC team or committee should be involved in planning all these activities and systems and in the design of buildings and infrastructures and construction in health care facilities.
- Practical actions to improve WASH in health care facilities should include:
 - conduct situational analysis and assessment
 - define roadmap and set targets
 - establish national standards and accountability mechanisms
 - improve and maintain infrastructure
 - monitor and review data
 - develop health workforce
 - engage communities and
 - conduct operational research and learning.

■ SECONDARY AND TERTIARY CARE

(in addition to primary care)

- A dedicated centralized decontamination area and/or sterile supply department for the decontamination and sterilization of medical devices and other items/equipment should be available and supplied with sufficient water and power.
- A dedicated clean storage area for patient care items and equipment, including sterile material, and a separate area for the storage of clean linen should be available as outlined in the WHO manual on decontamination and reprocessing of medical devices for health-care facilities (see 'resources').
- An adequate number of single rooms (with private toilet facilities and including some rooms with negative pressure mechanical ventilation system) and/or rooms suitable for patient cohorting for the isolation of suspected /infected patients, including those with tuberculosis, other airborne pathogens and multidrug-resistant organisms, should be available to prevent transmission to other patients, staff and visitors.
- Proper ventilation systems should be available in general and in the operating room, including either negative or positive air pressure conditions, depending on the situation.
- Risk assessment systems and measures should be developed to ensure protection during building and renovation work for patients, their families and staff, especially in high-risk areas, such as units where severely immunocompromised patients (transplant, patients with profound neutropenia, etc.) are managed, as well as in intensive care, neonatal and burn units and operating rooms.

PART 4. ANNEX

4.1 Annex 1. Summaries of the results of a systematic review and inventory on available IPC minimum standards

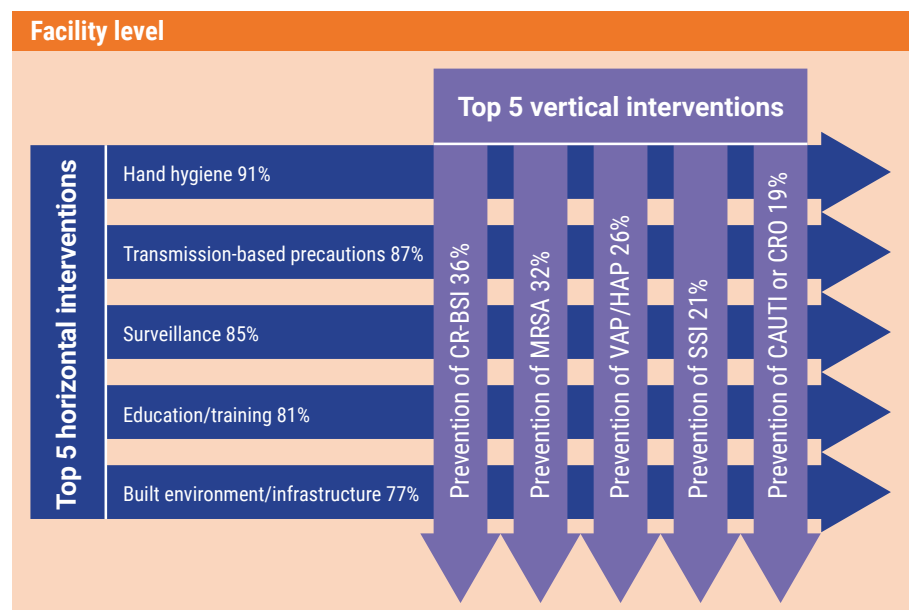
4.1.1 Overview of the results of the systematic literature review on minimum standards for IPC

The systematic review on IPC minimum standards was conducted as a basis for the expert consultation on the IPC minimum requirements. It focused on the question: "What are the minimum standards of effective IPC programmes aimed at reducing health care-associated infections at the national and health care levels?" The Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, GIM (WHO Global Index Medicus) and EMBASE databases were searched to identify reported minimum standards. IPC interventions were categorized as either horizontal (for example, IPC programme, education) or vertical (for example, prevention of surgical site infections). Hand hygiene, injection safety and education are examples of horizontal IPC interventions, while the prevention of surgical site infections, hospital-associated pneumonia and catheter-related bloodstream infections were categorized as vertical IPC interventions.

Horizontal interventions were more frequently mentioned compared to vertical interventions as being a minimum requirement (Fig. 1). Hand hygiene (91%), transmission-based precautions (including triage) (87%), surveillance (85%), education/training (81%) and the built environment/infrastructure (77%) were the five most frequently mentioned horizontal critical IPC measures, followed by guidelines (70%), decontamination (70%) and monitoring/audits/feedback (66%).

Fig. 1

Top 5 horizontal and vertical interventions mentioned as a minimum requirement at the facility level.



ABBREVIATIONS

CR-BSI, catheter-related bloodstream infection; **MRSA**, methicillin-resistant *Staphylococcus aureus*; **VAP/HAP**, ventilator-associated pneumonia/hospital-acquired pneumonia; **SSI**, surgical site infection; **CAUTI**, catheter-associated urinary tract infection; **CRO**, carbapenem-resistant organisms.

Compliance with standard precautions is usually low and it is therefore important to investigate implementation strategies to improve this key measure. Existing competencies of IPC practitioners, as well as existing indicators, will be useful to define minimum standards. It will be critical to draw on lessons learned from the past and to engage hospital leadership in further discussions regarding the importance of implementation of IPC programmes. The review also highlighted the low quality of studies reviewed (systematic reviews and before-after studies), a very great number of studies from high-income countries, a high percentage of systematic reviews on methicillin-resistant *Staphylococcus aureus* and *Clostridium difficile* from high-income countries, and an elevated number of facility-based studies.

4.1.2 Summary of the global inventory on IPC minimum standards

The aim of developing the global inventory of IPC minimum standards was to produce a catalogue of already available guidance on these standards (especially from the perspective of low-resource settings) from WHO regional and country offices, other organizations and countries directly. This was to complement the systematic review and country experiences gathered previously and to provide insights into what could be considered as 'minimum standards' for IPC at the national and facility level. A global call was made to relevant networks, as well as a search for any publicly available IPC-related documents. The database used for the guidelines on the core components of IPC was also searched for any relevant documents. A total of 23 documents were reviewed in full (1-23), but only nine included approved national IPC standards defined as 'minimum' for health care facilities (1-9).

Overall, these documents provided validation of the WHO guidelines on core components for IPC programmes as all reviewed documents could be categorized and related to the eight core components. Most notably, core components 1 (IPC programmes), 3 (education and training) and 8 (built environment) were the most referred to, while core component 7 (workload, staffing and bed occupancy) was the least reported. The limitations of the final inventory had already been acknowledged as it was taken from direct submissions and those that were publicly available. However, despite some countries specifically identifying IPC minimum standards, the majority lacked any standard definition of minimum standards and their approach remained broad with a lack of specificity.

4.1.3 References

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