Interim Practical Manual supporting national implementation of the WHO Guidelines on Core Components of Infection Prevention and Control Programmes

World Health Organization

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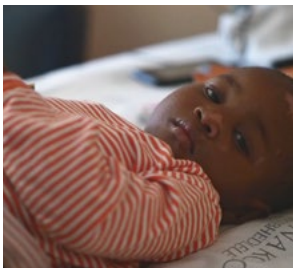

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Acknowledgements

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Key to symbols

Development of an action plan

Hands-on work or implementation activities

Focus on sustainability and long-term improvement

Key concepts – why, when, who, and how

Advocacy for funding or resources needed

Evaluation or assessment needed

Key people to be involved in an activity

Case study

Key tool or resource that can be referenced

Extra attention point ("NB")

Testimonial on country experience

Action checks

Abbreviations and acronyms

AMR	antimicrobial resistance
APIC	Association for Professionals in Infection Control and Epidemiology
CDC	Centers for Disease Control and Prevention
ECDC	European Centre for Disease Control and Prevention
GLASS	Global Antimicrobial Resistance Surveillance System
GPS	good practice statement
HAI	health care-associated infection
HIV	human immunodeficiency virus
HMIS	health management information system
IHR	International Health Regulations
ICAN	Infection Control Africa Network
IPC	infection prevention and control
IPCAT	infection prevention and control assessment tool
JEE	joint external evaluation
MDRO	multidrug-resistant organism/s
NGO	nongovernmental organization
NHSN	National Healthcare Safety Network
PAHO	Pan American Health Organization
R	recommendation
SARA	service availability and readiness assessment
SDG	Sustainable Development Goals
SMART	specific, measurable, attainable, realistic, timely
UNICEF	United Nations Children's Fund
USA	United States of America
WASH	water, sanitation and hygiene
(WASH) FIT	facility improvement tool
WHO	World Health Organization

Introduction to the manual

1. Purpose of the manual

This practical manual is designed to support implementation of the World Health Organization (WHO) Guidelines on core components of infection prevention and control programmes (http://www.who.int/infection-prevention/publications/core-components/en/) at the **national level**, with special focus on countries with limited resources.

The Guidelines describe **what** is necessary (that is, recommendations) to effectively improve infection prevention and control (IPC). This practical manual outlines **how** to do this (that is, how to implement the Guidelines). It focuses on the development of a sustainable action plan informed by the local context to put into operation the Guideline recommendations. It is essential for the reader to review these recommendations before using the manual (http://www.who.int/infection-prevention/publications/core-components/en/).

The manual is grounded in the theory of implementation science and uses practical examples from a range of countries to illustrate "implementation in action". The three main aims of the manual are outlined in Box 1.

This practical manual is an important resource to strengthen IPC and improve the quality and safety of health service delivery through the establishment of evidence-based and locally adapted integrated IPC programmes. The International Health Regulations (IHR) position effective IPC as a key requirement for a successful response to public health threats of international concern. More recently, the United Nations Sustainable Development Goals (SDG) reinforced the importance of IPC as a contributor to safe, effective high quality health service delivery, in particular those related to water, sanitation and hygiene (WASH), quality of care and universal health coverage (Figure 1) .

This is an interim version of the manual as the next phase will see intensive work happening in countries implementing the new IPC core components' recommendations and it is anticipated that more practical examples and case studies will be gathered from its initial dissemination. Additional resources and implementation tools are also under development. Therefore, as lessons learned and additional resources become available, they will be incorporated in future versions of the practical manual. If you have a tool/ resource or an example to illustrate the implementation of the IPC core components, please contact us at allegranzib@who.int and we will consider featuring it in the next version of the manual.

Box 1. Three aims of the manual

- **To provide clear direction and supporting resources** to aid the development of a practical, outcome-focused action plan, informed by local examples and existing realities
- **To describe how to operationalize the plan** based on evidence and national-level implementation experience
- **To support sustainability of the plan** with a focus on integrating and embedding IPC within relevant national policies and strategies

Figure 1. IPC supports the SDG's

2. Target audience

This manual is intended to primarily support governments and policy-makers interested in developing or strengthening their national IPC programmes. This includes policy-makers and implementers responsible for establishing and monitoring national and sub-national IPC programmes (that is, IPC national leads and teams tasked with the implementation of the WHO IPC core components in their country), as well as policy-makers responsible for the delivery of national action plans for antimicrobial resistance (AMR). WHO staff based at country level who is involved in supporting the development or implementation of IPC guidelines, AMR national action plans, including the core capacities of the IHR (2005), may also benefit from using this manual.

The manual may be helpful to a secondary range of actors, including those responsible for health care quality improvement, patient safety, health facility accreditation/regulation, public health/disease control, WASH, occupational health and antimicrobial stewardship programmes. In addition, it may be of value to development partners/non-governmental organizations (NGOs).

Of note, it is crucial to identify clear roles and responsibilities for each implementation step among these various players. The primary and secondary target audiences are summarized in Box 2.

Box 2. Target audience

Primary target audience

Policy-makers and implementers within ministries of health responsible for:

- The establishment and monitoring of national IPC programmes.
- The delivery of AMR national action plans.
- The delivery of IHR (2005) plans.
- WHO country office staff supporting IPC, AMR and IHR (2005).

Secondary target audience

- People within ministries of health/health service departments, or those in charge of:
  - Health facility accreditation/regulation.
  - Health care quality improvement.
  - Public health/disease control.
  - WASH.
  - Occupational health programmes.
  - Antimicrobial stewardship programmes.
- Development partners/NGOs (where appropriate).

3. Structure of manual

The manual is presented in three parts to help the user navigate the implementation journey (Box 3). Part I focuses on the **"what",** that is, the core component recommendations. It also introduces a visual representation of the IPC core components to help understand how they fit together. Part II shifts the user's thinking towards the **"how"** with a focus on how each recommendation can be put into operation. It introduces a classic stepwise approach to implementation and includes a range of country case studies. Part III contains a list of supporting tools and resources that have been used or developed to support the implementation of IPC programmes.

Box 3. Manual structure

PART I	PART II	PART III
The "What"	**The "How"**	**Supporting the "How": Tools**
• Outline and visual summary of the core component	• Stepwise approach to implementing each core component recommendation including case study examples	• Summary of the key tools and resources to support each step of the implementation process
• *At-a-glance summary of the guideline recommendations* • *Visual representation of the core component recommendations and how they relate to each other*	• *The **what, why, where, who, when** and **how** of each core component* • *Practical examples from a range of countries implementing the core components*	• *Checklists, links to training, monitoring and evaluation tools, advocacy and communications supporting tools, culture change tools, etc.*

4. Stepwise approach to implementation

All those working at the national level will know that implementation of any health care improvement can be a complex undertaking. The existing science suggests that the process takes time and is comprised of a number of incremental steps, each requiring different conditions and activities.[1] This manual outlines five steps (Figures 2 and Box 4) for implementing IPC programmes to maximize the likelihood of success and overcome some of the process' complexity. The emphasis within each step is on local adaptation.

Each step is essential to the process. However, depending on the local situation, some steps may already have been achieved, while others may need gradual development or to be revisited as new challenges or changes within the health care system arise. Step 1 focuses on national preparedness and moving towards a readiness for action. Step 2 involves conducting a baseline evaluation to establish an understanding of the current situation and which actions are necessary. Step 3 is concerned with putting the implementation action plan into practice and addressing the gaps identified by the baseline assessment. Steps 4 and 5 involve conducting follow-up evaluations to assess the progress of the action plan and developing a cycle of improvement for the coming years to sustain the gains. Detailed objectives of each step are described in Box 4.

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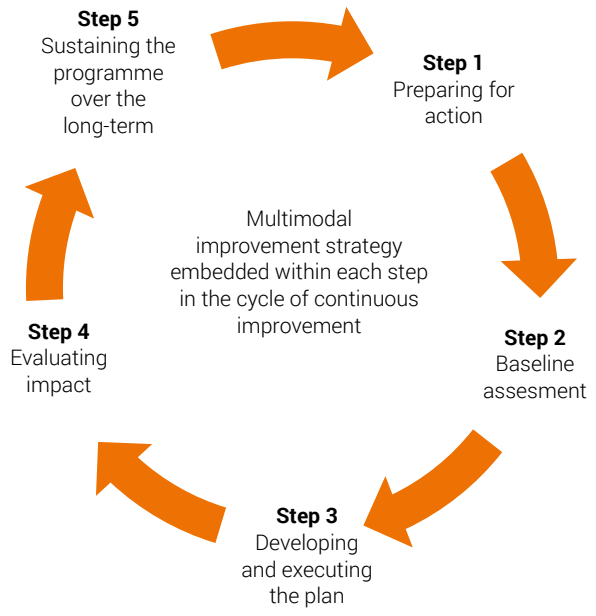
Figure 2. Steps of implementation



Based on the Guide to the implementation of the WHO multimodal hand hygiene strategy. Geneva: World Health Organization; 2009 (http://www.who.int/gpsc/5may/Guide_to_Implementation.pdf, accessed 20 April 2017).

Box 4. Objectives of the implementation steps

Step	Objective
1. Preparing for action recommendations for the national level	Ensure that all of the prerequisites that need to be in place for success are addressed, including the necessary planning and coordination of activities and the identification of roles and responsibilities. This includes addressing the necessary resources (both human and financial), putting infrastructures in place and identifying key leaders and "champions", including an overall coordinator and deputy.
2. Baseline assessment	Conduct an exploratory baseline evaluation of the current national situation, including identification of existing strengths and weaknesses.
3. Developing and executing an action plan	Use the results of the baseline assessment to develop and execute an action plan based around a multimodal improvement strategy *(see Annex 4).*
4. Evaluating impact	Conduct a follow-up evaluation to assess the effectiveness of the plan with a focus on its impact, acceptability and cost-effectiveness.
5. Sustaining the programme over the long term	Develop an ongoing action plan and review cycle to support the long-term impact and benefits of the programme and the extent to which it is embedded across the health system and country, thus contributing to its overall impact and sustainability.

1 An introductory guide to implementation. Dublin: Centre for Effective Services: 2012 (http://:www.effectiveservices.org/implementation, accessed 20 April 2017).

Part I: Outline of the IPC Core Components

The WHO Guidelines on core components of IPC programmes (http://www.who.int/infection-prevention/publications/core-components/en/) comprise the following eight core components, including **six** which are particularly relevant for **the national level** (below in italics) and the focus of this manual:

1. **IPC programmes**
2. **Evidence-based guidelines**
3. **Education and training**
4. **Health care-associated infection (HAI) surveillance**
5. **Multimodal strategies**
6. **Monitoring and audit of IPC practices and feedback**
7. Workload, staffing and bed occupancy **(for facility level)**
8. Built environment, materials and equipment for IPC **(for facility level)**

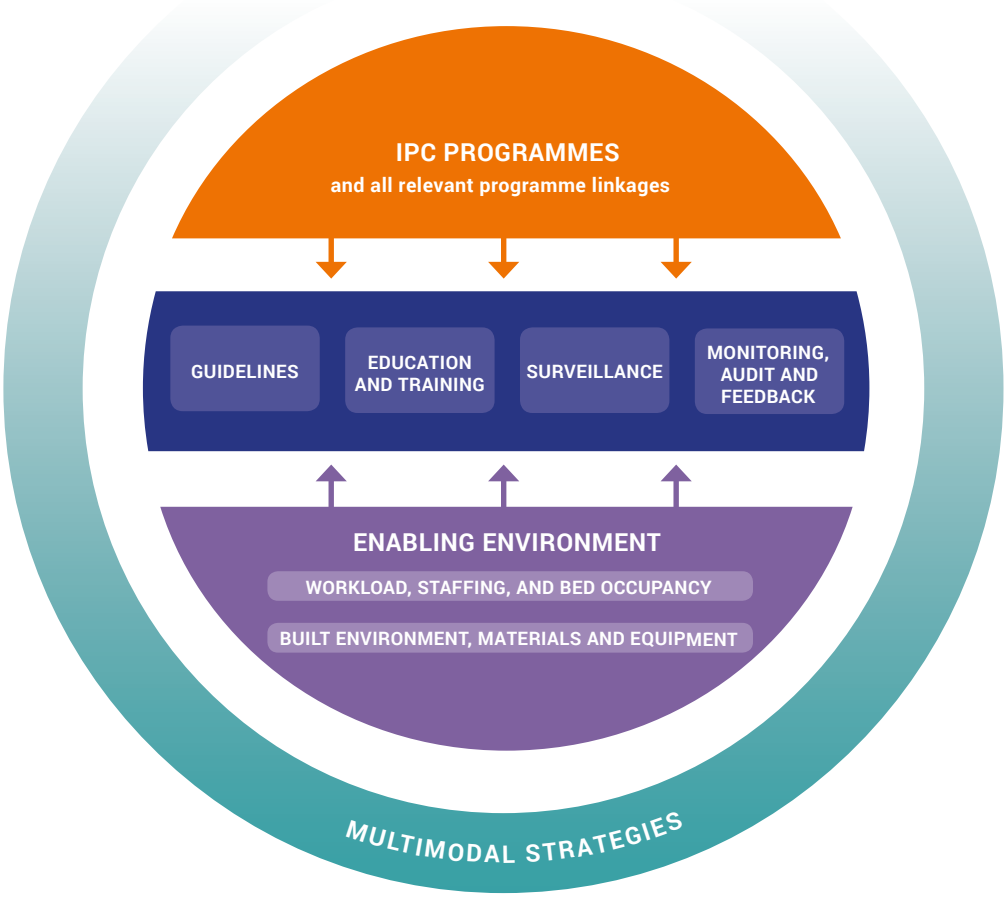
Although the last two core components are typically implemented at facility level, leadership, coordination and policy development by the national authorities supporting these components are critical. A second practical manual will focus on guidance for all core components at the facility level.

Each of the recommendations for the national level can be found at the beginning of each section of this manual dedicated to the implementation of core components 1-6.

Figure 3 presents a visual representation of the IPC core components and how they are interconnected.

A comprehensive and effective approach to IPC consists of establishing ***IPC programmes*** with strong links to other national programmes, for example, those addressing quality and safety and AMR. The presence of an IPC programme is a necessary, but not a sufficient condition to achieve safe high quality health care. In addition, at the facility level, an adequate ***built environment*** (including the necessary infrastructure, materials and equipment, appropriate bed occupancy, adequate human resources or staffing and workload) represents the foundation enabling the implementation of all other core components and the achievement of safe practices. These two prerequisites, that is, an IPC established programme and an adequate built environment, support the effective implementation of ***IPC guidelines, training and education, monitoring, audit, feedback and surveillance***. Implementation success in each of these areas also depends on the adoption of a ***multimodal approach,*** that is, a strategy consisting of several elements implemented in an integrated way with the aim of improving an outcome and changing behaviour.

Figure 3. Visual representation of the core components of infection prevention and control (IPC) programmes.*



*Note how they are interconnected to improve IPC practices and reduce infection outcomes.

Part II: How to successfully implement each core component of an IPC programme

Successful implementation is dependent on identifying a clear plan of action that systematically addresses what needs to happen by developing a clear rationale for each action to help win hearts and minds **("why")**, identifying and assigning roles and responsibilities **("who")**, a realistic and achievable timeline **("when")**, and an operational plan to achieve the recommendation **("how")**.

The section below guides the user through the process of implementation. Each country will be at a different stage of development and implementation in terms of IPC programmes. In countries with an established IPC programme, the following section acts as a prompt to ensure that all aspects of effective IPC programmes as outlined in the Guidelines are always addressed and secured. In countries at the start of their IPC journey, each section should be considered to guide strategy and action.

Core Component 1: IPC programmes

WHO Guideline national recommendation

An active, stand-alone, national IPC programme with clearly defined objectives, functions and activities should be established for the purpose of preventing HAI and combating AMR through IPC good practices. National IPC programmes should be linked with other relevant national programmes and professional organizations.

> **"We will not win the fight combating HAIs and AMR without IPC. An effective IPC action at the point of care is not possible without an integrated IPC programme and dedicated champions. Whenever we could – at every relevant ministry of health meeting – we presented on IPC and advocated for its importance until we gained leadership support and grew from there."**
>
> IPC National Lead from Africa

WHY

- The development and maintenance of a national IPC programme is the **foundation** for the implementation of all other core components.
- Developing and establishing an IPC programme ensures that national leadership and the right technical expertise is in place to support all IPC activities.
- IPC national programmes support the prevention of avoidable infections and saves lives. Effective IPC programmes lead to more than a 30% reduction in HAI rates.
- IPC national programmes support the implementation of the IHR (2005) and the WHO global action plan on AMR.
- A strong, effective and sustained IPC programme ultimately strengthens health systems and supports the delivery of high quality, people-centred and integrated health services that are a necessary prerequisite to achieve universal health coverage and SDGs.

WHEN

- The development of a national IPC programme is a **critical first step** that will support the implementation of all core components.
- The existence of a national IPC programme and team with a clear mandate will enable the prioritization and implementation of other IPC core components according to the local context and baseline and regular assessments.
- Of note, there are examples of countries where IPC action has started while a national IPC programme was still being established due to emergency situations (for example, an outbreak) or acute public health events (for example, tackling AMR spread in health care).

WHO

- The key players for the development of a national IPC programme are:
  - IPC lead/focal point, technical support team at the ministry of health or designated national responsible body, and an IPC committee with members from other relevant departments and areas within the ministry of health, as well as other sectors concerned.
  - Committed senior leadership.
  - IPC technical partners (for example, WHO country office IPC technical lead, United States of America [USA] Centers for Disease Control and Prevention [CDC], other organizations with competence and activities in the field of IPC).
  - Leads of other programmes where links can be useful for synergistic action (for example, WASH).
- If the country already has an established national programme, but needs to maintain it and ensure that funding is constantly secured, critical people to continue to involve are in particular:
  - Senior leadership and national authorities.
  - IPC technical partners.
  - Leads of other programmes where links can be useful for synergistic action (for example, WASH).

HOW

- Secure support and funding from national authorities, that is, senior leadership in the government and the ministries, including ministries other than health (for example, finance, environment, education).
- Appoint at least one competent person (that is, with IPC experience and training) to lead the IPC work. The ultimate aim is to build a strong, effective, multidisciplinary IPC team with the time and authority to make decisions and develop and implement a national action plan.
- It is important to stimulate collaboration and coordination between the IPC programme and other relevant projects to achieve real and continuous integration as there are many common objectives across programmes. To achieve this, consider engaging the following relevant programmes/organizations:
  - Prevention and control of AMR in health care settings, including antibiotic stewardship.
  - Surveillance of disease and outbreaks and response to public health emergencies.
  - Quality management (that is, quality assurance, control and improvement), health care facility licensing and accreditation, patient safety, occupational health).
  - WASH, waste management and environment.
  - Tuberculosis, human immunodeficiency virus (HIV), hepatitis, maternal and child health.
  - Immunization among other public health programmes.
  - Public health departments.
  - National referral laboratories, laboratory biosafety/biosecurity.
  - Sub-national authorities, such as provincial or district health offices (first referral health facilities).
  - National healthcare professional organizations and academia (for example, IPC associations, health care professional bodies).
  - Patients' associations/civil society bodies.

STEP 1: PREPARING FOR ACTION

MAIN ACTIVITIES

1. Secure national, sub-national and local political commitment.

a. Identify relevant national, sub-national and local authorities and leaders and gain their support, commitment and buy-in.
b. Consider how to build momentum for political support – what are the political priorities in your country at the moment? Can IPC act as a solution and contribute to achieving this agenda? How can you build a case to articulate this? Are there any national campaigns in which IPC has been addressed that can be revisited? Outbreak experiences can act as catalysts for change. If you have a recent experience of outbreaks, leverage national attention to drive forward IPC action at the political level. It is important to note that implementing the core components will mitigate against future outbreaks and strengthen the resilience of the health system. A high prevalence of specific infectious diseases, such as hepatitis, has led to the development of specific programmes where the prevention component is key. Again, collaboration with these programmes can act as a catalyst for the development of IPC programmes.
c. Is there the potential to integrate IPC within existing legislation or accreditation?
d. Are there any active groups or professional bodies with power and influence to advocate for IPC improvement at the national level?
e. Use the results of existing assessments that may have addressed IPC-related matters, such as specific IPC assessments, health management information systems (HMIS), service availability and readiness assessments (SARA), national AMR assessments, WASH, etc.
f. Use global campaigns/movements to sell your IPC messages and gather commitment, for example, calls for action on hand hygiene promotion in health care from WHO each 5 May (SAVE LIVES: Clean Your Hands), World Antibiotic Awareness Week, etc. Did your country sign the WHO global patient safety challenge pledge relating to Clean Care is Safer Care and therefore committed at the political level to improve IPC and prevent HAI? If so – use the opportunity to remind policy-makers of this commitment and leverage the pledge for renewed action now. See whether your country is one of the 139 Member States that has pledged here: http://www.who.int/infection-prevention/countries/hand-hygiene/statements/en/

"After trying other approaches to build political will for IPC, we started to regularly attend the ministerial advisory committee for AMR where we continuously advocated for IPC among programme managers. This is how we were able to get official recognition of IPC and a national mandate."
Regional IPC Focal Person from the Americas

"Legislation has been a critical part to building recognition as many won't consider IPC and its value until there is a norm or requirement for an IPC programme."
IPC Professional from Africa

"For the last decade, we have worked with an IPC committee with representation from all main scientific and medical societies. The committee has provided the expertise and input to drive the national IPC programme at the ministry of health."
IPC National Lead from Africa

"It is critical to link the IPC programme to the prevention of certain public health priorities, including bloodborne pathogens, such as hepatitis and HIV, as well as AMR. Having a ministerial decree to establish the IPC unit is critical to define the mission and function of the unit and to allocate adequate resources".
IPC National Lead from Africa

2. Make sure that the IPC programme is led by a team of passionate, credible individuals to progress the work.

a. Has IPC been addressed previously in other quality improvement work? Is there someone from this work who can contribute to the IPC team?
b. Are there any champions at the national level working in other programmes who can influence decision-makers and support advocacy for IPC? Would they have time to commit some hours to the IPC programme?
c. Does a leader of any IPC programme currently exist? If not, consider who might be able to lead the programme. Alternatively, are there individuals with the required skills or the potential to be trained in the technical and adaptive aspects of IPC?
d. It is important to prepare before approaching potential champions and stakeholders using points contained in the tools mentioned above.

Start thinking about the composition, competence and remit of a sustainable IPC team (Box 5). The core components' guidelines recommend:

a. At least one IPC lead with the ultimate aim of developing a multidisciplinary team (medical, nursing and pharmacist professionals with competencies in IPC, epidemiology, implementation at the point of care, clinical experience).
b. Dedicated time (at least for the IPC lead, this means full time) to undertake the role.
c. The IPC lead and team should have formal training in IPC. If the country does not yet have existing capacity, seek international training opportunities and aim to achieve it as soon as possible.
d. A multidisciplinary IPC committee, including senior leads at the ministry of health (for example, chief medical officer, chief nurse officer, director of hospitals and medical services, officers in charge of quality improvement and infectious diseases surveillance, etc.) to support IPC activities. Different technical/advisory working groups could also be considered.
e. In discussion with the IPC committee, the IPC team should develop clear objectives and a national action plan based on local problems and priorities (links to core components 4 and 6), IPC policies and guidelines.
f. The IPC team will support the implementation of guidelines, policies and standards through education and training, surveillance, monitoring and feedback, and ensuring that procurement systems are in place.
g. The IPC team will coordinate IPC action to support any outbreak response.

Links to resources

- WHO IPC core components summary (see Annex 1).
- WHO IPC core components advocacy video: https://www.youtube.com/watch?v=LZapz2L6J1Q&feature=youtu.be
- WHO video: Healthcare without avoidable infection – people's lives depend on it: https://www.youtube.com/watch?v=K-2XWtEjfl8
- WHO booklet: Health care without avoidable infections: the critical role of infection prevention and control: http://www.who.int/infection-prevention/publications/ipc-role/en/
- WHO/United Nations Children's Fund (UNICEF) infographic: Tackling antimicrobial resistance: Supporting national measures to address infection prevention and control, and water sanitation and hygiene in health care settings: http://www.who.int/water_sanitation_health/facilities/amr-ipc-wash-flyer-nov16.pdf
- Stakeholder mapping tool: https://www.k4health.org/sites/default/files/stakeholder_analysis_tool_generic_0.doc
- Association for Professionals in Infection Control and Epidemiology (APIC) HAI cost calculator: http://www.apic.org/Resources/Cost-calculators
- Research articles that implementers may find useful to develop a business case for IPC:
  - Douglas-Scott II R. The direct medical costs of healthcare-associated infections in U.S. hospitals and the benefits of prevention. Atlanta (GA): Centers for Disease Control and Prevention; 2009: https://www.cdc.gov/hai/pdfs/hai/scott_costpaper.pdf
  - Perencevich EN, Stone PW, Wright SB, Carmeli Y, Fisman DN, Cosgrove SE; Society for Healthcare Epidemiology of America. Raising standards while watching the bottom line: making a business case for infection control. Infect Control Hosp Epidemiol. 2007;28(10):1121-33: https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/raising-standards-while-watching-the-bottom-line-making-a-business-case-for-infection-control/F5B126A74D8B7BDBDC6309D5F6583E05
  - Graves N. Economics and preventing hospital-acquired Infection. Emerg Infect Dis. 2004; 10(4):561-6: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3086182/

"We recognized that we had to first train committed IPC professionals so that they would be able to understand IPC, its epidemiology, and how to advocate for its importance, thereby increasing political will."
Regional IPC Focal Point from the Americas

"We first created an IPC committee with representatives from different ministry of health departments. It took time to identify the right committee chair and "champions" to participate in this committee and to gain approval for their involvement. We regularly push to give presentations at various meetings across programmes and venues. We are always looking for "champions" who demonstrate interest and commitment.
IPC Professional from Africa

"A small group of high-performing hospitals were selected as "model hospitals". IPC professionals from each of these hospitals make up a committee that is tasked to support the national IPC programme."
IPC Professional from South-East Asia

3. Think about funding, resources and infrastructure.

a. Consider the best strategy for the local context to convince decision-makers to allocate and sustain a budget for IPC - the WHO Guidelines recommend a protected and dedicated budget.
b. Involve all key stakeholders in addressing resource requirements – focus on key people, departments or organizations who have a vested interest in IPC improvement, for example, the potential national champions mentioned in point 2 above, and also those working on AMR and IHR (2005).
c. Can existing resources, staff or infrastructure be leveraged for IPC improvement? It can help to sit with other relevant programmes and identify joint areas of work across work plans and existing staff with IPC within their scope.
d. Specifically consider resources for policies, regulations and tools to enable an effective central coordination of facility level improvement.
e. Develop a budget case for presenting to the ministers of health and finance as appropriate.

"An important step is to advocate for a budget line item, even if it's small. One can do a lot with this recognition, and also leverage existing resources."
IPC Professional from Africa

4. Establish a series of sensitization and advocacy meetings with leaders.

a. Meet regularly with programme managers (for example, department heads of quality management, disease programmes, AMR) and senior leadership to advocate for the importance of IPC.
b. Take the time to explain to them why IPC is crucial and beneficial to other areas (that is, illustrate by using simple examples of local practice that may have changed to obtain quick visible results).

"We had a champion within the quality assurance programme who was passionate about IPC. She started by advocating for a portion of dedicated time to work on IPC and was allowed a small team from the regional health associations to do so. This team focused on constant engagement through senior meeting presentations and individual meetings with programme managers. Meetings were held to share work plans and identify joint actions. They were also able to leverage public concerns about the cleanliness of hospitals to raise awareness about the importance of IPC. They worked with facilities to convince leadership on the need for IPC focal persons that could dedicate 1-2 days per week in the beginning. With time and results, much of the dedicated time to IPC at the national and facility level grew."
National IPC Lead from Africa

Box 5. Roles & Responsibilities of the national IPC team

ROLES OF THE IPC NATIONAL TEAM

1. Develop and execute the national IPC programme, including setting formal objectives and plans and establishing a formal IPC group or committee.

2. Develop and disseminate national guidelines and support implementation.

3. Develop and coordinate a programme of continuous education and training.

4. Develop and coordinate systems for HAI surveillance, including an alert system for outbreaks detection, and monitoring, audit and feedback of IPC indicators.

5. Facilitate access to the essential infrastructures, materials and equipment necessary for safe IPC practice. Support and promote safe workloads, staffing and bed occupancy levels (that is, an enabling environment).

6. Build effective linkages with related national programmes.

7. Promote and support the implementation of multimodal strategies to achieve IPC improvements at the facility level.

RESPONSIBILITIES OF THE IPC NATIONAL TEAM

1. National programme, objectives and plans

a. Formulate clear goals for the prevention and control of endemic and epidemic infections.

b. Prepare national plans for the prevention of HAI aligned with the IHR (2005) and AMR programmes and involving key players and partners.

c. Conduct monitoring and evaluation of the national programme and disseminate feedback of the results.

d. Establish an official multidisciplinary IPC group, committee or an equivalent structure to support the integration of IPC within the national health system including the IPC programme and its monitoring and evaluation.

e. Ensure that a national outbreak prevention plan is in place.

2. National guidelines

a. Develop or strengthen national policies and standards of practice (including technical, evidence-based guidelines for the prevention of relevant risks informed by local risk assessment and/or adapted to local conditions) regarding IPC activities in health care facilities.

b. Prepare dissemination plans and a programme of support for local implementation.

c. Ensure that a system is in place for the documentation and dissemination of successful local or national initiatives to highlight examples of effective interventions and their implementation.

3. Continuous education and training

a. Support the development and enhancement of educational programmes on IPC.

b. Ensure advanced educational programmes that target IPC specialists, all health care workers involved in service delivery and patient care, as well as other personnel that support health service delivery, including administrative, managerial and all other support staff.

4. Surveillance, monitoring, audit and feedback

a. Formulate processes to monitor the implementation of and adherence to national policies and standards and put in place feedback mechanisms.

b. Formulate a system of surveillance of HAIs, as well as AMR, including early outbreak detection and the associated dissemination of data.

5. Enabling environment

a. Ensure national procurement of an appropriate selection of adequate supplies relevant for IPC practices, for example, personal protective equipment, hand hygiene products, disinfectants, etc.

b. Ensure effective waste management and adequate access to safe water, sanitation and environmental cleaning across health care facilities.

6. Programme linkages

a. Ensure that effective relationships are built with related teams, programmes and other ministries including: WASH; environmental authorities and waste management; those responsible for the prevention and containment of AMR, including antimicrobial stewardship programmes, tuberculosis, HIV and other priority public health programmes; national referral laboratories and laboratory biosafety programmes; occupational health; quality and safety programmes; patients' associations/civil society bodies; scientific professional organizations; training establishments/ academia; relevant teams or programmes in other ministries; relevant sub-national bodies, such as provincial or district health offices; immunization programmes; and maternal and child health programmes.

7. Multimodal strategies

a. Provide coordination and support to health facilities in the development and implementation of multimodal strategies aligned with other national quality improvement programmes or health facility accreditation bodies, including providing support and the necessary resources, policies, regulations and tools.

STEP 2: BASELINE ASSESSMENT

MAIN ACTIVITIES

1. Undertake a baseline assessment.

a. Irrespective of whether a national functioning IPC programme does or does not exist, a baseline assessment:
   a. Will help you understand where your country stands regarding the WHO recommendations on IPC core components.
   b. Will identify current strengths and existing gaps and enable activity to be prioritized and targeted (see link below to the modified national IPC assessment tool [IPCAT2]).
   c. Is key to develop a specific, measurable, actionable, realistic and timely (SMART) action plan to be refreshed every year or biannually.
b. Identify in advance who needs to lead the assessment and what team members should be involved to ensure efficient management and accurate results that will be acted upon.
c. Remember to draw on existing assessments that may have addressed IPC-related matters, such as HMIS/SARA, joint external evaluation (JEE), national AMR assessments, etc.

2. Use the results to provide actionable feedback to all relevant stakeholders.

a. Share with the IPC team and the IPC committee if it exists.
b. Share with national leaders and decision-makers, including ministers.
c. Share with other relevant programme leads to re-assess joint areas of work.
d. Present the results in a format suitable to each audience.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/

STEP 3: DEVELOPING AND EXECUTING AN ACTION PLAN

MAIN ACTIVITIES

1. Translate the findings of the baseline assessment into a written action plan (see link below to action plan template) by considering the following:

a. Using the results, identify priorities and SMART objectives (for example, "by 31 December 2019, at least one IPC focal person will be in place and have undergone a training programme in IPC").
b. Identifying corresponding action steps and timeframes, including an agreed-upon schedule of reporting, to assess progress according to objectives.
c. Designating lead persons and support staff for each action as necessary

2. In addition to the standard action plan components, the following questions should be considered when developing the key action steps for guideline development:

a. How will sensitization and advocacy meetings be held with leaders?
b. Has a multidisciplinary team been created with a dedicated IPC professional lead?
c. How will budgeting and resource planning be considered?

3. Put the plan into action and monitor progress.

a. Take action plan steps according to the timeline.
b. Follow agreed-upon roles and timeframes.
c. Communicate and hold meetings with key individuals at set time intervals to investigate how actions are progressing and identify any barriers to progress.

Links to resources

- Action plan template (see Annex 3).
- WHO Handbook on national health strategic planning: http://www.who.int/healthsystems/publications/nhpsp-handbook/en/

STEP 4: EVALUATING IMPACT

MAIN ACTIVITIES

1. Develop and maintain an evaluation plan to assess the impact of the IPC programme.

a. Establish a frequency for follow-up assessments using the tools used in step 2 - a minimum annual frequency is recommended in the first instance.
b. Embed/integrate the evaluation plan into other national monitoring and evaluation programmes as appropriate, addressing all available sources of data and technical expertise.
c. Communicate evaluation findings to leadership and other stakeholders.

2. Put the evaluation plan into operation

a. Update the action plan based on the results of the evaluation, considering the effectiveness of the programme, acceptability and value for money.
b. Report on evaluation impact as outlined in the plan, including at key decision-making meetings.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/

STEP 5: SUSTAINING THE PROGRAMME OVER THE LONG TERM

MAIN ACTIVITIES

1. Use the initial action plan and evaluations to develop a long-term (5 years) action plan and review cycle to address long-term sustainability with a focus on:

a. Securing long-term policy level support for the IPC programme (including legislation to regulate IPC action).
b. Securing long-term commitment from identified champions.
c. Providing regular feedback on action plan progress.
d. Harnessing available financial, human and other necessary resources.
e. Building a financial case for long-term investment.
f. Building a portfolio of success stories and communicating examples of success to key stakeholders and networks as part of awareness raising.
g. Document the IPC programme.

Case study 1

Building an IPC programme as a core activity: the case of Chile

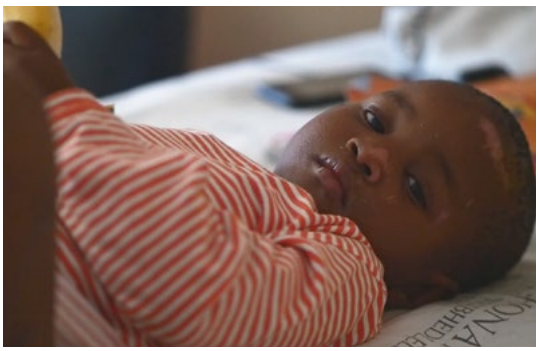
Chile is a middle-income country with a strong public sector and a Ministry of Health that regulates 186 public hospitals and a similar number of private facilities. In the early 1980s, outbreaks of HAIs with high media coverage motivated the creation of a national programme. This started with appointing IPC nurses to 12 hospitals and their basic training to perform point prevalence studies in intensive care units. Soon after, IPC nurses were appointed to over 60 larger facilities trained by yearly national seminars that included doctors and microbiologists. Training of IPC teams aimed to establishing a surveillance system, problem solving using local data with evidence-based interventions according to the local situation and documenting results. Other training in epidemiology, outbreak management and cost assessments aimed at IPC doctors, administrators and clinical directors of hospitals was established. The ministry of health disseminated a series of guidelines/ regulations based on evidence in order to support the local efforts in matters such as sterilization/disinfection, isolation, sterile technique, prevention of device-associated infections and outbreak management. The ministry of health implemented a periodic process of external evaluation of the hospitals that contributed to monitor and document the progress. The programme can now document the impact of reducing the rates of device/procedure HAIs over the past decade as between 18% and 70%, depending on the site of infection. Currently, IPC is a key pillar of the strategies for AMR containment and preparedness for epidemics.

"We had success in our IPC programme using a multimodal strategy and strong leadership from the highest levels of the health authority. Acting upon local data with evidence-based interventions and documenting results has been key to obtain local acceptance and integration to routine hospital health care."

IPC National Lead from Chile

Case study 2

Building an IPC programme in the face of adversity: the story of Liberia



Liberia is representative of many low-income countries in that prior to the outbreak of Ebola virus disease in 2014, IPC was virtually non-existent at the national level. The outbreak acted as a catalyst for change and with the support of the international community, the ministry of health started to build a basic IPC programme focusing initially on building IPC capacity within the ministry that could support national cascade training (that is, training-the-trainers) coupled with monitoring and feedback. Despite the challenges associated with the lack of WASH and IPC infrastructures, a cadre of IPC professionals has been developed, supported by national political commitment and leaders who championed IPC as a critical element of quality improvement. Two years later, the IPC programme now occupies a strong place in Liberia's national quality agenda.

"We had success integrating IPC into the quality management programme, but it was important to be clear and advocate for dedicated staff and time to IPC within this programme."

Assistant Minister of Health, Liberia

Key lessons from country case studies

1. Integration with AMR and quality improvement.
2. Awareness-raising with senior leaders and programme managers (for example, regular meetings, presentations).
3. Identification of champions to drive the programme forward.
4. Consider necessary legislation to develop an "IPC norm".

ACTION CHECKS

To address the implementation of this core component, you should have done the following:

Key actions

1.	Secured national and sub-national political commitment	☐
2.	Identified a multidisciplinary IPC team including assigned roles and responsibilities	☐
3.	Identified possible sources of funding and resources to leverage, including existing ones	☐
4.	Held regular sensitization and advocacy meetings with other programmes and integrated/aligned where applicable	☐
5.	Collected baseline data	☐
6.	Developed a process for feeding back results	☐
7.	Developed an action plan including a timeline	☐
8.	Established a frequency of follow-up assessments and a defined feedback process	☐
9.	Developed an annual review cycle	☐

Core Component 2: National IPC guidelines

WHO Guideline national recommendation

Evidence-based guidelines should be developed and implemented for the purpose of reducing HAI and AMR. The education and training of relevant health care workers on the guideline recommendations and the monitoring of adherence with guideline recommendations should be undertaken to achieve successful implementation.

WHY

- The development of IPC guidelines, protocols and standard operating procedures[2] and related implementation strategies is a key function of national IPC programmes.
- Technical guidelines should provide clear directions on IPC priorities, clear evidence-based standards and a framework for local adaptation. If effectively linked to education and training when implemented and monitored, guidelines can lead to desired IPC outcomes and quality improvement.
- IPC guidelines provide a means by which health care facilities/workers can be held accountable.

WHEN

- The development of guidelines should be considered among the priority functions of a national IPC programme (see Core Component 1).
- Where established national guidelines and standard operating procedures already exist, consider the extent to which they are embedded and sustained across all health care facilities.
- Each country should establish when is the best time to develop IPC guidelines in the implementation sequence of the core components' recommendations. The availability of technical guidelines on IPC programme organization and key IPC practices is usually a prerequisite for rolling out IPC education and training, including IPC monitoring and evaluation, and these should adhere to IPC principles and standards referred to in national guidelines.

2 **Guidelines** are developed to improve decision-making by providing guidance and recommendations according to the best available evidence.

A standard operating procedure is a set of step-by-step instructions compiled by an organization to help workers carry out routine operations in the most effective manner.

A protocol is a detailed plan of a scientific or medical experiment, treatment, or procedure.

WHO

- IPC lead/focal point, technical team or committee at the ministry of health or national responsible body as guideline development and implementation are key activities in their mandate.
- Senior leads in key positions at the ministry level.
- Scientific committee to develop the initial guideline standards.
- It is important to inform all other relevant programmes and national actors (see the list of possible partners under "How" in the section on Core Component 1) and identify key joint areas of work across guidelines.
- In a country where the IPC team is newly established and has limited experience/ expertise, consider external IPC technical support as needed for initial guideline development/review.
- Ask occupational health professionals to contribute with a focus on health care worker protection.

"We first identified an IPC technical expert consultant to work with us to identify the key evidence-based standards and then worked internally to focus on local adaption. We met with each of the managers from the vertical disease programmes, including AMR, HIV, tuberculosis, maternal and child health care, and reviewed the inclusion of IPC principles in their guidelines so that we made sure they were harmonized with our IPC guidelines. We also used this as a way to build collaboration and relevant programme linkages (that is, sharing of technical documents and identifying joint action)."

IPC National Lead from Africa

HOW

- It is important to note that the development of guidelines requires a functioning national IPC programme. Many of the actions outlined in steps 1-5 are common to the implementation of all aspects of IPC programmes.

STEP 1: PREPARING FOR ACTION

MAIN ACTIVITIES

1. Convene the national IPC project team to focus on the development of guidelines.

a. The project team will comprise those identified in the above "Who" section.
b. Identify existing or external IPC technical expertise, for example, a scientific committee, with the capacity to develop the initial guideline standards.
c. Invite representatives from other relevant areas, for example, those responsible for the health workforce, other vertical disease programmes, WASH, waste management, and the field of behavioural science.

> **"We selected "model IPC hospitals." From these hospitals, the selected IPC professionals made up a team that was tasked to lead the guideline writing and provide the necessary technical expertise for its development."**
> IPC Professional from South-East Asia

2. Identify key stakeholders, champions, leaders and networks to drive forward guideline development and implementation.

a. The support of relevant stakeholders is necessary to develop a supportive climate for the development and implementation of guidelines. Consider how best to identify IPC champions, health facility leaders, frontline health workers and the public to gain their buy-in. Their input will be critical to the local adaptation of the guidelines.
b. Identify key networks (teams and groups across the country) who can be engaged to support the required actions and sustainability. This might include professional societies, nursing and medical bodies, research institutions, development partners.
c. Hold a meeting to identify existing guidelines including IPC across the health care system and define joint areas of work that can be harmonized.

3. Address the need for funding, resources and infrastructure.

a. Consideration should be given to the necessary funding and technical support, particularly for guideline implementation. It is critical that activities do not stop after the initial guideline development and careful planning for their implementation, including financial implications, can help with this. Resources for policies, regulations and tools to enable the effective central coordination of facility level improvement should also be considered.
b. Involve all key stakeholders in addressing resource requirements. If the country partially relies on external funding, make sure that grant proposals prioritize topics that are the object of national guidelines. Similarly, NGOs should be urged to follow national guidelines and to use their resources for their implementation.
c. The IPC team should follow up with accountable sectors that the necessary infrastructure and supplies are in place to enable guideline implementation.

> **"We considered existing resources and then worked with facilities to set plans and deadlines for the implementation of the guidelines to ensure operationalization and that it wouldn't just stop after its development."**
> IPC Professional from South-East Asia

4. Alignment with other policies and programmes.

a. Consider how to harmonize the guidelines with other national policy and programme guidelines, for example, AMR, IHR (2005), quality and safety, and other vertical disease programmes. Many of these may already have IPC components included in their guidelines, so it is important to take the time to identify joint areas of work and harmonize accordingly.

b. Develop a comprehensive guideline dissemination strategy (for example, awareness-raising, training, websites, stakeholders' support).
c. Consider how guideline implementation can also be harmonized, such as the integration of linked education, training, monitoring of guidelines and their implementation in clinical services.

5. Consider the content of guidelines with a focus on adaptation.

a. An IPC technical expert can develop the initial guideline standards, but it is the responsibility of the IPC team to discuss the necessary adaptation to ensure their feasibility and effectiveness in the local context.
b. If available, it is essential to rely on recommendations and templates from international evidence-based guidelines. Make a systematic inventory of available guidelines.
c. A literature review (including personal communications with country experts) should be conducted to identify any relevant local research that could be used in the guideline development process.
d. A sound baseline assessment, as described in step 2, is an important tool to assist with such local adaptation.

Links to resources

- Stakeholder mapping tool: https://www.k4health.org/sites/default/files/stakeholder_analysis_tool_generic_0.doc
- National IPC guidelines template: currently under development - to be launched in 2017.
- Specific WHO guideline examples:
  - WHO Global guidelines on the prevention of surgical site infection: http://www.who.int/infection-prevention/publications/ssi-guidelines/en/
  - WHO Guidelines on hand hygiene in health care: http://www.who.int/infection-prevention/publications/hh_evidence/en/
  - WHO Manual on the decontamination and reprocessing of medical devices for health care facilities: http://www.who.int/infection-prevention/publications/decontamination/en/
  - WHO Guideline on the use of safety-engineered syringes for intramuscular, intradermal and subcutaneous injections in health care settings: http://www.who.int/infection-prevention/publications/injection-safety/en/
- Research article that implementers may find useful:
  - Fervers B, Burgers JS, Haugh MC, Latreille J, Mlika-Cabanne N, Paquet L, et al. Adaptation of clinical guidelines: literature review and proposition for a framework and procedure. Int J Qual Health Care. 2006; 18(3):167-76: https://academic.oup.com/intqhc/article-lookup/doi/10.1093/intqhc/mzi108

STEP 2: BASELINE ASSESSMENT

MAIN ACTIVITIES

1. If a baseline assessment has already been undertaken as part of the overall core component implementation, focus on the results relating to guideline development and implementation.

2. If a baseline assessment has not yet taken place, undertake one now.

a. The national core components checklist and the modified national IPCAT2 will provide crude information on the status of guideline development and implementation to guide action planning.
b. Focus on the guideline section of the results. What does this tell you about the current situation? Where are the strengths and gaps?
c. The findings from existing surveys and data collection from other policies and programmes as described above should also be considered as important results to inform guideline development and implementation (for example, HMIS, SARA, national AMR assessment, and other vertical disease programmes).
d. In your baseline assessment of available guidelines, refer to the list of topics identified as priority for IPC guideline content by the WHO Guidelines on core components. As a minimum, these are:
   - standard precautions
   - hand hygiene
   - use of personal protective equipment
   - sterilization and medical device decontamination
   - safe handling of linen and laundry
   - health care waste management
   - patient placement
   - respiratory hygiene and cough etiquette
   - environmental cleaning
   - principles of asepsis
   - prevention of injuries from sharp instruments and post-exposure prophylaxis
   - transmission-based precautions
   - aseptic technique and device management for clinical procedures.
e. Additional topics could include: surgical site infection, specific guidelines for multidrug-resistant organisms (MDRO).

3. Use the results and feedback to all relevant stakeholders.

a. Review and compare all results.
b. Compile a summary of your assessments and guideline inventory and start to identify priorities for guideline development.
c. Provide key stakeholders with feedback on the results of assessment of existing IPC guidelines and consequent needs to motivate the development of new guidelines.

STEP 3: DEVELOPING AND EXECUTING AN ACTION PLAN

MAIN ACTIVITIES

1.Translate the priorities identified in the baseline assessment into a written plan of action for guideline development that should include:

a. SMART objectives, action steps, designated persons leading the writing and reviewers, timeframes, costing, draft guideline validation process with key stakeholders, final clearance process.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/

2. In addition to the standard action plan components, the following questions should be considered when developing the key action steps for guideline development:

a. Are there specific topics where there is a perceived critical need for guidance (for example, large burden of disease of

hepatitis C associated with unsafe injection practices)? Are there ministry of health priority programmes (for example, safe surgery)?

b. Is someone with the necessary expertise available (for example, environmental vs. surgical background)?

c. Will IPC international standards be used in the initial guideline development?

d. How will you work with a local IPC team to ensure that the guidelines are adapted to the local context? Are you using evidence to inform this process?

e. How will the guidelines be harmonized and integrated across other relevant policies and programmes at the ministry of health?

f. Is there a plan in place for the dissemination and implementation of the guidelines (for example, consideration of feasibility and ease of implementation)? Are resources and programmes available that could implement these guidelines when developed (that is, can we avoid writing "aspirational guidelines" that have no hope of actually getting implemented?)

g. How will the guidelines be linked to education and training and awareness-raising workshops?

h. How will the implementation of the guidelines be monitored and how will the results be fed back?

i. Is a multimodal approach being considered for guideline implementation (see Core Component 5)?

3. Put the plan into action.

a. Take action plan steps!
b. Follow agreed-upon roles and timeframes.
c. Communicate and meet key individuals regularly.
d. Once the final guideline draft is available, undertake a validation and finalization process by seeking comments and consensus by all key stakeholders (see above).

"The key challenge is operationalizing the guidelines. It is important to assess the baseline situation and then plan not only for the guideline development but also to make an explicit plan early for how the guidelines will be disseminated, used, and monitored."
Regional IPC Focal Point in Africa

Links to resources

- Action plan template (see Annex 3).
- WHO Handbook on national health strategic planning: See chapters:
  - Estimating cost implications: http://www.who.int/healthsystems/publications/nhpsp-handbook-ch7/en/
  - Budgeting for health: http://www.who.int/healthsystems/publications/nhpsp-handbook-ch8/en/

STEP 4: EVALUATING IMPACT

MAIN ACTIVITIES

1. Develop a regular evaluation plan to assess guideline development and implementation.

a. Establish a frequency of follow-up assessments using the tools used in step 2.
b. A minimum annual frequency is recommended in the first instance.
c. Consider the need to re-evaluate available evidence and adapt the guidelines accordingly.
d. Focus on evaluating guideline development and dissemination (for example, "Have we provided the right guidance that our country needs on environmental cleaning? Do any of our guidelines need updating based on recent findings of the environmental persistence of Candida auris?")? Also consider evaluating the implementation of guidelines (for example, "Are people adhering to recommended environmental cleaning practices?").
e. Embed the evaluation plan into other national monitoring and evaluation programmes as appropriate, addressing all available sources of data and technical expertise.

2. Put the evaluation plan into operation.

a. Update the action plan based on the results of the evaluation, considering the effectiveness of the programme, acceptability and value for money.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/

STEP 5: SUSTAINING THE PROGRAMME OVER THE LONG TERM

MAIN ACTIVITIES

1. Use the initial action plan and evaluations to develop a long-term action plan and review cycle to address long-term sustainability with a focus on:

a. Securing long-term policy level support for the implementation of the guidelines, aligning with other policy priorities.
b. Securing long-term commitment from identified champions for implementation and expertise for guidelines yet to be developed.
c. Securing continuous evaluation of needs and recent research for updating guidelines and prioritizing guidelines yet to be developed.
d. Provision of regular feedback on the progress of the action plan (for example, ongoing process to convene experts to assess whether guidelines have addressed needs).
e. Harnessing available financial and human resources.
f. Building a financial case for long-term investment in guideline implementation.
g. Building a portfolio of success stories and communicating examples of success to key stakeholders and networks.

Case study 1

What makes guideline development successful: stories from the Region of the Americas

"The two requirements are skilled human resources and integration. The country needs a dedicated and skilled IPC person to work on this. In many scenarios, it has worked for us to provide the initial technical support to draft the document and the country then works to adapt it to their local context to promote its success."
Regional IPC focal point from the Pan American Health Organization [PAHO]

"Without adaptation, international guidelines may be seen as unfeasible recommendations so in my experience, this is the key point that needs to be addressed in the development of evidence-based guidelines. A lot of evidence on IPC implementation published in the literature comes from high-income countries and this can't be simply transferred to every context. More research needs to be promoted at the local level to identify the right evidence that will allow for adaption to particular settings. We are working to perform such research at the local level, carried out in cooperation with the national and state level to address our local needs. Countries should explore more strategies to facilitate the dissemination of research production from low- and middle-income countries."
IPC Professional from Brazil

Key lessons from country case studies

1. Secure initial expert technical assistance for guideline co-development, which should then be followed by local adaptation
2. Identify joint guideline areas with other programmes
3. Focus early on guideline implementation (for example, link to training, monitoring, other tools)

ACTION CHECKS

To address the implementation of this core component, you should have done the following:	
Key actions	
1. Convened a national multidisciplinary project team to focus on guideline development, adaptation, and implementation	☐
2. Held a meeting to explore existing guidelines from other programmes to identify priorities and joint areas of work	☐
3. Identified existing or external IPC technical expertise to draft initial guideline standards, including other key stakeholders, champions, leaders and networks to involve and help drive forward guideline development and implementation	☐
4. Assessed the funding situation, including existing resources that could be leveraged	☐
5. Undertaken a baseline assessment to understand the current situation	☐
6. Undertaken an inventory of existing evidence-based guidelines on the topic	☐
7. Developed an action plan for guideline development and implementation based on priorities identified in the baseline assessment	☐
8. Initiated the execution of an action plan according to defined steps, roles, timelines and costing	☐
9. Established a frequency of follow-up assessments and a defined feedback process	☐
10. Developed a long-term action plan	☐

Core Component 3: IPC education and training

WHO Guideline national recommendation

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

WHY

- Support of IPC education and training for the health workforce is another key function of national IPC programmes.
- The ultimate aim is to have a skilled and knowledgeable health workforce, including a frontline workforce with IPC basic competencies and IPC specialists with advanced knowledge and mentorship and implementation skills.
- Health worker training has been found to be an essential component for effective IPC guideline implementation, contributing to the ultimate prevention of HAIs and AMR and provision of high quality health service delivery.

WHEN

- IPC education and training should be considered during the establishment of a national IPC programme (see Core Component 1).
- If an established national health worker education and training programme already exists, consider the extent to which IPC training is embedded and sustained across all health care facilities and faculties (especially pre-service) when evaluating the progress of the IPC core components implementation in your country.
- The implementation sequence of the core component recommendations for evidence-based guidelines, education and training, monitoring, audit and feedback, and surveillance should be determined according to the specific local context.

WHO

- IPC lead/focal point, technical team or committee 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.
- It is important to include all other relevant programmes and national actors (see the list of possible partners under "How" in the section on Core Component 1) and identify key joint areas of work across education and training efforts.
- It is critical to involve local academic institutions in curricula development and training delivery, including universities and others with a mandate on health workforce education.
- Consider involving adult education experts, particularly those specializing in health care education.
- Target audience for training:
  - **Pre-service:** students of various faculties (for example, medical, nursing, dentistry)
  - **Postgraduate:**
    - Health professionals (doctors, nurses, and other professionals designated as members of the technical teams responsible for the IPC programme) who need to acquire expert competencies and are intended to become IPC specialists
    - Other specialists who need to acquire specific competencies to embed best IPC practices in clinical care (for example, intensive care specialists, infectious disease doctors).
  - **In-service continuous education to ensure basic competencies** (to be run at the facility level, but regulated/mandated at the national level and including new employee orientation, as well as regular training for all health care workers):
    - All health care workers in service delivery and patient care.
    - Other personnel that support health service delivery (for example, cleaners, auxiliary service staff, administrative and managerial staff).

HOW

- It is important to note that the development of a comprehensive training programme with curricula at all levels as indicated above requires a functioning national IPC programme and team.

STEP 1: PREPARING FOR ACTION

MAIN ACTIVITIES

1. Convene the national IPC project team to focus on the support of IPC education and training efforts.

a. The project team will comprise those identified in the "Who" section above. It should include also at least some of the persons involved in the development of the guidelines to ensure a clear link to education and training efforts.
b. Hold a meeting to explore existing health care worker education and training efforts, including IPC across the health care system and existing curricula, and identify joint areas of work that can be harmonized.
c. Invite representatives from other relevant areas, for example, those responsible for the health workforce, other vertical disease programmes, such as HIV, tuberculosis, etc., WASH, the field of behavioural science and education/curricula development academia.

2. Identify key stakeholders, champions, leaders and networks to drive forward IPC education and training efforts.

a. The support of relevant stakeholders is necessary to develop a supportive climate for IPC education and training. Consider how best to identify IPC champions, health facility leaders, frontline health workers and representatives from the public to gain their buy-in.
b. Identify key institutions (teams and groups across the country) who can be engaged to support the required actions and sustainability. This should include adult education experts and local academic institutions concerned with health care worker pre-graduate and postgraduate courses.

3. Address the need for funding.

a. Consideration should be given to the necessary funding and technical support for health care worker IPC education and training. Resources for policies, regulations and tools to enable the effective central coordination of facility level improvement should also be considered.
b. Involve all key stakeholders in addressing resource requirements, including ministerial finance officers, potential donors and NGOs interested in training.
c. Consider ways to leverage resources and create an efficient training roll-out, for example, training-the-trainers model with supportive supervision, integration in existing health care worker education pre- or in-service.

> **"We have developed a long-term education and training strategy, including identifying local leaders, support of scientific societies and educational institutions, provision of training materials to facilities, workshops for administrators, etc. Early in the programme, we had access to resources from PAHO and the United Nations Development Programme for these activities, but currently these resources are part of standard hospital and national budgets."**
> National IPC Lead from the Americas

4. Alignment with other policies and programmes.

a. Consider how to align the education and training efforts with other relevant national policy and programmes (for example, AMR, IHR [2005], quality and safety, and other vertical disease programmes).
b. Consider how to align to national approaches to health care worker pre- and in-service education through collaboration with local academic institutions.
c. Start to consider how new curricula can be endorsed by the local academic institutions and investigate the processes for establishing IPC certificates, diplomas, or masters, etc.
d. Discuss how the various possible scenarios of IPC specialization can be reflected in future national career paths.

5. Start to consider IPC education and training curricula with a focus on adaptation.

a. Other international IPC education and training curricula and materials can offer a useful starting point. However, country adaptation of the approach to IPC education and training is critical. IPC education and training activities should be linked to the local evidence-based guidelines and integrated with other health care worker pre- and in-service programme structures.
b. In addition to IPC best practices and procedures, other important skills for IPC, such as leadership, mentoring, communication, advocacy and programme management, should be considered according to the local context.
c. As described in step 2, a sound baseline assessment is an important tool to assist with local adaptation.

"For better integration, the educational programme should be accredited/certified and include a participatory approach with demonstration and follow-up."
Regional IPC focal point from the Eastern Mediterranean Region

"Integration is the key challenge for education and training. For example, many medical doctors are not included in hospital IPC training. Theoretical approaches only (for example, how to prevent bloodstream infections) are not enough and need to include practical approaches (for example, how to care for an intravenous line). We have generally found it easiest to start with training on topics including surveillance, isolation, outbreak investigation, and sterilization. Education and training also needs to be considered in the context of other ongoing programme training activities in the local situation."
Regional IPC Focal Point from the Americas

Links to resources

- Stakeholder mapping tool: https://www.k4health.org/sites/default/files/stakeholder_analysis_tool_generic_0.doc
- Basic and advanced IPC training modules: under development - to be launched in 2017.
- European Centre for Disease Prevention and Control (ECDC). Core competencies for infection control and hospital hygiene professionals in the European Union: http://ecdc.europa.eu/en/publications/publications/infection-control-core-competencies.pdf
- Infection Prevention Society. Outcome competencies for practitioners in infection prevention and control (United Kingdom): http://journals.sagepub.com/doi/pdf/10.1177/1757177410395797
- APIC competency model for the infection preventionist (USA): http://www.apic.org/Professional-Practice/Infection_preventionist_IP_competency_model
- International Federation of Infection Control. Basic IPC training: http://theific.org/basic-ic-training/
- WHO Multi-professional patient safety curriculum guide: http://apps.who.int/iris/bitstream/10665/44641/1/9789241501958_eng.pdf?ua=1
- WHO hand hygiene tools and resources for training and education: http://www.who.int/infection-prevention/tools/hand-hygiene/en/

STEP 2: BASELINE ASSESSMENT

MAIN ACTIVITIES

1. If a baseline assessment has already been undertaken as part of the overall core component implementation, focus on the results relating to IPC education and training.

2. If a baseline assessment has not yet taken place, undertake one now.

a. Focus on the IPC education and training section of the results. What does this tell you about the current situation? Where are the strengths and gaps?
b. The national core components checklist and modified national IPCAT2 will provide crude information on the status of IPC education and training to guide action planning.
c. Consider the development or use (if already existing) of a tool to assess the level of knowledge among health care workers or the target audiences of specific IPC training.
d. Findings from existing surveys and data collection from other policies and programmes described above should also be considered as important results to inform the approach to IPC education and training (for example, HMIS, SARA, national AMR assessment, other vertical disease programmes).
e. Communicate with the ministry of education, universities, partners and NGOs to explore any data collection they may have conducted and which could be used to inform these IPC-related efforts.

3. Use the results and feedback to all relevant stakeholders

a. Review and compare all results.
b. Provide feedback about the results and discuss with key stakeholders (indicated above).

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/

STEP 3: DEVELOPING AND EXECUTING AN ACTION PLAN

MAIN ACTIVITIES

1. Translate the priorities identified in the baseline assessment into a written plan of action that includes SMART objectives, action steps, designated lead persons, timeframes and costing.

2. In addition to the standard action plan components, the following questions should be considered when developing key action steps for IPC education and training development:

a. Are the IPC education and training efforts being linked to the local evidence-based guidelines?
b. Are the IPC education and training efforts being aligned with other relevant policies and programmes at the ministry of health?
c. Are the IPC education and training efforts being coordinated with academia and universities for an agreed-upon approach for pre- vs. in-service?
d. Are the key learning objectives and job competencies being defined first to inform curricula planning? Are they creating the right competencies for HAI and AMR surveillance (see Core Component 4) and the monitoring, audit and feedback of relevant IPC indicators (see Core Component 6)?
e. What is the strategy for in-service planning and structures that need to be in place (for example, training-the-trainers)?
f. What type of encounters with trainees will occur after the training for mentorship?

g. **Is there a long-term strategy to develop an IPC career path (for example, accreditation, pre-service diploma or degree, recognition of training outside of the country)?**
h. **How will IPC education and training efforts be monitored and how will these results be fed back?**
i. **In addition to IPC best practices and procedures, are other important skills for IPC such as leadership, mentoring, communication, advocacy and programme management according to the local context being considered for the curricula?**
j. **Is IPC education and training being considered as part of a multimodal approach (see Core Component 5)?**

2. Put the plan into action.

a. Take action plan steps!
b. Follow agreed-upon roles and timeframes (for example, use a Gantt chart to illustrate the schedule).
c. Communicate and meet key individuals regularly.
d. Make sure that the education approaches used are informed by behavioural change theories and methods and are suited to be embedded within clinical practice training.
e. Advocate for effective educational methods to be used, such as task-oriented training sessions and lectures, e-learning modules, simulation-based training, bedside training by dedicated teams or IPC link nurses/practitioners, or group sessions with online modules and lectures.

Links to resources
- Action plan template (see Annex 3).

STEP 4: EVALUATING IMPACT

MAIN ACTIVITIES

1. Develop a regular evaluation plan to assess the IPC education and training efforts.

a. Establish a frequency of follow-up assessments to evaluate the progress of establishing or strengthening IPC education and training programmes/curricula, as well as knowledge improvement among target audiences (a minimum annual frequency is recommended in the first instance).
b. Evaluation should include process measures (for example, number of training courses and sessions, timing, quality, participants' satisfaction with the training) and outcomes (for example, knowledge evaluations, competencies acquisition reflected in behavioural change related to the training topic).
c. Embed the evaluation plan into other national monitoring and evaluation programmes as appropriate, addressing all available sources of data and technical expertise.

2. Put the evaluation plan into operation.

a. Update the action plan based on the results of the evaluation, considering the effectiveness of the programme, acceptability and value for money.

Links to resources
- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/

STEP 5: SUSTAINING THE PROGRAMME OVER THE LONG TERM

MAIN ACTIVITIES

1. Use the initial action plan and evaluations to develop a long-term action plan and review cycle to address long-term sustainability with a focus on:

a. Securing long-term policy level support for the IPC education and training and aligning with other policy priorities.
b. Securing long-term commitment from identified champions and institutions
c. Provision of regular feedback on the progress of the action plan concerning pre- and in-service training strategies.
d. Harnessing available financial and human resources.
e. Building a financial case for long-term investment (for example, has the commitment of universities been secured? Has the integration of pre-service diffused costs? Has online training or e-learning also helped to diffuse costs?).
f. Building a portfolio of success stories and communicating examples of success to key stakeholders and networks.

Case study 1

Building a legacy of IPC education and training in Africa and the Middle-East

"We have created a suite of tools and started the process of finalizing national IPC indicators to inform the national health information system. The system has yet to become standard practice, but we have developed a "centres of excellence" programme (grades 1-3) based on results of a checklist and national assessors. The checklist is of medium length and adapted from a tuberculosis infection monitoring tool (that is colour coded to measure performance). This tool works well with administrators, for example, we had one matron who took the results of the checklist to the administrator and said "you are responsible for the red colour because we don't have colour waste bags". The administrator asked "why didn't you tell me we were being audited?" He then presented the results at the provincial meeting and advocated for change (key for motivation!). We have also established a working group on surveillance and monitoring in the national IPC committee to push this forward."

Chair, Infection Control African Network [ICAN]

"First, we sent a few interested and committed health care workers to outside training with ICAN. With these trained professionals, we worked on a basic IPC project and an IPC training-the-trainers course. The critical point was who was recruited to be trained. This had to come through direct discussions with heads of hospitals and managers. Different disciplines should be represented and some previous IPC experience was important. The early involvement with the district officers/district medical officers was important as they control the funding for the district and facilities. These trainers assist with IPC training for all health workers within their facilities and within their province. We are now working to expand this so that IPC expert trainers are assigned to district hospitals in the process of district hospital IPC programme expansion. An IPC diploma course will also start in October 2017 in collaboration with our country's infection control association and ICAN at a local university. This will initially include those trained in the "train-the-trainer" programme. It will be externally funded for start-up, but it should then be sustained once lecturing staff are capacitated and funded through a fee payment structure. Lastly, it is important to consider sustainability and what will happen after the training. We focused on monitoring and evaluation as well as a centres of excellence programme (grades 1-3) using a checklist and national assessors."

IPC Professional from Zimbabwe

"We adapted training modules from the guidelines and incorporated dissemination next steps and monitoring, audit and feedback in our initial planning. We conducted a "train-the-trainers" programme. Master trainers were already employed at the regional level (so required no extra salary) and were selected based on specific criteria, such as previous involvement in IPC work, willingness to train others, and recommendation by regional directors. The training included communication skills, such as how to advocate among senior decision-makers, etc. Regular mentorship is given to these master trainers and a certification programme is being explored (that is, recognition, career path)."

National IPC lead from Ghana

"When we were establishing the national IPC program, we explored options for training/ education of IPC practitioners. Three scenarios were evaluated: to send people for training abroad, to bring international trainers or to institutionalize training locally. The last option was feasible and affordable. We worked with a specialized nursing institute to develop one-academic year long diploma training program. The curriculum was developed by local experts and validated by international experts. The curriculum was approved and accredited by the ministry of health and it is now a very successful programme."

National IPC Lead from Oman

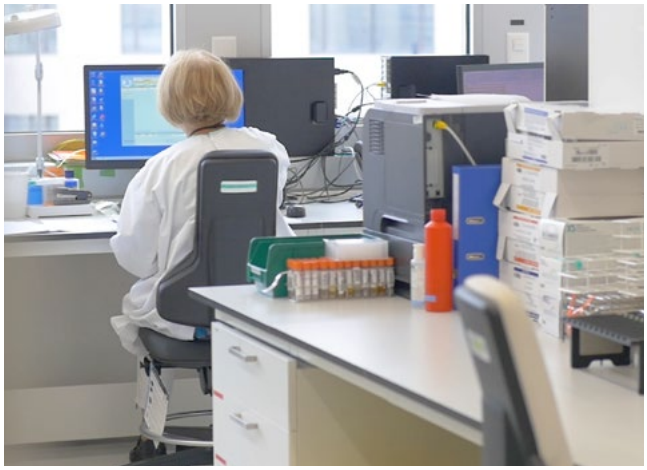
Key lessons from country case studies

1. Make sure that your plans target pre-service, postgraduate and in-service training. If none of these are well established, take a gradual approach and go step-by-step.
2. Think strategically about IPC education and training in terms of building a long-term IPC career path to encourage retention and growth of IPC professionals.
3. Look for opportunities to integrate IPC education and training and leverage existing resources.
4. Consider multidisciplinary training sessions to encourage IPC collaboration across health care professionals in the hospital setting.

ACTION CHECKS

To address the implementation of this core component, you should have done the following:	
Key actions	
1. Convened a national multidisciplinary project team (including necessary expertise in education/curriculum development) to focus on the support of IPC education and training efforts including pre- and in-service	☐
2. Held a meeting to explore other existing health care worker education and training efforts in the country to identify joint areas of work	☐
3. Identified key stakeholders, champions, leaders, and institutions (in particular, local academic institutions, scientific societies) to further involve and help drive forward IPC education and training efforts	☐
4. Assessed the funding situation, including existing resources that could be leveraged, and identified a dedicated budget	☐
5. Undertaken a baseline assessment to understand the current situation or used existing data collection findings from other relevant programmes	☐
6. Developed an action plan for implementation of IPC education and training efforts based on priorities identified in the baseline assessment for pre- and in-service strategies	☐
7. Initiated execution of an action plan according to defined steps, roles, timelines and costing	☐
8. Established a frequency of follow-up assessments and a defined feedback process	☐
9. Developed a long-term action plan	☐

Core Component 4: HAI surveillance



WHO Guideline national recommendation

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.

WHY

- Surveillance of HAIs is another key function of national IPC programmes.
- National HAI and AMR surveillance programmes can provide the following critical information:
  - Describe the incidence and prevalence of HAIs and AMR in health care facilities in the country (that is, identify "the problem"), including for benchmarking purposes.
  - Assess trends over time, geographically or across high risk populations.
  - Detect clusters or outbreaks of importance and take public health actions.
  - Guide IPC strategies and priorities and assess the impact and effectiveness of interventions.
  - Assist decision-makers and the IPC national team to identify priorities for IPC and develop targeted evidence-based standards and policies.
- Some evidence has shown significant reductions in HAI rates after the implementation of national HAI surveillance programmes, including mechanisms for timely feedback.

WHEN

- An approach to surveillance of HAIs should be considered during the establishment of a national IPC programme (see Core Component 1).
- Where an established national HAI or AMR surveillance programme already exists, consider the extent to which it is embedded and sustained across all health care facilities.
- The implementation sequence of the core component recommendations for evidence-based guidelines, education and training, monitoring, audit, feedback and surveillance should be determined according to the specific local context.
- While it is recognized that HAI surveillance can provide critical information on the magnitude of the problem for awareness-raising and, therefore, could be useful from the start of the implementation sequence, it is important to recognize that surveillance requires expertise, laboratory capacity and an established IPC programme.

WHO

- IPC lead/focal point, technical team or committee at the ministry of health or national responsible body as surveillance is a key activity in their mandate.
- Senior leads in key positions at the ministry level.
- Critical role of microbiologists and laboratory technicians with expertise and a clear understanding of the national laboratory system and its capacity and quality.
- Critical role of epidemiologists, statisticians, data managers and information technology experts with the appropriate capacity to accurately and efficiently collect, analyze and interpret data, both at the facility and national level.
- It is important to include all other relevant programmes and national actors focusing on the surveillance of other infectious diseases and identify key joint areas of work across surveillance programmes (see the list of possible partners under “How” in the section on Core Component 1). In particular, those working on HAI and AMR surveillance should be well-aligned, given the common priorities and outcomes.

HOW

- It is important to note that HAI surveillance requires specific expertise and an established IPC programme as well a national training programme for performing surveillance to ensure the appropriate and consistent application of national surveillance guidelines. Importantly, quality microbiology and laboratory capacity is essential to enable reliable national HAI and AMR surveillance and standardized definitions and laboratory methods should be adopted.

STEP 1: PREPARING FOR ACTION

MAIN ACTIVITIES

1. Convene a national HAI surveillance project team.

a. The project team will comprise the IPC lead and team and those identified in the "Who" section as having a critical role, that is, laboratory sciences/microbiology and epidemiology/information technology.
b. Hold a meeting to explore existing surveillance systems nationally and across the health care system to identify centres of excellence and joint areas of work that can be harmonized (for example, professionals and leads in charge of HAI surveillance should be specifically trained as this can be different compared to other public health surveillance systems).

2. Identify key stakeholders, champions, leaders and networks to drive forward HAI surveillance efforts.

a. The support of relevant stakeholders is necessary to develop a supportive climate for conducting surveillance. Consider how best to identify IPC champions, health facility leaders, frontline health workers and the public to gain their buy-in.
b. Stakeholders from hospital-based infection surveillance programmes should play an important role to ensure a strong link to the national public health infection surveillance network.
c. Identify other key networks (teams and groups across the country) who can be engaged to support the required actions and sustainability.

3. Alignment with other policies and programmes.

a. HAI surveillance strategies should be closely aligned with AMR surveillance strategies given the common priorities and outcomes. Joint efforts should be made to strengthen laboratory capacity and quality to support both strategies, as well as building upon international efforts (for example, in the context of the Global Antimicrobial Resistance Surveillance System [GLASS]).
b. Under the provision of the IHR (2005), Member States are required to develop the capacity to detect (for example, through surveillance systems) and report organisms that may constitute a public health emergency of international concern. Thus, HAI and AMR surveillance strategies should be aligned with such IHR-related activities.
c. Strong communication with the national reference laboratory is needed, including alignment of priorities.
d. Consider how to align the surveillance strategies with other national policies and programmes, particularly those with ongoing surveillance activities, for example, quality and safety and other vertical disease programmes.

> **"It has been helpful to take advantage of AMR work and global health security to strengthen surveillance for HAIs and integration into health management information system."**
> Regional IPC focal point from the Eastern Mediterranean Region

4. Address the need for funding.

a. Surveillance can be resource and time-intensive and significant advocacy with leadership is critical to convince them that "the resources are worth the expected net benefit"
   - The importance of surveillance should be advocated for by using messages similar to those in the section "Why?".
b. Careful consideration is needed to identify the necessary funding and technical support, particularly for laboratory/microbiology and epidemiology/information technology capacity. Resources for policies, regulations and tools to enable the effective central coordination of facility level improvement should also be considered.
c. Involve all key stakeholders in addressing these resource requirements.
d. Consider ways to leverage resources and prioritize objectives. A pilot project in selected facilities focusing on one to two types of HAIs according to the country situation may be a feasible starting point.

5. Consider your surveillance strategy with a focus on local adaptation

a. A sound baseline assessment, as described in step 2, will be an important tool to inform local adaptation of surveillance development and implementation.

b. HAI case definitions commonly used internationally can offer a useful starting point and should be referred to as much as possible for consistency and benchmarking (for example, the CDC National Healthcare Safety Network [NHSN] or the ECDC definitions). However, it is important to recognize that these definitions may not be feasible in low-resource settings. Thus, careful country adaptation of these definitions should be considered (that is, balancing considerations of microbiology and laboratory capacity with ensuring reliable and sensitive definitions; these considerations could lead for example to prioritize definitions that are based on clinical signs and symptoms, rather than microbiology).
   - More research is needed to identify and test reliable HAI definitions for low-resource settings with a limited microbiology laboratory capacity. Syndromic surveillance definitions (that is, based on clinical signs or syndromes alone) can be less reliable and do not comply with international standard definitions. Countries could work on stepwise microbiology capacity-building and training on surveillance methods, while focusing on IPC process monitoring, such as hand hygiene compliance.

c. After key case definitions are determined, continued discussion can be held to define the surveillance strategy and methods according to the local context.
   - Active prospective surveillance should be encouraged because passive surveillance can have a low sensitivity. Different active surveillance strategies can be considered according to the local setting:
     - Longitudinal/incident surveillance (that is, collecting continuous infection data over time, which can lead to results with higher sensitivity) is time- and resource-intensive, but can be restricted to selected facilities and wards (that is, sentinel surveillance).
     - Point prevalence surveys (that is, collecting infection data at a specific point in time) can have lower sensitivity, but can be more feasible and they are a common approach (for example, repeated surveys).
   - The denominator to be used should be carefully defined and discussions should be held with surveyors to make sure that there is consistent application of its definition.

"The largest gap is lack of skilled human resources to lead the local development and implementation of surveillance. The facilities need to appoint a dedicated and skilled person for surveillance that can then be trained. Local adaptation can be an opportunity (for example, definitions such as CDC NHSN are available), but it can be a problem if it is not well-addressed. Definitions have been freely adapted in the past and the consistency and predictive value is unknown. PAHO has developed a surveillance course, published surveillance guidelines, and data collection and report material. We support the country to do a national discussion and adaptation of surveillance definitions. After the country decides on the surveillance definition, we conduct a training on the development of a surveillance system using that definition."
Regional IPC Focal Point from the Americas

Links to resources
- Stakeholder mapping tool: https://www.k4health.org/sites/default/files/stakeholder_analysis_tool_generic_0.doc
- GLASS capacity-building documents: http://www.who.int/antimicrobial-resistance/global-action-plan/surveillance/glass/en/
- 2017 CDC NHSN patient safety component manual, including an overview of the surveillance system and HAI case definitions: https://www.cdc.gov/nhsn/pdfs/pscmanual/pcsmanual_current.pdf
- ECDC protocol for point prevalence surveys of HAI and antimicrobial use in acute care hospitals: http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/point-prevalence-survey/Pages/Point-prevalence-survey.aspx

STEP 2: BASELINE ASSESSMENT

MAIN ACTIVITIES

1. If a baseline assessment of existing HAI surveillance activities has already been undertaken as part of overall core component implementation, focus on the results relating to surveillance.

2. If a baseline assessment has not yet taken place, undertake one now.

a. The national core components checklist and modified national IPCAT2 will provide crude information on the status of surveillance to guide action planning.
b. Focus on the surveillance section of the results. What does this tell you about the current situation? Where are the strengths and gaps?
c. The findings from existing surveys and data collection from other policies and programmes as described above should also be considered as important results to inform the approach to surveillance (for example, IHR [2005], national AMR assessment, other vertical disease programmes, etc.).

3. Use the results and feedback to all relevant stakeholders.

a. Review and compare all results.
b. Provide feedback on the results related to the existing HAI surveillance system and/or gaps to key stakeholders in order to raise awareness on needs and motivate necessary actions to strengthen surveillance.
c. Based on a review of all results, draw up a list of priority areas for action.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/
- CDC updated 2001 guidelines for evaluating public health surveillance systems: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm
- Research article that implementers may find useful:
  - Calba C, Goutard FL, Hoinville L, Hendrikx P, Lindberg A, Saegerman C, et al. Surveillance systems evaluation: a systematic review of the existing approaches. BMC Public Health. 2015; 15:448: http://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-1791-5

STEP 3: DEVELOPING AND EXECUTING AN ACTION PLAN

MAIN ACTIVITIES

1.Translate the priorities identified in the baseline assessment into a written plan of action which should include SMART objectives, action steps, designated lead persons, time frames, costing.

2.In addition to the standard action plan components, the following questions should be considered when developing the key action steps for surveillance development:

a. Is the purpose of the surveillance plan being clearly defined (see "Why")?
b. Is there adequate epidemiology expertise and information technology capacity to oversee the surveillance methods and implementation, store and manage data, analyze and interpret the data collected and disseminate the findings?

c. Is there adequate microbiology and laboratory capacity and quality (for example, quality-assured laboratory data with quality management systems in place to ensure accuracy, reliability, and timeliness of results, adequate procedures for collection and transport of samples, ability to accurately identify the aetiology and susceptibility patterns of at least the most frequent and severe infections, differentiate community-acquired vs hospital-acquired infections, attention to avoid double-counting patients with multiple cultures)?

d. Is the necessary training on surveillance being conducted to ensure an adequate understanding of surveillance methods?

e. How have you determined the HAI to start with? Is the infection a major cause of morbidity and mortality? Is it common enough? Can it be reliably measured with the existing capacity? Is it associated with modifiable risk factors? Common HAIs to be prioritized include: epidemic infections; infections in vulnerable populations, such as neonates or those in the intensive care unit; infections with severe outcomes; MDRO; infections associated with invasive devices or specific procedures (for example, bloodstream infections associated with central or peripheral lines, catheter-associated urinary tract infection, ventilator-associated pneumonia, surgical site infection); and health care worker infections.

f. Are hospital-based surveillance programmes adequately linked to national public health infection surveillance networks? Are surveillance efforts being aligned with other national programmes, particularly those targeting AMR?

g. Are reliable case definitions (including accurate denominators) being developed by referring to international standardized definitions and adapting them according to local feasibility through a careful expert consultation process and prioritizing HAIs according to the country situation? Are there plans for validating these definitions?

h. Are active prospective surveillance methods being identified through a careful expert consultation and evidence-based process?

i. Are processes in place to regularly review data quality, including assessment of case report forms, integration of clinical microbiology results, data accuracy, denominator determination (that is, total exposed population), etc.? Is supportive supervision or other related mentorship in place?

j. Are processes in place for data management and analysis?

k. Are processes in place for reporting, including clear lines of communication in the network and timely dissemination? Are surveillance reports regularly shared with decision-makers for advocacy of organizational and behavioural change? Is there a process in place for reporting identified diseases of potential concern or outbreaks? Has public reporting and legislation been carefully considered?

l. Have benchmarks been set using initial surveillance data that can be used for comparison?

m. Is HAI surveillance being considered as part of a multimodal approach (see Core Component 5)?

3. Put the plan into action.

a. Take action plan steps!
b. Follow agreed-upon roles and timeframes (for example, use a Gantt chart to illustrate the schedule).
c. Communicate and meet key individuals regularly.

Links to resources

- Action plan template (see Annex 3).
- WHO Handbook on national health strategic planning: See chapters:
  - Estimating cost implications: http://www.who.int/healthsystems/publications/nhpsp-handbook-ch7/en/
  - Budgeting for health: http://www.who.int/healthsystems/publications/nhpsp-handbook-ch8/en/

STEP 4: EVALUATING IMPACT

MAIN ACTIVITIES

1. Develop a regular evaluation plan to evaluate the surveillance system.

a. Conduct follow-up assessments of the progress in establishing or strengthening the HAI surveillance system using the tools described in step 2.
b. Evaluate the progress made in conducting national surveillance, including:
   - Regularly reviewing data quality, including a review of case report forms, clinical microbiology results and denominators.
   - Assessing the efficiency of the data collection, analysis and dissemination system using identified indicators.
   - Evaluating the impact of data feedback in terms of informing IPC improvement action strategies.
c. Establish a frequency of follow-up assessments (a minimum annual frequency is recommended in the first instance).
d. Embed the evaluation plan into other national monitoring and evaluation programmes as appropriate, addressing all available sources of data and technical expertise.

2. Put the evaluation plan into operation.

a. Update the action plan based on the results of the evaluation, considering the effectiveness of the programme, acceptability and value for money.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/
- CDC updated 2001 guidelines for evaluating public health surveillance systems: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm
- Research article that implementers may find useful:
  - Calba C, Goutard FL, Hoinville L, Hendrikx P, Lindberg A, Saegerman C, et al. Surveillance systems evaluation: a systematic review of the existing approaches. BMC Public Health. 2015; 15:448: http://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-1791-5

STEP 5: SUSTAINING THE PROGRAMME OVER THE LONG TERM

MAIN ACTIVITIES

1. Use the initial action plan and evaluations to develop a long-term action plan and review cycle to address long-term sustainability with a focus on:

a. Securing long-term policy level support for the implementation of surveillance and aligning with other policy priorities.
b. Securing long-term commitment from identified champions and networks.
c. Provision of regular feedback on the progress of the action plan.
d. Harnessing available financial and human resources.
e. Building a financial case for long-term investment.
f. Building a portfolio of success stories and communicating examples of success to key stakeholders and networks.

Case study 1

Finding a way to scale up surveillance in Viet Nam

"We developed a "model IPC hospital approach." IPC leaders from each of the selected model hospitals were first trained for the overall IPC programme. Six of the model hospitals were then engaged to implement standardized HAI surveillance. Bloodstream and urinary tract infections were prioritized. The setting was also prioritized: one intensive care unit from each of their hospitals was selected. The surveillance protocol was adapted from the CDC NHSN through an expert consultation process and then shared with the select leaders of the core IPC model hospital cadre who demonstrated an initiative to provide feedback for further local adaptation of the surveillance system. Regular support visits to the surveillance hospitals were planned and conducted to evaluate and address surveillance implementation challenges. The visits include refresher training, stakeholder interviews (IPC team, microbiology laboratory, clinicians in units performing surveillance), assessment of case finding and denominator data collection practices, review of completed surveillance forms to assess quality, discussion of use of data for local action. The model hospital network is useful for providing coordination and mentorship across participating hospitals."
IPC lead from International organization working on IPC in Viet Nam

Case study 2

Finding a way to scale-up surveillance in India

"The Ministry of Health (with a development partner) is developing a network of hospitals to improve IPC practices, prevent HAIs, and track AMR. The major network hospital in New Delhi is coordinating the network's activities on behalf of the ministry of health. The network is first implementing bloodstream infection and urinary tract infection surveillance in a phased approach. The coordinating hospital plus four additional network hospitals were first trained in central line-associated bloodstream infection surveillance in July 2016 at a large partner-led workshop. Staff from the coordinating hospital received additional training on the surveillance protocol, suggested methods for implementation and mentorship. The trained staff from the coordinating hospital then visited the four surveillance hospitals in October-November 2016 to provide supportive supervision and implementation guidance to ensure that the protocol was being followed consistently across sites. Laboratory practices vary by hospital and it is unlikely that all will implement the surveillance protocol in the same way, but there is consensus that it is important to ensure consistent application of definitions across sites as the key step. Support visits will be important to ensure supervision, mentorship, assessment of data quality and use of data. The expectation is that these support visits will continue at least twice a year at all participating hospitals as the surveillance network expands."
IPC lead from International organization working on IPC in India

Key lessons from country case studies

1. Set up the national central coordination of HAI surveillance and link it directly to selected facilities to establish the initial system.
2. Start with a comprehensive discussion on surveillance definitions and necessary training.
3. Start with a pilot approach prioritizing selected HAIs and selected settings to demonstrate its effectiveness and advocate for the value of surveillance.
4. Integrate HAI surveillance with AMR surveillance efforts.
5. Emphasize use of data for action.
6. Provide continuous training and supportive supervision to the surveillance activities.

ACTION CHECKS

To address the implementation of this core component, you should have done the following:

Key actions

1.	Convened a national multidisciplinary project team to focus on HAI surveillance, including necessary laboratory/microbiology and epidemiology/information technology capacity	☐
2.	Conducted assessments and held a meeting to explore other existing surveillance efforts in the ministry of health to identify joint areas of work, particularly for AMR	☐
3.	Undertaken a baseline assessment to understand the current situation or used existing data collection findings from other relevant programmes	☐
4.	Identified key stakeholders, champions, leaders, and networks (including hospital-based surveillance programme leadership) to further involve and help drive forward surveillance efforts	☐
5.	Assessed the funding situation including existing resources that could be leveraged and advocacy among leadership on the importance of surveillance investment	☐
6.	Identified HAI case definitions and surveillance methods while carefully considering local adaptation	☐
7.	Assessed the existence of microbiology and laboratory capacity and quality and information technology systems to support HAI surveillance	☐
8.	Developed an action plan for the implementation of surveillance based on priorities identified in the baseline assessment	☐
9.	Initiated execution of the action plan according to defined steps, roles, timelines and costing	☐
10.	Established a frequency of follow-up assessments and a defined feedback process	☐
11.	Developed a long-term action plan	☐

Core Component 5: Multimodal strategies

WHO Guideline national recommendation

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

In other words, the strategy involves **"building"** the right system, **"teaching"** the right things, **"checking"** the right things, **"selling"** the right messages, and ultimately **"living"** IPC throughout the entire health system (see Annex 4). Targeting only ONE area (that is, unimodal) at the expense of the others is highly likely to result in failure. All five areas should be considered and necessary action taken, based on the local context and situation informed by periodic assessments.

RAPID REMINDER

A two-page document on the multimodal strategies concept is in Annex 4.

A multimodal strategy comprises several elements or components (three or more, usually five) implemented in an integrated way with the aim of improving an outcome and changing behaviour. It includes tools developed by multidisciplinary teams that take into account local conditions, such as bundles and checklists. The five most common components include: (i) **system change** (availability of the appropriate infrastructure and supplies to enable IPC good practices); (ii) **education and training** of health care workers and key players (for example, managers); (iii) **monitoring** of 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. It is important to note the distinction between a multimodal strategy and a bundle. A bundle is an implementation tool aiming to improve the care process and patient outcomes in a structured manner.

WHY

- A national approach to support the implementation of multimodal strategies for IPC improvement is recognized as having key benefits compared to local efforts alone.
- The use of multimodal strategies in IPC has been shown to be the best evidence-based approach to achieve sustained behavioural change for the implementation of IPC interventions, with a large body of evidence related to hand hygiene improvement.
- A multimodal approach spans all aspects of IPC and underpins all of the guideline recommendations.
- A focus only on single strategies (for example, training and education) in isolation without paying attention to monitoring and feedback, infrastructures or organizational culture does not support long-term improvement.
- National facilitation and coordination in the context of wider quality improvement supports facility-level improvements, resulting in improved practices that help reduce the spread of HAIs and AMR.

WHEN

- The use of multimodal strategies should be considered during the establishment of a national IPC programme (see Core Component 1) as one of the key functions of the national team will be to lead on their development and implementation. However, these strategies are typically used for implementation. Ideally, other core components should be tackled before engaging in implementing multimodal strategies (for example, identification or development of guidelines and determining appropriate approaches for education and training and surveillance and/or monitoring).
- Where an established IPC programme already exists, consider the extent to which multimodal strategies are already embedded.

> **"We used an annual hand hygiene campaign to drive our multimodal approach. Leadership made a commitment to safety and allowed modest resources to implement the multimodal strategy. We have a quality indicator for hand hygiene adherence and we perform the self-assessment in different services throughout the year. We have conducted a range of training sessions and made staff observations across shifts. We are just starting to apply this multimodal strategy to other HAI objectives."**
> IPC Professional from the Americas

WHO

- IPC lead/focal point, technical team or a committee at the ministry of health or national responsible body 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 action plan, including joint areas of work (see the list of possible partners under "How" in the section on Core Component 1)-
- National and local experts on implementation, as well as those from the fields of behavioural science and communication.

HOW

- It is important to note that the establishment of multimodal strategies requires a functioning national
  IPC programme.
- Many of the actions outlined in steps 1-5 are common to the implementation of all aspects of IPC programmes.

STEP 1: PREPARING FOR ACTION

MAIN ACTIVITIES

1. Put together a national project team to focus on multimodal strategies.

a. The project team will comprise those identified in the "Who" section.
b. Hold a meeting to explore the status quo with respect to the use of multimodal strategies across the health care system.
c. Invite representatives from other relevant areas, for example, those responsible for the health workforce, WASH, waste management, procurement, pharmacy, finance, facility engineering, and behavioural science experts. Discuss how facilities can be supported in their cultural preparedness as they focus on using multimodal strategies. In particular explore whether any programmes or areas have used safety culture assessments before putting in place previous improvements – what key lessons can be shared to feed into the development of action plans?
d. Consider how best to collect information on the extent of understanding and application of multimodal strategies across the health facilities in your country.
e. A useful starting point is to focus on the use of multimodal strategies in the context of hand hygiene improvement, for example, has the WHO hand hygiene self-assessment framework been undertaken across health facilities in your country?
f. Draw up a preliminary list of examples of excellence at the health facility level based on what is already known. Consider developing a suite of examples and vignettes to be used as national examples.

"We found that it was easiest to start with the hand hygiene multimodal approach, but we need to work further adapting these same principles in other areas."
IPC National Lead from Europe

"We used the national hand hygiene campaign as the first major multimodal approach using standard methodology and adaption for our country context"
Regional IPC Focal Point from the Americas

"Multimodal strategies can be very resource consuming and the results can be difficult to measure at the central level. Hand hygiene can be an easy way to start and you can then assess how to scale-up and build awareness about the wider approach."
Regional IPC Focal Point from the Americas

"The easiest multimodal approaches can involve outcome-focused ones on hand hygiene, tuberculosis, ventilator-associated pneumonia and surgery."
IPC Professional from Africa

2. Identify key stakeholders, champions, leaders and networks to drive forward the multimodal strategies.

a. The support of relevant stakeholders is necessary to develop a supportive climate for the implementation of multimodal approaches. Consider how best to identify health facility leaders, frontline health workers and the public to sell the benefits of multimodal strategies.
b. Champions who have pioneered or successfully used multimodal strategies will act as effective supporters and drivers of implementation. Based on the examples/vignettes already identified above, consider how to secure the commitment of champions to advocate for multimodal strategies. Focus on how key messages from champions can be best communicated across the country to reach target audiences at the health facility level.
c. Identify key networks (teams and groups across the country) who can be engaged to support the required actions and sustainability.

3. Address the need for funding.

a. Consideration should be given to the necessary funding and technical support that will be required for local implementation of multimodal strategies. Resources for policies, regulations and tools to enable an effective central coordination of facility level improvement should also be considered (for further information, see Core Component 1, step 1).
b. Involve all key stakeholders in addressing resource requirements.
c. Develop clear messages and craft good case stories describing successful examples for donors and partners to understand that multimodal strategies are the most effective approach for implementing IPC.
d. Consider all available sources of funding including development partners.
e. Develop a budget case for presenting to ministries of health and finance.

4. Alignment with other policies and programmes.

a. Consider how to align the multimodal strategies approach with other national policy and programme priorities, for example, WASH, AMR, IHR (2005), quality and patient safety.

5. Focus on adaptation.

a. Country adaptation of the multimodal implementation strategies is critical. A sound baseline assessment, as described in step 2, is an important tool to assist with such local adaptation.

Links to resources

- Stakeholder mapping tool: https://www.k4health.org/sites/default/files/stakeholder_analysis_tool_generic_0.doc
- Multimodal strategies fact sheet (see Annex 4).

"For ventilator-associated pneumonia prevention, several groups of clinical staff worked together to not only apply bundles, but also to make sure that the following was happening: regular changing of ventilator equipment; decontamination of re-usable devices; writing of standard operating procedures for all clinical staff; evaluation of related clinical outcomes; and documentation of HAIs. They acted as persistent champions for the approach, including supervision and mentorship. The key thing we tried to emphasize to health care workers is that IPC programmes need to be structured with different types of activities to impact outcomes. Examples where "it hurts the most" (that is, what embarrasses/concerns wards, what looks good to improve), such as outbreaks, can drive political will for multimodal approaches."
Chair, Infection Control Africa Network (ICAN)

"To enable system change, we prepared the local production of alcohol-based handrub. Industry played a role in cost-sharing for these activities. Academic alliances and research allowed for experience-sharing and dissemination of multimodal activities."
IPC Professional from the Americas

"We found that the national action plan on AMR work provided a good opportunity for advocating for a multimodal strategy. For addressing AMR in the IPC strategic pillar, we proposed activities as part of a multimodal approach."
IPC National Lead from Europe

STEP 2: BASELINE ASSESSMENT

MAIN ACTIVITIES

1.If a baseline assessment has already been undertaken as part of the overall core component guideline implementation, focus on the results relating to multimodal strategies.

2. If a baseline assessment has not yet taken place, undertake one now.

a. The national core components checklist and the modified national IPCAT2 will provide crude information on the status of multimodal strategy application across the country to guide action planning.
b. Focus on the multimodal strategy section of the results. What does this tell you about the current situation? Where are the strengths and gaps?
c. More detailed information can be gathered in a number of ways:
    i. Consider a short survey of a cross-section of health facilities to drill into specific aspects of the strategy and its understanding and to provide more comprehensive information for action.
    ii. Request health care facilities (all of them or a sample depending on feasibility) to undertake the WHO hand hygiene self-assessment framework as an initial proxy for the use of multimodal strategies.
    iii. Gather together other national assessments that will provide information on certain elements of the multimodal strategy (for example, IHR [2005], JEE, SARA, HMIS, health workforce).
    iv. Consider undertaking or promoting safety culture assessment surveys.

3. Use the results and feed back to all relevant stakeholders.

a. Review and compare all results.
b. Provide key stakeholders with feedback on the results related to the use and understanding of multimodal strategies in the country. Use this opportunity to provide them with more explanations and examples of these strategies and their value as they are usually poorly understood.
c. Based on a review of all results, draw up a list of priority areas for action.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/
- WHO hand hygiene self-assessment framework: http://www.who.int/gpsc/country_work/hhsa_framework_October_2010.pdf?ua=1
- WASH facility improvement tool (FIT): https://www.washinhcf.org/fileadmin/user_upload/documents/WHO-UNICEF-2017-WASH-FIT_final.pdf
- Culture assessment surveys, for example: Agency for Healthcare Research and Quality hospital survey on patient safety culture: https://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/index.html
- Health workforce indicators' tool: http://www.who.int/hrh/resources/wisn_user_manual/en/

STEP 3: DEVELOPING AND EXECUTING AN ACTION PLAN

MAIN ACTIVITIES

1. Translate the priorities identified in the baseline assessment into a written plan of action, which should include SMART objectives, action steps, designated lead persons, time frames and costing.

2. In addition to the standard action plan components, the following questions should be considered when developing the key action steps for multimodal strategy development:

a. **How will the value of a multimodal approach be promoted, for example, through the use of workshops?**
b. **How will infrastructure, procurement, and organizational cultural needs be considered?**
c. **How will capacity be built, for example, through training and education of all relevant persons involved in the implementation of the multimodal approach?**
d. **How will accountability frameworks, accreditation and reward systems be used?**
e. **How will results be fed back and discussed with stakeholders?**

3. Put the plan into action.

a. Take action plan steps!
b. Follow agreed-upon roles and timeframes (for example, use a Gantt chart to illustrate the schedule).
c. Communicate and meet key individuals regularly.

Links to resources

- Action plan template (see Annex 3).
- WHO Handbook on national health strategic planning: See chapters:
  - Estimating cost implications: http://www.who.int/healthsystems/publications/nhpsp-handbook-ch7/en/
  - Budgeting for health": Please update the link: http://www.who.int/healthsystems/publications/nhpsp-handbook-ch8/en/

Considerations on multimodal improvement strategies by national focal points

"We provided workshops for facility administrators to build awareness about this approach and its importance."
National IPC Lead from Africa

"We are starting with a hand hygiene multimodal approach including training, the use of the self-assessment hand hygiene tool, feedback/publishing of results and communication and buy-in of the district medical officers. We have tried to advocate for the importance of the application of data. Technical assistance may be needed to analyze the data, but partners can sit with the relevant government officials to mentor on interpretation, use for action, and accountability. Overall, understanding of the multimodal approach remains somewhat unclear and needs continued advocacy."
National IPC Lead from Africa

"We offer workshops using the examples of a multimodal approach for increasing hand hygiene and to reduce catheter-associated urinary tract infections at a ward level to illustrate the definition of a multimodal approach. We find that these two examples are the easiest way to teach this concept."
National IPC Lead from Africa

"Best examples have come with accountability mechanisms and rewarding teams for best performance."
National IPC focal point from the Eastern Mediterranean Region

"We see that multimodal strategies usually occur after outbreaks, but there are no structured strategies as part of a systematic prevention strategy. This suggests that the key gap is communication on the definition and advocacy for the implementation of the multimodal approach. In the case of our country, we have focused first on packaging IPC training, site-support mentoring visits and monitoring and evaluation."
National IPC Lead from Africa

STEP 4: EVALUATING IMPACT

MAIN ACTIVITIES

1. Develop a regular evaluation plan to assess the impact of the multimodal strategies approach.

a. Conduct follow-up assessments of the progress of developing and implementing multimodal strategies at the national level using the tools described in step 2.
b. Establish a frequency of follow-up assessments (a minimum annual frequency is recommended in the first instance).
c. Embed the evaluation plan into other national monitoring and evaluation programmes as appropriate, addressing all available sources of data and technical expertise.

2. Put the evaluation plan into operation.

a. Update the action plan based on the results of the evaluation, considering the effectiveness of the programme, acceptability and value for money

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/
- WHO hand hygiene self-assessment framework: http://www.who.int/gpsc/country_work/hhsa_framework_October_2010.pdf?ua=1

STEP 5: SUSTAINING THE PROGRAMME OVER THE LONG TERM

MAIN ACTIVITIES

1. Use the initial action plan and evaluations to develop a long-term action plan and review cycle to address long-term sustainability with a focus on:

a. Securing long-term policy level support for multimodal strategies and aligning with other policy priorities.
b. Securing long-term commitment from identified champions.
c. Provision of regular feedback on progress of the action plan.
d. Harnessing available financial and human resources.
e. Building a financial case for long-term investment.
f. Building a portfolio of success stories and communicating examples of success to key stakeholders and networks.

Case study 1

National commitment to multimodal strategies to improve hand hygiene in Costa Rica: the example of the Hospital Nacional de Niños

In 2007, the National Children´s Hospital in Costa Rica started working with WHO on a pilot study to reduce HAI, including antibiotic-resistant bacteria. The ministry of health provided support to start the initiative and a local private company donated the alcohol-based handrub for the first year. Using the framework of a multimodal approach, this is what happened in Costa Rica:

1. **Building the right system:** Throughout Costa Rica, health care workers historically used soap, water and towels to clean their hands when providing care. Water shortages were an issue during the dry season, so there was a need for an alternative method for cleaning hands in health care. Following WHO recommendations to ensure safe, clean hands at the right times, alcohol-based handrub was made available throughout the hospital at patient bedsides where it is needed most and in health centres. Since 2007, a major part of the success has been the commitment to having alcohol-based handrub at the National Children's Hospital.
2. **Teaching the right things:** Every health care worker that started work at the National Children's Hospital received training on hand hygiene and HAI. This included interns and students from all the different professions. As a result, all health care workers understood the importance of clean hands to prevent patient infections.
3. **Checking the right things:** Monitoring was a vital part of the approach for continuous improvement in patient safety. Early reports showed average hand hygiene compliance to be as low as 40% - this acted as a big driver. Once the multimodal approach was put into practice, the hand hygiene compliance rates increased from 40% to 70%, with HAI falling from 7% to 4%. This resulted in fewer infections and deaths. The National Children's Hospital also started collecting data on antibiotic-resistant bacteria and introduced standardized monitoring methods;
4. **Selling the right messages**: Working with WHO's PAHO, the hospital translated all of the hand hygiene improvement tools and advocacy and promotional materials into Spanish and held awareness-raising events to promote the value of clean hands.
5. **Living IPC throughout the entire health system:** Strong leadership support nationally and at the Children's Hospital was a critical ingredient and the multimodal strategy helped to change the culture. For example, when there was a shortage of alcohol-based handrub, a survey showed that staff missed using the product and found it more difficult to clean their hands during patient care. The strength of the approach and its impact can be illustrated by the way the improvement spread. Subsequently, the Costa Rica health care centres also followed the WHO recommendations and the multimodal improvement approach to address their HAI problem.

Case study 2

Employing multimodal strategies to drive national improvement in Chile

"Our IPC programme had a multimodal strategy from the beginning. We didn't label it as such but that is what it was.

1. **Building the right system:** we had a national IPC committee with representation of all main scientific societies to steer the programme; advocated for resources (for example, human resources and funding activities); and established the minimum architectural and structural standards for healthcare facilities for the country. We implemented a full plan for normalizing the sterilization equipment and units for the country and provided isolation graphic signage with instructions to be used in hospitals among a range of other activities.
2. **Teaching the right things:** we developed guidelines and other written documents with knowledge and instructions; we promoted training in small groups for in-service education according to the goals established by facilities.
3. **Checking the right things:** we used surveillance data to illustrate the need for interventions and then documented their impact; we socially acknowledged good results on external evaluations as a good performance in the organization.
4. **Selling the right messages:** we created instances in which IPC professionals could show their work (for example, poster sessions in congresses).
5. **Living IPC throughout the entire health system:** we promoted leadership; we invited local professionals to elaborate on training documents and discuss our guidelines.

For a specific example that brings all of this together, we used catheter-associated urinary tract infection outcome monitoring data to drive a multimodal strategy to reduce this common infection. First, we identified that there was a major problem in some facilities reporting high rates of catheter-associated urinary tract infection, which were hypothesized to be linked to poor practices (that is, poorly managed indwelling urinary catheters due to non-closed systems utilized for urine drainage). We trained the IPC specialists in a train-the-trainers approach on catheter and drainage system protocols. These IPC specialists then conducted training in the facilities regarding aseptic management of catheters and drainage systems. Observation audit and feedback was conducted to closely assess health care worker compliance with our protocols. We then followed up regularly with the specialists in the facilities as they are "our eyes." After the implementation of this approach, our catheter-associated urinary tract infection rates have decreased dramatically."
IPC National Lead from Chile

Key lessons from country case studies

1. Many countries already employ multimodal strategies to improve IPC, even if this is not explicit!
2. Experience and lessons learned from implementing multimodal strategies for hand hygiene improvement offer valuable insight and should be built on when tackling other topics.
3. Advocacy and awareness-raising on the value of multimodal strategies is key.
4. Monitoring, audit and feedback are also important components of the approach.

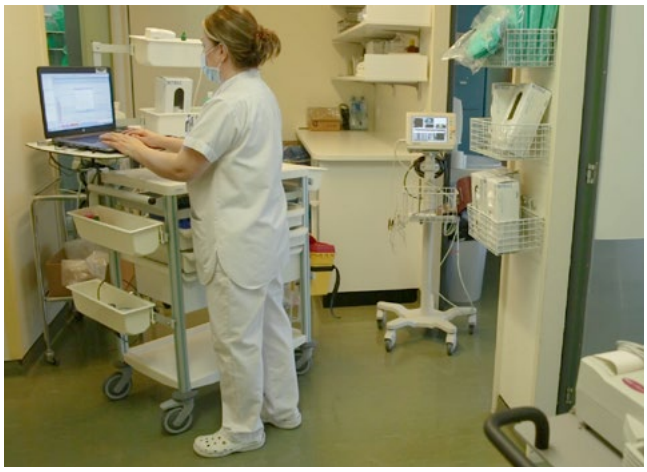
ACTION CHECKS

To address the implementation of this core component, you should have done the following:

Key actions

1.	Convened a national multidisciplinary project team to focus on multimodal strategies	☐
2.	Integrated/aligned with other national policy and programme priorities where applicable	☐
3.	Identified possible sources of funding and resources to support implementation	☐
4.	Undertaken a baseline assessment to understand the current situation	☐
5.	Developed an action plan for multimodal strategies based on priorities identified in the baseline assessment	☐
6.	Initiated the execution of the action plan according to defined steps, roles, timelines and costing	☐
7.	Established a frequency of follow-up assessments and defined a feedback process	☐
8.	Developed a long-term action plan	☐
9.	Developed a portfolio of case studies/vignettes	☐

Core Component 6: Monitoring/audit of IPC practices and feedback



WHO Guideline national recommendation

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.

WHY

- Nationally coordinated monitoring and evaluation programmes, together with feedback of data to relevant stakeholders, have been shown to be effective in increasing adherence to IPC practices and ultimately to decrease overall HAI.
- Monitoring and auditing allows assessing the extent to which standards are being met, goals accomplished, activities performed according to requirements, and to identify aspects that may need improvement. This includes the regular evaluation of facility compliance with regulations and IPC best practices and standards, and identification of actions that need reinforcement or a change in strategies, as well as successful experiences. Doing this helps to create a "monitoring and learning" culture.
- Monitoring and auditing also provides a systematic method to document the impact of national programmes using defined indicators.
- Hand hygiene has the potential to act as a key indicator for all national IPC programmes, including hand hygiene compliance monitoring.
- Learning from the field of quality improvement, monitoring, audit and feedback can be an important tool for convincing people that there is a problem and that the solution chosen is the right one. Time investment in stakeholder engagement, data collection, monitoring, audit and feedback systems, particularly timely feedback, are important success factors in driving improvement.

WHEN

- The use of monitoring, audit and feedback activities should be first considered during the establishment of a national IPC programme (see Core Component 1).
- Where an established national approach to monitoring, audit and feedback already exists, consider its level of progress and impact, as well as the extent to which it is embedded and sustained across all health care facilities.
- The implementation sequence of the core component recommendations for evidence-based guidelines, education and training, monitoring, audit and feedback, and surveillance should be determined according to the specific local context.

WHO

- IPC lead/focal point, technical team or committee at the ministry of health or national responsible body as national monitoring, audit and feedback are key activities in their mandate.
- Senior leads in key positions at the ministry level.
- Team members of all other relevant programmes and national actors who will be responsible for implementation and monitoring of the action plan (see the list of possible partners under “How” in the section on Core Component 1).
- National quality and safety leaders and, ideally, monitoring and evaluation experts.

HOW

- It is important to note that the establishment of national monitoring, audit and feedback systems, including hand hygiene monitoring, requires a functioning national IPC programme.
- Many of the actions outlined in steps 1-5 are common to the implementation of all aspects of IPC programmes.

STEP 1: PREPARING FOR ACTION

MAIN ACTIVITIES

1. Put together a national project team to focus on monitoring, audit and feedback.

a. The project team will comprise of those identified in the "Who" section.
b. Identify existing expertise on monitoring and evaluation, including data collection and analysis at the national level, and invite these persons to the preliminary meeting.
c. Hold a meeting to explore the status quo with respect to the use of monitoring, audit and feedback across the health care system.
d. Invite representatives from other relevant areas for example, those responsible for the health workforce, WASH, waste management, AMR and quality improvement.
e. The use of self- or peer-evaluation against national standards or goals should be considered and examples collected of where this has been used.
f. Draw up a preliminary list of examples of excellence at the health facility level based on what is already known. Consider developing a suite of examples and vignettes to be used as national examples. Hand hygiene measurement can be a good initial starting point.

2. Identify key stakeholders, champions, leaders and networks to drive forward monitoring, audit and feedback.

a. The support of relevant stakeholders is necessary to develop a supportive climate for the implementation of monitoring, audit and feedback. Consider how best to identify health facility leaders, frontline health workers and the public to sell the benefits of monitoring, audit and feedback.
b. Champions who have pioneered or successfully used monitoring, audit and feedback will act as effective supporters and drivers of implementation. Based on the examples/vignettes already identified above, consider how to secure the commitment of champions to advocate for monitoring, audit and feedback. Focus on how key messages from champions can be best communicated across the country to reach target audiences at the health facility level.
c. Identify key networks (teams and groups across the country) who can be engaged to support the required actions and sustainability.

3. Address the need for funding.

a. Consideration should be given to the necessary funding and technical support that will be required for the local implementation of monitoring, audit and feedback. Resources for policies, regulations and tools to enable effective central coordination of facility level improvement should also be considered.
b. Involve all key stakeholders when addressing resource requirements.

4. Alignment with other policies and programmes.

a. Consider how to align with the monitoring, audit and feedback approaches of other national policy and programme priorities, for example, AMR, IHR (2005), quality and safety.
b. All countries routinely collect a range of monitoring, audit and feedback data. Explore with the project team the feasibility of integrating IPC monitoring, audit and feedback with existing systems or using existing data, for example, IHR (2005) and AMR-related data. The project team should consider how to establish or build on existing mechanisms:
   - To provide regular reports on the state of national goals (outcomes and processes) and strategies.
   - To regularly monitor and evaluate WASH services and the infrastructure of health care facilities that are relevant to IPC.
   - To promote the evaluation of the performance of local IPC programmes in a non-punitive institutional culture.
   - To provide timely and effective feedback.

5. Focus on adaptation.

a. Country adaptation of monitoring, audit and feedback approaches is critical. A sound baseline assessment, as described in step 2, is an important tool to assist with such local adaptation.

Links to resources

- Stakeholder mapping tool: https://www.k4health.org/sites/default/files/stakeholder_analysis_tool_generic_0.doc
- WHO Eastern Mediterranean Region patient safety assessment manual: http://applications.emro.who.int/dsaf/emropub_2011_1243.pdf?ua=1
- WHO Eastern Mediterranean Region patient safety toolkit http://applications.emro.who.int/dsaf/EMROPUB_2015_EN_1856.pdf

Country experiences with monitoring, audit and feedback

"We have introduced a monitoring system for IPC that has been partially integrated into the HMIS. We are also in the process of integrating IPC into a facility-based monitoring tool that is used to monitor all services at the facility, including IPC. WASH FIT includes a framework for routine and ongoing monitoring of a facility by building monitoring activities into existing facility activities."
WASH Focal Point from Africa

"In the Eastern Mediterranean Region, we developed an initiative - the "patient safety friendly hospital initiative" – a Regional Office set of patient safety standards, with the aim of assessing the patient safety programmes in hospitals where IPC was one key part in order to help instil a culture of safety. Monitoring is integrated within the "patient safety friendly hospital" assessment and related improvement toolkit. Adaptation of the tools was done and they are used on a regular basis to evaluate and monitor the progress of the IPC programme."
Regional IPC focal point from the Eastern Mediterranean Region

"Especially since this is time-consuming, it is important to specify from the beginning how the results will be used."
Regional IPC Focal Point from the Americas

"We are using the WASH and IPC core indicators as performance standards. With the standards-based management and recognition approach, the best facility will receive recognition for good performance on these and we hope this feedback approach will further contribute to behavioural change."
National IPC Lead from Africa

"We still have a gap in local adaptation. Health care workers are not used to the climate of audit and feedback. They feel like it is linked to punitive actions (that is, fault-finding) and have resisted its implementation. We have tried to adapt this intervention to our local context by starting with surveillance data (that is, the problem) and slowly building awareness concerning the need for audit and feedback."
IPC Professional from South-East Asia

"We provided workshops for facility administrators to build awareness about this approach and its importance."
IPC Professional from Africa

"We found that the national action plan on AMR work provided a good opportunity for advocating for a multimodal strategy. To address AMR in the IPC strategic pillar, we proposed activities in a multimodal approach."
IPC National Lead from Europe

STEP 2: BASELINE ASSESSMENT

MAIN ACTIVITIES

1. If a baseline assessment has already been undertaken as part of the overall core component guideline implementation, focus on the results relating to monitoring, audit and feedback.

2. If a baseline assessment has not yet taken place, undertake one now.

a. The national core components checklist and modified national IPCAT2 will provide crude information on the status of monitoring, audit and feedback systems across the country to guide action planning.
b. Focus on the section of the results related to monitoring, audit and feedback. What does this tell you about the current situation? Where are the strengths and gaps?
c. Other baseline information can be gathered from previously conducted assessments such as:
   - WHO hand hygiene self-assessment framework.
   - Patient safety culture assessment surveys.
   - Other national assessments, for example, IHR (2005), JEE, SARA, HMIS and the health workforce.

3. Use the results and feedback to all relevant stakeholders

a. Review and compare all results.
b. Provide key stakeholders with feedback on the status of monitoring, audit and feedback systems and activities in the country. Catalyse the discussion about what needs to be improved and what are the best indicators to use, also considering alignment with other existing systems.
c. Based on a review of all results, draw up a list of priority areas for action.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/
- WHO hand hygiene self-assessment framework: http://www.who.int/gpsc/country_work/hhsa_framework_October_2010.pdf?ua=1
- WASH facility improvement tool (FIT): https://www.washinhcf.org/fileadmin/user_upload/documents/WHO-UNICEF-2017-WASH-FIT_final.pdf
- Culture assessment surveys, for example: Agency for Healthcare Research and Quality hospital survey on patient safety culture: https://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/index.html
- Health workforce indicators' tool: http://www.who.int/hrh/resources/wisn_user_manual/en/

STEP 3: DEVELOPING AND EXECUTING AN ACTION PLAN

MAIN ACTIVITIES

1.Translate the priorities identified in the baseline assessment into a written plan of action, which should include SMART objectives, action steps, designated lead-persons, time frames and costing.

2. In addition to the standard action plan components, the following questions should be considered when developing the key action steps for the development of a monitoring, audit and feedback programme:

a. What practices/processes will be evaluated at the national level?
b. What will be the level of feedback of results? Results should be shared at the national level as a benchmarking approach, as well as at the

facility level, including hospital management and senior administration.

c. **How will monitoring, audit and feedback data be collected? Identify clear roles and responsibilities**
d. **How will monitoring, audit and feedback data be compared?**
e. **How frequently will monitoring, audit and feedback data collection take place?**
f. **How will feedback be provided?**
g. **How will the value of monitoring, audit and feedback data be promoted, for example, through the use of workshops?**
h. **How will capacity be built through the training and education of all relevant persons involved in the national implementation of monitoring, audit and feedback data?**
i. **Focus on hand hygiene monitoring, audit and feedback data. The establishment of regular hand hygiene compliance monitoring according to the WHO method should be included as a mandatory undertaking (at least for reference hospitals in the country).**
j. **How will it be considered as part of a multimodal approach?**

3. Put the plan into action.

a. Take action plan steps!
b. Follow agreed-upon roles and timeframes (for example, use a Gantt chart to illustrate the schedule).
c. Communicate and meet key individuals regularly.

Links to resources

- Action plan template (see Annex 3).
- Guide to implementation of the WHO multimodal hand hygiene improvement strategy: http://www.who.int/gpsc/5may/tools/WHO_IER_PSP_2009.02_eng.pdf?ua=1

STEP 4: EVALUATING IMPACT

MAIN ACTIVITIES

Develop a regular evaluation plan to assess the impact of the monitoring, audit and feedback programme

a. Establish a frequency of follow-up assessments using the tools used in step 2.
b. A minimum annual frequency is recommended in the first instance.
c. Embed the evaluation plan into other national monitoring and evaluation programmes as appropriate, addressing all available sources of data and technical expertise.

2. Put the evaluation plan into operation.

a. Update the action plan based on the results of the evaluation, considering the effectiveness of the programme, acceptability and value for money.

Links to resources

- The national IPC core component checklist is a simple tool to check which core components are in place and which ones need to be addressed (see Annex 2).
- Modified national IPCAT2 assessment tool: http://www.who.int/infection-prevention/tools/core-components/en/
- WHO hand hygiene self-assessment framework": http://www.who.int/gpsc/country_work/hhsa_framework_October_2010.pdf?ua=1

STEP 5: SUSTAINING THE PROGRAMME OVER THE LONG TERM

MAIN ACTIVITIES

1. Use the initial action plan and evaluations to develop a long-term action plan and review cycle to address long-term sustainability with a focus on:

a. Securing long-term policy level support for monitoring, audit and feedback and aligning with other policy priorities.
b. Securing long-term commitment from identified champions.
c. Provision of regular feedback on the progress of the action plan.
d. Harnessing available financial and human resources.
e. Building a financial case for long-term investment.
f. Building a portfolio of success stories and communicating examples of success to key stakeholders and networks.

Case study 1

Developing a national "centres of excellence" programme in Zimbabwe

"We have created a suite of tools and started the process of finalizing national IPC indicators to inform the national health information system. The system has yet to become standard practice, but we have developed a "centres of excellence" programme (grades 1-3) based on results of a checklist and national assessors. The checklist is of medium length and adapted from a tuberculosis infection monitoring tool (that is colour coded to measure performance). This tool works well with administrators, for example, we had one matron who took the results of the checklist to the administrator and said "you are responsible for the red colour because we don't have colour waste bags". The administrator asked "why didn't you tell me we were being audited?" He then presented the results at the provincial meeting and advocated for change (key for motivation!). We have also established a working group on surveillance and monitoring in the national IPC committee to push this forward."

IPC Professional from Africa

Case study 2

The importance of training in national monitoring and audit activities in Chile

"We established a periodic external evaluation system (with assessments conducted maximum every 3 years depending on results) managed by the ministry of health with initial training support from the Joint Commission on the Accreditation of Healthcare Organizations. We had a group of highly recognized surveyors who performed the surveys, which were IPC or administration professionals in public hospitals and we trained them yearly for this task. Currently, these surveyors come from the regional health services. We use standards that are fully aligned with the guidelines and norms. The criteria for scoring are public. The evaluations have no punitive (nor any other incentive) effect. However, a plan for improvement was required if the results were not optimal.

IPC National Lead from Chile

Case study 3

Demonstrating the value of monitoring, audit and feedback in Argentina

"Although it is required for accreditation, only some institutions with IPC programmes are doing monitoring, audit and feedback. Last year, a big hospital had a multidrug resistance outbreak and they requested assistance from the (Argentinian) Association of Nurses for Infection Control. We helped to implement a basic programme with surveillance, guidelines, hand hygiene, a clean and disinfection improvement programme, monitoring, audit and feedback. The outbreak situation provided them with political will to see the importance of this data collection."

IPC National Lead from Argentina

Key lessons from country case studies

1. Train a cadre of monitoring, audit and feedback experts to undertake periodic external monitoring, audit and feedback.
2. Identify at an early stage how the data will be used, for example, the process of feedback to stakeholders, linkage of results to incentives (that is, non-punitive) and improvement plans.
3. Integrate monitoring, audit and feedback with existing health management information systems.
4. Demonstrate the value of monitoring, audit and feedback to facility administrators, for example, presentation of data, workshops.
5. Leverage outbreaks to secure commitment and resources and use as a foundation for improvement.

ACTION CHECKS

To address the implementation of this core component, you should have done the following:

Key actions

1.	Convened a national multidisciplinary project team to focus on monitoring, audit and feedback	☐
2.	Secured the involvement of national experts on monitoring, audit and feedback	☐
3.	Collected a bank of examples of the effective use of monitoring, audit and feedback in IPC across the country	☐
4.	Identified key stakeholders, champions, leaders and networks to drive forward monitoring, audit and feedback	☐
5.	Explored alignment with relevant national policies and programmes	☐
6.	Assessed the funding situation, including existing resources that could be leveraged	☐
7.	Undertaken a baseline assessment to understand the current situation or used existing data collection findings from other relevant programmes	☐
8.	Developed an action plan for monitoring, audit and feedback based on priorities identified in the baseline assessment	☐
9.	Initiated the execution of an action plan according to defined steps, roles, timelines and costing	☐
10.	Established a frequency of follow-up assessments and defined feedback process	☐
11.	Developed a long-term action plan	☐

Part III: Annexes of tools to support implementation

Annex 1. WHO infection prevention and control core components summary

The 2016 World Health Organization (WHO) Guidelines on Core Components of Infection Prevention and Control (IPC) Programmes at the National and Acute Health Care Facility Level build on the original WHO Core Components for Infection Prevention and Control Report published in 2009. They have been developed by international experts adhering to WHO's Guideline Development Process, to support IPC in every country and every health facility across the world, in particular acute health care facilities.

Summary

The objectives of the new Guidelines are:

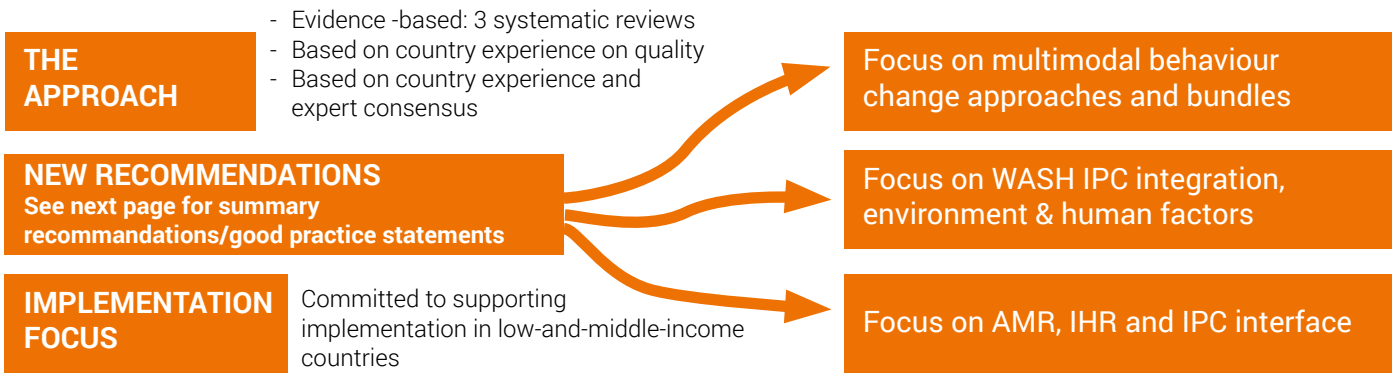
1. to provide evidence- and expert consensus-based recommendations on the core components of IPC programmes needed at the national and facility level, to effectively prevent health care-associated infections (HAIs) and combat antimicrobial resistance (AMR);
2. to support countries and health care facilities to develop or strengthen IPC programmes and AMR action plans, and improve IPC practices through a feasible, effective and acceptable framework that can be adapted to the local context, while taking account of available resources and public health needs.

Why a new set of guidelines?

1. Increasing acknowledgement of the threats posed by epidemics, pandemics and AMR and international support for IPC as one important part of the solution to protect people from these threats.
2. Renewed focus on the International Health Regulations (IHR) which position IPC as a key strategy for dealing with public health threats of international concern.
3. Sustainable Development Goals 3 and 6 and the requirement for effective, integrated IPC programmes to support quality health service delivery in the context of universal health coverage and water, sanitation and health (WASH) at national and facility levels.

What's new in these Guidelines?

Many of the principles of what constitute the central elements of IPC programmes remain the same as those presented in 2009. However, the following aspects are highlighted as new:



Annex 1. continued
Guideline Recommendations (R) & Good Practice Statements

1. IPC Programmes (R1a & GPS1b)

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.
Stand-alone, active **national** IPC programmes with clearly defined objectives, functions and activities for the purpose of preventing HAI and combating AMR through IPC good practices should be established. National IPC programmes should be linked to other relevant national programmes and professional organizations.

2. Evidence-based guidelines (R2)

Evidence-based guidelines should be developed and implemented for the purpose of reducing HAIand AMR. Education and training of the relevant health care workers on guidelinerecommendations and monitoring of adherence with guideline recommendations should be undertaken to achieve successful implementation.

3. Education & training (R3a & GPS3b)

At the **facility** level, IPC education should be in place for all health care workers by utilizing teamand task-based strategies that are participatory and include bedside and simulation training to reduce the risk of HAI and AMR.
The **national** IPC programme should support education and training of the health workforce as one of its core functions.

4. Surveillance (R4a & R4b)

Facility-based HAI surveillance should be performed to guide IPC interventions and detectoutbreaks, including AMR surveillance with timely feedback of results to health care workers andstakeholders and through national networks.
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 toreduce HAI and AMR.

5. Multimodal strategies (R5a & R5b)

At the **facility** level, IPC activities should be implemented using multimodal strategies to improve practices and reduce HAI and AMR.
National IPC programmes should coordinate and facilitate the implementation of IPC activities through multimodal strategies at the national or sub-national level.

6. Monitoring, audit and feedback (R6a & R6b)

Regular monitoring/audit and timely feedback of health care practices should be undertaken according to IPC standards to prevent and control HAIs and AMR at the health care facility level. Feedbackshould be provided to all audited persons and relevant staff.
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.

7. Workload, staffing & bed occupancy (R7)

In order to reduce the risk of HAI and the spread of AMR, the following should be addressed: (1) bed occupancy should not exceed the standard capacity of the facility; (2) health care worker staffing levels should be adequately assigned according to patient workload.

8. Built environment, materials & equipment (GPS8a & R8b)

At the **facility** level, patient care activities should be undertaken in a clean and/or hygienic environment that facilitates practices related to the prevention and control of HAI, as well as AMR, including all elements around the WASH infrastructure and services and the availability of appropriate IPC materials and equipment.
At the **facility** level, materials and equipment to perform appropriate hand hygiene should be readily available at the point of care.

Annex 2. National infection prevention and control (IPC) core component checklist

CORE COMPONENT	RECOMMENDATION	CHECKS TO SUPPORT IMPLEMENTATION	REFERENCE
1 . IPC programmes	Establish active, stand-alone IPC programme for the purpose of preventing HAI and combating AMR through IPC good practices.	☐ Programme objectives, functions, and activities clearly outlined ☐ Technical team of trained infection preventionists in place ☐ Dedicated IPC budget allocated ☐ Evidence that the IPC programme is linked with other relevant programmes and professional organizations	Practical manual Chapter 1
2. Evidence-based guidelines	Develop evidence-based national IPC guidelines and related implementation strategies. Ensure health care workers education and training on guideline recommendations and systems monitoring adherence with guideline recommendations.	☐ Essential IPC guidelines developed or adapted from international standards ☐ Necessary infrastructure and supplies to enable guideline implementation in place/being addressed ☐ Measures to support and mandate health care worker education and training on the guidelines' in place ☐ System to monitor adherence with guideline recommendations in place	Practical manual Chapter 2
3. Education and training	Support IPC education and training of the health workforce.	☐ Curricula target audience, learning objectives, competencies and teaching strategy developed ☐ Pre-graduate curricula developed or under development ☐ Post-graduate IPC curricula developed or under development ☐ New employee orientation and in-service continuous training on IPC developed or under development	Practical manual Chapter 3
4. Surveillance	Establish HAI surveillance programmes and networks that include mechanisms for timely feedback and can be used for benchmarking purposes.	☐ Support and engagement by governments and authorities for IPC surveillance secured ☐ Human and financial resources secured ☐ Adequate microbiology and laboratory capacity and quality in place or under development - at least in national reference laboratories ☐ Surveillance strategy developed ☐ • Clear objectives ☐ • Standardized case definitions ☐ • Methods ☐ • Process for data analysis, reporting, and evaluation of data quality ☐ Specific training for data collectors established	Practical manual Chapter 4

5. Multimodal strategies	Coordinate and facilitate the implementation of IPC activities through multimodal strategies adapted to the local context.	☐ Multimodal implementation strategies according to WHO definitions identified and actively promoted to prevent specific types of HAIs and/or AMR ☐ Requisite funding identified to support a multimodal approach ☐ Evidence of IPC integration with other quality improvement/safety/accreditation programmes demonstrated ☐ Evidence of local adaptation of multimodal implementation strategies demonstrated ☐ Evidence of monitoring compliance with the strategies and impact of the intervention on desired outcomes demonstrated	Practical manual chapter 5
6. Monitoring, audit and feedback	Establish a monitoring and evaluation programme to assess the extent to which standards are being met and activities are being performed according to the programme's goals and objectives. Consider using hand hygiene monitoring with feedback as a key performance indicator.	☐ Hand hygiene monitoring with feedback established as a key performance indicator at national level ☐ Other important IPC process indicators determined ☐ Strategy for using the data for action developed ☐ Regular reports produced and distributed	Practical manual Chapter 6
7.*			
8.*			
9.*			

*Can be added according to the local context

Annex 3. Implementation action plan template

CORE COMPONENT:<INSERT NAME OF CORE COMPONENT>						
Priority gaps identified	**Action required**	**Lead person**	**Start date**	**End date**	**Budget (if applicable)**	**Monitoring and evaluating implementation progress (include review/ completion dates)**
<List all gaps identified from baseline assessment and prioritized for action>	<List the actions that are planned using information gathered as you work through the 5 steps of the implementation cycle>	<List the lead person or group driving the action plan>	<State when the action will start to be addressed>	<Estimate the deadline for action to be completed, including periodic review dates if applicable>	<Estimate the budget required to address the required actions>	<Describe the progress that has been made at each review date including decisions and actions taken, and the need for further actions to be taken to achieve completion>
Gap 1:						
Gap 2:						
Gap 3:						
Gap 4:						
<INSERT MORE ROWS AS REQUIRED>						

EXAMPLE USING CORE COMPONENT 1						
Priority gaps identified	**Action required**	**Lead person**	**Start date**	**End date**	**Budget (if applicable)**	**Monitoring and evaluating implementation progress (include review/ completion dates)**
GAP 1: No stand-alone IPC programme.	• Make a list of the national, sub-national and local authorities and leaders and professional groups/bodies. • Use all advocacy materials listed in step 1 to develop a script to guide introductory meetings, e-mails and other correspondence presenting a case for investing in an IPC programme. Focus on how this will strengthen health service resilience, support IHR (2005) core capacities and JEE, prevent catastrophic outbreaks, prevent the spread of AMR and support the achievement of health service quality and safety. • Focus on the results of the baseline assessment that highlight the lack of an IPC programme and how this is contrary to international IPC guideline recommendations. • Set up a series of monthly advocacy and sensitization meetings with all identified leaders and stakeholders. • Establish a project team to include national champions, quality and safety colleagues. • Working with the project team, identify who might form the national IPC team and committee. • Working with the project team, identify a preliminary budget required to start and maintain the IPC budget. • Develop a budget case for presenting to the ministers of health and finance.	Acting IPC lead.	Date x	Date x + 6 months.	Estimate budget based on agreed actions to address human resources, office space, equipment, administrative support, meeting support, conference calls, travel, etc.	

Annex 4. WHO multimodal improvement strategy

Multimodal implementation strategies are a core component of effective infection prevention and control (IPC) programmes according to the WHO Guidelines on Core Components of IPC programmes at the National and Acute Health Care Facility Level.

The guidelines' **recommendation** 5 states that IPC activities using multimodal strategies should be implemented to improve practices and reduce HAI and AMR. In practice, this means the use of multiple approaches that in combination will contribute to influencing the behaviour of the target audience (usually health care workers) towards the necessary improvements that will impact on patient outcome and contribute to organizational culture change. Implementation of IPC multimodal strategies needs to be linked with the aims and initiatives of quality improvement programmes and accreditation bodies both at the national and facility levels.

Five key elements to focus on when improving IPC

- The multimodal strategy consists of several elements (3 or more; usually 5) implemented in an integrated way to guide action and provide a clear focus for the implementer.
- WHO identifies five elements for IPC multimodal strategies in a health care context:
  - the **system change** needed to enable IPC practices, including infrastructure, equipment, supplies and other resources;
  - **training and education** to improve health worker knowledge;
  - **monitoring and feedback** to assess the problem, drive appropriate change and document practice improvement;
  - **reminders and communications** to promote the desired actions, at the right time, including campaigns;
  - a **culture of safety** to facilitate an organizational climate that values the intervention, with a focus on involvement of senior managers, champions or role models.
- Targeting only ONE area (i.e. unimodal), is highly likely to result in failure. All five areas should be considered, and necessary action taken, based on the local context and situation informed by periodic assessments.

In other words, the WHO multimodal improvement strategy addresses these five areas:

1. Build it
(system change)

What infrastructures, equipment, supplies and other resources (including human) are required to implement the intervention?

Does the physical environment influence health worker behaviour? How can ergonomics and human factors approaches facilitate adoption of the intervention?

Are certain types of health workers needed to implement the intervention?

Practical example: when implementing hand hygiene interventions, ease of access to handrubs at the point of care and the availability of WASH infrastructures (including water and soap) are important considerations. Are these available, affordable and easily accessible in the workplace? If not, action is needed.

2. Teach it
(training & education)

Who needs to be trained? What type of training should be used to ensure that the intervention will be implemented in line with evidence-based policies and how frequently?

Does the facility have trainers, training aids, and the necessary equipment?

Practical example: when implementing injection safety interventions, timely training of those responsible for administering safe injections, including carers and community workers, are important considerations, as well as adequate disposal methods.

3. Check it
(monitoring & feedback)

How can you identify the gaps in IPC practices or other indicators in your setting to allow you to prioritize your intervention?

How can you be sure that the intervention is being implemented correctly and safely, including at the bedside? For example, are there methods in place to observe or track practices?

How and when will feedback be given to the target audience and managers? How can patients also be informed?

Practical example: when implementing surgical site infection interventions, the use of key tools are important considerations, such as surveillance data collection forms and the WHO checklist (adapted to local conditions).

4. Sell it
(reminders & communications)

How are you promoting an intervention to ensure that there are cues to action at the point of care and messages are reinforced to health workers and patients?

Do you have capacity/funding to develop promotional messages and materials?

Practical example: when implementing interventions to reduce catheter-associated bloodstream infection, the use of visual cues to action, promotional/reinforcing messages, and planning for periodic campaigns are important considerations.

5. Live it
(culture change)

Is there demonstrable support for the intervention at every level of the health system? For example, do senior managers provide funding for equipment and other resources? Are they willing to be champions and role models for IPC improvement?

Are teams involved in co-developing or adapting the intervention? Are they empowered and do they feel ownership and the need for accountability?

Practical example: when implementing hand hygiene interventions, the way that a health facility approaches this as part of safety and quality improvement and the value placed on hand hygiene improvement as part of the clinical workflow are important considerations.

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