NATIONAL INFECTION PREVENTION AND CONTROL POLICY

2022

Acknowledgements

On behalf of myself and the Nigeria Centre for Disease Control team, we are immensely grateful to the leadership of the Federal Ministry of Health, for the support given to the national Infection Prevention and Control programme and guidance towards the review of the 2013 National IPC Policy.

We also acknowledge with gratitude the Policy Working Group, which led and coordinated the review of this policy with support from the U.S Centre for Disease Control. The review of the policy also received tangible support from the Africa Centre for Disease Control, DR. Ameyo Stella Adadevoh Health Trust, World Health Organisation, United States Agency for International Development through the Medicines Technologies, and Pharmaceutical Services project. The work also reflects the significant input from technical partners such as Infection Control Africa Network, Nigerian Society for Infection Control, the Orange Network and experts from states and academia.

We wish to thank all stakeholders and subject matter experts who provided valuable and evidence-based comments. All these contributions ensured the timely development of a renewed policy framework that will guide efforts towards preventing healthcare associated infections and slowing down rising antimicrobial resistance trends. The implementation of this policy will improve the quality of healthcare services and impact positively on healthcare worker and patient safety. The 2022 National IPC Policy represents our resolve to continue protecting the health of Nigerians.

A full list of organisations that contributed to this work is provided in the appendix.

Dr. Ifedayo Adetifa

Director General, NCDC

Foreword

Available evidence shows that improving infection prevention and control practices at all levels has direct effects on the cost and quality of healthcare, duration of hospital stay and healthcare associated infection related morbidity and mortality. Evolving changes in infection prevention and control (IPC) approach and literature, on preventing healthcare associated infections including those caused by multi-drug resistant organisms have made the review of the 2013 national IPC policy necessary. In addition, the burden of other endemic infectious diseases e.g., TB, Lassa Fever and Cholera, including the emergence of evidence-based strategies for enhancing patient and healthcare worker safety have all necessitated the need for this policy review.

This policy strengthens the establishment of IPC programmes in Nigeria. It also states roles and responsibilities of the NCDC in coordinating and anchoring the national infection prevention and control programme as established in the National Action Plan for Antimicrobial Resistance (2017 – 2022). The policy further outlines the IPC governance structures that should exist at national and sub-national level including at health facility level.

Proper establishment of IPC programmes including the implementation and monitoring of IPC activities at all levels will enhance safety of patients and healthcare workers. Infection prevention and control is neither a switch, that can be turned on or off, nor is it is a one-man business; thus requires a team based and participatory approach in all its ramifications. At all levels, the IPC teams and committees are required to work with the identified IPC champions and other stakeholders in proffering sustainable solutions to prioritised IPC challenges of the facility.

Lastly, we remain grateful to our development partners who continue to work with us daily in supporting our institutional mandates. My kind appreciation also goes to the Nigeria Centre for Disease Control for coordinating and anchoring the review of the 2013 National IPC Policy.

Dr. Osagie Emmanuel Ehanire

The Honourable Minister of Health

Contents

LIST OF ABBREVIATIONS

ABHR	Alcohol-Based Hand Rub
ACDC	Africa Centre for Disease Control
AIDS	Acquired immunodeficiency syndrome
AMR	Antimicrobial resistance
AMR–NAP	Antimicrobial resistance National Action Plan
BCG	Bacillus Calmette-Guérin
BSI	Bloodstream infection
CI	Confidence interval
FMoH	Federal Ministry of Health
FMWR	Federal Ministry of Water Resources
HAI	Healthcare-associated Infection
HCF	Healthcare facilities
HCW	Healthcare workers
HEPA	High efficiency particulate air
HHSAF	Hand Hygiene Self-Assessment Framework
HIV	Human immunodeficiency virus
HMB	Hospitals Management Board
ICAN	Infection Control Africa Network
ICU	Intensive care unit
IHR	International Health Regulations
IPC	Infection Prevention and Control
IPCAF	Infection Prevention and Control Assessment Framework
IPCAT	Infection Prevention and Control Assessment Tool
IPCC	Infection Prevention and Control Committee
IPCP	Infection prevention and control professional
LGA	Local Government Authority
MDA	Ministries, Departments and Agencies

MDRO	Multidrug resistant organisms
MDR-TB	Multi-drug resistant tuberculosis
MTaPS	Medicines, Technologies and Pharmaceutical Services
NAP-AMR	National Action Plan for Antimicrobial Resistance
NCDC	Nigeria Centre for Disease Control
OHS	Occupational health and safety
OR	Operating room
PHC	Primary healthcare
PPE	Personal protective equipment
SARS	Severe acute respiratory syndrome
SMoH	State Ministry of Health
SSI	Surgical site infection
SMoH	State ministry of health
SMoWR	State Ministry of Water Resources
SOP	Standard operating procedure
SPHCDA	State Primary Healthcare Development Agency
TB	Tuberculosis
TWG	Technical working group
USAID	United States Agency for International Development
U.S CDC	United States Centre for Diseases Control
VHFs	Viral Haemorrhagic Fevers
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

1 - INTRODUCTION

1.1 Background

Infection prevention and control (IPC) is a discipline concerned with the identification, assessment and prioritization of the risk of acquiring infections during the provision of healthcare services, followed by a coordinated and economical application of resources to prevent, minimise, monitor and control the problem and its impact.[1] Infection prevention and control is an essential component of health care delivery and has the potential to reduce healthcare-associated infections (HAIs) and improve healthcare outcomes. Healthcare-associated Infections are infections that are acquired in healthcare facilities or any setting healthcare is provided as a result of healthcare interventions that were not present or incubating at the time of admission and which may present after discharge.[2] They are a major patient safety challenge as they can lead to serious illness, prolonged hospital stay, long term disability, increased financial cost, and death.

Prevention of HAIs is central to providing high quality and safe health care, even in settings with limited resources. The burden of HAIs in developing countries remains underestimated. However, systematic reviews and metanalysis have shown that surgical site infections (SSIs) are the most prevalent HAI in most African countries. The impact of HAIs implies prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobials, a massive additional financial burden for health systems, high costs for patients and their families, and excess deaths. In Nigeria, the cumulative incidence of HAIs in surgical wards has been reported to be as high as 45.8% in some facilities with an incidence density of 26.8 infections per 1000 patient-days among paediatric surgical patients.[3] There is paucity of a nationally representative HAI data, as most HAI surveillance data from Nigeria, is based on studies from single referral health facilities, which makes extrapolation difficult. More so, the pooled cumulative incidence of SSIs from metanalysis was 14.5% (95% confidence interval [CI]: 0.113-0.184) with the highest incidence reported in the north-eastern region (27.3%, 95% CI: 0.132-0.481) of the country.[4]

The 2013 national IPC policy was structured around TB/HIV programme. Whereas breaking the chain of TB/HIV transmission is important in IPC, but a policy document on IPC should be broad-based and built on establishing IPC programmes to address HAI including TB/MDRTB with strong linkage to other national programmes like Antimicrobial Resistance (AMR) and Water Sanitation and Hygiene (WASH). The scope of the 2013 national IPC policy largely focused on TB/HIV, as such the framework was not comprehensive in broadly supporting the objectives of an IPC programme at any level. More so, the discipline of IPC has evolved over

[1] *American Journal of Infection Control*, 2000. Centre for Disease Control and Prevention 4th Decennial International Conference on Nosocomial and Healthcare-Associated Infections. 28(1), pp.76-99.
[2] Gatti, C., 2017. Healthcare Associated Infections in a Resource Limited Setting. *journal of clinical and diagnostic research*.
[3] Tombari, G., 2017. Incidence and Mortality of Post-Surgical Wound Sepsis in Surgery Wards of University of Port Harcourt Teaching Hospital, Port Harcourt. *Journal of Medical Science and Clinical Research*, 5(7).
[4] Abubakar, U., 2020. Point-prevalence survey of hospital acquired infections in three acute care hospitals in Northern Nigeria. *Antimicrobial Resistance & Infection Control*, 9(1).

the past 8 years; WHO core components on IPC, core competencies of IPC structures, the national IPC curriculum co-developed by the partners and the NCDC, AMR-NAP. All of which the existing policy does not speak to and as such creates gaps that need to be addressed. It is on that basis; the current national IPC policy is being reviewed.

The World Health Organisation (WHO) recommends the establishment of an IPC programme based on the 8 core components, namely: At all levels - IPC programme, IPC guidelines, IPC education and training, HAI surveillance, multimodal strategies, monitoring/audit of IPC practices and feedback; At facility level - workload, staffing and bed occupancy; built environment, materials, and equipment for IPC.

Resources are always limited; thus, proper planning, implementation, and evaluation of IPC activities are essential in all healthcare settings irrespective of their size or scope of services provided. Successful IPC programmes at national and health care facility levels are based on understanding the problems or needs, prioritizing activities, and using available resources effectively. The implementation of IPC programmes has been shown to reduce HAIs by up to 50%.[5] Thus, IPC is not only the most cost-effective option, but also the best strategy available to protect health workers, patients as well as relations, and limit the spread of disease within health care facilities. Moreover, the experience accumulated in the past two years in responding to the COVID-19 pandemic unequivocally shows that both patients and health workers can be at high risk of being infected with SARS-CoV-2 during health care delivery and need to be protected.

1.2 Policy statement

This policy shall ensure excellence in the delivery of patient-centred care and adequately protect all health workers, reduce the risk of HAI to: patients, relations, visitors, and the general public. In line with the provisions of the National Action Plan for Antimicrobial Resistance (NAP-AMR), the Federal Ministry of Health (FMoH) through the Nigeria Centre for Disease Control (NCDC) shall ensure the development and sustainability of comprehensive IPC programmes at all levels of care within the healthcare delivery system.

1.3 Policy aim

The goal of this policy is to provide a framework for the establishment and management of effective IPC programmes and promote safe healthcare delivery across health facilities in Nigeria.

1.4 Policy objectives

The objectives of the policy are to:

[5] Storr, J., Twyman, A., Zingg, W., Damani, N., Kilpatrick, C., Reilly, J., Price, L., Egger, M., Grayson, M., Kelley, E. and Allegranzi, B., 2017. Core components for effective infection prevention and control programmes: new WHO evidence-based recommendations. *Antimicrobial Resistance & Infection Control*, 6(1).

1. Establish the principles and framework for the prevention and control of HAIs/infectious diseases in healthcare settings nationwide.
2. Provide guidance on IPC roles, responsibilities, and activities at all levels of the healthcare system.
3. Provide standards of practice for infection prevention and control.
4. Establish and strengthen IPC programmes in healthcare facilities across the healthcare delivery system.
5. Ensure IPC professionals are engaged to lead IPC programmes at all levels.
6. Prevent and/or minimize occupational and environmental hazards associated with healthcare delivery.
7. Improve surveillance of HAIs at all levels of healthcare delivery.
8. Provide guidance and strategy in outbreak settings.

1.5 Scope of Policy

The National IPC policy shall be due for review after 5 years from the date of publication and/or at any time deemed fit by the National IPC programme.

1.6 Guiding principles

The policy will be guided by the following principles:

1. Teamwork: Effective IPC requires multidisciplinary teams. Every effort will be made to encourage collaboration between staff and other programmes.
2. Quality: The dignity and rights of patients to consistent high standards of healthcare will be the goal at all times.
3. Safety: The rights of patients, health workers and visitors to healthcare settings without avoidable harm from infections will be upheld during healthcare delivery.
4. Evidence-based: All procedures and processes will be evidence-based and according to best practices to prevent healthcare associated infections during the provision of healthcare and related services.
5. Sustainability: All efforts will be made to ensure IPC processes and procedures will be integrated into routine healthcare delivery and this will include securing the commitment of leadership at different levels.
6. Resource mobilization: IPC cannot function/be implemented without human and capital resources. A budget line is required for IPC programmes as well as dedicated trained and certified manpower.

1.7 Linkage with the National Health Act 2014 and other legal frameworks

This policy shall have relevance for the underlisted acts and policies, and other health sector relevant legislations referenced within that act:

1. Constitution of the Federal Republic of Nigeria, 1999 as amended.
2. National Health Act, 2014.

3. Nigeria Centre for Disease Control Act, 2018.
4. Patients' Bill of Rights, 2018.
5. National Health Insurance Authority Act, 2022.
6. Primary Healthcare Under One Roof Policy, 2013
7. The National Tuberculosis, Leprosy and Buruli ulcer Management and Control Guidelines, Sixth Edition, 2015.
8. National Guidelines on Infection Prevention and Control for Viral Haemorrhagic Fevers, 2020.
9. National Water Resources Policy, 2016.
10. The National Policy on the Environment, Revised 2016.
11. National Solid Waste Management policy, 2021.
12. International Health Regulation, 2005.
13. Sustainable Development Goals, 3 and 6 – 2015.
14. National Policy on HIV/AIDS, 2003.
15. National Drug Policy, 2003.

1.8 Policy review

This National IPC policy shall be due for review after 5 years from the date of publication and/or at any time deemed fit by the National IPC programme.

2 - INFECTION PREVENTION AND CONTROL GOVERNANCE STRUCTURE

2.1 Roles and Responsibilities of the National IPC programme

The Infection Prevention and Control (IPC) programme should be an integral part of the health service delivery system in Nigeria. As much as possible, existing structures within the health sector shall be integrated for effective implementation of the IPC programme.

At the national level, the FMoH through the NCDC is the main authority for coordinating the implementation of all infection prevention and control activities. There shall be a national IPC programme with a management unit led by a trained IPC programme coordinator. The NCDC shall have the responsibility and authority for ensuring the availability and use of IPC policies and guidelines.

The national IPC programme should have clear objectives, functions, activities, appointed IPC professionals, and a defined scope of responsibilities. The functions of the national IPC programme shall include but not limited to the following:

1. Develop and update national, evidence-based IPC guidelines and implementation strategies to reduce HAIs and antimicrobial resistance.
2. Develop a national surveillance programme to monitor selected HAIs and antimicrobial resistance patterns, including locally appropriate, standardized definitions, reporting channels, data management, laboratory support, and timely data feedback and benchmarking.
3. Coordinate and facilitate the implementation of IPC activities using multimodal strategies at all levels.
4. Develop a national monitoring and evaluation system to assess that IPC standards are being met.
5. Monitor hand hygiene compliance data and feedback as a key performance indicator.
6. Collaborate with local academic institutions to develop pre- and post-graduate IPC curricula.
7. Link with relevant programmes.

Framework for coordinating IPC in Nigeria

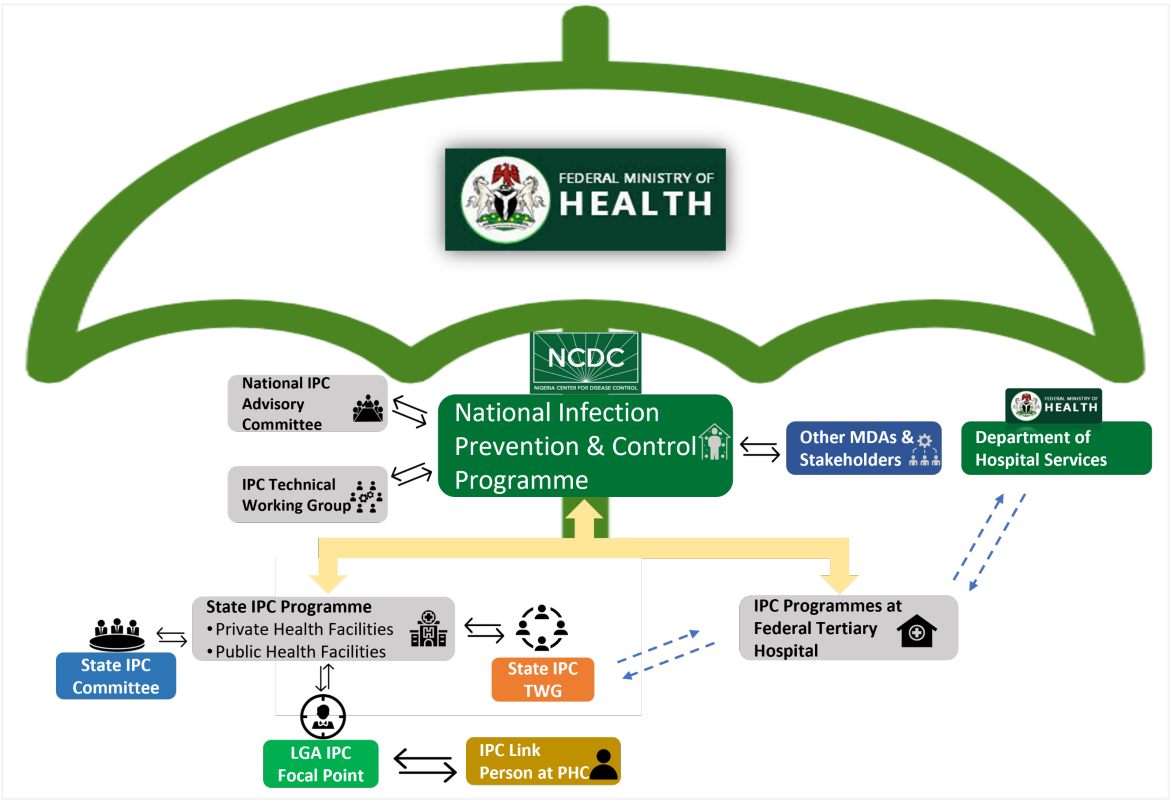


Fig 1.0: How Infection Prevention and Control programme is coordinated in Nigeria

2.2 Roles of the Federal Ministry of Health

1. Commitment to provide adequate support to the optimal functioning of the national IPC programme. This will include among others resource mobilization, advocating and ensuring domestic financing for the national IPC programme
2. Provide technical guidance in the development of national IPC strategic documents and involvement in other strategic activities of the national IPC programme with sector-wide effects.
3. Promotion of activities that strengthen the national IPC programme and
4. Budget advocacy for domestic financing and resources mobilization for IPC
5. Ministerial approval of national IPC policy and strategic framework and documents.

2.3 Roles of the Nigeria Centre for Disease Control

1. NCDC will serve as the secretariat for the National IPC programme. The National IPC programme will be domiciled at the NCDC led by a National IPC Coordinator.
2. Developing national IPC guidelines, policies, and standard operating procedures (SOPs)
3. Commitment to provide adequate resources to the optimal functioning of the national IPC programme.

4. Support the establishment and function of IPC governance structures at national and sub-national levels.
5. Development and review of the strategic action plan including other relevant national documents on IPC.
6. Establishing a system for monitoring, evaluating, and reporting key IPC indicators.
7. Plan and coordinate national HAI surveillance at national and subnational levels.
8. Instituting the governance structure within which the national IPC programme and personnel will operate, as defined in this National IPC Policy document.
9. Strengthen the IPC technical capacity of healthcare workers nationwide.
10. Collaborate with institutions, organisations, and other relevant key stakeholders in strengthening IPC practice based on the WHO core component of IPC.
11. Update the FMoH and relevant stakeholders annually on the progress of the national IPC programme.
12. Advocate for resource mobilization and budget allocation for the national IPC programme.

2.3.1 National Infection Prevention Control Programme Coordinator

The National IPC Programme Coordinator is responsible for the overall coordination and leadership of the National IPC programme activities in line with global best practices. The coordinator should be a healthcare professional, trained and certified in IPC.

The National IPC Programme Coordinator in collaboration with other stakeholders will report progress and issues at standing meetings of the national IPC advisory committee and IPC TWG.

The functions of the National IPC programme coordinator include, but not limited to:

1. Lead the development of the strategic action plan for the National IPC programme based on objective assessments, availability of resources and identified priorities.
2. Ensure the established IPC governance structures are functional
3. Define and set national IPC standards.
4. Oversight of the development, updating, and distribution of IPC guidelines, IPC manual, strategic documents, training curricula, monitoring and evaluation tools, systems, and performance standards to health workers nationwide.
5. Liaise with relevant stakeholders to ensure that IPC activities are coordinated across the country.
6. Advise on the quality, quantity, and availability of IPC supplies across the country.
7. Coordinate monitoring and evaluation of IPC activities across the country.
8. Facilitate education and training of IPC professionals across the country.
9. Provide an annual report on the national IPC programme.

2.4 Roles of the National Infection Prevention and Control Advisory committee

An external body consisting of the national IPC Programme Coordinator, partners, public health institutes, academia, research institutions, professional groups, networks, and other stakeholders in the IPC community established for advisory and guidance purposes to the national IPC Programme. The roles of the committee include:

1. Advise the national programme on IPC standards for safe healthcare delivery of healthcare services at all levels.
2. Serve as IPC champions on advocacy for securing sector-wide buy-in for the implementation of the national IPC policy recommendations.
3. Support and advise the national IPC programme on the development of relevant technical document and guidelines related to IPC.
4. Advise the national IPC programme on strategic engagements with relevant stakeholders and institutions required for driving and sustaining the programme.
5. Advise on resource mobilization required for implementing planned activities in the national IPC strategic plan.
6. Shall meet bi-annually or as may be required by the national programme coordinator.

2.5 Roles of the Infection Prevention and Control Technical Working Group

To prevent the spread of infections, it is important to implement Infection Prevention and Control programmes across human and animal communities, and healthcare settings. The IPC programmes will thrive effectively through personal and environmental sanitation including hygiene, as well as through biosecurity measures throughout the entire value chain from farm to plate. The IPC pillar within the National One Health AMR Technical Working Group in line with the AMR-NAP is the principal forum for strengthening the infection prevention and control programme in human health, animal health and the environment at community and all governmental levels. The group shall:

1. Support the development, adoption and periodic review of IPC/biosecurity and WASH policies, regulations, and guidelines.
2. Support establishment and/or strengthen existing IPC, biosecurity, and WASH programmes.
3. Build capacity, mobilise resources/finances and optimise standard of infrastructure to improve interventions at healthcare facilities, farms, and the environment.
4. Support conduct of research on IPC, biosecurity and WASH related interventions, activities, and programmes.
5. Strengthen intersectoral collaboration, track and obtain information on AMR and IPC in some national programmes in human, animal, and the environment sectors (e.g., TB, HIV, STI etc.)
6. Conduct advocacy to relevant stakeholders on the implementation of IPC, biosecurity, and WASH programmes.
7. Advocate for the availability and optimal use of vaccines to prevent Infectious diseases in human and animal health.

8. Report to the National AMR Coordinating Committee through the National AMR Technical Working Group.
9. This pillar shall have members with the following diverse skills:
    a. Quality assurance
    b. Handling of hazardous materials
    c. Biosecurity
    d. Infection prevention and control

2.6 Roles and responsibilities at state level

2.6.1 State Ministry of Health

The state ministry of health (SMoH) through its agency/department/unit responsible for hospital services, shall ensure the domestication and implementation of this policy in all healthcare settings (public, private, and faith-based) in the state. The Honourable Commissioner of Health for each state shall constitute the state IPC committee.

Framework for coordinating IPC at state level

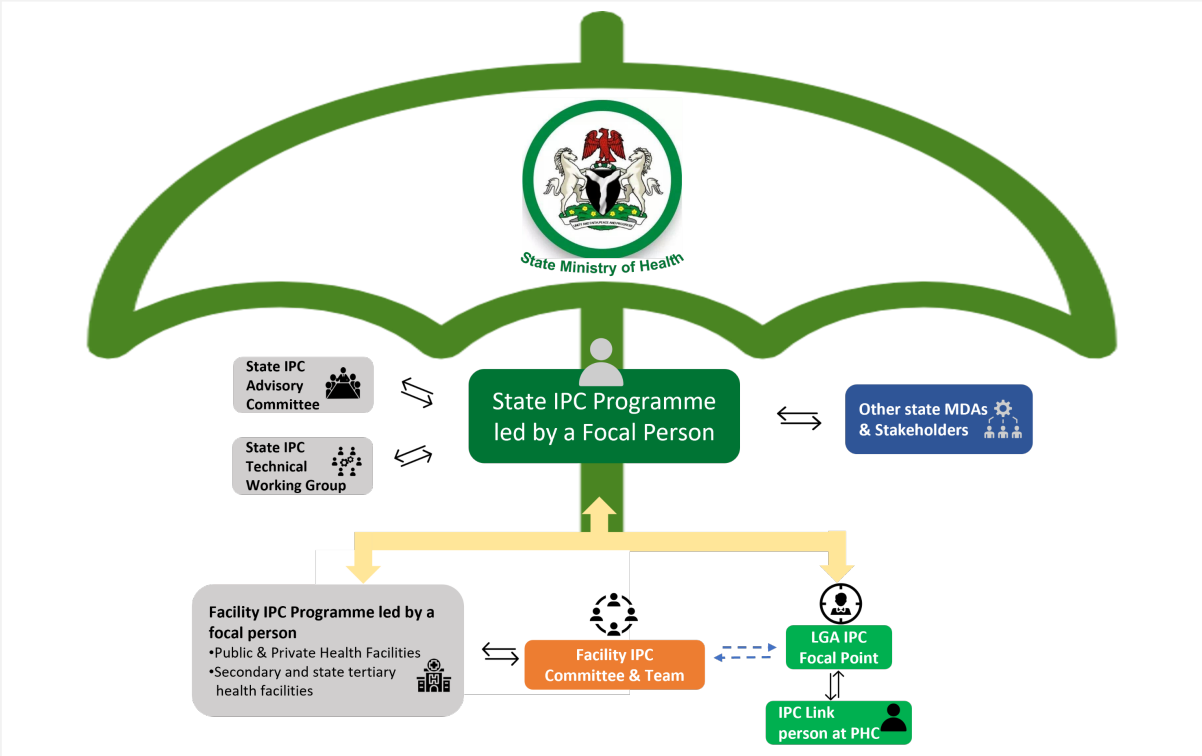


Fig. 2.0: How Infection Prevention and Control programme is coordinated at the state level

2.6.2 State Infection Prevention and Control committee

1. Shall coordinate and manage the state IPC programme in line with national IPC standards.
2. Should comprise representatives from clinical, nursing, laboratory, quality and safety, State Primary Healthcare Development Agency, pharmacy, administration and Finance , works, public health/Epidemiology and environmental health services.

3. Leadership should be a medical doctor/nurse/other senior health personnel with expertise and certification in IPC.
4. Ensure implementation of IPC programme at the state level.
5. Coordinate all IPC activities at the state level.
6. Ensure all health facilities under the state establish functional IPC programmes that align to the National standards with at least a trained and dedicated IPC practitioner.
7. Ensure all health facilities under the state establish IPC committees and teams/focal points.
8. Advocate for resource mobilization and state budgetary allocation for IPC activities.
9. Ensure IPC trainings for health facilities, MDAs, and other organizations and that they align with the National IPC curriculum.

2.6.3 State Infection Prevention and Control Technical Working Group

The IPC pillar within the state One Health AMR Technical Working Group in line with the AMR-NAP and 2022 National IPC policy, is the principal forum for strengthening the infection prevention and control programme in human health, animal health and the environment at community and all governmental levels. The group shall:

1. Support the development, adoption and periodic review of IPC/biosecurity and WASH policies, regulations, and guidelines.
2. Support establishment and/or strengthen existing IPC, biosecurity, and WASH programmes.
3. Build capacity, mobilise resources/finances and optimise standard of infrastructure to improve interventions at healthcare facilities, farms, and the environment.
4. Support conduct of research on IPC, biosecurity and WASH related interventions, activities, and programmes.
5. Strengthen intersectoral collaboration, track and obtain information on AMR and IPC in some national programmes in human, animal, and the environment sectors (e.g., TB, HIV, STI etc.)
6. Conduct advocacy to relevant stakeholders on the implementation of IPC, biosecurity, and WASH programme.
7. Advocate for the availability and optimal use of vaccines to prevent infectious diseases in human and animals.
8. Report to the National AMR Coordinating Committee through the state AMR Technical Working Group.
9. The pillar should be multi-sectoral with other relevant sectors and partners represented for planning, implementation, and evaluation of the one health activities for the purpose of preparedness, detection, and response of all IPC deliverables in the state.
10. Other relevant representatives should be from State Primary Healthcare Development Agency, state HMB, state Ministry of Agriculture (animal health division), state Ministry of Environment, State Emergency Management Agency, State Ministry of

Water Resources, Public health department, epidemiology, and environmental services etc.

11. This pillar shall have members with the following diverse skills:
    a. Quality assurance
    b. Handling of hazardous materials
    c. Biosecurity
    d. Infection prevention and control

2.6.4 State Infection Prevention and Control Team/Focal Person

The team should be multidisciplinary and consist of healthcare workers with expertise and certification in IPC preferably: Medical Doctor/Nurse/other senior health personnel with expertise and certification in IPC. The team members should be staff of agency, department, or unit responsible for hospital services. The team/focal persons:

1. Shall lead the planning, implementation, monitoring and evaluation of IPC programme and activities at the state level.
2. Shall be a member of the state IPC committee and IPC TWG.
3. Shall coordinate and provide technical support activities of facility IPC programmes.
4. Provide technical support and mentorship to public (tertiary, secondary, primary) and private healthcare facilities.
5. Shall provide quarterly report on state IPC programme to the national IPC programme.
6. Lead the development of the strategic action plan for the state IPC programme based on objective assessments, availability of resources and identified priorities.

2.7 Roles and responsibilities at the local governments

2.7.1 The Local Government Area PHC department

1. Should designate an LGA IPC focal point in line with national core competencies and IPC standards to coordinate activities at the LGA level.
2. Provide technical support, training and mentorship to IPC link persons at primary healthcare facilities (PHCs).
3. Ensure budgetary provisions to support the implementation of IPC activities.
4. Ensure that IPC equipment and materials are available at primary healthcare facilities.
5. Plan and coordinate IPC training for staff at primary healthcare facilities according to the national curriculum.
6. Provide input within the LGA on the surveillance, prevention, investigation, and control of infectious disease in the community.
7. Ensure that mechanisms are in place to identify outbreaks and set up alert systems in primary healthcare facilities.
8. Provide input towards the development of LGA outbreak preparedness plans and guidelines.
9. Development, distribution, and placement of SOPs in various service points for easy access and adherence

2.8 Roles and responsibilities at the health facility level

The governing structure for the IPC programme is dependent on the type and complexity of healthcare delivery. In hospitals, the governance structure will include the IPC committee which is responsible for developing policies and procedures related to infection control in the facility and the IPC team which is responsible for day-to-day implementation of IPC activities.

2.8.1 Health facility management

Shall provide leadership and support for the IPC programme to foster a safe environment for patients, staff, and visitors.

Should facilitate an effective hospital-based IPC programme with personnel with the required skills and knowledge on infection prevention and control.

Framework for coordinating IPC at facility level

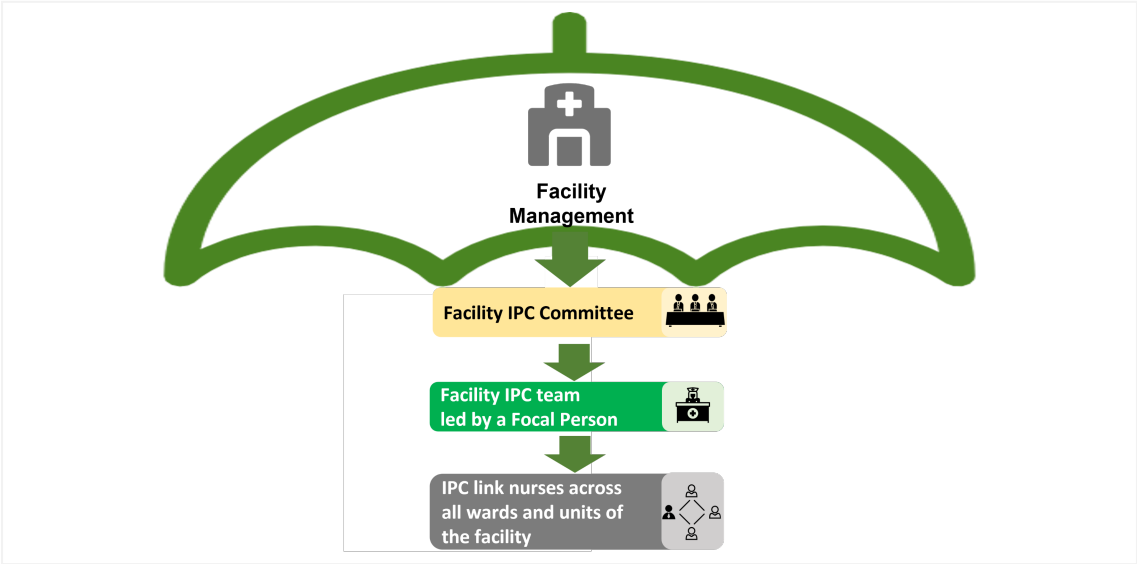


Fig 3.0: How Infection Prevention and Control programme is coordinated at the facility level

2.8.2 Health facility Infection Prevention and Control committee

The IPC committee is multidisciplinary and acts as a source of expertise and IPC advocates in the facility. The committee reports directly to the facility management/leadership through its chairperson who should be the Chief Medical Director, or anybody appointed by him/her. The committee comprises as its core group the Infection Control Doctor (Public health physician/epidemiologist or clinical microbiologist or infectious disease physician with IPC training) or infection control nurse, and representatives from nursing, laboratory, public health/epidemiology, occupational health and safety, quality, administration/finance, works, environmental health and services as necessary.

2.8.3 The specific roles of the facility Infection Prevention and Control committee

1. Review IPC activities and annual workplan and recommend for the approval of the hospital management.
2. Ensure facility management provides budget support for implementing approved IPC activities.
3. Review outbreaks of infection and advice on prevention strategies.
4. Support management in planning and development of programmes and facilities on issues relevant to IPC.
5. Review risk assessment reports to advise on programme objectives based on local epidemiology and facility priorities as submitted by the IPC team.
6. Ensure enabling environment is provided for operationalizing, evidence-based national IPC guidelines based on international and national standards submitted by the IPC team.
7. Report on the incidence and prevalence of Alert Organisms and novel or infectious diseases of importance to management of the facility.
8. Ensure enabling environment is provided for operationalizing national policies/plans on HAI surveillance, audits and M&E of infection prevention and control programmes and facilitate the prompt reporting to facility management, local and national authorities.
9. Work with the IPC team to develop a plan to assess the effectiveness of interventions to improve patient safety at the facility.
10. Design programmes and schedules for the education of staff and students on IPC and review the impact of the training on the practice of IPC.
11. Prioritize the procurement of materials and products essential for hygiene and safety and ensure it is accessible to the staff.
12. Ensure regular reports are shared directly with the administration or medical staff to promote programme visibility and effectiveness.

2.8.4 Health facility Infection Prevention and Control team

The health facility IPC team is responsible for the day-to-day running of the programme and should have be led by an IPC focal person (a medical doctor, nurse or other related health professional trained and certified in IPC). A minimum of 1 IPC professional is recommended per 250 beds at a facility.

2.8.5 Specific Role and Responsibilities of facility Infection Prevention and Control Team

1. The team should meet at least once weekly.
2. Conduct a quarterly review of risk assessment and establish an annual IPC programme with clear objectives, goals, and targets.
3. Develop an annual IPC workplan for the facility based on identified IPC gaps and priorities.
4. Develop written site-specific policies and procedures on IPC.
5. Conduct surveillance for healthcare associated infections.

6. Investigate outbreaks and provide expert advice, analysis, and leadership during outbreak response.
7. Conduct surveillance and reporting of Alert Organisms.
8. Develop and carry out regular training and retraining of all staff on national and facility IPC policies, procedures, and practices relevant to areas of work.
9. Communicate and cooperate with the other hospital committees with common interests (such as pharmacy, antimicrobial resistance committee, biosafety, blood transfusion committee, etc.).
10. Oversee the implementation and compliance with IPC practices.
11. Participate actively in the development and operation of regional and national IPC initiatives.
12. Participate in programmes and initiatives to promote rational antimicrobial use.
13. Be involved in the planning, construction, renovation, and structural design of any building in the hospital to ensure IPC compliant structures.
14. Ensure that patient care practices are appropriate to the level of patient risk.

2.8.6 Infection Prevention and Control team Meetings and minutes

1. The team should meet regularly (at least weekly) to discuss relevant IPC issues.
2. A standing agenda may include:
    a. Updates on surveillance.
    b. IPC workplan plan development or review.
    c. Reports on alert organisms.
    d. Reports on HAIs.
    e. Observations of IC practice.
    f. Policy reviews or revisions, status of educational efforts.
    g. Follow-up on any problems identified, e.g., supply/equipment issues.
3. Minutes should be prepared for all meetings and filed appropriately.
4. Rules or regulations agreed upon to facilitate monitoring of IPC activities at the healthcare facility should be communicated to stakeholders.
5. Feedback from stakeholders at all levels should be encouraged.

2.8.7 Infection Prevention and Control link nurses

These are support structures of the IPC system. They are the eyes and ears of the IPC team at unit/ward levels. Each ward and unit should have a link nurse that reports IPC status to the IPC focal point. Preferably, this nurse should be the head nurse of the department or a senior nurse. Some roles and responsibilities of the IPC link nurses are highlighted below:

1. Act as a liaison for communication and coordination between the IPC Focal Person, IPC team and all the staff of the department or ward.

2. Convey the recommendations of the Infection Control team to the staff of the ward and to send feedback to the Infection Control team.
3. Ensure implementation of infection prevention and control activities at the ward level.
4. Responsible for prompt reporting of any healthcare associated infections in the department.
5. Responsible for maintaining good IPC practices in the ward/units.
6. Motivate and encourage effective IPC practices.
7. Help identify IPC related issues and implement solutions when problems occur.
8. Encourage hand hygiene and monitor aseptic techniques.
9. Recognize communicable diseases and liaise with the infection prevention and control unit.
10. Maintain IPC supplies and other relevant patient care supplies.

2.8.8 Infection Prevention and Control Focal Person

Health care professional (medical doctor, nurse, or other health-related professional) who has completed a certified postgraduate IPC training course, or a nationally or internationally recognized postgraduate course on IPC, or another core discipline including IPC as a core part of the curriculum as well as IPC practical and clinical training. The focal person leads the IPC team at the facility level.

The IPC focal person assumes responsibility for the programme activities, including guiding the implementation of the yearly IPC plan, managing the IPC staff, building technical capacity, and providing skills in assuring quality of day-to-day IPC activities in the facility.

2.8.9 Roles and responsibilities of the Infection Prevention and Control focal person

1. Ensure adaption/adoption and Implementation of the National IPC Policy at the hospital facility.
2. Advise staff on all aspects of IPC to maintain a clean and safe environment for patients, visitors, and staff.
3. Monitor staff adherence to IPC practices (e.g., hand hygiene, PPE use, sharps disposal, disinfection, sterilization, waste management, laundry management etc.) and ensures compliance with National IPC Guideline and SOPs.
4. Document and initiate immediate corrective actions when lapses in IPC are noticed.
5. Collaborate with state IPC Focal Person, SMoH, and other partners (if available) to share data and to ensure the recommended IPC practices and trainings are implemented and conducted within the hospital.
6. Plan and conduct on-going IPC training programmes to ensure that all hospital staff are knowledgeable and are implementing the recommended IPC practices.
7. Ensure the necessary and recommended IPC equipment and supplies are identified, forecasted, available and used appropriately; (e.g., stocking wards with PPEs, soap, and WASH facilities).

8. Monitor and document daily, IPC activities and incidents within the hospital, including hospital acquired infections, health worker injuries and other indicators as required by the National IPC Programme.
9. Conduct IPC assessments as per National IPC Programme requirements.
10. Generate and present reports for the quarterly Hospital IPC Committee meeting. These reports include incidence of healthcare associated infections, health worker injuries, trend analysis on facility IPC assessments and other indicators as required.
11. Develop a yearly Hospital IPC Programme risk assessment and action plan which includes performance measures to meet the above activities.
12. Report on IPC activities and issues at the quarterly IPC meetings of the LGA and state
13. Lead outbreak investigation and development of an action plan for the facility.

2.8.10 Infection Prevention and Control Nurse

A nurse hired mainly (100%) for the purpose of conducting IPC related activities. At least 1 IPC nurse is recommended per 250 patient beds.

Role and Responsibilities

1. Understand and ensure consistent IPC practices are used when providing direct patient care to minimize infections.
2. Serve on or participate in IPC teams and IPC committees, as required.
3. Notify the IPC staff about HAIs and infections with potential to spread within the hospital and initiate immediate containment measures.
4. Liaise with microbiologists/microbiology lab to identify infections caused by alert organisms.
5. Actively participate in Outbreak management in healthcare facilities.
6. Initiate and/or participate in M/E and audit of IPC programmes.
7. Provide feedback to IPC focal person and team on IPC practices and policy implementation.

3 - INFECTION PREVENTION AND CONTROL PROGRAMMES

The establishment of IPC programmes is one of the 8 core components of IPC recognized by the WHO.[6] These core components are evidence-based pillars for strengthening health systems across high, middle, and low-income countries. Establishment of IPC programmes represent the bedrock upon which the other core components are built at National, State, Local government, and health facility levels. A strong, effective, and sustained IPC programme ultimately strengthens the health system and supports the delivery of high quality, patient - centred, and integrated health services.

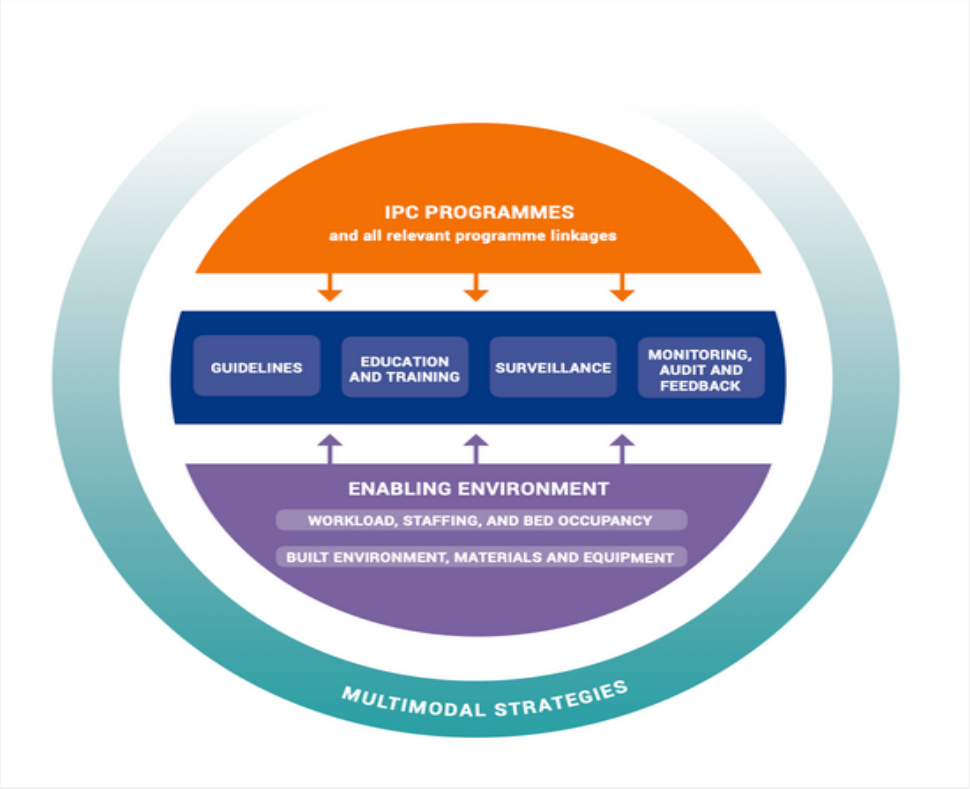


Fig. 4.0: WHO core components of IPC

A functional and stand-alone National IPC programme led by a full-time focal point, trained in IPC, should be based at the NCDC. The programme should have clearly defined responsibilities for the Infection Preventionist, goals, objectives and activities established for the purpose of preventing HAIs and combating AMR through standard IPC practices. The National IPC programme should be linked to other national programmes and professional bodies. At the minimum, the objectives of the IPC programme should include:

1. Goals and objectives with measurable outcome indicators to be achieved for endemic and epidemic diseases.

[6] http://www.who. int/infection-prevention/publications/core-components/en/.

2. Development of an IPC manual which details recommended IPC processes and practices with proven effectiveness in preventing HAIs and combating AMR.
3. Monitoring of IPC implementation and audit of IPC practices feedback.
4. Strengthening HAI surveillance.
5. The establishment of IPC programmes at National, State, LGA, and facility level should include the following components:

    a. National IPC programme representation at the IPC TWG under AMR CC
    b. IPC committee (at facility and state levels).
    c. IPC teams (at facility level).
    d. At a minimum have one dedicated IPC professional per 250 beds employed mainly for IPC.
    e. A dedicated budget to implement planned IPC activities.
    f. Appointed technical team of trained infection preventionists, including medical and nursing professionals.
    g. The technical teams should have formal IPC training and allocated time according to tasks.
    h. The team should have the authority to make decisions and to influence field implementation.
    i. The linkages between the national IPC programme and other related programmes are key and should be established and maintained.
    j. The National/State/LG IPC advisory committee or an equivalent structure should be established to interact with the IPC technical team across all tiers of government.

3.1 Minimum requirements for IPC programme in health facilities:

Infection prevention and control standards that should be in place at both national and health facility level to provide minimum protection and safety to patients, health care workers and visitors, based on the WHO core components for IPC programmes.[7] The existence of these requirements constitutes the initial starting point for building additional critical elements of the IPC core components according to a stepwise approach based on assessments of the local situation.

3.1.1 Tertiary level

The programme shall:

1. Have clearly defined objectives, measurable IPC process and outcome indicators, and annual work plan based on local epidemiology and risk assessments.
2. Have a multidisciplinary IPC committee that should include senior facility leadership; senior clinical staff; leads of other relevant complementary areas such as biosafety,

[7] http://www.who. int/infection-prevention/publications/minimum requirements for infection prevention and control programmes/en/.

pharmacy, microbiology or clinical laboratory, quality and safety, waste management, and WASH services. The committee should support the IPC team.

3. Have a full-time, trained IPC team to implement the IPC policy for the purpose of preventing HAI and combating AMR.
4. Have an IPC team led by an IPC focal person (medical doctor, nurse, or other health-related professional trained and certified in IPC), preferably a doctor with a specialty in Medical microbiology or infectious diseases or epidemiology or public health with proven expertise and experience in IPC.
5. The IPC programme should have a dedicated budget and resources.
6. Have at least one IPC professional per 250 hospital beds.
7. Have access to a medical microbiology laboratory.
8. The IPC programme should have a dedicated budget and resources.
9. If a formal IPC programme is not yet in place, some of its functions may be fulfilled or integrated within other established programmes (for example, tuberculosis [TB], human immunodeficiency virus [HIV]).

3.1.2 Secondary Level

1. Trained IPC focal point (one full-time trained IPC Officer [nurse or doctor]) as per the recommended ratio of 1:250 beds with dedicated time to carry out IPC activities in all facilities (for example, if the facility has 120 beds, one 50% full-time equivalent dedicated officer).
2. Dedicated budget for IPC implementation.
3. At secondary health care facility level, hospital director, medical director, chief nurse, environmental health officer and finance office director have a critical role in the decision to establish the minimum requirements.

3.1.3 Primary level

1. Trained IPC link person (dedicated or part time) in each primary health care facility.
2. One IPC-trained health care officer at the next administrative level (for example, LGA) to supervise the IPC link professionals in primary health care facilities.

4 - INFECTION PREVENTION AND CONTROL GUIDELINES

4.1 National and state level

Evidence-based guidelines should be developed, disseminated, and implemented at National and sub-national level. Health care workers need to be educated to understand the theoretical background of the recommendations and how they should be applied in their daily tasks. On guidelines for IPC, the national IPC programme has the following responsibilities:

1. Development of relevant guidelines for tertiary, secondary and primary levels of care for implementation.
2. Developing relevant evidence-based national IPC guidelines and related implementation strategies is one of the key functions of the national IPC programme.
3. The national and state IPC programme should also ensure that the necessary infrastructures and supplies to enable guideline implementation are in place.
4. The national and state IPC programme should support, and mandate healthcare workers' education and training focused on the guideline recommendations.

4.2 Facility level

The education and training of relevant health care workers on the guideline recommendations and the monitoring of adherence to guideline recommendations should be undertaken to achieve successful implementation. Guidelines should address priority HAIs and standard IPC practices and should be drawn from those developed for the national and state IPC programme.

1. The IPC team is responsible for writing, adapting, promoting the adoption, and monitoring adherence to guidelines. If the expertise of the IPC team is limited, external support should be sought.
2. The facility level IPC guidelines should be evidence-based and can be in form of a compendium or a manual to guide safe delivery of healthcare services at the facility
3. Adoption/adaptation of relevant IPC guidelines for the facility.
4. Adherence to the given guidelines should be monitored and evaluated as a process indicator which should be reported to the next administrative level and feedback given to healthcare workers, ward managers and facility leadership.

5 - INFECTION PREVENTION AND CONTROL EDUCATION AND TRAINING

5.1 National and State levels

Continuous training on the implementation of the guidelines should be provided for all health care workers. Different training strategies and content should be used for IPC professionals, other health care staff and support staff. The training should include practical and simulation training methods, learning to identify risks and preventive measures. Adequate staff should be allocated for education on infection prevention measures and control activities. The following advisory is to be considered for IPC capacity buildings:

1. All IPC professionals should undergo post-graduate IPC trainings at accredited institutions and be certified.
2. The national IPC programme should support the education and training of the health workforce as one of its core functions. The IPC national team plays a key role to support and ensure IPC training is conducted at the facility level.
3. To support the development and maintenance of a skilled, knowledgeable health workforce, national undergraduate and postgraduate IPC curricula should be developed in collaboration with local academic institutions.
4. All HCWs should be trained in IPC at least annually. This should be a mandatory practice as part of continuous professional development. The curricula should form part of routine syllabi taught across institutions where healthcare workers are trained at both undergraduate and postgraduate levels.
5. The national IPC programme mandates for regular in-service training to be conducted at the facility level according to detailed IPC core competencies for healthcare workers and involving all professional categories.
6. There should be an approved IPC national curriculum aligned with national policy and guidelines and endorsed by the FMoH through the NCDC.
7. The NCDC should schedule monitoring and evaluation exercises to assess the effectiveness of IPC training and education (at least annually).
8. The NCDC and States MoH should prioritise IPC education and training as part of their key mandate.
9. Local academic institutions, including universities and post-graduate medical colleges with mandates on workforce education and training, have a key role in curricula development and endorsement, and in training delivery.

5.2 Facility level

5.2.1 Tertiary healthcare

1. IPC training for all staff upon hire *and annually*
2. All front-line clinical staff and support staff must receive education and training on the facility IPC guidelines/SOPs upon hire and annually.
3. All IPC staff need to receive specific IPC training either on-line or participate in courses.

4. Use a blended approach to training including written information and/or oral instructions and/or e-learning and interactive and practical sessions (including simulation and/or bedside training).
5. The IPC focal person (or IPC team if it exists) is responsible for training front-line HCWs and cleaners.
6. IPC expertise is required to lead IPC training. If the expertise of the IPC focal point is limited, external support should be sought, for example, at the state or national level.
7. In addition, non-IPC personnel with adequate skills (for example, link nurses/practitioners or champions and opinion leaders) could play a role of mentorship to refresh IPC principles and champion IPC practices at the ward level.
8. IPC education and training should be part of an overall health facility education strategy, including new employee orientation and the provision of continuous education opportunities (at least annually) for existing staff regardless of level and position (for example, including also senior administrative and housekeeping staff).
9. Individual, team, and peer supportive supervision mechanisms are effective in helping staff to improve performance. This must be instituted and monitored in the health facility.
10. Establish regular, at least annual evaluation of the effectiveness of training (for example, hand hygiene audits and other checks on knowledge).
11. Integrate IPC training into clinical practice and the training of other specialties (for example, training of surgeons involves aspects of IPC).
12. Tailored IPC education for patients or family members should be considered to minimize the potential for HAI (for example, patients who are immunosuppressed or with invasive devices or with multidrug resistant infections).

5.2.2 Secondary healthcare

IPC training for all front-line clinical staff and support staff upon hire:

1. All front-line clinical staff and support staff must receive education and training on their IPC guidelines/SOPs upon employment.
2. Individual, team, and peer supportive supervision mechanisms are effective in helping staff to improve performance. This must be instituted and monitored in the health facility.
3. Establish regular, at least annual, evaluation of the effectiveness of training (for example, hand hygiene audits and other checks on knowledge).
4. All IPC staff need to receive specific IPC training either on-line or participate in courses.

5.2.3 Primary healthcare

IPC training for all frontline clinical staff and support staff upon hire:

1. All front-line clinical staff and support staff must receive education and training on the facility IPC guidelines/SOPs upon employment and at least annually.
2. All IPC link persons in primary care facilities and IPC focal points at the LGA level (or other administrative level) need to receive specific IPC training either on-line or in-person.
3. IPC link persons should provide on-the-job supervision/mentorship to HCWs and support staff in their facility.

6 - HEALTHCARE ASSOCIATED INFECTIONS SURVEILLANCE

It is recommended that facility HAI surveillance linked with national surveillance programmes on HAIs and antimicrobial resistance is established to guide interventions and detect outbreaks. These should also include mechanisms for data feedback to health-care workers and other stakeholders. Microbiology and laboratory capacity and quality are critical components, where standardized definitions and methods should be applied.

Priorities should be established for surveillance of infections and pathogens. Tasks include systematic assessment of compliance and impact of IPC practices, detection of outbreaks for prompt response and description of HAI status.

6.1 National and state level

1. National HAI surveillance systems feed into general public health capacity building and the strengthening of essential public health functions. National surveillance programmes are also crucial for the early detection of some outbreaks in which cases are described by the identification of the pathogen concerned or a distinct AMR pattern. Furthermore, national microbiological data about HAI aetiology and resistance patterns also provide information relevant for policies on the use of antimicrobials and other AMR-related strategies and interventions.
2. Establishing a national HAI surveillance programme requires full support and engagement by state governments and other respective authorities and the allocation of human and financial resources.
3. National surveillance should have clear objectives, a standardized set of case definitions, methods for detecting infections (numerators) and the exposed population (denominators), a process for the analysis of data and reports and a method for evaluating the quality of the data.
4. Clear regular reporting lines of HAI surveillance data from the local facility to the national level should be established.
5. International guidelines on HAI definitions are important, but it is the adaptation at country level that is critical for implementation.
6. Microbiology and laboratory capacity and quality are critical for national and hospital-based HAI and AMR surveillance. Standardized definitions and laboratory methods should be adopted.
7. Good quality microbiological support provided by at least one national reference laboratory is a critical factor for an effective national IPC surveillance programme.
8. A national training programme for performing surveillance should be established to ensure the appropriate and consistent application of national surveillance guidelines and corresponding implementation toolkits.
9. Surveillance data is needed to guide the development and implementation of effective control interventions.

6.2 Facility level - Secondary and tertiary levels

1. Surveillance of HAI is critical to inform and guide IPC strategies.
2. Health care facility surveillance should be based on national recommendations and standard definitions and customized to the facility according to available resources with clear objectives and strategies. Surveillance should provide information for:
    a. Describing the status of infections associated with health care (that is, incidence and/or prevalence, type, aetiology and, ideally, data on severity and the attributable burden of disease).
    b. Identification of the most relevant AMR patterns.
    c. Identification of high-risk populations, procedures, and exposures.
    d. Existence and functioning of WASH infrastructures, such as a water supply, toilets, and health care waste disposal.
    e. Early detection of clusters and outbreaks (that is, early warning system).
    f. Evaluation of the impact of interventions.
3. Quality microbiology laboratory capacity is essential to enable reliable HAI surveillance.
4. The responsibility of planning, conducting surveillance, analysing, interpreting and disseminating the collected data remains usually with the IPC committee and the IPC team in collaboration with the AMS team or committee.
5. Methods for detecting infections should be active. Different surveillance strategies could include the use of prevalence or incidence studies.
6. Hospital-based infection surveillance systems should be linked to integrated public health infection surveillance systems at the state and national levels to ensure data sharing.
7. Surveillance reports should be disseminated in a timely manner to those at the managerial or administration level (decision-makers) and the unit/ward level (frontline health care workers).
8. A system for surveillance data quality assessment is of utmost importance.

7 - MULTIMODAL STRATEGIES

An IPC programme should be implemented multimodally, i.e., using an integrated approach in several areas which are system change, education, and training, monitoring and feedback, reminders, behaviour and culture change.[8]

7.1 National and state

1. The National IPC programme approach to coordinating and supporting local (health facility level) multimodal interventions should be within the mandate of the national IPC programme and be considered within the context of other quality improvement programmes or health facility accreditation bodies.
2. Successful multimodal interventions across all levels should be associated with overall cross-organizational culture change as effective IPC can be a reflector of quality care, a positive organizational culture, and an enhanced patient safety climate.

7.2 Facility level

1. The use of multimodal strategies supports all aspects of IPC implementation and underpins all the core component guideline recommendations.
2. Multimodal thinking means that IPC practitioners do not focus only on single strategies to change practices (for example, training and education), but consider a range of strategies that target different influencers of human behaviour, for example monitoring and feedback, infrastructures, or organizational culture and behavioural response to change.
3. All facility level IPC interventions should be holistic in addressing practices for the reason of entrenching sustainability.
4. Successful multimodal interventions should be associated with an overall organizational culture change as effective IPC can be a reflector of quality care, a positive organizational culture, and an enhanced patient safety climate.
5. Successful multimodal strategies include the involvement of champions or role models/mentors.
6. Implementation of multimodal strategies within health care institutions needs to be linked with national quality aims and initiatives, including health care quality improvement.

[8] Based on the Guide to the implementation of the WHO multimodal hand hygiene strategy. Geneva: WHO; 2009 (http://www.who.int/gpsc/5may/tools/WHO_IER_PSP_2009.02_eng.pdf?ua=1).

8 - MONITORING/AUDIT OF INFECTION PREVENTION AND CONTROL PRACTICES AND FEEDBACK

Health care practices should be regularly monitored and evaluated at facility, LGA, state and national levels. Feedback from the evaluations should be given to relevant staff and stakeholders who are able to act based on the evaluations as well as the audited persons. It is important that the monitoring and feedback is conducted in a blame-free, non-punitive manner.

8.1 National and State levels

1. Regular monitoring and evaluation provide a systematic method to document the progress and impact of national programmes in terms of defined indicators, for example, tracking hand hygiene improvement as a key indicator, including hand hygiene compliance monitoring.
2. National level monitoring and evaluation should have in place mechanisms that:
    a. Provide regular reports on the state of the national goals (outcomes and processes) and strategies.
    b. Regularly monitor and evaluate the WASH services, IPC activities and of the health care facilities through audits or other officially recognized means.
    c. Promote the evaluation of the performance of local IPC programmes in a non-punitive institutional culture.

8.2 Facility level

1. The main purpose of auditing/monitoring practices and other indicators and feedback is to achieve behaviour change or other process modification to improve the quality of care and practice with the goal of reducing the risk of HAI and AMR spread. Monitoring and feedback are also aimed at performance improvement, engaging stakeholders, creating partnerships, and developing working groups and networks.
2. Sharing the audit results and providing feedback not only with those being audited in a non-punitive way, but also with facility management and other relevant stakeholders.
3. IPC programmes should be periodically evaluated to assess the extent to which the objectives are met, the goals accomplished, whether the activities are being performed according to requirements and to identify aspects that may need improvement identified via standardized audits. Important information that may be used for this purpose includes the results of the assessment of compliance with IPC practices, other process indicators (for example, training activities), dedicated time by the IPC team and resource allocation.

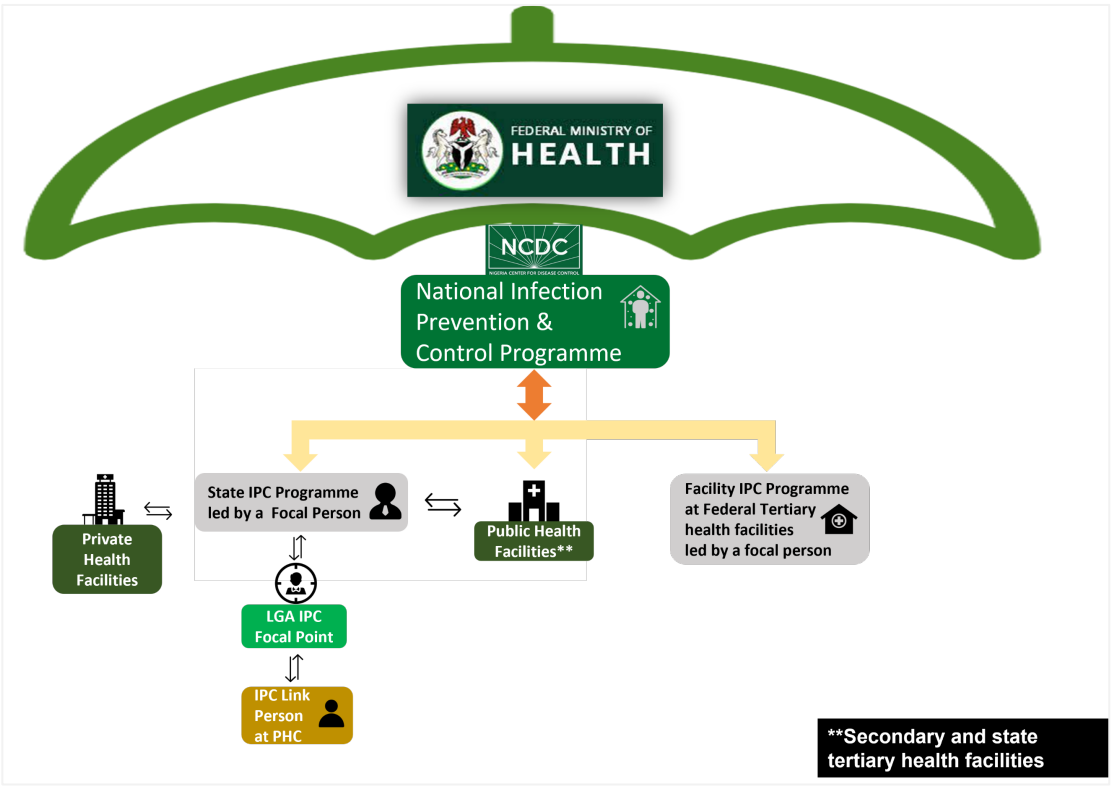


Fig. 5: Data flow and reporting from the lowest level of healthcare to National

9 - WORKLOAD, STAFFING AND BED OCCUPANCY AT FACILITY LEVEL

This component has greater implication at policy implementation level, thus, applies only at the health facilities. Overcrowding and understaffing are serious problems in health care facilities. Both contribute to lowered quality of care and increased disease transmission between patients and even between patients and visitors. Standard facility design recommends one patient per bed with at least 1 meter between beds. Adequate staffing based on workload should be ensured.

The National, state and LGA level should provide guidance on facility level using the Workload Indicators of Staffing Need method. The guidance/tool should provide health managers with a systematic way to determine how many health workers of a particular type are required to cope with the workload of a given health facility and support their decision-making.

As emphasized in other sections, the facilities should hire human resource personnel with protected time dedicated to the planning, implementation, and monitoring of IPC programmes. At the minimum, there should be 1 IPC doctor/nurse per 250 beds.

Intended capacity may vary from original designs and across facilities and countries. For these reasons, ward design regarding bed capacity should be adhered to and in accordance with standards. In exceptional circumstances where bed capacity is exceeded, health care facility management should act to ensure appropriate staffing levels that meet patient demand and an adequate distance between beds. These principles apply to all units and departments with inpatient beds, including emergency departments.

10 - BUILT ENVIRONMENT, MATERIALS AND EQUIPMENT FOR INFECTION PREVENTION AND CONTROL AT THE FACILITY LEVEL

This principle underpins the safety, standard and quality of patient care environment. Patient care activities should be undertaken in a clean and hygienic environment that facilitates practices related to the prevention and control of HAI, as well as AMR, including all elements around the WASH infrastructure and services.

The cornerstone of all IPC programmes is hand hygiene. Washing stations with water, soap, single use towels should be available in key areas such as toilets however, at the point of care alcohol-based hand rub should be available. Standards for water quality, sanitation and environmental health should be implemented. Other materials such as personal protective equipment should be available at the point of care and other sites where potentially contaminated material is handled.

An appropriate environment, WASH services and materials and equipment for IPC are a core component of effective IPC programmes at health care facilities.

Ensuring an adequate hygienic environment is the responsibility of senior facility managers and SMoH. However, the NCDC and national IPC and WASH programmes also play an important role in developing standards and recommending their implementation regarding adequate WASH services in health care facilities, the hygienic environment, and the availability of IPC materials and equipment at the point of care.

At the minimum a standard of 1:10 sink to bed ratio in healthcare facilities and handwashing stations within 5 meters of toilets is recommended.

Effective multimodal programmes can significantly improve hand hygiene and sustain compliance in HCFs. WHO 5 Moments for improved Hand Hygiene campaign (consisting of system change, training & education, observation and feedback, reminders in the hospital, and a hospital safety climate) is effective for improvement and sustainability of hand hygiene compliance.[9]

10.1 Role of the FMoH, NCDC and SMoH in WASH

1. Establish financing for hygiene in HCFs that ensures resources support the inclusion of hand hygiene infrastructure and supplies for environmental cleaning in health facility design and the implementation of IPC strategies and programming.
2. Strengthen monitoring systems and standardize streamlined hygiene indicators into national health assessments and surveillance to inform, adapt, and validate HAI reporting mechanisms.

[9] World Health Organization. Improving infection prevention and control at the health facility. Interim practical manual supporting implementation of the WHO guidelines on core components of infection prevention and control programmes. Geneva: WHO; 2018.

3. Develop and implement healthcare strategies that recognize the links between the underlying causes and drivers for hygiene-related behaviour change, incorporating key components into HCF programming.
4. Employ accreditation systems to mandate and enforce minimum facility design, construction, and maintenance requirements for HCFs, including hand washing stations at critical points.
5. Ensure hygiene products that prevent germ spread (e.g., surgical gloves, hand soap or hand-rub, disinfectants, cleaning supplies) are available and used in HCFs, and ensure cleanliness of supplies, equipment, and infrastructure.
6. Ensure access to essential hygiene services and maintain hardware (e.g., handwashing stations), and guarantee that facilities are accessible to all users, including people with disabilities.
7. Ensure all HCFs have access to basic WASH facilities including environmental cleaning supplies.
8. Work with partners, such as the private sector, to develop supply-chains for access to low-cost hygiene supplies.

9. Assign adequate number of Environmental health officers in the facilities

10.2 Role of health facilities

1. Implement the five components of the WHO multimodal approach to hand hygiene improvement based on drivers of hand hygiene compliance: system change (alcohol-based hand-rub at the point of care); training and education; observation and feedback; reminders in the workplace; and a culture of safety.
2. Involve the IPC team in the planning, construction, renovation, and structural design of any building in the health care facility to ensure IPC compliant structures.
3. Integrate core hygiene compliance as part of a comprehensive IPC approach and ensure that IPC committees and teams have authority to reinforce IPC strategies when HCFs face understaffing, overcrowding, limited supply coverage, and health or environmental crises.
4. Encourage healthcare workers to use effective behaviour change approaches and distribute essential products that can promote IPC behaviours within and beyond health settings.
5. Ensure availability of supplies for IPC.

11 - STANDARD PRECAUTION POLICIES

Standard Precautions are the basic infection prevention practices that when used consistently and diligently reduce the transmission of potentially pathogenic organisms from both recognised and unrecognised sources.

Implementation of infection prevention standard precautions results in a reduction in prevalence of Healthcare Associated infections; ultimately protecting patients, staff and visitors. Standard precautions consist of eight key elements. These include correct hand hygiene, safe cleaning and decontamination, safe handling and disposal of waste and linen, sharps safety, correct use of personal protective clothing, safe handling of blood and body fluids and respiratory hygiene.

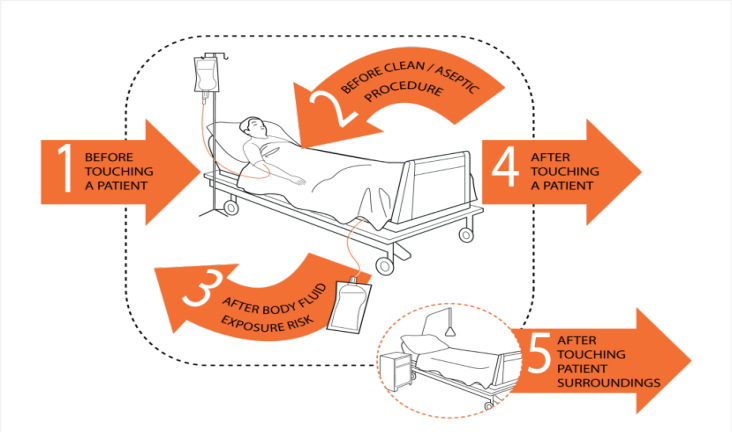
11.1 Hand hygiene

(Refer to the National Infection Prevention and Control Manual for more details)

Hand hygiene is recognised as one of the most effective methods to prevent the transmission of pathogens and is a central component of standard precautions.10 It involves the use of soap under running water and Alcohol-Based Hand Rub(ABHR).

11.1.1 General principles

1. Healthcare workers should follow the World Health Organisation (WHO) 5 Moments for Hand Hygiene.
   a. Before direct patient contact.
   b. Before clean/aseptic procedure.
   c. After handling body fluids.
   d. After touching a patient.
   e. After contact within the immediate environment/vicinity of the patient.



Source: WHO hand hygiene technical reference manual

2. ABHR is the preferred method for hand hygiene except when hands are visibly soiled

[10] World Health Organization. Patient safety workshop: learning from error. Geneva: WHO; 2010

3. Soap and water must always be used for hand hygiene when hands are visibly soiled, following handling of blood or body fluids or when caring for patients with suspected or confirmed Clostridium difficile.
4. Individual ABHR bottles are appropriate in the community or within a ward where a 'locked door' is between the point of care and the clinical hand wash basin or where access to running water may be limited.
5. ABHR can be used when hands are visibly clean.
6. Cover any cuts/sores or lesions with a waterproof plaster.
7. Hands must always be cleaned following removal of PPE.
8. Protect skin integrity - Use moisturisers and lotions when appropriate.

Source: WHO hand hygiene technical reference manual

Source: WHO hand hygiene technical reference manual

11.2 Environmental cleaning and decontamination

(Refer to the National Infection Prevention and Control Manual for more details)

Safe and effective decontamination of equipment and the environment between patients is an essential part of standard precautions.

Where practicable, single use disposable equipment should be used for high risk or invasive procedures. Where this is not possible, services are responsible for ensuring items are decontaminated according to manufacturer's instructions to protect service users and staff.

11.2.1 General Principles

1. Always move from the cleanest to the dirtiest area.
2. Clean from higher level areas to low areas, outer to inner.
3. Clean isolation areas last & with dedicated cleaning equipment.
4. Damp dusting and wet mopping are recommended to minimize dust.
5. Use a 3-bucket system for cleaning and disinfection.
6. Water for cleaning should be clean water.
7. Spraying of disinfectants is not recommended.
8. Increase frequency of cleaning by housekeeping in patient care areas.
9. Isolation areas should have their own cleaning supplies that are separate from clean patient care areas.
10. All waste from the isolation area is considered contaminated and should be disposed of following your facilities methods for contaminated waste.
11. Cleaners/housekeeping should ensure they are wearing the appropriate PPE when cleaning an isolation room or area.
12. General everyday cleaning requires detergent, water and effort. All items are to be dried thoroughly.
13. Enhanced cleaning must be undertaken following recognised infection risk or contamination with blood or body fluids.
14. Single use items must never be reused.
15. Single patient use items must be securely retained for one named patient for a period of time which is usually determined by the manufacturer or agreed with the Infection Prevention and Control Team.
16. Handle equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of pathogens to other patients or the environment.
17. Clean, disinfect, and reprocess reusable equipment appropriately before use with another patient.
18. Terminal cleaning of the environment.

11.3 Safe handling and disposal of waste

(Refer to the National Infection Prevention and Control manual and National healthcare waste management guidelines for more details)

Healthcare waste has the potential to be toxic, hazardous and/or infectious. All staff have a 'duty of care' to ensure that waste must be segregated, handled, properly stored, transported and disposed of in an appropriate manner to ensure it does not harm staff, patients/service users, the public or the environment.

11.3.1 General principles

1. Waste should be disposed of at the point of care in the nearest appropriate bin, if necessary, take a fresh bag to the patient's bedside.

2. Odorous waste should be removed from patient areas immediately.
3. Colour coding for the plastic bags should correspond or match whenever possible the waste containers both at the internal and external storage sites (see appendices)
4. All waste bags or containers should be labelled with basic information in English and the local language of the area where the HCF is located. Basic label information should include type of waste in the container; name of the ward/facility, date of collection and warning of hazardous nature.
5. Waste bags must be changed before 3⁄4 full, and at least daily.
6. Waste bags must be swan necked when closed.
7. Holding waste bags slightly away from the body will reduce risk if accidentally containing a sharp object.
8. The bag must be clearly labelled/tagged with the generator's ID as per local protocol.
9. Waste bags must be stored for final disposal in an appropriate sealed, leak-proof container, which must always be locked or within a locked compound/room, free of rodents.

11.4 Sharps safety

(Refer to the National Infection Prevention and Control manual for more details)

Injuries from healthcare sharps pose a significant risk to the physical and mental health of staff, cost the healthcare organisation time and resources.

11.4.1 General principles

1. Staff are responsible for the safe use and disposal of every sharp they generate.
2. Sharps must be handled with care and respected as potentially dangerous items.
3. Sharps containers must be correctly assembled, tagged, and labelled with start date, ward/department and the initials of the person assembling it.
4. Do not overfill the sharps container, dispose of before 2/3 full as indicated by the 'Fill line'.
5. Containers must be stored in an appropriate place and at an appropriate height, off the floor and away from children and vulnerable adults.
6. Partially close the lid when not in use.
7. Never re-sheath used needles.
8. Dispose of needles and syringes as one complete unit – do not disconnect the needle.
9. Staff are encouraged to use safer sharp devices where possible.
10. If there is any safety device present on the syringe use it according to the manufacturer's instructions.
11. Carry container only by the handle or on the correct size designated sharps tray.
12. Dispose of in designated areas having securely closed, labelled, tagged, and signed.
13. Dispose of sharps bin after 3 months even if not full.

11.5 Use of PPE

(Refer to the National Infection Prevention and Control manual for more details)

Wearing PPE serves to protect the healthcare worker from contamination with blood, body fluids or pathogens and to prevent the onward transmission of potentially pathogenic microorganisms onto service users, colleagues, or to their own family members. The use of PPE should be guided by point of care risk assessment and the extent of anticipated contact with blood, body fluids or pathogens.

The minimum PPE that must be available for all clinical staff, community, or inpatient areas.

1. Plastic aprons.
2. Nonsterile gloves (general use) and sterile gloves (for aseptic procedures).
3. Long sleeved water impervious gowns.
4. Eye and face protection – fluid/splash repellent standard goggles or face shields.
5. Medical Mask.

11.5.1 General principles

Aprons or gowns

1. Aprons are inexpensive yet effective at reducing contamination to the front of clothing where most contamination occurs.
2. Aprons are single use items and must be changed between patients.
3. Aprons must be changed between dirty and clean procedures on the same patient i.e., after toileting then assisting with a meal.
4. Long sleeved water impervious gowns may be used if the risk of contamination is excessive e.g., large blood or body fluid spillage or when skin to skin contact should be avoided i.e., untreated scabies.

Non-sterile gloves

1. Gloves are NOT 100% impervious and handwashing after removal is essential.
2. Gloves must be worn if contact with blood, body fluids, secretions, excretions, or hazardous substances are expected.
3. Disposable gloves are single use items and must be discarded after each procedure.
4. Gloves must be changed between dirty and clean procedures on the same patient.

Masks, spectacles, or visors

1. Eye protection (visor or goggles) and/or surgical masks should be used when mucous membranes are likely to be exposed to body fluids (or splashes of hazardous chemicals).
2. Specialist N-95 or higher respirator masks should only be used when indicated by Infection Prevention Team i.e., during a pandemic influenza outbreak or according to local SOP/policy i.e., Multidrug resistant Tuberculosis (MDRTB) or aerosol generating procedure.

11.5.2 Removal of PPE

(Refer to the National Infection Prevention and Control manual)

PPE should be removed in a specific order to minimise the potential for cross- contamination. This is gloves, apron/gown, eye, and face protection (if worn).

1. Grasp the outside of the opposite gloved hand, peel off holding the removed glove in the gloved hand.
2. Slide the fingers of the un-gloved hand under the glove at the wrist, peel forward. Gloves.
3. Discard both gloves in clinical or offensive waste streams as appropriate.
4. Hand hygiene must follow removal of the final item of PPE.

Apron

1. Pull ties to break.
2. Pull away from the neck .
3. Wrap apron in on itself to contain the 'dirty' side – dispose as appropriate.
4. Hand hygiene must follow removal of the final item of PPE.

Goggles

1. Handle by side arms.
2. If disposable, discard in appropriate waste stream or if reusable clean with detergent wipe, dry and store.
3. Hand hygiene must follow removal of the final item of PPE.

Face mask

1. Break bottom ties followed by top ties.
2. Pull away from face holding ties.
3. Dispose of directly into waste.
4. Hand hygiene must follow removal of the final item of PPE.

11.6 Safe handling of blood and body fluids

(Refer to the National Infection Prevention and Control manual for more details)

Blood and body fluids can potentially contain Blood borne viruses or other pathogens. Therefore, dealing with spills of blood or body fluid may expose the healthcare worker to this blood borne pathogens and spills must be dealt with swiftly, safely, and effectively.

11.6.1 General principles

Spot cleaning

1. Select appropriate PPE.
2. Wipe up spot immediately with damp cloth, tissue or paper towel and discard
3. contaminated materials in the appropriate waste bin.
4. Perform hand hygiene.

Small spills (up to 10 cm diameter)

1. Select appropriate PPE.
2. Absorb spill with tissue or other absorbent material or granules and discard into appropriate waste bin.
3. Clean area with detergent solution.
4. Wipe area with a hospital grade disinfectant and allow it to dry –
5. Perform hand hygiene after removal of gloves.

Large spills (greater the 10 cm diameter)

1. Restrict the area around the spill.
2. Where large spills have occurred in a 'wet' area, such as a bathroom or toilet area, the spill should be carefully washed off into the sewerage system using copious amounts of water and the area flushed with warm water and detergent.
3. Large blood spills that have occurred in 'dry' areas (such as clinical areas) should be contained and generation of aerosols should be avoided.
4. Select appropriate PPE (gloves, apron, mask, boots) and gather necessary materials and equipment. Allow to absorb for ~10 mins.
5. Cover area of spill with absorbent paper towel or tissue and
6. Use scraper and pan to scoop up absorbent material and any unabsorbed blood or body substance.
7. Place all contaminated items into biohazard or plastic bag for disposal.
8. Discard contaminated materials.
9. Clean the area with a detergent solution.
10. Pour 0.5% bleach on area again and leave for 10 mins,
11. Thereafter mop the area with detergent solution.
12. Remove PPE and dispose appropriately (refer to donning and doffing in National IPC manual).
13. Perform hand hygiene.

11.7 Safe handling and disposal of linen

(Refer to the National Infection Prevention and Control manual)

Handle, transport, and process used linen in a manner which: prevents skin and mucous membrane exposures and contamination of clothing and voids transfer of pathogens to other patients and or the environment. Linen can be classified in three categories:

1. Clean
2. Used/dirty
3. Soiled/Infected

11.7.1 General principles

Clean Linen

1. Clean/unused linen must be stored off the floor on shelves in a clean designated room, cupboard or trolley with doors preventing airborne contamination.

2. Clean linen MUST NOT be stored in sluices, bathrooms, or communal bed areas.
3. Clean linen should only be transferred onto open trolleys for immediate use.
4. Clean linen taken into isolation rooms MUST NOT be returned to linen stores until laundered.

Dirty/Used Linen

1. Staff must wear PPE when handling used or soiled linen.
2. Dirty/Used Linen that is dry and used for patients without known or suspected infection must be disposed of in standard linen stream according to the laundry contract in place.
3. Staff should avoid shaking linen as this may result in the dispersal of potentially pathogenic micro-organisms and skin scales.
4. Staff should ensure there are no extraneous items discarded into linen bags.
5. Dispose into linen skip at the point of removal. Never drop linen on the floor or other surfaces as this will lead to environmental contamination.
6. Linen bags must not be over 2/3 full - tied and appropriately labelled before transporting.
7. Used linen should be stored within a designated area which cannot be accessed by the public.
8. Hand hygiene is essential before and after removal of PPE.

Soiled/Infected linen

1. All linen from isolation rooms or cohort bays must be treated as infected.
2. Bags must be securely tied prior to leaving the isolation room to prevent further contamination.
3. Follow local procedure for handling of infected/soiled linen – using water soluble inner bags and designated outer bags.
4. Bags must be tagged with details of the ward it's coming from.
5. Used linen bags must be stored within a designated area which cannot be accessed by the public.
6. Hand hygiene is essential after removal of PPE.

Personal Laundry - inpatients

1. Relatives and carers should be encouraged to wash patients' laundry at home, using hot water suitable for the fabric and not mixing with other householder's laundry.
2. Soiled linen must be given to relatives in a sealed plastic bag inside a patient's property bag.
3. Relatives must be advised of the condition of the clothing.
4. Personal laundry must not be sent off site to laundry contractors (unless local agreement in place).

5. Patients undertaking their own laundry as part of their care should follow ward guidance found in each laundry room providing instructions on machine usage.
6. Patients' personal laundry must be washed on its own and not be mixed with personal laundry from other patients.
7. Ward washing machines must be regularly serviced and maintained to ensure effective cleaning.
8. Monitoring must be managed at ward level.
9. Hand hygiene must be done before and after handling dirty laundry.

11.8 Respiratory hygiene

(Refer to the National Infection Prevention and Control manual for more details)

Correct respiratory hygiene and cough etiquette is effective in decreasing the risk of transmission of pathogens contained in large respiratory droplets e.g., influenza virus.

11.8.1 General Principles

1. Cover mouth and nose when coughing or sneezing.
2. Dispose of tissues immediately into the appropriate waste bin.
3. Perform hand hygiene frequently.
4. Ensure a safe distancing of at least 1m between patients.
5. Educate patients on cough etiquette and respiratory hygiene.
6. Should be applied across all healthcare facilities, including areas that are the first point of contact for individuals.
7. Use simple face masks as source control when having respiratory symptoms.
8. If available, contain respiratory secretions with disposable tissue and dispose in the waste containers.
9. Perform hand hygiene after contact with respiratory secretions, contaminated objects.
10. Encourage coughing persons to be seated away from others in common waiting areas (ideally, at least 3 feet from others), or ask them to wait outside and attend to them promptly.
11. Locate dispensers of alcohol-based hand rub conveniently.
12. Where sinks are available, ensure that supplies for handwashing (e.g., soap and disposable towels) are consistently available.
13. Post signs at the entrance and inside the outpatient facilities with instructions to practice respiratory hygiene/cough etiquette.
14. This applies to patients, visitors and HCWs.

12 - ISOLATION/TRANSMISSION-BASED PRECAUTIONS

Transmission-based Precautions are designed for patients documented or suspected to be infected or colonized with highly transmissible or epidemiologically important pathogens for which additional precautions beyond Standard Precautions are needed to interrupt transmission in hospitals. Transmission-based Precautions are to be always used together with standard precautions. Cohorting of patients is discouraged, when facilities are inadequate; ensure to cohort patients with the same diagnosis.

There are three types of Transmission-Based Precautions: Airborne Precautions, Droplet Precautions, and Contact Precautions. They may be combined for diseases which have multiple routes of transmission. When used either singularly or in combination, they are to be used in addition to Standard precautions. All HCW need to be familiar with this policy and are responsible for following the procedures contained within it. The IPC team at facility level is responsible for monitoring adherence to this policy. The responsibility of providing the materials and equipment for isolation precautions lies with the hospital management/SMoH/FMoH as the case may be.

12.1 Fundamentals of isolation precaution

A variety of infection prevention and control measures are used for decreasing the risk of transmission of microorganisms in hospitals. These measures make up the fundamentals of isolation precautions.

12.1.1 Hand hygiene and Gloving

1. Hand hygiene is the single most important measure for preventing the spread of infection.
2. Washing hands as promptly and thoroughly as possible between patient contacts and after contact with blood, body fluids, secretions, excretions and equipment or articles contaminated by them is an important component of infection prevention control and isolation precautions. In addition to hand hygiene, gloves play an important role in the prevention of the spread of infection.
3. Gloves are worn for three important reasons in hospitals. First, gloves are worn to provide a protective barrier and prevent gross contamination of the hands when touching blood, body fluids, secretions, excretions, mucous membranes, and non-intact skin; the wearing of gloves in specified circumstances to reduce the risk of exposures to Bloodborne pathogens. Second, gloves are worn to reduce the likelihood microorganisms present on the hands of personnel will be transmitted to patients during invasive or other patient-care procedures involving touching a patient's mucous membranes and non-intact skin. Third, gloves are worn to reduce the likelihood the hands of personnel contaminated with microorganisms from a patient, or a fomite can transmit these microorganisms to another patient. In this situation, gloves must be changed between patient contacts and hands washed after gloves are removed.

4. Wearing gloves does not replace the need for handwashing.
5. Failure to change gloves between patient contacts is an infection control hazard.

12.1.2 Patient placement

1. Appropriate patient placement is an important component of isolation precautions. When possible, patients with highly transmissible or epidemiologically important microorganisms are placed in a private room with handwashing and toilet facilities to reduce opportunities for transmission of microorganisms. A private room is also important to prevent direct- or indirect-contact transmission when the source patient has poor hygienic habits, contaminates the environment, or cannot be expected to assist in maintaining infection control precautions to limit transmission of microorganisms.
2. When a private room is not available, infected patients are placed with appropriate roommates. Patients infected by the same microorganism can usually share a room provided:
   a. They are not infected with other potentially transmissible microorganisms; and,
   b. The likelihood of reinfection with the same organism is minimal.
3. Such sharing of rooms, also referred to as cohorting patients, is especially useful during outbreaks or when there is a shortage of private rooms. When a private room is not available and cohorting is not achievable or recommended, it is very important to consider the epidemiology and mode of transmission of the infecting pathogen and the patient population being served in determining patient placement. Under these circumstances, consultation with infection control professionals is advised before patient placement.

12.1.3 Transport of Infected Patients

Limiting the movement and transport of patients infected with virulent or epidemiologically important microorganisms, and ensuring such patients leave their rooms only for essential purposes, reduces opportunities for transmission of microorganisms in hospitals. When patient transport is necessary, it is important that:

1. Appropriate barriers (i.e., mask, impervious dressings) are worn or used by the patient to reduce the opportunity for transmissions of pertinent microorganisms to other patients, personnel, and visitors and to reduce contamination of the environment.
2. Personnel in the area to which the patient is to be taken are notified of the impending arrival of the patient and of the precautions to be used to reduce the risk of transmission of infectious microorganisms; and
3. Patients are informed of ways by which they can assist in preventing the transmission of their infectious microorganisms to others.

12.1.4 Personal protective equipment

Various types of gowns and protective apparel are worn to provide barrier protection and to reduce opportunities for transmission of microorganisms in hospitals. Gowns are worn to prevent contamination of clothing and protect the skin of personnel from blood and body fluid exposures.

12.1.5 Patient care equipment

Many factors determine whether special handling and disposal of used patient- care equipment and articles are prudent or required, including the likelihood of contamination with infective material; the ability to cut, stick, or otherwise cause injury (needles, scalpels and other sharp instruments [sharps]); the severity of the associated disease; and the environmental stability of the pathogens involved. Used sharps are placed in puncture-resistant containers; other articles are placed in an appropriate bag.

Contaminated reusable critical medical devices or patient-care equipment (i.e., equipment which enters normally sterile tissue or through which blood flows) or semi-critical medical devices or patient-care equipment (i.e., equipment which touches mucous membranes) are sterilized or disinfected (reprocessed) after use.

Noncritical equipment (i.e., equipment which touches intact skin) contaminated with blood, body fluids, secretions or excretions is cleaned and disinfected after use. Contaminated disposable (single-use) patient-care equipment is handled and transported in a manner which reduces the risk of transmission of microorganisms and decreases environmental contamination in the hospital. The equipment is disposed of according to hospital policy and applicable regulations.

12.1.6 Linen and laundry

Although soiled linen may be contaminated with pathogenic microorganisms, the risk of disease transmission is negligible if it is handled, transported, and laundered in a manner which avoids transfer of microorganisms to patients, personnel, and environments

12.1.7 Cutlery and eating utensils

No special precautions are needed for dishes, glasses, and cups, or eating utensils. Either disposable or reusable dishes and utensils can be used for patients on isolation precautions. The combination of hot water and detergents used in hospital dishwashers is sufficient to decontaminate dishes, glasses, and cups, and eating utensils.

12.1.8 Routine and terminal cleaning

The room or cubicle and bedside equipment of patients or isolation precautions are cleaned using the same procedures used for other patients unless the infecting microorganism(s) and the amount of environmental contamination indicates special cleaning. Please refer to the National IPC manual for more details.

12.2 Levels of isolation precaution

There are three types of Transmission-Based Precautions: Airborne Precautions, Droplet Precautions, and Contact Precautions. They may be combined for diseases which have multiple routes of transmission. When used either singularly or in combination, they are to be used in addition to Standard precautions.

12.2.1 Airborne precautions

1. Put up signage indicating level of precautions and IPC practices that must be adhered to by all individuals entering the patient room.
2. Applies to patients known or suspected to be infected with a pathogen that can be transmitted by airborne route: these include but are not limited to:
    a. Tuberculosis, Measles, Chickenpox (until lesions are crusted over), Localized (in immunocompromised patient) or disseminated herpes zoster (until lesions are crusted over).
3. Patient placement: Place the patient in a room having:
    a. Monitored negative air pressure in relation to the surrounding areas
    b. A minimum of six air changes per hour; and,
    c. Appropriate discharge of air outdoors or monitored high-efficiency filtration of room air before the air is circulated to other areas in the hospital.
4. Keep the room door closed and the patient in the room.
5. When a private room is not available, provide a facemask to the patient and place the patient immediately in a room with a closed door. Instruct the patient to keep the facemask on and to change the mask if it becomes wet, and initiate protocol to transfer the patient to a healthcare facility that has the recommended infection-control capacity to properly manage the patient.
6. PPE use
    a. Wear a fitted N-95 of higher-level disposable respirator, if available, when caring for the patient: the respirator should be donned prior to room entry and removed after exiting the room.
    b. If substantial spraying of respiratory fluids is anticipated, gloves and gown as well as goggles or face shield should be worn.
    c. Perform hand hygiene before and after touching the patient and after contact with respiratory secretions and/or body fluids and contaminated objects/materials. Note: Use soap and water when hands are visibly soiled.
    d. Instruct patients to wear a facemask when exiting the room, avoid coming into close contact with other patients, and practice respiratory hygiene and cough etiquette.
    e. The patient room should remain vacant for one hour before anyone enters, if staff enter the room during this one hour wait time, they are required to use respiratory protection.

7. Patient transport
    a. Limit the movement and transport of the patient from the room for essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplet nuclei by placing a surgical mask on the patient, if possible.

12.2.2 Droplet precautions

1. Put up signage indicating the level of precautions and IPC practices that must be adhered to by all individuals entering the patient room.
2. Applies to patients known or suspected to be infected with a pathogen that can be transmitted by the droplet route: these include, but are not limited to:

    a. Respiratory viruses (influenza), SARS-CoV-2, pertussis, and Neisseria meningitidis (group A streptococcus) etc.
3. Place the patient in a private room. When a private room is not available, place the patient in a room with a patient(s) who has/have active infection with the same microorganism, but with no other infection (cohorting). When a private room is not available, maintain spatial separation of at least 3 feet between the infected patient and other patients and visitors.
4. Use of PPE
    a. Wear a face mask when working within 3 feet of the patient. The face mask should be donned upon entering the patient's room.
    b. If substantial spraying of respiratory fluids is anticipated, gloves and gown as well as goggles (or face shield in place of goggles) should be worn.
    c. Perform hand hygiene before and after touching the patient and after contact with respiratory secretions and contaminated objects/materials; Note: Use soap and water when hands are visibly soiled.
    d. Instruct patients to wear a facemask when exiting the patient room, avoid coming into close contact with other patients, and practice respiratory hygiene and cough etiquette.
    e. Clean and disinfect the patient room accordingly.
    f. Patient Transport: Limit the movement and transport of the patient from the room to essential purposes only. If transport or movement is necessary, minimize patient dispersal of droplets by masking the patient, if possible.

12.2.3 Contact precautions

1. Put up a signage indicating level of precautions and IPC practices that must be adhered to by all individuals entering the patient room
2. Applies to patients with any of the following conditions:

a. Presence of stool incontinence (may include patients with norovirus, rotavirus, of clostridium difficile c-diff), draining wounds, uncontrolled secretions, pressure ulcers, or presence of ostomy tubes and/or bags draining body fluids

3. Prioritize placement of patients in a private room when available. When a private room is not available, place the patient in a room with a patient(s) who has/have active infection with the same microorganism, but with no other infection. When this is not achievable, consider the epidemiology of the microorganism and the patient population when determining patient placement.
4. Use of PPE:
    a. Wear gloves when touching the patient and the patient's immediate environment or belongings.
    b. Wear a gown/shoe covering if substantial contact with the patient or environment is anticipated.
    c. Perform hand hygiene after removal of PPE. Note: Use soap and water when hands are visibly soiled, or after caring for patients with known or suspected infectious diarrhoea.
    d. Instruct patients with known or suspected infectious diarrhoea to use a separate bathroom if available.
    e. Clean and disinfect the patient room accordingly.

13 - INFECTION PREVENTION AND CONTROL POLICIES FOR SOME SPECIFIC INFECTIOUS DISEASES

Tuberculosis infection control is focused on actions and policies put in place to reduce the transmission of TB at all levels. Health care workers and other staff are at particularly high risk of infection with TB because of frequent exposure to patients with infectious TB disease. They may also be immune-suppressed due to HIV infection and be at higher risk of developing TB disease once infected.

Long waiting hours as well as overcrowding and poor ventilation of health facilities increase the risk of TB transmission among clients receiving care and portraying danger to health workers delivering care.

13.1 Infection Prevention and Control interventions to reduce risk of TB infection

There are four ways in which the risk of Tuberculosis infection can be reduced:

1. Organisational controls provide an enabling environment for the implementation of all the other levels of control.
2. Work practice and administrative control measures.
3. Environmental control measures.
4. Use of protective wears (respirators).

Table 1.0 - Showing package of interventions for TB infection prevention and control in healthcare facilities

S/N	Organisational activities
1	Identify and strengthen coordinating bodies for planning, development of national guidelines and implementation plan
2	Conduct surveillance and assessment of TB infection risk at all levels of the health system
3	Engage civil society and address advocacy communication and social mobilization
4	Conduct monitoring and evaluation
5	Enable and conduct operational research
	Administrative controls
1	Develop strategies to promptly identify potentially infectious cases (triage), separate them, control the spread of pathogens (cough etiquette) and minimize time in health care settings
	Environmental controls
1	Natural ventilation
2	Mechanical ventilation
3	Ultraviolet germicidal irradiation (UVGI) units
4	Health facility design and renovation
	Personal protective interventions
1	Respirators
2	Package of prevention and care for HCWs

13.1.1 Organisational activities

The organisational activities may include planning and budgeting, assessing the problem, developing policy, setting up surveillance activities, establishing coordinating bodies at all levels of the health system, conducting research, building human resource capacity, monitoring and evaluation. Organisational activities are based on public health principles and represent the foundation of any public health program. The activities include:

1. Training of staff
2. Patient education and increasing community awareness
3. Coordination and communication with TB and HIV programs

The facility IPC plan should include the following measures:

a. Prompt screening of all patients after arrival at the facility to identify persons with symptoms of TB or those who are being investigated or treated for TB disease;
b. Instructing the TB suspects and patients in respiratory hygiene/cough etiquette. This includes instructing them to cover their nose and mouth when coughing or sneezing and providing face masks or tissues to assist them in covering their mouths. Face masks help prevent the spread of M. tuberculosis from the patient to others. Paper tissues are less likely to be used effectively but are less costly and less likely to identify people as TB suspects with the attendant risk of stigma. Tissues and face masks should be disposed of in waste receptacles. Clients and staff should be encouraged to wash their hands after contact with respiratory secretions. M. tuberculosis cannot be spread from the hands, but other serious lung infections such as the flu virus can;
c. Placing TB suspects and cases in a separate well-ventilated waiting area such as a sheltered open-air space is ideal in warm climates;
d. Speeding up management of these persons so that they spend as little time as possible at the facility;
e. Ensuring rapid diagnostic investigation of TB suspects and ensuring that persons reporting TB treatment are adhering with their treatment;
f. Using and providing regular maintenance of appropriate environmental control measures;
g. Training and educating all staff on TB and the TB-IC plan (should include special risks for TB for HIV positive HCWs and patients, and need for diagnostic investigation for those with signs or symptoms of TB).
h. Providing voluntary, confidential HIV counselling and testing for staff with adequate access to treatment;
i. Monitoring the TB-IPC plan's implementation and correcting any inappropriate practices and enforcing adherence to institutional policies.

13.1.2 Environmental control

Environmental control measures are of secondary importance after administrative controls in prevention of nosocomial airborne transmission. In facilities with inadequate administrative measures, environmental measures alone will not eliminate the risk of TB

transmission. Environmental controls include measures to reduce the concentration of infectious respiratory aerosols (i.e., droplet nuclei) in the air, such as mechanical ventilation, enhancing natural ventilation, filtration, and ultraviolet germicidal irradiation (UVGI) units

Ventilation: This is the simplest and least expensive technique which basically removes and dilutes the air from areas with TB patients' channelling it away from other patients and HCWs without TB. Ventilation measures can be natural or mechanical.

1. Natural ventilation relies on open doors and windows to bring in air from the outside; "controlled" implies that checks are in place to make sure that doors and windows are maintained in an open position that enhances ventilation. When fresh air enters a room, it dilutes the concentration of particles in room air, such as droplet nuclei containing M. tuberculosis. Designing waiting areas and examination rooms so that they maximize natural ventilation can help reduce the spread of TB. In warm climates, this means open-air shelters with a roof to protect patients from sun and rain;
2. Mechanical ventilation should be considered in those facilities where natural ventilation is inadequate, because open windows are far too small, or the climate does not allow having the windows open (too hot or too cold). Mechanical ventilation measures include fans which may assist to distribute the air (this allowing better dilution of air from "dead" corners), evacuate the air (fans pushing air into or pulling air out of a room), air conditioning and negative pressure rooms (air sucked from the corridor into the room and evacuated through a HEPA filter on the roof). When mechanical ventilation systems are used, management must ensure that the system is regularly maintained. Filtration involves removing infectious particles from the air. Machines suck in air and pass it through a HEPA filter. Their efficiency is controversial, when compared to other measures, and they are expensive to buy and maintain.

Ultraviolet Germicidal Irradiation (UVGI): This blue light kills M. tuberculosis organisms when adequately exposed to the light (long enough and close enough). It can be considered for facilities managing DR-TB particularly in areas where climate conditions preclude the utilization of natural and mechanical ventilation and on wards with high patient numbers. If this modality is used, responsibility should be assigned to ensure the lamps are cleaned, maintained (replaced) and monitored (measure UV intensity), and adverse exposure is avoided. They work better in clean air without much dust or humidity. Natural sunlight is not very effective in killing M. tuberculosis bacilli and should not be relied upon in TB-IC measures. Sunlight passing through windows does not kill M. tuberculosis.

13.1.3 Personal protective interventions

Personal protective interventions aim to prevent the inhalation of infectious respiratory aerosols while assuming that they are in the air. They should be used together with administrative and environmental controls in situations where there is an increased risk of pathogen transmission. Personal protective interventions include use of personal respirators.

Face masks or surgical masks: There are important differences between a face mask and a respirator. Face masks, such as surgical masks (cloth or paper) prevent the spread of microorganisms from the wearer (e.g., surgeon, TB patient) to others by capturing the large wet particles near the nose and mouth but they do not provide protection to the wearer (e.g., HCW, patient, family member) from inhaling infectious droplet nuclei in the air. Although not the highest priority intervention, disposable masks can be used to reduce aerosols generated from potentially infectious TB patients.

Respirators: Respirators are the last line of defence for HCWs against nosocomial M. tuberculosis infection. They are made of a material that filters out very small particles in the air (including the infectious particles in aerosols). They are also called High Efficiency Particulate Air (HEPA) filters. Respirators are closely fitted to the face to prevent leakage around the edges. If the respirator is not fitted correctly, infectious droplet nuclei can easily enter a person's airways, potentially resulting in infection. Respirators manufactured with at least 95% filter efficiency (N95 respirators) for particles of 0.3 micron in diameter are usually recommended for use by HCWs. They are disposable but can be re-used repeatedly for several weeks up to a month if they are properly taken care of.

Without appropriate administrative and environmental controls, respirators will NOT adequately protect the HCW from infection. However, respirators may serve as a valuable complement to administrative and environmental infection measures. Since personal respiratory protection devices are also quite costly, they are most appropriate for use in high-risk areas in the referral hospital setting, namely:

a. Isolation rooms for patients with TB or MDR-TB;
b. During sputum induction or other cough-inducing procedures;
c. Bronchoscopy suites;
d. Autopsy areas;
e. Spirometry rooms;
f. During emergency surgery on potentially infectious TB patients (elective surgery should be always postponed).

Respirator fitting

a. Respirators are available in different sizes, because different people need different sizes. It is recommended that HCWs be "fit tested" to ensure selection of the appropriate respirator. Fit testing of respirators should be performed to ensure that the appropriate respirator (size and shape) for each HCW is used. Qualitative fit testing involves the use of an aerosol which may be "tasted". If the HCW "tastes" the aerosol (usually saccharin or a bitter-tasting material), the respirator must be adjusted (i.e., the nose clip) and retested. If the HCW fails the test a second time, a different size or brand respirator should be tested. Beard and facial hair do not allow proper sealing of

respirators to the face. Any leak between the face and the mask is a potential entry point for infectious droplet nuclei.

b. Where possible a respirator fit testing program should be incorporated into the infection control plan of each health facility.

TB infection control package: The set of interventions recommended in this policy are strongly interrelated and should therefore be implemented as a package. Organisational activities should be prioritized at national level. In facilities, however, administrative controls must be given the highest priority, so that they can support and facilitate the implementation of the other interventions.

For more information, please refer to the NTBLCP workers manual – 5th edition and National TB infection control guidelines 2008.

13.2 Lassa fever

Infection Prevention and Control (IPC) is an essential aspect of clinical management of Lassa fever. Healthcare workers involved in managing Lassa fever cases are at risk of being infected and as part of management must implement IPC measures always. The focus for this guideline will be on use of PPE and Hand hygiene in the care of Lassa fever patients.

13.2.1 Screening at health facilities

One of the most critical actions for prevention and control of VHF outbreaks is to identify cases of VHF early and separate such patients from others who are not infected. To prevent disease transmission within health care facilities, all patients and other persons entering the facility must be immediately screened. If screening raises a suspicion of VHF, isolation for further evaluation will be required followed by subsequent notification of appropriate authorities.

13.2.2 Screening, Isolation and Notification (S-I-N) approach

Screening, Isolation and Notification (S-I-N) of suspected cases ensures that the goal of promptly identifying and separating suspected cases from other patients and community members visiting healthcare facilities and immediately informing health authorities about a suspected case is achieved.

During an outbreak, each health care facility in the outbreak area and environs should have a well-equipped SCREENING area at the entrance of the health facility to identify any potential suspect patient. The Screen-Identify-Isolate-Notify (S-I-N) approach should then be used.

Foundation of S-I-N approach

1. SCREEN INDIVIDUAL for VHF disease
2. ISOLATE from other patients
3. NOTIFY appropriate authorities

Screen individuals	Isolate	Notify
All persons (patients, staff, and relatives) coming into the health facility should be screened at the entry points into the health facility or as close as possible to the entrance or just outside the entrance. Use of a standardized screening tool is required. a. Avoid direct contact with patients as much as possible by observing a “no touch” policy when screening a patient. b. Take the patient's temperature with an infrared thermometer.	Move suspected persons to a holding area to wait for further assessment by the designated physician. a. Suspected cases should be kept in an isolation room or holding area. b. Educate the suspected case on the need and requirements for Isolation c. Get a clinician suited in appropriate PPE to further evaluate the case for VHF (if there is a facility protocol for this, it should be followed). d. If the patient meets criteria for VHF, provide health education on respiratory/cough etiquette and provide a face mask.	Quickly Notify LGA DSNO or State Epidemiologist a. Call VHF helpline 080097000010 b. Initiate contact tracing

13.2.3 Use of PPE

Healthcare workers who work in the treatment centre must be proficient in donning and doffing PPE and this requires specific training for this. The donning and doffing of PPE must be done under constant supervision. All Healthcare workers (including ward- aides and cleaners) must wear a full set of PPEs when providing direct care to patients or managing medical or patient wastes, handling deceased bodies or cleaning. A full set of PPEs must be put on in a dedicated donning zone, before entering the isolation area and must be removed in a dedicated doffing area after use.

13.2.4 Who should wear PPE?

Different types of PPE apply to the various activities and locations within the treatment centre

1. All doctors, nurses, and health workers who provide direct patient care to suspected or confirmed LF patients.
2. All support staff who clean the isolation room, handle contaminated supplies and equipment, launder reusable supplies, and collect and dispose of infectious waste from Lassa fever patients.
3. All laboratory staff who handle patient specimens and body fluids from suspected Lassa fever cases.

4. Laboratory support staff who clean and disinfect laboratory equipment used to test Lassa fever specimens.
5. Environmental health/ burial teams who remove bodies of deceased Lassa fever patients and prepare them for burial.
6. Family members who care for Lassa fever patients.
7. The PPE is to be worn systematically prior to entry into isolation area, regardless of the tasks to be performed (care, cleaning, distribution of meals, etc.) and to be removed before leaving the isolation area

For more information, please refer to the National guidelines on IPC for VHFs

14 - ENVIRONMENTAL HEALTH POLICIES FOR INFECTION PREVENTION AND CONTROL

Effective functioning of health-care settings depends on several different requirements, including safe and sufficient water, basic sanitation, adequate management of health-care waste, appropriate knowledge and application of hygiene, and adequate ventilation. Health-care settings include hospitals, health centres, clinics, health posts, dental surgeries, general practitioner settings and home-based care. Interventions to improve environmental health in healthcare settings are intended to reduce the transmission of infections (in healthcare settings) and therefore directly reduce the disease burden. They are also targeted at high-risk populations (for example, immunocompromised patients). Healthcare settings also provide an educational opportunity to promote safe environments that are relevant to the population at large, and thereby also contribute to safe environments at home and in community settings, such as schools.

Rationale

Healthcare settings are environments with a high prevalence of infectious disease agents. Patients, staff, carers, and neighbours of the healthcare setting face unacceptable risks of infection if environmental health is inadequate. The healthcare setting might even become the epicentre of outbreaks of certain diseases, such as typhus or diarrhoea.

Table 2.0 showing preventive measures required for some diseases

Disease risk	Prevention measures
Airborne infections (e.g., *Legionella*, avian influenza, SARS, tuberculosis)	a. Ventilation b. Space available per patient c. Spacing of beds d. Use of separate rooms for highly vulnerable or infectious patients e. Use of masks and correct incineration of wastes
Water-, food- or hand borne infections (e.g., HEV, diarrhoea)	a. Water supply (quality and access) b. Excreta disposal c. Hygiene facilities d. Food hygiene e. Hand hygiene
Infection of wounds/surgical incisions from contaminated water, medical devices, and dressings (e.g., sepsis)	a. Use of single-use medical devices and dressings b. Pre-disinfection c. Cleaning and sterilization of instruments and dressings d. Good-quality water e. Asepsis in surgical or dressings procedures

Bloodborne infections due to contaminated needles and syringes, unsafe blood transfusion (e.g., HBV, HCV, HIV)	a. Healthcare waste management and use of single-use needles and syringes b. Safe blood transfusion
Heat- and cold-related stress and discomfort (e.g., higher fever)	a. Heating, ventilation, air-conditioning (HVAC) and insulation
Vector-borne disease transmission (e.g., malaria, dengue, leishmaniasis)	a. Control of disease vectors in and around buildings b. Protection of patients c. Protection of infrastructure

14.1 Essential measures required for health protection

1. Provision of safe drinking-water from a protected groundwater source (spring, well or borehole), or from a treated supply, and keep it safe until it is drunk or used. Untreated water from unprotected sources can be made safer by simple means such as boiling or filtering and disinfection.
2. Provide water for handwashing after going to the toilet and before handling food, before and after performing health care. This may be done using simple and economical equipment, such as a veronica bucket
3. Provide basic sanitation facilities that enable patients, staff, and carers to go to the toilet without contaminating the healthcare setting or resources such as water supplies. This may entail measures as basic as providing simple pit latrines with reasonable privacy.
4. Provide safe health-care waste management facilities to safely contain the amount of infectious waste produced. This will require the presence of colour-coded containers in all rooms where wastes are generated.
5. Provide cleaning facilities that enable staff to routinely clean surfaces and fittings to ensure that the health-care environment is visibly clean and free from dust and soil. Approximately 90% of microorganisms are present within visible dirt; the purpose of cleaning is to eliminate this dirt.
6. Ensure that eating utensils are washed immediately after use. The sooner utensils are cleaned the easier they are to wash. Hot water and detergent and drying on a stand are required.
7. Reduce the population density of disease vectors. Proper waste disposal, food hygiene, wastewater drainage, and a clean environment are key activities for controlling the presence of vectors.

8. Provide safe movement of air into buildings to ensure that indoor air is healthy and safe for breathing. This is particularly important if healthcare is being provided for people with acute respiratory diseases.
9. Provide information about, and implement, hygiene promotion so that staff, patients, and carers are informed about essential behaviours for limiting disease transmission in health-care settings and at home.

14.2 Water quality

Water for drinking, cooking, personal hygiene, medical activities, cleaning, and laundry is safe for the purpose intended.

14.2.1 General principles

1. *Escherichia coli* or thermotolerant coliform bacteria are not detectable in any 100-millilitre sample of drinking-water.
2. Drinking-water meets water quality standards as enshrined in the 2016 National Water Policy concerning chemical guidelines and radiological parameters.
3. All drinking-water is treated with a residual disinfectant to ensure microbial safety up to the point of consumption or use.
4. There are no tastes, odours or colours that would discourage consumption or use of the drinking-water.
5. Water that is below drinking-water quality is used only for cleaning, laundry and sanitation and is labelled as such at every outlet.
6. Water of appropriate quality is supplied for medical activities as well as for vulnerable patients, and standards and indicators have been established.
7. *Pseudomonas* is a recognized cause of hospital-acquired infections mainly transmitted through contact, but also through drinking-water, to immunocompromised patients (infectious dose 10^8–10^9 colony forming units/litre).

14.2.2 Microbial quality

Microbial quality is of overriding importance for infection control in health-care settings. The water should not present a risk to health from pathogens and should be protected from contamination inside the healthcare setting itself. Drinking-water supplied to health-care settings should meet national standards as established in the 2016 National Water Policy. In practice, this means that the water supply should be from a protected groundwater source, such as a dug well, a borehole or a spring, or should be treated if it is from a surface water source. Rainwater may be acceptable with disinfection if the rainwater catchment surface, guttering, and storage tank are correctly operated, maintained and cleaned.

Legionella spp. are common waterborne organisms, and devices such as cooling towers, hot-water systems (showers) and spas that use mains water have been associated with outbreaks of infections.

The FMWR/SMoWR should work with the management of health facilities including healthcare setting infection control committee and team to monitor the microbiological quality of the water in the health-care setting, as part of a routine surveillance and control programme.

14.2.3 Chemical constituents

Chemical constituents may be present in excess of guideline levels in water supplies, and it may not be possible, in the short term, to remove them or to find an alternative source of water. In circumstances where the national standard for drinking-water quality or national standards for chemical and radiological parameters cannot be met immediately, an assessment should be made by the IPC team on the risks caused to patients and staff, given the levels of contamination, the length of exposure (longer for staff than for patients) and the degree of susceptibility of individuals (some patients may be highly susceptible to some contaminants). It may be necessary to provide alternative sources of drinking-water for people most at risk.

14.2.4 Disinfection

Disinfection with chlorine is the most widely accepted and appropriate way of providing microbial safety in most low-cost settings. Bleaching powder, liquid bleach, chlorine tablets and other sources of chlorine may be used, depending on local availability. To ensure adequate disinfection, a contact time of at least 30 minutes should be allowed between the moment the chlorine is added to the water and the moment the water is available for consumption or use. The free chlorine residual (the free form of chlorine remaining in the water) after the contact time should be between 0.5 and 1.0 milligrams per litre in all points of the system, including end points. Residual chlorine can be measured with simple equipment (e.g., a colour comparator and diethyl-p- phenylenediamine tablets).

Mains supply water may need supplementary chlorination to ensure adequate disinfection and a sufficient level of residual chlorine up to the point of consumption or use. Majority of main water supplies do not achieve adequate water safety at the point of delivery, due to problems at the water treatment works and contamination in the distribution system. Stored water may also need supplementary chlorination before use.

Water must not be contaminated in the healthcare setting during storage, distribution and handling. Effective disinfection requires that the water has a low turbidity. Ideally, median turbidity should be below 1 nephelometric turbidity unit (NTU). However, 5 NTU is the minimum turbidity measurable with simple equipment (turbidity tube), so this level may be used in low-cost settings in practice. If turbidity exceeds 5 NTU then the water should be treated to remove suspended matter before disinfection, by sedimentation (with or without coagulation and flocculation) and/or filtration.

Filtration with ceramic (e.g., candle filters), chlorination and other technologies that can be used on a small scale may be appropriate for treating water in health-care settings that are not connected to piped supplies, as well as those that are connected to piped supplies whose quality is not consistently satisfactory.

14.2.5 Drinking water

Drinking-water should be acceptable to patients and staff, or they may not drink enough, or may drink water from other, unprotected sources, which could be harmful to their health. Particular care is needed to ensure that safe drinking-water is supplied to immunocompromised patients, because of their high susceptibility to infection. Provision of boiled water may be desirable.

14.2.6 Water for cleaning

Water used for laundry and for cleaning floors and other surfaces need not be of drinking-water quality, as long as it is used with a disinfectant or a detergent.

14.2.7 Water for medical procedures

Water used for some medical activities may need to be of higher quality. For example, water used for haemodialysis should meet strict criteria concerning microbial contamination and chemical contaminants, including chlorine and aluminium, which are commonly used in drinking-water treatment.

14.2.8 Water quantity

Minimum water quantity required per day as per WHO recommendation is summarized below:

Category	Water quantity
Outpatients	5 litres/consultation
Inpatients	40–60 litres/patient/day
Operating theatre or maternity unit	100 litres/intervention
Inpatient therapeutic feeding centre	30 litres/patient/day
Cholera treatment centre	60 litres/patient/day
Severe acute respiratory diseases isolation centre	100 litres/patient/day
Viral haemorrhagic fever isolation centre	300–400 litres/patient/day

14.3 Water facilities and access to water

Sufficient water-collection points and water-use facilities should be available in the healthcare setting to allow convenient access to, and use of, water for medical activities, drinking, personal hygiene, food preparation, laundry, and cleaning.

14.3.1 Standards on access to water facilities

1. A reliable drinking-water point is accessible for staff, patients, and carers at all times.
2. A reliable water point, with soap or a suitable alternative, is available at all critical points within the health-care setting (operating theatres, wards, consulting rooms, dressing stations, etc.) and in-service areas (sterilization, laboratory, kitchen, laundry, showers, toilets, waste zone and mortuary).
3. At least two hand washing basins should be provided in wards with more than 20 beds.
4. At least one shower is available for 40 users in inpatient settings (users include patients, staff and carers staying in the health-care setting).
5. Laundry facilities, with soap or detergent, hot water, and a disinfectant (such as chlorine solution), are available for inpatient settings.

14.3.2 Guidance on access

Drinking water points

Drinking-water should be provided separately from water provided for handwashing and other purposes, even if it is from the same supply. Drinking-water may be provided from a piped water system or via a covered container with a tap where there is no piped supply. Drinking-water points should be clearly marked.

Handwashing

Basic hygiene measures by staff, patients and carers, handwashing in particular, should not be compromised by lack of water.

Waterless, alcohol-based hand rub may be used for rapid, repeated decontamination of clean hands. Hand rub dispensers can be installed at convenient points and can also be carried by staff as they move between patients. However, hand rub may not be affordable, and they do not replace soap and water for cleaning soiled hands.

Hand washing facilities

Water points should be sufficiently close to users to encourage them to use water as often as required. Alternatively, a hand washing basin, soap and a jug of clean water may be placed on a trolley used for ward rounds, to encourage hand washing as often as needed between patient contacts.

Showering facilities

Although less important than handwashing in terms of reducing disease transmission, showering (or other means of washing the body) may be important for the recovery of certain patients and may be required by staff and carers in contact with infectious patients.

If piped hot water is available, measures should be taken to avoid the proliferation of bacteria in the water system. For this reason, piped water and water from showers should ideally be maintained below 20°C or above 50°C.[6]

Separate showers may be needed for staff and patients, and for both sexes, to ensure that all groups have adequate privacy and safety.

14.4 Toilets

Adequate, accessible, and appropriate toilets are provided for patients, staff, and carers.

14.4.1 Standards on toileting

1. There are sufficient toilets available: one per 20 users for inpatient settings; at least four toilets per outpatient setting (one for staff, and for patients: one for females, one for males and one for children).
2. Toilets are appropriate for local technical and financial conditions.
3. Toilets are designed to respond to local cultural and social conditions and all age and user groups.
4. Toilets are safe to use.
5. Toilets have convenient handwashing facilities close by.
6. Toilets are easily accessible (that is, no more than 30 metres from all users).
7. There is a cleaning and documented maintenance routine in operation that ensures that clean and functioning toilets are available at all times.
8. Time and effort required to reach the toilets need to be considered. In multi-storey buildings, there should be toilets available on all floors, and routes used to reach toilets should be smooth and flat, for easy access for people in wheelchairs.

14.4.1 Ratio of people per toilet

The recommended ratio of one toilet per 20 people is common and widespread and should be used as a planning guideline. Actual numbers required for inpatient settings will depend on several factors, including the average proportion of patients using bedpans instead of toilets. Users include patients, staff, and carers.

In outpatient settings, a suitable arrangement is often as follows: one toilet for staff (two if separate toilets are required for male and female staff), one toilet for male patients, one toilet for female patients, and one child's toilet. In larger outpatient settings, more toilets are required. The number required depends on several local factors, including the average time patients wait before consultations.

14.4.2 Local technical and financial conditions

If there is sufficient and reliable piped water available and there is a connection to a sewer system or a functioning septic tank and drainage system, flush toilets may be appropriate, depending on materials used for anal cleansing. In other situations, latrines (dry or pour- flush types) are appropriate. Care must be taken, when siting latrines, to avoid contaminating groundwater and risk of flooding.

14.4.3 Social and cultural considerations

In most cases, separate toilets are required for men and women, and separate toilets should be provided for staff and patients. They should be clearly signposted to help users find them. Patient toilets should be equipped to make them easy to use by people with physical handicaps, heavily pregnant women, elderly people, and people who are sick. Special children's toilets should be provided where many children use the health-care setting. Children's toilets are particularly useful where latrines are used and where the size of the drop hole and the conditions inside a normal latrine are off-putting for children or inconvenient for carers. Toilets should be designed and equipped to respond to cultural identities (e.g., anal cleansing with water).

14.4.4 Hygiene and safety concerns

Toilets should be designed, built, and maintained so that they are hygienic and acceptable to use and do not become centres for disease transmission. This includes measures to control fly and mosquito breeding, and a regularly monitored cleaning schedule.

To minimize the risk of violence, including sexual violence, toilets should be carefully located, should be lockable by the user (to protect people while using them), and they and their access routes should be lit at night.

14.4.5 Handwashing points

Water points, with soap, single used-disposal, and adequate drainage, should be provided at the exit of all toilets, and their use should be actively encouraged.

14.4.6 Cleaning and maintenance

Toilets should be cleaned whenever they are dirty, and at least twice per day, with a disinfectant used on all exposed surfaces and a brush to remove visible soiling. Strong disinfectants should not be used in large quantities, as this is unnecessary, expensive, potentially dangerous, and may affect the biodegradation process. If no disinfectant is available, plain cold water should be used. Records of cleaning activities should be maintained.

In specific contexts (e.g., isolation for cholera patients), a 0.5% active chlorine solution is used to disinfect faeces or vomit. Usually, the chlorine solution is already contained in the container that will receive the faeces or vomit from the patients in bed.

14.4.7 General principles for wastewater disposal

1. Wastewater is removed rapidly and cleanly from the point where it is produced.
2. Wastewater drainage from health-care settings is built and managed to avoid contamination of the healthcare setting or the broader environment.
3. Rainwater and surface run-off is safely disposed of and does not carry contamination from the healthcare setting to the outside surrounding environment.

14.4.8 Wastewater drainage system

Wastewater is produced from washbasins, showers, sinks, etc. (grey water) and from flushing toilets (black water). It should be removed in standard waste drainage systems to off-site sewer or on-site disposal systems. All open wastewater drainage systems should be covered, to avoid the risks of disease vector breeding and contamination from direct exposure.

Small quantities of infectious liquid wastes (e.g., blood or body fluids) may be poured into sinks or toilets. Most pathogens are inactivated by a combination of time, dilution, and the presence of disinfectants in the wastewater. Toxic wastes (e.g., reagents from a laboratory) should be treated as health-care waste (see Guideline 6). They should not be poured into sinks or toilets that drain into the wastewater system.

14.4.9 Prevention of environmental contamination

The most appropriate wastewater disposal option is connecting the healthcare setting to a properly built and functioning sewer system, which is, in turn, connected to an adequate treatment plant. If the sewer does not lead to a treatment facility, an on-site retention system with treatment will be necessary before wastewater is discharged.

In other situations, on-site disposal is needed. For grey water, soakaway pits or infiltration trenches should be used. These should be equipped with grease traps, which should be checked weekly and cleaned, if needed, to ensure the systems operate correctly. Pits or trenches should not overflow into the healthcare setting grounds or surroundings and create insect or rodent breeding sites. Black water should be disposed of in a septic tank, with the effluent discharged into a soakaway pit or infiltration trench. Grey and black water may be treated in the same septic tank and soakaway system, although this requires a larger septic tank than one used for black water alone. All systems that infiltrate wastewater into the ground should be sited to avoid contaminating groundwater. There should be at least 1.5 metres between the bottom of the infiltration system and the groundwater table (more in coarse sands, gravels, and fissured formations), and the system should be at least 30 metres from any groundwater source.

If the health-care setting has a septic tank, the sludge from the tank should not be used for agricultural purposes but should be buried following safe procedures.

14.5 Healthcare waste disposal

Health-care waste is segregated, collected, transported, treated, and disposed of safely.

14.5.1 General principles

1. Health-care waste is segregated at the point of generation according to its type, using four major categories: sharps, non-sharps infectious waste, non-sharps non-infectious waste and hazardous waste.
2. Colour-coded waste containers or containers bearing clearly understood signs and symbols are provided at convenient locations. They are collected from all health- care services and stored safely before treatment and/or disposal.

3. Each category of waste is treated and disposed of according to the safest feasible method available.
4. A specific waste-disposal zone exists, where wastes can be stored and disposed of safely and effectively.

14.5.2 Segregation

The four major categories of health-care waste recommended for organizing segregation and separate storage, collection and disposal are:

a. Sharps (needles, scalpels, etc.), which may be infectious or not
b. Non-sharps infectious waste (anatomical waste, pathological waste, dressings, used syringes, used single-use gloves)
c. Non-sharps non-infectious waste (paper, packaging, etc.)
d. Hazardous waste (expired drugs, laboratory reagents, radioactive waste, insecticides, etc.).

14.5.3 Storage and collection

Sharps should be placed immediately in yellow puncture-proof and covered safe sharps containers, which are regularly collected for disposal.

Non-sharps infectious yellow or red waste bags or containers (15–40-litre capacity, with lids) should be collected, emptied, cleaned, disinfected, and replaced after each intervention (e.g., in an operating or maternity unit) or twice daily.

Non-sharps non-infectious black waste containers (20–60 litre capacity) should be collected, emptied, cleaned, and replaced daily; alternatively, plastic bags may be used inside the containers.

For the above categories of waste, it is recommended that waste containers are a maximum of 5 metres from the point of waste generation, in two sets for each location, for a minimum of three types of waste. At least one set of waste containers should be provided per 20 beds in a ward.

Hazardous waste should be collected and stored in appropriate and labelled containers placed in secure locations . Radioactive waste should be stored in containers that prevent dispersion, behind lead shielding.

14.5.4 Treatment and disposal

Sharps should be disposed of in a sharps pit (buried drums in small health centres or emergency structures; concrete-lined pits in other settings). Off-site treatment in a decentralised facility in charge of collection, treatment and disposal is not advisable for safety reasons but may be necessary in an urban area where on-site treatment is not feasible because of lack of space.

Non-sharps infectious waste should be buried in a pit fitted with a sealed cover and ventilation pipe for on-site treatment in small health-care settings or, should be high-

temperature incinerated or steam sterilized on-site or off-site. Special arrangements may be needed for disposing of placentas, according to local custom.

The preferred option for specific infectious waste (such as blood samples, plastic syringes, and laboratory tests) is steam sterilization before disposal, if available. This avoids environmental pollution from incineration. One autoclave should be dedicated for waste sterilization, different from the autoclave used for sterilizing medical devices within the laboratory.

Non-sharps non-infectious waste should be buried in a pit, a landfill site or preferably recycled in non-food and non-medical items. If space is limited, non-sharps non- infectious waste should be incinerated. Ashes and residues should be buried in a pit.

There are several kinds of hazardous waste, and each requires specific treatment and disposal methods, which include encapsulation, sterilization, burial, incineration, and long-term storage. Some wastes, such as pharmaceutical wastes, cannot be disposed of in low-cost settings and should be sent to a large centre for destruction or returned to the supplier. In all cases, national legislation should be followed.

14.5.5 Waste disposal zone

The waste-disposal zone should be fenced off; it should have a water point with soap or detergent and disinfectant for handwashing or to clean and disinfect containers, with facilities for wastewater disposal into a soakaway system or sewer. The waste-disposal zone should also be located at least 30 metres from groundwater sources. Where an incinerator is used, it should be located to allow effective operation with minimal local air pollution in the health centre, nearby housing, and crops, and it should be large enough for extension if new pits or other facilities must be built.

14.6 Cleaning and laundry

Laundry and surfaces in the health-care environment are kept clean.

14.6.1 General principles

1. Routine programmed cleaning of surfaces and fittings is carried out to ensure that the health-care environment is visibly clean, and free from dust and soil. All horizontal surfaces are cleaned at least daily and whenever they are soiled.
2. The intensity of cleanliness maintained is appropriate to the likelihood of contamination and the degree of asepsis required.
3. Any areas contaminated with blood or body fluids are cleaned and disinfected immediately.
4. Soiled linen is placed in appropriate bags at the point of generation and pre-disinfected, washed in water, rinsed, and dried in a covered place.

5. Clean and soiled linen are transported and stored separately, in different (marked) bags.
6. Beds, mattresses, and pillows are cleaned between patients and whenever soiled with body fluids.

14.6.2 Routine cleaning

Ninety per cent of microorganisms are present within visible dirt, which should be eliminated by routine cleaning. Neither ordinary soap nor detergents have antimicrobial activity, and the cleaning process depends essentially on mechanical action. Wet mopping with hot water and detergent, if available, is recommended, rather than sweeping. If hot water is not available, a 0.05% chlorine solution, or other suitable disinfectant in cold water should be used. However, detergent is sufficient for normal, domestic cleaning of floors and other surfaces that are not in contact with hands and medical instruments.

14.6.3 Intensity of cleaning routine

Floors and other washed surfaces should be made of a suitable, non-porous material that is resistant to repeated cleaning with hot water and detergents or disinfectants. This may be achieved by classifying areas of the healthcare setting into three areas, each with a specific cleaning routine

a. Sweeping: offices and other non-patient areas; normal daily domestic cleaning.
b. Wet mopping daily: waiting areas, consulting rooms, non-infectious disease wards, pharmacy.
c. Cleaning with a detergent or disinfectant solution, with separate cleaning equipment for each room daily, whenever soiled and after each procedure (in the case of operating suites and delivery rooms): infectious disease or isolation wards, protective isolation wards for highly susceptible patients and protected areas, such as operating suites, delivery rooms, intensive care units, premature baby units, casualty departments, haemodialysis units, laboratory, laundry, kitchen, sterilization services.

In cholera treatment settings, a 0.5% chlorine solution or other disinfectant should be used for cleaning floors, walls, and beds daily and whenever soiled. Soiled clothing and bedding should be disinfected in 0.5% chlorine solution for 10 minutes and then rinsed, before being washed and dried as usual.

14.6.4 Cleaning soiled linen

Soiled linen should not be sorted in patient-care areas, and should be handled with minimum agitation to avoid releasing pathogens. Soiled linen should be cleaned and autoclaved before being supplied to operating rooms or theatres. Woollen blankets should be washed in warm water.

14.6.5 Transporting soiled linen

Securely closed impermeable bags should be used for transporting linen heavily soiled with body substances or other fluids.

14.6.6 Beds and bedding

Beds should be wiped with a disinfectant solution (e.g., 0.5% chlorine solution) following each hospitalization.

Mattresses should have waterproof protective covers for easy cleaning. Mattresses and pillows should be treated, as required, to control lice, bedbugs and other nuisances or disease vectors.

If woven mats are used instead of, or on top of, mattresses, they should be destroyed (burned) and replaced between patients.

If insecticide-treated nets are used on beds, they should be washed and reimpregnated every 6 months if used only for patients with non-infectious diseases. If used for patients with infectious diseases (cholera, haemorrhagic fevers, etc.), they should be washed and reimpregnated between patients and whenever soiled. Non-insecticide-treated nets should be impregnated.

14.7 Food storage and preparation

Food for patients, staff and carers is stored and prepared in a way that minimizes the risk of disease transmission.

14.7.1 General principles

1. Food handling and preparation is done with utmost cleanliness.
2. Contact between raw foodstuffs and cooked food is avoided.
3. Food is cooked thoroughly.
4. Food is kept at safe temperatures.
5. Safe water and raw ingredients are used.
6. Food handlers' test routinely conducted for staff
7. Powdered infant formula is prepared appropriately.

14.7.2 Food handling and preparation

Food handlers should be trained in basic food safety.

Food handlers should wash their hands after using the toilet and whenever they start work, change tasks, or return after an interruption. Soap and water should be available at all times during food preparation and handling, to ensure that handwashing can be done conveniently (see Guidance note 3).

Kitchen staff and carers with colds, influenza, diarrhoea, vomiting and throat and skin infections, or those who have suffered from diarrhoea and vomiting within the past 48 hours,

should not handle food unless it is packaged. All infections should be reported, and sick staff should not be penalised.

Food-preparation premises should be kept meticulously clean. Surfaces used for food preparation should be washed with detergent and safe water and then rinsed or wiped with a clean cloth that is frequently washed. Scraps of food should be disposed of rapidly, as they are potential reservoirs for bacteria and can attract insects and rodents. Refuse should be kept in covered bins and disposed of quickly and safely

Eating utensils should be washed immediately after each use with hot water and detergent, and air-dried. The sooner utensils are cleaned the easier they are to wash. Drying cloths should not be used, as they can spread contamination.

In many inpatient settings, carers may bring food to patients, or may prepare food at the health-care setting. In these cases, staff should seek to ensure that food is prepared hygienically, and that cooked food is consumed immediately. Cooking facilities may need to be provided.

14.7.3 Separation of food and equipment

Separate equipment and utensils, such as knives and cutting boards, should be used for handling raw foods or they should be washed and sanitized in between uses.
Food should be stored in containers to avoid contact between raw and prepared foods. Raw meat, poultry and seafood should be separated from other foods.

14.7.4 Cooking and serving

All parts of foods cooked must reach 70°C to kill dangerous microorganisms. To ensure this happens, soups and stews should be brought to the boil and meat should be heated until juices are clear, not pink.
Cooked food must be reheated thoroughly to steaming hot all the way through. Cooked food to be served should be kept hot (more than 60°C) before serving.

14.7.5 Storage

Cooked or perishable food should not be left at room temperature for more than two hours and should be prepared or supplied fresh each day. All food should be kept covered to protect it from flies and dust.
Non-perishable foods should be stored safely in a closed, dry, well-ventilated store and protected from rodents and insects. They should not be stored in the same room as pesticides, disinfectants, or any other toxic chemicals. Containers that have previously held toxic chemicals should not be used for storing foodstuffs.

Bought food should not be used beyond its expiry date.

Food should be protected from insects, rodents, and other animals, which frequently carry pathogenic organisms and are a potential source of contamination of food.

14.7.6 Washing and use of water

Only safe water should be used for food preparation, handwashing, and cleaning. For specification of safe water, see Guideline 1.

Fruit and vegetables should be washed with safe water. If there is any doubt about the cleanliness of raw fruit and vegetables, they should be peeled.

14.8 Building design, construction, and management

Buildings are designed, constructed, and managed to provide a healthy and comfortable environment for patients, staff, and carers.

14.8.1 General principles

1. The air temperature, humidity and airflow in the health-care setting provide a comfortable environment for patients, staff, and carers.
2. Airflow minimizes the risk of transmission of airborne pathogens from infected patients and minimizes risks to susceptible staff, patients, and carers.
3. Sufficient lighting is provided during all working hours to allow safe movement of staff, patients and carers, and normal undertaking of medical activities.
4. Buildings are designed and activities are organized to minimize the spread of contamination by the movement of patients, staff and carers, equipment, supplies and contaminated items, including health-care waste, and to facilitate hygiene.
5. Health-care settings are built, furnished, and equipped with materials that minimize infectious disease transmission and facilitate cleaning.
6. Sufficient space is provided for people in wheelchairs, as well as to minimize infectious disease transmission.
7. The building of new health-care settings or the improvement of existing ones should be in line with national building codes and standard healthcare setting building designs. For example, beds for patients should be separated by a minimum of one metre and should be easily accessible by people with physical handicaps or elderly people.
8. Given the size and complexity of the healthcare setting and the resources available, activities should be organized in zones, with the flow of people, equipment and materials managed to minimize movements from “dirty” to “clean” zones. Services should be located in relation to each other so as to facilitate hygienic management. For instance, the sterilization service should be close to the operating theatre.
9. All surfaces should be easy to clean by wet mopping and should be able to withstand repeated exposure to hot water, detergents, and disinfectants.
10. Walls, floors, and ceiling surfaces should be smooth and made of non-porous materials that are easy to clean and that do not provide a suitable environment for pathogen survival or development. The same is true for furniture and equipment used for patient care.

14.8.2 Ventilation

These recommendations should be followed by locating and constructing buildings that use designs and materials that produce the best indoor conditions, considering the local climate and prevailing winds.

The effective use of blinds, opening and closing of doors and windows, planting of suitable vegetation around the building and other operational measures can help optimize indoor conditions.

In addition to basic construction and operation measures, heating, ventilation, and air-conditioning, or filters may be required for specific areas or activities of the health-care setting. If heating, ventilation and air-conditioning, or filters are used, they should be maintained regularly to ensure their continued effectiveness. Filters should be inspected regularly and cleaned or changed as required, because biofilms may build up and become breeding places for microorganisms, resulting in, for example, healthcare acquired *Legionella* transmission. Ceiling fans and small portable ventilators are not recommended as they dispense dust around the room (especially over the sterile field and equipment in an *operating theatre).*

14.8.3 Air extraction to minimize pathogens

Minimizing the risk of transmission of airborne pathogens from infected patients may require isolation in a negative-air-pressure room, where air is drawn into the room and extracted by a fan, thus avoiding contaminated air circulating to other parts of the health- care setting. Care should be taken when siting the air extractor for an isolation room to reduce the risk of transmission to people outside the building and to minimize the risk of the contaminated air being drawn into another area of the building by other parts of the ventilation system.

Operating theatres and rooms for isolating particularly vulnerable patients (e.g., severely immunocompromised patients) may require positive air pressure conditions, where clean air is drawn into the room, thus avoiding contaminated air entering from other parts of the health-care setting.

In both negative and positive pressure facilities, operational procedures should be drawn up (e.g., ensuring doors are closed and that ventilation is operational) and staff should be properly trained to ensure correct operation of the room. In negative-pressure facilities, the risk of transmission to nursing staff may be significant and additional protective measures, such as masks, should be used routinely.

All occupied areas of the health-care facility should be adequately ventilated to meet comfort requirements. Where infected and susceptible people share the same air space and there is a risk of airborne transmission of infection, ventilation rates should be maximized to dilute and remove any infectious particles. Guidelines for the control of tuberculosis transmission in high-risk locations recommend that mechanically ventilated spaces have an air change rate of 6–12 air changes per hour (Jensen et al. 2005). While this is not feasible in many low-cost

settings, high ventilation rates are possible with natural ventilation (Escombe et al. 2007), and where the climate allows, large opening windows, skylights and other vents can be used to optimize natural ventilation.

Where possible, air should flow into rooms from the top and out of the room from the bottom (near the floor, which is generally the most likely contaminated part of the room), and natural ventilation should be optimized wherever feasible.

14.8.4 Lighting

Natural light may be sufficient in outpatient settings that operate only during the day. However, some form of lighting should be available for night-time emergencies.

In isolated inpatient settings (such as rural hospitals) and in temporary structures (such as cholera treatment centres), generators or solar panels and batteries are likely to be required and provision for these should be made. As a minimum, a safe type of kerosene or gas lantern and powerful hand torches should be available.

14.9 Vector control

Patients, staff, and carers are protected from disease vectors.

14.9.1 General principles

1. The number of vectors in the health-care setting is minimized.
2. Patients, staff, and carers are protected from potential disease-transmitting vectors.
3. Spread of vector-borne diseases is minimized by preventing contact with infected substances or materials.
4. Appropriate and effective methods for excluding or reducing vector numbers depend on the type of vector; the location and number or size of breeding sites; vector habits, including places and times of resting, feeding, and biting; and resistance of specific vector populations to control chemicals.

14.9.2 Minimizing disease vectors

Appropriate and effective methods for excluding or reducing vector numbers depend on the type of vector; the location and number or size of breeding sites; vector habits, including places and times of resting, feeding, and biting; and resistance of specific vector populations to control chemicals.

Basic environmental control methods, such as proper drainage, waste disposal and food hygiene, should be the basis of any strategy

Mosquitoes and flies can effectively be excluded from buildings by covering opening windows with fly screens and fitting self-closing doors to the outside.

Any use of chemical controls requires specialist advice, such as for residual insecticide spraying, in and around the health-care setting. Advice should be available from within the ministry of health.

14.9.3 Protect patient and staff

Once inside the health-care setting, patients, staff, and carers may be protected from certain vectors by using barriers (e.g., insecticide bed nets against mosquitoes or covered food storage to prevent contamination by rats and flies) or repellents.

Patients with vector-borne diseases, such as malaria, Lassa fever and typhus, should be treated or protected to ensure that the related vectors do not transmit the disease from them to other people in the health-care setting. This may require removal of the vectors (e.g., insecticide dusting to remove lice from typhus patients) or the use of a barrier (e.g., insecticide treated bed nets to isolate yellow fever patients from mosquitoes).

14.9.4 Prevent spread of vectors

Infectious substances such as excreta and soiled dressings should be disposed of immediately and completely to prevent flies and other mechanical vectors from carrying pathogens to food, eyes, wounds, etc., or distributing them to the environment.

15 - NOTIFIABLE DISEASE IN NIGERIA

The International Health Regulations (2005), (also referred to as the IHR or the Regulations) entered into force on 15 June 2007. The Regulations are binding on all 46 WHO Member States in the African Region as all have agreed in 2005 to be bound by these Regulations.

The IDSR is a strategy and a tool to promote rational use of resources by integrating and streamlining common surveillance activities. Many intervention programmes still rely on their own disease surveillance systems. Each programme has made efforts through the years to improve its ability to obtain reliable data on time to use information for taking action.

The IHR have a broad scope and the Regulations apply to —any emergency with international repercussions for health, including outbreaks of emerging and re-emerging epidemic-prone diseases, outbreaks of food borne disease, natural disasters, and chemical or radio nuclear events, whether accidental or caused deliberately ‘‘. The IHR takes into account lessons learnt in past decades in detecting and responding to disease outbreaks. The International Health Regulations aim at protecting global health security while avoiding unnecessary interference with international travel and trade.

The three main categories of events that require to be notified under the IHR are:

a. Four conditions that must be notified to WHO: smallpox, poliomyelitis due to wild-type poliovirus, human influenza caused by a new subtype, and SARS (see next paragraph and algorithm in Annex in Section 2). This notification will normally be conducted at district level or above, as decided by national authorities.
b. Other diseases and events may require notification if they are considered to be events of potential international public health concern. This assessment will normally be conducted at district level or above as decided by national authorities (by using the IHR decision instrument in Annex of Section 2). The diseases referred to in this category by the IHR include the following: cholera, plague, yellow fever, VHF, other diseases that are of special national or regional concern e.g., dengue fever. These conditions are fully dealt with in these Technical Guidelines.
c. Any event of potential international public health concern including those of unknown cause or source, and those involving other events or diseases‖ than those listed in the above two bullet points. A list of such events is provided in Section 2. These events are NOT specifically dealt with in these Technical Guidelines and more details can be obtained in environmental control literature.

16 - FUNDING INFECTION PREVENTION AND CONTROL PROGRAMMES

The IPC programmes at national and subnational levels are all required to have annual IPC work plans. All the work plans are required to have clear goals and objectives with SMART indicators for monitoring progress and learning. These work plans are to be prepared, costed by the IPC team/committee, and approved by the agency where the IPC programme secretariat is situated.

At facility level the IPC committee has the oversight responsibility of reviewing the submitted budgets before final submission to the facility leadership. The National, State and LGA IPC work plans are to be financed by the NCDC, SMoH/SHMB and LGA PHC department respectively. The responsibility of financing all IPC work plan activities including payment of dedicated IPC personnel rests with the agencies of government responsible for IPC. Periodic audits and reviews of expenditure by the audit unit/department is important for accountability reasons.

17 - OCCUPATIONAL HEALTH AND SAFETY (OHS)

OHS programmes are:

1. Means used to control all aspects of work production that involve any degree of risk or danger that may cause injury or harm
2. This process eliminates such elements to ensure the health and safety of all healthcare workers.

17.1 Infection Prevention and Control and Occupational Health and Safety policy

The national IPC programme, and the department of hospital services at FMoH, should work towards ensuring a safe environment for healthcare workers in healthcare facilities in Nigeria. Providing them with the entire necessary technical platform to perform their duty, which may include providing all preventable vaccines and vaccines for emerging diseases, and implementing policies for managing post exposure prophylaxis, as well as setting up surveillance for exposure at work.

17.2 Risk assessment and management

IPC risk assessments should be carried- out in each healthcare facility. In assessing risk, the following shall be done:-

a. Identify infections and its likely mode
b. Determine the likelihood of its occurrence
c. Ascertain the likely severity of its effect
d. Determine level of priority
e. Recommend level of action or control measures to be taken

17.3 Hierarchical control order application

a. Engineering & Environmental controls-e.g., provision of appropriate physical structures, adequate ventilation, and proper environmental cleaning.
b. Administrative controls-e.g., provision of adequate staff and supplies, education of health workers, patients, and visitors
c. Personal protective measures

17.4 Staff management strategies

There shall be health assessment during the pre-employment and exit periods.

17.5 Incident reporting

The safety learning system (SLS) is an application that enables all Nigeria healthcare services to record, manage, investigate, and analyse patient and worker incidents. All breaches of practice that affect patient or worker safety should be reported on the SLS. Examples of the breaches in infection control protocol include but not limited to:

a. Aseptic technique procedure not followed
b. Correct PPE not worn
c. Sharp safety procedures not followed
d. Errors in sterilization processes

18 - POLICY MONITORING AND EVALUATION

This policy ensures that ongoing monitoring and evaluation of the National IPC Programme will occur to confirm facility-and national-level indicators are being captured, recorded, and reported and ensure quality improvement is ongoing. Facility IPC Focal Points will perform periodic routine assessment and reporting of IPC practices and systems using currently available National IPC tools (IPC score card, HHSAF, IPCAF and National surveillance indicators etc.)

While outbreaks are ongoing, the National IPC programme may dictate more frequent assessments to initiate rapid corrective action to respond to the current emergency need. Data elements captured will be discussed at monthly/quarterly Hospital IPC Committee meetings. Certain data elements will be reported through the states, up to the National IPC programme, where the data will be compiled for dissemination and information of the top management via state and National progress reports. The performance of facility IPC Focal Points will be reviewed at least annually by their respective IPC committees.

19 - LINKS WITH THE NATIONAL PUBLIC HEALTH SYSTEM

There will be routine communication and collaboration between directorates within the NCDC (e.g., NPHLS, Surveillance and epidemiology, HEPR) and with other key directorates of the FMoH, other MDAs, working groups, and partner organizations. All directorates within the NCDC will collaborate and work together with the National IPC programme via different technical pillars and EOCs to help improve all aspects of IPC in Nigeria. The FMoH will collaborate with other relevant ministries to improve IPC in Nigeria, as needed. The NCDC will also collaborate with international and local technical organizations and other international and local partners. Information regarding diseases of public health concern identified in healthcare settings will be reported immediately to the SMoH/NCDC. This agrees with the requirements of the International Health Regulations (IHR).

20 - RESEARCH AND DEVELOPMENT

In compliance with the NHREC and other national and international regulations applicable when conducting research on human subjects, the NCDC encourages states, local NGOs, institutions, laboratories, and research programmes to conduct IPC-related research for informing public health policy locally at organisation/governance level.

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