

Infection Prevention and Control Status at Federal Medical Centre, Keffi, Nigeria

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Accepted

March 16, 2026

Published Online

May 25, 2026

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Abstract

Background. Healthcare-associated infections (HAIs) present a significant global health challenge, with over 25% of hospitalised patients in low- and middle-income countries (LMICs) affected. Standardised infection prevention and control (IPC) assessments are essential to identify weaknesses and guide improvements in healthcare settings.

Methods. This hospital-based, cross-sectional study evaluated IPC compliance at the Federal Medical Centre, Keffi (FMCK), Nasarawa State, Nigeria, using the World Health Organization (WHO) Infection Prevention and Control Assessment Framework (IPCAF) tool. The assessment was conducted in January 2025, and responses were reviewed, validated, scored, and interpreted according to WHO guidelines.

Results. The findings from this study revealed that FMCK's overall IPC compliance score was 500/800, placing the facility at an intermediate level. Of the eight IPCAF components assessed, the hospital achieved an advanced level of compliance in the IPC programme and guidelines. Despite having an established IPC programme, committee, and dedicated focal person, FMCK exhibited gaps in structured monitoring, budget allocation, and consistent resource availability, including essential IPC materials and a reliable water supply.

Conclusion. Despite partial implementation of IPC components, significant gaps persist. Strengthening these areas through targeted interventions and resource investments is essential to improve IPC and reduce HAIs in resource-limited settings.

Keywords. infection prevention and control; healthcare-associated infections; infection prevention and control assessment framework; low- and middle-income countries; antimicrobial resistance

Introduction

Healthcare-associated infections (HAIs) are infections that patients acquire while receiving care in healthcare facilities. These infections are not present or incubating at the time of admission and may even develop within 30 days after receiving health care [1,2]. HAIs are a significant global health concern, affecting over 1.4 million people worldwide, with a projected death rate exceeding 10%. The burden is disproportionately higher in low- and middle-income countries (LMICs), where up to 25% of hospitalised patients are affected, compared to 7% in high-income countries [1–6]. Inadequate IPC practices among healthcare workers (HCWs) facilitate the transmission of HAIs [2,7,8]. Evidence

indicates that 30% to 70% of HAIs are preventable through robust IPC programmes; however, many healthcare facilities, especially in LMICs, lack the resources, infrastructure, and training necessary to implement these IPC measures effectively and consistently [9,10].

To address these challenges, the World Health Organization (WHO) introduced the Infection Prevention and Control Assessment Framework (IPCAF) tool in 2018 [11]. This evidence-based tool is designed to assess, analyse, and enhance IPC activities in healthcare facilities. The IPCAF tool evaluates the eight core components of IPC, comprising: programme, guidelines, education and training, surveillance, multimodal strategies, monitoring and

feedback, workload and staffing, and the built environment [12,13]. Beyond compliance evaluations, a growing body of research underscores the tool's relevance to patient outcomes; for instance, a study in Eastern China found that facilities with IPCAF scores above 700 had a lower incidence of HCAs than those with lower scores [13].

The WHO's IPCAF has also been instrumental in evaluating IPC compliance across various LMICs. In Sierra Leone, assessments conducted in three tertiary healthcare facilities in Freetown revealed a basic level of IPC compliance, with notable deficiencies in HCAI surveillance and monitoring [14]. Similarly, in Uganda, an assessment conducted in Lira Hospital revealed a basic IPC compliance level with an overall IPCAF score of 225/800 (28.5%) [15]. The study identified gaps such as absence of an IPC committee and a dedicated IPC team, and no budgets to support IPC compliance. In Nigeria, the only other IPCAF assessments that have been conducted concentrated on the southern region of the country. This study involving 99 healthcare facilities in Rivers state reported that 56.6% of these facilities scored at the basic level and 43.4% at the intermediate level, indicating the possibility of substantial gaps in IPC compliance in Nigeria [16].

Despite evaluations conducted in the southern parts of Nigeria, similar comprehensive assessments have not taken place in the northern regions. Specifically, at the Federal Medical Centre, Keffi (FMCK), a tertiary hospital established in 2000, there has been no IPC evaluation using the WHO IPCAF tool. This absence of data hampers the hospital's ability to assess its IPC status, strengths, and weaknesses, thereby limiting targeted improvements and potentially compromising patient safety and healthcare outcomes.

Therefore, we conducted a study to evaluate IPC compliance at FMCK using the WHO IPCAF tool. The specific objectives of the study were to determine the facility's baseline level of IPC compliance; identify strengths and gaps in the facility's implementation of IPC activities; and document recommendations for improving the facility's IPC programme.

Methods

Study design and setting

This hospital-based cross-sectional study was conducted at FMCK, a tertiary hospital located in Keffi, Nasarawa State in North Central Nigeria. FMCK has a bed capacity of over 227 and employs over 1,000 staff across 15 departments [17–20].

Data collection and validation

Data were collected using the self-administered 81-question

WHO IPCAF tool (appended in the supplementary materials) [11], which evaluates eight core components of IPC. Based on the WHO's Guidelines on the Core Components of Infection Prevention and Control Programmes [21], a summary of each core component and the elements they assess is listed below.

1. **IPC programme:** This component evaluates the availability and implementation of an IPC programme at the health facility that includes a dedicated team, trained to prevent HCAs and antimicrobial resistance (AMR) through good IPC practices. It also assesses the availability of a good-quality microbiological laboratory to support the effectiveness of the IPC programme.
2. **IPC guidelines:** This component evaluates the availability and implementation of adapted evidence-based IPC guidelines at the health facility referencing national or international standards.
3. **IPC education and training:** The component assesses the availability and implementation of protocols designed to provide IPC education to all health workers in the health facility.
4. **Healthcare-associated infection (HCAI) surveillance:** This component assesses the implementation of facility-based HCAI surveillance protocols intended to guide IPC interventions and detect outbreaks.
5. **Multimodal strategies for implementing IPC interventions:** This component assesses the implementation of evidence-based, innovative, and synergistic strategies to achieve sustained system and behavioural change for IPC interventions.
6. **Monitoring and auditing of IPC practices and feedback:** This component evaluates the availability and implementation of protocols to regularly monitor, audit, and provide timely feedback on healthcare practices according to IPC standards.
7. **Workload, staffing, and bed occupancy:** This component evaluates the adherence to standards and regulations on health facility bed occupancy and health worker staffing levels.
8. **Built environment, materials, and equipment for IPC:** This component assesses the conditions and environments in which patient care activities are undertaken, ensuring that they facilitate practices related to the prevention and control of HCAs and AMR.

The IPCAF tool was completed by the hospital IPC focal person in the presence of a member of the IPC team who was consulted for clarification when necessary. The cross-validation process ensured that all questions across the different components of the tool were fully completed. In addition, the responses were systematically reviewed with the IPC team to verify accuracy, eliminate errors, and confirm that the information provided is a true and reliable

reflection of the facility’s IPC programme. No discrepancies or errors were identified during the review process. Data collection took place at FMCK in January 2025.

Data analysis

Responses to the IPCAF tool were evaluated and scored according to WHO guidelines. The possible responses for each question in each of the core components of the IPCAF tool were assigned a weighted score that summed to a maximum score of 100 points, resulting in a total possible score of 800. Based on the aggregate score, IPC compliance was classified into one of four levels:

- Inadequate (0–200 points)
- Basic (201–400 points),
- Intermediate (401–600 points), or
- Advanced (601–800 points).

The component areas that achieved the highest scores were identified as strengths, while those with lower scores were identified as areas requiring improvements. These strengths and gaps were presented in tables organised by core component.

In addition to the IPCAF scoring, a descriptive analysis was conducted for the total IPCAF score, the scores of individual core components, and selected questions of special interest. The full assessment result for this study is appended in the supplementary material.

Results

Baseline level of IPC compliance at FMCK

The overall IPCAF score was 500/800 (62.5%), which corresponds to an ‘intermediate’ IPC level. Component-level analysis, with individual scores ranging from 42.5% to 85%, revealed two components at advanced levels, four at intermediate levels, and two at basic levels. The best compliance was observed in the IPC programme, followed by IPC guidelines, and the lowest compliance was seen in the healthcare-associated infection surveillance section (Table 1).

Strengths and gaps in implementing IPC activities at FMCK

The strengths and gaps related to the different components of the IPC framework are summarised in Table 2 (full details provided in Annex Table 1 and in the supplementary materials). Consistent with the scores, there were gaps in all the components, but the most numerous were observed

under the healthcare-associated infection surveillance; workload, staffing, and bed occupancy; and monitoring/audit components of the IPCAF tool.

Table 1. Baseline IPC compliance level of Federal Medical Centre Keffi (January 2025).

IPCAF Core Components	Score*	Interpretation
IPC programme	85	Advanced
IPC guidelines	77.5	Advanced
IPC education and training	60	Intermediate
Healthcare-associated infection surveillance	42.5	Basic
Multimodal strategies	65	Intermediate
Monitoring/audit of IPC practices	55	Intermediate
Workload, staffing, and bed occupancy	50	Basic
Built environment, materials, and equipment for IPC	65	Intermediate
Overall score (Maximum 800)	500	Intermediate

*Maximum score for each core component was 100. Component levels: 0–25% = inadequate; 25.1–50% = basic; 50.1–75% = intermediate; 75.1–100% = advanced. IPC = Infection prevention and control. IPCAF = IPC Assessment Framework.

Discussion

This study evaluated IPC compliance at FMCK using the WHO IPCAF tool. The findings revealed an ‘intermediate’ level of IPC compliance (500/800, 62.5%), indicating that while some core components were well-implemented, major gaps remained in others. Of the eight IPCAF components assessed, the hospital achieved an advanced level of compliance regarding adapting the IPC programme and IPC guidelines. The challenges, however, were with the implementation of this programme and the adopted guidelines. This is most notable in the healthcare-associated infection surveillance component of the IPCAF tool, in which the hospital scored 42.5%, similar to findings from Misurata Medical Center (MMC) in Libya [22]. Although the hospital has integrated surveillance into its IPC programme—identifying priority HCAs with standard case definitions and training personnel for data collection—implementation remains weak. The absence of a standardised and harmonised data collection system resulted in a lack of available data for review. Consequently, this gap hinders effective monitoring and auditing of the IPC programme at the hospital, thereby impeding the development and execution of tailored, facility-based plans to strengthen IPC measures. The proximate reported reason for this lack of a standardised data collection system was the hospital’s computerised systems’ inability to support record keeping and tracking the parameters highlighted in the HCAI surveillance section of

Table 2. Summarised Strengths strengths and gaps in the different core components of the IPC programme at the Federal Medical Centre Keffi, in January 2025.

Components	Strengths	Gaps
IPC Programme	Dedicated, multidisciplinary IPC team with full-time professionals and an annual plan Active committee with senior leadership support Reliable microbiology lab support	No specific IPC objectives for critical areas No dedicated budget for the IPC programme
IPC Guidelines	Expertise and stakeholder engagement for developing/ adapting guidelines Comprehensive existing guidelines for key areas (e.g., standard precautions, surgical site infection, waste management) Training provided and regular monitoring conducted	Critical IPC guidelines missing (e.g., vascular catheter infections, multidrug-resistant (MDR) pathogens, HCW safety) Frontline HCWs not involved in planning implementation Implementation not adapted to local needs
IPC Education and Training	Trained IPC experts and additional trainers available Interactive training methods used for some staff Annual evaluation of training effectiveness Ongoing professional development for IPC staff	Only new employee orientation provided Administrative and managerial staff never trained No IPC training integrated into clinical specialties (e.g., surgery) No IPC training for patients or family members
Healthcare-Associated Infection Surveillance	Surveillance is a defined IPC program component Surveillance personnel trained in epidemiology, surveillance and IPC Prioritized HCAIs based on local context Active surveillance for surgical site infections and HCW infections Regular evaluations to ensure alignment with priorities Reliable international case definitions used Feedback regularly provided to IPC committee and management	No IT/informatics support for surveillance Critical surveillance gaps (device-associated, MDR pathogens, epidemic-prone infections) No standardized data collection or quality review processes Inadequate microbiology lab capacity Surveillance data not used for facility improvement plans No regular AMR analysis Feedback not provided to frontline HCWs or clinical leaders Feedback limited to written reports only
Multimodal Strategies	Multimodal strategies are used for IPC implementation Education and training component includes interactive sessions Visible leadership support with empowered multidisciplinary teams	No systems change interventions (e.g., ergonomic placement of supplies) No timely feedback of monitoring results No team communication initiatives across units Quality improvement and patient safety colleagues not engaged in developing or promoting IPC multimodal strategies Bundles and checklists not included
Monitoring/ Audit of IPC Practices	Trained monitoring/audit personnel available Hand hygiene, cleaning, disinfection/sterilization, and waste management monitored Annual WHO Hand Hygiene Self-Assessment Framework conducted Feedback provided to IPC team, hospital management, and senior administration Annual reporting of monitoring data conducted	No monitoring plan with clear goals and targets Critical IPC practices not monitored (catheter insertion/care, wound dressing, transmission-based precautions, MDRO isolation, handrub soap consumption, antimicrobial use) Feedback not provided to frontline HCWs or department leaders No assessment of safety culture
Workload, Staffing, and Bed Occupancy	System in place to act when staffing levels are considered low compared to needs Ward design meets international bed capacity standards in some departments Bed occupancy maintained at one patient per bed >1 meter spacing between beds ensured	Staffing levels not assessed based on patient workload No agreed WHO or national HCW-to-patient ratio maintained across the facility Patients placed on beds in corridors System to address exceeded bed capacity not managed by hospital administration
Built Environment, Materials, and Equipment for IPC	Functioning hand hygiene stations at all points of care Sufficient functioning toilets in outpatient and inpatient settings Functioning ventilation in patient care areas Isolation capacity with single or cohort rooms for patients with similar pathogens Functional incinerator for infectious and sharp waste Dedicated decontamination and sterile supply department Reliable and continuous supply of sterile and disposable equipment and items	Water services available only ≥ 5 days/week and insufficient quantity Safe drinking water not consistently available across all wards Unreliable energy/power supply No daily signed cleaning records Cleaning materials available but not well-maintained Personal protective equipment (PPE) not continuously available in sufficient quantities Waste bins inadequate (missing lids, overfilled, wrong number) Waste dump overfilled and unfenced No wastewater treatment system

the IPCAF. However, the more distal reason for suboptimal IPC implementation in low-resource contexts like Nigeria likely relates to the lack of resources required to build the institutional capacity to support these programmes.

Our study at FMCK aligns with findings from other low- and middle-income countries (LMICs), highlighting systemic challenges in IPC compliance and potential equity gaps. A Malawian study on 33 healthcare facilities had a median IPCAF score of 445 out of 800, corresponding to an intermediate IPC implementation level, similar to FMCK. However, this median score (445/800) was lower than FMCK's score of 500/800 [24]. Comparatively, some studies reported higher IPC compliance levels, such as Misurata Medical Center (MMC) in Libya, which had an advanced level with a score of 612.5 [22], and a study in Germany that reported an even higher score of 690 [23]. In contrast, other studies reported lower IPC compliance than FMCK, including Lira University Hospital in Uganda, which attained only a basic level with a score of 225 [15], and a study of 11 tertiary care hospitals in Bangladesh, where the overall median IPCAF score was 355, also indicating a basic level of compliance [5]. When compared to the only other IPC compliance study conducted in Nigeria which involved 99 health facilities in Rivers State [16], FMCK generally scored higher than the health facilities included in that study. While none of the health facilities had a score above 500, the Rivers State study reported that only two facilities had overall scores between 451 and 500, with 41 healthcare facilities scoring between 401 and 450. Overall, these findings suggest a persistent pattern of low adherence to IPC guidelines in LMICs driven by a variety of systemic factors.

Furthermore, a 2024 assessment of 33 Malawian hospitals found that two-thirds (22 of 33) of the hospitals were classified as intermediate [24], comparable to FMCK. However, FMCK demonstrated further progress in specific components such as healthcare-associated infection (HCAI) surveillance. For instance, while 21 of the 33 Malawian facilities reported that surveillance personnel had not received training in basic epidemiology and IPC surveillance for HCAs, FMCK's surveillance personnel had received such training. Conversely, the Malawian hospitals outperformed FMCK in IPC training and education, as administrative staff and cleaners received IPC training—an aspect missing at FMCK. These comparisons underscore the varying levels of IPC implementation across different settings, with health facilities in resource-limited contexts experiencing greater difficulties in compliance with IPC standards and recommendations. This reinforces the need for structured training programmes and continuous improvement efforts to strengthen IPC compliance, particularly in low-resource facilities.

One positive finding in our study was that FMCK had an established IPC programme, an IPC committee, and a dedicated IPC focal person. However, the facility lacked

a structured monitoring plan with defined goals, targets, and activities, mirroring findings from a study on IPC in three tertiary healthcare facilities in Freetown, Sierra Leone [14] and a study conducted in Germany where about 40% of German hospitals reported a similar gap [23]. This gap potentially affects the proper planning, coordination, and implementation of activities required by the IPC programme and its guidelines.

The absence of a dedicated IPC budget was another critical challenge observed at FMCK. This is consistent with studies in Sierra Leone [14] and Lira University Hospital in Uganda [15], but differs from findings in Ghana, where 37.5% of facilities had a dedicated IPC budget [25]. The lack of financial allocation for IPC activities is a recurring issue in many LMICs, affecting the sustainability of IPC interventions.

Access to clean and safe water, a fundamental component of IPC, remains a challenge in many LMICs. At FMCK, water services were available on average five or more days per week, but not always in sufficient quantities, and safe drinking water stations were intermittently available in only a few locations. This finding is consistent with studies from Sierra Leone, where only one of three facilities had a seven-day water supply, and none had constant, safe drinking water for patients, visitors, or HCWs [14]. Similar challenges were reported in Pakistan [26]. In contrast, studies conducted in Germany, Georgia, and Austria found that most healthcare facilities had an uninterrupted supply of clean water and electricity [23,27,28], showing further instances of inequity in access to quality healthcare. Evidence suggests that HCWs in facilities with a consistent water supply are 1.6 times more likely to adhere to IPC protocols compared to those without continuous access [14]. Lack of consistent access to clean water increases the risk of HCAs and exacerbates the consequences of their prevalence.

Senior leadership participation in IPC activities at FMCK was comparable to findings in Ghana, where 37.5% of facilities demonstrated leadership engagement [25]. However, this contrasts with a study in Germany, which reported a lack of senior leadership support for IPC programmes [23]. Training gaps were another major issue. At FMCK, only new employees received IPC training, and administrative and managerial staff were excluded. This finding is similar to findings from a study in Uganda, where 72.6% of facilities had never conducted in-service IPC training [29]. The lack of routine IPC training for employees, combined with the exclusion of administrative and managerial staff from IPC training, is another key factor impacting the effective implementation of the IPC programme and its guidelines.

Based on our study findings, we have developed the following short-term, medium-term, and long-term recommendations.

Short-term

These strategies require minimal funding and can be implemented within six months. The hospital IPC team, supported by relevant stakeholders, should conduct regular IPC training for all HCWs and administrative staff, beginning at orientation and continuing at least annually. Additionally, clearly defined, context-specific IPC objectives and action plans should be developed by the facility's IPC team. Regular audits and feedback should be shared with department heads, HCWs, and the IPC committee to enhance compliance. The training components can be both easily and cost-effectively implemented through the further development and adoption of the recently piloted self-paced and mobile-ready online IPC training for health workers in Nigeria, as detailed by Thomas and colleagues [30]. In their pilot study that included 372 health workers across different roles, they recorded a significant increase in post-test scores of the participants from 29% to 54%, indicating its potential for providing an effective, low-cost, scalable way to train health workers in IPC.

Medium-term

Medium-term recommendations require moderate levels of funding commitments and are designed for implementation over two to three years. National IPC stakeholders spearheaded by the Nigeria Centre for Disease Control and Prevention (NCDC) should develop and implement structured systems for routine audits, feedback, and compliance tracking. At the facility level, the WHO IPCAF tool should be applied at least quarterly to monitor progress and guide improvements at both the national and facility levels. IPC training should also be extended to include administrative staff, patients, and caregivers. This can be achieved and standardised through scaling up the multi-module training programme co-developed and piloted by the NCDC, designed to address the complexity of behavioural and systemic change required for IPC implementation in clinical practice [31]. This programme, with its participatory approach that prioritises institutional and systemic change, has been shown to help health facilities tailor actionable IPC improvement plans.

Long-term

These strategies require substantial funding and are designed for implementation over five years or above. The government, through the NCDC and its implementing partners, should ensure sustained supply of IPC materials and personal protective equipment (PPE) in health facilities. A comprehensive HCAI surveillance system should be established to track device-associated infections, clinically

defined infections, infections caused by multidrug-resistant (MDR) pathogens, epidemic-prone infections, and infections in vulnerable populations. This system should incorporate standardised data collection methods, such as active prospective surveillance, to monitor trends and inform targeted interventions.

Implications for practice and policy

The findings of this study have important implications for IPC practices at FMCK and similar healthcare facilities. Addressing the identified gaps—such as improving healthcare-associated infection surveillance, ensuring adequate staffing and bed capacity, and securing dedicated funding for IPC activities—has the potential to improve patient outcomes by reducing the incidence of HCAs and contributing to the fight against AMR. Strengthening leadership commitment, enhancing training programmes, and leveraging technology for data collection and monitoring could further improve IPC compliance. National guidelines and dedicated funding are needed to support IPC programmes, particularly in resource-constrained settings.

Strengths and limitations

Our study has several strengths. First, it employed the standardised WHO-recommended IPCAF tool, enabling comparability with other studies. Second, it provides a baseline assessment of IPC compliance at FMCK, useful for tracking future progress. Third, the findings were reported in line with STROBE guidelines. However, limitations exist. The use of self-reported data from the IPC focal person may introduce bias, though this was mitigated through cross-validation with other staff. Additionally, a limitation of the IPCAF scoring mechanism is that an overall score can obscure critically low performance in individual components. To address this, we have provided detailed findings for each component alongside the raw data in the supplementary materials. Finally, as a single-site study, the findings may not be generalisable to other tertiary facilities in Nigeria. Future research should involve multi-site, longitudinal studies and incorporate patient outcome data for a more comprehensive evaluation of IPC implementation in low-resource settings.

Conclusion

This study provides a critical baseline assessment of IPC compliance at FMCK, revealing an 'intermediate' level of IPC compliance with the WHO-recommended standards. At present, the health facility has succeeded

in establishing the necessary IPC frameworks and structures. However, our study identified notable gaps regarding the implementation and operationalisation of these structures particularly in the areas of healthcare-associated infection surveillance, workload, staffing and bed occupancy, and monitoring. Our findings contribute to the growing body of literature highlighting the need for structured IPC programmes, adequate funding, and improved infrastructure in LMIC healthcare facilities. Addressing these gaps will be crucial for strengthening global health security and reducing healthcare-associated infections.

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AI Statement

The author declares that AI was not used in this article.

Annex

Annex table 1. Strengths and gaps in IPC (Infection prevention and control) programme, guidelines, IPC education and training identified during a baseline IPC assessment at Federal Medical Centre Keffi, in January 2025. IPC programme at the Federal Medical Centre Keffi, in January 2025.

Components	Strengths	Gaps
IPC Programme	<p>IPC programme with a clearly defined annual activity plan</p> <p>The IPC team comprises IPC professionals supporting the IPC programme</p> <p>The IPC team has full-time IPC professionals (one per <=250 beds)</p> <p>The IPC team and focal person have dedicated time for IPC activities; the team includes both doctors and nurses</p> <p>The IPC committee actively supports the IPC team</p> <p>Senior facility leadership, senior clinical staff, and facility management are included in the IPC committee</p> <p>Some commitment and support for the IPC programme by senior leadership (participation in morbidity and mortality meetings)</p> <p>Microbiological laboratory support (delivering results reliably)</p>	<p>No clearly defined IPC objectives in specific critical areas!</p> <p>No allocated budget specifically for the IPC programme</p>
IPC Guidelines	<p>Expertise for developing or adapting IPC guidelines present.</p> <p>There are guidelines for standard precautions, hand hygiene, transmission-based precautions, outbreak management and preparedness, prevention of surgical site infections, prevention of hospital-acquired pneumonia, prevention of catheter-associated urinary tract infections, disinfection and sterilization, and waste management.</p> <p>Guidelines in the facility are consistent with national/ international guidelines and adapted to the local needs and resources while maintaining key IPC standards.</p> <p>Relevant stakeholders are involved in the development and adaptation of the IPC guidelines.</p> <p>HCW have received specific training related to new or updated IPC guidelines.</p> <p>There is regular monitoring of IPC implementation.</p>	<p>There are no guidelines for: prevention of vascular catheter-associated bloodstream infections, prevention of transmission of multidrug-resistant (MDR) pathogens, HCWs protection and safety, injection safety, and antibiotic stewardship</p> <p>Frontline HCWs are not involved in planning the implementation of IPC guidelines.</p> <p>Implementation of the guidelines not adapted according to the local needs and resources.</p>
IPC Education and Training	<p>Personnel with IPC expertise to lead the training and additional non-IPC personnel with adequate skills to serve as trainers and mentors present</p> <p>Some personnel were trained using interactive training sessions (e.g., simulation and bedside training)</p> <p>Periodic evaluation of the effectiveness of training programmes is conducted annually</p> <p>Ongoing development/education is offered for IPC staff (e.g., regularly attending conferences, courses)</p>	<p>Only new employee orientation for HCWs, cleaners and other personnel present.</p> <p>Administrative and managerial staff have never received IPC training</p> <p>No IPC training integrated in the clinical practice and training of some specialties (e.g., surgery)</p> <p>No specific IPC training for patients or family members</p>

Annex Table 2. Strengths and gaps in IPC (infection prevention and control) surveillance, monitoring, audit, and multimodal strategies observed during a baseline IPC assessment at Federal Medical Centre Keffi, in January 2025.

Components	Strengths	Gaps
Healthcare-Associated Infection Surveillance	<p>Surveillance is a defined component of the IPC programme</p> <p>Personnel responsible for surveillance activities are present and trained in basic epidemiology, surveillance, and IPC (capacity to oversee surveillance methods, data management, and interpretation)</p> <p>Prioritisation exercise has been done to determine the HCAs to be targeted for surveillance according to the local context</p> <p>There is surveillance for surgical infections and infections that affect HCWs</p> <p>There are regular evaluations to determine if surveillance is in line with the current needs and priorities for the facility</p> <p>Methods for surveillance</p> <p>Reliable surveillance case definitions according to international standards are present.</p> <p>Information analysis and dissemination</p> <p>Feedback of surveillance information regularly provided to the IPC committee and non-clinical management.</p>	<p>Informatics/IT support to conduct surveillance not available (e.g., equipment and electronic health records)</p> <p>No surveillance for, device-associated infections, clinically defined infections, infection caused by MDR pathogens, local priority epidemic prone infections and infections in vulnerable populations</p> <p>Methods for surveillance</p> <p>No standardised data collection methods</p> <p>No processes to regularly review data quality</p> <p>No adequate microbiology and laboratory capacity to support surveillance</p> <p>Information analysis and dissemination</p> <p>Surveillance data not used to make tailored facility-based plans for improving IPC</p> <p>Antimicrobial drug resistance is not analysed on a regular basis</p> <p>Feedback of surveillance information not provided to frontline HCWs, clinical leaders/heads of departments.</p> <p>Feedback up to date surveillance information provided by written information only.</p>
Multimodal Strategies	<p>Multimodal strategies are used to implement IPC interventions</p> <p>Education and training</p> <p>The multimodal strategy includes education and training using written information, oral instruction, and additional interactive training sessions (includes simulation and bedside training)</p> <p>Safety climate and culture change</p> <p>Leaders show visible support, and teams and individuals are empowered so that they perceive ownership of the intervention.</p> <p>A multidisciplinary team is used to implement IPC multimodal strategies</p>	<p>Systems change</p> <p>There are no interventions for ergonomics and accessibility, such as the best placement of the central venous catheter set and tray.</p> <p>Monitoring and feedback</p> <p>Timely feedback of monitoring results to HCWs and key players is not provided</p> <p>Communications and reminders</p> <p>Additional methods/ initiatives to improve team communication across units and disciplines (for example, by establishing regular case conferences and feedback rounds) not done.</p> <p>Quality improvement and patient safety colleagues are not engaged in developing or promoting IPC multimodal strategies.</p> <p>The strategies do not include bundles or checklists</p>
Monitoring/Audit of IPC Practices	<p>Trained personnel responsible for monitoring/audit of IPC practices and feedback present.</p> <p>Hand hygiene compliance, cleaning the ward environment, disinfection and sterilisation of medical equipment, and waste management processes and indicators are monitored.</p> <p>An annual survey using the WHO Hand hygiene self-assessment framework is conducted.</p> <p>Feedback report on the state of the IPC activities/ performance is provided to the IPC team, hospital management and senior administration.</p> <p>Annual reporting of monitoring data is conducted</p>	<p>No monitoring plan with clear goals, targets, and activities</p> <p>Intravascular catheter insertion and care, wound dressing change, transmission-based precautions and isolation to prevent the spread of multidrug resistant organisms (MDRO), consumption of alcohol-based handrub or soap, consumption of antimicrobial agents are not monitored.</p> <p>Feedback auditing reports on the state of the IPC activities/ performances not provided to frontline HCWs, department leaders and the IPC committee</p> <p>No assessment of safety cultural factors in the facility</p>

Annex Table 3. Strengths and gaps in workload, staffing, bed occupancy, built environment, materials, and equipment for IPC (infection prevention and control) observed during a baseline IPC assessment at Federal Medical Centre Keffi, in January 2025.

Components	Strengths	Gaps
Workload, Staffing, and Bed Occupancy	<p>System in place to act when staffing levels are deemed low compared to needs</p> <p>Design of wards in the facility in accordance with international standards regarding bed capacity in some departments</p> <p>Bed occupancy kept at one patient per bed</p> <p>Adequate spacing of >1 metre between patient beds ensured in the facility</p>	<p>Staffing levels not assessed according to patient workload</p> <p>There is no agreed WHO or national ratio of HCWs to patients maintained across the facility</p> <p>Patients in the facility are placed in beds standing in the corridor outside of the room.</p> <p>System in place to assess and respond when adequate bed capacity is exceeded is not the responsibility of the hospital administration/management</p>
Built Environment, Materials, and Equipment for IPC	<p>Functioning hand hygiene stations are available at all points of care</p> <p>Sufficient numbers of toilets or improved latrines are available, and all are functioning at the outpatient and inpatient settings</p> <p>Functioning environmental ventilation is available in inpatient care areas</p> <p>Have single patient rooms or rooms for cohorts of patients with similar pathogens if the number of isolation rooms is insufficient (TB, Measles, Ebola)</p> <p>Incinerator or alternative treatment technology for treatment of infectious and sharp waste present, functional, and of sufficient capacity</p> <p>Healthcare facility provides a dedicated decontamination area and/or sterile supply department for the decontamination and sterilisation of medical devices and other items</p> <p>Reliably have sterile and disinfected equipment ready for use</p> <p>Disposable items (gloves, injection safety devices) are continuously available.</p>	<p>Water services are only available on an average of ≥ 5 days per week and not in sufficient quantity.</p> <p>Reliable, safe drinking water stations are sometimes present and accessible for staff, patients, and families, but not at all times and not for all wards.</p> <p>Energy/power is only available sometimes</p> <p>No accessible record of cleaning, signed by the cleaners each day, for surfaces or floors being cleaned</p> <p>Appropriate materials (buckets, mops, detergent) for cleaning are available, but not well-maintained</p> <p>PPEs are not continuously available in sufficient quantities</p> <p>Separate bins for waste collection are available but inadequate: lids missing or bins more than $\frac{3}{4}$ full, only 2 bins (instead of 3), or bins at some but not all waste generation points</p> <p>Functional burial pit/ waste dump or municipal pick-up available, but the dump is overfilled and not fenced.</p> <p>Wastewater treatment systems are not present.</p>