REGIONAL MEETING ON INFECTION PREVENTION AND CONTROL

BEYOND COVID-19

March 2021

PAHO
Pan American Health Organization
World Health Organization
REGIONAL OFFICE FOR THE Americas

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Washington, D.C., 2021

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PAHO/PHE/IMS/COVID-19/21-0014

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ACRONYMS AND ABBREVIATIONS

AMR	Antimicrobial resistance
CDC	U.S. Centers for Disease Control and Prevention
COVID-19	Coronavirus disease
HAI	Healthcare-associated infection
IPC	Infection prevention and control
PAHO	Pan American Health Organization
PPE	Personal protective equipment
WHO	World Health Organization

SUMMARY

This report presents the main issues, discussions, and challenges involved in implementing infection prevention and control (IPC) programs in the Region of the Americas, as explained by the key actors who participated in the *Regional Meeting on Infection Prevention and Control: Beyond COVID-19*.

In addition to general conceptual presentations, the specific experiences of some of the countries were described, followed by the sharing of experiences in small working groups. Using this conceptual and applied approach, the meeting discussed the progress made in the organization and structure of IPC programs; development and implementation of guidelines; training and education; surveillance of healthcare-associated infections (HAI); and monitoring/audit and feedback. It concluded with thoughts and lessons learned from the multimodal strategies and the challenge posed by systemic change.

Highlighted among the conclusions was the progress made throughout the Region – despite the diversity of situations observed –, ranging from highly institutionalized programs to the establishment of activities and standards in health facilities. The coronavirus (COVID-19) pandemic has had an impact, heightening awareness about IPC programs, standards, training entities, and staffing. However, reassignment, turnover, and an excessive burden on human resources were observed, along with a weakening of other HAI surveillance.

It was recommended that national and local IPC programs be strengthened with guaranteed budgets and staffing, and that consideration be given to the core components in a gradual approach based on local priorities and available resources, with multimodal thinking to facilitate a culture of safety and quality in people-, community-, and environment- centered care.

BACKGROUND AND RATIONALE

Implementing infection prevention and control (IPC) programs in the countries is no simple task. The overall picture includes a lack of specialized staff, overlapping functions, and limited or nonexistent budgets. The *World Health Organization (WHO) Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level* provides a framework of recommendations and best practices in IPC to help countries develop and implement programs to combat infectious threats and guarantee quality in health service delivery.[1] The core components of IPC are: 1) IPC programs; 2) IPC guidelines at the national and health care facility levels; 3) IPC education and training; 4) surveillance of healthcare-associated infections (HAI); 5) multimodal strategies for the implementation of IPC activities; 6) monitoring/audit and feedback; 7) workload, staffing, and bed occupancy in health facilities, and (8) built environment, materials, and equipment for IPC in health facilities. Experience implementing the core components of IPC nationally has shown that countries and facilities should consider a gradual approach based on local priorities and resource availability.[2]

The International Health Regulations (IHR 2005) require Member States to notify WHO of events that may constitute a public health emergency of international concern and to indicate the importance of IPC practices in health facilities to contain HAIs after such events.[3] Furthermore, the IHR tool for monitoring and evaluating the core capacities specifically includes IPC among its 20 indicators.[4] Implementing IPC practices in health facilities will support the strengthening of IHR 2005 implementation.

The coronavirus (COVID-19) pandemic has shown the real potential for the spread of infectious agents as global threats, with unprecedented public health implications. The emergence of a new virus whose transmission mechanisms and clinical course are unclear underscores the need to follow IPC practices, including standard and transmission-based precautions, at both the national and health facility level.[5]

Finally, the COVID-19 pandemic in health facilities has also alerted health authorities to the increase in HAIs associated with multidrug-resistant pathogens due to non-compliance with standard and transmission-based precautions, poor environmental sanitation, and the improper use of personal protective equipment (PPE).[6]

[1] World Health Organization Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level [Internet]. Geneva: WHO; 2017 [cited: 25 March 2021]. Available from: https://apps.who.int/iris/handle/10665/251730.

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[3] World Health Organization. International Health Regulations (2005) [Internet]. Geneva: WHO; 2016 [cited: 25 March 2021]. Available from: https://apps.who.int/iris/handle/10665/246107

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[5] Vehreschild MJGT, Tacconelli E, Giske CG, Peschel A. Beyond COVID-19-a paradigm shift in infection management? Lancet Infect Dis [Internet]. 9 October 2020 [cited 25 March 2021]:S1473-3099(20)30789-1. Available from: https://doi.org/10.1016/S1473-3099(20)30789-1). Article published online before in print. PMID: 33045187; PMCID: PMC7546645.

[6] Patel A, Emerick M, Cabunoc MK, Williams MH, Preas MA, Schrank G et al. Rapid Spread and Control of Multidrug-Resistant Gram-Negative Bacteria in COVID-19 Patient Care Units. Emerg Infect Dis [Internet]. April 2021[cited 25 March 2021];27(4):1234-1237. Available from: https://doi.org/10.3201/eid2704.204036.

OBJECTIVES

The main objectives of the meeting (see Annex 1 for the meeting program) were to:

1. present country experiences in implementing the core components of IPC defined by WHO, in the context of COVID-19;
2. provide a forum for IPC experts to share experiences;
3. establish regional strategic lines of technical cooperation in IPC.

The audience consisted of national IPC focal points from the ministries of health of the countries of the Region, as well as professionals from the countries' infection prevention and control programs. It should be noted that the meeting was well attended, bringing together more than 130 participants from Member States in North, Central, and South America (see Annex 2 for the list of participants). Together with this report, a thematic document will be published that contains the main points discussed and conclusions reached. Another document will also be published with lessons learned and good practices in implementing IPC programs in the context of COVID-19 in the Region of the Americas, with special emphasis on developing a roadmap for strategic cooperation in IPC with the Member States of the Region.

REGIONAL MEETING ON INFECTION PREVENTION AND CONTROL: BEYOND COVID-19

> *The coronavirus pandemic is a great opportunity to begin transitioning to a new model of civilization [...] In the new age before us, nature no longer belongs to us; we belong to nature.*

Boaventura de Sousa Santos.
O Futuro Começa Agora: Da Pandemia à Utopia (2021)

The virtual meeting began on Tuesday, 23 March 2021 at 10:00 a.m. (Washington, D.C. time), with 114 delegates from 35 Member States of the Pan American Health Organization (PAHO) in attendance. Valeska Stempliuk (PAHO Representative Office in Jamaica) welcomed the participants on behalf of Sylvain Aldighieri (PAHO). João Toledo (PAHO) then presented the objectives and logistics of the meeting and stated that the intention was to share country experiences in the implementation of the core components of IPC defined by WHO in the context of COVID-19, provide a forum for IPC experts to share experiences, and establish regional strategic lines of technical cooperation in IPC. The final products would be a meeting report and a document with lessons learned and good practices for implementing IPC programs in the Region of the Americas.

SESSION 1

(Tuesday, 23 March 2021)

REGIONAL STATUS OF INFECTION PREVENTION AND CONTROL PROGRAMS (CORE COMPONENT 1)

CONCEPTUAL PRESENTATIONS

REGIONAL IMPLEMENTATION OF THE WHO GUIDELINES ON CORE COMPONENTS OF INFECTION PREVENTION AND CONTROL PROGRAMMES AT THE NATIONAL AND ACUTE HEALTH CARE FACILITY LEVEL: STATUS AND THE WAY FORWARD.

JOÃO TOLEDO (PAN AMERICAN HEALTH ORGANIZATION)

João Toledo centered his presentation on the emergence and reemergence of pathogens in the Americas, which had resulted in a critical need to consolidate the lessons learned from Ebola, detection (the care of health workers), prevention (biosafety), and responses (containment measures such as isolation). Another key point in his presentation was that the IPC program had core components found in the WHO Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level, where the multimodal strategy enhanced relevant program linkages in an environment conducive to the establishment of guidelines, education and training, surveillance, and monitoring/audit and feedback.

The regional picture showed that policies, legislation, and frameworks for IPC programs had been implemented, since more than a third of the countries had specific IPC policies and more half linked them

with other programs. The majority had specific guidelines, all had training entities, and 40% conducted specific epidemiological surveillance of HAIs, indicating significant but mixed progress. The speaker noted that COVID-19 had spurred the production of numerous technical papers. Of the 256 that were available, 95 were guidelines and procedures exclusively for the current pandemic. In addition, greater importance was being given to numerous training initiatives to upgrade the skills of human resources in this area. Key competencies (knowledge, skills, and attitudes) of IPC professionals needed to be bolstered in order to foster a deep understanding of situations and a critical, rational, analytical, and reflective thinking process for assessment and informed decision-making related to HAI prevention and control and antimicrobial resistance (AMR).

An interesting point that was raised is the emphasis on multimodal strategies as a necessary comprehensive approach based on a cycle of continuous improvement, where the monitoring and epidemiological surveillance of HAI is key. In that context, the greatest challenges were to provide and strengthen programs in health care settings and move beyond COVID-19. Qualitative research was therefore recommended to explore and identify the facilitators and challenges of IPC implementation strategies during the outbreak, what needed improvement, and the perceived effectiveness, in order to successfully contain the spread of the virus, given the influence of organizational culture on outbreak management.

COVID-19 AND ITS IMPACT ON INFECTION PREVENTION AND CONTROL PROGRAMS AND OUTBREAKS OF HEALTHCARE-ASSOCIATED INFECTIONS.

MICHAEL BELL (DIVISION OF HEALTHCARE QUALITY PROMOTION, CENTERS FOR DISEASE CONTROL AND PREVENTION)

Michael Bell began his talk by presenting the current COVID-19 data in the United States, explaining that incidence was declining after the big spike in the winter and that health care and intensive care resources were returning to pre-pandemic levels. He said that health workers were overworked and exhausted and that vaccinating the population and health professionals was a priority. He commented that a side effect of the pandemic was a drop in flu cases.

With respect to COVID-19 IPC activities, there was greater awareness and acceptance of PPE. The speaker drew attention to the key importance of indoor air management, patient positioning, an improved environment for workers, and the constant use of masks, since the pandemic had shown that interaction with patients and among the members of health teams were sources of infection. Here, he pointed to the need for better sick leave policies.

With respect to PPE for COVID-19, supply constraints stimulated other sources of supply; PPE use was spreading from professional settings to the community, and there was greater evidence of the need for improvements in medical masks to achieve better adjustment and filtration.

Finally, Bell touched on other impacts of COVID-19, such as less attention to other IPC needs and exhaustion and mental health issues among health workers.

Since community activities and emerging strains could contribute to another wave of infection, continued human-centered surveillance was needed, with emphasis on three aspects: (1) the central and critical importance of human resources – a key factor in fighting the pandemic – with investment in training and

staff, among other activities; 2) recognition that, despite the tragedy, progress was made in best practices and products; and 3) maintenance of constant, sustained surveillance in infection control.

COUNTRY EXPERIENCES

CHILE.
MAURO ORSINI (MINISTRY OF HEALTH)

One of Chile's strengths is that it has a National HAI Control Program and institutionalized IPC with objectives and standards. The program dates back to 1984 and was buttressed in 2011 with Technical Standard No. 124, which defines IPC settings, organization, functions, and tasks. Chile also has an extensive legal framework consisting of regulations, Law No. 20,584 on people's rights and responsibilities with respect to actions related to health care, regulation of hospitals and clinics, and an accreditation system.

Specifically, within the framework of IPC, active epidemiological surveillance is conducted using annual reference indicators, standardized definitions, and an online system called SICARS, managed by trained personnel. Progress is being made towards computerized mobile epidemiological surveillance (SICARS phase 2), with data on antimicrobial resistance of public health concern.

Mauro Orsini highlighted three key aspects: external evaluation, the training component, and multimodal online strategies that make it possible to reach many people where they are and when it is convenient for them. Training is also conducted in local programs with training facilitators.

The speaker underscored that some 70,000 students had received online training in COVID-19 (in 2020). With regard to surveillance, he indicated that the IPC program continuously monitored HAI outbreaks and noted that, in this scenario, 7.5% of the people infected with COVID-19 were health professionals (March 2021).

In conclusion, Orsini stressed that having a sound national and local program before and during epidemics and outbreaks was essential. This was an investment, not an expense. It was very important to have human resources with education, training, and time. Also essential was the existence of a single program to manage the relevant information that had regulatory capacity.

The challenges exist in a context of exhausted health teams and epidemiological changes (with new pathogens and outbreaks of infections from the 1990s); thus, strengthening the HAI control team during the current demand for IPC in health care is a compelling need.

BARBADOS.
COREY FORDE (THE QUEEN ELIZABETH HOSPITAL)

Corey Forde's presentation focused on the experience of the team at The Queen Elizabeth Hospital in Barbados, where a series of infection control activities are carried out in the context of COVID-19. Barbados is a small country and has experience fighting infections. The speaker displayed a 2017 infection prevalence study, stating that it was just the tip of the iceberg.

Based on the core components of IPC, Forde questioned the culture of routine in diagnostics, indicating that all information resources were used to re-examine day-to-day practices. Based on the application of the WHO tool for evaluating the core components of IPC programs, the team's leaders made a commitment to improving and monitoring the prescription of antibiotics.

The speaker underscored the need to ensure that the staff involved had time, authority, and responsibility. He stressed that in an environment of limited resources, everything necessary should be done to get everyone involved, using all communications media to disseminate information. This risk communication strategy should not only involve the health team but educate providers, patients, and the community at large through a single message aimed at controlling infections in the country.

In short, the presentation of experiences revealed the wide variety of situations, which ranged from a formal program to innovative experiences arising from the needs of a hospital team. Forde also noted a growing emphasis on the human resources of IPC programs in the context of the COVID-19 pandemic, in terms of the need to protect them and the resilience and capacity they have displayed in this pandemic.

SESSION 2

(Thursday, 25 March 2021)

THE IMPORTANCE OF GUIDELINES, EDUCATION, AND TRAINING (CORE COMPONENTS 2 AND 3)

The session began with a brief summary of the points discussed on the first day of the meeting. This session covered two of the core components of IPC programs: development of guidelines and training of human resources. As in the first session, since one of the meeting's explicit objectives was to produce and share knowledge gleaned from national experiences, there was a general introductory presentation, and the experiences of two countries were presented.

CONCEPTUAL PRESENTATION

THE IMPORTANCE OF GUIDELINES, EDUCATION, AND TRAINING IN THE IMPLEMENTATION OF INFECTION PREVENTION AND CONTROL PROGRAMS (CORE COMPONENTS 2 AND 3).

FERNANDO OTAÍZA (PAN AMERICAN HEALTH ORGANIZATION)

Fernando Otaíza began his presentation emphasizing that the development of guidelines (standards, rules, guides, and regulations) and training were two key, interrelated components of IPC programs: guidelines should reflect practice that would reduce infections and, to accomplish this, education and training of health workers must continue.

The speaker said that guidelines should be based on evidence known and understandable to those responsible for implementing them and should be focused on four key questions: 1) What should be done that effectively

reduces HAIs? 2) What should we teach? 3) What should we implement? and 4) What processes should we measure? These questions should be clear and simple and specify the target group and responsible party. The guidelines could be standard or transmission-based precautions and, depending on the context and type of care, could also be specific for preventing prevalent infections (e.g., urinary tract infections).

Otaíza stressed that all professionals responsible for the health care delivery program, such as clinical, laboratory, and janitorial staff, as well as administrative and managerial support staff, should be educated and trained. Different methods could be employed to improve hand hygiene and reduce HAIs, such as training in problem-solving, hands-on workshops, focus groups that address certain hospital areas or tasks, peer-to-peer training, classroom simulations, and in-service "bedside" training. The speaker noted that education and training were part of the multimodal strategies.

Finally, Otaíza indicated that an important crosscutting aspect of the two core components was that the guidelines and training lines could both be at the national level, but they should be implemented and adapted operationally at all local levels. The national level should offer guidance and recommendations for training in health facilities. In this same vein, all health workers should be educated in HAI control through task- or team-oriented strategies, including different strategies, focused on HAI and AMR prevention and control, and be based on scientific evidence and the measurement of adherence to the guidelines. The existence of permanent HAI control programs with strong staff training components based on clear guidelines was one of the pillars of epidemic and pandemic preparedness and response.

COUNTRY EXPERIENCES

TRINIDAD AND TOBAGO.
RAJEEV PEEYUSH NAGASSAR (EASTERN REGIONAL HEALTH AUTHORITY)

Rajeev Peeyush Nagassar opened his presentation on the importance of guidelines, education, and training in Trinidad and Tobago by saying that planning and budgeting should go hand in hand. He observed that the country's last IPC manual was from 2011. Produced in collaboration with PAHO, the manual contained policies and guidelines for the public and private sector. Therefore, it was important to update it for the training of health workers.

The IPC subcommittee of the National AMR Coordinating Committee is responsible for directing IPC activities. Trinidad and Tobago has tools such as the WHO IPC Assessment Tool (IPCAT2), which were used for situation analysis, planning, and understanding the current national situation. This helped the authorities decide that training and guideline updating were necessary, as was prioritization in health planning.

There are currently four guidelines: Guideline 1, "HAI prevention and control"; Guideline 2, "Occupational safety and health"; Guideline 3, "Sterilization and disinfection"; and Guideline 4, "Environmental sanitation". Guideline 5, "HAI Surveillance", is being finalized.

With regard to the specific topic of education and training, one university offers certificate in IPC, and PAHO provided training in 2019, just prior to the pandemic, which was very useful for nurses. Nonetheless, there is a need for training in HAIs and COVID-19. PAHO also provided remote training during the pandemic, which proved very useful and is recommended going forward. The speaker said that the current pandemic had altered the situation in the country, realigning priorities and emphasizing stakeholder engagement.

Finally, the speaker declared that guidelines, education, and training were essential for the implementation of IPC training and guidelines and that technical cooperation had been key to identifying gaps and aligning the plan and budget. This was important, since a plan without a budget was nothing but a wish list. The plan became viable through PAHO's involvement.

PARAGUAY.

REBECA GUERÍN (NATIONAL PROGRAM FOR THE PREVENTION, SURVEILLANCE, AND CONTROL OF HOSPITAL INFECTIONS, NATIONAL DIRECTORATE OF HEALTH SURVEILLANCE, MINISTRY OF HEALTH)

Rebeca Guerín opened her presentation commenting that Paraguay had a National Program for the Prevention, Surveillance, and Control of Hospital Infections (Law No. 4982) that covered nine areas, one of which was staff training. An initial aspect to note was that the COVID-19 pandemic had increased staffing at the central level of the National Program for the Prevention, Surveillance, and Control of Hospital Infections and had made it possible to add staff in different care facilities (Resolution No. 204 of 2020). Among the strategies implemented, the speaker mentioned the preparation and publication of national standards, such as the Technical Guide for Infection Prevention and Control during the Care of Suspected or Confirmed Cases of COVID-19, produced by consensus with national experts and representatives of scientific societies, and the Protocol for Risk Classification and Management of Exposed Health Workers and Contact with a Case Positive for SARS-CoV-2. An HAI Prevention and Control Manual was produced and adapted and is currently available and in use.

With regard to the training of human resources, the speaker indicated that the training was continuous, in person, and virtual (on web platforms) and benefitted from supportive supervision. Paraguay received support from the PAHO training program on infection control in health services (2020), with participants from several regions, the majority of whom completed the course with a final practicum that consisted of preparing an action plan based on the core components.

Going forward, a plan for the continuous training of health professionals, general service personnel, relatives, and patients will be prepared, along with a plan for regular evaluation through tests of knowledge and on site supervision.

Finally, with regard to COVID-19, health workers who are symptomatic or have been exposed to the COVID 19 virus have been monitored. Guaranteeing the sustainability of the progress made, concluding implementation of the plan, and overcoming the remaining challenges.

SESSION 3

(Tuesday, 30 March 2021)

HEALTHCARE-ASSOCIATED INFECTIONS SURVEILLANCE AND MONITORING SYSTEMS (CORE COMPONENTS 4 AND 6)

The session began at 10.00 a.m. (Washington, D.C. time) and covered core components 4 and 6 of the IPC programs, namely: surveillance of HAIs and monitoring/audit and feedback. Continuing with the methodology from the previous days, a summary of the last session was presented, followed by a general conceptual presentation and three presentations on country experiences in the Region.

CONCEPTUAL PRESENTATION

EVALUATION OF SURVEILLANCE SYSTEMS FOR HEALTHCARE-ASSOCIATED INFECTIONS IN THE REGION OF THE AMERICAS.

VALESKA STEMPLIUK (PAHO REPRESENTATIVE OFFICE IN JAMAICA)

The presentation focused on evaluation of the HAI surveillance systems in the Region of the Americas. Valeska began by mentioning the recommendations in the WHO guidelines on HAI surveillance: establish national programs and networks that include mechanisms for timely reporting of data, with the possibility of using them for benchmarking purposes to reduce HAIs and AMR.

At the local level, she recommended that facility-based HAI surveillance be conducted to guide IPC interventions and detect outbreaks; this should include ARM surveillance. The speaker stressed the importance of timely feedback to health care professionals and direct stakeholders. She noted that there were

basic requirements, such as having a multidisciplinary technical group for IPC surveillance and monitoring, supported by a strategic surveillance plan targeting priority infection in the local context. The objective of the surveillance was to understand and reduce the burden of infections, including AMR.

For this, comparable data was necessary, given the importance and impact of HAI as a public health problem representing a large group of different transmissible infections in different parts of the body, with different etiologies and specific diagnostic testing requirements.

Given the observed diversity, surveillance should be active and performed by specialized personnel trained for this purpose. This was compounded by the complication that the definition of HAI varied from country to county or even within the same country and depended on the available diagnostic resources. Given the difficulty of reaching an international consensus for each type of infection, the sensitivity and specificity of the definition required studies contextualized to each country's situation. Moreover, since the indicators were rates or proportions, denominators were needed, which also had to be collected and standardized. Finally, a national reference laboratory was essential.

With regard to component 6 on monitoring/audit and feedback, it is recommended that a national IPC monitoring/audit program be created to determine the extent to which standards are being met and activities are being carried out in keeping with the program's targets and objectives. At the facility level, regular monitoring/auditing and timely feedback on health care practices should be undertaken pursuant to IPC standards for HAI and AMR prevention and control. The basic requirements are to have a national strategic plan for HAI surveillance and IPC, with monitoring based on basic clinical indicators such as hand hygiene at the primary, secondary, and tertiary care levels, with timely feedback to all stakeholders.

The speaker concluded by acknowledging that surveillance was a complex task requiring trained human resources and that its implementation should be gradual. A microbiology laboratory and diagnostic support were essential, as were HAI data to secure resources and lend visibility to IPC. Finally, implementation of the monitoring system required careful planning to determine which indicator to monitor and how to do so. Monitoring took a long time but was very effective in changing practices. While many tools were available, the one most relevant to the country was adopted and adapted.

COUNTRY EXPERIENCES

COLOMBIA.
SANDRA CORREDOR (MINISTRY OF HEALTH AND SOCIAL PROTECTION)

Colombia has had a national HAI epidemiological surveillance system since 2012, to which a series of COVID-19 regulations have been added. Surveillance is a strategic component, and regulation in the health system is emphasized, along with institutional strengthening, for a comprehensive approach to HAIs and AMR. The HAI and AMR Prevention, Surveillance, and Control Program, which has been implemented gradually, has been in place since 2018. Mention should be made of the drafting of the National Antimicrobial Resistance Response Plan, guides, and lines of action for the surveillance, prevention, control, and management of outbreaks, including COVID-19. Continuous quality improvement in health has been consolidated in the "Technical Guidelines for Self-assessment of the Multimodal Hand Hygiene Strategy".

The speaker mentioned that in Colombia, surveillance, prevention, and control of HAI and AMR were emphasized in public health, together with the reporting HAI outbreaks and cases (2016-2020) through the WHONET tool, in which 315 hospitals participated. She identified the following strengths: definitions for surveillance; national and territorial teams; laboratories, and outbreak response at the different levels, supported by guidelines and continuous training.

To conclude, Corredor cited the following challenges: mandatory standards; online reporting tools and monitoring of prevention and control strategies; expansion of training strategies in HAI and AMR prevention, surveillance and control; and improvements in HAI and AMR investigations.

THE BAHAMAS.
AUBYNETTE ROLLE (MINISTRY OF HEALTH)

The speaker began her presentation noting the impact of the COVID-19 pandemic on health facilities in The Bahamas. An initial effect was the adaptation of the health system to respond to this emergency, which included: closure of outpatient services; cancellation of elective surgeries; reassignment of health workers; strengthening of the supply chain; and changes in the protocols for maximum processing capacity and approval.

The challenges to the system were concentrated in the administrative and clinical areas. With regard to the first aspect, it was necessary to guard against the exposure of health workers and increase care capacity; increase teleworking and productivity; monitor COVID-19 infection among frontline health workers; and manage health workers' anxiety. Clinical challenges included increasing the number of healthcare facilities, laboratory confirmation, increasing human resources, and strengthening protocols for pressurized air and ventilation in rooms and other spaces. In 2017, the existing IPC processes, policies, and procedures were revised, but other competing priorities prevented training in this area of expertise and the implementation of a national program. However, strengths include close monitoring of HAI in hospitals and trained staff. In addition, an audit is available to provide feedback to the national IPC strategy and an assessment of the national situation (IPCAT2). It is expected that, in the near future, comparative audits of IPC programs in health facilities and a SWOT analysis (strengths, weaknesses, opportunities, and threats) based on IPCAT2 results will be conducted, along with further development of IPC.

BRAZIL.
MAGDA MACHADO DE MIRANDA COSTA (NATIONAL HAI PREVENTION AND CONTROL PROGRAM, NATIONAL HEALTH SURVEILLANCE AGENCY)

Magda Machado de Miranda Costa opened her presentation with the fact that Brazil had a population of more than 210 million and was a nation of continental dimensions with vast socioeconomic differences in all its regions. The National Health Surveillance Agency (ANVISA), linked to the Ministry of Health, is part of the Unified Health System (SUS) and also coordinates Brazil's National Health Surveillance System (SNVS) throughout the country. Its function is to promote protection of the population's health through sanitary control of the production, marketing, and use of products and services subject to health regulations, including settings, procedures, inputs, and related technologies, as well as port, airport, and border control.

Since 1999, ANVISA has served as national coordinator of the HAI Control Program. HAI control activities are structured as follows: a federal coordinating agency (ANVISA), 27 state and district HAI prevention and

control coordinating entities, and more than 4,000 infection control committees in hospitals and other health services. Since 2010, these actors have been responsible for structuring and maintaining a National HAI and AMR Surveillance System in the health services. Currently, more than 3,000 health services are reporting their data monthly to ANVISA.

While Brazil has implemented all the core components of IPC programs, the presentation covered only components 4 and 6 (HAI surveillance and monitoring/audit and feedback, respectively).

With regard to HAI surveillance, the speaker mentioned the existence of national criteria for the diagnosis of HAIs described in various manuals; national reporting of HAI, AMR, and infectious outbreaks through online forms, which are mandatory for hospitals with intensive care units (adult, pediatric, and neonatal), surgical and obstetric centers, and dialysis services, in addition to the publication, since 2011, of epidemiological bulletins with HAI and AMR analysis by state and the Federal District every three months and annually, with data from the entire country.

In 2005, the National Network for the Monitoring of Microbial Resistance in Health Services (AMR Network) was created; in 2013 the first version of the National Program for the Prevention and Control of Healthcare associated Infections (PNIPCRAS) was published (and revised every three years); and a National Plan for the Prevention and Control of Antimicrobial Resistance in Health Services (2017) was published. In 2015, a Subnetwork for the Study of Antimicrobial Resistance in Health Services was created, whose objectives are to support the surveillance and monitoring of antimicrobial resistance activities in health services and the molecular identification of multidrug-resistant microorganisms during outbreaks. All this work enjoyed technical support from some of the country's most prestigious professionals, who collaborate in the working groups coordinated by ANVISA, and from the National HAI Prevention and Control Commission (CNCIRAS) and the Technical Chamber on Antimicrobial Resistance in Health Services (CATREM).

With regard to monitoring/audit and feedback, since 2013 ANVISA has conducted periodic evaluations and monitored the performance of HAI prevention and control programs at all levels (federal, state/district) and in hospitals and dialysis services. Moreover, since 2016, it has been conducting a national assessment of patient safety practices in health services with intensive care units (adult, pediatric, and neonatal), in an attempt to annually evaluate 21 indicators of these practices, including those for HAIs. ANVISA and the states and Federal District used the results of this evaluation to guide actions to meet these patient safety indicators in Brazilian health services.

SESSION 4

(Thursday, 1 April 2021)

MULTIMODAL STRATEGIES FOR THE IMPLEMENTATION OF INFECTION PREVENTION AND CONTROL ACTIVITIES (CORE COMPONENT 5)

In the final session, João Toledo commented on how well-received the meeting had been, with 114 delegates from 35 PAHO Member States in attendance, together with staff from several PAHO Representative Offices in the countries. He thanked the attendees for the valuable opportunity to learn about and discuss implementation of the core components of IPC programs through the actual experience of the countries. He also thanked his colleagues at the U.S. Centers for Disease Control and Prevention (CDC) for their continued support for the implementation of IPC activities in the Region. He stated that one of the lessons of the COVID 19 pandemic was the need to strengthen current IPC measures in health facilities to protect not only health workers but patients, their families, and the environment. He therefore advocated stronger, more sustainable, and better structured national IPC programs. He also underscored the great opportunity the meeting afforded to share experiences, discuss challenges, and produce a new "IPC and COVID-19 generation" to provide higher-quality care in a safer environment. Finally, he stated that the regional meeting would make it possible to develop a roadmap for the strategic lines of technical cooperation in IPC with the PAHO Member States.

As indicated in the program, Session 4 of the meeting covered core component 5: multimodal strategies for the implementation of IPC activities. The session consisted of a conceptual presentation and the experiences of three countries in regard to the topic of the day. Furthermore, on the final day of the meeting,

the conclusions of the discussions held in the six working groups after each of the three previous sessions were presented, and closing remarks were made.

CONCEPTUAL PRESENTATION

CORE COMPONENT 5 AND HAND HYGIENE PRACTICES IN THE CONTEXT OF COVID-19. **CLAIRE KILPATRICK (WORLD HEALTH ORGANIZATION)**

Claire Kilpatrick began her presentation by asking participants how many were "multimodal thinkers" – a very provocative and innovative question. To answer it, she gave a presentation focused on the synergy between a multi element strategy and activities for implementing and improving effective IPC activities to support HAI reduction.

The speaker indicated that the strategy involved behavioral change and a way of simultaneously thinking and acting in several dimensions (three or more; usually five) in an integrated manner and included tools to provide protection and safety for patients, health workers, and visitors.

The minimum IPC requirements, which are based on evidence and the WHO core components of IPC programs, included the use of a multimodal strategy that should be found at both the national and facility level to cover all areas of health care and health interventions. At the primary level, this consisted of interventions to improve hand hygiene, promote safe injection practices and the decontamination of medical instruments and devices, and improve environmental sanitation. At the secondary level, the use of multimodal strategies should, at the very least, consider interventions to increase the use of standard and transmission based precautions and triage. At the tertiary level, the multimodal strategies covered standard precautions, triage, and precautions aimed at reducing specific infections in high-risk areas or patient groups, in keeping with local priorities.

The speaker pointed out that there was a great deal of evidence in systematic reviews that hand hygiene is a core component of IPC that can serve as the basis for a multimodal strategy. The five core components of WHO's Multimodal Hand Hygiene Improvement Strategy are: (1) system change, to ensure access to alcohol based hand sanitizers and a continuous supply of soap, clean water, and towels; 2) training; 3) monitoring and feedback; 4) reminders in the workplace; and 5) an institutional culture of safety.

Kilpatrick supported this strategy, saying that, just as it was developed, it must be taught, reviewed, promoted, and implemented. The main message is to shift to multimodal thinking in IPC; in other words, conceptual change must go beyond isolated activities such as training and education. The five elements that would target different key actors should be considered simultaneously to achieve a real change in organizational culture.

The speaker said it was important to consider all elements of the process, taking all the necessary action and considering the local context, with feedback provided by regular evaluations. The main and genuine innovation was the invitation to a systemic cultural change of "living" a culture of safety. To shift to this type of thinking, the speaker posed the key questions presented in Table 1.

Table 1. Key questions for developing multimodal thinking

Component	Key question
Changing the system	Can staff easily wash their hands at all points of care?
Training	Who needs to be trained or educated to address the gaps identified in knowledge and practice? How will this happen and who will be in charge of training or education? Does the training reinforce and integrate the five moments for hand hygiene?
Evaluation and feedback	Does the facility have specifically trained staff for monitoring hand hygiene resources and compliance with hand hygiene requirements among the different types of health workers? Does the facility monitor perceptions and knowledge about hand hygiene? How is feedback provided to support improvements in practices? How will the facility know that there has been an improvement (for example, how regularly are evaluation and feedback conducted)?
Reminders in the workplace	What is the best way to inform staff about activities to support improvements? Are medical staff or others tapped to collaborate in producing a variety of reminders? Do the posters and reminders used reinforce and promote the five moments related to this scenario?
Institutional safety climate	How is hand hygiene made and kept a priority in the facility? Is it discussed at the senior management level? How can managers, executives, opinion leaders, and others be engaged over time? Do all levels of personnel, including senior managers and other leaders, understand, serve as models, and value the five moments for hand hygiene?

With this challenge in mind, the speaker focused on hand hygiene as a behavior that can be modified and improved with a multimodal strategy. Since efforts should be made to ensure that hand hygiene is performed properly and at the right time, the infrastructure and resources available for it must be guaranteed and staff trained in the why, when, and how must be available. It is also necessary to be able to monitor and verify on site whether staff are practicing hand hygiene, whether it can be done at the right time and in the right way, and to provide timely feedback so that corrective action can be taken. It is therefore proposed that a culture of hand hygiene be developed (a way of "living it"), guaranteeing the key elements of education and training, monitoring/audit, and feedback, and reminders and communication, fostering a systemic shift toward a culture of safety.

To conclude, Kilpatrick asked the participants the following questions: Do protocols exist? Are they well established? Are they used to educate staff? Teach them. Are there mechanisms to monitor, for example, knowledge? Review them. Are staff reminded to follow the protocols? Promote them. Do leaders defend the protocols? In summary, the speaker invited the participants to take integrated action that would result in synergies and systemic changes in the safety and quality of health care.

COUNTRY EXPERIENCES

ECUADOR.
CLAUDIA HOYOS (MINISTRY OF PUBLIC HEALTH)

Claudia Hoyos began her presentation by noting that one of Ecuador's strengths in IPC was having a significant regulatory history in biosafety and patient safety, as well as technical guidelines for IPC based

on risk factors (e.g., central venous catheter, permanent urinary catheter, endotracheal tube, and guidelines for the prevention and control of surgical-site infections). Together, these policy documents served as the foundation for the available COVID-19 guidelines, whose preparation and updating had been based on the best available scientific evidence.

The speaker indicated that the six components evaluated in the country had uncovered important challenges, such as improving aspects of infrastructure in healthcare settings for patients with respiratory symptoms and hand hygiene, guaranteeing a continuous supply of PPE at the different points of care, and strengthening the methodology employed for monitoring and feedback on the degree of compliance with current regulations. In the area of education and training, she also noted the need to strengthen the rational and proper use of PPE, based on indications for use and degree of exposure, which include on-site evaluation and feedback to health workers in general. The speaker also indicated that it was vitally important to encourage patients and users to participate in the care process.

Hand hygiene is one of the safe practices included in patient safety regulations. This has been addressed in Ecuador through implementation of the Multimodal Hand Hygiene Improvement Strategy (MHHIS) in some health facilities as a basic, crosscutting line in IPC. The percentage of health worker compliance with the strategy is moderate. Nonetheless, the practice must continue to be institutionalized and the continuous availability of supplies to perform it at the different points of care must be guaranteed, along with a permanent supply of running and clean water to boost compliance levels and thus contribute to the reduction of HAI.

The percentages of hospital compliance with respect to the alternate route component are adequate, but signage inside facilities needs to be improved and health workers' skills strengthened in this regard.

The vast majority of hospitals have isolation areas based on typology. However, many areas have had to be adapted for this purpose due to the high demand. Thus, more PPE equipment and supplies are needed and, insofar as possible, the professionals and workers responsible for environmental sanitation in these areas must be cohorted. There is a high degree of compliance in cleaning and disinfection activities. However, it is necessary to avoid worker turnover, evaluate competencies, regularly provide feedback, and have a permanent supply of the necessary inputs.

In short, the major challenges are consolidating the IPC program as a mandatory national policy; sustaining the operations of the National Technical Commission for HAI Monitoring, Prevention, and Control; coordinating lines of work with national IPC offices at the central level to implement the components (AMR, surveillance); strengthening the competencies of local IPC teams (continuing education); having a virtual platform for data reporting, program self-assessments, and monitoring of continuous improvement cycles; and allocating a budget for the IPC program itself.

JAMAICA.
KAREN SHAW (OFFICE OF THE CHIEF OF MEDICAL SERVICES, MINISTRY OF HEALTH)

Karen Shaw, focal point in Jamaica, provided a brief update on infection control. Jamaica is in the process of developing an IPC program with a regulatory framework. The COVID-19 pandemic put heavy pressure on the health services, leading to greater development of their infrastructure and isolation capacity. The last evaluation of Jamaica's IPC program was conducted with PAHO support in 2019 using the IPCAT2 tool and identified gaps and areas for the implementation of core components.

Jamaica's program was launched after reports of an outbreak of gram-negative sepsis with a high mortality rate in two hospital nurseries (2015). Like many of its global counterparts, Jamaica is not immune to HAI threats, and that prompted the need for comprehensive implementation of a national IPC program. Additional pressure from Ebola (2014 and 2018) and the introduction of COVID-19 have led the Ministry of Health and Wellness to take action.

A National Strategic Plan was drafted in 2019 and is expected to be updated and ratified for implementation in the next three to five years. While national protocols do exist, they must be updated, and a monitoring and evaluation strategy must be drawn up. Coordinator posts in IPC facilities must be consolidated, since the staff responsible for coordination must perform many overlapping tasks. The focal points of the national IPC unit will be named.

Health worker training and HAI surveillance are two priority areas for Jamaica, as seen in the IPC assessment of 2019. In the core component of education and training, it was observed that the onset of COVID-19 contributed to an increase in IPC in health and at the community level, and that teleconferencing extended the reach and coverage of these initiatives. Training is available to different groups and is guided by PAHO. From this it can be concluded that IPC needs to be integrated into academic curricula and in health services.

ARGENTINA.

IRENE PAGANO (NATIONAL EPIDEMIOLOGY AND HOSPITAL INFECTION CONTROL PROGRAM, MINISTRY OF HEALTH)

Irene Pagano reported that Argentina had a National System for the Evaluation of Healthcare-associated Infection Prevention, Surveillance, and Control Programs (SisWAP, 2018), and an Undersecretariat for Quality, Regulation, and Oversight, operating under the National Directorate for Quality in Health Services and Health Regulation, responsible for implementing the National Program for Healthcare Quality Assurance (PNGCAM). Each health facility conducted its self-assessment and underwent an external evaluation, and in the future would obtain government certification.

The National Epidemiology and Hospital Infection Control Program works in six areas: teaching, research, regulation, surveillance, advisory services, and health education. The country's high-complexity health institutions are part of a permanent systematized national network for prevention, surveillance, and continuous oversight.

The "VIHDA-COVID-19" project is designed to assess the impact of the COVID-19 pandemic on infection control and antimicrobial optimization measures in critical and intermediate care units in Argentina.

The speaker reported that in a study of 10 intensive care units (which were part of the VIHDA-COVID-19 project), as well as other (private) facilities, infection incidence density indicators were rather high, revealing the magnitude of the problem. Regarding the multimodal strategy, a monthly prevalence study on adherence to the hand hygiene protocol showed high compliance. However, a steady decline was noted (2021), prompting strengthening of the recommendations for health teams. Activities aligned with the Global Action Plan on Antimicrobial Resistance (WHO, 2016) have been devised, and the speaker noted that AMR was a multifactorial global problem requiring immediate integrated action. Finally, with regard to the workplace reminders component, there was a major push to constantly disseminate information and raise

awareness about AMR in the community at large and among work teams through specific campaigns as part of World Antimicrobial Awareness Week (18-24 November 2020).

Finally, Pagano stressed that continued discussions on the implementation of IPC programs in the Region were necessary, because their promotion at the highest levels was essential for consolidating regulatory frameworks, guaranteeing budgets and human resources, and making progress in the implementation of these programs.

CLOSURE AND CLOSING REMARKS

The meeting produced important materials and many lessons. One of them is that the degree IPC program implementation in the Region varies. Thus, activities for sharing knowledge, experiences, and practices in IPC in the Region serve as enrichment for achieving similar levels of IPC program implementation. Furthermore, the meeting showed that every country, without exception, has improved infection control, though many challenges persist, as the COVID-19 pandemic has brought to light, making the pandemic an opportunity to improve IPC programs.

The meeting was closed by PAHO Deputy Director Sylvain Aldighieri, who thanked the Organization's Member States for their extensive participation, reiterating that more than 100 delegates from 35 Member States and colleagues from different countries had attended. He said the pandemic had underlined the need to strengthen IPC programs to protect not only human resources and health workers but patients and their families.

Aldighieri noted the value of learning about the implementation of IPC programs in the Region and hearing about implementation experiences from the people actually involved. He thanked the U.S. CDC for its continued support and response to COVID-19.

Finally, João Toledo, in his final remarks, highlighted that the challenges posed by the pandemic included the training of a generation of IPC professionals and the need to develop a roadmap for the strategic line of the PAHO Member States. Supported by images of earlier pandemics that were more deadly but more contained, he said that the COVID-19 pandemic was yielding lessons in good public health practices that we must assimilate going forward, since we would continue to face the same issues and problems in IPC beyond COVID-19. He revisited the idea of "a generation of IPC professionals in the context of COVID 19" who would advocate for IPC programs that protect health workers, patients, families, and the environment.

THOUGHTS AND MAIN DISCUSSION POINTS IN THE WORKING GROUPS

Below are the main topics discussed in the meetings of the six working groups that the participants were divided into on Tuesday, 23; Thursday, 25; and Tuesday, 30 March. A rapporteur was in charge of the groups' logistics, and a presenter was chosen for the final session, held Thursday, 1 April, whose result is presented in this section. The work methodology consisted of a series of questions designed to stimulate discussion on the implementation and progress of IPC programs, as well as the core components. For each topic, the groups were asked about the tangible progress in each country, the impact of the COVID 19 pandemic, and the gaps or barriers, opportunities, and solutions.

COVID-19 AND ITS IMPACT ON INFECTION PREVENTION AND CONTROL PROGRAMS

Overall, COVID-19 is considered to have had a positive impact on IPC programs in several respects. There is greater recognition of these programs as a national priority of the ministries of health, and communication and support for IPC among management and government agencies has increased. IPC has been strengthened at the central level and in health facilities and hospitals. Furthermore, budget allocations have increased. It was also reported that opportunities have emerged for collaboration with the non-traditional health sector, the private sector, and other actors. There has also been an increase in knowledge and awareness of IPC in healthcare and non-healthcare settings and in different areas such as practice, training, human resources, and supplies.

There is agreement that COVID-19 has had a positive impact on strengthening the role of IPC, with the development of standards and the recognition of IPC teams in areas such as PPE management, among others.

In regulation, there has been an expansion of the IPC approach beyond hospital-acquired infections and AMR. Protocols have also improved. Here, it should be noted that IPC guidelines were extended to other sectors, such as gyms and restaurants.

COVID-19 has also had a positive effect on IPC training, since it has increased coverage at the national level, with greater awareness and education on IPC standards in the public and private sectors. New training programs have also been implemented. There is more training, and it is provided on a more regular basis. Rapid testing algorithms have also been developed and disseminated.

COVID-19 has had a positive overall impact, as well as specific impacts, for example, in Caribbean countries, where resources, training, and staffing increased (even retired staff were called in). In Canada, it has been observed that the quality of infection committees, access to training, and increased staffing have all improved.

Finally, a positive side effect has been a decline in some communicable diseases due to greater compliance with IPC program measures.

Notwithstanding, the working groups all mentioned negative impacts that weakened IPC programs. These include the reassignment of IPC human resources to other areas. Among other things, this has undermined HAI surveillance, especially at the local level, although higher-risk IPC staff were teleworking in several countries. In some cases, hospital infection committees ceased operations, and, in others, IPC human resources were overburdened (IPC teams at the national and local levels were very small for the number of tasks they had to perform). Moreover, they had to focus on COVID-19, which meant decreasing epidemiological surveillance. As a result, there is underreporting of HAIs and diminished opportunities for outbreak detection. In the same vein, surveillance in most of the countries was already deficient prior to the pandemic; as it worsened, some epidemiological surveillance data for certain time periods were lost.

In short, COVID-19 has generally had a positive impact in terms of greater visibility and awareness of IPC programs and an increase in regulations, training, and staffing. However, given the scale of COVID-19 prevention and control efforts, human resources were reassigned or overburdened with multiple responsibilities, and surveillance of other HAIs declined in several countries, weakening IPC in this respect.

COVID-19 AND ITS IMPACT ON HEALTH WORKER TRAINING

Overall, COVID-19 has had a positive impact on health professionals' motivation to learn about infection control. It has exposed the gaps in health workers' knowledge and led to increased training. There has been a cultural shift, with greater awareness and interest, more staff eager to receive IPC training at all levels, and different categories of health workers with the ability to reach more people online. The pandemic has also heightened health workers' awareness of and attention to IPC and the need for adequate practices, resources, and tools. IPC awareness has increased, and the acquisition or strengthening of knowledge among health workers and non-health workers alike has increased, since IPC training was also provided outside the health sector.

Most countries have had to grapple with an "infodemic" that caused confusion. Contradictory indications for prevention measures and treatments were disseminated. Participants also stated that people were interested specifically in COVID-19 prevention but not in other prevention measures, and that the focus was on personal care rather than the prevention of other infections and patient care. The goal is for the knowledge acquired to be maintained over time.

Greater access to the available educational resources and the development of new resources have also been observed. Health worker education significantly improved. The use of online learning platforms has increased access to these resources, which have been supplemented with on-the-job training.

E-learning options have facilitated the training of essential frontline workers. The need was noted for a national IPC training coordinator to provide support at the national, local, and community levels.

Specific, targeted training and the inclusion of IPC in the core training curriculum of health facilities are needed. Training with mixed synchronous and asynchronous learning should be more common.

Efforts are under way to strengthen the IPC component of the medical and nursing curriculum.

The biggest challenge is improving virtual training and technology and computer support. It was observed that in-person training should be provided to small IPC teams and that there are time and travel constraints. New strategies should be sought, such as modeling or classroom and hands-on learning. A training focus should be adopted with audiovisual support and continuous monitoring to strengthen the teams.

COVID-19 AS A HEALTHCARE-ASSOCIATED INFECTION

There are different opinions as to whether COVID-19 should be considered an HAI and there has been debate about it as such. Two countries reported that COVID-19 is indeed considered an HAI, and systematic epidemiological surveillance has been ordered since the second half of 2020. However, most countries have not considered including COVID-19 in routine HAI surveillance. Some countries in the working group have consolidated reports of outbreaks classified as HAIs, depending on the surveillance. In any case, studies are being conducted to understand where the cases occurred, and discussions are under way to define HAIs. Hospital outbreaks have been reported, and some hospitals are independently reporting infections in patients. Prevalence studies have been conducted among health workers, with notifications. COVID-19 is considered a notifiable occupational disease in every country.

HAI COVID-19 cases are related to epidemic outbreaks in health facilities. It is hard to identify COVID-19 pneumonia specifically associated with mechanical ventilation due to the lack of standardized criteria. It was noted that in one country, the WHO/PAHO risk assessment tool had been used to determine whether COVID-19 was an HAI. Most staff exposure occurs indoors, including in health facilities. Protocols are being developed in this regard.

IMPLEMENTATION AND PROGRESS IN INFECTION PREVENTION AND CONTROL PROGRAMS: CHALLENGES TO IMPLEMENTING CORE COMPONENT 1

Group members observed that progress in IPC programs is very mixed and that programs varied not only with a country's size, but its economic level in particular. There appears to be a correlation between a country's income level and the degree of IPC program implementation: in high-income countries, IPC programs operate at different levels; in middle-income countries, they have been implemented at both the national and health facility level; and finally, in small countries with fewer resources, IPC programs are found mostly at the health facility level, and in several cases, there is no national program.

It was noted that there seem to be two types of models: in one, national IPC programs are usually run by a hierarchy of directors, epidemiologists, nurses, and IPC committees; in the other, there are hospital programs with a more horizontal structure, run primarily by an IPC nurse under the supervision of the Department of Public Health.

In the Caribbean countries, IPC programs (and the manuals that serve as the basis for many strategies) exhibit different degrees of development and implementation and require more updating and human resources. Continuous training is required through partnerships with external groups such as PAHO/WHO. Notwithstanding, it was pointed out that in most countries, health facilities have IPC committees and focal points. Mention was made of Canada, where the program is not national but federal, with each province supported by advisory committees and agencies with information from the IPC programs that is systematically and uniformly disseminated throughout the country.

More specifically, due to uneven development, in some countries, mandatory programs are developed and strengthened at the central level and in others, hospitals follow their own specific regulations. In the former, there is centralized surveillance and information and trained specialized human resources, basic and specific prevention and control standards, and systems for evaluating program operations. In the latter, countries have regulations governing implementation, operations, and basic prevention measures, but they are not permanent fixtures in hospitals, mainly because of the lack of human resources specialized in IPC. Furthermore, two complicated situations were identified: in some countries, the implementation of IPC programs is not mandatory, and, in others, program operations at the central level are divided among different divisions or units, resulting in separate regulations for epidemiological surveillance, for example. This is considered a barrier to national implementation.

It was noted that even in countries with longstanding IPC programs, implementation had been patchy. When there is no consolidated and centralized IPC program, the different units and departments deploy isolated strategies. It was emphasized that countries with IPC programs and a support policy had more experience to enable them to deal with the pandemic and had maintained surveillance, monitoring, and supervision; in these cases, countries had managed to combine IPC quality initiatives and regulations with greater monitoring and feedback. In the other countries, there was greater emphasis on primary care.

In short, all countries have made progress, but with situations ranging from highly institutionalized programs to activities and regulations determined at the health facility level, primarily hospitals.

BARRIERS AND GAPS

The main gaps observed are a lack of human resources and funding. Too few professionals are devoted exclusively to IPC, with staff responsible for dual and even multiple functions. The lack of funding particularly affects training, resulting in inadequate human and material resources.

In addition to the dearth of trained and certified IPC professionals, there is a lack of commitment among decisionmakers to the implementation of IPC, coupled with high staff turnover, lack of budget, underestimation of the technical criteria issued by hospital IPC technical committees, and failure to consider IPC programs a cornerstone of the institutional safety climate.

The group noted that the human resources gap was present in all countries and was not only numerical but related to IPC training and specialization as well. It noted that in large countries, the gap was related to

access and geographic distance from hospitals. Laboratory capacity also varies in different areas of each country.

The absence of infection control policies was considered a barrier, since not all countries had mandatory IPC standards in health facilities or an independent national IPC program with dedicated staff and an allocated budget.

The group also noted the weak institutional commitment and recognition of the program by all pertinent authorities, as well as the lack of involvement and engagement among key actors, due to multiple responsibilities. This is coupled with a disjointed and fragmented approach and a lack of awareness in general and among national infection committee coordinators in particular. Another barrier is the lack of IPC program sustainability due to staff turnover and lack of trained personnel, as well as higher demand for and lower supplies of PPE.

It was mentioned that COVID-19 had led to a decrease in the surveillance of other diseases and in the space available for the isolation of non-COVID-19 patients.

In short, there are gaps in the implementation of IPC programs due to fragmentation and a lack of recognition and institutional support, as well as limitations in funding, staffing, and training for human resources, coupled with high staff turnover.

SOLUTIONS AND OPPORTUNITIES

Suggested solutions and opportunities include the formulation and updating of national policies, increased funding, and a specific budget for the IPC program, with dedicated staff and teams, as well as the creation of a regulatory agency active at the national and health facility level. It was pointed out that increased sustainability of IPC programs may require the restructuring of IPC departments, quarterly reviews by IPC clinical teams, and standardization of best practices. In this regard, it was proposed that managers be made aware of the importance and economic role of an IPC program with clear, standard regulations.

Reducing training gaps would require more staff and greater participation by incentivizing the creation of IPC positions with appropriate certification. External aid was considered an opportunity, and the important role of the agencies was underscored. Mandatory continuing education in IPC, with improvements in education programs through e-learning platforms to staff IPC teams with highly trained paid personnel, together with dedicated IPC focal points, would be optimal. Training must be up-to-date, evidence-based, and geared to professionals not only from the central level but hospitals as well, including laboratory staff. The creation of graduate-level IPC training program was suggested, making it possible to evaluate competencies and provide feedback.

The group indicated need for national standards to create IPC programs at all levels, stipulating the basic number of professionals required. It suggested that national experts be consulted to formulate the recommendations and work with other areas, such as those devoted to antimicrobial therapies or tuberculosis.

It recommended that ongoing surveillance, monitoring, and auditing be strengthened at all levels, emphasizing the need to collaborate with the private sector, improve technology use, upgrade the training of IPC professionals in information management, and monitor procedures in different national facilities.

It also proposed improving supply chains and increasing inventories, since quality control of IPC and PPE practices was considered an opportunity.

In addition, it also recommended having up-to-date information in the languages of the Region, compiling and organizing records from the pandemic to correct errors, and holding regular meetings to share experiences with other countries of the Region and present results.

In summary, it was recommended that implementation of the IPC program be buttressed with a specific, nationally allocated budget based on the core components, and that targets for institutional compliance be set. Improvements in training and regular meetings to share experiences with other countries of the Region and present results were identified as key aspects. Table 2 presents the proposals for improving IPC programs.

Table 2. Proposals for improving IPC programs

Proposals for improving IPC programs
Obtain multinational support for IPC personnel.
Make IPC programs mandatory in countries where they are currently not mandatory.
Formulate national standards for IPC programs.
Create information systems for monitoring the implementation of IPC measures and providing feedback to the health services.
Put IPC teams under the senior management of health facilities and the health system in order to involve them in results and decision-making.
Secure greater stakeholder engagement and participation at the highest level.
Ensure resources and financing.
Reduce the gap in human resources necessary for the good operation of IPC programs at the central and hospital levels.
Increase financial resources to improve structural aspects.
Improve collaboration with ministries of health and civil society organizations, as well as between public and private institutions, including nongovernmental organizations, etc.
Increase technical support to strengthen teams at the central and health facility levels to guarantee compliance.
Constantly review and improve standards and procedures with regular updating of the guidelines.
Provide formal training and certification for IPC staff at all levels.
Ensure the training of trainers.
Create an IPC training and education program that makes it possible to evaluate competencies and report results in this regard.

DEVELOPING GUIDELINES AND TRAINING IN THE CONTEXT OF COVID-19: CHALLENGES TO IMPLEMENTING CORE COMPONENTS 2 AND 3

The COVID-19 pandemic heightened the importance of IPC programs, stimulating the development of standards and specialized training. Health workers became more interested in the subject. The pandemic also increased intersectoral work and the opportunity to develop IPC guidelines in other programs, such as maternal and child health, schools, and the community.

It was generally recognized that guidelines and guidance had increased and improved at the national and health facility levels and in other areas (administrative, medical, and surgical). This improvement has been observed in national institutional guidelines and those emerging from experience in the field. Implementation of IPC measures and guidelines in hospitals and other areas, such as the tourism industry, ports, etc., was also noted. Better planning, development, and implementation of these measures and guidelines were also observed, both in the adaptation of existing standards and the generation and dissemination of extensive information in this regard, thus improving communication channels.

It was noted that the PAHO/WHO guidelines were essential for the rapid development of national and local guidance. The participation and collaboration of multiple stakeholders was also observed, revealing commitment and support among managers and decisionmakers, with less bureaucracy and greater urgency due to the concerns raised by the pandemic. Based on these international guidelines, some countries produced guidance in collaboration with scientific societies, and reviewed documents produced by other areas.

This process was considered to be associated with the improvement in virtual and in-person training, though there was no substitute for some types of hands-on training, such as the use of PPE. It was also associated with the increase in the information on infection control to update guidelines. Engineering and architecture have also made a major contribution to the creation of isolation and quarantine facilities.

Mention was made of mechanisms for positive feedback and inter- and intrasectoral collaboration on the pandemic plan, facilitating the engagement of different actors in the drafting and promotion of guidance for containing the pandemic. Notwithstanding, in some countries with fragmented health systems, each area developed or interpreted the guidance in its own way.

BARRIERS AND GAPS

There was consensus that the biggest gap was the scarcity of human and material resources, supplies, and funding, resulting in problems for the quality of care and treatment. This was compounded by institutional difficulties in adapting to or managing the situation with these scarce resources, high management turnover that interrupted the continuity of IPC activities, red tape, and the fragmented work at the central level, which also hindered the coordination of activities in some countries.

In several countries, it was found that, due to limited human resources, staff were exhausted by simultaneous commitments, such as work and family in quarantine conditions. In addition, there was constant need for training due to the reassignment of IPC human resources to other duties. Furthermore, it was noted that

virtual training could not always be tailored to the local situation, and there were connectivity issues. Many – often contradictory – opinions were also expressed about the measures to adopt. Policies and guidelines must therefore be updated frequently to keep up with the recommendations issued by national and international agencies.

Specifically, gaps were identified in the dissemination and local implementation of national guidelines, the practical application of new knowledge, and the translation of guidelines and manuals into the languages spoken in each country to make them more accessible and available.

Standardized manuals are lacking in some countries, and there is a need for a group approach in staffing to boost effectiveness and support for internships. While there is training based on international guidance, it is not enough.

Limited knowledge of basic prevention, control, and biosafety measures among health workers was also found (in waste management, for example), exacerbated by fear and the scarcity of resources. There is disinformation and fatigue with information overload. Infrastructure constraints were observed.

Finally, training effectiveness is not monitored, and the communication of new recommendations needs improvement. Another constraint is the lack of time to prepare and disseminate guidelines.

SOLUTIONS AND OPPORTUNITIES

More funds and trained human resources should be allocated to IPC to procure new tools. Furthermore, focal points should be named to ensure sustainability, along with national compliance officers to monitor adherence to the IPC program, and more attention should be paid to AMR, which should be addressed more diligently (public and private sector).

There should be greater involvement of IPC staff as regional focal points, and more collaborations should be established to reduce gaps. IPCAT2 and COVID-19 tools developed specifically to evaluate these issues are available. Misinformation should also be handled appropriately, and PPE standards, laboratory response guidelines, and support for IPC should be improved. The guidelines should be communicated through annual reports.

Health workers' knowledge about the available tools should be increased, and a national regulatory agency should be created.

There should be more investment in training, considering risk and risk assessment training, as well as command centers to standardize published information. Training should be mandatory and provided to other groups of professionals and organizations. Distance learning should continue to be improved, along with communication between the central level and hospitals.

Digital means of training should be strengthened, and the reach of digital tools should be extended.

Virtual training courses must be available. An IPC training and learning program should be created that makes it possible to evaluate competencies and provide feedback.

Innovative ideas and everything at each country's disposal should be used to promote training (computer graphics or short videos, among other things). Mention was made of the need to train leaders in this field to

serve as replicators in their workplaces. The undergraduate curriculum should be improved with respect to prevention and control measures in order to enable professionals to enter the workplace with these skills.

Technology should be used to distribute recorded training sessions and draft consensus documents, which will be produced once the pandemic is over.

Prompt and specific public international recommendations should be available to guide and buttress national recommendations. There must also be centralized guides and a governance agency, and professional functions and those of each area must be maintained.

The political will for the implementation of standard, administrative, human resource, and environmental measures, including webinars, virtual training tools, and lessons learned from COVID-19 was seen as an opportunity.

HEALTHCARE-ASSOCIATED INFECTION SURVEILLANCE AND MONITORING SYSTEMS: CHALLENGES TO THE IMPLEMENTATION OF CORE COMPONENTS 4 AND 6

HAI surveillance was generally maintained in most hospitals, but the forwarding of information to the central level has been delayed. Surveillance was discontinued in some institutions due to lack of human resources and the assignment of IPC professionals to other duties.

There was less HAI surveillance in most reporting countries for the following reasons: lack of staff or their availability; a shift in focus to patient monitoring, clinical management, and immunization; change of government; and lack of electronic patient records. This was caused by the redirection of IPC resources (both human and financial) to the COVID-19 response. As a result, routine HAI surveillance fell, data were missing, or their collection and submission were delayed. Also, COVID-19 has hindered the ability of staff to conduct surveillance of all infectious diseases and funding has decreased. There are constraints with respect to laboratories' availability to perform tests and report COVID-19-related illnesses. Given the urgency of addressing the pandemic, the focus was on critical care units, and other surveillance was discontinued. An increase in outbreaks of COVID-19 and other pathogens in health workers was noted.

BARRIERS AND GAPS

The first barriers mentioned were insufficient human resources, excessive workload, and leave from work, which limited surveillance and monitoring efforts. Furthermore, there are still many paper-based systems. Another major constraint is that observational audits decreased and external audits were suspended in many countries. Furthermore, the results of external audits are not always disclosed.

Among the gaps identified, the lack of trained auditors and human resources was mentioned. It was noted, for example, that staff members themselves conducted the IPC training, which had to be continuous. It is hard to monitor prevention measures due to lack of human resources and the change in the responsibilities of IPC

professionals, as well as their high turnover in facilities. It was remarked that surveillance and monitoring focused only on a few settings, such as isolation units, and a few measures, such as donning and doffing PPE.

The group commented that there was a budget gap in some countries, hindering surveillance and monitoring. Not only were IPC human resources redirected to the COVID-19 response, but financial resources were as well.

In some countries, it was found that health workers were not following the guidelines, in part because of a lack of standard auditing tools in facilities. Disinformation and fear also contributed to the failure to strictly adhere to some standards.

Another point worth noting is that the guidelines were communicated poorly or at the wrong time, resulting in poor hospital practices that were hard to supervise and correct.

One important aspect to consider, moreover, is geographic barriers, particularly in the Caribbean subregion; one country, for example, is composed of 700 islands, which naturally limits its ability to conduct audits, especially if this is compounded by unequal access to technology and a lack of trained personnel.

SOLUTIONS AND OPPORTUNITIES

Proposed solutions include establishing an IPC program to improve knowledge in all areas, not just related to COVID-19, and promoting and expanding IPC networks through collaboration with other areas: clinical, occupational health, epidemiology, laboratory, and pharmacy.

It was pointed out that funds were needed for some infection control activities. As human resources are essential for IPC surveillance, it was suggested that measures be devised to keep IPC teams from losing specialized professionals.

One solution mentioned was to implement national guidelines in the countries and conduct national inspections to verify compliance. Furthermore, the use of standardized tools would help to improve information about IPC activities and practices.

The IPC team should be trained for surveillance tasks involving not only nurses but other teams and the community. In the same vein, it was noted that functions within the IPC team should be defined, that certain activities should be prioritized, and that greater continuity in surveillance, supervision, and training should be guaranteed.

With regard to laboratories, the necessary supplies should be delivered. Senior management should be made aware of the importance of surveillance in order to provide the resources needed to guarantee ongoing surveillance.

Staff training is necessary so that other health workers follow the IPC guidelines. The availability of WHO tools and remote working were viewed an opportunity. The use of virtual platforms is considered a great opportunity.

National and regional HAI surveillance systems should be established where they do not exist, with standard guidelines and tools (surveillance and auditing). A good solution is to procure IPC software with electronic record, surveillance, and auditing systems.

The possibility of systematizing outbreak experiences and reviewing them to improve AMR plans and policies, as well as HAI surveillance, prevention, and control, was considered an opportunity. The review and adaptation of older instruments to improve patient records was also considered an opportunity. Finally, it was observed that having entities outside the Ministry of Health (such as the Ministry of National Security) assist with the audit was an advantage that should be exploited.

Table 3 summarizes the impact of COVID-19 on key aspects of IPC.

Table 3. Impact of COVID-19 on key aspects of IPC

Key aspect	Impact
IPC Program	COVID-19 had a positive impact on IPC programs, revealing the importance of IPC and the need to provide such programs with key components, such as adequate resources.
IPC Guidelines and Training	COVID-19 improved the way guidelines, recommendations, and standard operating procedures are developed and implemented and demonstrated that they can be mastered more quickly and flexibly and better adapted and implemented. COVID-19 also revealed the fundamental value of IPC education and training.
HAI Surveillance	Overall, HAI surveillance was maintained in most hospitals, but the pandemic caused delays in feedback to the central level. Surveillance was discontinued in some institutions due to lack of human resources and the reassignment of IPC professionals to other duties. It was observed that human resources for HAI surveillance systems were exhausted, and weaknesses in the existing IPC programs were revealed. Another important point that was noted was the increase in hospital outbreaks due to microorganisms of epidemiological importance detected in the countries that maintained active surveillance.

CONCLUSIONS, RECOMMENDATIONS, AND KEY AREAS FOR FUTURE WORK

Most of the countries made progress in implementing IPC programs and strategies. However, their development and implementation were uneven, from institutionalized national programs to local guidelines for health facilities. It is therefore recommended that existing programs be strengthened, and national programs implemented in countries that currently lack institutional entities for coherently coordinating and supervising IPC.

The participants confirmed the need for increased trust, recognition, and support from ministry of health and management levels; for a dedicated and protected budget; and for more trained human resources specifically assigned to IPC tasks. It is therefore recommended that all senior and general management levels of the Ministry of Health entities that run these programs or initiatives be more actively involved, especially in relation to quality of care and biosafety. It is also recommended that all societal actors involved in this process in the public and private sector be included, as well as nongovernmental organizations and the community. In this same vein, it is recommended that specific funding for IPC programs and initiatives be guaranteed to ensure their sustainability.

While human resource numbers had grown in some countries, it was found that there had been considerable reassignment and turnover of IPC staff, who in several countries had to assume multiple duties of a complexity for which some of them had received no prior training. The recommendation, therefore, is to increase, strengthen, and guarantee specialized health workers dedicated full-time to IPC through human resource policies and programs to improve and protect health teams, since health teams are the main tool for continuing to strengthen IPC, not only during the COVID-19 pandemic but with a view to future global pandemic scenarios.

Significant progress was noted with respect to IPC guides, guidelines, and manuals, spurred by the urgent need to combat the pandemic. This not only led to the improvement and updating of earlier guides but facilitated the production of new ones as well. This process triggered by COVID-19 has clearly improved the quality and increased the quantity of infection control measures, especially those related to HAIs. The role played by the guidelines and guides developed by PAHO/WHO was noted.

One aspect that has become increasingly relevant in the current health context is the training and education of human resources working in the different areas of IPC. The meeting noted the critical role of training and the key role of online training in the context of the pandemic, which reached more staff in different fields and hard-to-reach places. Within this context, it is recommended that systematic, ongoing, and timely training be ensured for the acquisition of up-to-date evidence-based knowledge to improve the quality and safety of IPC measures. It is suggested that online training be supplemented with the application of this knowledge at the local level and with in-person supervision to boost the efficiency and effectiveness of IPC activities, for example in the use of PPE.

With regard to surveillance and monitoring, it can be concluded that the COVID-19 pandemic has had a complex impact on these core components. On the one hand, there was greater interest in surveillance and monitoring, including of HAIs and COVID-19 in health workers, which raised awareness and concerns and shifted the issue of patient safety toward health teams. On the other, mainly due to the reassignment of human resources, the surveillance and monitoring of other HAIs fell. For these components, it is recommended that HAI surveillance systems be buttressed at all levels, including health facilities, and that reports on these infections, as well as AMR, should be updated for a timely, effective response. It is recommended that electronic or digital networked systems be unified at the national level and that regular oversight be ensured with audits by all available means.

Finally, a significant challenge among the key issues going forward is to consolidate a conceptual IPC program model with an integrated, multicomponent perspective focused on quality and patient safety, health teams, and the environment.

Along with political will and adequate funding for the implementation of IPC programs in the countries of the Region, the challenge is to think multimodally, acting and building a new culture of safe care and a new way of living, thinking, and acting interconnectedly in particular social and health contexts. Within this context, multimodal strategies offer a conceptual and practical means of building this new safety model in combination with improvements in the quality of care. Scientific evidence and lessons learned about proper hand washing as a modifiable behavior that can be improved with a multimodal approach show that this must be done at the right time and in the right way, while simultaneously and synergistically guaranteeing systemic changes, education and training, monitoring and feedback, use of reminders, and smooth communication. A change in model is needed, building a culture of safety and quality care focused on people, their communities, and the environment as a first step on the road to tackling the challenges of an increasingly complex, changing, and globalized world.

ANNEX 1

MEETING PROGRAM

Session 1 (Tuesday, 23 March 2021)

Time	Activity	Coordinator	Presenter
10.00	Welcome and opening remarks	João Toledo (PAHO)	Sylvain Aldighieri (PAHO)
10.10	Meeting objectives and logistics		João Toledo (PAHO) and Georgegette Pusey Morrell (PAHO)
10.15	Regional implementation status of the WHO Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Facility Level and Way Forward.	Valeska Stempliuk (PAHO Representative Office in Jamaica)	João Toledo (PAHO)
10.25	COVID-19 and its impact on infection prevention and control programs and outbreaks of healthcare-associated infections.		Michael Bell (Division of Healthcare Quality Promotion, CDC)
10.45	Q&A and comments	Valeska Stempliuk (PAHO Representative Office in Jamaica)	
11.00	Country experiences	Francini Placencia (PAHO)	
11.00	Country Experience No. 1: Chile		Mauro Orsini (Ministry of Health of Chile)
11.15	Country Experience No. 2: Barbados		Corey Forde (The Queen Elizabeth Hospital, Barbados)
11.30	Q&A and comments		
11.45	**BREAK**		

Time	Activity	Coordinator	Presenter
11.55	Instructions for working group meetings	João Toledo (PAHO)	
12.00	Working group meetings		
13.30	End of working group meetings		
13.30	End of Session 1		

Session 2 (Thursday, 25 March 2021)

Time	Activity	Coordinator	Presenter
10.00	**Summary of Session 1**	Valeska Stempliuk (PAHO Representative Office in Jamaica)	Ana María Oyarce (PAHO)
10.05	The importance of guidelines, education, and training in the implementation of IPC programs (core components 2 and 3).		Fernando Otaíza (PAHO)
10.25	Country experiences		
10.25	Country Experience No. 1: Trinidad and Tobago		Rajeev Peeyush Nagassar (Ministry of Health of Trinidad and Tobago)
10.40	Country Experience No. 2: Paraguay		Rebeca Guerín Villamayor (Ministry of Health of Paraguay)
10.55	Q&A and comments		
11.10	**BREAK**		
11.15	Working group meetings		
12.45	End of working group meetings		
13.00	End of Session 2		

Session 3 (Tuesday, 30 March 2021)

Time	Activity	Coordinator	Presenter
10.00	**Summary of Sessions 1 and 2**	João Toledo (PAHO)	Ana María Oyarce (PAHO)
10.10	Evaluation HAI surveillance systems in the Region of the Americas.		Valeska Stempliuk (PAHO Representative Office in Jamaica)
10.30	Country experiences	Fernando Otaíza (PAHO)	
10.30	Country Experience No. 1: Colombia		Sandra Milena Corredor Suárez (Ministry of Health of Colombia)
10.45	Country Experience No. 2: The Bahamas		Aubynette Rolle (Ministry of Health of The Bahamas)

Time	Activity	Coordinator	Presenter
11.00	Country Experience No. 3: Brazil		Magda Machado de Miranda Costa (National Health Surveillance Agency of Brazil)
11.15	Q&A and comments		
11.40	**BREAK**		
11.45	Working group meetings		
13.15	End of working group meetings		
13.15	End of Session 3		

Session 4 (Thursday, 1 April 2021)

Time	Activity	Coordinator	Presenter
10.00	**Summary of Session 3**	João Toledo (PAHO)	Ana María Oyarce (PAHO)
10.00	Core component 5 and hand hygiene practices in the context of COVID-19.	João Toledo (PAHO)	Claire Kilpatrick (WHO)
10.20	Country experiences	João Toledo (PAHO)	
10.15	Country Experience No. 1: Ecuador		Claudia Hoyos (Ministry of Public Health of Ecuador)
10.30	Country Experience No. 2: Jamaica		Karen Shaw (Ministry of Health & Wellness of Jamaica)
10.45	Country Experience No. 3: Argentina		Irene Pagano (Ministry of Health of Argentina)
11.00	Q&A and comments		
11.15	**BREAK**		
11.30	**Working group reports – Plenary session**	Valeska Stempliuk (PAHO Representative Office in Jamaica)	One rapporteur per group (10 minutes per group)
11.30	Group 1		Group 1
11.40	Group 4		Group 4
11.50	Group 2		Group 2
12.00	Group 5		Group 5
12.10	Group 3		Group 3
12.20	Group 6		Group 6
12.30	Plenary session		
13.20	Final summary and next steps		João Toledo (PAHO)
13.30	Closure		Sylvain Aldighieri (PAHO)

ANNEX 2

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