World Health Organization

REGIONAL OFFICE FOR Europe

# SUPPORTING IMPROVEMENT OF INFECTION PREVENTION AND CONTROL PROGRAMMES

## at national and facility levels in Ukraine during the COVID-19 pandemic in 2020

## REPORT

## Abstract

The WHO Country Office in Ukraine has been supporting the Ministry of Health of Ukraine and the Public Health Centre of Ministry Health of Ukraine to strengthen Infection Prevention and Control (IPC) programmes in health care facilities and prevent health-care associated transmission of COVID-19 since the beginning of the outbreak using a multimodal approach.

This report offers a summary of the provided support and recommendations on priority activities for IPC improvement at national and facility levels.

The COVID-19 pandemic spotlighted areas for improvement in the IPC programme at national and facility levels. Improvements in the IPC programme were achieved during the acute phase of the pandemic response. WHO will continue to support the Ministry Health of Ukraine and the Public Health Centre, as well as health facility managers and health-care providers, on the next steps to ensure the sustainability of progress achieved and to further enhance IPC in health-care settings.



## Key words

Infection prevention and control, prevention of COVID-19, health care associated infections, hospital readiness.

WHO/EURO:2021-2051-41806-57293

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# ACKNOWLEDGMENTS

The report was authored by Dr Arkadii Vodianyk under the leadership of Mr Guillaume Simonian, and Dr Jarno Habicht provided coordination and guidance.

WHO would like to thank the Ministry of Health of Ukraine and the Public Health Centre of the Ministry of Health of Ukraine, as well as all health-care providers for their outstanding cooperation, dedication and motivation to provide the best care possible for patients with COVID-19.

The work would have been impossible to conduct without support from colleagues in the WHO Country Office in Ukraine and the WHO Regional Office for Europe. Special thanks for their technical guidance, inputs and support in review to Ms Ana Paula Coutinho Rehse, Mr Ievhen Mostovyi, Mr Oleg Mikhalov, Ms Tetiana Dolhova and Mr Sergey Boyarskiy.

The technical support described in this report was made possible by funding from the European Union, the United States Agency for International Development and the German government.

# ABBREVIATIONS

| | |
|---|---|
| ABHR | alcohol-based hand rub |
| CSU | central sterilization unit |
| GCA | government-controlled areas |
| ICU | intensive care unit |
| IPC | infection prevention and control |
| HAI | health care associated infections |
| MMIS | Multimodal implementation strategies |
| NGCA | nongovernment-controlled areas |
| PPE | personal protective equipment |
| SOP | standard operating procedure |
| UPHC | Public Health Centre of the Ministry of Health of Ukraine |

# A MULTIMODAL APPROACH TO IPC PROGRAMME STRENGTHENING

On 30 January 2020, following the recommendations of the Emergency Committee, the WHO Director-General declared that the COVID-19 outbreak constituted a Public Health Emergency of International Concern. On 11 March, WHO declared a COVID-19 pandemic. In Ukraine the first COVID-19 case was registered on 29 February.

As COVID-19 has the potential for rapidly spreading in healthcare facilities *(1)*, which can subsequently lead to cases among vulnerable population groups with comorbidities, and decreasing capacity of the health-care system due to spread of infections among health workers, WHO in collaboration with health authorities provided support to strengthen IPC programmes at both the national and facility levels using the WHO multimodal improvement strategy.

Multimodal implementation strategies (MMIS) are a core component of effective infection prevention and control (IPC) programmes, according to the WHO Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. At its core, a multimodal implementation approach/ strategy supports the translation of guideline recommendations into practice within health care with a view to changing health worker behaviour. In 2006, WHO developed a multimodal improvement strategy to provide users of the WHO Guidelines on hand hygiene in health care with a ready-to-go approach to translate recommendations into practice at the facility level *(2)*. The multimodal implementation strategy consists of several elements (usually five) implemented in an integrated way to guide action and provide a clear focus for the implementer. Targeting only one area (i.e. unimodal), is highly likely to result in failure. All five areas should be considered, and necessary action taken, based on the local context and situation, informed by periodic assessments *(3)*.

WHO identifies five elements for IPC multimodal strategies in a health-care context:

1. **the system change needed to enable IPC practices, including infrastructure, equipment, supplies and other resources;**
2. **training and education to improve health worker knowledge;**
3. **monitoring and feedback to assess the problem, drive appropriate change and document practice improvement;**
4. **reminders and communications to promote the desired actions, at the right time, including campaigns;**
5. **a culture of safety to facilitate an organizational climate that values the intervention, with a focus on involvement of senior managers, champions or role models.**

A summary of the provided support and recommendations on priority activities to strengthen the IPC programme are outlined in the report.

# ENHANCING SYSTEMS AND BUILDING ENVIRONMENT

## Personal protective equipment

The first step in a multimodal approach for IPC programme strengthening is to build an enabling environment, which is also one of the core components of an IPC programme according to the WHO guidelines. Even before the COVID-19 pandemic, hospitals in Ukraine experienced lack of equipment for reprocessing medical devices and waste management, as well as insufficient quantities of IPC-related supplies including personal protective equipment (PPE). However, with the first cases of COVID-19 in Ukraine, health workers experienced great challenges to access hand hygiene supplies and PPE, which threatened the safety for medical personnel and consequently patients and visitors.

Photo 1. PPE for COVID-19 designated hospitals on arrival in Ukraine

In March 2020, right after the identification of the first COVID-19 cases Chernivtsi Oblast, upon request of health authorities, WHO provided essential support to the affected area. This included provision of more than 7 000 items of PPE – including isolation gowns, face shields, particulate respirators, medical masks and examination gloves – as well as consumables for hand hygiene and disinfection of surfaces. As the number of COVID-19 cases increased, WHO continued to support health authorities and frontline health workers. In April, Kyiv city hospitals were provided with more than 65 000 items of PPE as a part of WHO COVID-19 response operations in Ukraine.


Photo 2. Frontline health-care providers in COVID-19 designated hospitals receive PPE

In July 2020, as part of ongoing activities to suppoprt the Ministry of Health activities to strenght hospital readiness in COVID-19 designated facilities, WHO delivered more than 1 400 000 items of PPE, including 250 000 isolation gowns, 125 000 particulate respirators, 500 000 medical masks, 52 500 goggles and face shields and 500 000 pairs of gloves; which were delivered to fifty COVID-19 designated hospitals in twenty oblasts. It was observed in many COVID-19 designated hospitals an unequal distribution of different PPE items, which lead to situations where some hospitals were overstocked with medical masks but had limited access to isolation gowns. This situation resulted in reuse of PPE that should have been disposed of. To increase hospital readiness, as part of a national strategy, WHO donated full sets of PPE to the hospitals, as required for management of suspected and confirmed COVID-19patients. It was calculated that the donation of PPE would cover hospitals' needs for approximately two to three months of work at full capacity.

## Hand hygiene stations

Hand hygiene is an essential activity of any IPC programme and is one of the most efficient and cost-effective interventions for preventing spread of COVID-19, but also the transmission of resistant microorganisms and health care associated infections (HAI). WHO supported hospitals by providing equipment for hand hygiene stations, including wall-mounted elbow-press dispensers, disinfectants, liquid soap and paper towels, as well as UV-lamps for checking hand hygiene compliance.

Together with Health authorities, WHO supported the establishment of 1 560 hand hygiene stations in more than 100 hospitals in Ukraine. The provided equipment allowed hospitals to improve hand hygiene practices, ensured access to soap or hand sanitizer at point of care, and supported the implementation of the WHO "five moments for hand hygiene". Elbow-press dispensers were installed in patients' rooms to allow hand hygiene before and after touching patients, before clean or aseptic procedures, after contact with body fluids and patients' surroundings. Also, areas for donning and doffing PPE were equipped with dispensers to allow hand hygiene before PPE use and during PPE removal.


Photo 3. Delivery of equipment and consumables for hand hygiene stations

## IPC equipment

WHO recommends to use standard precautions that aim to reduce the risk of transmission of bloodborne and other pathogens from both recognized and unrecognized sources at all times in the care of all patients. In addition to using standard precautions, all individuals, including health workers and caregivers, should use contact and droplet precautions before entering the room where suspected or confirmed COVID-19 patients are admitted. To reduce the risk of airborne transmission of COVID-19 in settings where aerosol generating procedures are being conducted, WHO recommends that all health workers should wear a particulate respirator before entering areas with risk of airborne transmission of the infection. Fit-testing should be conducted for each new member of staff, annually for all medical personnel and when new a model of particulate respirator comes into use. To support fit-testing of particulate respirators, WHO donated fit tests to twenty six COVID-19 designated hospitals.

Photo 4. Donation of fit tests to COVID-19 designated hospitals

## Support to non-government controlled Donetsk and Lugansk

WHO provided continuous support to health authorities aiming at protecting health workers and making provision of medical care safer in nongovernment controlled areas (NGCA) of Donetsk and Lugansk. Since the beginning of the pandemic, WHO has delivered more than 520 000 items of PPE to 7 hospitals in NGCA Lugansk and Donetsk, including isolation gowns, particulate respirators, face shields, medical masks and gloves. Hospitals were also supported with hand hygiene and waste management commodities including hand sanitizer and biohazard bags.


Photo 5. Donation of PPE to NGCA Lugansk

## Delivery and distribution of IPC commodities

WHO supported the delivery and distribution of IPC commodities such as the 6 000 000 medical masks that were donated by Jack Ma: 100 000 masks each were delivered to 50 COVID-19 hospitals and 1 000 000 were delivered to NGCA Lugansk and Donetsk.

WHO also supported the Ministry of Health of Ukraine to distribute of more than 96 000 packs of sterilization barriers donated by the packaging company AMCOR to support the reprocessing of medical devices during the pandemic in seven hospitals. This donation will cover approximately one year's need by health-care facilities for packaging medical equipment for sterilization.

# TRAINING AND EDUCATION

Due to COVID-19 related public health and social measures, the traditional approach to training, including several days of face-to-face workshops, schools and field visits, were not possible to implement. However, the need for IPC-related training was very high, since the means of preventing COVID-19 transmission were not well understood, the majority of doctors and nurses had not received IPC-related training as part of their post-graduate and continuing education, and a lot of medical personnel were re-tasked for COVID-19 care and were not previously involved in provision of care to patients with infectious diseases.

A combination of online training (webinars) and on-site training in COVID-19 designated facilities was employed. Regular online webinars allowed health workers to have interactions with presenters and ask questions, and as webinar recordings were publicly available, participants were able to watch the webinar at a convenient time or watch it several times. On-site training was conducted at the workplace and helped reduced barriers for further implementation of knowledge transfer. This approach also overcame some transportation restrictions that were present during movement restrictions, as trainers were visiting COVID-19 designated hospitals. Precautions were taken to ensure safety during on-site trainings, including selection of premises where patient access was restricted, screening for symptoms, and availability of hand hygiene stations, ensuring physical distancing, proper ventilation and use of masks when indicated.

## Spring series of webinars on IPC programme strengthening

During April–June 2020, upon request of health authorities, WHO conducted 13 webinars for health workers. In total, more than 600 health workers from COVID-19 designated hospitals participated during online trainings and more than 10 000 watched webinar recordings.

The webinar "COVID-19 epidemiology, modes of transmission and interventions to interrupt transmission chain, addressed key aspects of COVID-19 epidemiology, spread and ways of transmission in order to increase understanding of IPC measures for COVID-19. WHO recommendations on establishment of severe acute respiratory infection (SARI) treatment centres *(4)* and approaches to hospital repurposing were presented during the webinar "Minimal reorganization, which health-care facilities need in order to meet the IPC requirements with regards to COVID-19". A separate webinar was conducted on "COVID-19 patient triage at admission and inside the facility", considering the importance of the topic.

Approaches to COVID-19 surveillance in health-care facilities and administrative IPC controls were described during the webinar "Timely detection of COVID-19 among health workers. Isolation measures". The majority of questions from participants were focused on the use of PPE. This issue was also addressed in the webinar "PPE choice, optimization and required stocks based on risk assessment and expected workload", during which the WHO surge planning tool was also presented for PPE need forecasting *(5)*. Separate training was also conducted on "PPE donning and doffing", where WHO recommendations on rational use of PPE during the COVID-19 pandemic were presented.

Webinars also covered the engineering components of IPC, and were focused on "Effective use of natural ventilation" and on "Environmental cleaning in the context of the COVID-19 pandemic".

Special attention was dedicated to hand hygiene as the most effective measure to prevent HAI *(6)* and the topic was covered during a webinar on "Hand hygiene performance and monitoring". Two webinars were dedicated to IPC in the context of critically ill patients and were focused on "Comprehensive IPC measures in [intensive care units] ICU" and "Prevention of [ventilator associated pneumonia] VAP".

A webinar on "Management of dead bodies" described WHO updated interim guidance *(7)* and another was fully dedicated to recommendations and best practices for "Waste management" during the COVID-19 outbreak *(8)*.


Photo 6. Announcement of a webinar on hand hygiene that was conducted by WHO Regional Office for Europe. The text reads: "Webinar. 19 May, 18.00. Monitoring of hand hygiene in health care facilities"

## Autumn series of webinars on IPC programme strengthening

During September–October 2020, upon request of health authorities, WHO conducted a second series of 12 IPC webinars. The target audience was extended to all doctors involved in COVID-19 diagnosis, care and treatment. The second series attracted more than 700 participants and 12 000 views of the recordings. The focus was on demonstrating and sharing good examples of IPC programme strengthening in Ukraine during the COVID-19 pandemic. A second area of focus was decontamination and reprocessing of medical equipment, as during technical field visits suboptimal knowledge in this area was observed among health workers, increasing the risk HAI due to ineffective decontamination processes.

Best practice examples of IPC programme implementation in outpatient settings were presented during the webinars "How to start implementation of an IPC programme in a city outpatient clinic" and "How to start implementation of an IPC programme in a rural primary health care centre". During these webinars, examples of implementation of WHO IPC core components *(2)* in Ukraine were presented. Separate webinars addressed questions on IPC improvement in secondary and tertiary care: "IPC programme in an infection diseases hospital", "IPC programme in an ICU unit" and "IPC programme in tertiary level hospitals".

Another block of webinars was dedicated to providing a detailed overview of WHO recommendations on decontamination and reprocessing *(8)*. One webinar focused on "Basics of structure of the central sterilization unit and its functions", and two webinars were dedicated to "Basics of decontamination and reprocessing of medical devices for health-care facilities". The webinar "Reprocessing including cleaning and disinfection/ sterilization of respiratory equipment" tackled this subject separately due to the high importance of such equipment in the context of the COVID-19 pandemic.

One webinar was dedicated to "Packaging for reprocessing medical devices including preparations, packaging materials and packaging techniques". A special focus was placed on quality assurance of decontamination and reprocessing, with webinars covering "Basics of monitoring and evaluation of cleaning, disinfection and sterilization of medical devices" and "Basics of validation of reprocessing of medical devices". As the majority of hospitals were using chemical methods of waste management, which is not recommended, a separate webinar was focused on the topic of "Overview of waste-treatment technologies including technical requirements for procedures and equipment".


Photo 7. Announcement of a webinar on reprocessing of respiratory equipment that was conducted by WHO Regional Office for Europe. The text reads: "Webinar. Reprocessing including cleaning, disinfection and sterilization of respiratory equipment. Tuesday 6 October, 18.00–18.45"


Photo 8. Announcement of a webinar on central sterilization unit structure that was conducted by WHO Regional Office for Europe. The text reads: "Webinar. Basics of central sterilization unit structure and functions. 17 September, 18.00–18.45"

## Webinars on IPC programme strengthening for Lugansk and Donetsk

As the ongoing conflict in eastern Ukraine has created additional challenges for health care during the COVID-19 pandemic, a separate series of webinars were designed and implemented for health-care providers in Lugansk and Donetsk government-controlled areas (GCA) and NGCA.

During June–December, 14 webinars were conducted with around 650 health-care providers and managers from COVID-19 designated hospitals in the Lugansk and Donetsk GCA and NGCA.

For Lugansk and Donetsk GCA two webinars were conducted for staff of COVID-19 designated hospitals and focused on "Implementation of core components of IPC and strategies to prevent health care-associated COVID-19 infections". A further two webinars were held for mobile teams and covered "PPE use and COIVD-19 prevention during the work of mobile teams".

For Lugansk and Donetsk NGCA, two webinars also covered "Implementation of core components of IPC", and two were held on "PPE use during healthcare of COVID-19 patients". Other IPC webinars were developed to cover the most important aspects of COVID-19 prevention in in-patient care and included "COVID-19 detection in health-care facilities", "Administrative IPC controls during the COVID-19 pandemic" and "Implementation and monitoring of hand hygiene, standard precautions, waste management, IPC implementation in ICU and decontamination and reprocessing".

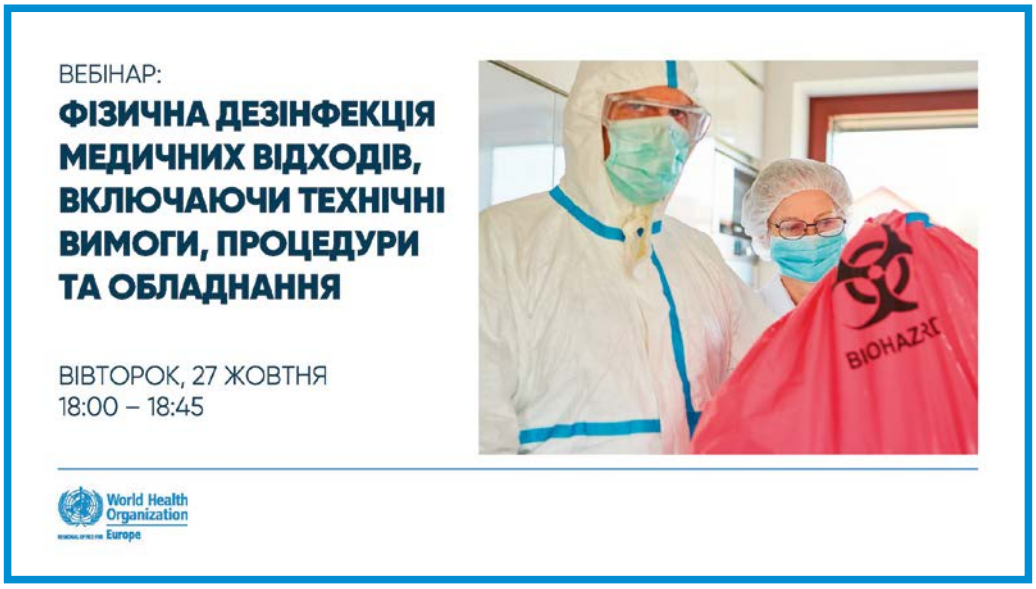


Photo 9. Announcement of a webinar on waste management that was conducted by WHO Regional Office for Europe. The text reads: "Webinar. Physical methods of waste disinfection including requirements and equipment. Tuesday, 27 October, 18.00–18.45"

## On-site training on PPE use during care and treatment for COVID-19 cases

At the beginning of the COVID-19 pandemic, insufficient knowledge and lack of experience on the correct use of PPE on the part of health-care providers was observed.

WHO in collaboration with the Public Health Centre of the Ministry of Health of Ukraine (UPHC) conducted two training of trainers sessions on WHO recommendations on PPE use during the COVID-19 pandemic *(10)* for trainers from the Ukrainian Red Cross. During April–May, 208 on-site trainings on PPE donning and doffing and rational use were conducted at all COVID-19 designated hospitals around Ukraine for more than 1000 frontline health-care providers.

It was observed that many health workers were using the same disposable coveralls several times and the process of decontamination of non-disposable PPE was not established in the majority of hospitals. Particulate respirators that were in use had not been fit tested and were used not only during aerosol generating procedures but all the time, for many days and not adequately disposed. Simultaneous use of biohazard suits and isolation gowns, use of medical masks simultaneously with particulate respirators (below or above), face shields and goggles, and double-gloves were often observed. Also, in some hospitals PPE doffing procedure was not in line with WHO recommendations. Often gloves were taken off as the last item (not first, as recommended) and sometimes doffing started with goggles. Insufficient attention was paid to hand hygiene during doffing and to the selection of place for PPE doffing.

On-site trainings were focused on WHO recommendations on the area for PPE donning and doffing, selection of PPE according to risk assessment, and correct procedures for PPE donning and doffing, including hand hygiene and requirements for PPE change. Trainers conducted PPE donning and doffing to demonstrate all details of the process and answered questions related to PPE use.

Photo 10. On-site training on PPE use

## On-site training on respirator fit-testing

WHO recommends for settings where aerosol generating procedures are performed on COVID-19 patients, health workers should wear gown, gloves, eye protection, and particulate respirators (N95 or FFP2 standard or equivalent). To ensure proper protection from aerosols, staff must be fit tested before using a respirator in the workplace and must be retested at least every 12 months to make sure that the respirator that is in use still fits the person. Staff must be fit tested with the specific model, style and size of respirator that they will be using *(10)*. WHO recommends that respirator fit-testing be conducted for all health-care providers before work in areas with risk of airborne transmission of infection. In the context of the COVID-19 pandemic, health workers who provide care to patients with COVID-19 in settings where aerosol generating procedures are performed, are considered to have a risk of airborne transmission of the virus and therefore should use particulate respirators in addition to administrative, engineering and environmental controls.

WHO in collaboration with the UPHC conducted training of trainers for 18 individuals who had previous experience with coordinating fit-testing actvities. During August–September, a respirator fit-testing was conducted in 46 designated COVID-19 hospitals in all regions of Ukraine. As a result, more than 650 health-care providers who worked in high-risk areas for COVID-19 transmission were able to test and select particulate respirators that were appropriate for them.

Among the different models and brands of particulate respirators tested, none of them fit all health workers. The models that were often in use in health-care facilities fit only 30% of users. During the COVID-19 pandemic, access to particulate respirators has been limited at times due to local or global stock outs. Procurement of one model of respirator might not provide equal protection for all staff due to a possible poor/suboptimal fit of the respirator for some individuals. Procuring adequate quantities of a variety of available models and brands of particulate respirators based on fit-testing can result in rational procurement and ensuring that all staff have access to particulate respirators that fit their individual needs and consequently provide an adequate level of protection.

Photo 11. On-site respirator fit-testing

## On-site training on hand hygiene improvement

During IPC technical support visits to hospitals it was observed that the majority of medical personnel had a good level of knowledge on the procedures for handwashing and hand hygiene with alcohol-based hand rub (ABHR) as recommended by WHO, however indications for hand hygiene according to the (five moments for hand hygiene) *(6)* were not well understood or followed by personnel. One of the reasons for suboptimal adherence to hand hygiene was limited access to hand hygiene stations (ABHR and/or soap, water and clean or disposable towels) in critical areas and lack of knowledge on evaluation of requirements for hand hygiene during provision of care.

During May–December, WHO in collaboration with health authorities, conducted 44 on-site trainings for more than 500 health-care providers in COVID-19 designated hospitals. WHO guidelines on hand hygiene in health-care facilities were used as the basis for the training and focused on indications for hand hygiene, quality requirements for ABHR, access to hand hygiene stations and necessary equipment, and the monitoring framework for hand hygiene.

Photo 12. On-site training on hand hygiene

# EVALUATION AND FEEDBACK

During March–July 2020, WHO in collaboration with the Ministry of Health and the UPHC conducted assessment and technical support visits to 27 designated COVID-19 hospitals in Kyiv, Chernigiv, Cherkassy, Zhytomyr, Kharkiv, Poltava and Vinnitsa oblasts and Kyiv city. The aim of these visits was to support the establishment of evidence-based preventive measures in health-care facilities to avoid health care-associated transmission of COVID-19, assess existing weaknesses and strengths of IPC programmes at facility level and identify areas for further support.

The main objectives of the visits were to complete the WHO hospital readiness checklist for COVID-19 (interim version) *(12)*; conduct on-site assessment of IPC programmes in hospitals; assess surge capacity of hospitals in the context of the COVID-19 pandemic; identify key gaps in hospital readiness; develop assessment reports on hospital readiness; provide recommendations to the Ministry of Health, UPHC and health-care facilities on key interventions to strengthen hospital readiness and improve IPC practices; and identify areas for further WHO technical support.

**All 27 hospitals that were visited had an action plan for COVID-19 response.**
**Key gaps that were identified during action plan reviews include:**

- Action plans did not cover all aspects of the hospital response.
- Some hospital action plans were generic and not specifically tailored to the COVID-19 response.
- Not all members of hospital staff were aware of activities outlined in the hospital action plan.

**Only four hospitals (17%) had separate action plans on IPC.**
**Key gaps that were identified during action plan reviews include:**

- Not all WHO recommended core components of IPC were covered in the action plans.
- Surveillance for HAI and the IPC monitoring and evaluation framework were missing from the action plans.


Photo 13. WHO experts are assessing triage camps during technical support visit

Four hospitals (17%) had a full time IPC focal point; another four had an IPC focal point working part time; the other hospitals did not have a dedicated focal point and responsibilities for IPC programme implementation were delegated to the head nurse or other staff members as an additional task.

In six hospitals (26%) risk assessment of all hospital areas had been carried out appropriately, and areas were correctly divided to three risk zones (red, yellow, green). Other hospitals either had not conducted a risk assessment, had not marked areas or made an assessment with inaccuracies.

**Key gaps in zoning included:**

- Signs indicating zones with different levels of risk were not visible to staff or were incomprehensible.
- Places for donning and doffing of PPE were often situated in inappropriate areas, creating risks for personal in green zones.

It is important to mention, that the architectural structure of health-care facilities and even infectious disease departments did not allow for proper zoning. Rooms for personnel and patient rooms were often mixed and repurposing of hospitals was very complicated. Architectural plans and the location of different rooms should be amended as a part of hospital readiness improvement to allow for proper zoning in case of an outbreak response.

**According to the assessment results four hospitals (17%) had a comprehensive system of patient triage and symptoms screening. Key gaps included:**

- COVID-19 designated hospitals have triage tents that were not designed for effective and safe triage of patients. These tents were not properly ventilated, did not have access to water supply, did not allow "one-way-flow", did not have waiting areas, and therefore did not ensure a safe environment for health workers, patients and visitors.
- Active screening of symptom among patients was not implemented in any of the hospitals. Visual signs to ensure passive screening of symptom among patients were often small and not strategically placed.
- The majority of hospitals did not have separate patient pathways for patients with and without symptoms, or a system for rapid isolation of patients with respiratory symptoms.
- Waiting areas in the majority of hospitals were poorly ventilated and did not allow physical distancing.
- The majority of hospitals provided access to ABHR at the point of entry to the hospital; however, patients were not encouraged to use ABHR, monitoring systems were not established and according to observations during the visits few visitors used ABHR.
- In the majority of hospitals, masks were not provided to patients at the point of entry.
- Areas for triage and examination of patients that were transferred by ambulance were small in the majority of hospitals and allowed examination of only one patient, which therefore could become bottlenecks in case of increased numbers of admissions.

**In 13 hospitals (48%) the level of knowledge on PPE use was assessed as sufficient. However, not-recommended practices included:**

- spraying PPE with disinfectants in disinfection tunnels
- applying UV-light for PPE disinfection in tunnels
- reuse of disposable PPE, including gowns and particulate respirators
- use of medical masks simultaneously with particulate respirators (below or above)
- incorrect procedures for removing PPE.

**Only two health-care facilities (7%) had a waste management system in line with WHO recommendations. Key areas for improvement included:**

- absence of waste labelling and other required information
- absence of sharps containers
- inappropriate sharp waste management
- chemical disinfection of waste, including of PPE, was conducted manually.

None of the facilities have COVID-19 surveillance systems for health workers and patients or surveillance systems for HAI and AMR.

**None of the facilities met recommended requirements for a central sterilization unit (CSU) and medical device reprocessing. Key areas for improvement included:**

- Not all reprocessing stages were conducted in a CSU.
- Reprocessing was conducted by staff that were not trained.
- The reprocessing cycle was not in line with WHO recommendations and started with disinfection rather than cleaning.
- The flow for reproscessment of medical devices was not established in a CSU.
- CSU areas were not separated.
- Hot air sterilization was widely in use, which is not a recommended approach for sterilization.

**All health-care facilities had IPC-related standard operating procedures (SOPs). According to assessment results, in two health-care facilities (7%) SOPs were fully in line with WHO recommendations. In other health-care facilities key areas for improvement in SOP included:**

- Not all critical IPC processes were described in SOPs.
- Some SOPs were outdated and not in line with WHO and national standards.
- SOPs were long and contained non-essential information.

Photo 14. Who experts are assessing central sterilization unit during technical support visit

None of the facilities had a monitoring and evaluation framework for IPC practices, including monitoring of hand hygiene practices.

During November–December 2020, upon request of health authorities, WHO conducted technical support visits to 20 designated COVID-19 facilities, 13 of which were previously visited during April–June. The objectives of the visits were: to assess and evaluate the implementation of WHO recommendations provided during the initial technical assistance visit; assess and evaluate the implementation of the SOPs for key components of COVID-19 prevention; define the main barriers for the implementation of WHO experts' recommendations and identify ways to overcome them; conduct on-site training on hand hygiene and introduce MMIS; assess the status of the IPC programmes in the health-care facility; provide recommendations for further strengthening of IPC programmes; and assist in the development of key SOPs.

It was observed that knowledge on PPE use improved in the majority health-care facilities and the number of non-recommend practices decreased, although they were still observed in some hospitals. Implementation of IPC-related SOPs was observed in the majority of health-care facilities, as there were improvements in patient triage and waste management practices in some hospitals. However, recommendations in areas that require more structural changes were not addressed, including availability of IPC experts, risk specific areas, reprocessing practice improvements, HAI and COVID-19 surveillance.

**Additional support and efforts at national, regional and facility level are needed to further improve IPC practices.**


Photo 15. WHO IPC technical support visits

# PROMOTION
# IPC INTERVENTIONS

Following discussions with UPHC, WHO and health authorities jointly promoted implementation of IPC intreventions. WHO designed and translated into Ukrainian *The COVID-19 risk communication package for healthcare facilities (13)*, providing an overview of the key steps to be taken to keep personnel safe and healthy at the workplace.

Information materials on donning and doffing PPE were developed in digital, print and video formats, and were disseminated through the UPHC, the Health Cluster and the partnering network of nongovernmental organizations.

WHO communicated with frontline workers to enhance their safety and health at the workplace, including dissemination *of The COVID-19 risk communication package* in 53 designated COVID-19 health-care facilities across Ukraine. Through this action WHO was able to directly inform health workers on workplace safety standards.

As part of a hand hygiene strengthening initiative in COVID-19 designated hospitals, WHO disseminated information materials on the "five moments of hand hygiene", procedures for hand hygiene with ABHR and handwashing.

WHO developed a framework including SOPs on triage, use of natural ventilation, disinfection of highly touched surfaces, PPE use, hand hygiene and waste management – covering important aspects of COIVD-19 prevention in infectious disease hospitals and health-care facilities that were repurposed for COVID-19 response. The SOPs were based on WHO recommendations and include information on SOP aims, definitions of main terms, descriptions of the procedures of interest, approaches to monitoring, and references to other related SOPs and national legislation, as well as WHO guidelines.

WHO provided IPC-related SOPs to more than 30 health-care facilities during technical support visits and provided on-site technical assistance on SOP adaptation to the context of the health-care facility.


Photo 16. Visual materials for PPE donning and doffing

# USE OF MULTIMODAL STRATEGIES FOR IPC PROGRAMME STRENGTHENING AT FACILITY LEVEL

On 8–9 September, upon request of health authorities, WHO experts conducted a technical visit to support strengthening of the IPC programme at the infectious disease department of Rubizhansk City Hospital. The department has 30 beds designated for patients with COVID-19, ten of which were occupied by patients during the visit. The department has 11 oxygen concentrators; and no central oxygen supply system available. The department has no ICU beds, but it is possible to admit patients to the hospital's ICU, which has eight intensive care beds available.


Photo 17. Place for PPE doffing

Photo 17 illustrates the designated place for PPE doffing. The surfaces of the table that were in use were hard to disinfect properly [1]. ABHR was available in a sprayer [2], which increases contact with the bottle during the doffing process and requires multiply uses to receive the appropriate volume of sanitizer. Reprocessing of non-critical medical equipment and reusable PPE such as goggles was done in an undesignated place. Reprocessing of goggles did not include cleaning and was done using alcohol-based wipes that cannot ensure proper disinfection. Failure to properly clean an item hinders the disinfection process.

The hand hygiene station near the PPE doffing place (Photo 18) did not have designated equipment for paper towels [1], and hand sanitizer dispensers were hard to use as they were placed at the edge of the sink and often fell down [2].


Photo 18. Hand hygiene station near the PPE doffing place

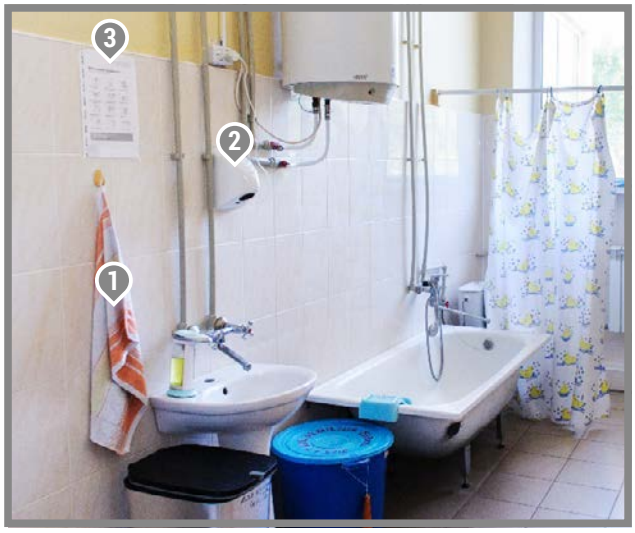


Photo 19. Hand hygiene station for medical personnel

At the hand hygiene stations in the infectious disease department (Photo 19), cloth towels [1] and hand dryers [2] were in use. Information materials on hand hygiene were impossible to read due to the low quality of the image [3].

In the examination room (Photo 20), hand dryers were also in use [1], ABHR dispensers were placed in hard to reach locations [2], and multiple bins were used for chemical disinfection of category B wastes [3].


Photo 20. Hand hygiene station in examination room


Photo 21. Bin for medical waste

The majority of bins for medical waste were in a condition that did not allow safe waste management (Photo 21 [1]).

Disinfection tunnels and carpets with disinfectants were used in the department for PPE and "additional" disinfection (Photo 22). Spraying individuals with disinfectants (such as in a tunnel, cabinet or chamber) is not recommended under any circumstances. This could be physically and psychologically harmful and does not reduce an infected person's ability to spread the virus through droplets or contact *(13)*.

Photo 22. Use of disinfection tunnels and carpets for disinfection

Access to ABHR was limited as dispensers were absent in patients' rooms and places for PPE donning (Photo 23).

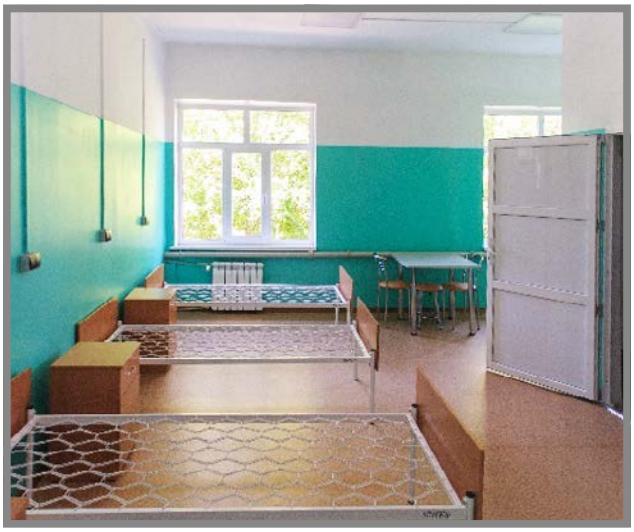

Photo 23. Limited access to hand sanitizer in patient wards and places for PPE donning

The reuse of biohazard suits with suboptimal procedures for decontamination was observed (Photo 24). Also, staff of the infectious disease department did not have fit-testing before particulate respirator use and some mistakes in PPE doffing procedures were observed, including PPE being taking off in the wrong sequence.

Photo 24. Multiple use of biohazard suits

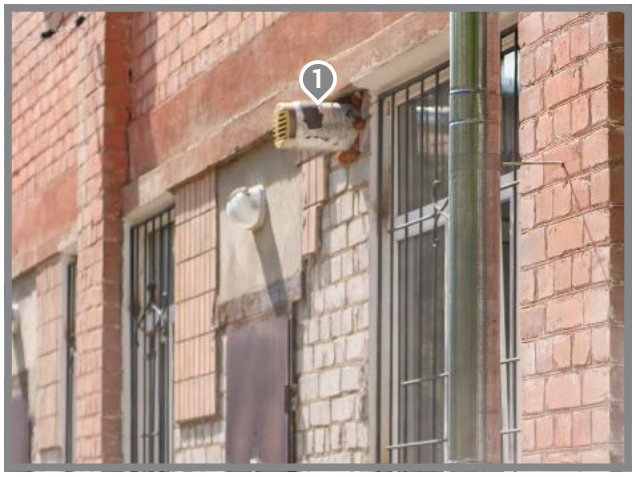


Photo 25. Use of a recuperator for ventilation

The recommended ventilation rate of 60 l/s/patient for general wards *(15)* was not achieved as recuperation was used only (Photo 25 [1]). The air flow from clean to dirty zones was not arranged.

As Photo 26 illustrates, a two-bucket system was used for cleaning of the floor [1]. However, lack of mops and suboptimal procedures for washing and reuse of cleaning equipment [2, 3] as well as the absence of SOPs for cleaning, created possibilities for cross-contamination of the surfaces and made the process of cleaning unsafe for personnel.


Photo 26. Cleaning equipment

WHO provided equipment including ABHR and soap dispensers, paper towel dispensers, elbow taps, and consumables including ABHR supplies, paper towels, and liquid soap, for the establishment of 80 hand hygiene stations. Hand hygiene stations were renovated and established in places for PPE donning and doffing, examination rooms and patient rooms.

In the area for PPE doffing (Photo 27) all surfaces were made easy to disinfect [1]; elbow-press dispensers for hand sanitizer were installed, which are easy to use without contamination [2]; decontamination and reprocessing of all equipment was moved to another area; properly marked containers for reusable PPE (googles) were put in place [3]; bins with an automatic system for opening were made available for single use PPE disposal, and treatment of hazardous wastes (including PPE) is now conducted without chemical disinfection [4] (incinerators are used for hazardous wastes); and information materials on PPE doffing and hand hygiene are displayed where they are easily visible to staff [5].


Photo 27. Place for PPE doffing

All hand hygiene stations (Photo 28) were equipped with paper towel dispensers [1], soap dispensers [2] and WHO information materials [3]; and all will be equipped with elbow taps [4].


Photo 28. Hand hygiene stations

In all patient rooms (Photo 29), hand sanitizer dispensers [1] and information materials with the WHO "five moments for hand hygiene" [2] were installed. In each entrance to the patient rooms, hand hygiene stations were established [3].


Photo 29. Access to hand sanitizer in patient rooms and entrances

WHO supported the infectious disease department by providing SOPs on hand hygiene and equipment for hand hygiene monitoring (Photo 30).

Photo 30. UV-lamp for monitoring of hand hygiene compliance

WHO provided fit-testing for the hospital and training on respirator fit-testing for staff involved in providing care with aerosol-generating procedures (Photo 31).


Photo 31. Respirator fit-testing procedure

WHO conducted on-site training on rational use of PPE, and provided informational materials and PPE for cleaning and care provision (Photo 32).

Photo 32. On-site training and information materials to improve rational use of PPE

WHO equipped all patient rooms with automatic closers (Photo 33 [1]) to prevent movement of air from dirty zones to clean zones, in accordance with the risk assessment. Training on natural ventilation use was conducted and mosquito nets were provided to the hospital to ensure comfortable use of natural ventilation in the summer and autumn months (Photo 33).

Photo 33. Improving natural ventilation use and preventing the flow of air from dirty to clean zones

Cleaning equipment was provided to the infectious disease department with colour coding to avoid cross-contamination of zones with different risks of infection transmission (Photo 34 [1]). Detailed, fit-for-purpose SOPs and training on environmental cleaning were provided to the staff. Equipment for washing and automatic drying of mops [2, 3] and color-coded buckets for linen handling [4] were provided to support implementation of standard precautions.


Photo 34. Equipment for cleaning and linen handling

The technical support provided to the infectious disease department of Rubizhansk City Hospital followed the WHO recommended approach of multimodal implementation of IPC core components.

The assessment of needs, provision of essential IPC materials, on-site training and implementation of up-to-date SOPs and monitoring frameworks strengthened the IPC programme in a very short time.

The support provided was focused on strengthening all WHO-recommended strategies to prevent spread of health care associated COVID-19; including administrative, environmental and engineering control measures; as well as standard and transmission-based precautions (droplet, contact and airborne), which are essential components of an effective COVID-19 response in hospitals.

Photo 35. Summary meeting with hospital leadership

# BUILDING THE INSTITUTIONAL SAFETY CLIMATE

The COVID-19 pandemic spotlighted areas for improvement in IPC programmes at national and facility levels. The pandemic also illustrated the importance of IPC implementation and strengthening of hospital readiness for outbreak responses, including ward repurposing. COVID-19 stimulated great interest in IPC among health workers and the general public, which was observed during technical visits and through analysing participants' involvement in IPC-related webinars and lectures.

Some improvements in the IPC programme were achieved during the acute phase of the response, both at national and facility level. These included regular updates on COVID-19 standards of care with an IPC component, improving the knowledge of health-care providers on PPE use and improving waste management practices.

According to the 2018/2019 Global Monitoring of Country Progress on Antimicrobial resistance, no national IPC programme or operational plan is available in Ukraine *(16)*.

In 2018, WHO supported national authorities to conduct a self-assessment on the implementation of the core components for infection prevention and control (IPC) programmes at the national level using the WHO National Infection Prevention and Control Assessment Tool 2 (IPCAT2) *(17)*.

The results of the self-assessment at national level showed relatively good implementation of core component 1 (IPC programmes), however further improvement is needed for core component 2 (IPC guidelines), core component 3 (education and training), core component 4 (HAI surveillance), core component 5 (multimodal strategies) and core component 6 (Monitoring of IPC practices and feedback).

To ensure the sustainability of progress achieved and to enhance IPC in health-care settings a number of steps should be taken by the government, public health authorities, health facility managers and health-care providers to build back stronger and ensure safe services and a safe working environment for medical personnel.

Photo 36. Health-care providers in a COVID-19 designated ward

## The following steps in IPC strengthening are recommended:

- develop and execute an IPC national action plan and budget to guide further IPC strengthening;
- develop a national outbreak prevention plan to strengthen health-care system readiness;
- appoint a national IPC committee/group to support implementation of the IPC national action plan;
- develop and execute regional plans for IPC strengthening as a part of national strategy implementation;
- update national guidelines for HAI prevention, surveillance and IPC programme establishment at facility level;
- ensure that at least one IPC specialist is employed full time for each 250 beds in acute care hospitals;
- develop certified postgraduate training for IPC specialists and sterilization technicians;
- integrate IPC modules into undergraduate and postgraduate educational curricula for doctors and nurses;
- develop minimal IPC requirements and monitoring system for health-care providers contracted by the NHSU to ensure an increase in IPC standards;
- follow multimodal approaches for IPC strengthening at national and facility level.

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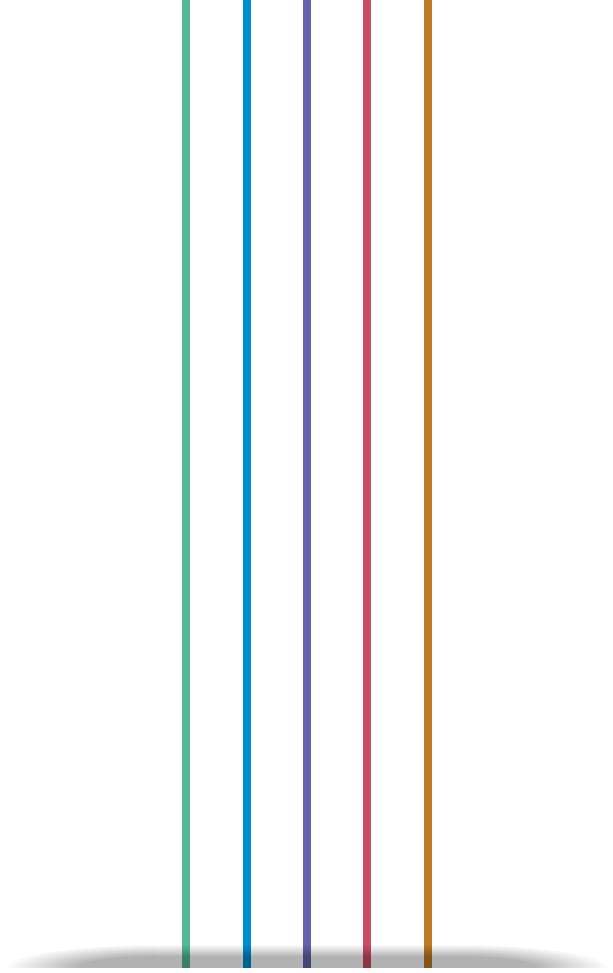

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WHO/EURO:2021-2051-41806-57293

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