What can research evidence tell us about:
Covid-19 Infection Prevention Control (IPC) practices for health facilities at the district level

**Key messages**

- Infection Prevention and Control (IPC) practices should be established for
  i) the physical environment and inpatient wards, ii) for individual healthcare workers (HCW) and iii) for the management of district level health facilities in order to prevent and control infection from covid-19

- IPC protocols should
  - be instituted in all health facilities and should be observed and complied with
  - spell out mechanisms with clear leadership and clear roles and responsibilities with accountability trails.
  - have regular training for personnel, e.g. through simulations.

- The highest likely sources of transmission within facilities are fomites, hence these should be regularly cleaned and disinfected

- HCWs should have PPE at all times, regular updates and continuous medical education even during the outbreak, periodic refresher training on IPC and mental health assessment and support.
Summary

Background: By April 02, 2020 Uganda had confirmed 44 cases and these are expected to increase. Although health care workers (HCWs) are the first point of contact of patients with the health system, it is not unusual for lower health facilities in Uganda to lack or have inadequate infection prevention control (IPC) protocols and vital personal protection equipment for them. Healthcare workers are therefore continuously exposed to infections while performing their duties, more so with an infection. There is concern amongst District health authorities about this and the urgent need to plan for infection prevention and control for healthcare workers under their jurisdictions during the covid-19 pandemic.

Rapid Response Question: How can lower health facilities in a district institute infection prevention and control practices in preparation for a potential Covid-19 outbreak?

Findings:
Infection prevention and controls within lower health facilities should be instituted at different levels- management level, environment and inpatient ward, and among the healthcare workers.

Health facility - Environment and context
- Health facilities can design and tailor mechanisms to their contexts to screen, identify and isolate any potential covid-19 suspect. These can be done starting with the gate, creating a screening, isolation and containment zones.
- Reduce congestion within the health facility.
- The containment room should be a safe distance away from other rooms and with its toilet and means of waste disposal management. Health facilities should restrict entry to this room to a few staff and cleaners.
- Regular cleaning and disinfection of materials and devices within the hospital because these were the most common sources of transmission in the past severe acute respiratory syndrome disease outbreaks.
- Ensure sources of disinfection are in visible and accessible places. If possible, have a separate source of disinfection for staff.

Health facility - inpatient wards
- Communicate to patients and carers about protocols of accessing and disinfection at the health facility
- Create a triage protocol and reduce congestion within the wards
- Enforce visitation times

Health facility - individual healthcare worker level
- All personnel within health facility should observe strict IPC protocols. Strategies like trainings e.g. through simulations should be regularly conducted to ensure that these protocols are understood and practiced.
- All personnel should have regular continuous medical education about the outbreak. These can be accessed through various sources e.g. WHO website
- All personnel should use PPE at all times.
- Have strategies to regularly assess the level of compliance to IPC protocols
- Support HCWs who might have increased their risk of exposure to covid-19.
- Provide mental health support to all healthcare workers.

Health facility - management level
- Set up a focal IPC team led by someone with experience and authority at the facility
- The responsibilities of the IPC focal team should be standardised, clear and with well-articulated accountability trails.
- All personnel should be trained to identify covid-19 suspect cases with clear instructions on isolating them from the rest of the patients.
o All personnel should receive clear roles and regular refresher trainings e.g. through simulations in IPC for covid-19 or any potential infectious disease outbreak.

o There should be available personal protection equipment at the facility and clear mechanisms on how the healthcare workers can access them.

o Messages to patients, carers and staff should be clear, respectful and in a language they understand.

o Assessment of suspects should be done in a designated place by designated staff or one who has PPE.

o Set clear channels and mechanisms of conducting responsible authorities for transfer of suspected covid-19 patient to designated facilities for diagnosis and management were applicable.

Conclusions:
IPC protocols should be instituted at all health facilities. The protocols should be implemented, regularly trained and audited at all levels such as management, physical environment and individual healthcare workers. There should be clear messages in the health facilities on the covid-19 that are easily accessible and in a language personnel, patients and carers understand. It requires team effort of the personnel at the health facility to ensure that they protect themselves and their patients. Lastly, health facilities can set up mental health support such as group psychotherapy amongst their staff throughout the outbreak.
Background

The World Health Organization (WHO) declared coronavirus disease 2019 (Covid-19) a pandemic on March 11, 2020 [2]. Over 950,000 confirmed cases and 45,000 deaths had been reported by April 02, 2020 [3]. The rate of spread of Covid-19 has been shown to vary widely, with a case expected to cause at least 2 or more secondary cases. [4]. Although country statistics might vary, 8 out of every 10 of those found infected are reported to have mild disease, and at least 2 out of 10 of would be cases never develop any symptoms. [5]. However, these can still transmit the infection making it difficult for any country with cases to stem the outbreak. Uganda has confirmed 44 cases on April 02 2020, which cases are expected to increase and most likely constrain the health system.

Healthcare workers (HCWs) face continuous and consistent exposure in the line of duty during outbreaks. For example, China reported more than 3000 healthcare workers infected with Covid-19 [6] while in Uganda, healthcare workers were 7% of the infected individuals during the Ebola outbreak in 2002, killing more than 50% [7]. This risk increases exponentially in situations where health facilities do not have IPC protocols in place, have unrecognized patients, have poor compliance to standards and lack appropriate PPE for individual HCWs [8]. The case of inadequate infection prevention control protocols in health facilities in Uganda is not unusual [9]. Furthermore, it is also common knowledge that many of these health facilities in Uganda do not have vital personal protection equipment for HCWs or IPC protocols that are vital for preventing them from acquiring the infection [9].

District health authorities including District Health Officers (DHOs) have expressed concern about the continuous exposure to infections that HCWs in lower health facilities face. These cadres are typically at the frontline of any epidemic as they are the first point of contact that patients have with the public health system. This risk of exposure is amplified by the nature of covid-19, where patients can spread the disease even when asymptomatic or with mild disease. Furthermore, infectious disease outbreaks such as the current covid-19 pandemic are a source of anxiety, worry, loss of morale and confidence among HCWs in lower health facilities[10]. As part of their mandate, DHOs in Uganda are expected to support and monitor the provision of health services within their jurisdictions which ranges from the village health teams through to health centre IV. It is in this capacity that they have raised the urgent need for guidance in order to plan for infection prevention and control for healthcare workers under their jurisdictions during the covid-19 pandemic.

Rapid response question:

What infection prevention and control (IPC) practices can health facilities at the district level institute to manage the Covid-19 outbreak?

How this Rapid Response was prepared

After clarifying the question being asked, we searched for systematic reviews, local or national evidence from Uganda, and other relevant research. The methods used by the SURE Rapid Response Service to find, select and assess research evidence are described here: www.evipnet.org/sure/rr/methods
Summary of findings

In this section, we summarise the considerations that lower level health facilities can undertake to establish infection prevention and control of Covid-19 disease. The evidence is informed by experiences and commentaries of health facilities, several countries' experiences in hospitals, systematic reviews and remarks from infectious diseases' experts.

The IPC practices are at different levels of the health facility; management, health facility and healthcare worker levels. Included in these strategies is also evidence on the effects of various methods or materials that are used in IPC.

### IPC for the health facility - environment and context

- Health facilities should take every effort to ensure and/or minimize the chances of all HCWs of getting infected. Special attention has to be placed on HCWs taking face-to-face assessments of anyone suspected to have covid-19 (which should be done by knowledgeable, and experienced personnel with the appropriate PPE).

- The following are ways in which facilities can set up advanced and basic infection prevention and control mechanisms suited to their context to protect HCWs and other patients:
  - Establish a mechanism to **screen, identify and isolate** probable cases of Covid-19. Some facilities have reported doing this in a staged manner, i.e. screening at the gate- measuring temperature by a professional nurse –if possible and security [11]. Security personnel are part of the staff and should be included in the drills and information guidance provided.
  - Set up an **isolation room or containment zone**. This place should have clear demarcation from the health facility- with enough distance from other places, well-aerated and close to a separate toilet or disposal place. The waste from this room should be handled separately and carefully. It should not be accessible by anyone apart from a member of the team and cleaner.
  - Some facilities have used and described different models or tools such as traffic control bundling that describes three clear and separate zones within a health facility – isolation, containment and transition.
  - Facilities should ensure one personnel observe adequate spacing between patients. Considerations should include providing adequate care.
  - Patients identified to have a fever or any symptom of Covid-19 should then be isolated and assessed by a HCW with PPE.
  - Set up stations for inquiries or registration, pre-examination and triage station. Facilities with enough room might use an open and aerated space or set up an observation tent outside the health facility. A HCW should provide clear information to patients every morning.
  - Facilities should provide visible sources of hand hygiene such as water and soap for personnel and that of patients. These should have clear instructions for washing hands, and this should be for at least 20-30 seconds [16].
• Materials and devices in the health facility e.g. materials and devices e.g. stethoscopes or thermometers are a huge source of infection and should be regularly disinfected with appropriate disinfectants [14]. The previous Severe acute respiratory virus (SARs) outbreak caused by a virus in the same family as the current coronavirus caused outbreaks within health facilities through the materials and devices [14]. Health facilities can consider different disinfectants as shown in table 1.

Table 1: Table showing the effect of select materials used as disinfectant on coronavirus

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Effect on virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol (78%-95%) in combination with 45% isopropanol</td>
<td>Readily inactivates coronavirus by more than $10^4 (4 \log_{10})$ viral particles or more [17]</td>
</tr>
<tr>
<td>Ethanol (62%-71%)</td>
<td>Reduced coronavirus infectivity within 1 minute of exposure by at least $10^2 – 10^4$ times or 2,000,000 viral particles [17]</td>
</tr>
<tr>
<td>Sodium hypochlorite (at least 0.21%)</td>
<td>Effective in reducing coronavirus infectivity [17]</td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>At a concentration of 0.5%, it is effective at an exposure of at least 1 minute [17]</td>
</tr>
<tr>
<td>Benzalkonium chloride</td>
<td>A concentration of 0.05% was more effective than 0.2%. 0.04% was less effective [17]</td>
</tr>
<tr>
<td>Chlorhexidine digluconate</td>
<td>At 0.02% it is ineffective</td>
</tr>
<tr>
<td>Sodium hypochlorite 0.1%-0.5% and glutardialdehyde</td>
<td>Effective with a reduction of more than $10^3$ times the viral particles~ 200,000,000 [17]</td>
</tr>
<tr>
<td>Sodium hypochlorite</td>
<td>Concentration of 0.06% is less effective [17]</td>
</tr>
<tr>
<td>Ortho-phthalaldehyde</td>
<td>Concentration of 0.55% is less effective [17]</td>
</tr>
</tbody>
</table>

• Health facilities should have strategies to control overcrowding within their environment [4].
If possible, some patients with mild disease (which is majority of cases) can consult over the phone. Contacts of HCWs who can provide advice at home should be provided to patients [10].

- There should be clear and appropriate management and careful waste disposal guidelines.
- IPC practices should be available in all units of the health facility including administration, finance and clinical care.

### IPC for health facilities - Inpatient care

- Because carers are potential sources of infection as they go back to the communities [11]
  - Reduce the number of carers to one per patient at any time
  - Companions not providing care should be advised not to stay around the health facility environment
  - Carers and patients should be provided with clear and simple messages
  - Carers should be screened and isolated each time they visit the health facility
  - Time of carers within wards should be minimized and can be done in several ways; for example, a certain number of carers might access the wards for a given amount of time [11, 13].
  - Enforce visitation times.
- The wards should be regularly cleaned and disinfected.
- Reduce the congestion within inpatient wards [11, 13].
- Inpatient wards should be an inadequate distance away from triage, containment rooms [1].
- Sources of hand hygiene should be placed in visible and clear places [11].

### Measures at the individual personnel level

- All personnel within the health facility should observe strict IPC practices [11]. There should be strategies to ensure compliance of strict IPC practices. Several approaches have been studied on improving and compliance to hand hygiene, including WHO recommendation strategies and different types of performance feedback. WHO recommendations include:
  - Increasing the availability of Alcohol-based rub (ABHR)
  - Different types of education for staff
  - Reminders (written or verbal)
  - Different types of performance feedback
  - Administrative support
  - Staff involvement

- **Different methods of wearing and removing procedures**
  - Double gloving may lead to less contamination compared to single gloving by at least 64% [19].
  - Following CDC recommendations for removing PPEs may lead to less contamination compared to no guidance) [19].
- Alcohol-based hand rub used during the removing process may not lead to less contamination than the use of a hypochlorite based solution [19].
- Additional spoken instruction may lead to fewer errors in removing PPEs. These might be daily instructions [19].

**Box 2: Evidence of the impact of the strategies to improve hand washing practices.**

- **Combination of interventions that include some but not all strategies recommended in the WHO guidelines may slightly improve hand hygiene compliance and may slightly reduce infection rates [18].**
- **Combination of interventions that include all strategies recommended in the WHO guidelines may slightly reduce colonisation rates. It is unclear whether the intervention improves hand hygiene compliance or reduces infection [18].**
- **Combination of interventions that contain all strategies recommended in the WHO guidelines plus additional strategies may slightly improve hand hygiene compliance. It is unclear whether this intervention reduces infection rates [18].**
- **Performance feedback may improve hand hygiene compliance. This intervention probably slightly reduces infection and colonisation rates [18].**
- **Education may improve hand hygiene compliance [18].**
- **Cues, such as signs or scent, may slightly improve hand hygiene compliance [15, 18].**
- **Placement of ABHR close to the point of use probably slightly improves hand hygiene compliance [18].**
- **All healthcare workers in all departments other than infectious diseases should be trained to be able to identify suspicious cases, proper use of PPE and care for suspects [18].**
- **Strategies to improve compliance in using PPE include:**

  *NB: The evidence related to the strategies used to improve handwashing practices is mostly of low certainty, meaning there is a high likelihood of getting a different result when this is repeated [18].*

**Different types of training**

- The use of additional computer simulation may lead to fewer errors in removing PPE [15, 19].
- A video lecture on wearing PPE may lead to better skills scores than a traditional lecture [15, 19].
- Face to face instruction may reduce noncompliance by 55% with removing guidance more than providing folders or videos only [15, 19].
- There were no studies on the effects of training in the long term or on resource use [15, 19].
- All personnel should have regular, continuous medical education on Covid-19. Evidence on Covid-19 is regularly updated, so there should be efforts to ensure this information is shared amongst all personnel. Strategies for CMEs might include:
- Daily or weekly continuous medical education sessions depending on the context of the facility.
- Ensuring that there is access to the internet at the health facility. The personnel can then be provided sources where they can get information, e.g. WHO has training modules where certificates are offered.
• Social media platforms, e.g. WhatsApp, Twitter or Facebook, can be used to share information between personnel.
• Regularly monitor all personnel for exposure with individuals infected with Covid-19 using standard tools such as the WHO risk assessment and management of exposure of healthcare workers in the context of Covid-19. Healthcare workers found to have an increased risk of exposure should be given leave and psychological support.
• Have strategies in place to regularly provide mental health assessment of healthcare workers and the necessary support needed. There are several strategies to assess and manage the mental health of HCWs, such as group psychotherapy which can be done among the healthcare workers within the health facility. Group psychotherapy was shown to significantly reduce the mean of depression scores among participants [20].

IPC at management level

• The leadership of the health facility takes responsibility for ensuring IPC at different levels. This can be done by setting up a dedicated team within the health facility that is responsible for ensuring that IPC protocols are available and adhered to [2, 11].
• The composition of the team has to be suited to the context of the health facility. The lead of the team should be an individual with authority to make decisions and ensure compliance to IPC protocols, for example, a hospital in China reported that this team was headed by the head of the health facility deputized by another staff of similar authority and experience [11, 12].
• The roles and responsibilities of the IPC focal team have to be standardized and transparent.

Roles and Responsibilities of the IPC focal team might include:

1. Responsible for the full implementation of the plan, resources, Organisation and coordination of IPC practices within a health facility [6].
2. Ensure that protocols to support the identification, isolation and infection control are available at the health facility [6]. These protocols include; (i) definitions of cases: probable, suspect, confirmed and (ii) the disease classification such as those who have mild, severe and acute respiratory distress syndrome.
3. The team has to make contingency plans to minimise hospital-acquired infections for unforeseen situations or when during extreme difficulties, e.g. when the health facility is overwhelmed by suspects [13].
4. Organise and coordinate resources required for IPC within the health facility, e.g. masks, goggles, aprons, boots, gloves and disinfectants. Logistics management includes a recording of the stock ins and outs of the resources [11].
5. Take full responsibility for the use of resources for IPC, e.g. recording personnel with materials such as goggles, rationing materials where these are limited [11].
6. Ensure that information about Covid-19 is available at the health facility and readily accessible to all personnel and patients in a language they understand and easy to find places, e.g. notice boards in different areas or walls [11].
7. Communicate to other personnel within the health facility and other stakeholders about government and local authority guidance on protocols, evolving policies and several suspects handled by a health facility.
cases confirmed within the health facility, district and the country. They should report in an accurate and
timely fashion.

8. Regular audits of IPC practices within the health facility, for example, a hospital in China reported that
weekly reviews improved IPC practices [14].


10. Ensure that the personal protection equipment (PPE) is available for personnel, and these are in good
condition. There are several types of PPE, and these have different risks of contamination and exposure to
the HCWs. According to WHO and CDC guidelines HCW should use gloves, masks, goggles or face
shields and isolation gowns when there is a risk of contamination. The intention is to cover mouth, nose
and eyes against droplets secreted by patients and to cover the upper part of the body including the arms
and hands. This should also protect against contact transmission. It is unclear what is the best PPE but the
following considerations can help to make a decision.

a. PPE made of more breathable material may not lead to more contamination spots on the trunk than
more water repellent material but may have greater user satisfaction.

b. Gowns may protect better against contamination than aprons [15].

c. The use of a powered air-purifying respirator may protect better than a simple ensemble of PPE
without such ventilator [15].

d. Alterations to PPE design may lead to less contamination such as added tabs to grab masks or
gloves, a sealed gown and glove combination by 73%, or a better fitting gown around the neck,
wrists and hands by at least 92% compared to standard PPE [15].

11. PPE does not replace the need for hand hygiene. This is most of the important IPC measure HCW can take

12. If there is a shortage of PPE it is good to know that any extra part of PPE in addition to hand hygiene
that can be used will already decrease the risk of infection

13. The facility should have regular meetings where updates on Covid-19 should be discussed; for
example, a hospital in China reported that these meetings were daily [11].

14. The contacts of the IPC focal team should be shared to all personnel and protocol of communication made
clear.

15. The mechanism to retrieve additional PPE must be clear to all staff with the unit

16. Other practical measures- cancelling non-essential events to prioritise resources; provision of food, rest,
and family support; and psychological support.

17. Regular review of services should be done and altered regularly as the situation evolves

18. All staff should be part of the process from gatekeepers to head of facilities, and these should be assigned
standardised responsibilities with clear accountability. The staff have been shown to increase the
confidence of and empowers the personnel to ensure that IPC practices are done adequately and
appropriately [10, 11].

19. Put in place a mechanism for contacting the responsible authorities for transfer of a suspected case to the
national designated places for quarantine, testing and management were necessary.
20. Communicate regularly to patients and their carers with messages that are clear, respectful and in a language they understand.

Conclusion
IPC protocols at lower health facilities should be instituted, trained, simulated and observed at management, the physical environment and individual healthcare workers. An IPC focal team should be set up with an experienced person who has authority within the health facility like the head of the facility. The focal team should have clear roles and accountability trails to ensure compliance with IPC protocols. The health facility has to design mechanisms to observe screening, identification, isolation, social distancing of all patients, carers and personnel in all processes within the locale of the health facility. The physical environment should be regularly disinfected and decongested to minimise the risk of infection. The messages should be clear, easily accessible and in some language personnel, patients and carers understand. It requires a team effort of the staff at the health facility to ensure that they protect themselves and their patients. Health facilities can set up mental health support, such as group psychotherapy amongst their staff throughout the outbreak.

Box 3: Helpful guidance and information sources for health facility personnel on IPC

Updates on Covid-19 outbreak in Uganda
https://covid19.gou.go.ug/

Resources for hospitals and healthcare professionals preparing for patients with suspected or confirmed covid-19

Corona virus technical guidance


References

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