

# Impact of the COVID-19 pandemic on gastrointestinal endoscopy in Africa



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## Supplementary material

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## ABSTRACT

**Background and study aims** As with all other fields of medical practice, gastrointestinal endoscopy has been impacted by the COVID-19 pandemic. However, data on the impact of the pandemic in Africa, especially sub-Saharan Africa are lacking.

**Methods** A web-based survey was conducted by the International Working Group of the European Society for Gastrointestinal Endoscopy and the World Endoscopy Organization to determine the impact and effects the COVID-19 pandemic has had on endoscopists in African countries.

**Results** Thirty-one gastroenterologists from 14 countries in north, central, and sub-Saharan Africa responded to the survey. The majority of respondents reduced their endoscopy volume considerably. Personal protective equipment including FFP-2 masks were available in almost all participating centers. Pre-endoscopy screening was performed as well.

**Conclusion** The COVID-19 pandemic has had a substantial impact on gastrointestinal endoscopy in most African countries; however, the impact may not have been as devastating as expected.

## Introduction

The novel coronavirus disease (COVID-19), which first appeared in Wuhan, China in December 2019, has had a global impact of historically unprecedented scale [1, 2]. Medical institutions all

over the world have been challenged not only with severely afflicted patients but also with restructuring and reorganization of medical practice to accommodate the influx of patients as well as for reasons of infection protection and control [3, 4].

In central and sub-Saharan Africa, disease epidemics have been easily spread and sustained, primarily due to socio-economic, regulatory, and demographic factors [5]. Weak and poorly resourced health-care systems in African countries have led to concerns about the possible devastating effects that a rapidly spreading Coronavirus could have in these countries [6–8]. At the time of writing, the World Health Organization has reported 83,913 cases of COVID-19 and 2,287 deaths in Africa [9]. Nevertheless, many African countries have made quick and timely efforts to prepare their medical systems for the pandemic [10]. Also, the experience of many African countries with past epidemics, including the Ebola virus disease epidemic of 2014, may prove advantageous in the current situation. In addition to this, infrastructure from previous global initiatives in dealing with HIV, malaria, and tuberculosis could also have a positive effect in facing the current pandemic [4].

As with all other fields of medical practice, the COVID-19 pandemic has impacted gastrointestinal endoscopy, especially with regards to triage and prioritization of patients and procedures, cleaning and disinfection of equipment as well as protection of health care workers (HCW) [11,12]. A survey from northern Italy showed a dramatic burden of the pandemic on endoscopy units [13]. However, data on the effects of the pandemic on gastrointestinal endoscopy in central and sub-Saharan Africa (SSA) are lacking. Possible underreporting of disease burden, unavailability of test kits, and scarcity of personal protective equipment (PPE) may have had a greater impact on endoscopy practice in SSA than in other parts of the world.

In this study, we report the results of an Africa-wide survey of the impact of the COVID-19 pandemic on endoscopy practice in central Africa and SSA. The survey was developed by the International Affairs Working Group (IAWG) of the European Society of Gastrointestinal Endoscopy (ESGE) and the World Endoscopy Organization (WEO) and conducted between the 13 and 27 May, 2020.

## Methods

To acquire information on the impact of the COVID-19 pandemic in SSA including changes in endoscopic activity, availability of PPE, use of pre-endoscopic screening measures, and capacity of endoscopy units in general, a web-based survey with 29 questions (**Appendix 1**) was distributed to 86 gastroenterology and endoscopy centres across northern and central Africa and SSA. Survey participants included personal contacts and members of national societies with close-working relationships to the ESGE and WEO [14–16].

## Results

Overall, 31 responses were received from 14 different African countries. To provide context on the results, we have included the current per-country World Health Organization (WHO) COVID-19 situation report (**Table 1**) [9]. Detailed results of the individual questions are reported in **Appendix 2**, and the main results are summarized below.

**Table 1** Number of survey responses from each country and WHO External Situation Report per country.

Country	Survey Responses, n	WHO External Situation Report No. 13 [9]		
		Total Cases	Total Deaths	HCW
Benin	1	208	3	2
Burkina Faso	1	845	53	N/A
Democratic Republic of Congo	2	2,403	2,403	63
Ethiopia	3	701	6	N/A
Kenya	1	1,348	52	6
Mali	1	1,077	70	N/A
Morocco	2	N/A	N/A	N/A
Mozambique	1	213	1	N/A
Nigeria	12	8,344	249	606
South Africa	1	24,264	524	326
Senegal	1	3,61	37	77
Sudan	2	N/A	N/A	N/A
Togo	1	391	13	12
Tunisia	2	N/A	N/A	N/A

HCW, health care worker

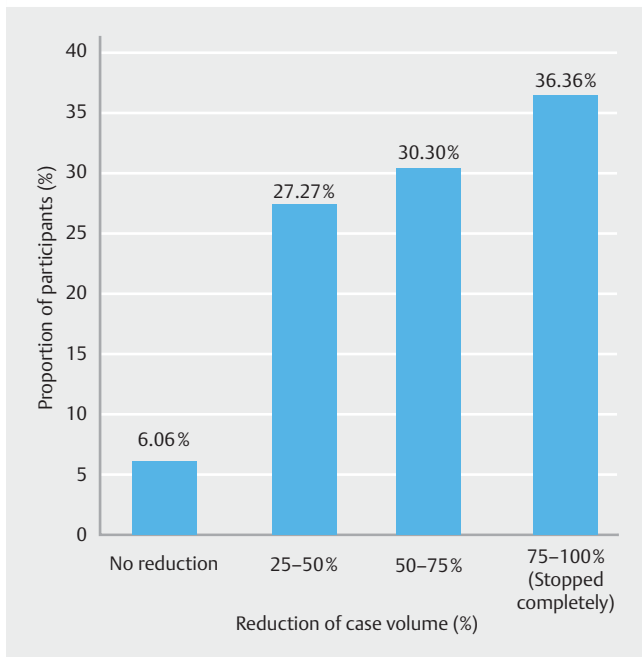
## General questions and case volume of centers

Fifty-three percent of participants perform fewer than 100 endoscopic procedures, 26% between 100 and 300, and 21% more than 300 endoscopic procedures per year.

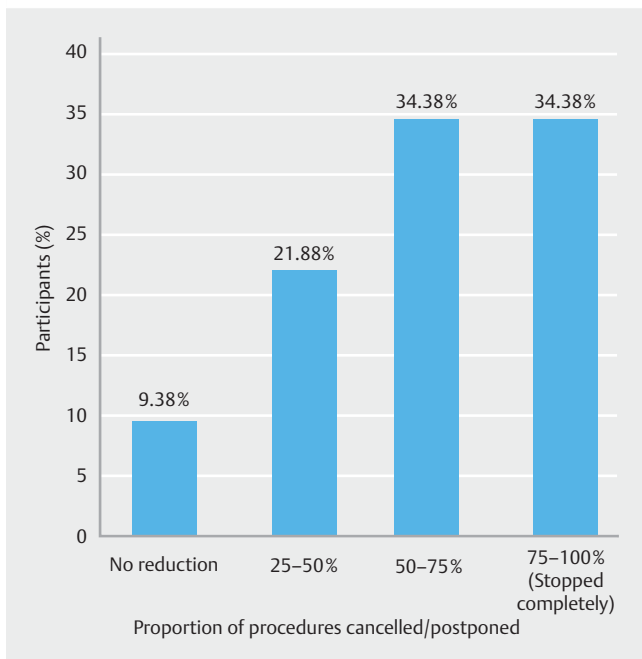
The majority of participants (88%) had not performed an endoscopy on a patient with confirmed or suspected COVID-19 but 62% of participants were working in medical institutions that took care of patients with COVID-19. However, more than 75% of participants felt that COVID-19 was underreported or underdiagnosed in their countries. Where an emergency endoscopy was performed on a patient with COVID-19 (12%), the indication was upper gastrointestinal bleeding.

## Changes in endoscopic activity

Overall, 36% of participants reduced their endoscopy case volume by 75% to 100%, 30% by 50% to 75%, 27% by 25% to 50%, while 6% had no reduction in case load (**Fig. 1**). Ninety-four percent of participants changed their triage protocol during the pandemic. In reducing endoscopy volume, the majority of participants performed only emergency and urgent procedure but 12% continued all procedures including elective endoscopy throughout the pandemic. Sixty-nine percent of participants cancelled 50% to 100% of all procedures, while 9% did not cancel or postpone endoscopic examinations (**Fig. 2**). Eight-sev-



► **Fig. 1** Impact of the COVID-19 pandemic on case volume.

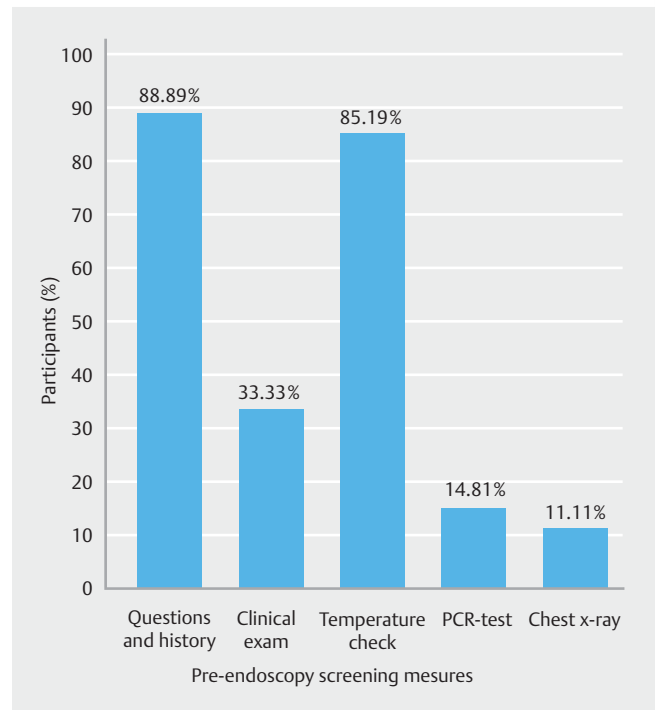


► **Fig. 2** Cancellation and postponement of endoscopy due to the pandemic.

en percent postponed their procedures indefinitely or for a least 4 weeks.

### Prescreening measures

Patients with COVID-19 represent a potential disease transmission risk to the hospital staff, endoscopy staff, and other patients, which requires specific risk management practice. One



► **Fig. 3** Prescreening of patients mostly by questions and history-taking.

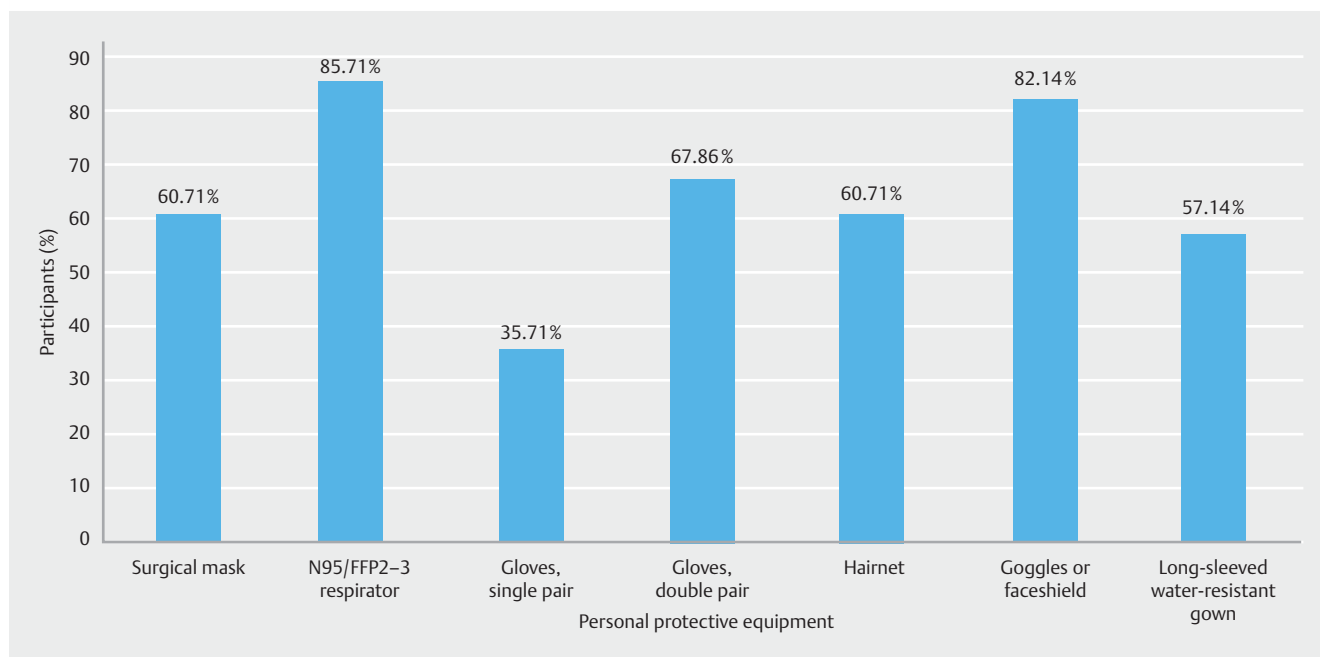
such practice is prescreening, which involves assessment of a patient's infectiousness risk prior to arrival at the hospital, admission or undergoing a procedure.

While 17% of respondents used no prescreening measures, 83% prescreened their patients prior to endoscopy. Questions and history-taking as well as temperature check were the predominant prescreening procedures prior to endoscopy. Only 15% of respondents used viral polymerase chain reaction (PCR) testing as a prescreening measure (► **Fig. 3**).

### Personal protective equipment

During the pandemic, PPE regulations changed in 97% of respondents' centers. Eighty-two percent of participants answered that PPE changed for all patients, irrespective of confirmation or suspicion of COVID-19. N95 masks and long-sleeved, water-resistant gowns were the most limited PPE during the pandemic even though 86% of participants used N95 masks for endoscopy in their centers (► **Fig. 4**). Fewer than half of respondents (43%) reused PPE. The respondents were asked what PPE reuse strategies their centers employed, if any. The most common reuse strategies implemented by the respondents included:

1. Covering N95 masks with surgical masks.
2. Reusing N95 masks continuously for a whole day.
3. Disinfecting masks and face-shields between procedures.
4. Hanging N95 masks for several days before reusing.
5. Continuously reusing PPE for non-suspected COVID-19 cases.



► **Fig. 4** Availability of PPE during the pandemic (multiple answers were possible).

## Endoscopy rooms

For 90% of respondents, a negative-pressure room was not available for examination of COVID-19 patients while 24% had a specifically dedicated room for examination of confirmed or suspected COVID-19 cases. In 80%, family members were not allowed access into the endoscopy unit.

## Cleaning and disinfection of endoscopes

Only 23% of respondents changed their disinfection and cleaning protocol as a result of the pandemic. Furthermore, 68% changed the personal protection procedures for cleaning personnel. Changes described by the respondents included:

1. Regular hand hygiene/washing with soap.
2. Cleaning and disinfecting endoscopy rooms between each procedure.
3. Extending disinfection time for endoscopy equipment and endoscopy rooms.
4. Routinely using surgical face masks and two pairs of gloves for cleaning and disinfection of endoscopes.
5. Using complete PPE for cleaning and disinfection of endoscopes.

## Return strategies

In consideration of low prevalence rates for COVID-19 patients, 56% of participants are now considering changing back to normal and 42% have a specific return-to-normal strategy. Most return strategies involve continuation of prescreening procedures for risk-stratification as well as performing all endoscopy procedures in the future with surgical masks irrespective of COVID-19 risk.

## Discussion

SSA experiences major infectious disease outbreaks on a regular basis that threaten public health, with the WHO regularly reporting regional outbreaks of Ebola, river blindness, and malaria among others [17]. In the face of this, the preparedness for COVID-19 with its potential to rapidly spread and devastate a resource-deprived population in SSA is of particular concern.

In this paper, we presented data on the effects and impact of the COVID-19 pandemic on the practice of gastrointestinal endoscopy in northern, central, and sub-Saharan Africa. The prevalence of COVID-19 in most parts of Africa [9] seems to be lower than the rates reported in Europe and the United States; however, more than three-quarters of participants agreed that COVID-19 may be underreported or underdiagnosed in their countries. Nevertheless, a considerable burden on gastrointestinal endoscopy with reduction or cancellation of procedures in almost all participating centers was observed. Most cancelled procedures were postponed indefinitely or for at least 4 weeks while procedures still being performed were limited to urgent indications or emergencies. Only two survey participants had examined patients with COVID-19 in an emergency situation. This is in contrast to the results of a survey from Italy in which about half of all endoscopy units were directly involved in emergent or urgent procedures in COVID-19 cases [13]. However, this may not have been the case in other parts of the world that did not experience the same extremely sharp rise in incidence of COVID-19 cases within a short period of time. In comparison, we have included the survey results from three other centers in Australia, Denmark, and Germany in **Appendix 2**.

An interesting aspect of the survey is the impact the pandemic had on use and availability of PPE as well as reuse strategies implemented by participating centers. As was the case in

Europe and the United States, N95 /FFP-2 masks were the PPE for which shortages, scarcity, and reuse strategies were most commonly described. Nevertheless, all forms of PPE including N95 masks were available in most centers (► Fig. 4). At least from the results of this survey, there does not seem to be much of a difference between the availability of PPE for gastrointestinal endoscopy in Africa and in other parts of the world. However, this must be interpreted in context of endoscopy case volume and COVID-19 prevalence rates in most centers in central and sub-Saharan Africa.

With regards to prescreening, again there seems to be no difference from other parts of the world in which viral PCR testing is not done routinely while temperature checks as well as pre-endoscopy risk-stratification are commonly recommended [18,19]. Finally, return strategies are now being planned by more than half of the participating centers in Africa, again similar to approaches in Europe.

The main limitation of this survey is the relatively low overall response rate received, which may limit the generalizability of the data. However, the limitation is relativized by the adequate number and distribution of countries that participated in the survey.

## Conclusion

The results of this Africa-wide survey have shown that the COVID-19 pandemic has had a substantial impact on gastrointestinal endoscopy in most African countries; however, due to the low prevalence rate and the low case-volume in most centers, and possibly also the local experience with communicable diseases, the short- and intermediate-term impact may not have been as devastating as expected.

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## Competing interests

The authors declare that they have no conflict of interest.

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