BACKGROUND
In response to the global emergence of the Coronavirus disease (COVID-19) caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), there has been genuine concerns about the risk of transmission during gynaecological endoscopy via the diffusion of contaminated aerosols generated from CO2 leakage and smoke created by energy devices. A pragmatic step in mitigating transmission at the University College Hospital, Ibadan, resulted in the closure of the Endoscopic unit for 3 months whilst deploying increased hygienic methods coupled with social distancing. This however had its unintended consequences of delay and increased backlog of cases aside the economic losses. Developing a unit-based policy/protocol in response to any future unforeseen occurrence should take front stage in the planning and administration of the unit. Adopting global best practices and guidelines from researched evidence is not only imperative but desirable especially in the context of limited resources.

TRENDS IN GYNAECOLOGICAL ENDOSCOPY
Minimal access surgery at the University College Hospital, Ibadan, began with the introduction of minilaparotomy for tubal sterilization in September, 1975. It provided a quick and safe out-patient procedure conducted under local anesthesia. Over the

Correspondence:
Dr. G.O. Obajimi
Dept. of Obstetrics and Gynaecology,
University College Hospital,
Ibadan
Email: gbolahanobajimi@gmail.com

ABSTRACT
The impact of the COVID-19 pandemic on endoscopic services in a low resource economy is formidable. With the emergence of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), there has been genuine concerns about the risk of transmission during gynaecological endoscopy via the diffusion of contaminated aerosols generated from CO2 leakage and smoke created by energy devices. A pragmatic step in mitigating transmission at the University College Hospital, Ibadan, resulted in the closure of the Endoscopic unit for 3 months whilst deploying increased hygienic methods coupled with social distancing. This however had its unintended consequences of delay and increased backlog of cases aside the economic losses. Developing a unit-based policy/protocol in response to any future unforeseen occurrence should take front stage in the planning and administration of the unit. Adopting global best practices and guidelines from researched evidence is not only imperative but desirable especially in the context of limited resources.

TRENDS IN GYNAECOLOGICAL ENDOSCOPY
Minimal access surgery at the University College Hospital, Ibadan, began with the introduction of minilaparotomy for tubal sterilization in September, 1975. It provided a quick and safe out-patient procedure conducted under local anesthesia. Over the
years, the unit has been transformed into a gynaecological endoscopic unit with facilities for outpatient laparoscopy and hysteroscopy. Procedures carried out include a wide range of services aimed at optimizing infertility management.

With the onset of the COVID-19 pandemic, the gynaecological endoscopic unit was shut down for 3 months beginning on the 1st of April 2020 till the 30th of June 2020. Skeletal services resumed in July 2020 and have remained so till this publication. Prior to the pandemic, an average of 24 endoscopic procedures were performed monthly with a preponderance of diagnostic laparoscopy for tubal patency evaluation.

3. **Consumables:** A shift from the use of recyclable materials to disposable ones became the norm and this extra financial burden was transferred to the patients or their insurance. This paradigm shift was imperative to safeguard the health of both patients and staff especially from the possible consequence of contamination from body fluids.

4. **Risk Assessment:** Each patient presenting for evaluation had to go through a series of epidemiological questions with risk assessment for the most common symptoms of SARS-CoV-2. This was then followed by measuring body temperature with an infra-red thermometer.

- **Figure 1:** Trends in Gynaecological endoscopy, March-October 2020

**IMPACT ON GYNAECOLOGICAL ENDOSCOPY**

1. **Patient Care:** The closure of the unit during the pandemic resulted in the cancellation of all scheduled endoscopic procedures. This event contributed to the current backlog of cases awaiting evaluation. In a developing country where resources may be scarce, delays resulting from prompt evaluation may contribute negatively to disease outcome and patient satisfaction.

2. **Staffing:** The COVID-19 pandemic made it imperative to train and retrain theatre staff on the use of personal protective equipment and the deployment of safety checks. The concept of physical distancing, use of face masks and staggered appointments were imbibed. Also, improved hand hygiene via frequent washing and sanitizing was made mandatory.

5. **Revenue loss:** Like in any other service providing unit, the closure of the unit and consequent gradual scale-up of services resulted in a significant loss of revenue thereby impacting negatively on planning and budgeting. The increased deployment of PPEs and other safety requirements increased the expenditure for both the patient and the unit.

**DISCUSSION**

The global impact of the COVID-19 pandemic resulted in many hospitals across the world reducing both elective and non-urgent cases in favor of caring for symptomatic COVID-19 patients by redeploying staff and resources. The situation at the out-patient gynaecological endoscopy unit of the University College Hospital, Ibadan was not different.
The unit was closed for three months while the hospital made central arrangements for emergency surgeries and procedures. The need to maintain safety for both patient and staff resulted in an increased deployment of personal protective equipment along with the enforcement of strict hygiene rules.

Minimally invasive procedures have gradually gained popularity in developing countries because of the perceived advantages of rapid recovery, less bleeding and short hospitalization. In advanced countries, it is the route of choice for most pelvic and abdominal surgeries. However, following the COVID-19 pandemic with the attendant concerns about transmission via aerosols at surgery, there has been a temporary shift in favor of open surgery. These SARS-CoV-2 contaminated aerosols are often generated from CO2 leakage and the creation of smoke when using energy devices. Laparoscopy in particular entails the creation of CO2 pneumoperitoneum resulting in an increased risk of aerosol contamination of the theatre. Various studies have demonstrated the presence of viral DNA such Heptatitis B and Human Papilloma Virus (HPV) in surgical smoke, hence the plausibility of transmission of SARS-CoV-2. It has been suggested that at deflation after laparoscopic procedures, all ports used to allow CO2 escape should be fitted with a smoke extraction device. As shown in figure 1, there has been a gradual decline in laparoscopic surgeries in favor of hysterectomy.

Various safety recommendations have been suggested before minimal access surgery and can be summarized to include Risk assessment for SARS-CoV-2, Testing for SARS-CoV-2, Non-surgical management where applicable, Deployment of Personal Protective Equipment, Postponement of all Elective Procedures, Minimizing the generation and leakage of aerosols (low power setting and reduced activation time of electrosurgical devices) and use of Disposable instruments. Many of these measures are cost-intensive and not readily adaptable in a low resource environment. Therefore, it was imperative to close the gynaecological endoscopy unit till such a time that it was safe to recommence a gradual scale-up of activities. This pragmatic approach ensured an equitable distribution of scarce resources, audit of patient care and improvement in safety measures aimed at preventing/reducing the transmission of SARS-CoV-2.

CONCLUSION
The challenges posed by the COVID-19 pandemic on health care delivery especially in a low resource setting are numerous.

The final common pathway is the ensuing delay or outright cancellation of elective surgeries especially endoscopic procedures. Taking steps to prevent transmission of SARS-CoV-2 necessitated the closure of the out-patient gynaecological endoscopy unit of the University College Hospital, Ibadan with its attendant economic consequences and a shift in favor of open surgeries where necessary. The COVID-19 pandemic, however, provided a window of opportunity to audit patient care, improve on hygienic practices and health education of both patients and theatre staff. Espousing global best practices at endoscopy is paramount and steps must be taken to decrease aerosol diffusion whilst ensuring the deployment of personal protective equipment.

REFERENCES
1. Angioni S. Laparoscopy in the coronavirus disease 2019 (COVID-19) era. Gynaecological Surgery 2020;17(3):1-4. https://doi.org/10.1186/s10397-020-01070-7
2. World Health Organization. Coronavirus disease (COVID-2019) situation reports 26 March 2020. https://www.who.int/emergencies/diseases/novel-coronavirus-2019
3. Li R, Pei S, Chen B, et al. Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2). Science. 2020; Mar 16. doi: https://doi.org/10. 1126/science.abb3221
4. Cho K, Hogan C, Lee M, et al. Cells are present in the smoke created during laparoscopic surgery. Br J Surg 1997; 84(7):993-995
5. Knolmayer TJ, Asbun HJ, Shibata G, Bowyer MW. An experimental model of cellular aerosolization during laparoscopic surgery. Surg Laparosc Endosc 1997; 7(5):399-402
6. Ikramuddin S, Lucas J, Ellison EC, et al. Detection of aerosolized cells during carbon dioxide laparoscopy. J Gastrointest Surg 1998; 2(6):580-583
7. Zhang W, Du RH, Li B et al. Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes. Emerg Microbes Infect. 2020; 9:386-389
8. Doremalen van N, Bushmaker T, Morris DH et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. N Engl J Med 2020; 382:1564-1567
9. Alabi OC, Okohue JE, Adewole AA, Ikechebelu JI. Association of gynecological endoscopy surgeons of Nigeria (AGES) advisory on laparoscopic and hysteroscopic procedures during the COVID-19 Pandemic. Niger J Clin Pract 2020; 23:747-749
10. **Otolorin EO**, Ladipo OA, Ojo AO. Outpatient interval sterilization at the University College Hospital Ibadan. Afr. J Med. and Med. Sc. 1985;14:3-9

11. **Mallick R**, Odejinmi F, Clark TJ. Covid 19 pandemic and gynaecological laparoscopic surgery: knowns and unknowns. Facts Views Vis Obgyn. 2020;12(1):3-7

12. **Brander P**, Neis KJ, Walle M. The influence of operating laparoscopy on the general operative concept in gynaecology. J AM Assoc Gynecol Laparosc. 1994; (4,Part2):S4-S5

13. **Prudence V Aquino-Aquino**, Maria Antonia E Habana, Marinella Agnes G Abat, et al. PSGE Statement on Minimally Invasive Gynaecologic Surgeries during the Covid-19 pandemic in the Philippines. J Minim Invasive Gynecol. 2020; 27(5): 1215–1216.

14. **Alp E**, Bijl D, Bleichrodt RP, Hansson B et al. Surgical smoke and infection control. J Hosp Infect. 2006;62(1):1-5

15. **Rafal Stojko**, Jakub Staniczek, Anita Olejek, et al. The Polish Society of Gynecologists and Obstetricians statement on surgery in gynecology during the COVID-19 pandemic. Ginekol Pol 2020;91(7):424-427.