Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Hepatology, Mayo Clinic Florida, Jacksonville, FL, USA (FAF); University of Manitoba IBD Clinical and Research Centre, Section of Gastroenterology, Winnipeg, MB, Canada (CNB); The China Crohn's and Colitis Foundation, Hangzhou, China (J-JZ); and Division of Colorectal Surgery (RPK) and Center for Inflammatory Bowel Disease (BS), Columbia University Irving Medical Center/New York-Presbyterian Hospital, New York, NY 10032, USA

1 WHO. Coronavirus disease 2019 (COVID-19) situation report 96. April 25, 2020. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200425-sitrep-96-covid-19.pdf?sfvrsn=a33836bb_2 (accessed April 26, 2020).

2 SECURE-IBD. COVID-19 in people with inflammatory bowel disease. https://ucalgary.maps.arcgis.com/apps/opsdashboard/index.html#/7f596bdbf46654e19a3a3cf13b6e597de (accessed April 26, 2020).

3 Mao R, Liang J, Shen J, et al. Implications of COVID-19 for patients with pre-existing digestive diseases. *Lancet Gastroenterol Hepatol* 2020; **5:** 426–28.

4 Yang H, Zhu LR, Tian D, Inflammatory Bowel Disease Group, Chinese Society of Gastroenterology, Chinese Medical Association. Management of patients with inflammatory bowel disease during epidemic of 2019 novel coronavirus pneumonia. *Chin J Dig* 2020; **40:** E001 (in Chinese).

5 International Organisation for the study of IBD. IOIBD update on COVID19 for patients with Crohn's disease and ulcerative colitis. April 23, 2020. https://www.ioibd.org/ioibd-update-on-covid19-for-patients-withcrohns-disease-and-ulcerative-colitis (accessed April 23, 2020).

6 Rubin DT, Abreu MT, Rai V, Siegel CA. Management of patients with Crohn's disease and ulcerative colitis during the COVID-19 pandemic: results of an international meeting. *Gastroenterology* 2020; published online April 6. DOI:10.1053/j.gastro.2020.04.002.

7 Rubin DT, Feuerstein JD, Wang AY, Cohen RD. AGA clinical practice update on management of inflammatory bowel disease during the covid-19 pandemic: expert commentary. *Gastroenterology* 2020; published online April 10. DOI:10.1053/j.gastro.2020.04.012.

8 Allocca M, Fiorino G, Furfaro F, et al. Maintaining the quality standards of care for inflammatory bowel disease patients during the COVID-19 pandemic. *Clin Gastroenterol Hepatol* 2020; published online April 15. DOI:10.1016/j.cgh.2020.04.028.

9 Percudani M, Corradin M, Moreno M, Indelicato A, Vita A. Mental health services in Lombardy during COVID-19 outbreak. *Psychiatry Res* 2020; **288:** 112980.

10 Zhang WR, Wang K, Yin L, et al. Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychother Psychosom* 2020; published online April 9. DOI:10.1159/000507639.

Converging pandemics: implications of COVID-19 for the viral hepatitis response in sub-Saharan Africa

For the **WHO Africa Dashboard** see https://www.afro.who.int/health-topics/coronavirus-covid-19

Sub-Saharan Africa is currently bracing itself as the next front in the fight against the coronavirus disease 2019 (COVID-19) pandemic. Despite low testing capacity, 61 991 cases and 1778 deaths had been reported in the WHO Africa Region as of May 18, 2020, with a recent increase in reported daily cases and deaths. Despite younger age demographics and less travel than in other regions, and strong efforts for early containment, the potential for widespread community-based transmission in sub-Saharan Africa is high, but current modelled estimates vary widely. Poor baseline heath status, overcrowded urban housing conditions, and limited health-care infrastructure for testing, contact tracing, and treatment could exacerbate the expected morbidity and mortality. Certainly, there will be an accompanying loss of economic growth, and millions could be impoverished.[1]

There has been speculation about the potential impact of COVID-19 on people living with well recognised, pre-existing conditions in sub-Saharan Africa (eg, HIV, tuberculosis, and malaria), as well as the potential implications for reproductive, maternal, child, and neonatal health and nutrition.[2] However, the implications for people living with viral hepatitis have not yet been well considered. Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are estimated to affect 71 million people in sub-Saharan Africa, more than three times the number infected with HIV in the region, and comprising more than a fifth of the global burden of viral hepatitis.[3] Only 1% of these individuals have been diagnosed. As clinicians, researchers, and programme implementers in sub-Saharan Africa, our concerns regarding the impact of the COVID-19 pandemic on people living with viral hepatitis in sub-Saharan Africa can be described in three major areas.

First, people with viral hepatitis-related liver disease in sub-Saharan Africa are likely to remain undiagnosed or to present at very late stages of disease. This is evidenced by sub-Saharan Africa having the highest death rate from liver cirrhosis in the world (32·2 deaths per 100 000 population).[4] Guidelines from the US Centers for Disease Control and Prevention have included patients with chronic liver disease as a vulnerable population with increased risk for severe manifestations of COVID-19.[5] Although the presence of viral hepatitis does not seem to increase susceptibility to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, there is increasing evidence that the innate immune response to SARS-CoV-2 infection results in liver damage.[6,7] SARS-CoV-2 infection might therefore be an important risk factor for critical disease and

severe outcomes in this large and underdiagnosed population living with viral hepatitis in sub-Saharan Africa. Additionally, poorly controlled HIV co-infection and chronic diseases (eg, hypertension and diabetes) are highly prevalent among individuals living with viral hepatitis in sub-Saharan Africa. The additional risks posed by the interaction of such comorbidities are not yet known.

Second, for patients already diagnosed with HBV or HCV, substantial disruptions to ongoing monitoring and treatment are now occurring. In most settings where we work, travel restrictions have been strictly enforced, severely reducing access to critical health services. Professional societies in high-income settings have strongly encouraged remote consultation via telemedicine and other virtual platforms to maintain continuity of care.[8,9] However, in sub-Saharan Africa, many patients and providers do not have mobile phones or internet-enabled devices, broadband networks or connectivity, or payment mechanisms to enable such telemedicine solutions. Remote laboratory monitoring is complicated by the absence of diagnostic services outside major centres. We have witnessed marked reductions in the already precarious supply of both tenofovir-based and direct-acting antiviral drugs in both public sector treatment programmes and private pharmacies. Many patients in this context typically access medications through out-of-pocket payments, and current pressures on economic livelihoods will markedly reduce the numbers able to initiate or maintain antiviral treatments. Undertreated infection, disease flares, and loss to follow-up due to treatment interruption are inevitable. The critically low detection and management of severe outcomes, such as liver decompensation and hepatocellular carcinoma, are likely to worsen further in this context.

Third, there are considerable pressures on the health system that will have direct implications for the core interventions needed for viral hepatitis elimination. The overall reduction in the availability and use of routine health services is likely to substantially reduce case finding of early stage and asymptomatic viral hepatitis infection among those at higher risk. Redeployment of laboratory equipment, infrastructure, and personnel for SARS-CoV-2 diagnosis is a crucial component of the pandemic response. However, such actions have further decreased the availability of the already limited PCR-based testing for viral hepatitis. Routine vaccination for HBV in sub-Saharan Africa had shown steady progress over the past decade but is still lacking adequate coverage in many subregions and is highly vulnerable to disruptions in core health system functioning and community perceptions of vaccine risks and benefits. Birth-dose HBV vaccine, which is still scarce in most parts of sub-Saharan Africa but is a central focus of elimination efforts, faces challenges such as an increase in the frequency of home deliveries, the breakdown of complicated cold-chain requirements, and shifting of government priorities and financing. Finally, further reductions in scarce services for harm reduction and opioid substitution therapy have already exacerbated outcomes among key populations, particularly in urban settings.[10]

The collateral damage incurred by the emergence of COVID-19 in sub-Saharan Africa is by no means unique to individuals with viral hepatitis. There will be widespread epidemiological, clinical, and socioeconomic consequences of the COVID-19 pandemic for people already living with a broad range of conditions in sub-Saharan Africa. However, the extremely underdiagnosed, highly prevalent, and severely advanced nature of liver disease due to viral hepatitis in sub-Saharan Africa requires careful attention to, and awareness of, this vulnerable population by policy makers and clinical providers and a pragmatic, clear strategy to mitigate risks during the growing pandemic. The momentum towards viral hepatitis elimination in sub-Saharan Africa will need a new and highly focused approach to ensure that early gains in the coverage of core viral hepatitis interventions are not lost. Innovative implementation strategies and novel financing mechanisms to maintain and strengthen health systems in low-income countries are urgently required to tackle not only emerging pandemics, but also pre-existing ones.

NG and CWS report grants for investigator-sponsored research from Gilead Sciences, outside the submitted work. KL reports personal fees from Gilead and AbbVie outside the submitted work. All other authors declare no competing interests.

Neil Gupta, Hailemichael Desalegn, Ponsiano Ocama, Karine Lacombe, Richard Njouom, Mary Afihene, Lina Cunha, C Wendy Spearman, Mark W Sonderup, Fredrick Kateera

ngupta5@bwh.harvard.edu

Division of Global Health Equity, Brigham & Women's Hospital, Boston, MA 02115, USA (NG); Partners In Health, Boston, MA, USA (NG); Medical Department, St Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia (HD);

Makerere University College of Health Sciences, Kampala, Uganda (PO); Department of Infectious and Tropical Diseases, Saint-Antoine Hospital, Paris, France (KL); Institut Pierre Louis d'Épidémiologie et de Santé Publique, INSERM, Sorbonne Université, Paris, France (KL); Virology Department, Centre Pasteur of Cameroon, Yaounde, Cameroon (RN); Department of Medicine, School of Medical Sciences, Kwame Nkrumah University of Science and Technology, Komfo Anokye Teaching Hospital, Kumasi, Ghana (MA); Hospital Privado de Maputo, Hepato-Gastroenterology Division, Department of Medicine, Maputo, Mozambique (LC); Division of Hepatology, Department of Medicine, University of Cape Town, Cape Town, South Africa (CWS, MWS); Faculty of Health Sciences and Groote Schuur Hospital, Observatory, Cape Town, South Africa (CWS, MWS); and Clinical Programs Department, Partners in Health/Inshuti Mu Buzima, Kigali, Rwanda (FK)

1 Mahler DG, Lakner C, Aguilar RAC, Wu H. The impact of COVID-19 (coronavirus) on global poverty: why Sub-Saharan Africa might be the region hardest hit. April 20, 2020. https://blogs.worldbank.org/opendata/impact-covid-19-coronavirus-global-poverty-why-sub-saharan-africa-might-be-region-hardest (accessed May 5, 2020).

2 Roberton T, Carter ED, Chou VB, et al. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study. *Lancet Glob Health* 2020; published online May 12. https://doi.org/10.1016/S2214-109X(20)30229-1.

3 WHO. Global hepatitis report, 2017. Geneva: World Health Organization, 2017.

4 GBD 2017 Cirrhosis Collaborators. The global, regional, and national burden of cirrhosis by cause in 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet Gastroenterol Hepatol* 2020; **5:** 245–66.

5 US Centers for Disease Control and Prevention. Information for healthcare professionals: COVID-19 and underlying conditions. April 6, 2020. https://www.cdc.gov/coronavirus/2019-ncov/hcp/underlying-conditions.html (accessed May 5, 2020)

6 Zhang C, Shi L, Wang FS. Liver injury in COVID-19: management and challenges. *Lancet Gastroenterol Hepatol* 2020; **5:** 428–30.

7 Mantovani A, Beatrice G, Dalbeni A. Coronavirus disease 2019 and prevalence of chronic liver disease: a meta-analysis. *Liver Int* 2020; published online April 4. DOI:10.1111/liv.14465.

8 Fix OK, Hameed B, Fontana RJ, et al. Clinical best practice advice for hepatology and liver transplant providers during the COVID-19 pandemic: AASLD expert panel consensus statement. *Hepatology* 2020; published online April 16. DOI:10.1002/HEP.31281.

9 Boettler T, Newsome PN, Mondelli MU. Care of patients with liver disease during the COVID-19 pandemic: EASL-ESCMID position paper. *JHEP Rep* 2020; **2:** 100113.

10 Stowe M-J, Scheibe A, Shelly S, Marks M. COVID-19 restrictions and increased risk of overdose for street-based people with opioid dependence in South Africa. *S Afr Med J* 2020; published online April 30. DOI:10.7196/SAMJ.2020.v110i6.14832.

Green endoscopy: a call for sustainability in the midst of COVID-19

The coronavirus disease 2019 (COVID-19) pandemic has led to radical curtailing and reconfiguring of health services across the world to slow the spread of the disease. Planning for acute COVID-19 services has inevitably resulted in a precipitous reduction in endoscopy activity, but in the deceleration phase of the pandemic, endoscopy units will aim to restart. The primary concern will understandably be to protect patients and staff, while providing enough capacity to meet demand and manage postponed appointments.

However, it is crucial that we also use this time to analyse current practice in the context of another sustained and serious threat: climate change. The climate crisis has major consequences for global health, including food insecurity, respiratory and vector-borne diseases, and excess heat-related deaths, even in the UK.[1] The National Health Service (NHS) accounts for 5·4% of UK carbon dioxide emissions,[2] which, in 2015, amounted to 26·6 million tonnes of carbon dioxide equivalent—equating to 39% of all public sector emissions in England.[3] Even during the brief period of lockdown around the world, the reduction in global activity has led to a decrease in greenhouse gas emissions by as much as 5·5%,[4] and potentially thousands of lives saved through cleaner air.[5] This drop might seem substantial but emissions will rebound rapidly once lockdowns end. If there is to be any chance of limiting global heating to less than 1·5°C above pre-industrial temperatures, year-on-year reductions of more than 7·6% are required for the next decade.[6] Radical change is necessary across every part of society, and health care must be included in the process, both because of the health service's role as a major contributor to the problem but also because of the serious public health risks posed by climate change.[1]

Endoscopy appears to be a major contributor to the environmental footprint of health care, generating about 3·09 kg of waste per bed per day (the third highest emitting hospital department).[7] High throughput caseloads, multiple non-renewable waste streams, numerous hospital visits for patients and relatives, and resource-heavy decontamination processes all contribute. Although some processes are necessary, others are ripe for change. Endoscope decontamination, for example, requires high volumes of water per decontamination cycle and multiple disinfectants, and has a major environmental impact as a result. There are no robust data on transport for patients and relatives, departmental energy use, and reusable versus disposable equipment.