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## Practice patterns of diagnostic upper gastrointestinal endoscopy during the initial COVID-19 outbreak in England

During the initial outbreak of COVID-19, concerns have been raised regarding SARS-CoV-2 aerosolisation and transmission during invasive procedures such as upper gastrointestinal endoscopy.<sup>1,2</sup> In the UK, this led to the strategic pause in endoscopic services for 6 weeks at the beginning of the COVID-19 crisis for all but emergency and essential procedures nationally, as advised by the British Society of Gastroenterology.<sup>3</sup> The lack of adherence to National Institute for Health and Care Excellence criteria for urgent direct access upper gastrointestinal endoscopy<sup>4</sup> and the continued reduction in diagnostic oesophagogastroduodenoscopy across England might lead to many undiagnosed oesophageal and gastric cancers, with delay in diagnosis and stage migration, substantially affecting long-term survival in these patients.<sup>5</sup> We assessed changes in diagnostic oesophagogastroduodenoscopy by hospital trusts and cancer vanguards (regional cancer partnerships), and estimated the potential number of undiagnosed cancers during a 4-month period from January to April, 2020.

Data from NHS Digital was retrieved for the number of diagnostic oesophagogastroduodenoscopies done by each hospital trust in England between Jan 1, 2020, and April 30, 2020, which was then compared with a historical cohort from these same trusts from Jan 1, 2019, to April 30, 2019. Details of data sources and methods can be found in the appendix (p 2). We calculated the percentage change in diagnostic oesophagogastroduodenoscopies in each hospital

trust associated with the COVID-19 pandemic. Data regarding the number of deaths due to COVID-19 per bed for each hospital trust over the 4-month study period were used to consider the effects of the burden of COVID-19 on the provision of oesophagogastroduodenoscopy by trust. Published data from the national oesophago-gastric cancer audit<sup>6</sup> from 2016 to 2018 was used to estimate the number of oesophageal and gastric cancers that might not have been diagnosed during this 4-month study period as a result of changes in the number of diagnostic oesophagogastroduodenoscopies done. Trusts with incomplete data over the study period were excluded and trusts that merged during the study period were treated as merged throughout (appendix p 3).

The number of diagnostic endoscopies done between January, 2020, and April, 2020, in the 122 analysed trusts was around 28% lower than in the same period in 2019 (149 043 vs 208 212). Compared with the same period in 2019, activity was slightly lower in January, 2020 (53 909 vs 54 979; 2.0%), and February, 2020 (49 906 vs 50 572; 1.3%). Activity fell considerably in March, 2020 (37 854 vs 54 520 in March, 2019; 30.6%) and in April, 2020 (5638 vs 49 877 in April, 2019; 88.7%). In April, 2020, activity was more than 90% lower than in April, 2019, in 83 (68%) of 122 trusts and in 12 (63%) of 19 vanguards.

We found no correlation between the number of deaths due to COVID-19 per bed and the percentage change in diagnostic oesophagogastroduodenoscopies during the study period, both at the hospital trust level (Spearman  $R=-0.04$ ;  $p=0.66$ ) and at the cancer vanguard level ( $-0.24$ ;  $p=0.33$ ; appendix p 5).

Based on the reductions seen in diagnostic oesophagogastroduodenoscopy, the estimated number of undiagnosed oesophageal and gastric cancers across England was 750, with a median of 47.3 (IQR 35.7–57.5) across

cancer vanguards (appendix p 5). The estimated number of undiagnosed oesophageal and gastric cancers that would have been treated curatively across England was 213, with a median of 11.0 (IQR 6.3–14.4) across cancer vanguards (appendix p 5).

Oesophageal and gastric cancers are particularly aggressive with a poor prognosis, primarily driven by a delayed presentation and advanced stage at diagnosis. The COVID-19 pandemic has led to huge reductions in diagnostic oesophagogastroduodenoscopies across England; as a result, a proportionally large number of patients with oesophageal and gastric cancer will remain undiagnosed. In England and Wales, approximately 30% of patients with oesophageal and gastric cancers are treated curatively; our data suggest that delays in diagnosis caused by the reduction in oesophagogastroduodenoscopy services will mean increasing numbers of patients presenting with advanced disease, who are less likely to be treated curatively.<sup>5</sup> Furthermore, time from diagnosis to initiation of treatment is often used as a quality metric for efficiency of the cancer treatment pathway.<sup>6</sup> Large increases in waiting lists for oncological and surgical treatment as a result of COVID-19 will substantially affect cancer waiting times, although the true effect of this delay on trust performance is not yet known, in part because oesophagogastroduodenoscopy screening pathways for oesophageal and gastric cancer in England are being reinstated at varied rates across hospital trusts. The necessary national endoscopy uptake and capacity for optimum diagnostic screening during the COVID-19 recovery compared with baseline is unclear. Regardless, clear oncological and surgical pathway planning is urgently needed so that upper gastrointestinal cancer services are able to adapt to the surge in new upper gastrointestinal cancer diagnoses that will inevitably be



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See Online for appendix

detected. One proposed strategy is the creation of cancer hubs that will provide capacity.<sup>7</sup> However, these hubs must be modelled to account for local patient factors, hospital capacity, and likely endoscopic detection rates.

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