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Global Impact of the COVID-19 Pandemic on Endoscopy: An International Survey of 252 Centers From 55 Countries

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The coronavirus disease 2019 (COVID-19) pandemic is having a profound impact on the world. As of May 18, 2020, there were 4,889,287 confirmed cases and 322,683 deaths globally.¹ The health care system is wrestling with a virus that threatens to overwhelm hospital capacity while simultaneously confronting an unprecedented reduction in elective and nonessential care.^{2,3} A survey by the American Cancer Society showed that 50% of cancer patients and survivors reported some impact to their health care due to the COVID-19 epidemic.⁴ Forbes et al⁵ recently conducted a survey to evaluate the changes in gastrointestinal and endoscopy practices in North America. However, the impact of this epidemic on endoscopy units globally has not been studied.

Methods

A web-based survey was developed by leaders of the World Endoscopy Organization. The questionnaire included 16 questions focused on the endoscopy units' baseline volumes, the impact on procedure numbers during the peak of the COVID-19 epidemic, the use of personal protection equipment (PPE), and whether any endoscopy personnel contracted the infection. The survey was sent April 23, 2020, and responses were collected through May 12, 2020. The detailed questionnaire is provided in Supporting Document 1. All participants provided informed consent for the collection, handling, and storage of data. For this survey, Institutional Review Board exemption was provided by Swedish Medical Center, Seattle, Washington.

Statistical Analysis

Descriptive statistics were used to analyze responses. Continuous variables are reported as mean \pm SD or median and interquartile range (IQR), and categorical variables are summarized as frequency and percentage. Data were compared across continents and tertiles of pre-COVID-19 volume using 1-way analysis of variance for continuous and the χ^2 test for categorical variables. All statistical analyses were performed using SAS 9.4 software (SAS Institute Inc, Cary, NC).

Results

From April 23 to May 12, 2020, 252 endoscopy units globally responded to the survey, performing 2,069,447 endoscopic procedures in a year (at baseline). These endoscopy units represent 2810 endoscopists, 3024 endoscopy nurses, and 1334 endoscopy technicians from 55 countries across 6 continents. The median number of endoscopic procedures performed annually among the endoscopy units was 5000 (IQR, 2000–9000), number of endoscopists in each center was 7 (IQR, 3–13), number of endoscopy nurses was 6.5 (IQR, 3–15), and number of technicians was 3 (IQR, 1–6).

Impact of COVID-19 on Baseline Endoscopy Volumes

Compared with baseline, endoscopy units reported an average 83% reduction in total endoscopy volumes during the COVID-19 pandemic. There was an 82% reduction in upper endoscopy procedures (esophagogastroduodenoscopy, endoscopic ultrasonography, and endoscopic retrograde cholangiopancreatography) and an 85% reduction in lower endoscopy (flexible sigmoidoscopy and colonoscopy) (Figure 1B).

These reductions in endoscopy volumes were consistent across all continents except for Oceania (Australia and New Zealand), which continued to perform approximately 41% of procedures compared with baseline ($P = .008$ for comparison with other continents) (Figure 1A).

Use of Personal Protective Equipment

For upper endoscopy, the use of PPE was as follows: N95/powered air-purifying respirator (PAPR) in 78.6% of cases, surgical masks in 65.9%, gloves in 96%, gown in 92.1%, and goggles in 83.7%. The use of N95 by continent is shown in Figures 1C and 1D (grouped by baseline case volume).

Abbreviations used in this paper: COVID-19, coronavirus disease 2019; ECRP, endoscopic retrograde cholangiopancreatography; EGD, esophagogastroduodenoscopy; EUS, endoscopic ultrasonography; IQR, interquartile range; PAPR, powered air-purifying respirator; PPE, personal protection equipment; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

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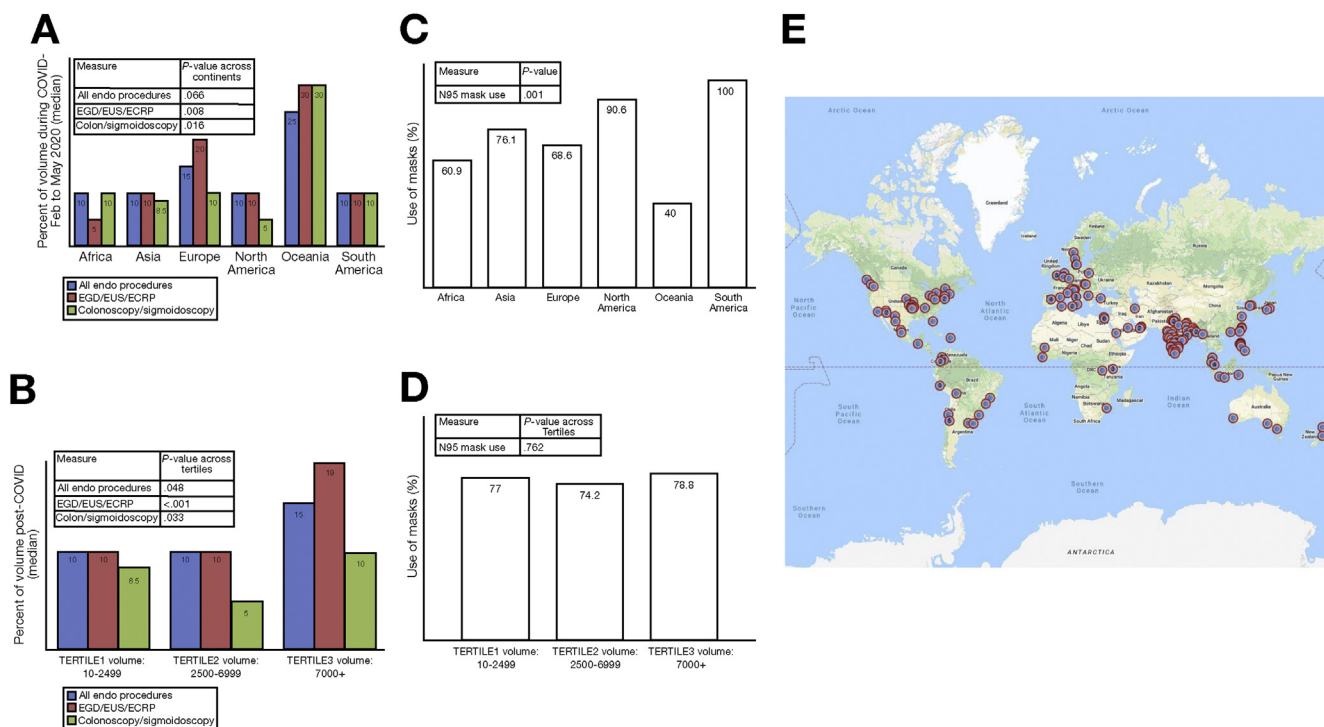


Figure 1. Histograms show the distribution of type of endoscopy that was performed before and at the beginning of COVID-19 pandemic (A) by each continent and (B) based on baseline volume. Histograms shows the use of N95 during (C) upper endoscopy and (D) based on baseline volume of procedures. (E) Map shows the number of endoscopy units' respondents according to geographic location. ECRP, endoscopic retrograde cholangiopancreatography; EGD, esophagogastroduodenoscopy; EUS, endoscopic ultrasonography.

Endotracheal intubation was used in approximately 12% of the upper endoscopy procedures.

With regard to PPE use for lower endoscopy: N95/PAPR was used in 68.7% of cases, surgical masks in 77.2%, gloves in 96%, gowns in 91.3%, and goggles in 77% (Supplementary Table 1). Use of N95/PAPR masks was significantly higher for upper compared with lower endoscopy ($P < .001$). Results of PPE use stratified by baseline procedure volumes is summarized in Supplementary Table 2, with no significant difference in PPE use noted among centers based on these volumes (characteristics of participating endoscopy units based on baseline total number of procedures were performed in tertiles).

Severe Acute Respiratory Syndrome Coronavirus 2 Infection Among Endoscopy Personnel

A total of 34 endoscopy units (13.5%) reported severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)-positive cases among their endoscopy personnel, with 48.6% of these cases in Europe. Only 7.9% of the positive cases required hospitalization. Endoscopy units that performed a higher procedure volume at baseline reported a higher rate of SARS-CoV-2 infection: 27.1% in the third tertile vs 13.5% in the first tertile ($P < .001$).

In addition to the analyses above, we assessed the geographic distribution of our sample to display survey data using ArcGIS Pro 2.5 (Esri, Redlands, CA) (Figure 1E).

Discussion

This is the first study to assess the impact of the COVID-19 pandemic on endoscopy practices around the world. We surveyed endoscopy units representing 55 countries across 6 continents. The most important finding of the present study was the massive cutback of endoscopy procedures by 83% (compared with baseline procedures) across the world during the pandemic period. This type of approach both by the health/ hospital authorities and the endoscopists has several undoubtable reasons: to save resources for COVID-19 patients (medical and nurse staff, hospital beds, intensive care units, economical resources, PPE) and to reduce the risk of infection (staff and patients). An interesting finding was the relatively higher volume of upper and lower endoscopies performed in Oceania during the COVID period, possibly a reflection of the impact of COVID 19 in these countries (only 1500 cases by May 25, 2020).

In addition, our survey showed that only 34 of the participating centers (13.5%) reported SARS-CoV-2-positive cases among their endoscopy staff, suggesting that the risk of transmission of this infection among endoscopy personnel while using appropriate PPE may be low. This finding is in agreement with data from an Italian study showing a low risk of infection⁷ as well. Although several gastrointestinal societies have suggested that all endoscopic procedures should be considered aerosol-generating procedures, our survey showed that the use of N95 masks was

significantly higher during upper compared with lower endoscopy procedures. This could be due to the perception of an increased risk of transmission via aerosolized droplets perceived to be higher during upper endoscopy.

Conclusion

This is the first study to evaluate the impact of COVID-19 pandemic on 252 endoscopy units worldwide across 6 continents encompassing 55 countries. A substantial reduction (>80%) in endoscopy procedures has been noted globally. Future research can evaluate potential clinical impacts of this reduction. In general, the proportion of endoscopy units reporting infected personnel has been low.

Supplementary Material

Note: To access the supplementary material accompanying this article, visit the online version of *Gastroenterology* at www.gastrojournal.org, and at <https://doi.org/10.1053/j.gastro.2020.06.009>

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CRediT Authorship Contributions

Sravanthi Parasa, MD (Conceptualization: Equal; Data curation: Equal; Writing – original draft: Lead). Nageshwar Reddy, MBBS, MD (Data curation: Supporting; Supervision: Supporting; Writing – review & editing: Supporting). Douglas O Faigel, MD (Conceptualization: Supporting; Supervision: Supporting; Writing – original draft: Supporting). Alessandro Repici, MD (Data curation: Supporting; Writing – original draft: Supporting). Fabian Emura, MD (Data curation: Supporting; Writing – original draft: Supporting). Prateek Sharma, MD (Conceptualization: Equal; Data curation: Supporting; Investigation: Supporting; Supervision: Lead; Writing – original draft: Equal).

Conflicts of interest

The authors disclose the following: Alessandro Repici receives consulting fees from Medtronic and Boston Scientific and a research grant from Fujifilm. Fabian Emura is a consultant for Fujifilm. Prateek Sharma is a consultant for Olympus and Boston Scientific and discloses grants from US Endoscopy, Medtronic, Irownwood, Erbe, Cdx, and Fujifilms. Authors Sravanthi Parasa, Nageshwar Reddy, Kevin Kennedy, and Douglas O. Faigel disclose no conflicts of interests.

Supplementary Table 1. Characteristics of Endoscopy Units That Participated in the Survey Based on Continents

Variable	Continent							<i>P</i> value ^a
	Total (N = 252)	Africa (n = 23)	Asia (n = 138)	Europe (n = 35)	North America (n = 32)	Oceania (n = 5)	South America (n = 19)	
Volume of procedures performed in a year								<.001 K
Mean ± SD	8212.1 ± 15133.2	2619.6 ± 1792.5	9623.0 ± 19372.2	9380.0 ± 7492.4	6523.4 ± 6985.4	5340.0 ± 1789.7	6182.9 ± 8535	.3
Median (IQR)	5000.0 (2000.0–9000.0)	2400.0 (1000.0–3000.0)	5000.0 (1600.0–9715.0)	9000.0 (5000.0–12000.0)	4500.0 (2000.0–8500.0)	5000.0 (4500.0–6700.0)	4000.0 (901.0–6000.0)	
Sum	2,069,447	60,250	1,327,971	328,300	208,750	26,700	117,476	
Endoscopy volume during February–May 2020								.001 K
Mean ± SD	1833.7 ± 8166.5	477.5 ± 532.3	2545.0 ± 10946.8	1518.6 ± 1417.6	699.3 ± 1015.0	2365.2 ± 1835.9	660.0 ± 1008.3	
Median (IQR)	500.0 (125.0–1500.0)	300.0 (120.0–600.0)	500.0 (100.0–1748.7)	1000.0 (400.0–2040.0)	300.0 (150.0–750.0)	1875.0 (1125.0–3000.0)	250.0 (70.0–600.0)	
Sum	462,086.7	10,982.5	351,212.1	53,150	22,376.5	11,826	12,539.6	
Total endoscopists in your unit, n								.187 K
Mean ± SD	11.0 ± 14.4	10.4 ± 9.9	11.0 ± 16.9	9.7 ± 7.4	11.3 ± 13.0	14.4 ± 5.5	12.1 ± 13.8	<.001 K
Median (IQR)	7.0 (3.0–13.0)	6.0 (4.0–12.0)	5.0 (3.0–12.0)	8.0 (5.0–12.0)	7.0 (4.0–14.0)	14.0 (12.0–15.0)	8.0 (4.0–16.0)	
Total endoscopy nurses in your unit, n								
Mean ± SD	11.8 ± 14.8	7.3 ± 6.0	10.3 ± 13.6	17.5 ± 19.0	16.1 ± 18.6	27.8 ± 10.7	6.1 ± 6.8	.069 K
Median (IQR)	6.5 (3.0–15.0)	6.0 (4.0–8.0)	5.0 (3.0–15.0)	12.0 (7.0–18.0)	10.0 (5.5–15.5)	27.0 (25.0–35.0)	4.0 (2.0–7.0)	
Total endoscopy technicians in your unit, n								
Mean ± SD	5.2 ± 7.8	2.8 ± 2.8	4.2 ± 5.2	7.7 ± 13.6	6.0 ± 5.9	2.2 ± 2.2	10.2 ± 12.7	.066 K
Median (IQR)	3.0 (1.0–6.0)	2.0 (1.0–4.0)	3.0 (2.0–5.0)	4.0 (0.0–8.0)	5.5 (2.5–8.0)	3.0 (0.0–3.0)	7.0 (1.0–10.0)	
Procedures performed in your center since COVID-19 infection in your region compared with baseline, %								
Mean ± SD	17.1 ± 17.6	20.2 ± 21.2	16.3 ± 17.3	20.0 ± 16.9	13.3 ± 15.0	41.6 ± 25.9	13.7 ± 13.4	
Median (IQR)	10.0 (5.0–20.0)	10.0 (5.0–30.0)	10.0 (5.0–20.0)	15.0 (5.0–30.0)	10.0 (5.0–17.5)	25.0 (25.0–60.0)	10.0 (5.0–15.0)	

Supplementary Table 1. Continued

Variable	Total (N = 252)	Continent						P value ^a
		Africa (n = 23)	Asia (n = 138)	Europe (n = 35)	North America (n = 32)	Oceania (n = 5)	South America (n = 19)	
EGD/EUS/ERCP procedures during COVID-19 compared with baseline, %								.008 K
Mean \pm SD	18.8 \pm 20.7	17.1 \pm 23.1	17.7 \pm 20.8	27.1 \pm 22.2	14.1 \pm 15.4	44.4 \pm 26.9	13.9 \pm 11.8	
Median (IQR)	10.0 (5.0–25.0)	5.0 (2.0–20.0)	10.0 (5.0–20.0)	20.0 (5.0–50.0)	10.0 (5.0–17.5)	30.0 (25.0–70.0)	10.0 (3.0–25.0)	
Colonoscopy/ sigmoidoscopy procedures performed during COVID compared with baseline, %								.016 K
Mean \pm SD	15.2 \pm 18.9	16.6 \pm 21.4	14.2 \pm 18.7	19.8 \pm 20.1	10.7 \pm 13.8	44.0 \pm 29.0	12.2 \pm 13.6	
Median (IQR)	10.0 (3.0–20.0)	10.0 (2.0–25.0)	8.5 (2.0–20.0)	10.0 (5.0–30.0)	5.0 (2.0–10.0)	30.0 (25.0–70.0)	10.0 (3.0–10.0)	
PPE for colonoscopy/ sigmoidoscopy								
Face mask/surgical mask, n (%)	182 (72.2)	18 (78.3)	98 (71.0)	22 (62.9)	26 (81.3)	5 (100.0)	13 (68.4)	.422
PAPR, n (%)	36 (14.3)	3 (13.0)	21 (15.2)	4 (11.4)	6 (18.8)	1 (20.0)	1 (5.3)	.781
N95, n (%)	167 (66.3)	11 (47.8)	95 (68.8)	21 (60.0)	23 (71.9)	1 (20.0)	16 (84.2)	.031
None, n (%)	5 (2.0)	3 (13.0)	2 (1.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	.055
Gloves, n (%)	242 (96.0)	20 (87.0)	135 (97.8)	31 (88.6)	32 (100.0)	5 (100.0)	19 (100.0)	.028
Gown, n (%)	230 (91.3)	19 (82.6)	128 (92.8)	29 (82.9)	31 (96.9)	5 (100.0)	18 (94.7)	.202
Goggles, n (%)	194 (77.0)	12 (52.2)	108 (78.3)	28 (80.0)	25 (78.1)	4 (80.0)	17 (89.5)	.099
How often used?, %								
Mean \pm SD	92.9 \pm 20.7	96.4 \pm 5.5	90.7 \pm 24.3	90.2 \pm 25.0	98.7 \pm 3.1	100.0 \pm 0.0	98.4 \pm 5.1	
Median (IQR)	100.0 (100.0–100.0)	100.0 (90.0–100.0)	100.0 (95.0–100.0)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	.443 K
PPE for EGD/EUS/ ERCP								
Face mask/surgical mask, n (%)	166 (65.9)	16 (69.6)	91 (65.9)	20 (57.1)	24 (75.0)	4 (80.0)	11 (57.9)	.649
PAPR, n (%)	39 (15.5)	2 (8.7)	25 (18.1)	4 (11.4)	5 (15.6)	1 (20.0)	2 (10.5)	.809
N95, n (%)	193 (76.6)	14 (60.9)	105 (76.1)	24 (68.6)	29 (90.6)	2 (40.0)	19 (100.0)	.001
None, n (%)	7 (2.8)	3 (13.0)	4 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	.123
Gloves, n (%)	242 (96.0)	21 (91.3)	134 (97.1)	31 (88.6)	32 (100.0)	5 (100.0)	19 (100.0)	.109

Supplementary Table 1. Continued

Variable	Total (N = 252)	Continent						P value ^a
		Africa (n = 23)	Asia (n = 138)	Europe (n = 35)	North America (n = 32)	Oceania (n = 5)	South America (n = 19)	
Gown, n (%)	232 (92.1)	21 (91.3)	127 (92.0)	29 (82.9)	32 (100.0)	5 (100.0)	18 (94.7)	.19
Goggles, n (%)	211 (83.7)	18 (78.3)	116 (84.1)	29 (82.9)	28 (87.5)	4 (80.0)	16 (84.2)	.933
How often used?, %								.763 K
Mean ± SD	94.8 ± 17.9	94.9 ± 18.7	93.0 ± 21.5	95.4 ± 17.2	98.4 ± 5.0	100.0 ± 0.0	98.2 ± 5.1	
Median (IQR)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	100.0 (100.0–100.0)	
Did any of your endoscopy staff have COVID infection?, n (%)	34 (13.5)	2 (8.7)	10 (7.2)	17 (48.6)	3 (9.4)	0 (0.0)	2 (10.5)	<.001
Endoscopy staff with COVID infection who needed hospitalization, %								.049 K
Mean ± SD	7.9 ± 23.8	100.0 ± 0.0	1.0 ± 1.6	2.8 ± 5.5	0.0 ± 0.0	± (–)	5.0 ± 7.1	
Median (IQR)	0.0 (0.0–2.0)	100.0 (100.0–100.0)	0.0 (0.0–2.0)	0.0 (0.0–0.0)	0.0 (0.0–0.0)		5.0 (0.0–10.0)	

ECRP, endoscopic retrograde cholangiopancreatography; EGD, esophagogastroduodenoscopy; EUS, endoscopic ultrasonography.

^aContinuous variables were compared using 1-way analysis of variance. Categorical variables were compared using χ^2 or Fisher's exact test, except as noted with the Kruskal-Wallis (K) test.

Supplementary Table 2. Characteristics of Participating Endoscopy Units Based on Baseline Total Number of Procedures Performed

Variable	Total (N = 252)	Volume of procedures performed in a year			P value ^a
		Tertile 1 (<24,99) (n = 74)	Tertile 2 (2500 to 6999) (n = 93)	Tertile 3 (7000 to 150,000) (n = 85)	
Continent					.001
Africa, n (%)	23 (9.1)	12 (16.2)	10 (10.8)	1 (1.2)	
Asia, n (%)	138 (54.8)	44 (59.5)	45 (48.4)	49 (57.6)	
Europe, n (%)	35 (13.9)	4 (5.4)	11 (11.8)	20 (23.5)	
North America, n (%)	32 (12.7)	9 (12.2)	12 (12.9)	11 (12.9)	
Oceania, n (%)	5 (2.0)	0 (0.0)	4 (4.3)	1 (1.2)	
South America, n (%)	19 (7.5)	5 (6.8)	11 (11.8)	3 (3.5)	
Volume of procedures performed in your center in a year					<.001 K
Mean \pm SD	8212.1 \pm 1513	1092.0 \pm 635.9	4253.2 \pm 1233.8	18742.2 \pm 22540.5	
Median (IQR)	5000.0 (2000.0–9000.0)	1000.0 (600.0–1500.0)	4000.0 (3000.0–5000.0)	12000.0 (9000.0–20000.0)	
Sum	2,069,447	80,806.0	395,550.0	1,593,091	
Volume of procedures performed during COVID					<.001 K
Mean \pm SD	1833.7 \pm 8166.5	206.3 \pm 304.0	665.1 \pm 872.1	4529.1 \pm 13681.1	
Median (IQR)	500.0 (125.0–1500.0)	102.5 (25.0–240.0)	400.0 (150.0–750.0)	1875.0 (900.0–3600.0)	
Sum	462086.7	15263.1	61850.5	384973.1	
Total number of endoscopists in your unit					<.001 K
Mean \pm SD	11.0 \pm 14.4	8.0 \pm 18.2	8.3 \pm 7.6	16.5 \pm 15.0	
Median (IQR)	7.0 (3.0–13.0)	3.0 (2.0–8.0)	6.0 (4.0–10.0)	12.0 (8.0–20.0)	
Total number of endoscopy nurses in your unit					<.001 K
Mean \pm SD	11.8 \pm 14.8	5.1 \pm 6.9	9.4 \pm 11.0	20.2 \pm 19.0	
Median (IQR)	6.5 (3.0–15.0)	3.0 (2.0–6.0)	6.0 (3.0–11.0)	16.0 (8.0–25.0)	
Total number of endoscopy technicians in your unit					<.001 K
Mean \pm SD	5.2 \pm 7.8	3.3 \pm 6.2	3.6 \pm 2.9	8.5 \pm 11.1	
Median (IQR)	3.0 (1.0–6.0)	2.0 (1.0–3.0)	3.0 (2.0–5.0)	5.0 (3.0–10.0)	
Procedures performed in your center since COVID infection in your region compared with baseline, %					.048 K
Mean \pm SD	17.1 \pm 17.6	17.9 \pm 19.7	14.7 \pm 16.4	19.0 \pm 16.9	
Median (IQR)	10.0 (5.0–20.0)	10.0 (5.0–25.0)	10.0 (5.0–20.0)	15.0 (7.0–25.0)	
EGD/EUS/ERCP procedures during COVID-19 compared with baseline, %					<.001 K
Mean \pm SD	18.8 \pm 20.7	16.2 \pm 21.2	16.9 \pm 20.2	23.0 \pm 20.4	
Median (IQR)	10.0 (5.0–25.0)	10.0 (2.0–20.0)	10.0 (3.0–20.0)	19.0 (10.0–30.0)	

Supplementary Table 2. Continued

Variable	Volume of procedures performed in a year				P value ^a
	Total (N = 252)	Tertile 1 (<24,99) (n = 74)	Tertile 2 (2500 to 6999) (n = 93)	Tertile 3 (7000 to 150,000) (n = 85)	
Colonoscopy/ sigmoidoscopy procedures performed during COVID compared to baseline					.033 K
Mean ± SD	15.2 ± 18.9	15.8 ± 20.6	12.8 ± 17.2	17.3 ± 19.2	
Median (IQR)	10.0 (3.0–20.0)	8.5 (2.0–20.0)	5.0 (2.0–15.0)	10.0 (5.0–20.0)	
PPE for colonoscopy/ sigmoidoscopy					
Face mask/surgical mask, n (%)	182 (72.2)	50 (67.6)	72 (77.4)	60 (70.6)	.338
PAPR, n (%)	36 (14.3)	10 (13.5)	14 (15.1)	12 (14.1)	.959
N95, n (%)	167 (66.3)	49 (66.2)	61 (65.6)	57 (67.1)	.978
None, n (%)	5 (2.0)	3 (4.1)	2 (2.2)	0 (0.0)	.231
Gloves, n (%)	242 (96.0)	70 (94.6)	90 (96.8)	82 (96.5)	.782
Gown, n (%)	230 (91.3)	66 (89.2)	83 (89.2)	81 (95.3)	.271
Goggles, n (%)	194 (77.0)	51 (68.9)	77 (82.8)	66 (77.6)	.104
How often used?, %					.832 K
Mean ± SD	92.9 ± 20.7	89.3 ± 27.9	93.5 ± 19.4	95.4 ± 13.2	
Median (IQR)	100.0 (100.0– 100.0)	100.0 (99.0– 100.0)	100.0 (100.0– 100.0)	100.0 (100.0– 100.0)	
Missing	79	23	28	28	
PPE for upper endoscopy (EGD/EUS/ERCP)					
Face mask/surgical mask, n (%)	166 (65.9)	46 (62.2)	66 (71.0)	54 (63.5)	.420
PAPR, n (%)	39 (15.5)	12 (16.2)	15 (16.1)	12 (14.1)	.913
N95, n (%)	193 (76.6)	57 (77.0)	69 (74.2)	67 (78.8)	.762
None, n (%)	7 (2.8)	4 (5.4)	2 (2.2)	1 (1.2)	.300
Gloves, n (%)	242 (96.0)	70 (94.6)	90 (96.8)	82 (96.5)	.782
Gown, n (%)	232 (92.1)	67 (90.5)	85 (91.4)	80 (94.1)	.676
Goggles, n (%)	211 (83.7)	61 (82.4)	81 (87.1)	69 (81.2)	.529
How often used?, %					.880 K
Mean ± SD	94.8 ± 17.9	92.0 ± 26.1	95.7 ± 14.6	96.4 ± 11.4	
Median (IQR)	100.0 (100.0– 100.0)	100.0 (100.0– 100.0)	100.0 (100.0– 100.0)	100.0 (100.0– 100.0)	
Missing	54	16	20	18	
Did any of your endoscopy staff have COVID-19 infection?, n (%)	34 (13.5)	2 (2.7)	9 (9.7)	23 (27.1)	<.001
Endoscopy staff with COVID-19 infection who needed hospitalization, %					.582 K
Mean ± SD	7.9 ± 23.8	0.0 ± 0.0	14.4 ± 32.7	6.0 ± 20.7	
Median (IQR)	0.0 (0.0–2.0)	0.0 (0.0–0.0)	0.0 (0.0–15.0)	0.0 (0.0–2.0)	
Missing	218	72	84	62	

ERCP, endoscopic retrograde cholangiopancreatography; EGD, esophagogastroduodenoscopy; EUS, endoscopic ultrasonography.

^aContinuous variables were compared using 1-way analysis of variance. Categorical variables were compared using χ^2 or the Fisher's exact test, except as noted with the Kruskal-Wallis (K) test.