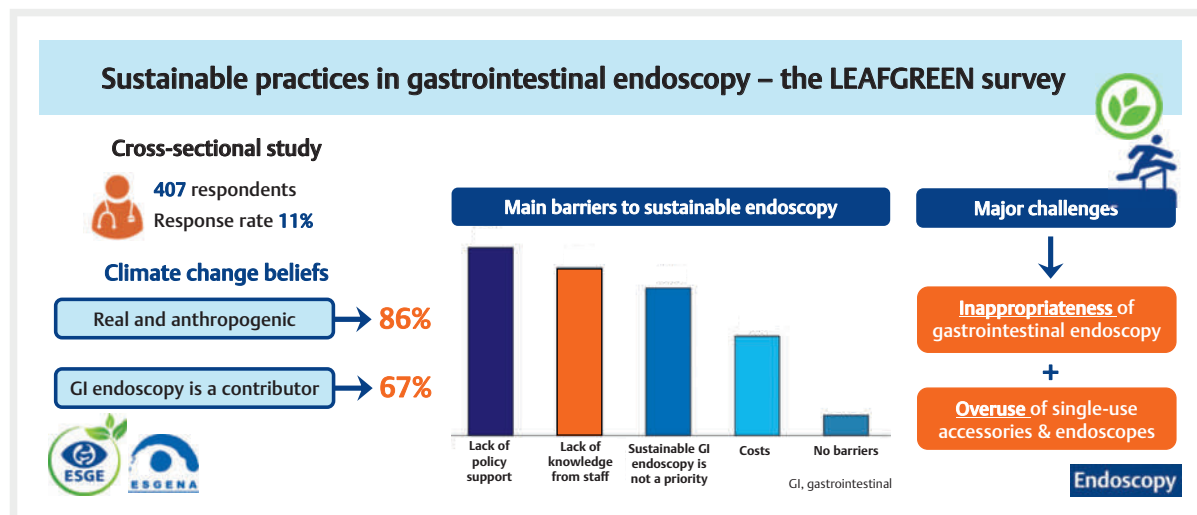


Perspectives and awareness of endoscopy healthcare professionals on sustainable practices in gastrointestinal endoscopy: results of the LEAFGREEN survey

GRAPHICAL ABSTRACT



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ABSTRACT

Background Gastrointestinal (GI) endoscopy is one of healthcare's main contributors to climate change. We aimed to assess healthcare professionals' attitudes and the perceived barriers to implementation of sustainable GI endoscopy.

Methods The LEAFGREEN web-based survey was a cross-sectional study conducted by the European Society of Gastrointestinal Endoscopy (ESGE) Green Endoscopy Working Group. The questionnaire comprised 39 questions divided into five sections (respondent demographics; climate change and sustainability beliefs; waste and resource management; single-use endoscopes and accessories; education and research). The survey was available via email to all active members of the ESGE and the European Society of Gastroenterology and Endoscopy Nurses and Associates (ESGENA) in March 2023.

Results 407 respondents participated in the survey (11% response rate). Most participants (86%) agreed climate change is real and anthropogenic, but one-third did not consider GI endoscopy to be a significant contributor to climate change. Improvement in the appropriateness of endoscopic procedures (41%) and reduction in single-use accessories (34%) were considered the most important strategies to reduce the environmental impact of GI endoscopy. Respondents deemed lack of institutional support and knowledge from staff to be the main barriers to sustainable endoscopy. Strategies to reduce unnecessary GI endoscopic procedures and comparative studies of single-use versus reusable accessories were identified as research priorities.

Conclusions In this survey, ESGE and ESGENA members acknowledge climate change as a major threat to humanity. Further improvement in sustainability beliefs and professional attitudes, reduction in inappropriate GI endoscopy, and rational use of single-use accessories and endoscopes are critically required.

Introduction

Climate change and global warming represent undeniable threats to the environment and humanity. In particular, the healthcare sector remains one of the main contributors to this global crisis, and gastrointestinal (GI) endoscopy is believed to generate the third largest amount of medical waste in hospitals [1, 2, 3].

This disruptive reality led the European Society of Gastrointestinal Endoscopy (ESGE) and the European Society of Gastroenterology and Endoscopy Nurses and Associates (ESGENA) to recognize the need to implement more sustainable practices [4]; however, even simple measures such as correct disposal of endoscopic waste have revealed themselves to be a challenge owing to a general lack of awareness among endoscopy staff and institutional barriers [5, 6, 7]. In order to design future strategic plans and implement change in clinical practice, a better

understanding of endoscopy healthcare professionals' attitudes towards more sustainable practices is urgently required.

The viewpoints of the leadership of major endoscopic societies have already been assessed, suggesting that a lack of understanding of the matter and an overlap with daily work routine justify the detachment between the leaders' and their GI societies' ranking of the problem [8]. These may not however illustrate the beliefs and behaviors of their individual members [8]. To better understand the views and opinions on sustainable GI endoscopy of ESGE and ESGENA members, and with the goal of "Leading Endoscopy Awareness Further GREEN," the ESGE Green Endoscopy Working Group developed the LEAFGREEN survey. This initiative arose from ESGE and ESGENA's commitment to withstand climate change. The questionnaire aimed to assess the attitudes to and current knowledge of sustainable GI endoscopy practices of ESGE and ESGENA members. Secondly, we aimed to identify barriers to action at a local level and to ascertain research and educational priorities.

Methods

Study design and ethical considerations

The LEAFGREEN survey was an industry-independent, cross-sectional study conducted by the ESGE Green Endoscopy Working Group. The Consensus-based checklist for Reporting Of Survey Studies (CROSS) guideline was used to report this study [9] (**Appendix 1s**, see online-only Supplementary material).

The survey was developed by a panel of 13 consultants and two nurses from eight different countries (twelve members from the ESGE Green Endoscopy Working Group and three non-members), all with sustainability and GI endoscopy expertise. The group discussed and reviewed all survey items for one week (27 January to 2 February 2023). The items were thoroughly discussed via email, leading to 39 final questions. A draft version of the survey was piloted among 20 healthcare professionals of differing age and healthcare professional status from three different countries (four senior gastroenterologists, four gastroenterology trainees, four endoscopy nurses, four endoscopy auxiliary staff members, and four medical students), with resulting adjustments made to language and scaling. The final version of the questionnaire was approved by all members of the panel.

Participants provided online informed consent prior to completion of the survey. After consultation, the Institutional Review Board from Ramón y Cajal University Hospital waived formal study approval as no patient clinical data were planned to be collected.

Data collection methods and sections

The questionnaire (**Appendix 2s**) was composed of five sections: (i) respondent demographics; (ii) climate change and sustainability beliefs; (iii) waste and resource management; (iv) single-use endoscopes and accessories; and (v) education and research. A total of 39 questions (38 closed-ended questions and 1 partial closed-ended question) were included in the survey. Items were developed to be clear and consistent with the educational level of the intended respondents.

Sample characteristics

Participants were invited to complete the survey if they had an "active membership" of ESGE or ESGENA. For this purpose, on 20 March 2023, the total number of participants was drawn from the mailing directories of the ESGE and ESGENA secretaries. Data were collected and the response rate was calculated from 3815 active members (3502 ESGE and 313 ESGENA). To assess the representativeness of the ESGE sample, age and gender data were compared to ESGE's overall membership population. Owing to data regulation policies, ESGENA population comparative analysis was not performed.

Survey administration

An invitation email with a dedicated link to the survey was sent out twice (6 March and 20 March 2023) to all eligible participants. The survey link was unique for each member and could be completed only once per Internet Protocol address to prevent multiple participation. In this email, participants were informed about the topic, the research team, the survey's scope, and the estimated time to complete the questionnaire (6–8 minutes). The survey was promoted in ESGE and ESGENA's e-newsletter and social media channels (Twitter and LinkedIn), but the link was not shared on these platforms.

The survey was available on SurveyMonkey (SurveyMonkey Inc., San Mateo, California, USA; www.surveymonkey.com) from 6 March until 26 March 2023, and only in the English language. The platform ensures that confidential data are protected with enhanced security including encryption, Single Sign-ON technology, and features that guarantee compliance with General Data Protection Regulation from the European Union. Participation was anonymous and voluntary, without financial or other incentives.

Statistical analysis

All survey questions were deemed compulsory to reduce missing data and non-response error. Descriptive statistics are described as absolute (n) and relative frequencies (%) for categorical variables. Continuous variables are summarized as mean (SD) or median and interquartile range (IQR), depending on the statistical distribution. Comparison of categorical variables was performed using the chi-squared test. Incomplete responses were deleted from the primary analysis. Data analysis was performed by two independent physicians (J.A.C.N. and E.R.d. S.) using SPSS, v.29.0 (IBM Corp.).

Results

Response rate and respondent demographics

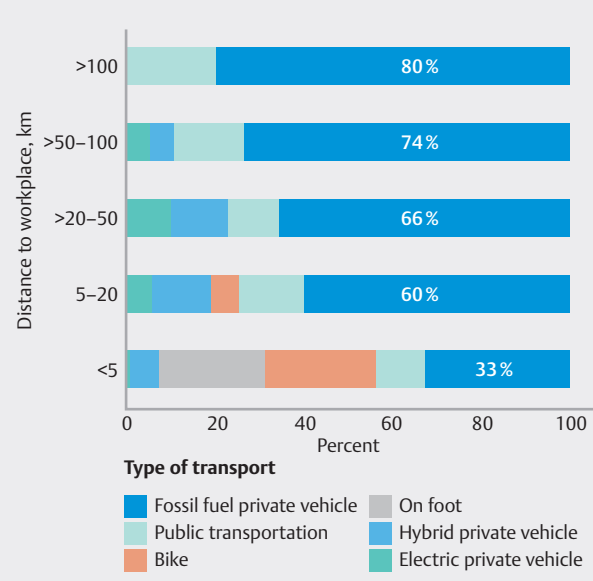
Overall, 407 members from 49 different countries completed the survey, corresponding to an overall response rate of 11% (**Fig. 1s**). ESGE respondents' age ($P = 0.66$) and gender ($P = 0.53$) were comparable to the overall ESGE membership population (**Fig. 2s**). Most participants were from Europe (88%) and Asia (7%); there were also some respondents from America, Africa, and Oceania (5%). ► **Table 1** presents participants' professional and sociodemographic characteristics. A fossil fuel

► **Table 1** Professional and sociodemographic data of the 407 survey respondents.

Characteristic	n (%)
Age group, years	
▪ <35	70 (17)
▪ 35–50	198 (49)
▪ 50–65	123 (30)
▪ >65	16 (4)
Gender, male	230 (57)
Main professional status	
▪ Endoscopist	255 (63)
▪ Endoscopy nurse	112 (27)
▪ Trainee/resident	20 (5)
▪ Other*	20 (5)
Health sector of work	
▪ Public	332 (82)
▪ Private	69 (17)
▪ Not applicable, I work for the industry	6 (1)
Workplace	
▪ Tertiary/referral/teaching hospital	272 (67)
▪ Community hospital	105 (26)
▪ Gastroenterology office	24 (6)
▪ Not applicable, I work for the industry	6 (1)
Distance to workplace, km	
▪ <5	155 (38)
▪ 5–20	158 (39)
▪ >20–50	70 (17)
▪ >50–100	19 (5)
▪ >100	5 (1)
Type of transport to workplace	
▪ Fossil fuel private vehicle	210 (52)
▪ Public transportation	52 (13)
▪ Bike	49 (12)
▪ Hybrid private vehicle	41 (10)
▪ On foot	37 (9)
▪ Electric private vehicle	18 (4)

* Including industry members, students, and research coordinators.

private vehicle (52%) was the most common type of transport for participants, regardless of the distance to their workplace (► **Fig. 1**).



► **Fig. 1** Chart showing the type of transport used by respondents according to the distance to their workplace.

Climate change and sustainability beliefs

Even though 86% of participants agreed that climate change is real and mostly driven by human-related emissions, 9% believed that climate change is real but its cause is mostly unknown, and 1% did not believe climate change is real. When asked to rank climate change as a threat to humanity on a scale of 0 (no threat at all) to 100 (the greatest threat to humanity), the vast majority considered that climate change is an important threat to humanity (median 90 [IQR 25–100]). Nonetheless, approximately one-third of participants were neither aware of the definition of sustainable endoscopy nor seemed to consider GI endoscopy to be a contributor to climate change (► **Table 2**). When asked who is most responsible for lowering the environmental impact of GI endoscopy, 27% and 25% of respondents answered the individual or industry, respectively. Improvement in the appropriateness of endoscopic procedures (41%) and reduction in single-use accessories (34%) were considered the most important strategies to reduce the environmental burden of GI endoscopy.

Waste and resource management

A total of 154 participants (38%) agreed that GI endoscopy is one of the highest waste generators per clinical procedure, while only 1% did not consider waste produced by endoscopy to be significant (**Table 1s**).

More than half of the participants (56%) were aware of the presence of recycling facilities at their units. Almost every respondent (94%) stated that waste segregation must be considered in GI endoscopy; however, 47% of participants reported not knowing how to separate GI endoscopic waste adequately (**Table 1s**).

Regarding the current practice within endoscopy units, 64% of participants revealed that proper recycling of GI endoscopic

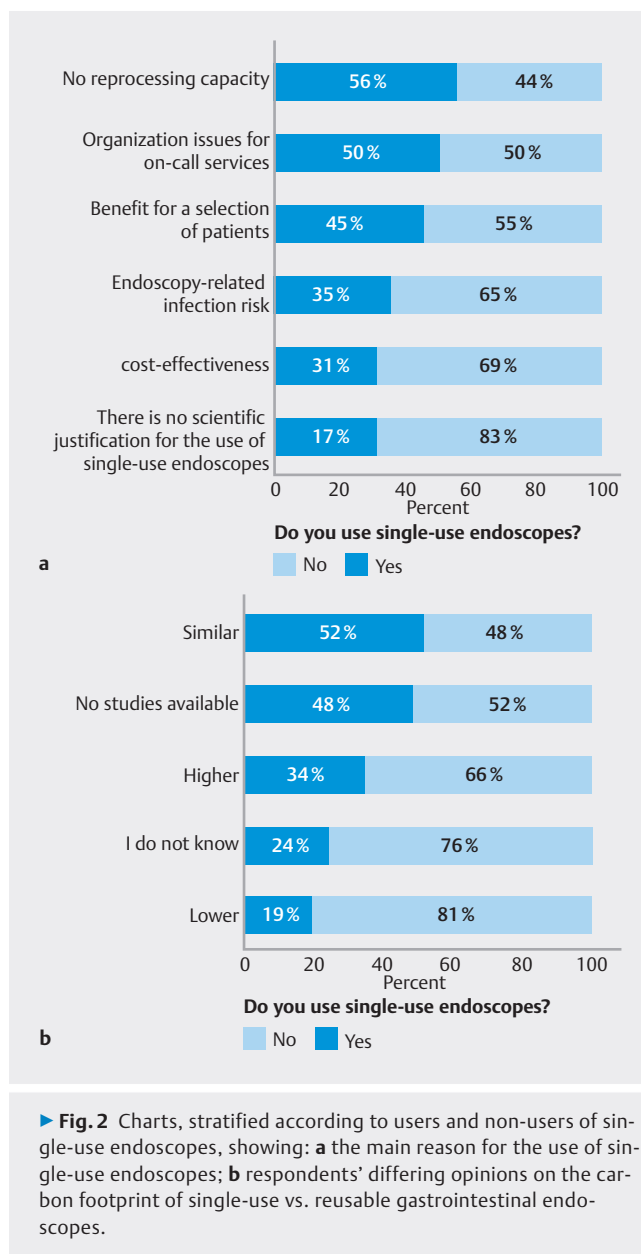
► **Table 2** Participants views on climate change and sustainability beliefs on the impact of gastrointestinal (GI) endoscopy.

Opinions and beliefs	n (%)
What is your opinion regarding climate change?	
Climate change is real and driven by human-related emissions	349 (86)
Climate change is real, but the cause is mostly unknown	36 (9)
Climate change is real, but not driven by human-related emissions	17 (4)
Climate change is not real	5 (1)
Do you believe that GI endoscopy is a significant contributor to global carbon footprint?	
Yes	273 (67)
No	134 (33)
Are you familiar with the term "sustainable GI endoscopy"?	
Yes	274 (67)
No	133 (33)
Which of the following do you believe is most important in decreasing the environmental impact of GI endoscopy?	
Improvement of the appropriateness of endoscopic procedures	167 (41)
Reduction of single-use accessories	139 (34)
Placement of recycling bins in the GI endoscopy unit	78 (19)
Implementation of non-invasive alternatives to GI endoscopy (e. g. FIT, capsule endoscopy, CT colonography)	23 (6)
In your opinion, who is most responsible for lowering the environmental impact of GI endoscopy?	
The individual (e. g. endoscopist, nurse, auxiliary staff)	110 (27)
Industry	104 (25)
Governments and politicians	80 (20)
Hospital administration	72 (18)
Scientific societies	40 (10)
Patients	1 (0)

FIT, fecal immunochemical test; CT, computed tomography.

waste is not a quality indicator, and that neither regular waste disposal training sessions (82%) nor regular audits (75%) have been performed in their departments. In addition, only 12% were aware of the existence of a "Green Endoscopy Champion," and 4% disclosed that the annual carbon footprint of their GI endoscopy units had already been estimated.

Implementing and promoting non-invasive alternatives to GI endoscopy and enhancing department vetting procedures were considered to be the most effective strategies for reducing the rate of inappropriate GI endoscopy procedures (41%



and 26%, respectively). Finally, when asked about strategies already implemented to reduce the carbon footprint of GI endoscopy, 27% were still unaware of potential measures to reduce the environmental burden of GI endoscopy in their units.

Single-use endoscopes and accessories

Most participants (65%) reported never having used single-use endoscopes. The participants who had used disposable endoscopes believed these were needed mainly because of a lack of reprocessing capacity or organizational issues for on-call services (► Fig. 2a). In addition, single-use endoscope users were either of the opinion that these devices have a similar carbon footprint to reusable endoscopes or that further studies are required to assess the true impact of single-use vs. reusable endoscopes (► Fig. 2b).

Regarding reusable accessories, 21% of participants use only single-use endoscopy accessories in their everyday practice, and 45% of respondents replied that all of their personal protective equipment (PPE) is single-use. The majority of participants (87%) agreed that manufacturers and industry should provide the estimated carbon footprint of their endoscopes and accessories, and that endoscopists should consider green-preferable purchasing (► **Table 3**).

Education and research

Respondents considered that lack of support (30%) or lack of knowledge from the staff (27%) are the main barriers to sustainable GI endoscopy (► **Fig. 3**).

Almost half of the respondents (47%) currently prefer attending scientific conferences in a hybrid format. In addition, 93% of participants agreed that dedicated abstract sessions and/or webinars should be included in congresses to raise awareness of sustainable GI endoscopy. Likewise, the majority (87%) considered that sustainability should be included in the training curricula of GI endoscopy.

Concerning research on this topic, 69% of respondents believed that it is a priority. “Strategies to reduce unnecessary GI endoscopic procedures and to lengthen follow-up intervals” and “comparative studies of single-use versus reusable accessories” were selected as the two most needed areas of upcoming research.

Lastly, almost two-thirds of respondents do not believe that GI endoscopy in Europe will be a net-zero greenhouse gas emissions practice by 2050 (**Table 2s**).

Discussion

The LEAFGREEN survey is the first international survey that assessed the personal attitudes and level of knowledge on sustainable practices among members of two GI endoscopy scientific societies. Of the 407 respondents, most are aware of the threat posed by the current climate crisis and the polluting impact of their working activity. Nonetheless, our data indicate significant room for improvement in waste management, resource optimization, “reuse” policies, and sustainability education.

Our professional carbon footprint begins before arriving at our work place. A recent study revealed that 45% of greenhouse gas emissions of ambulatory GI endoscopy come from the travel of patients and healthcare professionals [10]. Our survey revealed that two-thirds of participants who lived within 5–20 km and one-third of those who lived less than 5 km from their workplace still used their fossil fuel private vehicles to commute. Recently, the World Health Organization and other societies made an open call to avoid the proliferation of fossil fuels [11]. Therefore, educational green policies for healthcare professionals should include replacing fossil fuel private vehicles by public transportation, or biking and walking when feasible.

Human activities are at the core of global warming [12]. Our results demonstrate that the majority of participants are aware of the consequences of these human-related activities. This is in line with a recent survey by the European Commission, which

► **Table 3** Participants' use of and views on single-use endoscopes and accessories.

Practice and opinion	n (%)
Do you use single-use endoscopes in your GI endoscopy unit?	
▪ Never	263 (65)
▪ Yes, very rarely (less than one procedure per month)	75 (18)
▪ Yes, at least one procedure per month	23 (6)
▪ Yes, at least one procedure per week	15 (4)
▪ Yes, every day	25 (6)
▪ Not applicable, I work for the industry	6 (1)
In your opinion, what is the main reason for the use of single-use endoscopes in GI endoscopy units?	
▪ Endoscopy-related infection risk	221 (54)
▪ There is no scientific justification for the use of single-use endoscopes	87 (21)
▪ Benefit for a selection of patients	51 (13)
▪ Organizational issues for on-call services	26 (7)
▪ Cost-effectiveness	13 (3)
▪ No reprocessing capacity	9 (2)
In your opinion, the carbon footprint of single-use compared with reusable GI endoscopes is?	
▪ Higher	257 (63)
▪ Similar	31 (8)
▪ Lower	21 (5)
▪ I do not know	71 (17)
▪ No studies available	27 (7)
Do you use reusable accessories in your GI endoscopy unit?	
▪ Yes, everyday	140 (35)
▪ Yes, at least one procedure per week	70 (17)
▪ Yes, at least one procedure per month	31 (8)
▪ Yes, very rarely (less than one procedure per month)	75 (18)
▪ Never	85 (21)
▪ Not applicable, I work for the industry	6 (1)
Regarding personal protective equipment (PPE), which reusable items do you use?*	
▪ All PPE are single use	184 (45)
▪ Reusable face shield	151 (37)
▪ Reusable gowns	79 (19)
▪ Reusable caps	70 (17)
▪ Reusable masks	53 (13)
▪ Not applicable, I work for the industry	6 (1)

► **Table 3** (Continuation)

Practice and opinion	n (%)
In your opinion, should manufacturers and industry provide the carbon footprint of GI endoscopes and accessories?	
<ul style="list-style-type: none"> Yes, and gastroenterologists should consider green-preferable purchasing† 	354 (87)
<ul style="list-style-type: none"> Yes, but gastroenterologists should not worry about green-preferable purchasing† 	33 (8)
<ul style="list-style-type: none"> No 	20 (5)
GI, gastrointestinal. * More than one choice possible. † Green-preferable purchasing is the buying of a product that has a lesser or reduced negative effect or increased positive effect on human health and the environment, when compared with competing products that serve the same purpose.	

revealed that European citizens identify climate change as the single most serious threat to humanity [13]. Yet, 14% of healthcare professionals admitted to being unaware of what truly causes climate change or considered this to either not be caused by human-related activities or to be non-existent. These beliefs are consistent with other recent surveys [8, 14]. Similarly, one-third of participants do not consider GI endoscopy to be a major contributor to the global carbon footprint or ignore what sustainable endoscopy stands for. This highlights the need to disclose the environmental impact of GI endoscopy and to continue to raise awareness amongst our community, as one endoscopic procedure can release up to 28.4 kg of CO₂ equivalents (CO_{2e}) [1, 2, 4, 10].

Guidance towards green endoscopy should be based on the 5R sustainability principles (Reduce, Reuse, Recycle, Rethink, and Research) [15, 16, 17]. A reduction in unnecessary endoscopic procedures is likely the most effective measure to reduce the carbon footprint of GI endoscopy [18]. Recent studies suggest that 56% of upper GI referrals and up to 52% of colonoscopies are inappropriate [18, 19, 20]. Most respondents placed implementation of guideline-supported referral pathways and enhancement of department vetting procedures as the main strategies to reduce the burden of inappropriate endoscopic procedures.

Endoscopy is one of healthcare's biggest waste generators, yet studies focusing on waste production and management remain anecdotal. Agrawal et al. found that the understanding of recommended disposal methods for endoscopic accessories was very poor, and 98% of respondents felt that GI endoscopy personnel should be better informed about medical waste [5]. Subsequently, a cross-sectional study estimated that each endoscopy generates 2.1 kg of waste, of which only 9% was recycled [21]. Most participants agreed that waste segregation is important, but almost half were unaware of how to perform this. Another alarming finding of our survey was the high rate of endoscopy units without recycling facilities [22]. To a certain extent, this can be explained by the absence of Green Endoscopy Champions in most units, as 82% of respondents admitted to either not having or not knowing what "Green Endoscopy

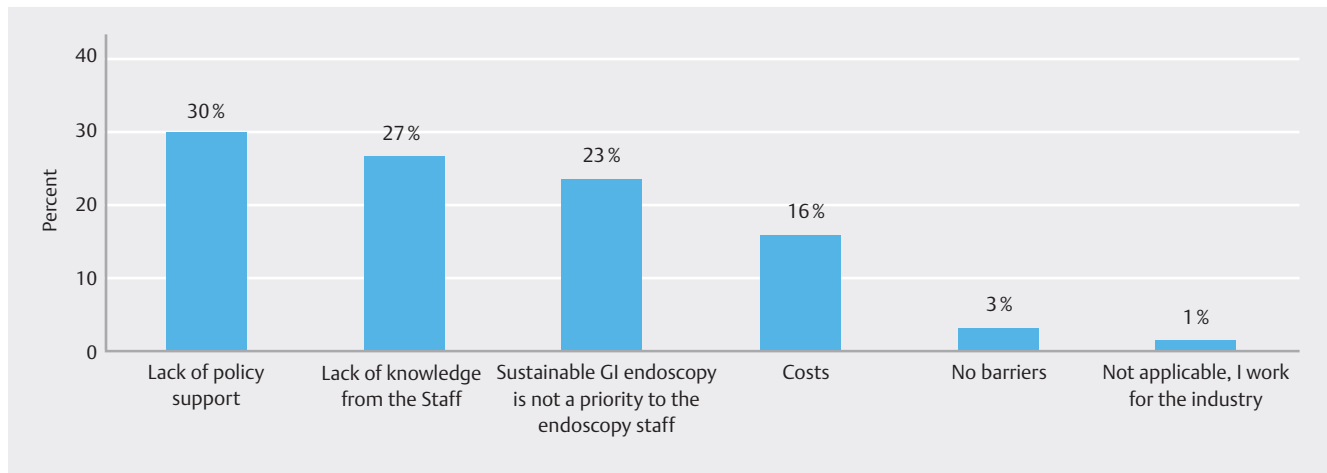
Champion" stands for. Appointing a motivated staff member to take the lead on sustainability projects is an effective method for implementing green endoscopy practices [23]. Applying educational sustainability measures to a real-world scenario achieves regulated medical waste reduction and improves recycling rates without compromising productivity [7].

However, waste represents a minor proportion of endoscopy's carbon footprint [4, 10, 24]. Energy production and distribution, particularly heating and cooling systems, are responsible for 40% of healthcare's carbon footprint [4, 24]. Despite the lack of guidelines on optimal temperature within endoscopy rooms, one-third of participants already have established temperature control to avoid overheating or overcooling [25]. In addition, we found that a similar percentage of respondents have implemented other energy-saving strategies, such as the systematic shutdown of electronic devices at the end of the working day or the replacement of inefficient light bulbs with LED's. The latter, combined with the installation of motion sensors, is thought to generate potential greenhouse gas emissions savings of up to 66% [18]. Likely, several endoscopy units have not considered any energy-saving measures, as 27% of respondents were unaware of the implementation of any local carbon footprint reduction strategies.

A section of our survey focused on the recent increase in use of single-use endoscopes. This trend is mainly driven by lower purchasing costs and the elimination of reprocessing and infectious cross-contamination risk. Companies have used these arguments to expand their use, based on limited data on duodenoscopy-related infections [26, 27]. One may question the clinical relevance of these data and the potential to misrepresent the infection risk posed by gastroscopes or colonoscopes, as these are far less complex and easier to decontaminate than duodenoscopes. Moreover, the environmental burden of single-use endoscopes is yet to be clearly defined, but evidence shows that they can increase net waste mass by 25% per procedure and generate up to 47 times more CO_{2e} than reusable endoscopes [21, 28]. The LEAFGREEN survey reflects the diverse opinion concerning the use of single-use endoscopes, but further studies and data evaluation on the indications for single-use endoscopes are urgently required.

Single-use accessories also contribute to the environmental impact of GI endoscopy [4]; however, the transition from reusable accessories lacks solid scientific data and studies are required to clarify its rationale. Not only are single-use accessories defined as such exclusively on the basis of a manufacturer's verdict, but they also seem to incur higher financial costs and environmental impact [29]. One-third of participants still reported daily employment of reusable accessories, and nearly half included at least one reusable item in their PPE, which has been shown to reduce the carbon footprint compared with single-use PPE [30].

Knowledge of endoscopic device composition and environmental impact are paramount to implement green-preferable purchasing strategies. The fact that companies are not obliged to publicly disclose the lifecycle assessment of their products was identified as an important field of intervention. Likewise, our survey demonstrates an increasing awareness of the need



► **Fig. 3** Bar graph of respondents' views on the main barriers to sustainable endoscopy.

for green-preferable purchasing. Recent data based on the life cycle assessment of four major brands of endoscopic device suggests that similar endoscopic instruments vary significantly in terms of their composition, with differences in greenhouse gas emissions mainly attributed to their production or incineration, depending on the main composition of the device [31]. These findings further highlight the importance of manufacturers providing their products sourcing and composition.

Scientific organizations should be the main drivers for high quality education and research in sustainability. The COVID-19 pandemic forced scientific societies to switch educational activities into an online format. Interestingly, most participants revealed a preference for hybrid events. Apart from the negative aspect of lower interaction levels, this shift from in-person to virtual events was revealed to be a sustainable practice, with a carbon footprint offset of 94% [32]. Hybrid events have emerged as an optimal alternative, allowing a reduction of 60%–82% of the carbon footprint [32,33]. According to most respondents, research on sustainable endoscopy and introducing sustainability in the training curricula of GI endoscopy should be prioritized.

Our study has limitations inherent to survey-based investigations. First, the response rate was modest and limited to active members of ESGE and ESGENA, which may limit generalizability. The survey was underpowered to enable comparisons between countries and multivariable analyses; however, this is the largest survey of its kind, and the response rate was within an acceptable range [34,35]. In addition, we did not disclose the precise age of respondents to preserve anonymity. Even though analysis of ESGENA's age and gender representativeness was precluded by data regulation policies, we may conclude that ESGE respondents were similar to the overall ESGE membership population. Finally, we cannot rule out social desirability bias or that the members more concerned about sustainability were more prone to answer the survey.

In conclusion, respondents identified the current climate crisis as a major threat. Moreover, the survey results showed there is room for improvement regarding certain sustainability

beliefs, waste management, and professional attitudes. Inappropriate GI endoscopy and single-use accessories and endoscopes were recognized as the major environmental challenges for the coming years. Although survey participants were reluctant to believe that GI endoscopy in Europe will be a net-zero greenhouse gas emissions practice by 2050, all endoscopy societies should firmly adopt this goal to build a greener future.

Green Stamp Explained

The objective of the study is at the very heart of the idea of a green stamp. The paper contributes to our understanding about current beliefs and attitudes of our profession – how relevant we consider sustainability in our endoscopy practice and what green changes we are willing to make.

Conflict of Interest

E. Rodríguez de Santiago has received fees from Olympus (educational and advisory roles), Apollo Endosurgery (educational activities), Norgine (congress fee) and Casen Recordati (congress fee). I.M. Gralnek has received fees from Motus GI, Medtronic, Boston Scientific, CheckCap, Clexio Biosciences, Astra-Zeneca, and Vifor Pharma. M. Dinis-Ribeiro has received fees for consultancy (Roche and Medtronic). J.A. Cunha Neves, H. Pohl, V. Lorenzo-Zuñiga, M.F. Cunha, A.M. Voiosu, C. Römmele, D. Penman, E. Albeniz Arbizu, K. Siau, L. Donnelly, L. Elli, M. Pioche, U. Beilenhoff, M. Arvanitakis, B.L.A.M. Weusten, R. Bischofs, C. Hassan, and H. Messmann declare that they have no conflict of interest.

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