



IFSO Worldwide Survey 2020–2021: Current Trends for Bariatric and Metabolic Procedures

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Abstract

Purpose This IFSO survey aims to describe the current trends of metabolic and bariatric surgery (MBS) reporting on the number and types of surgical and endoluminal procedures performed in 2020 and 2021, in the world and within each IFSO chapter.

Methods All national societies belonging to IFSO were asked to complete the survey form. The number and types of procedures performed (surgical and endoluminal interventions) from 2020 to 2021 were documented. A special section focused on the impact of COVID-19, the existence of national protocols for MBS, the use of telemedicine, and any mortality related to MBS. A trend analysis of the data, both worldwide and within each IFSO chapter, was also performed for the period between 2018 and 2021.

Results Fifty-seven of the 74 (77%) IFSO national societies submitted the survey. Twenty-four of the 57 (42.1%) reported data from their national registries. The total number of surgical and endoluminal procedures performed in 2020 was 507,806 and in 2021 was 598,834. Sleeve gastrectomy (SG) remained the most performed bariatric procedure. Thirty national societies (52%) had regional protocols for MBS during COVID-19, 61.4% supported the use of telemedicine, and only 47.3% collected data on mortality after MBS in 2020. These percentages did not significantly change in 2021 ($p > 0.05$).

Conclusions The number of MBS markedly decreased worldwide during 2020. Although there was a positive trend in 2021, it did not reach the values obtained before the COVID-19 pandemic. SG continued to be the most performed operation. Adjustable gastric banding (AGB) continues to decrease worldwide.

Keywords Metabolic and bariatric surgery · COVID-19 pandemic · IFSO chapters

Introduction

The International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) aims to promote the dissemination of scientific knowledge to inform and orientate bariatric surgeons and integrated health professionals in their daily clinical practices. Since the presidential address of Nicola Scopinaro during the Second Congress of the IFSO

in Cancun on October 1997 [1], the ambitious idea of collecting the number and type of operations performed in the national societies belonging to IFSO was introduced resulting in several surveys published [2–7]. The total number of MBS has steadily increased worldwide, and bariatric surgeons have been constantly evolving their opinion regarding the safety and efficacy of the different bariatric procedures over the years.

The last 2018 IFSO survey [7], confirmed that sleeve gastrectomy (SG) was the most performed operation, the decline of adjustable gastric band (AGB), and the increasing popularity of one-anastomosis gastric bypass (OAGB).

This survey aims to describe the number and types of procedures performed in 2020 and 2021, in the world and within each IFSO chapter taking into account the negative impact of the pandemic “coronavirus disease 19” (COVID-19). Elective surgeries were cancelled or delayed to reallocate medical

Key Points

- SG was the most performed procedure worldwide and in each IFSO chapter.
- AGB continues to decrease while the endoluminal procedures are definitively increasing.
- Video consultation have officially entered clinical practice.
- IFSO survey will continue to report the changing trends of the different MBS procedures.

Extended author information available on the last page of the article

personnel and equipment towards helping the intensive care unit (ICU) capacity. In May 2020, the IFSO position statement [8] recommended that elective surgical and endoscopic cases for MBS should be postponed during the pandemic and that clinic and hospital follow-up visits should be delayed and replaced by video consultations or other types of telemedicine. Consequently, a special section was introduced in this survey regarding the existence of national COVID protocols for bariatric and metabolic procedures, the use of telemedicine, and the collection of data on mortality after bariatric and metabolic procedures during the pandemic.

Methods

The 2020–2021 IFSO survey form was emailed by the IFSO secretariat to all the national IFSO societies in March 2022. The form is mainly required to report the type of operations and number of primary and revisional procedures performed.

Regarding the data source, it was specifically asked if they were provided by national registry, national survey, expert opinion, or by other means. It has to be considered that 72 IFSO national societies are spread over five earth continents with large diversity in terms of Health Service System, economic resources, level of organization, and methods of data collection. In case of the absence of official answer after repeated emails, direct telephone contact was used with the National Society President and well-known senior surgeons leaders in the field. Only in case of a total lack of recorded data system, expert opinion was stimulated to provide the required information.

Part of this survey was also dedicated to COVID-19: the adoption of national protocols for procedure selection, the use of telemedicine, and data on mortality after MBS during the pandemic (Fig. 1). The data from Canada came only from Ontario.

The results of the 2020–2021 IFSO survey were compared to the last 2018 published survey.

The obtained data were expressed as absolute and relative frequencies. The relative frequency was calculated by dividing the absolute frequency by the total number of values for the variable.

Results

The IFSO survey form 2020–2021 (Table 1) was sent to 74 IFSO national societies. Fifty-seven (77%) of the national IFSO societies completed and submitted the form.

Costa Rica, Egypt, Honduras, Hungary, Iceland, Indonesia, Kuwait, Lebanon, Pakistan, Panama, Perù, the Philippines, Serbia, Sri Lanka, Thailand, Ukraine, and Uzbekistan did not respond.

Twenty-four (42.1%) IFSO societies reported data from their national registries.

The total number of surgical and endoluminal procedures performed in the world in 2020 was 507,806 and in 2021 was 598,834. Considering the last IFSO survey report [7], the number of bariatric and metabolic procedures decreased, as reported in Table 1.

Figure 2 demonstrates the worldwide trend in the percentage of the main surgical bariatric and metabolic operations from 2018 to 2021, which continued to increase though only slightly over time and confirmed that the SG was the most commonly performed MBS in the world.

Thirty (52%) of the IFSO national societies had national protocols for bariatric procedures, 35 (61.4%) of the national societies used telemedicine for patient follow-up after a MBS, and 27 (47.3%) societies collected data on mortality after MBS. These percentages did not significantly change in 2021 ($p > 0.05$).

There was not any significant difference among the IFSO chapters in the percentages of adoption of national protocols for bariatric and metabolic procedures both in 2020 and 2021. The use of telemedicine in 2021 was higher in LAC and NAC compared to the other IFSO societies ($p = 0.045$).

Asia Pacific Chapter (APC)

The total number of surgical and endoluminal procedures performed in the APC in 2020 was 63,343 and in 2021 was 76,635. In the last IFSO survey report [7], 70,573 bariatric procedures in APC were reported in 2018. While MBS performed in the APC, declined in 2020, it increased in 2021 (Table 2).

Figure 3 demonstrates the trend in the percentage of the main MBS performed in the APC from 2018 to 2021. There was a further increase of SG in 2021 which now represented about 70% of all the procedures performed. The OAGB remained the second most performed MBS, although it had a slight decrease. The popularity of the AGB continued to decrease and its use was essentially abandoned. This finding is of special interest because in the APC the percentage of AGB was high for a long time.

The IFSO APC societies that had national protocols for MBS, the use of telemedicine, and the data collection about mortality after MBS (during the year 2020 and 2021) were reported in the Supplementary Fig. 1S.

European Chapter (EC)

The total number of surgical and endoluminal procedures performed in the EC in 2020 was 136,584 and in 2021 was 178,471. Considering the last IFSO survey report [7], the number of MBS performed in 2020 and 2021 was lower than in 2018, as reported in Table 3.



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Society/ Country: _____

- 1 Are these data provided by a National Registry? YES
If NO please specify method (national survey, expert opinion, other) _____
- 2 Did your Society provide protocols for selection of bariatric procedures during the COVID-19 pandemic? YES/NO
- 3 Did your Society suggest Telemedicine for the follow-up after bariatric procedures during the COVID-19 pandemic? YES/NO
- 4 Did your Society collect any data about mortality after bariatric procedures? YES/NO. If Yes, please specify _____

| Number and Type of procedures performed in your Country in 2020 | | Number and Type of procedures performed in your Country in 2021 | |
|---|--------------------------------------|---|--------------------------------------|
| SURGICAL PROCEDURES 2020 | NUMBER | SURGICAL PROCEDURES 2021 | NUMBER |
| Adjustable Gastric Banding | Total : Primary : Revisional : | Adjustable Gastric Banding | Total : Primary : Revisional : |
| Roux-en-Y Gastric Bypass (RYGB) (including banded RYGB) | Total : Primary : Revisional : | Roux-en-Y Gastric Bypass (RYGB) (including banded RYGB) | Total : Primary : Revisional : |
| Sleeve Gastrectomy | Total : Primary : Revisional : | Sleeve Gastrectomy | Total : Primary : Revisional : |
| One Anastomosis Gastric Bypass (OAGB) ¹ | Total : Primary : Revisional : | One Anastomosis Gastric Bypass (OAGB) ¹ | Total : Primary : Revisional : |
| Biliopancreatic diversion (BPD) ² | Total : Primary : Revisional : | Biliopancreatic diversion (BPD) ² | Total : Primary : Revisional : |
| Other operations | Total : Primary : Revisional : | Other operations | Total : Primary : Revisional : |
| ENDOLUMINAL PROCEDURES 2020 | NUMBER | ENDOLUMINAL PROCEDURES 2021 | NUMBER |
| Intragastric Balloons | | Intragastric Balloons | |
| Endoscopic transoral gastroplasty (POSE, Apollo overstiches) | | Endoscopic transoral gastroplasty (POSE, Apollo overstiches) | |
| Endoscopic transoral revision of gastric bypass | | Endoscopic transoral revision of gastric bypass | |

1- Please include: Mini-gastric bypass (MGB); Omega loop Gastric Bypass; Single anastomosis gastro-ileostomy (SAGI); Sleeve Ileal (SASI) Bypass
2- Please include: Standard Scopinaro BPD, Duodenal Switch (DS), One Anastomosis Duodena Switch, Single anastomosis duodeno-ileostomy sleeve (SADI), Intestinal Pylorus Sparing Surgery Single Anastomosis (SIPS)

Signature (Name and Role in the society)

Date

Fig. 1 The IFSO survey form 2020–2021

Figure 4 demonstrates the trend in the percentage of the main MBS performed in the EC from 2018 to 2021. There was a decrease in SG, which remained the most commonly performed procedure, and a slight increase in OAGB. RYGB and AGB were stable over time.

The IFSO EC societies that had national protocols for bariatric and metabolic procedures, the use of telemedicine, and the data collection on mortality after MBS during 2020 and 2021 were reported in the Supplementary Fig. 2S.

Table 1 The number and the type of operations worldwide in 2018, 2020, and 2021

| | 2018 | 2020 | 2021 |
|---------------------------------------|----------------|----------------|----------------|
| Sleeve gastrectomy (SG) | 386,096 | 304,352 | 351,689 |
| Roux-en-Y gastric bypass (RYGB) | 203,769 | 133,007 | 159,543 |
| One anastomosis gastric bypass (OAGB) | 46,406 | 29,117 | 46,113 |
| Biliopancreatic diversion (BPD) | 6506 | 6896 | 7973 |
| Adjustable gastric banding (AGB) | 9757 | 6116 | 5010 |
| Other surgical operations | 14,346 | 13,949 | 13,238 |
| Intragastric balloons | 27,780 | 11,492 | 12,421 |
| Other endoluminal procedures | 1531 | 2877 | 2707 |
| Total | 696,191 | 507,806 | 604,099 |

Latin America Chapter (LAC)

The total number of surgical and endoluminal procedures performed in the LAC in 2020 was 82,523 and in 2021 was 104,239. Considering the last IFSO survey report [7], the

number of MBS performed in 2020 and 2021 was lower than in 2018, as reported in Table 4.

Figure 5 demonstrates the trend in the percentage of the main surgical bariatric operations performed in the LAC from 2018 to 2021. There was a remarkable increase of SG, which in 2020 overtook the RYGB and became, for the first time in LAC, the most performed procedure. OAGB and AGB were stable and represented a small part of the surgical interventions.

The LAC IFSO societies that used national protocols for MBS, the use of telemedicine, and the data collection on mortality after MBS during 2020 and 2021 were reported in the Supplementary Fig. 3S.

Middle East and North African Chapter (MENAC)

The total number of surgical and endoluminal procedures performed in the MENAC in 2020 was 46,272 and in 2021 was 52,918. Considering the last IFSO survey report [7], the

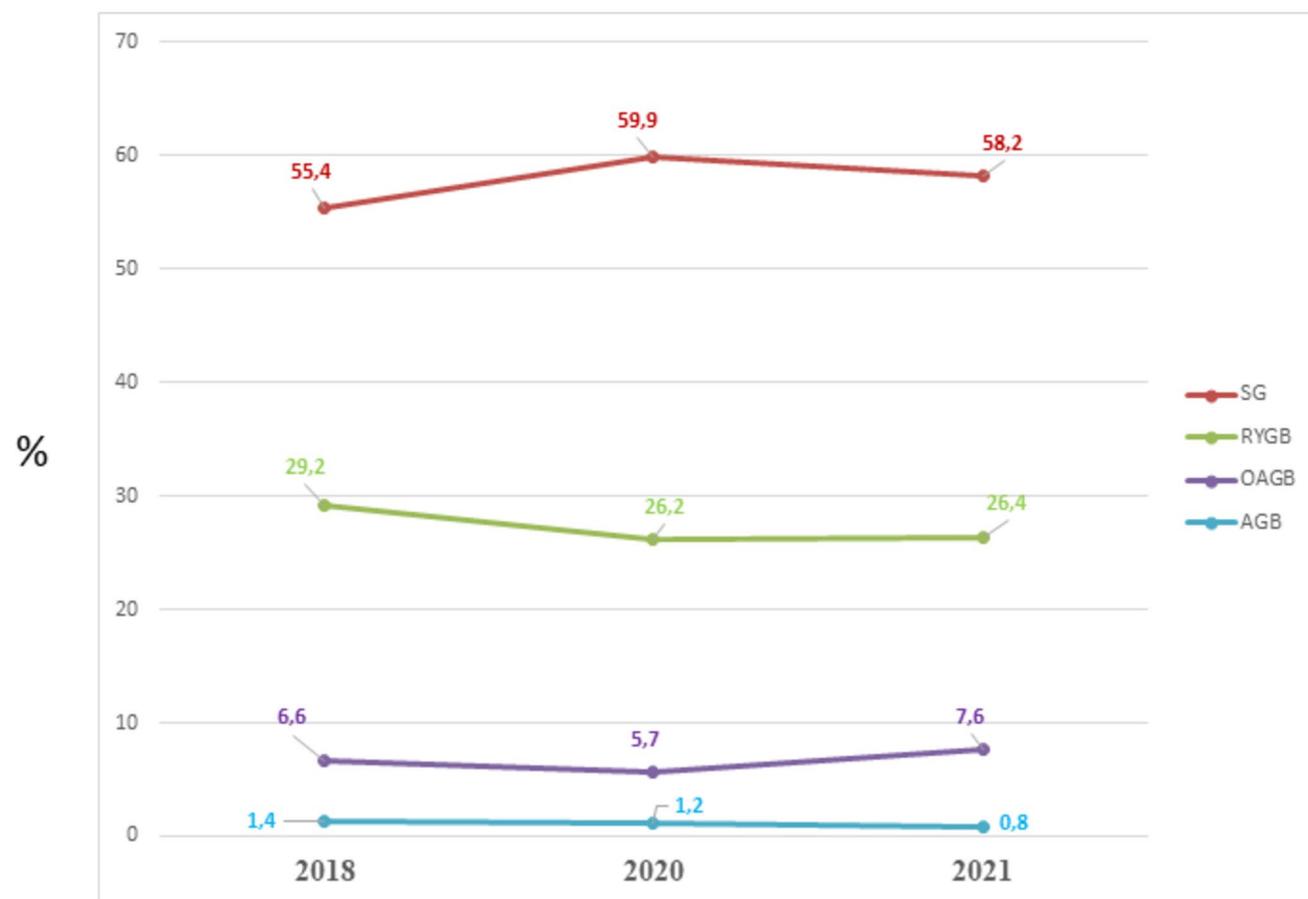
**Fig. 2** The worldwide trend from 2018 to 2021 of the main bariatric/metabolic procedures

Table 2 The number and the type of operations performed in the APC in 2018, 2020, and 2021

| | 2018 | 2020 | 2021 |
|---------------------------------------|---------------|---------------|---------------|
| Sleeve gastrectomy (SG) | 38,160 | 40,408 | 52,398 |
| Roux-en-Y gastric bypass (RYGB) | 9488 | 8712 | 9386 |
| One anastomosis gastric bypass (OAGB) | 14,164 | 9127 | 11,450 |
| Biliopancreatic diversion (BPD) | 1103 | 521 | 639 |
| Adjustable gastric banding (AGB) | 1297 | 371 | 224 |
| Other surgical operations | 2807 | 2924 | 1109 |
| Intragastric balloons | 3359 | 980 | 1109 |
| Other endoluminal procedures | 195 | 300 | 320 |
| Total | 70,573 | 63,343 | 76,635 |

the number of MBS performed, both in 2020 and 2021, was higher than in 2018, as reported in Table 5.

Figure 6 demonstrates the trend in the percentage of the main surgical bariatric operations performed in the MENAC from 2018 to 2021. There was a remarkable increase of SG, which represented more than 80% of bariatric interventions. Both OAGB and RYGB decreased, and AGB was abandoned.

The MENAC IFSO societies that used national protocols for MBS, the use of telemedicine, and the data collection on mortality after MBS during 2020 and 2021 were reported in the Supplementary Fig. 4S.

North America Chapter (NAC)

The total number of surgical and endoluminal procedures performed in the NAC in 2020 was 179,083 and in 2021 was 186,568. Considering the last IFSO survey report [7], the number of MBS performed in 2020 and 2021 was lower than in 2018, as reported in Table 6.

Figure 7 demonstrates the trend in the percentage of the main surgical bariatric operations performed in the NAC from 2018 to 2021. SG was stable over time representing about 70% of all bariatric interventions. RYGB had a slight increase. From 2020, data about the OAGB were available, but it represented < 1% of the bariatric surgical interventions.

The IFSO NAC societies that used national protocols, the use of telemedicine, and the data collection on mortality as MBS during 2020 and 2021 were reported in the supplementary Fig. 5S.

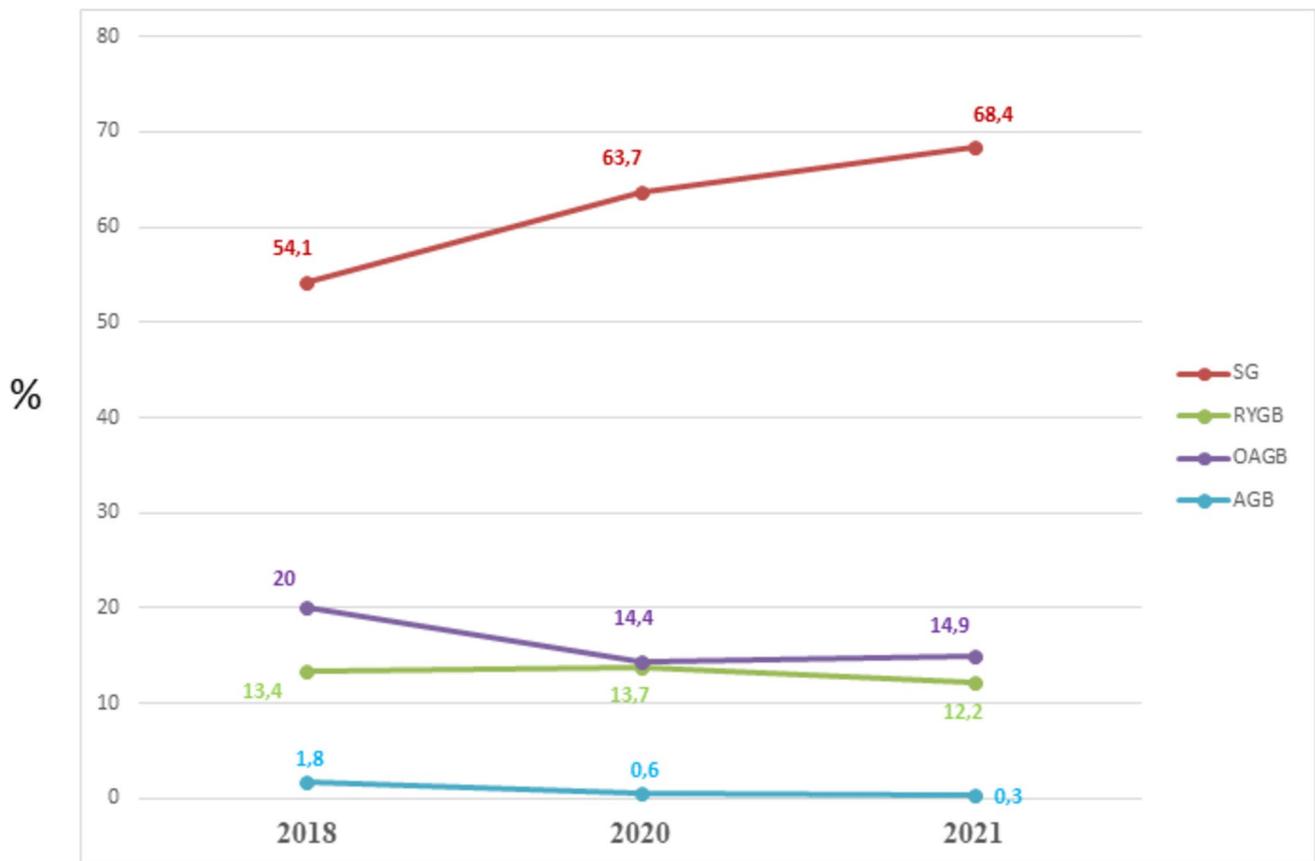


Fig. 3 The trend in the percentage of the main surgical bariatric operations performed in the APC from 2018 to 2021

Table 3 The number and the type of operations performed in the EC in 2018, 2020, and 2021

| | 2018 | 2020 | 2021 |
|---------------------------------------|----------------|----------------|----------------|
| Sleeve gastrectomy (SG) | 104,052 | 63,666 | 79,499 |
| Roux-en-Y gastric bypass (RYGB) | 48,872 | 42,918 | 53,918 |
| One anastomosis gastric bypass (OAGB) | 21,962 | 15,633 | 29,475 |
| Biliopancreatic diversion (BPD) | 1322 | 835 | 1245 |
| Adjustable gastric banding (AGB) | 4592 | 3013 | 2942 |
| Other surgical operations | 4110 | 7281 | 5313 |
| Intragastric balloons | 4829 | 2900 | 5301 |
| Other endoluminal procedures | 613 | 338 | 778 |
| Total | 190,352 | 136,584 | 183,736 |

Discussion

The IFSO survey which has been repeatedly published over the years, describes the total number of procedures performed worldwide for MBS and the trends analysis based on the surgeons' preference for one type of operation over another. These data were also provided for each individual IFSO chapter to recognize specific attitudes and

trends in different world regions. The results of the IFSO surveys over the years have been a source of relevant and useful information for clinical practice and the scientific community dedicated to the treatment of obesity and metabolic disorders. In fact, this was clearly confirmed by the scientific literature based on the large number of received citations.

Regarding the operation of choice for many surgeons, the supremacy of SG was maintained over the bypass operations worldwide [9] but without a significant growing trend as in the previous survey. Roux-en-Y gastric bypass (RYGB) and one anastomosis gastric bypass (OAGB) remain the most commonly performed operations after SG, with a consistent lead over the other procedures. There was a worldwide increase in endoscopic bariatric procedures such as endoscopic sleeve gastroplasty and the transoral outlet reduction after gastric bypass (from 1531 in 2018 to 2707 in 2021). A possible explanation of these unexpected findings could be the preference of some bariatric centers to adopt less invasive endoscopic procedures rather than standard MBS due to COVID's coexistence. Certainly, gastroenterologists are increasingly involved in the management of patients with obesity. However, the number of endoscopic procedures reported in this survey is still limited by the fact that only a

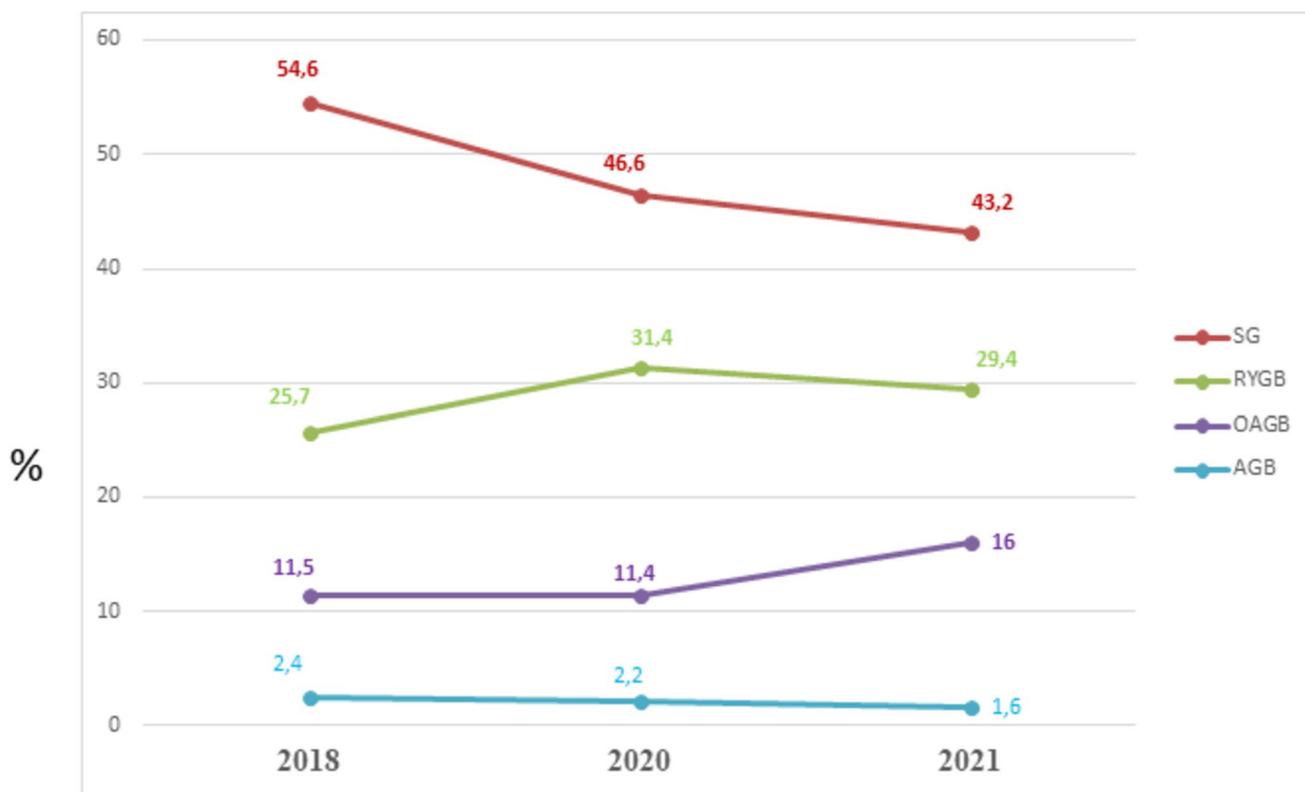
**Fig. 4** The trend in the percentage of the main surgical bariatric operations performed in the EC from 2018 to 2021

Table 4 The number and the type of operations performed in the LAC in 2018, 2020, and 2021

| | 2018 | 2020 | 2021 |
|---------------------------------------|----------------|---------------|----------------|
| Sleeve gastrectomy (SG) | 56,844 | 39,515 | 46,067 |
| Roux-en-Y gastric bypass (RYGB) | 94,146 | 36,004 | 44,177 |
| One anastomosis gastric bypass (OAGB) | 4044 | 857 | 1898 |
| Biliopancreatic diversion (BPD) | 1138 | 1436 | 1795 |
| Adjustable gastric banding (AGB) | 578 | 83 | 707 |
| Other surgical operations | 810 | 618 | 4439 |
| Intragastric balloons | 13,034 | 3778 | 4436 |
| Other endoluminal procedures | 555 | 232 | 720 |
| Total | 171,149 | 82,523 | 104,239 |

few gastroenterologists belong to the national bariatric societies and their data are not often officially available.

From 2018 to 2021 the number of AGB implanted was reduced by half.

As expected, the total number of bariatric surgery cases markedly decreased during 2020, with a partial rising trend in 2021. However, it did not reach the values before the COVID-19 pandemic. This should not be interpreted as a

true decrease in case volume worldwide but only as a lower response rate to this survey when compared to the IFSO 2018 survey (87.7% vs 77%).

Amongst the non-responders of the IFSO national societies there were Indonesia, the Philippines, Sri Lanka, and Thailand. However, in the published IFSO-APC National Reports 2021[10] these national societies reported to have performed a combined total of only 841 procedures. In addition, for the first time, Ukraine, Egypt, and Peru did not respond at all, probably due to lack of resources in their local healthcare services as a result of catastrophes such as the war and/or the COVID-19 pandemic. Although the worldwide trends of MBS did not significantly change before and after the COVID-19 pandemic, we revealed substantial differences among the IFSO chapters.

In the European and NA chapters, SG remained the most popular operation, although it was stable or had a slight decrease. On the contrary, in AP and MENA chapters, SG had a marked increase in numbers compared to 2018 (+14% and +16%, respectively). Moreover, during the COVID-19 pandemic, SG became, for the first time, the most-performed operation in the LAC, ending the RYGB supremacy in that region. Since 2014, the SG has continued to be the most

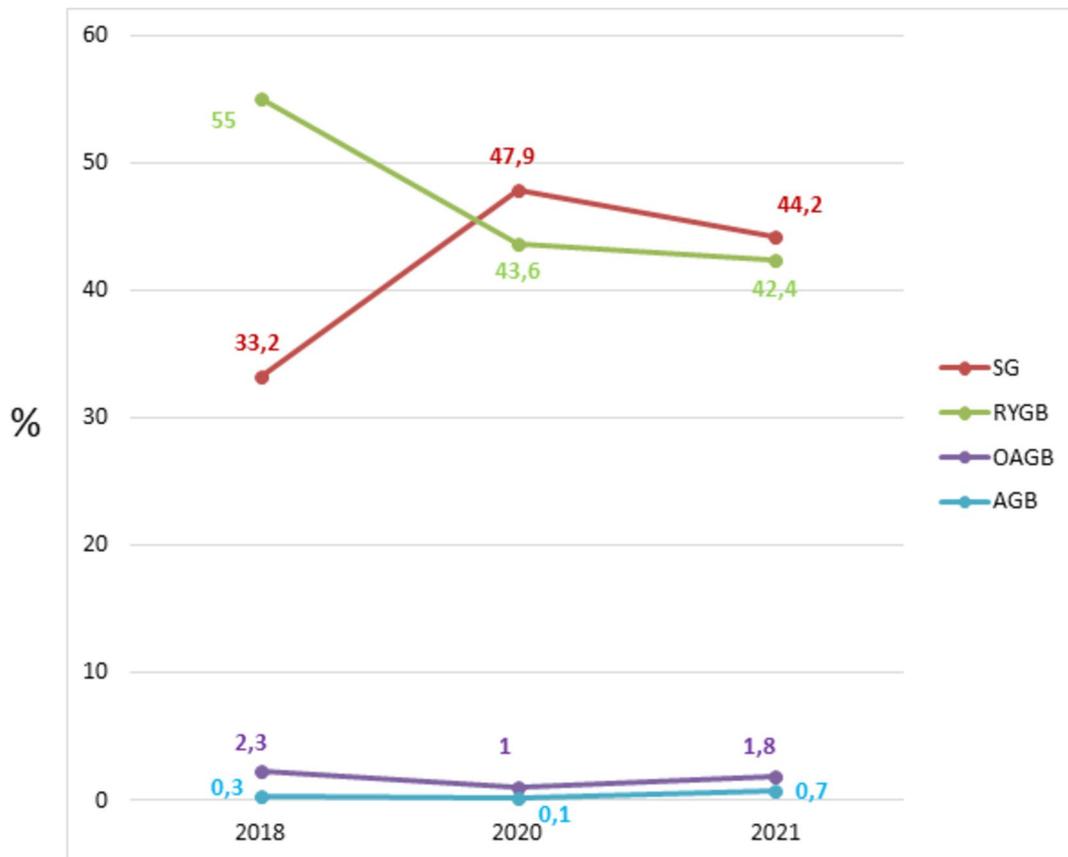


Fig. 5 The trend in the percentage of the main surgical bariatric operations performed in the LAC from 2018 to 2021

Table 5 The number and the type of operations performed in the MENAC in 2018, 2020, and 2021

| | 2018 | 2020 | 2021 |
|---------------------------------------|---------------|---------------|---------------|
| Sleeve gastrectomy (SG) | 27,579 | 38,244 | 44,034 |
| Roux-en-Y gastric bypass (RYGB) | 4185 | 2140 | 2357 |
| One anastomosis gastric bypass (OAGB) | 6236 | 2162 | 2346 |
| Biliopancreatic diversion (BPD) | 455 | 25 | 26 |
| Adjustable gastric banding (AGB) | 510 | 256 | 174 |
| Other surgical operations | 772 | 1904 | 1947 |
| Intragastric balloons | 1516 | 1034 | 1145 |
| Other endoluminal procedures | 168 | 507 | 889 |
| Total | 41,421 | 46,272 | 52,918 |

performed operation, probably due to its already-reported advantages [9]. Furthermore, the global health emergency due to the COVID-19 pandemic, which significantly impacted health services, probably changed the operative strategy of bariatric surgeons worldwide preferring a simpler operation with fewer surgical complications.

RYGB remained the second most commonly performed surgical operation in the world, as well as in European and North American chapters. On the contrary, in AP and MENA chapters, it represented the third most commonly performed procedure, after the OAGB. In 2020, in the LAC, the RYGB lost, for the first time, its supremacy as the most common operation performed. The OAGB was stable globally. It was the third most performed procedure. However, in the European chapter, it had a slight increase (+4%). In the AP and MENA chapters, the OAGB decreased and in the LA and NA chapters, it represented only a minority of the performed operations.

This survey also demonstrated an interesting increase in other unconventional operations, totaling 13,238 in 2021. Although the IFSO bariatric and metabolic community is committed to the standardization of surgical procedures through position statements and guidelines, there were a consistent number of procedures that were performed that were not included in the list of officially recognized interventions.

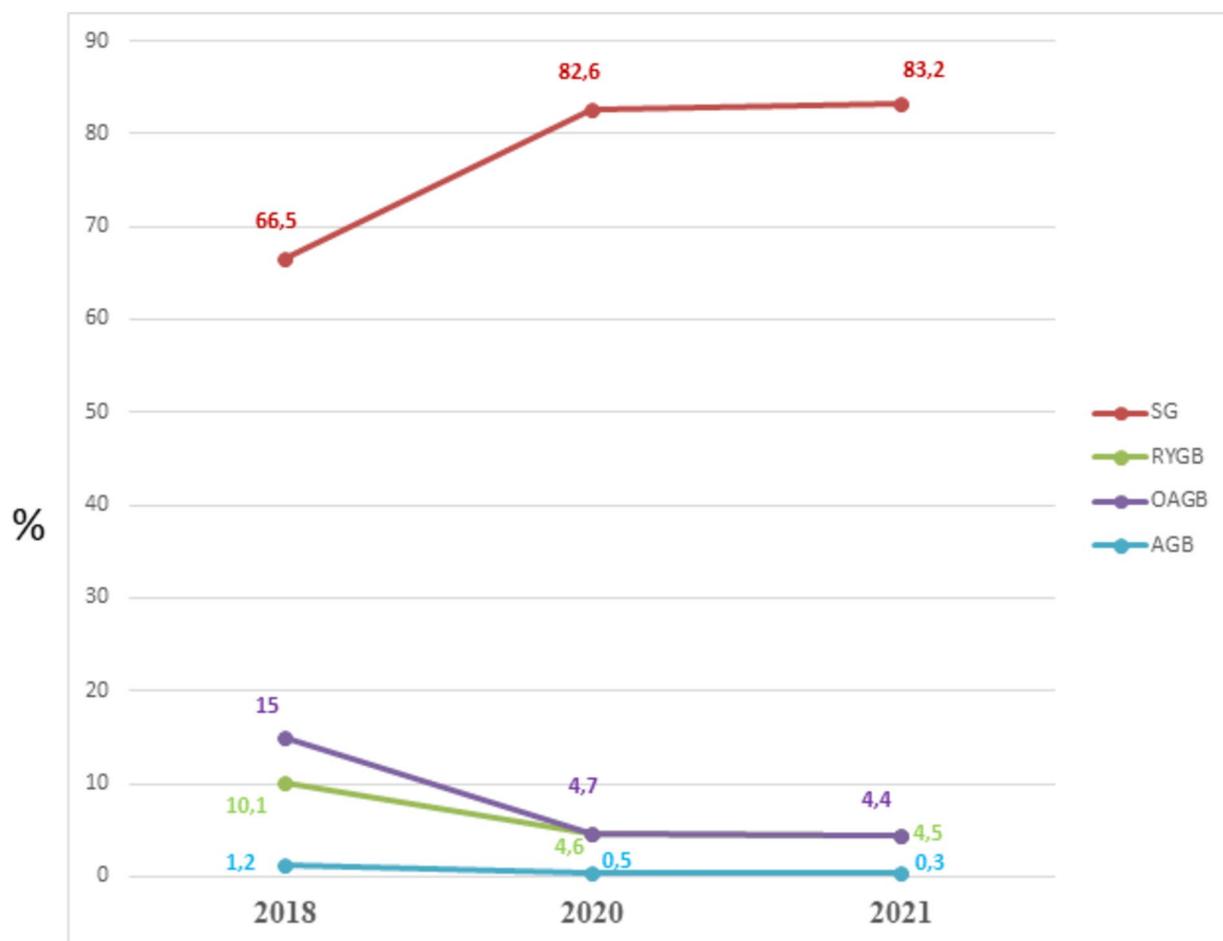
**Fig. 6** The trend in the percentage of the main surgical bariatric operations performed in the MENAC from 2018 to 2021

Table 6 The number and the type of operations performed in the NAC in 2018, 2020, and 2021

| | 2018 | 2020 | 2021 |
|---------------------------------------|----------------|----------------|----------------|
| Sleeve gastrectomy (SG) | 159,461 | 122,519 | 129,691 |
| Roux-en-Y gastric bypass (RYGB) | 47,078 | 43,233 | 49,705 |
| One anastomosis gastric bypass (OAGB) | n.r | 1338 | 944 |
| Biliopancreatic diversion (BPD) | 2488 | 4079 | 4408 |
| Adjustable gastric banding (AGB) | 2780 | 2393 | 960 |
| Other surgical operations | 5847 | 1221 | 430 |
| Intragastric balloons | 5042 | 2800 | 430 |
| Other endoluminal procedures | n.r | 1500 | n.r |
| Total | 222,696 | 179,083 | 186,568 |

As already reported in the previous IFSO surveys [3–7], the critical limiting factor for the scientific value of this report is the quality of the data and the methodology of collection. Data were obtained from an emailed questionnaire sent to the IFSO national societies but only 42% of them reported numbers extrapolated from the official national registry and about 32% from the National Surveys.

Both these data sources present consistent limitations. Registries undoubtedly produce better quality data [11], but are far from being complete, since many surgeons are reluctant to spend time to insert the required items and often are not willing to share detailed patient information, especially in the case of private practice settings. Registries, in fact, are mostly useful for outcome analysis. The Official National Society Survey does not require specific patient data and generally receives a much wider surgeons’ participation. Therefore, it might be considered more suitable for trend analysis.

Although the methodology is not flawless as previously pointed out, this IFSO survey offers a global overview of MBS performed in the national societies taking also into account the COVID-19 pandemic. The COVID-19 outbreak has dramatically reduced the number of bariatric and metabolic procedures. From 2021, we documented the “recovery” of MBS possibly due to the very rapid knowledge about this new coronavirus and, the subsequent widespread use of vaccinations. These results have enhanced the pivotal role of MBS in the management of patients with obesity and their comorbidities. In November 2020, the

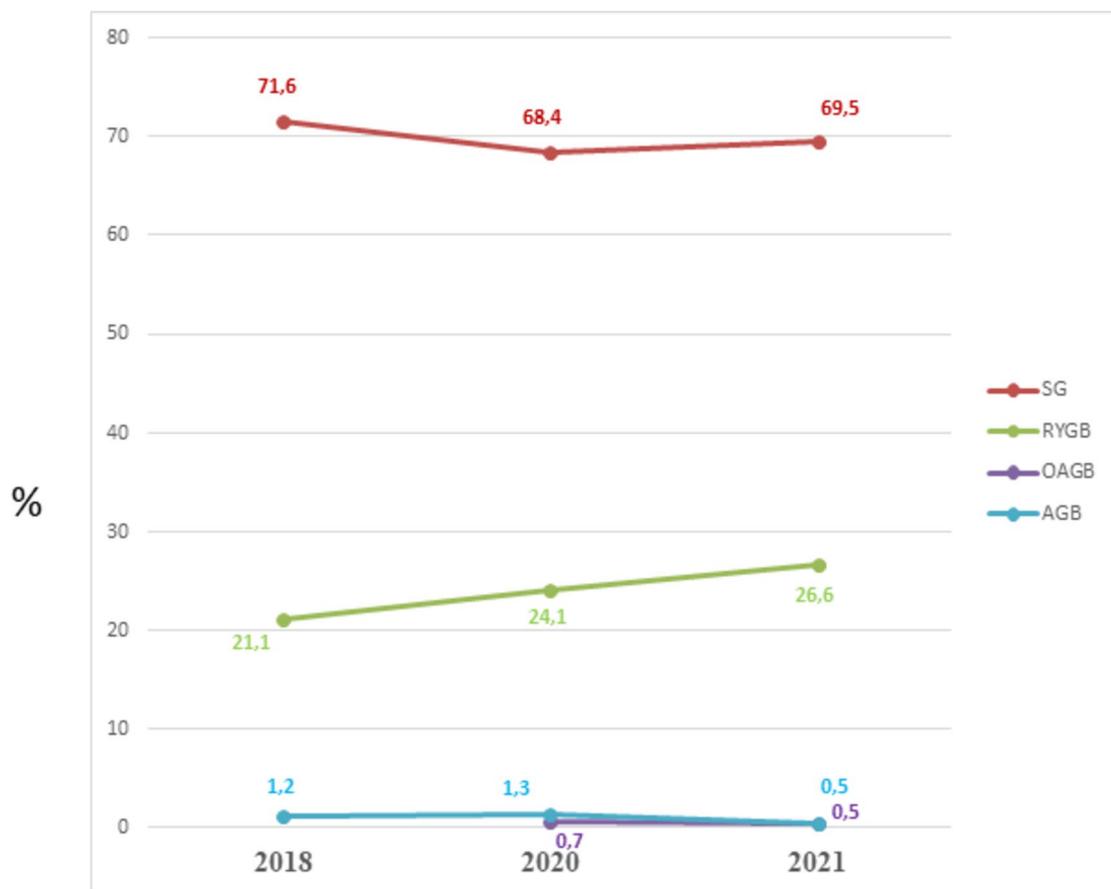


Fig. 7 The trend in the percentage of the main surgical bariatric operations performed in the NAC from 2018 to 2021

IFSO LAC published recommendations for the resumption of elective bariatric metabolic surgery during the COVID-19 pandemic. The pandemic demonstrated that patients with severe obesity had higher mortality due to COVID-19 compared to the general population [10] and that for these patients, MBS must be considered “life-saving” as well as surgical oncology. More recently, a multinational cohort study showed that with appropriate perioperative protocols [12], MBS could be safely performed also during the COVID-19 pandemic.

The use of telemedicine and video consultation deriving from patient management during the pandemic was another very important point reported in this study. Currently, these modern technologies have been rapidly incorporated by the bariatric surgeon’s community for patient management remotely.

In conclusion, this IFSO global survey confirmed that the sleeve gastrectomy is the most performed surgical procedure worldwide. It was not observed for any consistent growth and its trend is probably reaching a plateau. The AGB continues to decrease, and it may be that it will become an operation for historical purpose only. The endoluminal procedures are definitively increasing and current data are largely underestimated because these operations are mostly performed by medical gastroenterologists who are not generally involved in the national bariatric surgical societies.

The volume of MBS cases in the future will continue to increase with some interesting trends towards perhaps less invasive procedures. As such, the IFSO worldwide survey will continue to report on the global trends in years to come. It will continue to be devoted to witness and report on the changing trends of the different MBS procedures. These changing trends over time will reflect on the preference of surgeons globally and the evolution of the current and emerging techniques. Telemedicine and video consultation have officially entered clinical practice for the management of patients with obesity.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11695-024-07118-3>.

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Data Availability The data that support the findings of this study are available from the corresponding author [L.A.] upon reasonable request.

Declarations

Ethics Approval For this type of study formal consent is not required.

Informed Consent This is a survey in which we do not directly involve human subjects; it is limited to an analysis of bariatric procedures performed around the world.

Conflict of Interest The authors declare no competing interests.

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