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Changes in volumes and severity of surgical urgencies during the first two COVID-19 pandemic waves in a regional hospital network

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Abstract. *Background and aim:* This study analyses the impact of the first two pandemic waves on surgical urgencies/emergencies and their consequences on an entire provincial hospital network's surgical activities. *Methods:* Clinical and epidemiological data of urgent/emergent surgical admissions and interventions in the Autonomous Province of Trento›s hospital network were collected from the internal common electronic database. The investigation periods were March-May 2019 (reference period), March-May 2020 (phase-I), June - August 2020 (phase-II), and October - December 2020 (phase-III). The same data were divided and grouped for the six most represented diagnoses. *Results:* The number of admissions for surgical emergencies in the studied periods showed a sinusoidal trend. In the reference period of 2019, 957 patients were admitted in urgency, while in the three pandemic phases, urgent admissions were 511, 888 and 633 respectively (-47% in phase I, - 8% in phase II, -34% in phase III). This trend was also observed by stratifying admissions for single disease, except for gastrointestinal perforations and pancreatitis, which showed a slight increasing trend in phase-I. Among the studied population, the surgical rate was 35.2% in phase-I and 34.3% in phase-III; these data were significantly higher than in 2019 (25.6%). *Conclusions:* The effect of the COVID pandemic on surgical emergencies and urgencies (SUEs) was mainly indirect, manifesting itself with a significant reduction in the number of surgical admissions, particularly in phases-I and-III. Conversely, in the same phases, the surgical rate showed a significant increase compared to 2019. (www.actabiomedica.it)

Key words: Surgery, Urgent surgery, COVID-19, Pandemic Phases.

Introduction

The COVID-19 pandemic has led to severe consequences on routine hospital services globally. To offer the necessary care to COVID-19 patients and protect patients from viral transmission in the hospital and associated postoperative pulmonary complications, hospitals have reduced elective and partly emergency surgical activities. These choices have made it possible to release ward and intensive care beds for spikes in such patients, free healthcare personnel for COVID-19 wards, and preserve supplies of personal protective equipment for these patients' care. Recovery and operational rooms were also reused as ICUs overflows. Surgeons and OR teams have been redeployed to support other critical areas of the hospital. In Italian hospitals, this situation resulted in a reduction of about 80% of the elective surgical activity (1) and of 35-45% (2) of the urgent one, partially safeguarding only the cases considered unpayable, such as oncologi-

cal pathologies. Other authors have evaluated the impact of the pandemic on hospital activity. However, the effects on an individual hospital, especially in non-homogeneous territories such as insular or mountainous ones, are not very representative of larger realities such as provinces or regions since they are directly affected by variables such as the difficulty in transporting between centres, the presence or absence of ICUs in the various hospitals, the uneven spread of the virus in the population, the presence of a more or less deep-rooted and efficient network of family general practitioners or medical guards. In the Autonomous Province of Trento (PAT), a mountainous territory in the north-east of Italy, a single Hospital Company (APSS), distributed over a hospital network of 7 hospitals (two hubs and five spokes), meets the health needs of the entire population, composed of approximately 543,000 inhabitants (Fig.1).

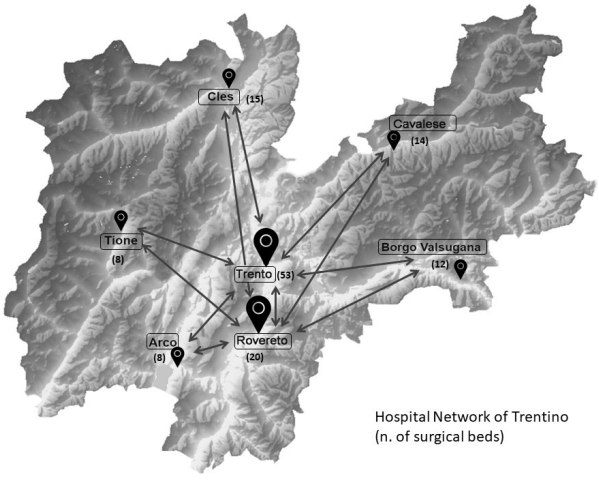


Figure 1. Hospital network of Trentino: 2 hub and 5 spoke hospitals for a total of 131 surgical beds

This organisation has allowed a precise quantitative analysis of the two pandemic waves' direct and indirect impact on regional surgical activities. The purpose of this study is to analyse the effect of the two pandemic waves on surgical emergencies and urgencies (SUEs) in the APSS's hospital network.

Materials and Methods

This study is a retrospective observational analysis of data collected from the hospital network's Surgical Units of the Autonomous Province of Trento (PAT). Data were gathered from the QlikView® software, which returns the absolute values of the SUEs' flows of the hospital network in the periods under examination collected by the SDOs, together with epidemiological and administrative data (DRG). The periods in question were the months of March-May 2019 (as reference), March-May 2020 (PHASE I - I pandemic wave with proclamation of national lockdown from 9/3 to 18/5), June-August 2020 (PHASE II - summer pandemic remission), October-December 2020 (PHASE III-II wave, with partial restrictions on circulation and commercial activities). The data of patients admitted in the general surgery units for SUEs during the studied periods were retrospectively analysed. Age and sex were considered as demographic variables. Data were also stratified according to the six most represented diseases in the SUEs' population: diverticulitis, intestinal obstruction, appendicitis, cholecystitis, gastrointestinal (GI) perforations, pancreatitis, traumas. Patients under the age of 14 were excluded. To assess the degree of severity of clinical pictures, variables related to worst outcomes were extrapolated from the electronic

Table 1. Severity Index for the three pandemic phases compared to 2019 (03-05)

	Age (mean)	Length of Hospital Stay (mean n. of days)	DRG weight	Deaths	Patients discharged home (mean number)	TOTAL
	0 (<65), 1(65-80), 2(>80)	0 (<4,5), 1(4,5-4,9), 2(5-5,4), 3(5,5-5,9), 4(>6)	0 (<0,8), 1(0,8-1,05), 2(1,06-2,0), 3(>2,0)	0 (<0,5), 2(0,5-1,5), 4(>1,5)	2 (<80), 1(80-85), 0(>85)	0-15
2019 March-May	0	0	1	2	0	**3**
Phase I	1	4	2	4	1	**12**
Phase II	0	1	1	2	0	**4**
Phase III	1	3	2	4	0	**10**

database: age, length of hospital stay, DRG weight, number of deaths and patients not discharged at home. A numerical weight was then assigned to each variable, obtaining a scoring system from 0 to 15 (Tab.1).

Statistical analysis

As primary outcomes were considered the overall number of admissions and surgical rates for SUEs in the study periods. As secondary outcome was considered the percentage of admissions and surgical interventions among the six most represented diseases in the study population. A first descriptive analysis represented the quantitative variables in the form of mean values with respective 95% confidence intervals, standard deviations (SD) and median values. Categorical variables were synthesised with absolute and percentage frequency distributions. The percentage value of the difference between admissions and surgical procedures of March 2019 (X) and of March 2020 (Y) was calculated with the following formula: (X - Y) / X * 100. The surgical rate was considered the ratio of surgical procedures over the admissions for SUEs multiplied by 100 calculated for each study period. To compare the quantitative variables' mean values, it was assumed that the data came from independent samples (for each period considered), and the non-parametric Wilcoxon-Mann-Whitney test was used. To verify if there were statistically significant associations between the periods under study and the categorical variables, such as gender, operated yes/no, the Chi-square test was used. The level of statistical significance was set at the conventional $p \leq 0.05$. The statistical analysis of the data is carried out by the APSS's clinical and evaluation epidemiology service. Results were analysed using the SAS System software (version 9.4).

Results

During pandemic phases, one of the more problematic issue was surgical activity reorganisation adapting preexisting structures to this new situation and redistributing medical and nursing staff. Elective procedures were reduced on average by 85% (range 75-90%) or even cancelled in the most critical periods in Spoke hospitals (mid-March - mid-April 2020 and November-December 2021). The number of admissions for SUEs in the studied period showed a sinusoidal trend. In the reference period of 2019, 957 patients were admitted in urgency; in phase I, urgent admissions were 511, in phase-II they rose to 888, with decreases of 47% and 8% respectively; finally, in phase-III they dropped again to 633 (-34% compared to 2019) (Fig.2).

The mean ± SD weekly number of admissions for SUEs was 71.2 ± 10.4 days in 2019, 38.8 ± 13.8 days in phase I, 67.7 ± 12.2 days in phase II, and 48.5 ± 10.1 days in phase III (Fig.3).

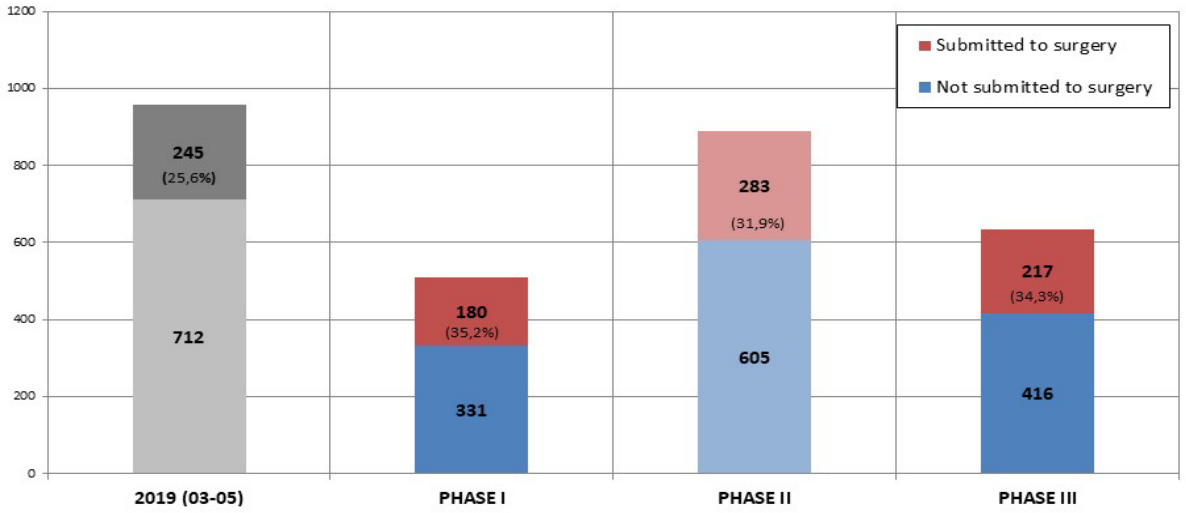
The Wilcoxon-Mann-Whitney test showed a statistically significant difference between the 2019 averages and phase-I (p-value <0.0001), 2019 and phase III (p-value <0.0001), phase-I and phase II (p-value <0.001) and phase II and phase III (p-value <0.001) (Tab.2).

This trend was also observed by stratifying admissions for the six most frequent pathologies, except for gastrointestinal perforations and pancreatitis, which showed no statistically significant increasing trend in phase I (Fig. 4) (Tab.3).

The surgical rate among hospitalised patients for SUEs was 35.2% in phase I and 34.3% in phase III; these data were significantly higher than in 2019 (25.6%) in the chi-square test (Tab.4).

Considering the six most frequent diagnosis individually, some had a progressive increase in the surgical rate in phases I and II (diverticulitis, bowel obstructions, cholecystitis), others showed an initial decrease and then settled on values not far from those of 2019 (GI perforations, appendicitis), others again had an initial significant increase and then gradually returned to values similar to those of 2019 in phase III (Traumas) (Fig.5).

Regarding the length of hospital stay (LOS), during 2019, we observed a mean±SD of 4.79±4.39 days, significantly lower than 6.04 days in phase I (p-value <0.01) and also compared with 5.47 days in phase II (p-value <0.05) (Tab.3). The mean LOS in phase I was significantly higher than the mean in phase III: 6.04 versus 5.53 (p-value <0.05). The mean patients age was significantly higher in phase I than in 2019 (p-value <0.001) and in phase II (p-value <0.05) (Tab.3). Consistently with the trend of the number of urgent admissions, even the severity index calculated on the SUEs population showed a sinusoidal trend (Tab.1).



Severity Index (0-15)

	Age (mean)	Length of Hospital Stay (mean n. of days)	DRG weight	Deaths	Patients discharged home (mean number)	TOTAL
	0 (<65) 1(65-80) 2(>80)	0 (<4,5) 1(4,5-4,9) 2(5-5,4) 3(5,5-5,9) 4(>6)	0 (<0,8) 1(0,8-1,05) 2(1,06-2,0) 3(>2,0)	0 (<0,5) 2(0,5-1,5) 4(>1,5)	2 (<80) 1(80-85) 0(>85)	0-15
2019	0	0	1	2	0	**3**
Phase I	1	4	2	4	1	**12**
Phase II	0	1	1	2	0	**4**
Phase III	1	3	2	4	0	**10**

Figure 2. Number pf SUEs in the Hospital Network of the APSS: 2019 (03-05) vs phase I vs phase II vs phase III.

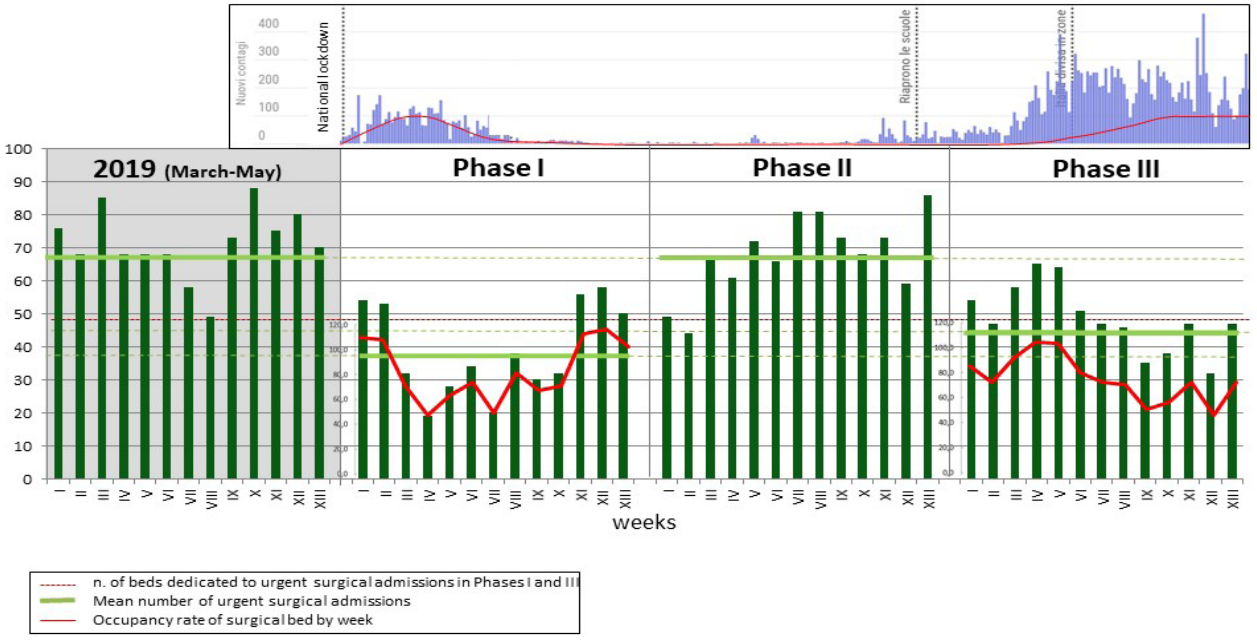


Figure 3. Weekly number hospital admissions for SUEs in the three pandemic phases compared to 2019 (03-05)

Table 2. Wilcoxon-Mann-Whitney test comparing quantitative variables of SUEs in 2019 and in the three pandemic phases.

Weekly number of admissions	**Mean (SD)**	**95% C.I. for mean**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019 (n=957)	71.2 (10.4)	64.9-77.5	nf	**<0,0001**	0,4246	**<0,0001**
Phase I (n=511)	38.8 (13.8)	30.4-47.1	**<0,0001**	nf	**0,0001**	0,0946
Phase II (n=888)	67.7 (12.2)	60.3-75.1	0,4246	**0,0001**	nf	**0,0008**
Phase III (n=633)	48.5 (10.1)	42.5-54.6	**<0,0001**	0,0946	**0,0008**	nf
Lenght of hospital stay (days)	**Mean (SD)**	**95% C.I. for mean**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019 (n=957)	4.79 (4.39)	4.51-5.07	nf	**0,0032**	**0,0114**	0,7229
Phase I (n=511)	6.04 (6.31)	5.49-6.59	**<0,0001**	nf	0,4219	**0,0207**
Phase II (n=888)	5.47 (5.19)	5.13-5.82	**0,0114**	0,4219	nf	0,0671
Phase III (n=633)	5.53 (8.08)	4.90-6.16	0,7229	**0,0207**	0,0671	nf
Age	**Mean (SD)**	**95% C.I. for mean**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019 (n=976)	58.3 (21.8)	56.9-59.7	nf	**0,0002**	0,0777	**0,0353**
Phase I (n=511)	62.6 (20.7)	60.8-64.4	**0,0002**	nf	**0,0241**	0,1395
Phase II (n=888)	60.1 (21.2)	58.7-61.5	0,0777	**0,0241**	nf	0,5887
Phase III (n=633)	60.4 (22.0)	58.7-62.2	**0,0353**	0,1395	0,5887	nf

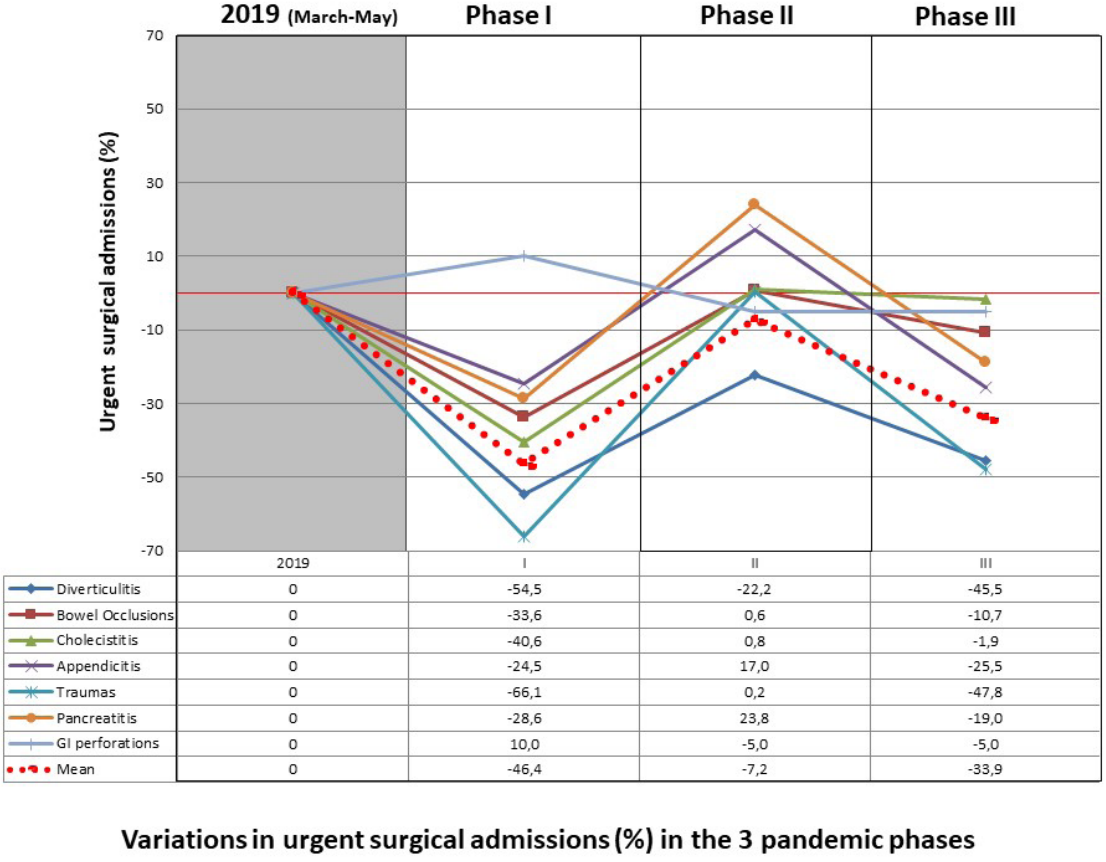


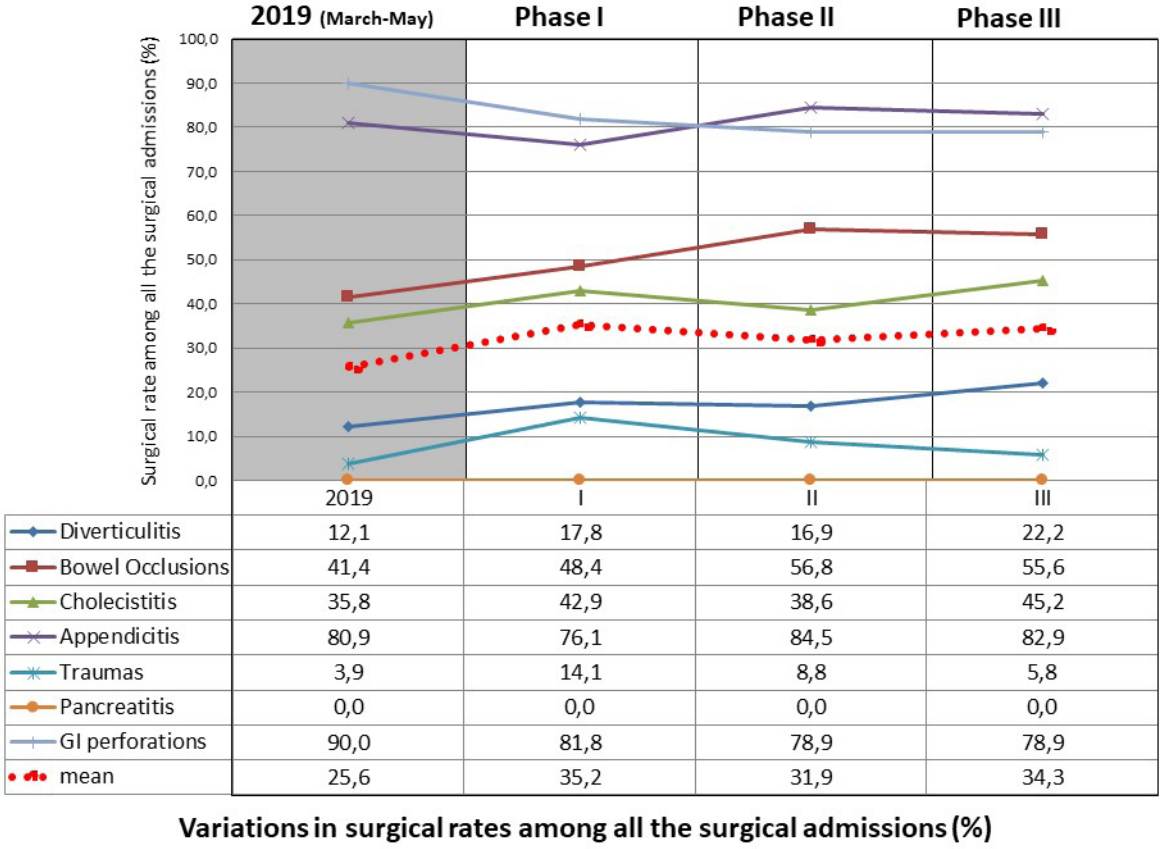
Figure 4. Variations in admissions for SUEs (%) in the three pandemic phases compared to 2019 (03-05)

Table 3. Wilcoxon-Mann-Whitney test comparing mean weekly number of admissions according to different diagnosis in 2019 and in the three pandemic phases.

Diverticulitis	**Mean n. of admissions (SD)**	**95% C.I.**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019	7.62 (2.75)	5.95 - 9.28	nf	**0,0021**	0,1344	**0,0084**
Phase I	3.46 (2.79)	1.78 - 5.15	**0,0021**	nf	**0,0322**	0,5489
Phase II	5.85 (2.73)	4.19 - 7.5	0,1344	**0,0322**	nf	0,0978
Phase III	4.15 (3.11)	2.28 - 6.03	**0,0084**	0,5489	0,0978	nf
Bowel Occlusions	**Mean n. of admissions (SD)**	**95% C.I.**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019	10.77 (3.17)	8.86 - 12.68	nf	**0,0113**	0,3129	0,3275
Phase I	7.15 (3.21)	5.21 - 9.09	**0,0113**	nf	**0,0017**	0,0711
Phase II	12.46 (3.76)	10.19 - 14.73	0,3129	**0,0017**	nf	**0,0324**
Phase III	9.62 (3.12)	7.73 - 11.5	0,3275	0,0711	**0,0324**	nf
Cholecistitis	**Mean n. of admissions (SD)**	**95% C.I.**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019	8.15 (2.23)	6.81 - 9.50	nf	**0,0123**	**0,0405**	0,7562
Phase I	4.85 (3.11)	2.97 - 6.72	**0,0123**	nf	**0,0004**	**0,0203**
Phase II	9.77 (2.01)	8.56 - 10.98	**0,0405**	**0,0004**	nf	0,1402
Phase III	8.00 (3.03)	6.17 - 9.83	0,7562	**0,0203**	0,1402	nf
Appendicitis	**Mean n. of admissions (SD)**	**95% C.I.**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019	7.23 (2.09)	5.97 - 8.49	nf	0,060	0,3793	**0,0429**
Phase I	5.46 (2.07)	4.21 - 6.71	0,060	nf	**0,0146**	0,979
Phase II	8.46 (3.1)	6.59 - 10.33	0,3793	**0,0146**	nf	**0,0098**
Phase III	5.38 (2.02)	4.16 - 6.61	**0,0429**	0,979	**0,0098**	nf
Trauma	**Mean n. of admissions (SD)**	**95% C.I.**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019	17.69 (6.63)	13.69 - 21.7	nf	**<0,0001**	0,6436	**0,0031**
Phase I	6.00 (4.02)	3.57 - 8.43	**<0,0001**	nf	**0,0001**	0,0754
Phase II	18.46 (6.09)	14.78 - 22.14	0,6436	**0,0001**	nf	**0,0007**
Phase III	9.23 (4.64)	6.43 - 12.03	**0,0031**	0,0754	**0,0007**	nf
GI perforations	**Mean n. of admissions (SD)**	**95% C.I.**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019	**1.54 (0.66)**	1,14-1.94	nf	0,759	0,7181	0,865
Phase I	**1.69 (1.03)**	1,07-2.32	0,759	nf	0,5705	0,6398
Phase II	**1.46 (1.05)**	0,83-2.1	0,7181	0,5705	nf	0,8912
Phase III	**1.46 (0.78)**	0,99-1-93	0,865	0,6398	0,8912	nf
Pancreatitis	**Mean n. of admissions (SD)**	**95% C.I.**	p-value vs 2019	p-value vs phase I	p-value vs phase II	p-value vs phase III
2019	1.62 (1.12)	0.94-2.29	nf	0,3613	0,6269	0,3404
Phase I	1.15 (1.07)	0.51-1.80	0,3613	nf	0,1439	0,872
Phase II	2,00 (1.29)	1.22-2.78	0,6269	0,1439	nf	0,1223
Phase III	1.31 (1.11)	0.64-1.98	0,3404	0,872	0,1223	nf

Table 4. Chi square test comparing surgical rate in 2019 and in the three pandemic phases

	Operated patients	%	Not operated patients	%	p-value vs 2019	p-value vs Phase I	p-value vs Phase II	p-value vs Phase III
2019	245	25,6%	712	74,4%	nf	**0,000107**	**0,002915**	**0,00019**
Phase I	180	35,2%	331	64,8%	**0,000107**	nf	0,199025	0,738829
Phase II	283	31,9%	605	68,1%	**0,00291**	0,199025	nf	0,323637
Phase III	217	34,3%	416	65,7%	**0,00019**	0,738829	0,323637	nf



	2019	I	II	III
Diverticulitis	12,1	17,8	16,9	22,2
Bowel Occlusions	41,4	48,4	56,8	55,6
Cholecistitis	35,8	42,9	38,6	45,2
Appendicitis	80,9	76,1	84,5	82,9
Traumas	3,9	14,1	8,8	5,8
Pancreatitis	0,0	0,0	0,0	0,0
GI perforations	90,0	81,8	78,9	78,9
mean	25,6	35,2	31,9	34,3

Variations in surgical rates among all the surgical admissions (%)

Figure 5. Variations in surgical rate for SUEs (%) in the three pandemic phases compared to 2019 (03-05)

Discussion

Italian surgical activity was dramatically impaired by the impact of the covid 19 pandemic. From a survey by the Association of Italian Hospital Surgeons (ACOI) conducted after the first wave, there is an 80% decrease in planned surgical activity at the national level. Besides this data, there has also been an evident decline in admissions and emergency surgery. Data reported in a recent multicentre study conducted in Lombardy, the Italian region most affected by COVID-19, show that in the first wave, there was a decrease in hospitalisations and emergency interventions of 45 and 41% respectively (2). Several possible explanations have been called into question to justify this phenomenon, all on a purely intuitive basis. The effects of the measures taken by the government in the lockdown phases that suggested the population to go to the emergency room only in case of extreme necessity; the reduction of accidents linked to the limitations im-

posed on car traffic; the change in lifestyle population confined to home; the trend of hospital and general practitioners towards at-home management for mild-moderate pathologies; the fear of coming in contact with infected patients in the emergency department may surely be responsible factors for the lower access rate during pandemic phase (4-6). However, to date, no scientific studies able to assess these factors' real impact on the decrease in surgical urgencies were published. Many data have been reported in the literature on surgical practice during the Covid-19 pandemic. However, the real quantification of the surgical activity decrease is difficult to analyse due to possible bias connected to collecting data from hospitals belonging to different realities. Consequently, data coming from different centres involved in such analysis lacks homogeneity and compromises a correct analysis. The Autonomous Province of Trento is made up of a vast mountainous territory (6,207 Km2) wholly covered by a single health company distributed over a hospital network of 7 centres (2 Hubs and 5 Spokes) (Fig.1). This organisation allows an excellent health control of the Trentino population regarding the services provided and epidemiological surveillance. The data collected by the network's computer system offers insight into the trend of each public health phenomenon throughout the province in the absence of confounding factors such as the distribution of patients between hospitals of several local health companies. In this study, we found a 47% reduction in the number of SUE's recorded in the APSS informatic database during the phase I wave of covid 19 pandemic period compared with the 2019 reference period. These data are consistent with those already emerged in other studies (2). The SUEs decrease in phase-I was confirmed in phase III (-34%). From a demographic perspective, patients hospitalised for SUEs in the two waves had a slightly higher median age in phases-I, -II and -III (respectively 62.6, 60.1 and 60.9) compared to 2019 (58.4) however, without reaching any statistical significance. Gender has always maintained males' prevalence (1.47, 1.19, 1.57, 1.71) with an increasing trend in phases II and III (Figs. 3, 4) (Tab 5).

The mean severity index, an indirect measure of the severity of clinical pictures admitted in urgency, showed a sinusoidal trend characterised by higher scores in phases I and III. Other studies have shown similar findings in the literature, with an increase of the emergencies' severity during the pandemic waves (2). In the stratified analysis by diagnosis, almost all the pathologies understudy showed a sinusoidal decline in admissions with evident and significant decreases in phases I and III (Fig.4). On the other hand, the surgical rates presented an inverse trend characterised by an increase in the two pandemic waves, except for pancreatitis and GI perforations (Fig.5). The latter, in particular, showed an increase in hospitalisations in phase I, settling in the following two phases on values similar to those of 2019 and an inverse trend in the surgical rate, gradually decreasing in the three phases up to -11.1%. These data are similar to those of the Lombardy experience reported by Rausei et al. during the first pandemic period (2). Nevertheless, it must be said that the low number of intestinal perforations in the present work does not allow to give statistical significance to this finding. A possible reason is related to the fact that GI perforations are events whose clinical severity leads in any case to hospital access and, subsequently, in most cases, to surgery. Therefore we believe it reasonable to consider they do not respond to the dynamics considered to justify the decline in SUEs during pandemic phases. Considering the surgical rate, acute appendicitis also represents an exception, showing a flat curve with insignificant variations in the study periods. Among all the examined diagnoses, traumas showed the most significant decline in both

Table 5. Chi square test comparing gender in 2019 and in the three pandemic phases.

	Male	**%**	**Female**	**%**	p-value vs 2 019	p-value vs Phase I	p-value vs Phase II	p-value vs Phase III
2019	528	55,2%	429	44,8%	nf	0,31122	0,304593	**0,00517**
Phase I	296	57,9%	215	42,1%	0,311222	nf	0,889659	0,137821
Phase II	511	57,5%	377	42,5%	0,304593	0,88966	nf	0,065783
Phase III	394	62,2%	239	37,8%	**0,00517**	0,13782	0,065783	nf

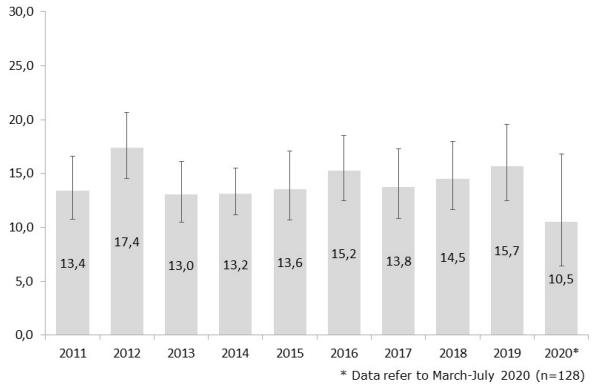


Figure 6. Prevalence of alcoholics binge abuse in PAT. Passi, 2011-2020 (n=4.543). Classified as binge consumers are men who consume 5 or more alcoholic units on one occasion, women who consume 4 or more alcohol units on one occasion. [*Data refer to March-July 2020 (n=128)].

the I and III phases. It does not take great imagination to imagine this phenomenon's possible causes, evidently linked to the total closure of car traffic and most of jobs activities in the lockdown phase (phase I) and partially in phase II. Simultaneously, there was an increase in the surgical rates for trauma (-10%) in phase I, then progressively decreased to values comparable to 2019. In the PAT, the highlighted decrease in hospital admissions for SUEs in the two pandemic waves cannot be attributed, as proposed by other authors, to a change in the population's lifestyle linked to periods of personal restrictions. The PASSI telephone questionnaire(7) conducted by the APSS's Epidemiology and Prevention service did not show substantial behavioural changes in physical activity, active mobility, alcohol consumption, smoking habits, passive smoking, or salt consumption. The only behaviours that showed a difference, although not significant, were a slight decrease in alcohol habit in the form of binge drinking (Fig.6) and an increase in the consumption of fruit and vegetables.

On the other hand, a national survey conducted by the NHS (PASSI d'argento) (8) during the first wave on a sample of over 1200 interviews among people over 65 years old showed that 44% of the cohort declared to have renounced to at least one medical examination (or diagnostic test) that they would have needed. In particular, 28% had to give it up due to services suspension, while 16% did so voluntarily for fear of contagion (Fig.7).

This finding could partially explain the observed decrease of SUEs as a change in the population's attitudes toward resorting to medical care for fear of possible contamination. Two other data could support this hypothesis: on the one hand, the significant drop of access to the APSS emergency room in the critical pandemic phases compared to the reference period of 2019 (-48% in phase I, -8% in phase-II, -36% in phase-III), on the other the progressive increase in admissions to surgical units following these accesses

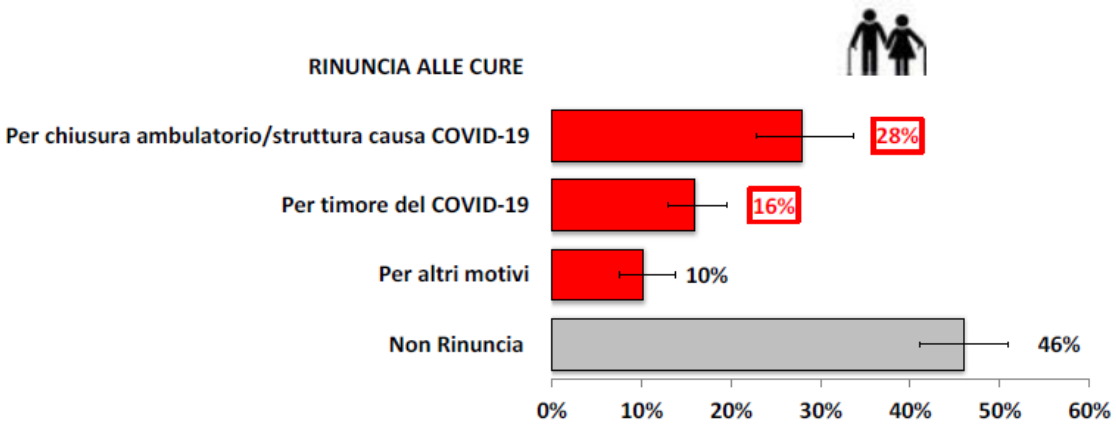


Figure 7. Renounce to medical assistance in the over 60 yrs population during the first wave of the COVID-19 pandemic. PASSI d'Argento 2020.

(1.3% in 2019, 1.6% in phase-I, 1.9% in phases-III). These findings suggest that the fall in SUEs was not due to the emergency room doctors' inclination toward a restriction in admitting patients in the pandemic's critical periods. This work's main limitations are the study design's retrospective observational nature and the limited number of cases for single surgical diagnosis. A third unavoidable limitation is linked to the pandemic's exceptional nature, spread in different waves, in limited periods, on a partially immunised population after Phase-I.

Conclusions

The effect of the COVID pandemic on SUEs resulted in a sinusoidal decrease in the number of hospitalisations (-47% and -38% respectively in phase-I and phase-III). This phenomenon was observed even after the stratification of data for single diagnosis. A greater severity of the clinical pictures was found during the same pandemic phases. Consistently with this finding, the surgical rates showed a sinusoidal increase for the most represented surgical diseases, with the only exceptions of pancreatitis and gastrointestinal perforations. In the view of a redistribution of health resources to face the COVID-19 emergency, the SUEs' numeric decrease in the first wave, then confirmed in the second, can be an object of evaluation to calibrate the reduction of hospital networks' surgical beds and OR staff during eventual new pandemic waves.

Conflict of Interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

Availability of data and material: Data collected for the study are available from the corresponding author on request.
Authors' contributions: All authors have made substantial contributions to all of the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

Ethics approval: No Ethical committee approval was requested since this study was a retrospective review of provincial casistics collected from electronic discharging charts.

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