

IMPACT OF COVID-19 ON PROSTHETIC ACTIVITY IN THE YEARS 2020 – 2021 IN THE AUTONOMOUS PROVINCE OF BOLZANO (ITALY) HIP, KNEE AND SHOULDER PROSTHESIS INTERVENTIONS

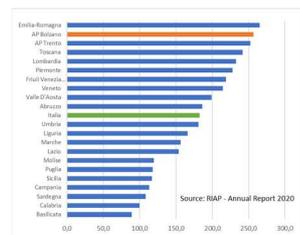
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Arthroplasty Register of the Autonomous Province of Bolzano
Observatory for Health – Health Department Province of Bolzano (ITALY)

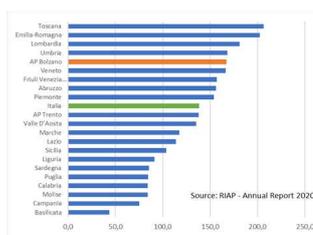
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INTRODUCTION

Rate of incidence (per 100,000 inhabitants) of primary hip replacement surgery in Italy, year 2019 (last available data)



Rate of incidence (per 100,000 inhabitants) of primary knee replacement surgery in Italy, year 2019 (last available data)



The Autonomous Province of Bolzano (PABZ) is one of the Italian regions with the highest incidence of prosthetic surgeries (number of interventions per 100,000 inhabitants) performed in recent years. This is particularly true for primary interventions for hip and knee prostheses, while for the shoulder a large volume of interventions relative to the population have not been recorded over the years. The Observatory of Health has examined the impact of Covid-19 on arthroplasty care in its territory in 2020 and 2021, focusing on the change in the offer of prosthetic interventions that has developed as a result of the pandemic.

METHOD

Hip, knee and shoulder replacements are analyzed using the provincial archive of hospital discharge forms (SDO), which records each hospitalization in the PABZ.

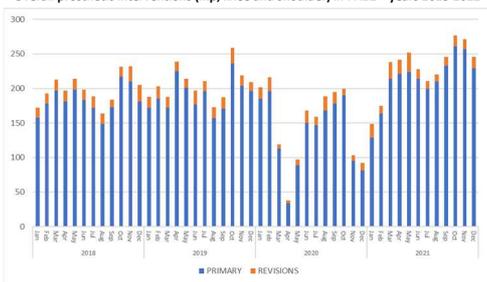
The volume of interventions in 2020 and 2021 – particularly the primary interventions - are compared to the pre-pandemic period 2018-2019, between different types of hospitalizations, hospitals and patients.

Hip, knee and shoulder replacements are identified in SDO by ICD9CM classification vers.2007.

Classification of prosthetic interventions in the SDO of the AP Bolzano

	HIP REPLACEMENT – ICD9CM CLASSIFICATION	KNEE REPLACEMENT – ICD9CM CLASSIFICATION	SHOULDER REPLACEMENT – ICD9CM CLASS.
PRIMARY INTERVENTIONS	81.51 "total hip replacement" 00.85 "resurfacing hip, total, acetabulum and femoral head" 81.52 "partial hip replacement" 00.86 "resurfacing hip, partial, femoral head" 00.87 "resurfacing hip, partial, acetabulum"	81.54 "total knee replacement"	81.80 "total shoulder replacement" 81.81 "partial shoulder replacement"
REVISIONS	00.70 "revision of hip replacement, both acetabular and femoral components"; 00.71 "revision of hip replacement, acetabular component"; 00.72 "revision of hip replacement, femoral component"; 00.73 "revision of hip replacement, acetab. liner and/or femoral head only"; 81.53 "revision of hip replacement, not otherwise specified"	00.80 "revision of knee replacement, total (all components)"; 00.81 "revision of knee replacement, tibial component"; 00.82 "revision of knee replacement, femoral component"; 00.83 "revision of knee replacement, patellar component"; 00.84 "revision of total knee replacement, tibial insert (liner)"; 81.55 "revision of knee replacement, not otherwise specified"	80.01 "Arthrotoomy for removal of prosthesis without replacement, shoulder"

Overall prosthetic interventions (hip, knee and shoulder) in PABZ – years 2018-2021



HIP				
YEAR	PRIMARY	REVISIONS	TOTAL	Δ% PREV YEAR
2018/2019	1,313	103	1,416	
2020	999	99	1,098	-22.5%
2021	1,445	131	1,576	+43.5%
KNEE				
YEAR	PRIMARY	REVISIONS	TOTAL	Δ% PREV YEAR
2018/2019	866	91	957	
2020	574	52	626	-34.6%
2021	1,038	68	1,106	+76.7%
SHOULDER				
YEAR	PRIMARY	REVISIONS	TOTAL	Δ% PREV YEAR
2018/2019	66	1	67	
2020	53	1	54	-19.4%
2021	73	0	73	+35.2%
OVERALL PROSTHETIC SURGERIES				
YEAR	PRIMARY	REVISIONS	TOTAL	Δ% PREV YEAR
2018/2019	2,245	195	2,440	
2020	1,626	152	1,778	-27.1%
2021	2,556	199	2,755	+54.9%

Prosthetic procedures for hip, knee and shoulder decreased by 27.1% in 2020 compared to pre-Covid-19 period average (two-year period 2018-2019). In the months immediately following the onset of the pandemic in Italy (March and April 2020), there was a near-blockage of interventions, reaching an unprecedented low volume of surgery.

It should be noted that in 2020 the revisions for hip prostheses are performed with a frequency comparable to the pre-Covid-19 period, while the knee and shoulder prosthesis have undergone a strong reduction in revision interventions.

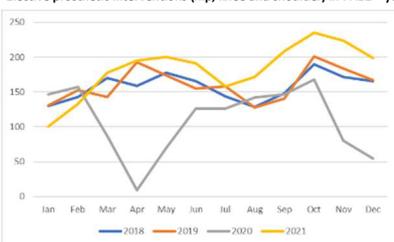
2021, on the other hand, recorded an increase of 54.9% compared to the previous year, with a peak of 76.7% regarding the knee prosthesis.

RESULTS

Analysis of elective activity shows that only from the second half of 2021 there is a real attempt to recover the interventions not performed in the previous years, exceeding the average of the interventions performed in the two-year pre-Covid-19 period.

The overall decrease in elective prosthetic procedures in 2020 was -31.3% compared to the 2018/2019 average, with a greater reduction in primary knee prostheses (-33.4%). 2021 recorded an overall increase in prosthetic activity of +67%, with knee prostheses in particular increasing by +80%. Comparing 2021 to the two-year pre-Covid-19 period, there was an overall increase of +14.8% in the entire prosthetic activity in that year, with a peak of +20% for the primary knee prostheses.

Elective prosthetic interventions (hip, knee and shoulder) in PABZ – years 2018-2021



ELEKTIVE PROSTHETIC SURGERIES				
YEAR	HIP	KNEE	SHOULDER	TOTAL
2018/2019	1,002	860	50	1,912
2020	704	573	37	1,314
2021	1,116	1,032	47	2,195

Δ% COMPARED TO PREVIOUS YEAR				
YEAR	HIP	KNEE	SHOULDER	TOTAL
2020 vs. 2018/2019	-29.7%	-33.4%	-25.3%	-31.3%
2021 vs. 2020	+58.5%	+80.1%	+27.0%	+67.0%
2021 vs. 2018/2019	+11.4%	+20.0%	+5.1%	+14.8%

Elective prosthetic interventions, distinguished by type of performing hospital in the PABZ

YEAR	PUBBL. HOSP	PRIV. HOSP	TOTAL	% PRIVAT
2018	2,037	160	2,197	7,3%
2019	2,108	184	2,292	8,0%
2020	1,383	243	1,626	14,9%
2021	1,795	761	2,556	29,8%
TOTAL	7,323	1,348	8,671	

2020 vs. 2018/2019	-33.3%	+41.3%	-27.6%
2021 vs. 2020	+29.8%	+213.2%	+57.2%
2021 vs. 2018/2019	-13.4%	+342.4%	+13.9%

Elective prosthetic interventions, distinguished by age class, in hospitals of PABZ

YEAR / AGE CLASS	<49	50-59	60-69	70-79	>=80
2018	81	262	518	735	299
2019	74	248	521	754	331
2020	56	180	374	519	185
2021	77	322	640	810	346

2020 vs. 2018/2019	-27.7%	-29.4%	-28.0%	-30.3%	-41.3%
2021 vs. 2020	+37.5%	+78.9%	+71.1%	+56.1%	+87.0%
2021 vs. 2018/2019	-0.6%	+26.3%	+23.2%	+8.8%	+9.8%

Public hospitals – having to face the Covid 19 emergency on the front line - suffered more from the drop in elective interventions in 2020, registering -33.3% compared to the average for the 2018/2019 period. On the other hand, the interventions performed by private hospitals increased by a total of +41.3% in 2020 compared to the previous year, and by +213.2% in 2021.

The elderly age groups were the most affected in 2020 (70-79 age group -30.3% and those over 80 years -41.3%).

The age groups that have 'recovered' the most from not having interventions are in 2021 the youngest, with a peak of +26.3% for the 50-59 age group compared to the pre-Covid-19 period.

CONCLUSIONS

The Covid-19 pandemic had a strong impact in PABZ, reducing the total primary elective interventions by 31.3% (in 2020) compared to 2018/2019 (-29.7% for elective hip prostheses, -33.4% for knee prostheses and -25.3% for shoulder prostheses). In the second year of the Covid-19 pandemic there was a strong recovery, due in part to greater utilization of the private hospitals for elective interventions (+213.2% compared to 2020 and +342.2% compared to the pre-covid 19 period). In 2021, the elective arthroplasties performed in private hospitals, reached more than 29% of total provincial interventions (compared to 8% before Covid-19). The age group most affected by the reduction in prosthetic surgeries was the oldest in the first year of the pandemic, while in 2021 it was not the one with the greatest "recovery" in terms of number of surgeries. This last year was characterized by a recovery in elective surgical activity, especially in the 50 to 59 and 60 to 69 age groups.

The effort of the Provincial Health System to recover "lost" prosthetic interventions through agreements – especially in 2021 - with private hospitals - is thus evident. The results and the "degree of recovery" will only be assessable at the end of the current year.