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Assessment of Bariatric Surgery Benefit for WI ETF GHIP Members

Background and Analytic Parameters

Bariatric surgery became a uniform benefit effective 2020

- Informed by evidence of benefit[1]
- Qualification/Requirement: BMI of 35 or higher
- Covered by all Plans
  - Slightly different additional requirements by health plans

Assessment

- Qualified member trends: demographics, costs, comorbidities
- Surgery: utilization and types, patient demographics, cost trends
- Post-surgery: before and after, compared to a matched control group:
  - Obesity and comorbidity prevalence and severity trends
  - Preliminary financial analysis

1 https://onlinelibrary.wiley.com/doi/full/10.1038/oby.2010.199

Time Periods

- 2020 – 2023 (4 years): for overall trends
- 2021 as baseline year for post surgery assessment

Eligibility for bariatric surgery

- BMI >= 35, using diagnosis codes:
  - E6601, E662, for morbid obesity
  - BMI specific Z68.35 – Z68.45

Inclusion in post surgery analysis

- continuously enrolled in GHIP 2020 – 2023
- qualified for surgery in both 2020 and 2021
  - **study group**: got bariatric surgery in 2021, not before or after
  - **control group**: no record of bariatric surgery

Summary Findings

Members Qualified for Bariatric Surgery

The total number of GHIP members potentially qualifying for bariatric surgery as a percentage of total membership has increased consistently between 2020 and 2023

- 9,402 (3.7%) in 2020 to 15,390 (5.9%) in 2023
- higher female and older (about 50 years average age) representation in qualifying group
- qualifying members utilize services and cost about 3X more than non-qualifying members

GHIP Bariatric Surgery Patients

The utilization of bariatric surgery peaked in 2021 with 297 patients and a total cost of **$10.0M**, and dropped in the two subsequent years, with 242 patients in the most recent 2023 at a total cost of **$7.8M**

- females aged between 36 and 55 years old consistently account for 50% of all the patients
- the average per patient cost for bariatric surgery for GHIP members has remained relatively stable from 2020 – 2023, about $32,000 in 2023
- most GHIP patients received services in in-patient settings, the facility costs account for the biggest portion of the surgery

Post Bariatric Surgery Assessment

Using a “matched” control group as basis for comparison, the study group receiving the bariatric surgery in 2021 show:

- a reduction in prevalence and severity of obesity and multiple comorbidities at a rate faster than the control group
- an estimated saving per member of the study group of:
  - $1,354 in 2022, 1 year after the surgery
  - $4,131 in 2023, 2 years after the surgery
    - the average cost for the study group in 2023 is 22% lower than the comparable control group

Review of Members Qualified for Bariatric Surgery

Qualifying Member Demographic Trends

- Increases in total number of GHIP members, and members potentially qualifying for bariatric surgery as a percentage of total membership
- Higher percentage of potential qualifiers among older members
  - average ages: 52 years and 54 years for female and male members, respectively
  - generally higher female rates
- Based on the obesity trends in the U.S., the number of GHIP members qualifying for bariatric surgery is expected to continue to increase

Figure 1 Trend of GHIP Members Qualifying for Bariatric Surgery

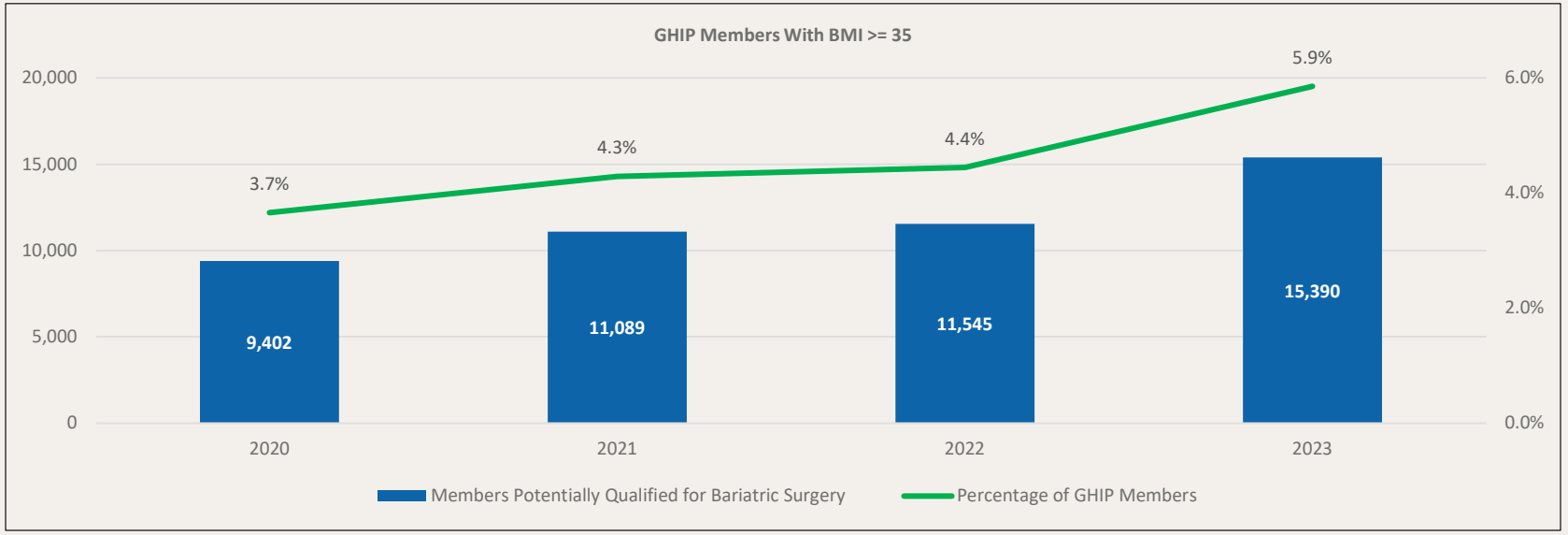
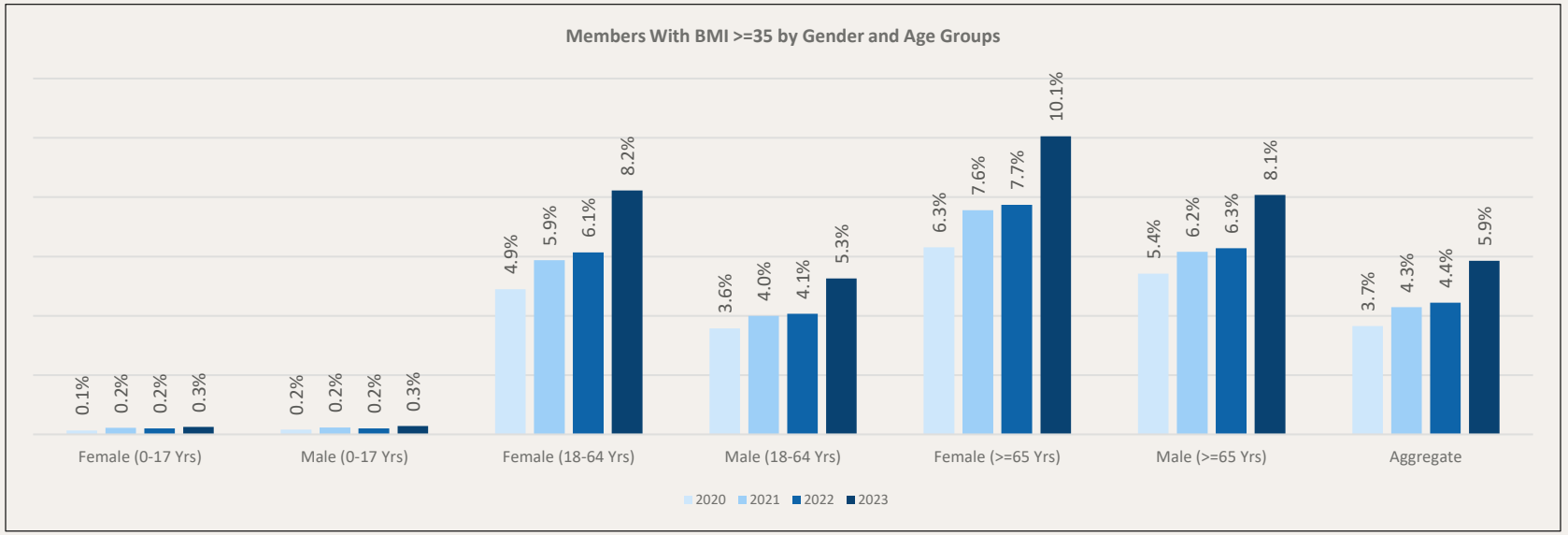


Figure 2 GHIP Members Qualifying for Bariatric Surgery by Age Groups and Gender



Qualifying Member – Top Comorbidities

- Members potentially meeting the obesity requirement for bariatric surgery typically have multiple other conditions, these span cardiovascular, endocrine and metabolic, musculoskeletal, mental health, and other disease condition types
- There is evidence that some of these obesity comorbidities completely resolve or go into remission post bariatric surgery[1], leading to future reduced cost for patients receiving surgery and improved quality of life

1.https://jamanetwork.com/journals/jamasurgery/fullarticle/1790378

Table 1 Top Obesity Comorbidities for GHIP Members

Top Episode Groups by Patient Counts*	Average Annual Cost Per Patient
Essential Hypertension	$2,783
Other Arthropathies - Bone and Joint Disorders	$1,735
Diabetes Mellitus (Type 2)	$10,611
Other Spinal and Back Disorders - Low Back	$2,178
Osteoarthritis (Except Spine)	$7,588
Depression	$3,288
Generalized Anxiety Disorder	$1,365
Sleep Disorders	$966
Bursitis	$3,094
Arrhythmias	$5,555

*Using Merative's Episode Grouper methodology, excluding some episodes types e.g. preventive care

Qualifying Members – Utilization and Cost Trends

- On the average, members meeting the obesity requirement for bariatric surgery utilize both medical and prescription drug services at rates much higher (about **3X** more) than those not meeting the requirement
- The average costs and risk scores* ratio between the qualifying and non-qualifying members reflects the difference in utilization between the groups

*Merative's non-rescaled risk scores are values indicating the expected utilization of medical and prescription drug resources by member

Figure 3 Medical And Prescription Drugs Service Utilization Rates for Qualifying and Non-Qualifying GHIP Members

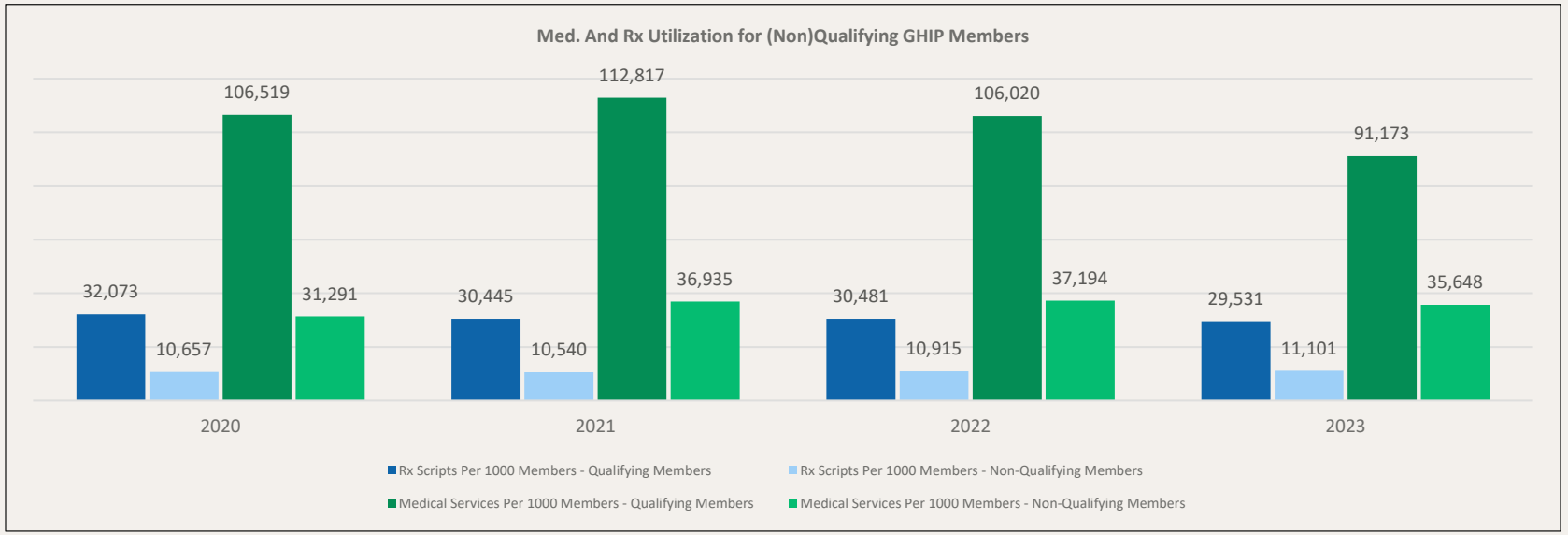
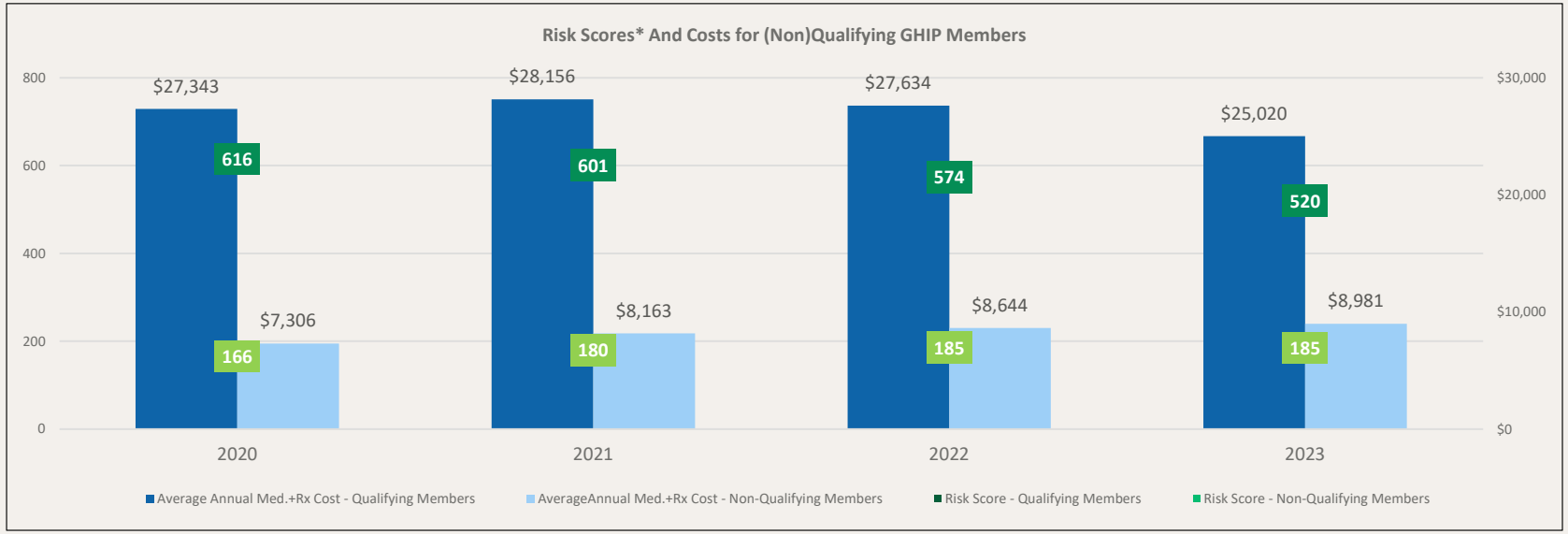


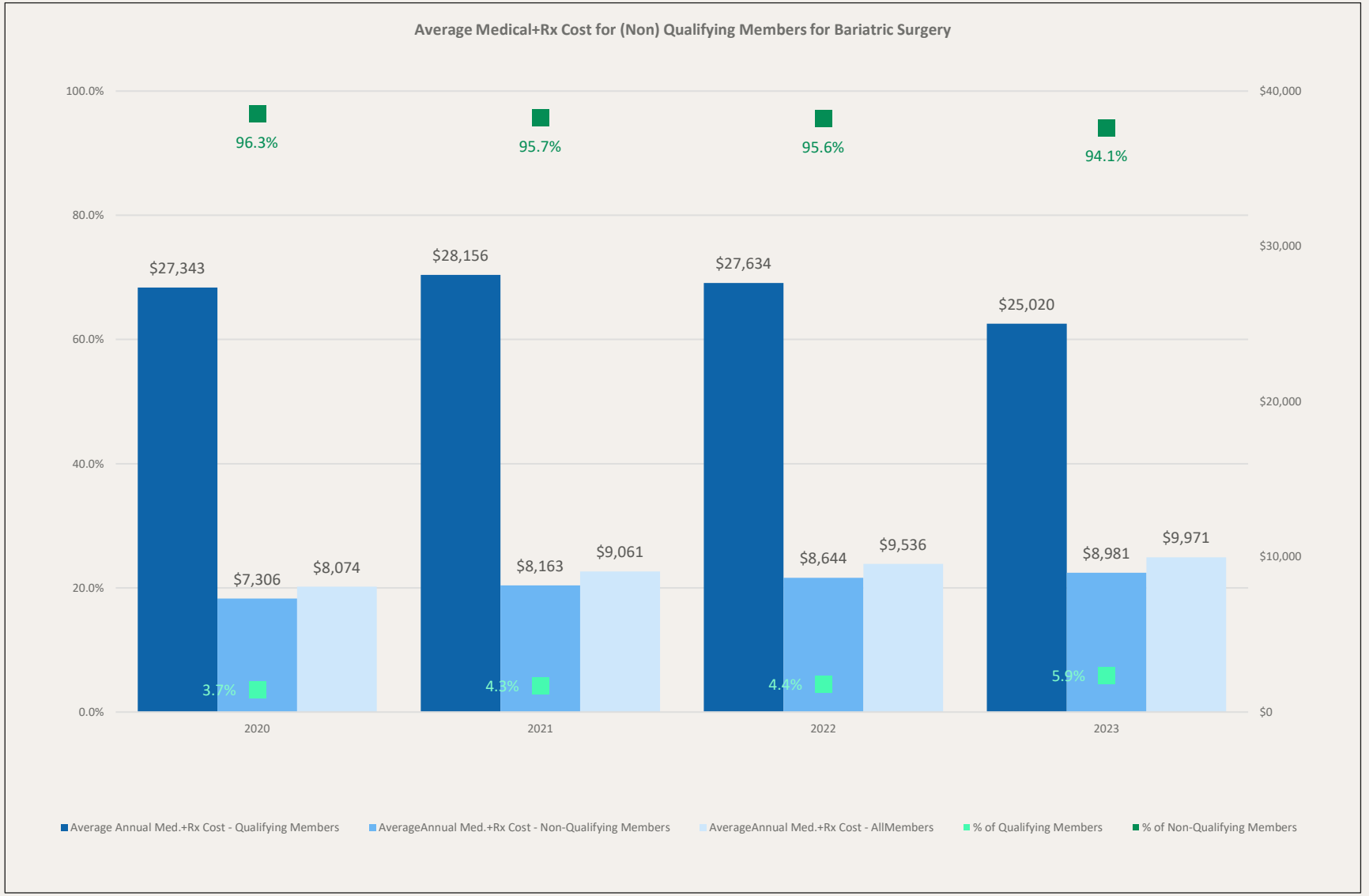
Figure 4 Risk Scores and Medical And Prescription Drugs Costs for Qualifying and Non-Qualifying GHIP Members



Qualifying Member – Cost Trends

- GHIP members potentially meeting the obesity requirement only account for 3.7% - 5.9% of the total GHIP membership between 2020 – 2023, but they account for a larger contribution to the total annual cost:
  - in 2023, the qualifying members making up **5.9%** of the population account for approximately **11%** increase in the average annual membership cost – the average cost of $8,981 for non-qualifying members increases to an average cost of $9,971 for all members when the cost for the qualifying members are included

Figure 5 Relative Cost Impact of GHIP Members Qualifying for Bariatric Surgery

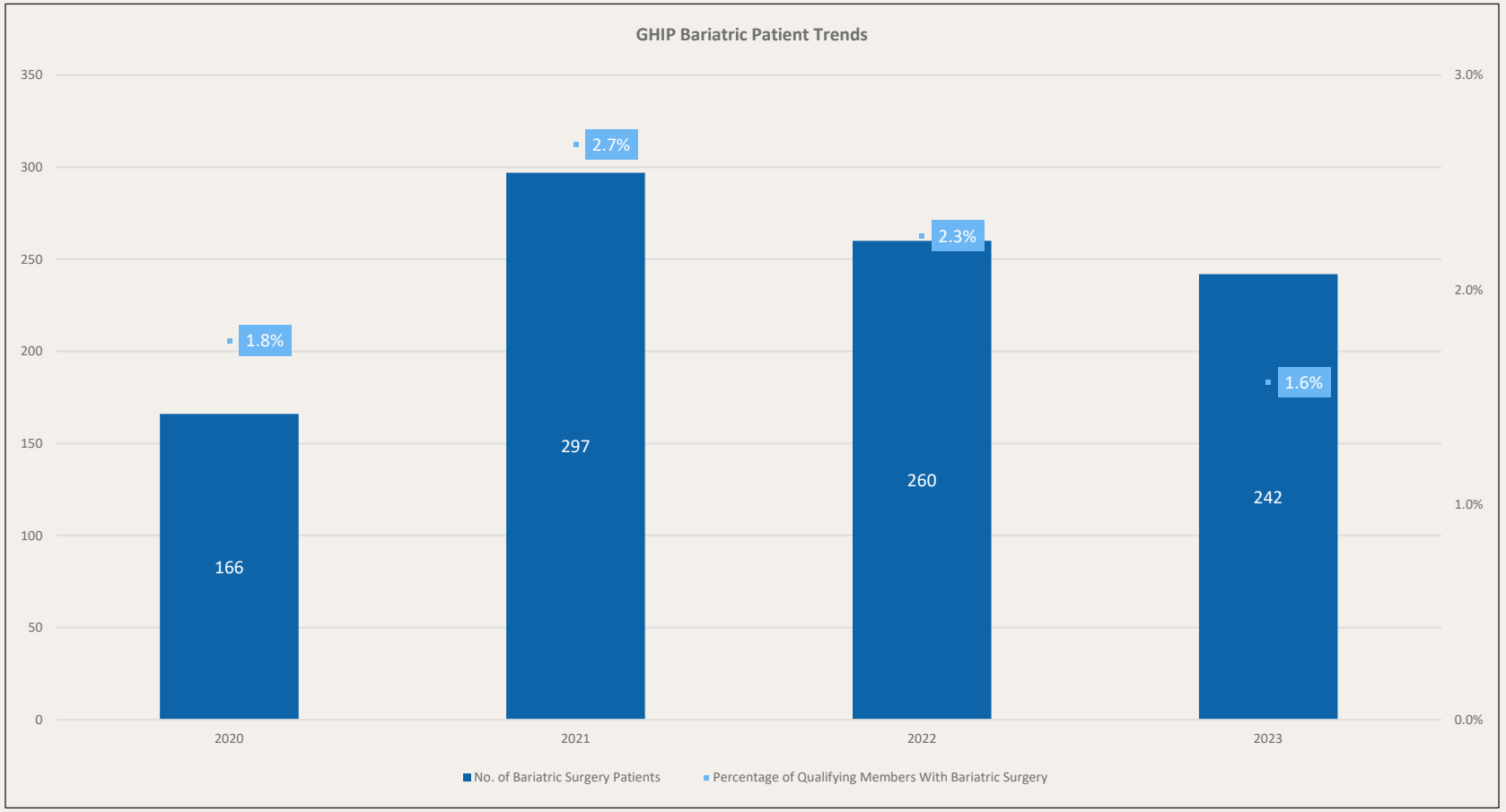


GHIP Bariatric Surgery Patients

Surgical Patients - Utilization Trends

- The number of GHIP bariatric surgery patients peaked in 2021 but has reduced in each of the two successive years
  - similar utilization rate pattern for members receiving surgery as a percentage of qualified members

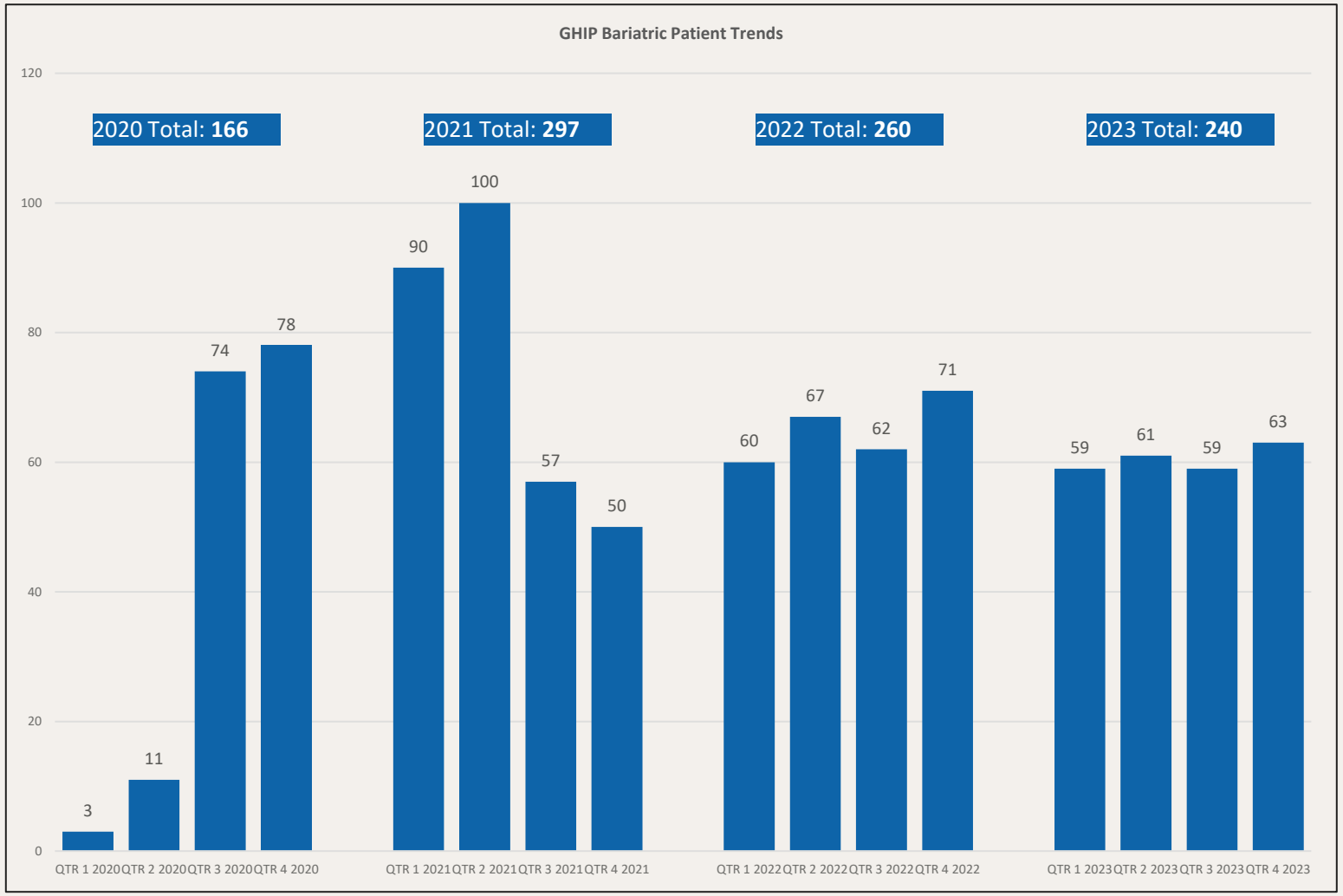
Figure 6 GHIP Bartiatric Surgery Utilization Trends – Annual Patient Counts



Surgical Patients - Utilization Trends

- Slower utilization in 2020 may be because it was a new benefit and COVID pandemic disruption to healthcare services
- Highest utilization in Q1 and Q2 2021 may be due to pent up demand from 2020
- Utilization seems to have stabilized in 2022 and 2023 to an average of about 250 GHIP bariatric patients per year

Figure 7 GHIP Bartiatric Surgery Utilization Trends – Quarterly Patient Counts



Surgical Patients - Demographics

- Most GHIP bariatric surgery patients are female – ranging from about 77% - 86% of patients between 2020 and 2023
  - females between the ages of 36 and 55 years old consistently account for 50% or more of all bariatric surgery patients
- Only one male less than 26 years old received bariatric surgery between 2020 – 2023, compared to multiple females in the same period

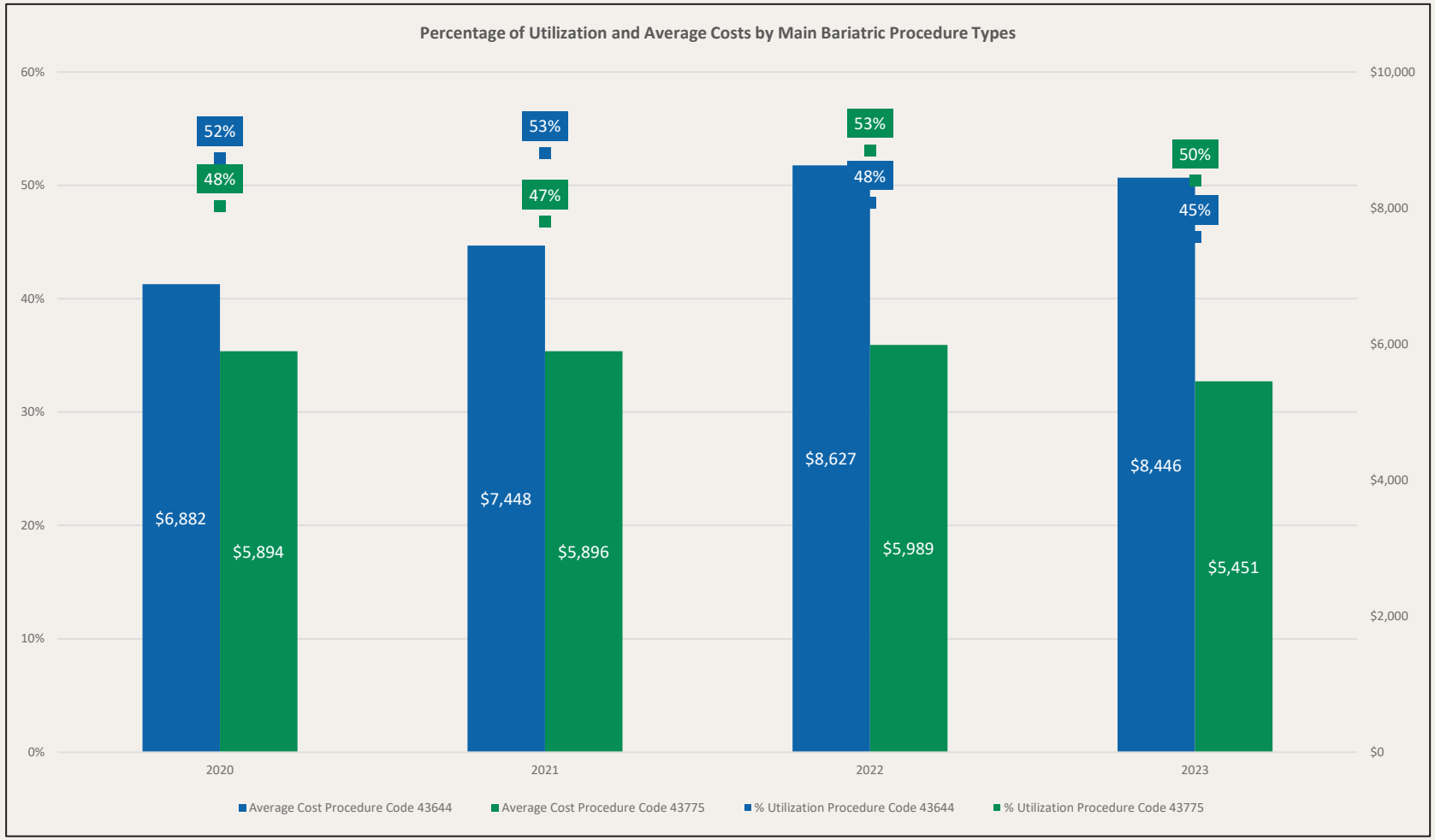
Table 2 Age and Gender Representation of GHIP Bariatric Patients

Gender	Age Groups	2020		2021		2022		2023	
		Patients	% of Total	Patients	% of Total	Patients	% of Total	Patients	% of Total
Female	18-25 Years	3	1.8%	8	2.7%	2	0.8%	4	1.7%
	26-35 Years	15	9.0%	38	12.8%	31	11.9%	42	17.4%
	36-45 Years	36	21.7%	77	25.9%	65	25.0%	75	31.0%
	46-55 Years	49	29.5%	74	24.9%	68	26.2%	54	22.3%
	56-65 Years	27	16.3%	30	10.1%	33	12.7%	28	11.6%
	>=65 Years	7	4.2%	3	1.0%	2	0.8%	4	1.7%
	Aggregate (Female)	***137***	***82.5%***	***230***	***77.4%***	***201***	***77.3%***	***207***	***85.5%***
Male	18-25 Years					1	0.4%		
	26-35 Years	5	3.0%	7	2.4%	5	1.9%	2	0.8%
	36-45 Years	10	6.0%	21	7.1%	22	8.5%	12	5.0%
	46-55 Years	9	5.4%	23	7.7%	18	6.9%	14	5.8%
	56-65 Years	4	2.4%	13	4.4%	12	4.6%	6	2.5%
	>=65 Years	1	0.6%	3	1.0%	1	0.4%	1	0.4%
	Aggregate (Male)	***29***	***17.5%***	***67***	***22.6%***	***59***	***22.7%***	***35***	***14.5%***
Aggregate		**166**		**297**		**260**		**242**	

Surgical Patients - Utilization Trends

- Almost all bariatric surgery patients got one of two procedures:
  - Procedure Code 43644: *Laparoscopy, surgical, gastric restrictive procedure with gastric bypass and Roux-en-Y gastroenterostomy (roux limb 150 cm or less)*
  - Procedure Code 43775: *Laparoscopy, surgical, gastric restrictive procedure ; longitudinal gastrectomy (IE sleeve gastrectomy)*
  - Higher relative utilization of Procedure code 43775 in more recent years
  - Lower average cost for the 43775 procedure; ranging between $5K-$6K from 2020-2023, compared to about $6K-$8K for the 43644 procedure over the same period

Figure 8 GHIP Bariatric Surgery Trends by Procedure Types and Costs



* Excluding procedures with very few patients

Surgical Patients – Utilization and Cost Trends

- The majority of GHIP bariatric patients (over 95%) received services in an in-patient or combination of in-patient and out-patient service location type
- The average per patient cost for bariatric surgery ranged from about $31K and $34K between 2020 and 2023
  - the cost was lowest for the very few patients that received services in out-patient settings only – approximately $25K in 2022 and 2023
  - the per patient cost is driven primarily by the facilities charges – about 70%, the professional costs closely associated with the procedure type typically account for 30% or less

Figure 9 GHIP Bariatric Surgery Trends by Place of Service

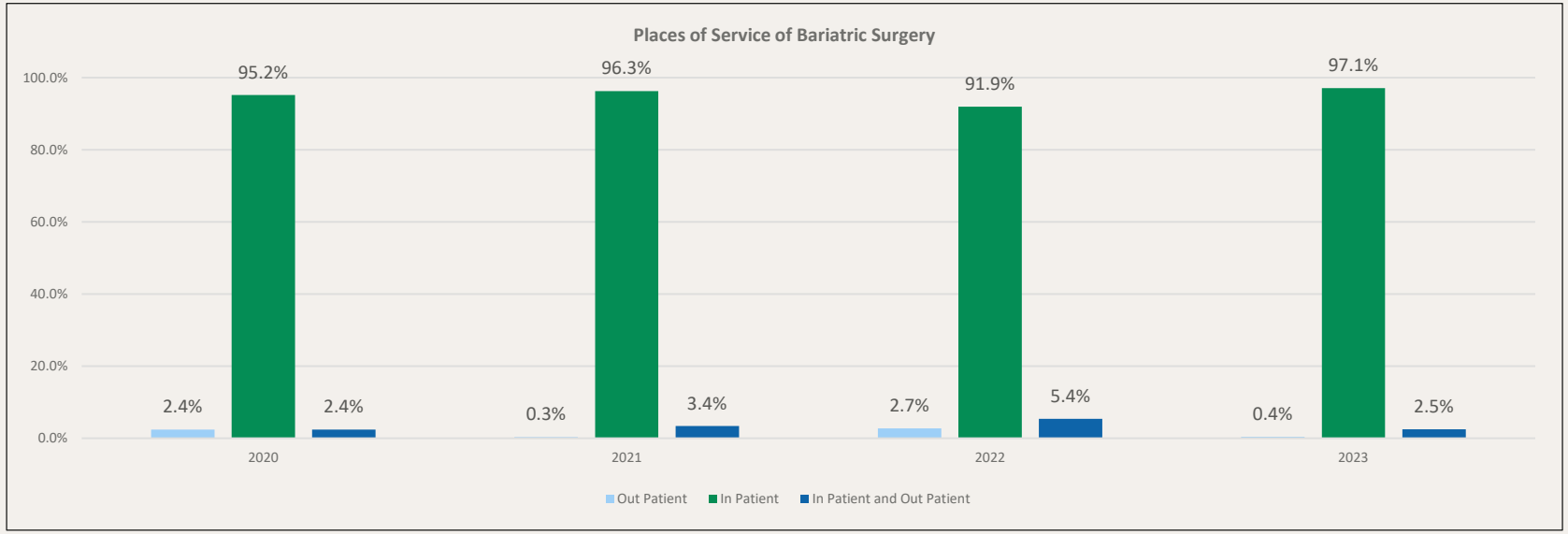
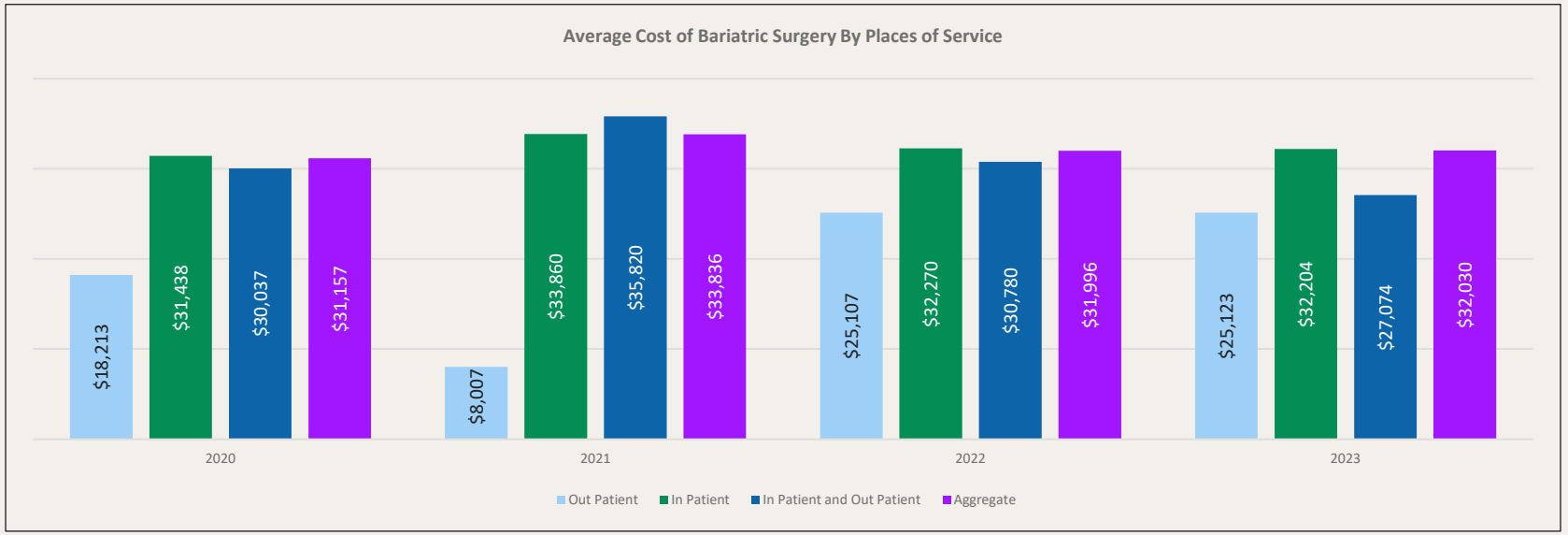


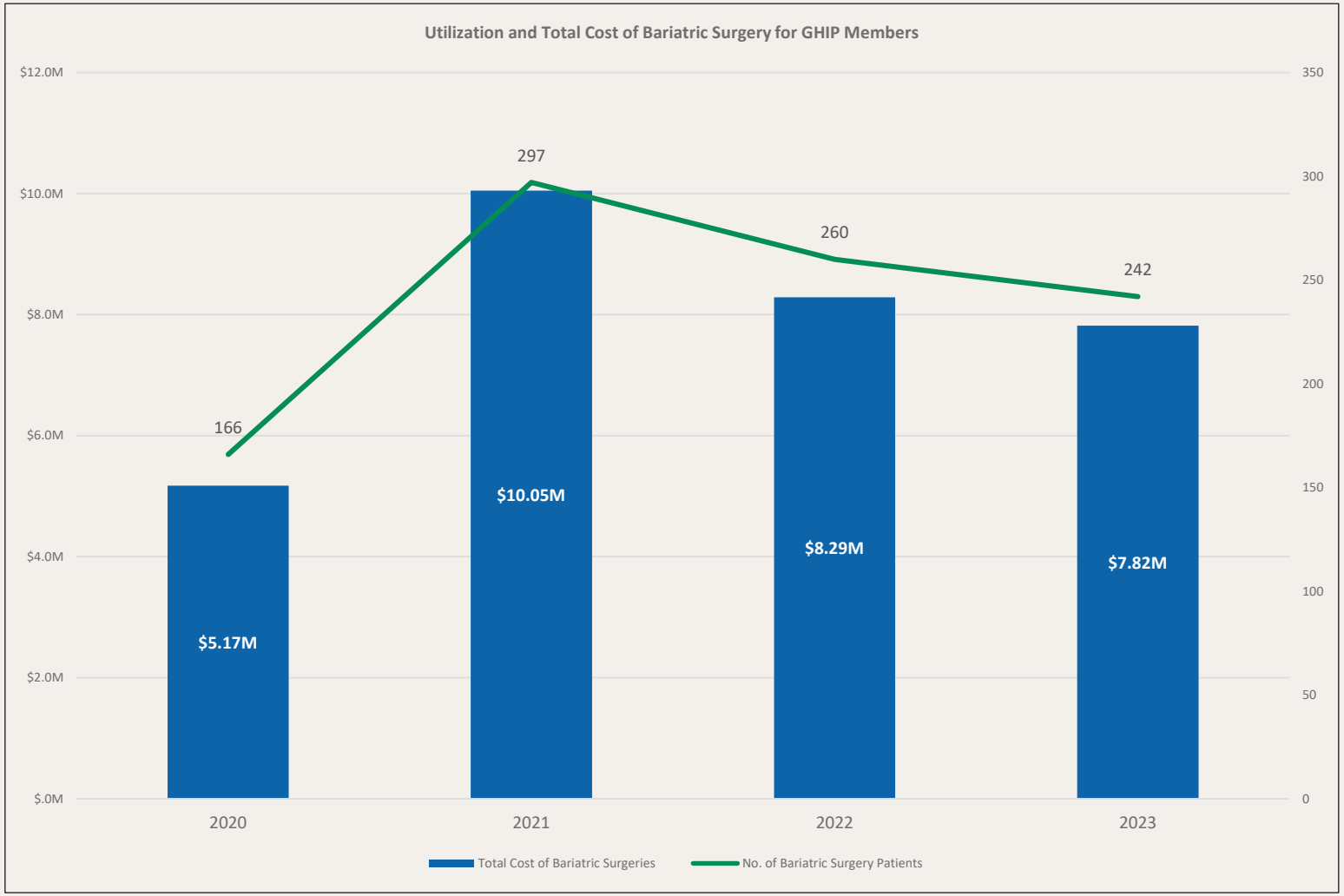
Figure 10 GHIP Bariatric Surgery Trends by Place of Service and Costs



Surgical Patients – Utilization and Cost Trends

- The total cost of bariatric surgery for GHIP peaked in 2021 and has continued to reduce since then
  - this trend is primarily driven by the reduction in utilization - the variation in unit cost between 2020 and 2023 has been relatively low
  - the total cost for bariatric surgery at the peak utilization in 2021 was **$10.0M** for **297** members receiving the surgery, it cost **$7.8M** for the **242** members receiving the surgery in 2023, the most recent complete calendar year data available

Figure 11 Average Annual Utilization and Cost Trends for GHIP Bariatric Surgery



Surgical Patients - Complications

- Complication rates are consistently about 20% except for 2022 when it is 30%:
  - typical post surgery complications e.g. development of nutritional deficiencies are mitigated through proper management
  - some studies have shown expected complication rates of 17% (95% CI, 11%-23%)[1,2]
- Indication of reduced trend in the readmission rate for GHIP bariatric patients - highest in 2020 at 1.8% and lowest in 2023 at 0.8%
  - abdominal hernias are the most common complications requiring follow-up surgery[1,2]

1. https://my.clevelandclinic.org/-/scassets/files/org/bariatric/guides/risks-and-complications-of-bariatric-surgery.pdf?la=en
2. https://jamanetwork.com/journals/jamasurgery/fullarticle/1790378

Figure 12 GHIP Bariatric Surgery Annual Re-Admission Rates

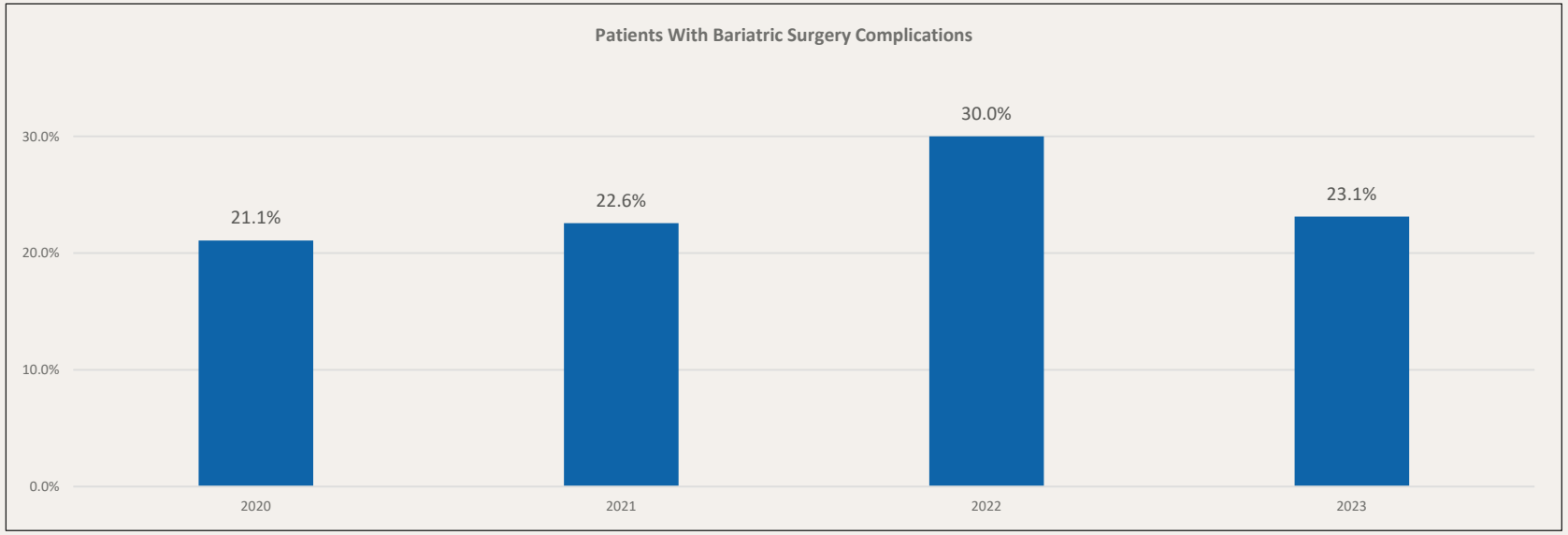
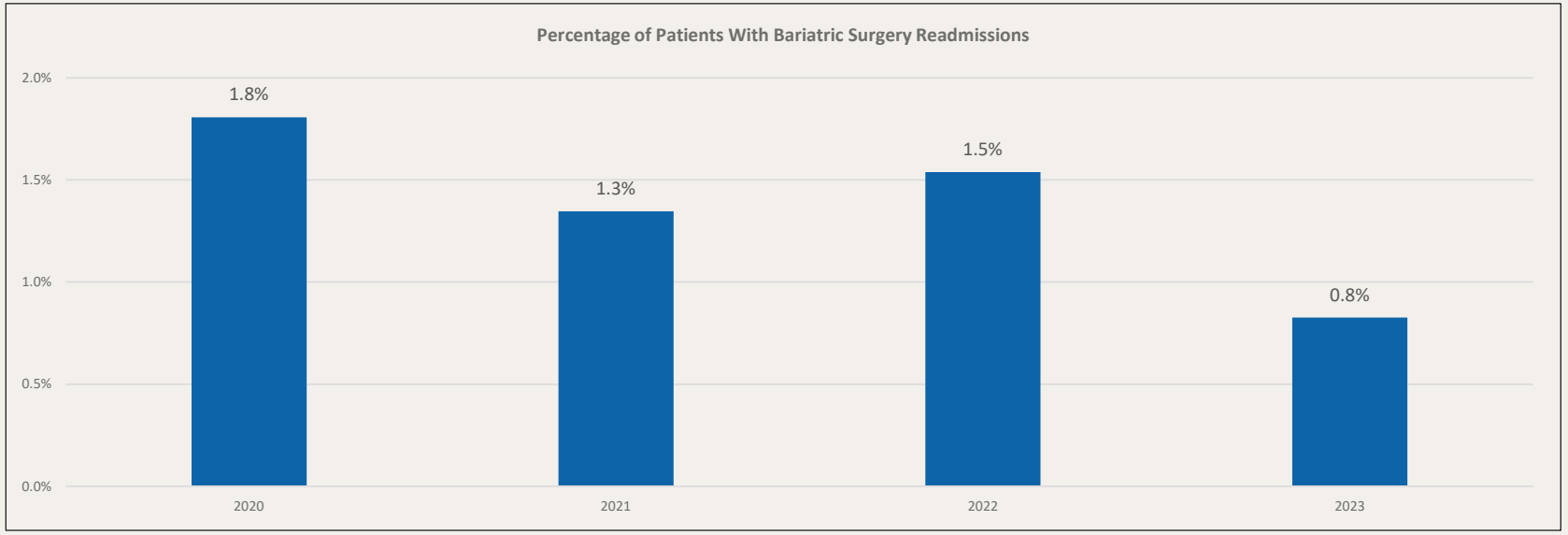


Figure 13 GHIP Bariatric Surgery Annual Complication Rates



Post Bariatric Surgery Assessment

Post Surgery Assessment

- Assessment inclusion criteria:
  - continuously enrolled in GHIP 2020 – 2023
  - qualified for surgery in both 2020 and 2021
    - **study group**: got bariatric surgery in 2021, not before or after
    - **control group**: no record of bariatric surgery
- "Matching" to determine subset of control group similar to the study group in:
  - demographics
  - risk categories* distributions and average annual costs
  - distribution of members by obesity disease stages**
- Analysis of post bariatric surgery performance compared to "matched" control group using trends in:
  - disease severity and progression
  - costs

*indication of the expected relative cost risk of a patient, ordered from low to high as follows:
{*Healthy, Stable, At Risk, Struggling, In Crisis*}

**Merative's disease staging methodology groups conditions from early onset (stages 0-1) to later stages where the condition is advanced and typically accompanied by multiple complications (stage 3)

Appendix A

Distribution of Gender and Ages (2020)

	Study Group			Control Group			Matched Control Group		
	Members	Ave. Age (Yrs)	% of Group	Members	Ave. Age (Yrs)	% of Group	Members	Ave. Age (Yrs)	% of Group
Female	125	45.3	74.0%	231	54.7	52.3%	125	49.5	74.0%
Male	44	48.5	26.0%	211	56.0	47.7%	44	48.1	26.0%
Aggregate	**169**	**46.1**		**442**	**55.3**		**169**		

Post Surgery Assessment – Population Matching

- A combination of a propensity score and direct identification by specific factors is used to achieve a good match between the study and control groups:
  - good gender and average age matching
  - exact match in risk categories and similar average annual medical and Rx costs
  - same distribution of members in obesity severity
- Matching is done with 2020 data, prior to bariatric surgeries for the study group members in 2021

Appendix A

Distribution of Risk Categories And Costs (2020)

	Study Group			Control Group			Matched Control Group		
	Member	Average Annual Cost (Med.+Rx)	% of Group	Member	Average Annual Cost (Med.+Rx)	% of Group	Member	Average Annual Cost (Med.+Rx)	% of Group
Healthy				4	$3,929.90	0.9%			
Stable	7	$3,051.44	4.1%	25	$2,365.19	5.7%	7	$2,714.24	4.1%
At Risk	62	$7,562.00	36.7%	117	$6,954.24	26.5%	62	$7,412.58	36.7%
Struggling	84	$21,049.92	49.7%	211	$16,535.01	47.7%	84	$21,449.49	49.7%
In Crisis	16	$51,490.87	9.5%	85	$44,282.54	19.2%	16	$48,314.17	9.5%
Aggregate	**169**	**$18,238.17**		**442**	**$18,419.45**		**169**	**$18,067.24**	

Appendix A

Distribution of Obesity Disease Stages (2020)

	Study Group		Control Group		Matched Control Group	
	Member	% of Group	Member	% of Group	Member	% of Group
Stage 0-1	1	0.6%	19	4.3%	1	0.6%
Stage 2	168	99.4%	420	95.0%	168	99.4%
Stage 3		0.0%	3	0.7%		0.0%
Aggregate	**169**		**442**		**169**	

Post Surgery Assessment – Disease Progression

- Post surgery, there is a more rapid drop in the number of members in the study group with episodes of obesity when compared to the control group:
  - only 39 of 169 in the control group in 2023, 2 years after surgery, compared to 76 for the control group
  - of the 39 in the study group, close to half are in the less severe stages 0-1, almost all the 76 in the control group are in the more severe stage 2
- The percentage of hypertensive patients has reduced consistently in the study group, post surgery, but has increased in the control group during the same time

Figure 14a Obesity Stage Transitions for Study and Matched Control Group

Overweight and Obesity Patient Trends

Study Group

	Patients			
	2020	2021	2022	2023
Stage 0-1	1		20	17
Stage 2	168	169	41	22
Stage 3				
Aggregate	**169**	**169**	**61**	**39**

Matched Control Group

	Patients			
	2020	2021	2022	2023
Stage 0-1	1	10	10	4
Stage 2	168	158	70	72
Stage 3		1		
Aggregate	**169**	**169**	**80**	**76**

Figure 14b Hypertension Stage Transitions for Study and Matched Control Group

Hypertension Patient Trends

Study Group

	Patients			
	2020	2021	2022	2023
Stage 0-1	22	26	25	15
Stage 2				
Stage 3				
Aggregate	**22**	**26**	**25**	**15**

Matched Control Group

	Patients			
	2020	2021	2022	2023
Stage 0-1	24	29	31	30
Stage 2				
Stage 3	2		3	6
Aggregate	**26**	**29**	**34**	**36**

Post Surgery Assessment - Disease Progression

- Diabetes is a highly correlated with obesity:
  - 40 members (23%) and 44 members (26%) of the study and control groups also had episodes of diabetes treatment in 2020
  - these rates have dropped rapidly two years post surgery to 20 members (12%) in the study group, but increased to 51 members (30%) in the control group
- Musculoskeletal conditions such as spinal and back disorders are also linked to obesity
  - reduced markedly post surgery for the control group but not for the control group
- The impact of bariatric surgery may vary by time e.g. faster for diabetes than musculoskeletal conditions

Figure 14c Diabetes Stage Transitions for Study and Matched Control Group

Type 2 Diabetes Patient Trends

Study Group

	Patients			
	2020	2021	2022	2023
Stage 0-1	19	15	14	9
Stage 2	20	18	13	12
Stage 3	1	1	1	
Aggregate	**40**	**34**	**28**	**21**

Matched Control Group

	Patients			
	2020	2021	2022	2023
Stage 0-1	17	15	20	27
Stage 2	26	23	29	24
Stage 3	1	1	1	
Aggregate	**44**	**39**	**50**	**51**

Figure 14c Spinal and Low Back Disorder Stage Transitions for Study and Matched Control Group

Spinal and Low Back Disorder Patient Trends

Study Group

	Patients			
	2020	2021	2022	2023
Stage 0-1	22	33	20	21
Stage 2				
Stage 3				
Aggregate	**22**	**33**	**20**	**21**

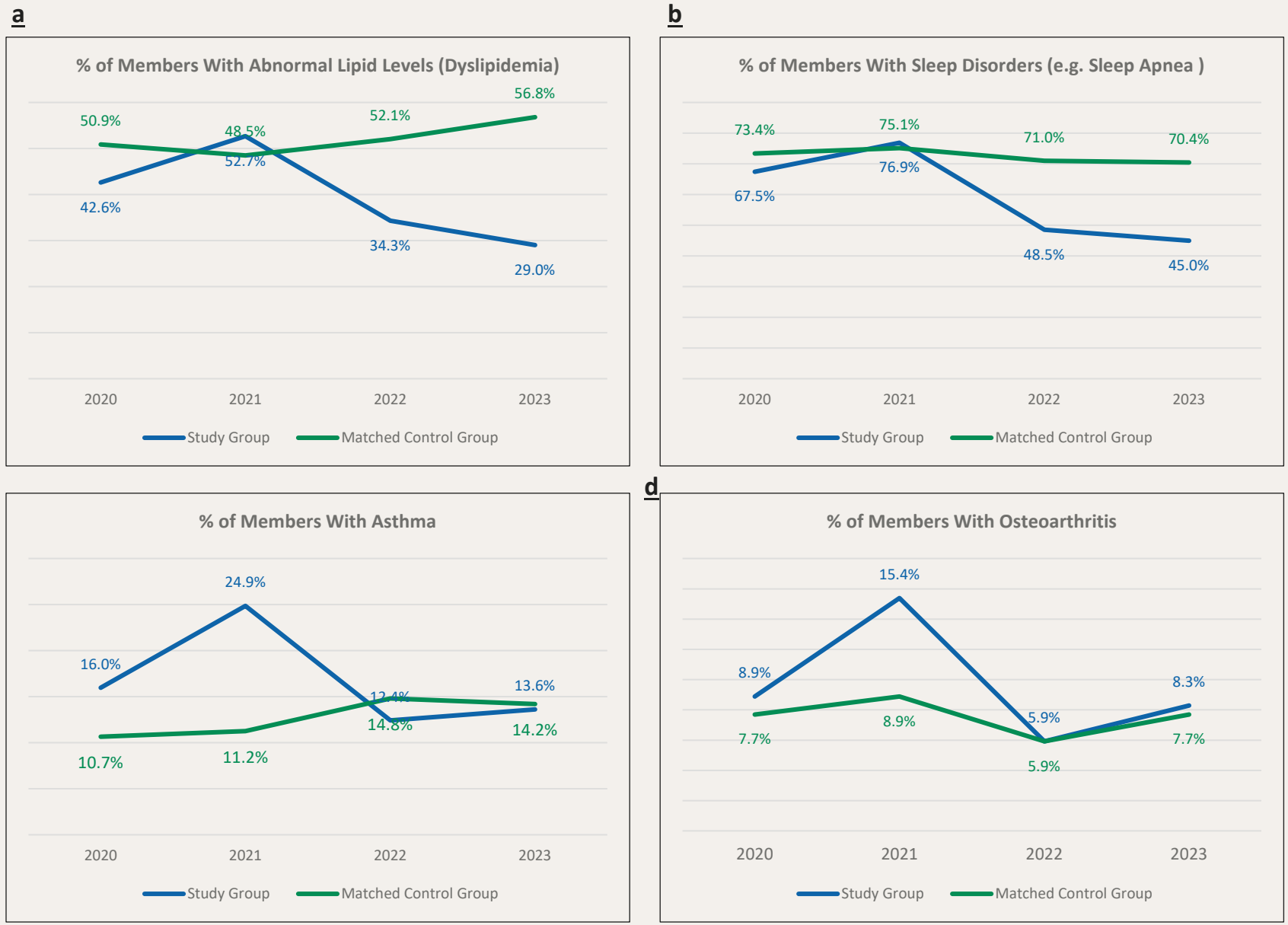
Matched Control Group

	Patients			
	2020	2021	2022	2023
Stage 0-1	24	32	29	32
Stage 2				
Stage 3				
Aggregate	**24**	**32**	**29**	**32**

Post Surgery Assessment – Other Comorbidities

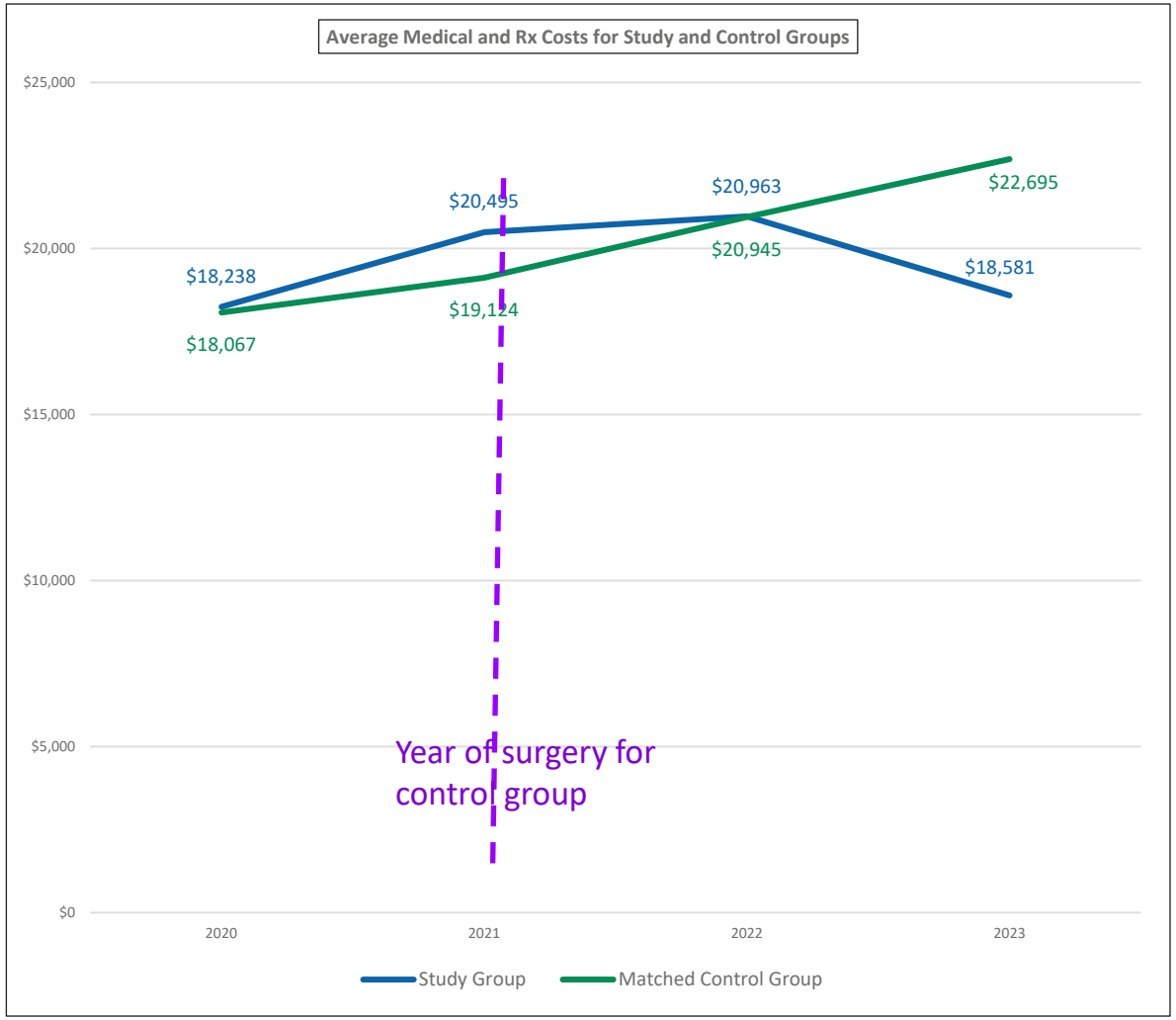
- Other conditions related to obesity also show different diagnosis rates for members in the study and control group:
  - diagnosis rates for abnormal lipid level conditions and sleep apnea are comparable for both the study and control groups: consistently reduce post surgery for the study group, but flat or increasing for the control group
  - asthma diagnosis rates are higher in the study group prior to surgery but consistently reduced post surgery, rates are increasing slightly in the control group
  - the impact of the surgery on musculoskeletal conditions like osteoarthritis may take longer

Figure 15 Trends of Obesity Comorbidities for Study and Matched Control Group



Post Surgery – Preliminary Financial Assessment

Figure 16 Average Annual Medical and Prescription Drugs Cost for Study and Matched Control Group



A "Difference in differences"[1,2] approach is used for a financial assessment of the bariatric surgery benefit

- The average annual cost of the study and control groups in 2021 is used as a baseline
  - excludes bariatric surgery cost for study group
- The underlying assumption is that the cost trends for the study group and the similar matched control group will be similar

Table 3 Average Annual Cost Trends for Study and Matched Control Group

		2021	2022	2023
Study Group	Average Cost	$20,495	$20,963	$18,581
	Difference from Prev. Year		$468	$2,382
Control Group	Average Cost	$19,124	$20,945	$22,695
	Difference from Prev. Year		$1,822	$1,749
	Difference of difference		**$1,354**	**$4,131**

The analysis estimates the following average per member savings for the study group that received the bariatric surgery in 2021:

- $1,354 in 2022, 1 year after the surgery
- $4,131 in 2023, 2 years after the surgery, the average cost for the study group in 2023 is 22% lower than the control group

1. https://theeffectbook.net/ch-DifferenceinDifference.html
2. https://en.wikipedia.org/wiki/Difference_in_differences

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Evaluation of WI ETF GHIP Clear Bagging Program

Background and Summary Findings

GHIP Clear Bagging Program

Transfer of a selection of specialty drugs previously covered under medical benefits to prescription drug benefits

- Arrangement between PBM (Navitus) covering the drugs, and UW Health Pharmacy dispensing the drugs
- For GHIP patients covered under the Quartz health plan
- Started January 2023
- Expected savings to GHIP from the benefit change

Analytic Notes

- Evaluating first full year (2023) of data
- Assessment based on Rx claims in DAISI, validated against records from Navitus
- Compared unit costs under Rx and medical benefits
  - using subset of commercial, "fee for service" costs in DAISI

Results

- Under the GHIP clear bagging program in 2023
  - **292** members received **952** specialty drug prescriptions
  - the dispensed specialty drugs cost the program **$1.68M** in net payments ($1.73M in total allowed amount)

- A representative subset of these drugs with available costs data under the medical benefits were evaluated for potential savings
  - 16 of the 24 specialty drugs, representing about **$1.4M** or 83% of the total cost
  - the comparison indicates cost reduction of **$0.7M** to GHIP, representing approximately 51% of the net payments under the clear bagging program, and a **saving of about 34%** over the average cost under medical benefits

Clear Bagging – Utilization and Costs

- 292 GHIP members received at least one of the 952 prescription specialty drugs under the clear bagging program in 2023
- The specialty drugs dispensed under the program cost $1.68M in GHIP net payments ($1.73M in total allowed amount costs)
- Notes:
  - the specialty drug product names are anonymized to protect proprietary information
  - rows highlighted in orange are excluded from costs comparisons because of a lack of equivalent medical costs data, the 16 (of 24) entries analyzed represent 83% of utilization and costs

Table 1 Utilization and Costs of Specialty Drugs Under the GHIP Clear Bagging Program in 2023

Product Name	Scripts Rx	Patients Rx	Base Units	Plan Paid (Rx)	Allowed Amount (Rx)
P1	2	1	160.00	$19,683	$19,783
P2	3	1	18,846.00	$22,090	$22,240
P3	7	3	4,200.00	$26,551	$26,901
P4	511	180	100,000.00	$609,332	$635,354
P5	9	2	4,400.00	$45,460	$47,324
P6	2	1	400.00	$3,405	$3,505
P7	10	2	2,100.00	$22,389	$22,889
P8	2	2	2,040.00	$3,911	$4,441
P9	83	12	6,000.00	$371,085	$374,936
P10	7	5	26,208.00	$27,109	$27,459
P11	4	3	76.00	$1,049	$1,249
P12	11	3	15,750.00	$27,621	$28,171
P13	1	1	10,038.00	$10,120	$10,170
P14	11	1	975.00	$52,735	$53,285
P15	2	2	120.00	$3,156	$3,256
P16	33	4	2,510.00	$192,619	$194,269
P17	1	1	390.00	$5,642	$5,692
P18	1	1	1.00	$48,014	$48,064
P19	5	1	1,050.00	$18,913	$19,163
P20	1	1	40.00	$114	$164
P21	40	12	8,600.00	$2,730	$4,730
P22	133	99	27,700.00	$132,853	$140,980
P23	12	1	1,440.00	$34,397	$34,997
P24	61	37	244.00	$98	$1,200
Aggregate	**952**	**292**		**$1,681,077**	**$1,730,223**

Clear Bagging – Potential Savings

- There is considerable savings to the GHIP for 13 of the 16 specialty drugs under the clear bagging program
  - specialty drugs with savings represent 94% of utilization and 84% in net payments
- GHIP is paying more for 3 of the specialty drugs considered, these represent 6% and 16% of the utilization and costs considered
- There is an aggregate estimated reduction of $713K in net payments under the clear bagging program, compared to the average costs under medical benefits, this represents a 51% of the $1.4M net payments and a saving of about 34% of the average cost under medical benefits of $2.1M

Table 2 Rx and Medical Costs Comparisons for Specialty Drugs under the GHIP Clear Bagging Program in 2023

Product Name	Scripts Rx	Base Units	Plan Paid (Rx)	Plan Paid Per Unit (Rx)	Plan Paid Per Unit (Med.)	% Plan Savings/ Extra	Total Savings/Extra in Plan Paid for Clear Bagging
P4	511	100,000	$609,332	$6.09	$9.10	49%	$300,918
P7	10	2,100	$22,389	$10.66	$19.90	87%	$19,408
P8	2	2,040	$3,911	$1.92	$0.86	-55%	($2,153)
P9	83	6,000	$371,085	$61.85	$117.52	90%	$334,015
P10	7	26,208	$27,109	$1.03	$1.14	10%	$2,707
P11	4	76	$1,049	$13.81	$42.82	210%	$2,205
P12	11	15,750	$27,621	$1.75	$1.51	-14%	($3,891)
P14	11	975	$52,735	$54.09	$61.51	14%	$7,238
P15	2	120	$3,156	$26.30	$37.23	42%	$1,312
P16	33	2,510	$192,619	$76.74	$61.85	-19%	($37,366)
P17	1	390	$5,642	$14.47	$20.71	43%	$2,433
P18	1	1	$48,014	$48,013.67	$107,343.07	124%	$59,329
P20	1	40	$114	$2.86	$9.53	233%	$267
P21	40	8,600	$2,730	$0.32	$0.48	51%	$1,391
P23	12	1,440	$34,397	$23.89	$37.23	56%	$19,217
P24	61	244	$98	$0.40	$27.78	6791%	$6,680
Aggregate	**790**		**$1,402,002**				**$713,710**