

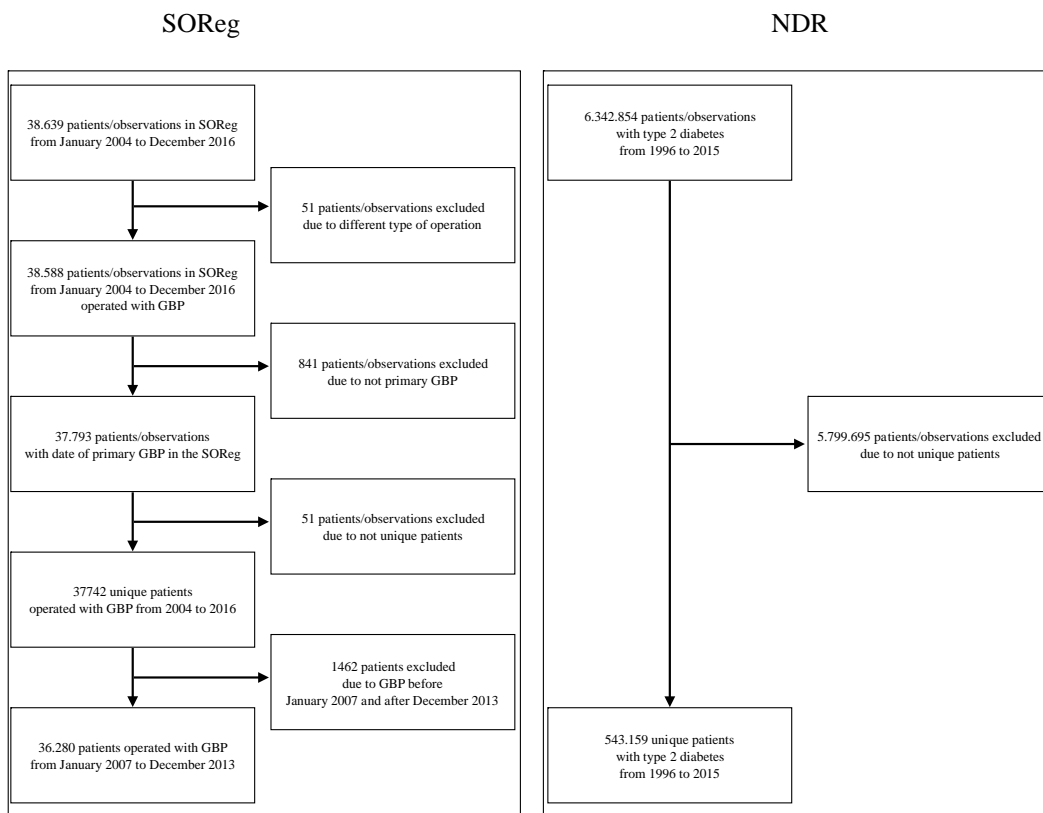
SUPPLEMENTARY MATERIAL

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Flowchart

Selection of our data from Scandinavian Obesity Surgery Register (SOReg) before merging with data from the National Diabetes Registry (NDR).



Merging the two databases led to our study population of 5,321 patients in the SOReg who had T2DM and had undergone GBP, and 5,321 matched control patients in the NDR.

Methods – database linkages

This study is based on data from the NDR and SOReg. Both registers are linked to Statistics Sweden at the National Board of Health and Welfare, which also stores data in the Swedish Inpatient Register (1997-2015).

We filed an application with our data and personal identity numbers [SOReg (2007-2013) & NDR (1996-2015)] to the National Board of Health and Welfare, from which all personal identity numbers have been identified and replaced by serial numbers. The coded data from the National Board of Health and Welfare were subsequently forwarded to Statistics Sweden for linkage with the Inpatient Register and LISA Database, which provides socioeconomic data. The linked data were then returned to us for validation and analysis.

Table S1: Pre-index diagnoses and outcomes after GBP

Diagnoses before and after gastric bypass surgery (index date) until December 2015 according to ICD-10.

Diagnosis	ICD-10	Variable origin	Registration period
Acute Myocardial infarction	<i>I21</i>	Swedish Inpatient Register	2007-2015
Coronary heart disease	<i>I20-25</i>	Swedish Inpatient Register	2007-2015
Stroke	<i>I61-64</i>	Swedish Inpatient Register	2007-2015
Cardiovascular disease	<i>I21, I61-64</i>	Swedish Inpatient Register	2007-2015
Atrial fibrillation	<i>I48</i>	Swedish Inpatient Register	2007-2015
Heart failure	<i>I50</i>	Swedish Inpatient Register	2007-2015
Valvular heart disease	<i>I05-09, I34-37, Q22, Q23</i>	Swedish Inpatient Register	2007-2015
Liver disease	<i>K70-74</i>	Swedish Inpatient Register	2007-2015
Kidney disease	<i>V42A, V45B, V56A, V56W, Z940, Z491, Z492, Z992, N17-19, N99</i>	Swedish Inpatient Register	2007-2015
Hyperglycemia	<i>E100, E101, E110, E111, E120, E121, E130, E131, E140, E141, R739</i>	Swedish Inpatient Register	2007-2015
Hypoglycemia (with or without coma)	<i>E100, E106A, E110, E110C, E110X, E116A, E120, E130, E140, E159, E160, E161W, E162, R402</i>	Swedish Inpatient Register	2007-2015
Cancer	<i>C0-9</i>	Swedish Inpatient Register	2007-2015

Dementia	<i>G300, G301, G308, G309, G31, F00-03</i>	Swedish Inpatient Register	2007-2015
Psychiatric disorders	<i>F11-19, F20-29, F30-39, F50, F55, F40-F43, F60, F61, F68, F69, F99</i>	Swedish Inpatient Register	2007-2015
Alcohol abuse	<i>F10</i>	Swedish Inpatient Register	2007-2015
Anemia	<i>D508-9, D51.0,3,8, D520</i>	Swedish Inpatient Register	2007-2015
Malnutrition	<i>E15-16, E51.2, E42-44, E46, E50-64, G63.3-4, G62.9, K91.1-2, M81.3, M83.2</i>	Swedish Inpatient Register	2007-2015
Bleeding	<i>T81.0</i>	Swedish Inpatient Register	2007-2015
Deep vein thrombosis and pulmonary embolism	<i>I80.0-9, I26, I81</i>	Swedish Inpatient Register	2007-2015
Amputation	<i>NHQ09, 11-14, 16, 17, 99, NGQ09, 19, 99, NFQ19, 99</i>	Swedish Inpatient Register	2007-2015
Bowel obstruction	<i>K56, K45</i>	Swedish Inpatient Register	2007-2015
Gastrointestinal leakage	<i>T84.4, K65.0, K63.1</i>	Swedish Inpatient Register	2007-2015
Pulmonary complications	<i>J18.0-9, J69.0, J80, J98.1</i>	Swedish Inpatient Register	2007-2015
Wound complications	<i>T81.3-4, K43.0-9</i>	Swedish Inpatient Register	2007-2015
Gastrointestinal ulcer and reflux	<i>K21, K22.1-3, K25-26, K28</i>	Swedish Inpatient Register	2007-2015
Hernia	<i>K40-43</i>	Swedish Inpatient Register	2007-2015
Gallstone, gallbladder disease and pancreatitis	<i>K80-85</i>	Swedish Inpatient Register	2007-2015
Gastrointestinal surgery not	All the operative diagnoses with	Swedish Inpatient Register	2007-2015

GBP	"J" except for gastric operation	Register	
Plastic surgery	<i>QBE, QBJ, QCJ05, QDJ05, QAJ35</i>	Swedish Inpatient Register	2007-2015
Abdominal pain	<i>R10.1-4</i>	Swedish Inpatient Register	2007-2015
All-cause mortality	Everyone in the Cause of Death Register	Cause of Death Register	2007-2015
Fatal coronary heart disease	<i>I20-24</i> and entered in the Cause of Death Register	Swedish Inpatient Register & Cause of Death Register	2007-2015
Fatal cardiovascular disease	<i>I20-24, I61-64</i> and entered in the Cause of Death Register	Swedish Inpatient Register & Cause of Death Register	2007-2015

Table S2: Risk estimates for men and women (Cox proportional hazards regression)

Outcome	Men HR with 95% CI (n=4024)	Women HR with 95% CI (n=6618)	p-value
All-cause mortality	0.58 (0.45, 0.74)	0.46 (0.35, 0.60)	0.2091
Coronary heart disease	1.14 (0.90, 1.44)	1.12 (0.88, 1.42)	0.9011
Cardiovascular disease	0.63 (0.44, 0.92)	0.69 (0.49, 0.96)	0.7614
Fatal coronary heart disease	0.42 (0.24, 0.73)	0.25 (0.12, 0.54)	0.2853
Fatal cardiovascular disease	0.60 (0.32, 1.14)	0.13 (0.05, 0.36)	0.0118
Acute myocardial infarction	0.55 (0.32, 0.92)	0.56 (0.35, 0.90)	0.9522
Stroke	0.67 (0.32, 1.12)	0.88 (0.55, 1.41)	0.4429
Atrial fibrillation	1.13 (0.86, 1.47)	0.72 (0.53, 0.98)	0.0313
Heart failure	0.63 (0.46, 0.86)	0.35 (0.24, 0.51)	0.0201
Valvular heart disease	0.83 (0.38, 1.84)	0.49 (0.21, 1.13)	0.3645
Hyperglycemia	0.22 (0.09, 0.53)	0.40 (0.23, 0.69)	0.2624
Hypoglycemia with coma	0.79 (0.39, 1.63)	1.21 (0.71, 2.05)	0.3490
Dementia	0.73 (0.19, 2.86)	0.00 (.,.)	0.9991
Kidney disease	0.84 (0.28, 2.54)	0.37 (0.12, 1.13)	0.2995
Amputation	0.82 (0.36, 1.85)	0.16 (0.04, 0.72)	0.0613
Cancer	1.02 (0.69, 1.51)	0.69 (0.53, 0.90)	0.1068
Psychiatric disorder	1.02 (0.76, 1.37)	1.51 (1.23, 1.85)	0.0289
Alcohol abuse	2.87 (1.98, 4.15)	2.94 (1.85, 4.69)	0.9298
Liver diseases	0.53 (0.25, 1.13)	0.92 (0.49, 1.73)	0.2731
Anemia	1.96 (0.96, 4.01)	1.90 (1.24, 2.90)	0.9390

Outcome	Men HR with 95% CI (n=4024)	Women HR with 95% CI (n=6618)	p-value
Bleeding	9.74 (4.69, 20.22)	5.50 (3.26, 9.29)	0.2110
Deep vein thrombosis and pulmonary embolism	1.10 (0.59, 2.03)	0.96 (0.60, 1.55)	0.7455
Bowel obstruction	6.17 (3.33, 11.46)	12.10 (7.10, 20.64)	0.1035
Gastrointestinal leakage	5.28 (1.55, 18.01)	5.73 (1.96, 16.79)	0.9217
Malnutrition	2.72 (1.59, 4.67)	2.86 [1.83, 4.47]	0.8879
Pulmonary complications	0.96 (0.59, 1.56)	0.78 [0.54, 1.12]	0.4915
Wound complications	4.70 (2.79, 7.90)	3.12 [2.36, 4.13]	0.1743
Gastrointestinal ulcer and reflux	5.57 (3.49, 8.89)	5.28 (3.36, 8.31)	0.8719
Hernia	3.53 (2.19, 5.69)	2.47 (1.83, 3.33)	0.2136
Gallstone, gallbladder disease and pancreatitis	2.33 (1.59, 3.41)	2.56 (1.99, 3.30)	0.6810
Gastrointestinal surgery (not gastric bypass)	9.93 (8.35, 11.80)	7.13 (6.37, 7.98)	0.0015
Plastic surgery	16.96 (6.84, 42.07)	20.73 (12.67, 33.92)	0.7024
Abdominal pain	7.22 (4.64, 11.24)	5.12 (4.08, 6.41)	0.1703