

## SUPPLEMENTARY DATA

### **Table of contents**

- Supplementary Table 1. ICD-10 codes
- Supplementary Table 2. Number of observations at baseline and after one and two years
- Supplementary Table 3. Additional baseline characteristics
- Supplementary Table 4. Changes from baseline after one and two years

SUPPLEMENTARY DATA

**Supplementary Table 1. Pre-index diagnoses, medication and outcomes after GBP**

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

<b>Diagnosis</b>	<b>ICD-10</b>	<b>Variable origin</b>	<b>Registration period</b>
Coronary heart disease	<i>I20-25</i>	Swedish Inpatient Register	1997-2015
Stroke	<i>I61-64</i>	Swedish Inpatient Register	1997-2015
Cardiovascular disease	<i>I20-25, I61-64</i>	Swedish Inpatient Register	1997-2015
Atrial fibrillation	<i>I48</i>	Swedish Inpatient Register	1997-2015
Congestive heart failure	<i>I50</i>	Swedish Inpatient Register	1997-2015
Valvular heart disease	<i>I05-09, I34-37, Q22, Q23</i>	Swedish Inpatient Register	1997-2015
Liver disease	<i>K70-74</i>	Swedish Inpatient Register	1997-2015
Severe renal disease	<i>Z940, Z491, Z492, Z992, N17-19, N99, DR015,16,23,24, KAS00, 10, 20</i>	Swedish Inpatient Register	1997-2015
Hyperglycemia	<i>E100, E101, E110, E111, E120, E121, E130, E131, E140, E141, R739</i>	Swedish Inpatient Register	1997-2015
Hypoglycemia (with or without coma)	<i>E100, E106A, E110, E110C, E110X, E116A, E120, E130, E140, E159, E160, E161W, E162, R402</i>	Swedish Inpatient Register	1997-2015
Amputation	<i>NHQ09, 11-14, 16, 17, 99, NGQ09, 19, 99, NFQ19, 99</i>	Swedish Inpatient Register	1997-2015
Cancer	<i>C0-9</i>	Swedish Inpatient Register	1997-2015
Dementia	<i>G300, G301, G308, G309, G31, F00-03</i>	Swedish Inpatient Register	1997-2015
Psychiatric disorders	<i>F11-19, F20-29, F30-39, F50, F55, F40-F43, F60, F61, F68, F69, F99</i>	Swedish Inpatient Register	1997-2015
Alcohol abuse	<i>F10</i>	Swedish Inpatient Register	1997-2015
Acute kidney failure	<i>N17</i>	Swedish Inpatient Register	1997-2015
Chronic kidney disease	<i>N18</i>	Swedish Inpatient Register	1997-2015
Chronic kidney disease not specific	<i>N19</i>	Swedish Inpatient Register	1997-2015
Diabetes nephropathy	<i>E10.2, E11.2, N08.3</i>	Swedish Inpatient Register	1997-2015
Hemodialysis or Peritoneal dialysis	<i>Z49.0-2, Z99.2, DR015,16,23,24</i>	Swedish Inpatient Register	1997-2015
Kidney transplantation	<i>Z94.0, KAS00, 10, 20</i>	Swedish Inpatient Register	1997-2015

SUPPLEMENTARY DATA

Fatal kidney disease	Z940, Z491, Z492, Z992, N17-19, N99, E10.2, E11.2, N08.3, DR015,16,23,24, KAS00, 10, 20 and entered in the Cause of Death Register within 28 days	Swedish Inpatient Register & Cause of Death Register	1996-2016
Fatal cardiovascular disease	I20-25,I61-64 and entered in the Cause of Death Register	Swedish Inpatient Register & Cause of Death Register	1996-2016
All-cause mortality	Everyone in the Cause of Death Register	Cause of Death Register	1996-2016
<b>Medication</b>	<b>ATC code</b>	<b>Variable origin</b>	<b>Registration period</b>
Platelet inhibitors	B01AC	Prescribed Drug Register	2005-2015
Anticoagulants	B01AA, B01AE07, B01AF, B01AX05	Prescribed Drug Register	2005-2015
Blood pressure medication	All blood pressure medications registered in National Diabetes Register	National Diabetes Register	1996-2015
ACE-inhibitors or ARB	C09A-D	Prescribed Drug Register	2005-2015
Loop diuretics	C03C, C03EB	Prescribed Drug Register	2005-2015
Other diuretics	C03A, B, D, EA	Prescribed Drug Register	2005-2015
Beta-blockers	C07	Prescribed Drug Register	2005-2015
Digoxin	C01AA05	Prescribed Drug Register	2005-2015
Nitrates	C01DA	Prescribed Drug Register	2005-2015
Calcium channel blockers	C08C,D	Prescribed Drug Register	2005-2015
Lipid lowering drugs	C10	Prescribed Drug Register	2005-2015
Insulin	A10A	Prescribed Drug Register	2005-2015
Metformin	A10BA	Prescribed Drug Register	2005-2015
Sulfonylureas	A10BB	Prescribed Drug Register	2005-2015
Alfa glucosidase inhibitors	A10BF	Prescribed Drug Register	2005-2015
Meglitinides	A10BX02,03	Prescribed Drug Register	2005-2015
Glitazones	A10BG	Prescribed Drug Register	2005-2015
DPP-4 inhibitors	A10BH	Prescribed Drug Register	2005-2015
GLP-1 analogues	A10BX04,7,10,13,14 and A10BJ	Prescribed Drug Register	2005-2015
SGLT2 inhibitors	A10BX09,11,12 and AB10BK	Prescribed Drug Register	2005-2015

SUPPLEMENTARY DATA

NSAIDs	<i>M01A</i>	Prescribed Drug Register	2005-2015
Opiate	<i>N02A</i>	Prescribed Drug Register	2005-2015

SUPPLEMENTARY DATA

**Supplementary Table 2. Number of observations at baseline and after one and two years used in the analysis**

Variable	Group	Baseline	1 year	2 years
BMI	GBP	5321	3625	2849
BMI	controls	5321	3939	3685
HbA1c	GBP	3755	3626	2894
HbA1c	controls	5130	4092	3858
Systolic BP	GBP	3486	3387	2733
Systolic BP	controls	4973	3953	3764
Diastolic BP	GBP	3487	3382	2726
Diastolic BP	controls	4968	3945	3753
Creatinine	GBP	3592	3416	2650
Creatinine	controls	4597	3584	3408
eGFR (MDRD)	GBP	3591	3415	2649
eGFR (MDRD)	controls	4596	3583	3407
eGFR (CKD-EPI)	GBP	3592	3416	2650
eGFR (CKD-EPI)	controls	4597	3584	3408
Total Cholesterol	GBP	2996	2818	2225
Total Cholesterol	controls	4174	3235	3089
LDL	GBP	3485	3354	2470
LDL	controls	3832	2996	2900
HDL	GBP	3560	3366	2446
HDL	controls	3906	3028	2861
Triglycerides	GBP	3571	3347	2430
Triglycerides	controls	3938	3032	2846
Microalbuminuria	GBP	2492	2491	1970
Microalbuminuria	controls	3575	2984	2780
Macroalbuminuria	GBP	2653	2526	1934
Macroalbuminuria	controls	3778	2970	2768
Physical activity	GBP	2630	2481	1970
Physical activity	controls	4023	3212	3052

BMI; Body Mass Index, GBP; gastric bypass, HbA1c; glycated hemoglobin, BP; blood pressure, eGFR (MDRD); estimated glomerular filtration rate according to the Modification of Diet in Renal Disease equation, eGFR (CKD-EPI); estimated glomerular filtration rate according to the Chronic Kidney Disease Epidemiology Collaboration equation, LDL; low-density lipoprotein, HDL; high-density lipoprotein.

SUPPLEMENTARY DATA

**Supplementary Table 3. Additional baseline characteristics**

<b>Characteristics</b>	<b>Gastric bypass (n=5321) Count (%) / Mean (SD)</b>	<b>Control (n=5321) Count (%) / Mean (SD)</b>	<b>Standardised difference</b>
Atrial fibrillation	148 (2.78%)	149 (2.80%)	0.0008
Valvular heart disease	24 (0.45%)	27 (0.51%)	0.0058
Hypoglycemia with coma	57 (1.07%)	61 (1.15%)	0.0051
Hyperglycemia	59 (1.11%)	84 (1.58%)	0.0289
Amputation	10 (0.19%)	12 (0.23%)	0.0059
Dementia	1 (0.02%)	4 (0.08%)	0.0184
Chronic kidney disease not specific	8 (0.15%)	10 (0.19%)	0.0065
Hemodialysis or Peritoneal dialysis	5 (0.09%)	6 (0.11%)	0.0041
Kidney transplantation	2 (0.04%)	4 (0.08%)	0.0112
Medication			
Platelet inhibitors	1284 (24.13%)	1160 (21.80%)	0.0392
Anticoagulants	153 (2.88%)	170 (3.19%)	0.0132
Loop diuretics	935 (17.57%)	834 (15.67%)	0.0361
Other diuretics	821 (15.43%)	744 (13.98%)	0.0289
Beta blockers	1681 (31.59%)	1522 (28.60%)	0.0461
Digoxin	39 (0.73%)	43 (0.81%)	0.0061
Nitrates	241 (4.53%)	220 (4.13%)	0.0137
Calcium blockers	1326 (24.92%)	1096 (20.60%)	0.0730

SUPPLEMENTARY DATA

**Supplementary Table 4. Descriptive statistics mean (SD) or count (%) after 1 and 2 years by treatment group, difference between groups in change from baseline for continuous variables and odds ratio at each time for discrete variables**

Variable	Group	Baseline	1 year	2 years
BMI (kg/m <sup>2</sup> )	GBP	42.03 (5.65)	32.60 (5.69)	30.54 (5.03)
	Control	40.95 (7.30)	39.04 (7.04)	38.64 (7.02)
	Difference		-7.21 [-7.41, -7.00]	-8.85 [-9.08, -8.61]
	P value		<0.0001	<0.0001
HbA1c (mmol/mol)	GBP	59.93 (16.93)	44.34 (11.83)	44.11 (12.10)
	Control	58.52 (16.93)	56.97 (16.56)	57.68 (17.45)
	Difference		-13.80 [-14.38, -13.22]	-14.65 [-15.36, -13.94]
	P value		<0.0001	<0.0001
Creatinine (mmol/l)	GBP	68.11 (27.65)	67.58 (30.14)	66.53 (29.86)
	Control	68.01 (25.40)	68.65 (27.79)	69.02 (30.93)
	Difference		-1.92 [-2.86, -0.99]	-3.87 [-4.99, -2.76]
	P value		<0.0001	<.0001
eGFR (MDRD) (ml/min/1.73 m <sup>2</sup> )	GBP	97.24 (25.02)	97.94 (24.08)	98.79 (24.04)
	Control	98.29 (27.49)	97.34 (27.72)	96.77 (28.28)
	Difference		1.98 [1.17, 2.78]	4.19 [3.23, 5.14]
	P value		<0.0001	<0.0001
eGFR (CKD-EPI) (ml/min/1.73 m <sup>2</sup> )	GBP	99.40 (17.55)	99.26 (17.25)	98.89 (16.70)
	Control	100.06 (20.15)	98.81 (20.60)	97.67 (20.77)
	Difference		1.71 [1.19, 2.22]	3.25 [2.66, 3.84]
	P value		<0.0001	<0.0001
Microalbuminuria	GBP	481 (19.3)	413 (16.6)	321 (16.3)
	Control	697 (19.5)	623 (20.9)	549 (19.7)
	Difference		0.80 [0.72, 0.88]	0.84 [0.76, 0.93]
	P value		<0.0001	0.0009

SUPPLEMENTARY DATA

Macroalbuminuria	GBP	199 (7.5)	166 (6.6)	121 (6.3)
	Control	298 (7.9)	226 (7.6)	250 (9.0)
	Difference		0.88 [0.75, 1.04]	0.74 [0.63, 0.87]
	P value		0.1322	0.0003

BMI; body mass index, GBP; gastric bypass, eGFR (MDRD); estimated glomerular filtration rate according to the Modification of Diet in Renal Disease equation, eGFR (CKD-EPI); estimated glomerular filtration rate according to the Chronic Kidney Disease Epidemiology Collaboration equation.