SUPPLEMENTAL MATERIAL

Supplemental Table 1. The table lists the Medcodes used to identify events in the CPRD with their corresponding READ codes and READ terms. Both prevalent and incident cases of HF were assessed. Heart failure cases identified prior to T2D index date were excluded when calculating incident rates of HF.

From CRPD

Medcode	READ code	READ term	Type
398	G580.00	Congestive heart failure	Incident
884	G581.00	Left ventricular failure	Incident
1223	G58..11	Cardiac failure	Incident
2062	G58..00	Heart failure	Incident
2906	G580.11	Congestive cardiac failure	Incident
4024	G58z.00	Heart failure NOS	Incident
5255	G581000	Acute left ventricular failure	Incident
5942	G581.13	Impaired left ventricular function	Incident
7251	33BA.00	Impaired left ventricular function	Incident
8966	G5yy900	Left ventricular systolic dysfunction	Incident
9524	G580.14	Biventricular failure	Incident
10079	G580.12	Right heart failure	Incident
10154	G580.13	Right ventricular failure	Incident
11284	585f.00	Echocardiogram shows left ventricular systolic dysfunction	Incident
11351	585g.00	Echocardiogram shows left ventricular diastolic dysfunction	Incident
11424	G580300	Compensated cardiac failure	Incident
12550	G5yyA00	Left ventricular diastolic dysfunction	Incident
13189	662g.00	New York Heart Association classification - class II	Incident
15058	14A6.00	H/O: heart failure	Incident
17278	G58z.12	Cardiac failure NOS	Incident
18853	662f.00	New York Heart Association classification - class I	Incident
19066	662h.00	New York Heart Association classification - class III	Incident
22262	G1yz100	Rheumatic left ventricular failure	Incident
23707	G580000	Acute congestive heart failure	Incident
24503	8B29.00	Cardiac failure therapy	Incident
26242	ZRad.00	New York Heart Assoc classification heart failure symptoms	Incident
27884	G580200	Decompensated cardiac failure	Incident
27964	G582.00	Acute heart failure	Incident
32898	8H2S.00	Admit heart failure emergency	Incident
43618	G581.12	Pulmonary oedema - acute	Incident
46672	388D.00	New York Heart Assoc classification heart failure symptoms	Incident

51214	662i.00	New York Heart Association classification - class IV	Incident
64062	9hH1.00	Excepted heart failure quality indicators: Informed dissent	Incident
94870	G580400	Congestive heart failure due to valvular disease	Incident
9913	1O1..00	Heart failure confirmed	Prevalent
12366	662T.00	Congestive heart failure monitoring	Prevalent
12627	9N0k.00	Seen in heart failure clinic	Prevalent
17851	8HBE.00	Heart failure follow-up	Prevalent
18793	9On..00	Left ventricular dysfunction monitoring administration	Prevalent
19002	9N2p.00	Seen by community heart failure nurse	Prevalent
19380	9Or0.00	Heart failure review completed	Prevalent
30749	9hH0.00	Excepted heart failure quality indicators: Patient unsuitabl	Prevalent
30779	662W.00	Heart failure annual review	Prevalent
32671	G580100	Chronic congestive heart failure	Prevalent
32911	9Or..00	Heart failure monitoring administration	Prevalent
32945	8CL3.00	Heart failure care plan discussed with patient	Prevalent
46912	14AM.00	H/O: Heart failure in last year	Prevalent
60099	67D4.00	Heart failure information given to patient	Prevalent
60710	9On0.00	Left ventricular dysfunction monitoring first letter	Prevalent
60721	9On1.00	Left ventricular dysfunction monitoring second letter	Prevalent
69062	9N6T.00	Referred by heart failure nurse specialist	Prevalent
70619	8HHz.00	Referral to heart failure exercise programme	Prevalent
71235	8Hk0.00	Referred to heart failure education group	Prevalent
72341	9On2.00	Left ventricular dysfunction monitoring third letter	Prevalent
72386	9Or4.00	Heart failure monitoring second letter	Prevalent
72965	9Or3.00	Heart failure monitoring first letter	Prevalent
83481	9N4w.00	Did not attend heart failure clinic	Prevalent
83502	662p.00	Heart failure 6 month review	Prevalent
89650	9Or5.00	Heart failure monitoring third letter	Prevalent
90192	9Or2.00	Heart failure monitoring verbal invite	Prevalent
90193	9Or1.00	Heart failure monitoring telephone invite	Prevalent
90935	9hH..00	Exception reporting: heart failure quality indicators	Prevalent
92305	9On3.00	Left ventricular dysfunction monitoring verbal invite	Prevalent
96484	9On4.00	Left ventricular dysfunction monitoring telephone invite	Prevalent
102585	8HgD.00	Discharge from heart failure nurse service	Prevalent

From HES

ICD10 CODE	**ICD 10 TERM**
I09.9	Rheumatic heart disease, unspecified
I11.0	Hypertensive heart disease with (congestive) heart failure

I13.0	Hypertensive heart and renal disease with (congestive) heart failure
I13.2	Hypertensive heart and renal disease with both (congestive) heart failure and renal failure
I25.5	Ischaemic cardiomyopathy
I42.0	Dilated cardiomyopathy
I42.5	Other restrictive cardiomyopathy
I42.6	Alcoholic cardiomyopathy
I42.7	Cardiomyopathy due to drugs and other external agents
I42.8	Other cardiomyopathies
I42.9	Cardiomyopathy, unspecified
I43.0	Cardiomyopathy in infectious and parasitic diseases classified elsewhere
I43.1	Cardiomyopathy in metabolic diseases
I43.2	Cardiomyopathy in nutritional diseases
I43.8	Cardiomyopathy in other diseases classified elsewhere
I50.0	Congestive heart failure
I50.1	Left ventricular failure
I50.9	Heart failure, unspecified
P29.0	Neonatal cardiac failure

Supplemental Table 2: Estimated hazard ratios for each of the three HbA_{1c}-variables when modelled as linear effects to estimate time to Heart Failure event.

Adjusting covariates*	**HR**
Sex, M vs F	1.35 (1.28, 1.42)
Age, per year	1.089 (1.086, 1.092)
BMI, per unit	1.04 (1.03, 1.04)
Smoking,	
yes vs no	1.37 (1.29, 1.45)
unkown vs no	1.26 (1.14, 1.38)
SBP in quintiles, ref. class 135- <142	
<126	1.21 (1.11, 1.31)
126- <135	1.00 (0.92, 1.09)
142- <155	0.94 (0.86, 1.01)
≥ 155	1.00 (0.93, 1.09)
DBP** in quintiles, ref. class 80- <83	
<72	1.25 (1.16, 1.35)
72- <80	1.07 (0.99, 1.16)
83- <90	0.91 (0.84, 1.00)
≥ 90	0.92 (0.84, 1.00)
prior MI, yes vs no	1.86 (1.66, 2.09)
prior Stroke, yes vs no	1.30 (1.12, 1.51)
Statin, yes vs no	0.93 (0.88, 0.98)
Betablockers, yes vs no	1.25 (1.18, 1.32)
ACEi, yes vs no	1.42 (1.35, 1.50)
ARBs, yes vs no	1.27 (1.18, 1.36)
ASA, yes vs no	1.21 (1.15, 1.28)

* The HR estimates of adjusting covariates are from the model where HbA_{1c} is included as updated mean HbA_{1c}. However the adjusting covariates change very little between the three different HbA_{1c} models.