

Figure 1: The path diagram showing the relationships amongst the variables: age, sex, BMI, eGFR, loop diuretics, ACE inhibitor, log₁₀(NT-proBNP), changes in BMI, changes in eGFR and changes in log(NT-proBNP) from baseline to 12 months for the whole population. A line with one arrow represents a relationship between two variables, and the variable with the arrow pointing toward it is the dependent variable such as LogBNP_BL and LogDiff_BNP, and the other is the independent variable. The line with two arrows represents a possible correlation between the two variables. The e1, e2, e3 and e4 in circle represent error terms.

Below are abbreviations for variables used in Figure 1:

Age_BL: age at baseline;

BMI_BL: BMI at baseline;

eGFR_BL: eGFR at baseline;

ACE_BL: ACE inhibitor at baseline;

Loop_BL: loop diuretics at baseline;

LogBNP_BL: log(NT-proBNP) at baseline;

AbsoluteChangeBMI: an absolute change in BMI from baseline to 1-year;

AbsoluteChangeGFR: an absolute change in eGFR from baseline to 1-year;

LogDiff_BNP: an absolute change in NT-proBNP from baseline to 1-year, and then with a log-transformation.

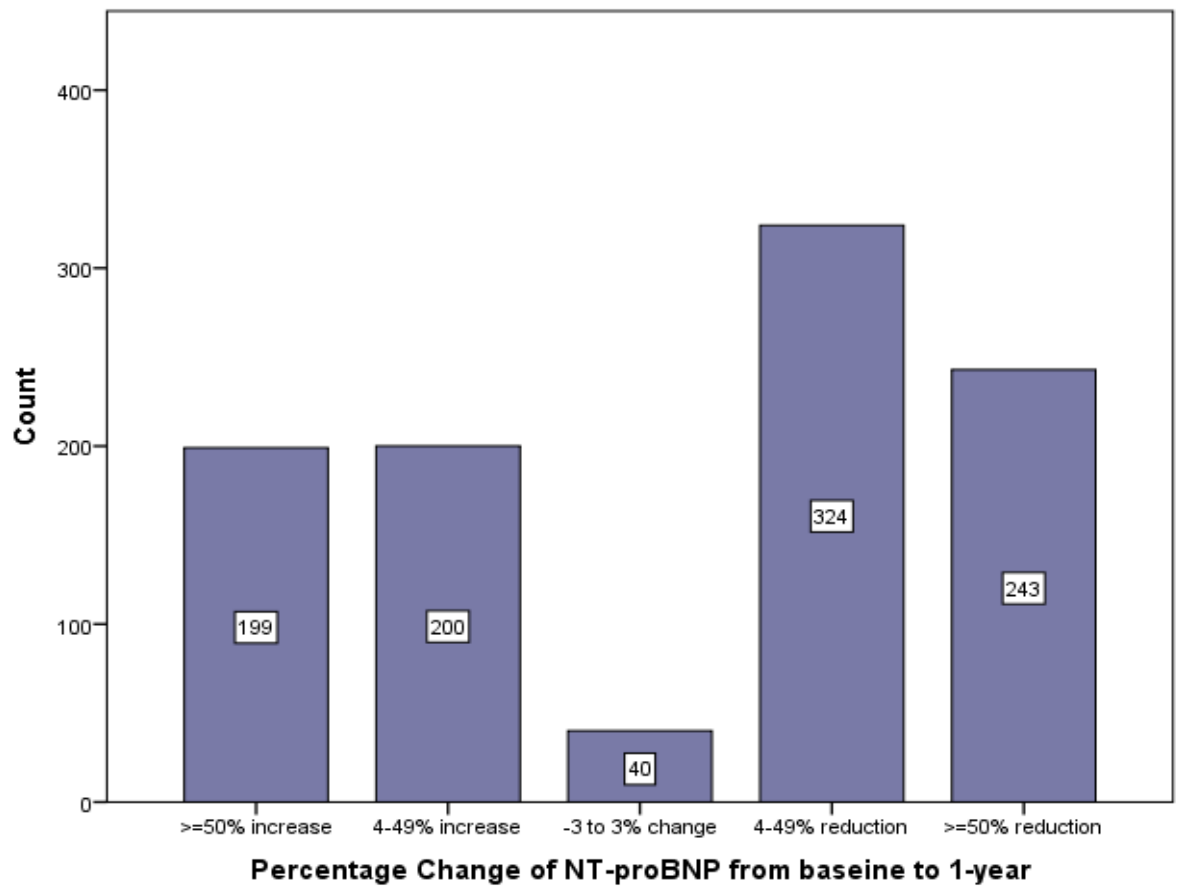


Figure 2: % changes of NT-proBNP

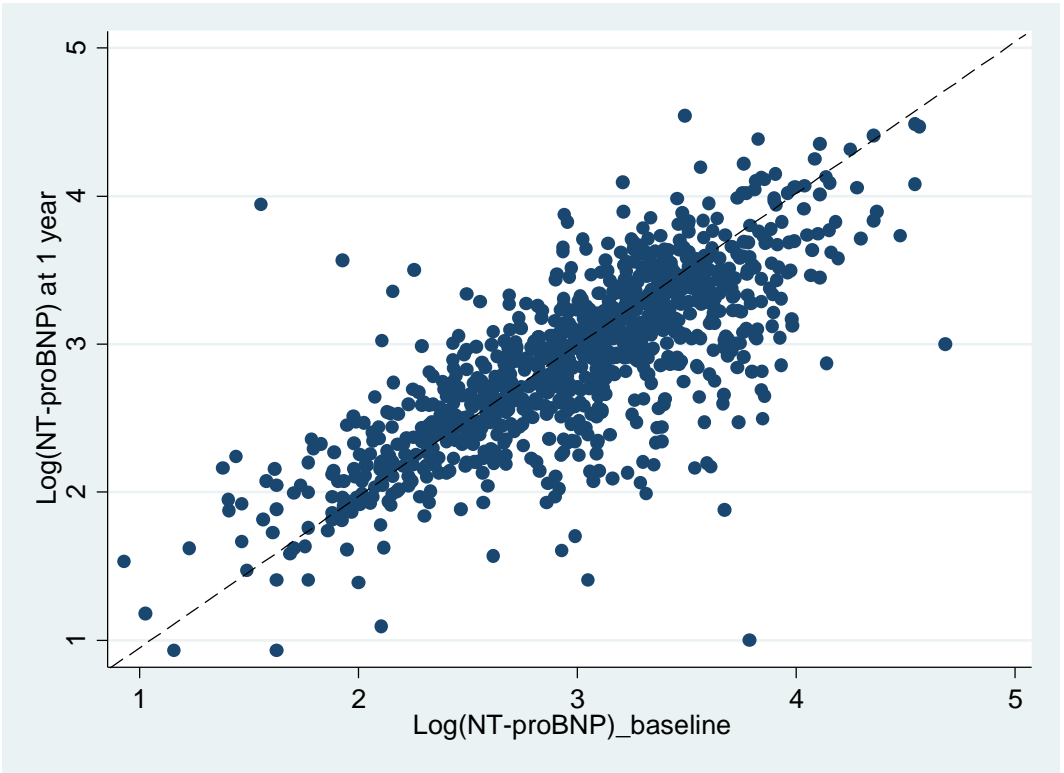


Figure 3: Scatter plot between log(NT-proBNP) at 1 year and baseline ($r=0.76$, $p<0.001$)

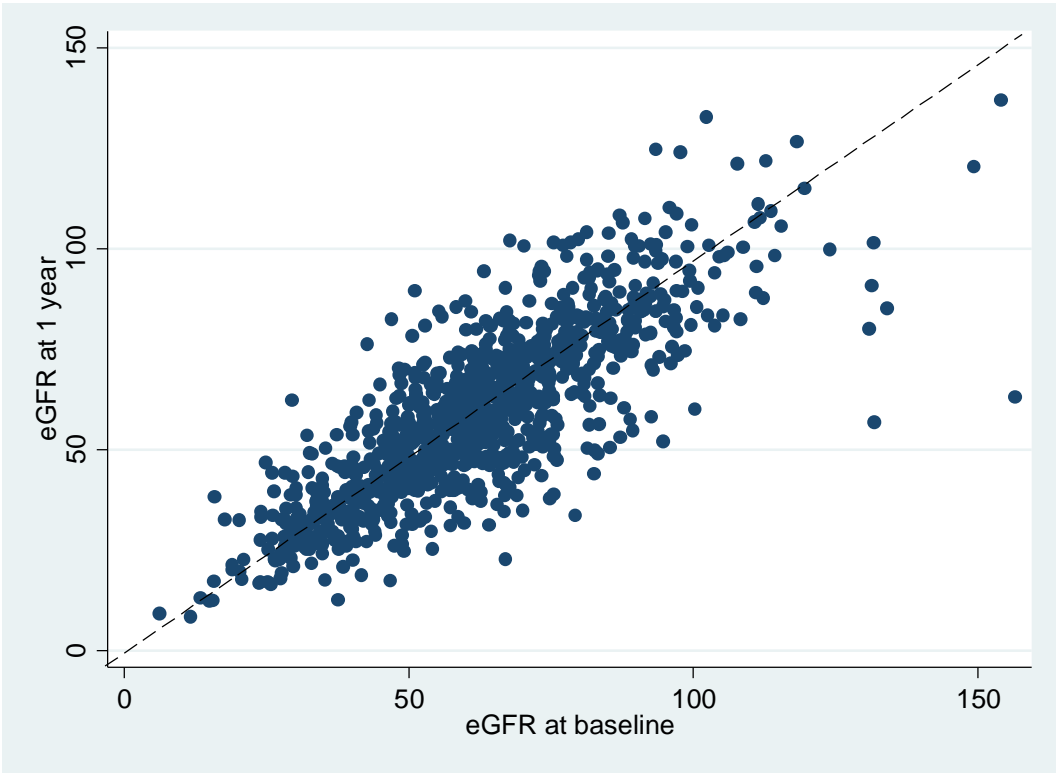


Figure 4: Scatter plot between eGFR at 1 year and baseline ($r=0.81$, $p<0.001$)

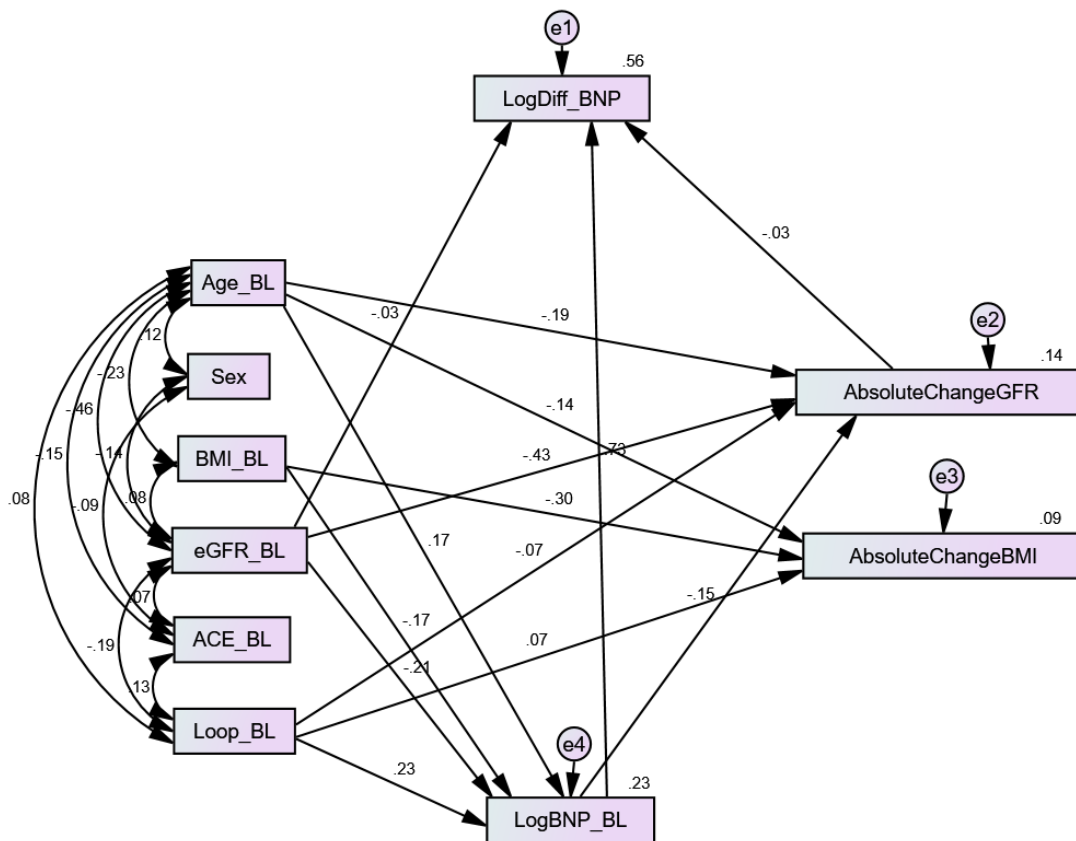


Figure 5: The significant relationships ($p < 0.05$) between changes in NT-proBNP (LogDiff_BNP) and variables: age, sex, BMI, eGFR, ACEi, loop diuretics, log(NT-proBNP), changes in BMI and changes in eGFR from baseline to 12 months apart from the relationships between changes in NT-proBNP with changes in eGFR ($p = 0.07$) and baseline eGFR ($p = 0.06$), and the relationship between taking loop diuretics and changes in eGFR ($p = 0.05$) using structure equation modelling for the whole cohort of patients ($n = 1006$). The number (a standardized regression coefficient) shows how each independent variable influences the dependent variable. The higher the value the greater the impact of the independent variable on the dependent variable. The detailed information was shown in Table 3.

Table 1: Baseline characteristics by three groups of the patients: whole population, patients with HF and patients in whom HF was refuted (not HF)

	Missing values (N)	Whole population (n=1006)	HF (n = 882)	Not HF (n =124)
Age (years)	0	72 (63-78)	72 (64-78)	70 (61-75)
Sex (male)	0	732 (73%)	651 (74%)	81 (65%)
IHD (yes)	0	625 (62%)	554 (63%)	71 (57%)
Diabetes	0	213 (21%)	187 (21%)	26 (21%)
BMI	0	27.9 (24.9-31.4)	27.8 (24.8-31.2)	29.5 (25.8-34.0)
COPD (yes)	0	106 (11%)	89 (10%)	17 (14%)
Sinus rhythm (yes)	0	630 (63%)	529 (60%)	101 (82%)
QRS width (msec)	96	108 (96-138)	111 (96-140)	97 (88-108)
NYHA class (III/IV)	0	295 (29%)	276 (31%)	19 (15%)
Systolic BP	53	132 (117-148)	131 (116-147)	139 (120-159)
Heart rate	82	69 (60-82)	70 (60-83)	64 (57-76)
LVI > Mild	0	668 (66%)	668 (76%)	0
Left atrial dimension (cm)	0	4.2 (3.8-4.8)	4.3 (3.9-4.8)	3.8 (3.5-4.3)
NT-proBNP (pg/ml)	0	1106 (423-2605)	1340 (652-2935)	162 (88-272)
NT-proBNP>400 pg/ml	0	769 (76%)	769 (87%)	0
Sodium (mmol/L)	0	139 (137-141)	139 (137-141)	140 (138-142)
Potassium (mmol/L)	3	4.4 (4.1-4.7)	4.4 (4.1-4.7)	4.4 (4.1-4.7)
Urea (mmol/L)	0	6.7 (5.2-9.0)	6.8 (5.3-9.2)	5.9 (4.5-7.6)
Creatinine (umol/L)	0	102 (86-125)	103 (87-128)	89 (80-105)
eGFR (ml/min/1.73m ²)	0	62 (49-75)	61 (48-74)	68 (60-83)
Hb (g/dL)	46	13.6 (12.5-14.7)	13.6 (12.3-14.7)	13.8 (12.9-14.7)
Loop diuretics (yes)	0	673 (67%)	621 (70%)	52 (42%)

IHD, ischaemic heart disease; BMI, body mass index; COPD, chronic obstructive pulmonary disease; NYHA class, the New York Heart association; LVI, left ventricular impairment; eGFR, estimated glomerular filtration rate; Hb, haemoglobin.

Table 2: Patients characteristics at baseline and follow up at one year with median and IQR

	All patients			Heart Failure		
	Baseline	1 year	p-value*	Baseline	1 year	p-value*
BMI	27.9 (25.0-31.4)	28.0 (25.0-31.8)	0.038	27.8 (24.8-31.2)	27.9 (24.9-31.6)	0.042
NT-proBNP (pg/ml)	1106 (423-2608)	871 (330-2003)	<0.001	1340 (652-2935)	1040 (448-2226)	<0.001
Urea (mmol/L)	6.7 (5.2-9.0)	7.1 (5.4-10.1)	<0.001	6.8 (5.3-9.2)	7.3 (5.5-10.5)	<0.001
Creatinine (umol/L)	102 (86-125)	106 (88-135)	<0.001	103 (87-128)	108 (90-137)	<0.001
eGFR (ml/min/1.73m ²)	61.9 (49.4-75.1)	58.7 (44.3-73.9)	<0.001	61.2 (47.9-74.0)	56.9 (42.8-72.6)	<0.001

*Paired t-tests were used

Table 3: The variables influencing NT-proBNP, changes in BMI, changes in eGFR and changes in NT-proBNP from baseline to 1 year using SEM method

	Baseline NT-proBNP*				Changes in NT-proBNP *				Changes in BMI				Changes in eGFR			
	Estimate d coefficie nt	S.E.	Standardi zed coefficie nt	p-value	Estimat ed coeffici ent	S.E.	Standardi zed coefficie nt	p-value	Estimat ed coeffici ent	S.E.	Standardiz ed coefficient	p-value	Estimate d coefficie nt	S.E.	Standardi zed coefficie nt	p- value
Age	0.01	0.002	0.17	<0.01	-0.003	0.002	-0.02	0.14	-0.02	0.01	-0.14	0.003	-0.23	0.04	-0.19	<0.01
Sex (male)	-0.05	0.037	-0.04	0.176	-	-	-	-	-	-	-	-	-1.08	0.86	-0.04	0.21
BMI	-0.02	0.003	-0.17	<0.01	-	-	-	-	-0.12	0.01	-0.30	<0.01	-	-	-	-
eGFR	-0.01	0.001	-0.21	<0.01	-0.002	0.001	-0.03	0.06	0.003	0.004	0.03	0.43	-0.27	0.02	-0.43	<0.01
Loop	0.28	0.036	0.23	<0.01	-0.02	0.04	-0.01	0.65	0.39	0.16	0.07	0.01	-1.65	0.85	-0.07	0.05
ACE	0.04	0.036	0.03	0.33	-	-	-	-	0.17	0.15	0.03	0.27	-1.14	0.83	-0.04	0.17
Log10(NT -proBNP)	-	-	-	-	0.97	0.03	0.73	<0.001	-0.21	0.13	-0.06	0.11	-3.29	0.71	-0.15	<0.01
Changes in BMI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Changes in eGFR	-	-	-	-	-0.002	0.001	-0.03	0.07	-	-	-	-	-	-	-	-
R ²	0.23				0.56				0.09				0.14			

* log transformation with base 10.

“ - “Assuming that there is no correlation between the two variables