

**eMethod S1. Data extraction procedures for preparing analyses datasets**

Let  $I = \{1, 2, \dots, n\}$  be the set of people included in this study.

We denote by  $c_y^i$  the health check-up for a person  $i \in I$  performed in year  $y \in Y = \{1999, 2000, \dots, 2009\}$ . Note that  $c_y^i$  may not exist for some persons  $(i, y) \in I \times Y$ . We define the set of three consecutive health check-ups as

$$S_i = \{(c_{y-1}^i, c_y^i, c_{y+1}^i) \mid 2000 \leq y \leq 2008\} \quad (i \in I).$$

Then each member of  $S_i$  is called a *sample*, and the number of all samples is given by

$$N = \sum_{i \in I} \#S_i,$$

where  $\#$  denotes cardinality. Note that  $1 \leq \#S_i \leq 9$  and  $n \leq N \leq 9n$ . Put  $S = S_1 \cup \dots \cup S_n = \{c_1, c_2, \dots, c_N\}$ .

Let  $S' = \{c_j \mid j \in J_1\}$  and  $S'' = \{c_j \mid j \in J_2\}$  (where  $J_1 \cup J_2 = \{1, 2, \dots, N\}$  and  $J_1 \cap J_2 = \emptyset$ ) be the sets of training and test samples, respectively.

Putting  $N_1 = \#S'$  and  $N_2 = \#S''$ ; we have  $n = 12977$ ,  $N = 42908$ ,  $N_1 = 32181$ , and  $N_2 = 10727$  in this study.

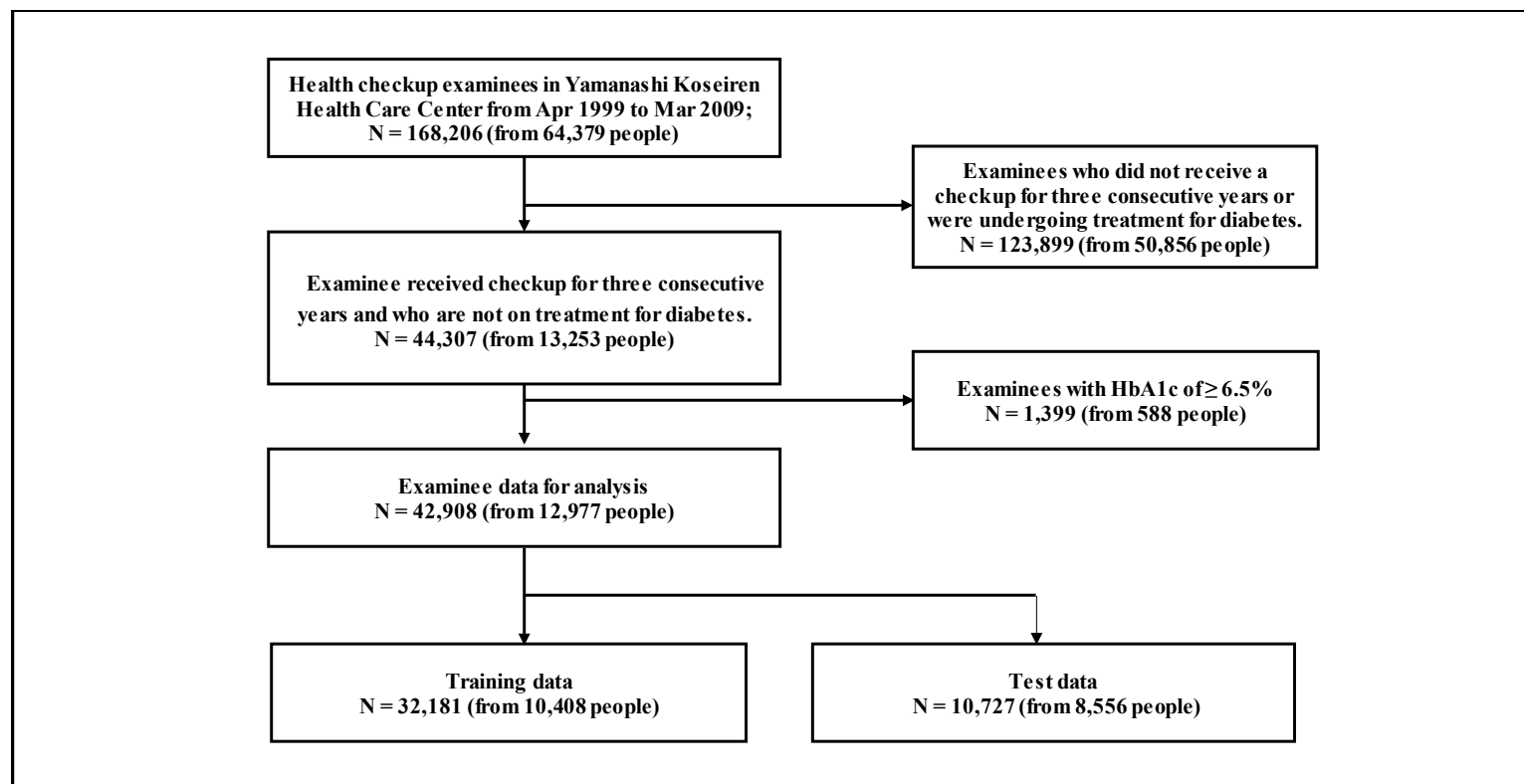
**Figure S1. Flowchart for the selection of subjects**

Table S1: Variables used in Random Forest method and multiple logistic regression models

Predictor variables	gender	age	Height	drink	smoke	Weight	weight_dif	BMI	BMI_dif	body fat	body fat_dif	WBC	WBC_dif	RBC	RBC_dif	Hb	Hb_dif	Ht	Ht_dif	MCV	
RF (all models: 97 in total)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
MLR (model 1: 59 in total)				✓	✓		✓	✓		✓	✓				✓			✓	✓	✓	
MLR (model 2: 56 in total)				✓	✓		✓	✓		✓	✓		✓						✓	✓	
MLR (model 3: 57 in total)	✓	✓		✓	✓	✓			✓			✓		✓				✓		✓	
MLR (model 4: 43 in total)		✓			✓			✓	✓			✓		✓	✓		✓	✓		✓	
MLR (model 5: 45 in total)		✓	✓			✓								✓			✓	✓		✓	
MLR (model 6: 34 in total)			✓		✓	✓								✓		✓	✓	✓	✓	✓	
vrRF (all models: 51 in total)	✓	✓	✓	✓	✓	✓		✓		✓		✓		✓		✓		✓		✓	
vrMLR (all models: 9 in total)	✓	✓			✓			✓		✓											
Predictor variables	MCV_dif	MCH	MCH_dif	MCHC	MCHC_dif	PLAT	PLAT_dif	TP	TP_dif	ALB	ALB_dif	A/G	A/G_dif	ChE	ChE_dif	T-Bil	T-Bil_dif	D-Bil	D-Bil_dif	L-Bil	
RF (all models: 97 in total)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MLR (model 1: 59 in total)	✓	✓		✓				✓			✓	✓	✓	✓	✓	✓				✓	✓
MLR (model 2: 56 in total)	✓	✓			✓				✓	✓	✓	✓	✓	✓	✓	✓				✓	✓

<b>MLR (model 3: 57 in total)</b>	✓	✓	✓		✓			✓		✓	✓		✓	✓	✓			✓		
<b>MLR (model 4: 43 in total)</b>	✓	✓		✓	✓	✓				✓	✓	✓						✓		
<b>MLR (model 5: 45 in total)</b>	✓	✓	✓	✓	✓	✓		✓					✓		✓	✓			✓	
<b>MLR (model 6: 34 in total)</b>				✓	✓	✓	✓			✓								✓		
<b>vrRF (all models: 51 in total)</b>		✓		✓		✓		✓		✓		✓		✓			✓		✓	
<b>vrMLR (all models: 9 in total)</b>																				
<b>Predictor variables</b>	<b>I-Bil_dif</b>	<b>ALP</b>	<b>ALP_dif</b>	<b>LAP</b>	<b>LAP_dif</b>	<b>GTP</b>	<b>GTP_dif</b>	<b>LDH</b>	<b>LDH_dif</b>	<b>AST</b>	<b>AST_dif</b>	<b>ALT</b>	<b>ALT_dif</b>	<b>BUN</b>	<b>BUN_dif</b>	<b>CRE</b>	<b>CRE_dif</b>	<b>UA</b>	<b>UA_dif</b>	<b>Na</b>
<b>RF (all models: 97 in total)</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>MLR (model 1: 59 in total)</b>	✓		✓			✓	✓		✓	✓	✓	✓	✓	✓		✓				✓
<b>MLR (model 2: 56 in total)</b>	✓		✓		✓	✓		✓	✓	✓	✓	✓	✓			✓				✓
<b>MLR (model 3: 57 in total)</b>	✓		✓				✓	✓	✓		✓	✓	✓		✓		✓			✓
<b>MLR (model 4: 43 in total)</b>	✓		✓								✓		✓	✓	✓		✓		✓	✓
<b>MLR (model 5: 45 in total)</b>				✓		✓					✓		✓	✓	✓		✓			✓
<b>MLR (model 6: 34 in total)</b>				✓		✓				✓		✓		✓	✓		✓			
<b>vrRF (all models: 51 in total)</b>		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓
<b>vrMLR (all models: 9 in total)</b>																				

Predictor variables	Na_dif	K	K_dif	Cl	Cl_dif	Ca	Ca_dif	CK	CK_dif	TG	TG_dif	TC	TC_dif	HDL-C	HDL-C_dif	LDL-C	LDL-C_dif	FBG	FBG_dif	HbA1c	
<b>RF (all models: 97 in total)</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>MLR (model 1: 59 in total)</b>	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
<b>MLR (model 2: 56 in total)</b>	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
<b>MLR (model 3: 57 in total)</b>	✓	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
<b>MLR (model 4: 43 in total)</b>	✓			✓	✓	✓	✓				✓				✓			✓	✓	✓	✓
<b>MLR (model 5: 45 in total)</b>	✓			✓	✓		✓			✓		✓				✓		✓	✓	✓	✓
<b>MLR (model 6: 34 in total)</b>				✓						✓		✓				✓		✓		✓	✓
<b>vrRF (all models: 51 in total)</b>		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	✓
<b>vrMLR (all models: 9 in total)</b>																		✓		✓	✓
Predictor variables	HbA1c_dif	S-BP	S-BP_dif	D-BP	D-BP_dif	FVC	FVC_dif	FEV1	FEV1_dif	P-FVC	P-FVC_dif	P-FEV1	P-FEV1_dif	CRP	CRP_dif	RF	RF_dif				
<b>RF (all models: 97 in total)</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
<b>MLR (model 1: 59 in total)</b>	✓			✓		✓		✓		✓	✓		✓				✓				
<b>MLR (model 2: 56 in total)</b>	✓							✓	✓	✓	✓			✓	✓		✓				
<b>MLR (model 3: 57 in total)</b>	✓	✓		✓		✓	✓		✓	✓	✓										

<b>MLR (model 4: 43 in total)</b>	✓	✓		✓		✓	✓												
<b>MLR (model 5: 45 in total)</b>	✓					✓	✓	✓	✓	✓		✓	✓			✓			
<b>MLR (model 6: 34 in total)</b>	✓	✓	✓				✓	✓		✓									
<b>vrRF (all models: 51 in total)</b>		✓		✓		✓		✓		✓		✓		✓		✓			
<b>vrMLR (all models: 9 in total)</b>		✓		✓															

\*The definition of each variable's abbreviation can be seen in Table S1.

\*\*RF=Random Forest; MLR=Multiple Logistic Regression; vrRF=variable restricted Random Forest (only use single year for predction); vrMLR=variable restricted Multiple Logistic Regression(only use 9 variables according to a previous study)

\*\*\*" \_dif": Change value from the previous year

**Table S2. Other characteristics of the study participants**

		Amount of HbA1c increase in the next year							
	(Unit)	All	<0	0-0.2	0.2-0.4	0.4-0.6	0.6-0.8	0.8-1.0	1.0-
<b>n</b>		42908	13459	15761	9945	2898	536	158	151
<b>WBC</b>	<b>10<sup>3</sup>/μL</b>	5.34	5.36	5.30	5.32	5.41	5.53	5.75	5.82
<b>RBC</b>	<b>10<sup>6</sup>/μL</b>	4.64	4.65	4.64	4.64	4.65	4.68	4.68	4.76
<b>Hb</b>	<b>g/dl</b>	14.16	14.15	14.14	14.15	14.20	14.37	14.49	14.76
<b>Ht</b>	<b>%</b>	42.89	42.76	42.89	42.97	43.06	43.38	43.45	44.09
<b>MCV</b>	<b>fl</b>	92.46	92.12	92.54	92.69	92.70	92.96	92.97	92.87
<b>MCH</b>	<b>pg</b>	30.51	30.48	30.50	30.51	30.55	30.77	30.99	31.05
<b>MCHC</b>	<b>%</b>	32.98	33.07	32.95	32.91	32.94	33.08	33.29	33.43
<b>PLAT</b>	<b>10<sup>4</sup>/μL</b>	231.61	232.68	231.20	230.89	233.33	228.35	225.91	209.36
<b>TP</b>	<b>g/dL</b>	7.28	7.28	7.29	7.29	7.28	7.26	7.21	7.33
<b>ALB</b>	<b>g/dL</b>	4.46	4.47	4.45	4.45	4.45	4.44	4.46	4.49
<b>A/G</b>	<b>-</b>	1.60	1.62	1.60	1.59	1.59	1.61	1.65	1.62
<b>ChE</b>	<b>U/L</b>	367.55	370.87	364.95	366.22	369.85	368.91	367.55	383.12
<b>T-Bil</b>	<b>U/L</b>	0.79	0.79	0.79	0.79	0.79	0.80	0.79	0.79
<b>D-Bil</b>	<b>U/L</b>	0.23	0.22	0.23	0.23	0.22	0.23	0.23	0.23
<b>I-Bil</b>	<b>U/L</b>	0.57	0.56	0.57	0.56	0.56	0.57	0.56	0.56
<b>ALP</b>	<b>U/L</b>	215.62	215.01	215.61	215.96	216.60	215.95	211.82	234.89
<b>LAP</b>	<b>U/L</b>	54.43	54.44	54.22	54.43	54.64	55.93	57.43	62.10
<b>LDH</b>	<b>U/L</b>	182.78	183.57	182.52	182.18	181.89	184.72	183.28	188.56

<b>AST</b>	<b>U/L</b>	22.95	23.19	22.70	22.70	23.09	24.75	26.20	30.25
<b>ALT</b>	<b>U/L</b>	23.02	23.21	22.68	22.78	23.53	25.44	28.16	34.83
<b>BUN</b>	<b>mg/dL</b>	14.73	14.81	14.69	14.70	14.65	14.72	14.58	14.25
<b>CRE</b>	<b>mg/dL</b>	0.74	0.74	0.74	0.74	0.74	0.75	0.76	0.76
<b>UA</b>	<b>mg/dL</b>	5.38	5.39	5.36	5.38	5.42	5.47	5.74	5.82
<b>Na</b>	<b>mmol/L</b>	141.00	140.95	141.04	141.02	140.96	140.91	140.72	140.52
<b>K</b>	<b>mmol/L</b>	4.29	4.30	4.28	4.28	4.30	4.33	4.31	4.35
<b>Cl</b>	<b>mmol/L</b>	104.49	104.52	104.54	104.48	104.27	104.03	104.08	103.43
<b>Ca</b>	<b>mg/dL</b>	9.28	9.27	9.29	9.29	9.28	9.24	9.24	9.30
<b>CK</b>	<b>U/L</b>	120.06	119.82	121.14	118.94	118.15	121.41	130.78	123.93
<b>TG</b>	<b>mg/dL</b>	111.81	112.28	110.32	111.28	114.06	123.64	132.59	152.62
<b>TC</b>	<b>mg/dL</b>	206.72	206.44	206.97	207.09	206.59	204.20	197.31	203.38
<b>FVC</b>	<b>ml</b>	3186.72	3152.22	3204.93	3208.53	3171.36	3166.88	3156.96	3320.13
<b>FEV1</b>	<b>-</b>	2628.52	2622.66	2636.08	2630.40	2602.04	2610.30	2662.78	2774.83
<b>P-FVC</b>	<b>%</b>	102.76	101.56	103.33	103.85	102.49	100.57	95.99	98.96
<b>P-FEV1</b>	<b>-</b>	82.88	83.55	82.64	82.41	82.53	82.95	84.49	83.65
<b>CRP</b>	<b>mg/dL</b>	0.12	0.13	0.12	0.12	0.13	0.16	0.14	0.19
<b>RF</b>	<b>IU/ml</b>	17.29	17.48	16.97	17.24	17.67	17.73	22.20	23.13

\*The definition of each variable's abbreviation can be seen in Table S1.



**Table S3. Variable importance on Random Forest models**

RF model 1			RF model 2			RF model 3		
Variables	VI	%	Variables	VI	%	Variables	VI	%
HbA1c_dif	771.17	100.00	HbA1c_dif	703.24	100.00	HbA1c_dif	195.86	100.00
HbA1c	515.21	66.81	HbA1c	292.34	41.57	FBG	104.39	53.30
RF_dif	211.83	27.47	MCV_dif	202.04	28.73	HbA1c	99.53	50.81
A/G_dif	208.26	27.01	FBG	199.76	28.41	FBG_dif	78.78	40.22
MCV_dif	194.12	25.17	RF_dif	180.80	25.71	MCV_dif	68.74	35.09
P-FEV1	179.75	23.31	MCHC_dif	176.63	25.12	CRP_dif	66.84	34.13
P-FEV1_dif	178.92	23.20	FBG_dif	175.71	24.99	PLAT	65.17	33.27
GTP	175.20	22.72	P-FEV1_dif	175.65	24.98	P-FVC	65.14	33.26
P-FVC_dif	172.94	22.43	P-FVC_dif	173.31	24.64	P-FEV1	63.77	32.56
CRP_dif	171.04	22.18	CRP_dif	171.45	24.38	ALP_dif	63.76	32.55
FBG	168.79	21.89	P-FEV1	169.30	24.07	MCHC_dif	62.94	32.13
P-FVC	167.82	21.76	P-FVC	168.31	23.93	BUN_dif	62.63	31.97
PLAT	162.82	21.11	RF	166.65	23.70	ALP	62.43	31.88
MCV	162.72	21.10	A/G_dif	165.43	23.52	TG_dif	62.37	31.84
BUN_dif	162.38	21.06	ALP_dif	162.82	23.15	TC	62.16	31.73
ALP	162.26	21.04	ALP	162.64	23.13	weight	62.09	31.70
RF	161.99	21.01	MCHC	160.20	22.78	ChE_dif	62.00	31.65
MCHC	161.46	20.94	TG_dif	159.79	22.72	P-FEV1_dif	61.81	31.56
LDH_dif	159.86	20.73	ChE_dif	159.04	22.62	ChE	61.54	31.42

A/G	159.28	20.65	BUN_dif	158.50	22.54	MCH	61.45	31.37
MCHC_dif	159.06	20.63	PLAT	158.22	22.50	PLAT_dif	61.24	31.27
HDL-C	158.92	20.61	A/G	158.11	22.48	TC_dif	61.12	31.21
TG_dif	157.86	20.47	LDH_dif	157.59	22.41	LDL-C	61.00	31.14
ALP_dif	156.65	20.31	BUN	155.85	22.16	BUN	60.96	31.12
CK_dif	156.25	20.26	HDL-C	155.78	22.15	CK	60.77	31.03
ChE	155.99	20.23	MCV	155.30	22.08	UA_dif	60.74	31.01
PLAT_dif	155.89	20.22	CK_dif	154.87	22.02	LDL-C_dif	60.10	30.69
BUN	155.78	20.20	MCH_dif	154.61	21.98	MCH_dif	59.75	30.51
CK	155.60	20.18	ChE	154.40	21.96	RF_dif	59.69	30.48
GTP_dif	153.82	19.95	CK	153.25	21.79	A/G_dif	59.64	30.45
TC	153.44	19.90	LDH	152.77	21.72	TG	59.50	30.38
LDH	153.39	19.89	TC_dif	152.74	21.72	CK_dif	59.24	30.24
height	153.33	19.88	TG	151.66	21.57	P-FVC_dif	59.04	30.15
TG	153.31	19.88	Height	151.20	21.50	MCV	59.01	30.13
weight_dif	152.76	19.81	PLAT_dif	150.37	21.38	A/G	58.55	29.90
MCH_dif	151.92	19.70	TC	150.06	21.34	RF	57.81	29.51
WBC_dif	151.68	19.67	Age	149.28	21.23	LDH	57.47	29.34
FBG_dif	151.43	19.64	GTP_dif	149.17	21.21	WBC_dif	57.47	29.34
HDL-C_dif	151.08	19.59	weight_dif	148.56	21.12	MCHC	57.44	29.33
weight	149.33	19.36	Weight	148.55	21.12	UA	57.12	29.16
LDL-C	149.29	19.36	LDL-C_dif	147.82	21.02	weight_dif	57.02	29.11

ChE_dif	148.81	19.30	LDL-C	146.20	20.79	S-BP	56.96	29.08
MCH	148.36	19.24	Ht_dif	145.83	20.74	HDL-C_dif	56.79	28.99
RBC	147.68	19.15	RBC_dif	144.90	20.60	height	56.58	28.89
WBC	147.63	19.14	WBC_dif	144.80	20.59	RBC_dif	56.24	28.71
age	147.53	19.13	UA_dif	144.42	20.54	RBC	56.24	28.71
FEV1_dif	145.99	18.93	MCH	143.92	20.47	LDH_dif	56.15	28.67
LDL-C_dif	145.95	18.93	GTP	142.85	20.31	HDL-C	56.05	28.61
FEV1	145.88	18.92	RBC	142.05	20.20	GTP_dif	55.48	28.33
FVC_dif	145.42	18.86	FVC_dif	141.37	20.10	WBC	54.88	28.02
FVC	145.17	18.82	FVC	140.70	20.01	Ht_dif	54.88	28.02
Ht	144.56	18.75	FEV1	140.65	20.00	K_dif	54.11	27.63
TC_dif	143.60	18.62	HDL-C_dif	140.22	19.94	Ht	53.82	27.48
UA	142.24	18.44	WBC	138.25	19.66	LAP	53.78	27.46
RBC_dif	141.08	18.29	Ht	136.39	19.39	FVC	52.52	26.82
UA_dif	140.74	18.25	S-BP_dif	136.11	19.36	GTP	52.15	26.62
Ht_dif	140.47	18.21	S-BP	135.42	19.26	FEV1	52.14	26.62
S-BP	135.30	17.54	UA	135.14	19.22	S-BP_dif	51.94	26.52
S-BP_dif	133.93	17.37	CRP	131.69	18.73	CRP	50.92	26.00
D-BP_dif	132.99	17.24	LAP	131.09	18.64	Ca_dif	50.54	25.81
Ca_dif	132.40	17.17	FEV1_dif	130.33	18.53	FVC_dif	50.17	25.62
LAP	132.22	17.15	K_dif	129.94	18.48	D-BP_dif	49.59	25.32
K_dif	132.13	17.13	Ca_dif	126.22	17.95	ALT_dif	49.35	25.20

Hb	130.59	16.93	ALT	124.34	17.68	Hb	49.22	25.13
CRP	130.14	16.88	ALT_dif	123.63	17.58	body fat	49.06	25.05
TP_dif	126.83	16.45	D-BP_dif	123.03	17.50	ALT	49.03	25.03
ALT	126.22	16.37	Hb	122.73	17.45	age	48.91	24.97
Hb_dif	125.36	16.26	body fat	122.36	17.40	FEV1_dif	48.89	24.96
ALT_dif	124.97	16.21	Hb_dif	122.11	17.36	D-BP	48.72	24.87
LAP_dif	123.39	16.00	D-BP	119.66	17.02	Hb_dif	48.27	24.64
body fat	122.51	15.89	TP_dif	117.33	16.68	AST	46.51	23.75
AST	122.40	15.87	AST	116.90	16.62	BMI	46.48	23.73
D-BP	120.46	15.62	LAP_dif	116.52	16.57	K	46.25	23.61
T-Bil_dif	117.72	15.26	T-Bil_dif	114.59	16.29	LAP_dif	45.82	23.39
K	117.10	15.18	AST_dif	112.92	16.06	TP_dif	45.79	23.38
AST_dif	114.32	14.82	TP	112.61	16.01	AST_dif	44.74	22.84
I-Bil_dif	114.23	14.81	I-Bil_dif	112.51	16.00	T-Bil_dif	44.40	22.67
Ca	113.34	14.70	BMI	112.36	15.98	I-Bil_dif	44.05	22.49
TP	112.30	14.56	K	107.75	15.32	TP	43.90	22.41
BMI	107.47	13.94	D-Bil_dif	106.98	15.21	Na_dif	42.13	21.51
ALB_dif	101.67	13.18	Cl_dif	105.50	15.00	Cl	41.50	21.19
Cl_dif	100.13	12.98	Ca	105.14	14.95	Ca	40.44	20.65
Na_dif	99.67	12.92	Na_dif	103.76	14.75	D-Bil_dif	39.35	20.09
T-Bil	99.04	12.84	T-Bil	98.67	14.03	ALB_dif	39.06	19.94
D-Bil_dif	98.28	12.74	ALB_dif	97.80	13.91	Cl_dif	38.97	19.90

Na	96.27	12.48	Cl	97.28	13.83	body fat_dif	38.82	19.82
Cl	94.38	12.24	I-Bil	91.35	12.99	T-Bil	38.50	19.66
I-Bil	92.56	12.00	CRE	90.86	12.92	CRE	38.40	19.61
body fat_dif	90.95	11.79	body fat_dif	88.58	12.60	ALB	37.28	19.04
ALB	90.72	11.76	ALB	87.69	12.47	CRE_dif	36.14	18.45
CRE	88.32	11.45	CRE_dif	86.38	12.28	I-Bil	35.68	18.22
CRE_dif	83.73	10.86	Na	80.86	11.50	Na	32.15	16.41
D-Bil	68.10	8.83	D-Bil	71.56	10.18	BMI_dif	29.57	15.10
BMI_dif	62.10	8.05	BMI_dif	65.11	9.26	D-Bil	25.42	12.98
drink	12.27	1.59	Drink	12.40	1.76	gender	4.40	2.25
smoke	10.75	1.39	Gender	10.70	1.52	drink	3.73	1.91
gender	10.73	1.39	Smoke	10.35	1.47	smoke	3.30	1.69

RF model 4			RF model 5			RF model 6			Total	
Variables	VI	%	Variables	VI	%	Variables	VI	%	Variables	%
HbA1c_dif	39.35	100.00	HbA1c	16.60	100.00	HbA1c	8.16	100.00	HbA1c_dif	100.00
HbA1c	38.01	96.59	HbA1c_dif	16.30	98.16	FBG	6.61	81.00	HbA1c	96.99
FBG	34.33	87.25	FBG	13.59	81.87	HbA1c_dif	6.40	78.50	FBG	79.07
FBG_dif	25.56	64.96	FBG_dif	13.30	80.11	FBG_dif	5.11	62.69	FBG_dif	59.50
ALP	17.01	43.23	ALP	7.17	43.17	weight	4.09	50.16	weight	42.22
TC	16.96	43.11	weight	6.92	41.71	ALP	3.50	42.92	ALP	41.19
weight	16.91	42.98	PLAT	6.64	40.02	TG	3.46	42.42	PLAT	38.70

CRP_dif	16.74	42.54	weight_dif	6.38	38.44	AST	3.33	40.80	CRP_dif	38.12
PLAT	16.47	41.84	CK_dif	6.20	37.37	weight_dif	3.21	39.29	ALP_dif	37.97
ChE	16.39	41.64	ALP_dif	6.18	37.25	ALP_dif	3.13	38.31	TG	37.66
RBC_dif	16.34	41.53	TG_dif	6.14	36.97	RF	3.11	38.12	weight_dif	37.39
TG_dif	16.18	41.11	RF_dif	5.77	34.76	CRP_dif	3.09	37.88	TG_dif	37.22
MCH	15.96	40.57	RBC_dif	5.67	34.17	FEV1	2.99	36.63	CK_dif	36.71
A/G	15.88	40.36	A/G_dif	5.66	34.09	PLAT	2.97	36.36	TC	36.39
LDL-C	15.77	40.07	TG	5.62	33.86	FEV1_dif	2.93	35.89	RF	36.18
CK	15.74	40.01	HDL-C	5.61	33.80	A/G	2.92	35.76	RF_dif	36.09
LDH	15.51	39.40	MCHC	5.59	33.70	CK_dif	2.89	35.46	A/G	35.89
WBC_dif	15.50	39.39	AST	5.58	33.63	RF_dif	2.89	35.39	CK	35.67
CK_dif	15.34	38.97	MCH	5.52	33.27	TG_dif	2.80	34.26	A/G_dif	35.66
height	15.24	38.74	RF	5.50	33.13	RBC	2.79	34.21	MCV_dif	35.48
P-FVC	15.20	38.63	TC	5.49	33.06	A/G_dif	2.78	34.08	RBC_dif	35.09
ChE_dif	15.16	38.54	LDL-C_dif	5.47	32.94	CK	2.78	34.07	LDL-C	34.95
TG	15.12	38.43	FVC	5.43	32.69	ALT	2.78	34.05	MCHC	34.89
weight_dif	14.99	38.09	LDH	5.40	32.51	TC	2.76	33.86	P-FVC	34.63
MCV	14.97	38.05	FEV1	5.39	32.47	LDL-C	2.74	33.59	ChE	34.48
ALP_dif	14.94	37.97	CK	5.36	32.31	body fat_dif	2.68	32.90	MCHC_dif	34.28
UA_dif	14.89	37.84	MCV	5.32	32.03	FVC	2.67	32.77	height	34.20
Ca_dif	14.86	37.76	CRP_dif	5.23	31.51	MCHC	2.64	32.40	FEV1	34.09
MCHC	14.75	37.48	A/G	5.21	31.37	BMI	2.64	32.38	WBC_dif	34.06

P-FEV1_dif	14.68	37.31	GTP_dif	5.20	31.30	height	2.62	32.13	LDH	33.95
BUN	14.68	37.31	P-FVC	5.19	31.28	WBC_dif	2.61	32.02	HDL-C	33.89
A/G_dif	14.57	37.02	height	5.18	31.18	RBC_dif	2.61	32.00	AST	33.85
RBC	14.56	36.99	Ca	5.17	31.17	MCHC_dif	2.61	31.98	LDL-C_dif	33.82
MCV_dif	14.55	36.98	FEV1_dif	5.17	31.14	GTP_dif	2.61	31.94	MCV	33.76
P-FEV1	14.45	36.72	TC_dif	5.16	31.09	HDL-C	2.56	31.33	RBC	33.55
RF	14.18	36.03	ALT	5.15	31.00	LDL-C_dif	2.53	30.96	GTP_dif	33.41
K_dif	14.11	35.87	WBC_dif	5.06	30.49	Ht_dif	2.47	30.28	BUN	33.33
GTP_dif	14.07	35.75	MCV_dif	5.05	30.43	BUN	2.43	29.74	MCH	33.15
MCHC_dif	13.93	35.40	LDL-C	5.04	30.35	ChE	2.37	29.04	TC_dif	33.15
TC_dif	13.92	35.37	ChE	5.01	30.15	AST_dif	2.36	28.88	FVC	33.02
BUN_dif	13.89	35.30	UA_dif	4.96	29.86	LDH	2.35	28.83	P-FEV1	32.85
LDL-C_dif	13.84	35.18	S-BP	4.95	29.79	ALT_dif	2.35	28.75	P-FEV1_dif	32.65
HDL-C	13.83	35.16	ALT_dif	4.84	29.15	MCV	2.34	28.67	P-FVC_dif	32.46
FEV1	13.79	35.04	WBC	4.81	29.00	TC_dif	2.33	28.56	ChE_dif	32.43
P-FVC_dif	13.76	34.97	GTP	4.80	28.90	MCV_dif	2.32	28.49	FEV1_dif	32.22
ALT_dif	13.73	34.90	RBC	4.71	28.37	P-FVC	2.31	28.37	ALT	31.96
GTP	13.66	34.72	AST_dif	4.70	28.32	S-BP	2.30	28.24	Ht_dif	31.94
RF_dif	13.64	34.67	MCHC_dif	4.70	28.29	body fat	2.26	27.73	UA_dif	31.90
Ht_dif	13.57	34.49	Ca_dif	4.69	28.28	CRP	2.24	27.50	PLAT_dif	31.64
WBC	13.54	34.42	TP	4.67	28.14	FVC_dif	2.24	27.47	S-BP	31.61
S-BP	13.40	34.04	BUN	4.66	28.05	P-FVC_dif	2.22	27.18	BUN_dif	30.85

FVC	13.37	33.98	ChE_dif	4.66	28.04	P-FEV1	2.19	26.80	GTP	30.75
MCH_dif	13.33	33.87	P-FEV1_dif	4.65	28.02	PLAT_dif	2.18	26.76	ALT_dif	30.72
PLAT_dif	13.32	33.85	Hb	4.64	27.92	Hb_dif	2.17	26.64	WBC	30.45
TP	13.13	33.36	P-FVC_dif	4.63	27.90	Hb	2.15	26.31	UA	30.34
HDL-C_dif	13.11	33.31	Ht_dif	4.62	27.83	Ht	2.14	26.27	MCH_dif	30.21
AST	13.05	33.15	UA	4.61	27.75	GTP	2.14	26.26	K_dif	30.03
S-BP_dif	13.04	33.13	PLAT_dif	4.58	27.61	UA	2.14	26.23	FVC_dif	29.64
UA	13.01	33.05	age	4.57	27.54	Ca	2.11	25.91	BMI	29.60
ALT	12.94	32.89	BMI	4.53	27.30	TP	2.09	25.59	Ht	29.36
LDH_dif	12.75	32.40	D-BP_dif	4.50	27.12	P-FEV1_dif	2.09	25.55	LDH_dif	29.35
Ht	12.48	31.71	BUN_dif	4.50	27.11	K_dif	2.08	25.52	Ca_dif	29.25
Ca	12.46	31.67	HDL-C_dif	4.46	26.84	ChE_dif	2.08	25.49	Hb	28.97
I-Bil_dif	12.39	31.49	K_dif	4.44	26.75	WBC	2.08	25.46	HDL-C_dif	28.96
FVC_dif	12.22	31.06	P-FEV1	4.44	26.73	LAP	2.07	25.38	AST_dif	28.88
body fat	12.21	31.03	LDH_dif	4.42	26.63	UA_dif	2.05	25.12	LAP	28.80
Hb	12.18	30.94	LAP	4.38	26.37	MCH	2.04	25.06	body fat	28.74
FEV1_dif	12.14	30.85	FVC_dif	4.37	26.30	Cl	2.00	24.52	S-BP_dif	28.71
Hb_dif	12.14	30.85	S-BP_dif	4.37	26.29	MCH_dif	1.98	24.30	CRP	28.65
LAP	11.98	30.46	LAP_dif	4.33	26.08	TP_dif	1.96	24.08	TP	28.32
CRP	11.95	30.36	MCH_dif	4.22	25.42	LAP_dif	1.95	23.94	Hb_dif	28.12
TP_dif	11.89	30.22	D-BP	4.21	25.35	D-BP	1.95	23.88	Ca	28.11
D-BP	11.88	30.19	Ht	4.14	24.91	S-BP_dif	1.94	23.82	age	27.24



T-Bil_dif	11.87	30.17	Cl	4.13	24.90	BUN_dif	1.91	23.36	D-BP	27.21
AST_dif	11.87	30.16	CRE_dif	4.13	24.86	I-Bil_dif	1.90	23.23	D-BP_dif	27.09
BMI	11.68	29.67	body fat	4.11	24.73	LDH_dif	1.88	23.03	body fat_dif	26.62
D-BP_dif	11.56	29.39	body fat_dif	3.97	23.91	Ca_dif	1.86	22.84	LAP_dif	26.48
age	11.10	28.22	Hb_dif	3.95	23.81	D-BP_dif	1.84	22.54	TP_dif	26.37
K	11.10	28.20	I-Bil_dif	3.91	23.53	HDL-C_dif	1.83	22.38	I-Bil_dif	26.17
LAP_dif	10.87	27.62	CRP	3.81	22.93	T-Bil_dif	1.82	22.29	T-Bil_dif	25.44
Cl	10.45	26.55	T-Bil_dif	3.80	22.87	age	1.81	22.16	Cl	25.24
D-Bil_dif	10.36	26.33	TP_dif	3.75	22.56	CRE_dif	1.67	20.51	K	23.08
T-Bil	10.24	26.02	D-Bil_dif	3.63	21.89	Na	1.66	20.34	D-Bil_dif	22.86
ALB	9.90	25.15	ALB	3.54	21.33	CRE	1.61	19.73	CRE_dif	22.27
body fat_dif	9.74	24.76	Na	3.50	21.09	D-Bil_dif	1.55	18.95	CRE	21.62
Cl_dif	9.50	24.14	CRE	3.30	19.86	Cl_dif	1.52	18.63	ALB	21.58
I-Bil	9.47	24.07	ALB_dif	3.24	19.54	ALB	1.52	18.57	Na_dif	21.56
CRE	9.45	24.01	K	3.18	19.14	Na_dif	1.50	18.43	T-Bil	21.50
ALB_dif	9.32	23.68	T-Bil	3.07	18.51	T-Bil	1.50	18.39	Cl_dif	21.49
Na_dif	9.24	23.49	Na_dif	3.07	18.49	K	1.50	18.33	Na	20.74
CRE_dif	9.13	23.19	Cl_dif	3.02	18.18	I-Bil	1.39	17.05	ALB_dif	20.69
Na	8.77	22.30	I-Bil	2.79	16.82	ALB_dif	1.34	16.37	I-Bil	19.96
BMI_dif	7.32	18.60	D-Bil	2.59	15.60	BMI_dif	1.31	16.02	BMI_dif	16.48
D-Bil	6.72	17.08	BMI_dif	2.54	15.27	D-Bil	1.16	14.25	D-Bil	15.50
gender	1.23	3.14	gender	0.46	2.74	gender	0.21	2.62	gender	2.75

smoke	0.78	1.98	drink	0.26	1.54	drink	0.10	1.17	drink	1.93
drink	0.77	1.96	smoke	0.23	1.39	smoke	0.09	1.05	smoke	1.78

\*The definition of each variable's abbreviation can be seen in Table S1. \*\*"\_dif": Change value from previous year

Table S4. Standard partial regression coefficient on multiple logistic regression models

MLR model 1			MLR model 2			MLR model 3		
Variables	SRC	%	Variables	SRC	%	Variables	SRC	%
MCH	-4.32	100.00	HbA1c_dif	1.19	100.00	MCH	5.02	100.00
MCV	3.56	82.51	HbA1c	-1.00	84.58	MCHC	-2.67	53.22
MCHC	1.49	34.45	FBG	0.96	81.28	MCV	-2.65	52.74
HbA1c	-1.42	32.99	TC	0.90	75.71	Ht	-2.33	46.50
Ht_dif	1.42	32.91	ALB_dif	-0.85	71.44	RBC	2.19	43.68
TC	1.33	30.70	MCH	-0.80	67.30	FVC	-2.15	42.79
LDL-C	-1.13	26.25	LDL-C	-0.75	63.27	MCH_dif	2.08	41.51
HbA1c_dif	1.07	24.72	MCV	0.69	58.37	MCV_dif	-1.98	39.42
FBG	0.89	20.58	HDL-C	-0.61	51.13	HbA1c_dif	1.87	37.30
HDL-C	-0.84	19.40	A/G_dif	0.52	43.56	FBG	1.60	31.94
RBC_dif	-0.70	16.22	TP_dif	0.49	41.63	MCHC_dif	-1.54	30.69
Hb_dif	-0.51	11.86	ALB	-0.44	37.00	P-FVC	1.15	22.94
FEV1	-0.48	11.15	Cl	-0.44	36.95	Cl	-1.02	20.29
TG	-0.46	10.72	FEV1	-0.36	30.71	gender	0.90	17.90
ALB_dif	-0.46	10.70	FBG_dif	0.36	30.47	TC	0.84	16.73
TP	-0.46	10.55	TG	-0.34	28.26	HbA1c	-0.81	16.19
Cl	-0.45	10.51	P-FVC_dif	-0.28	23.79	LDL-C	-0.77	15.45
MCV_dif	-0.45	10.49	D-Bil_dif	0.26	22.13	ALB	-0.73	14.57
A/G	-0.38	8.75	ALT	0.25	21.49	Na_dif	0.66	13.11

ALT	0.34	7.83	Na_dif	0.25	21.09	Na	0.63	12.59
FBG_dif	0.30	6.91	BMI	0.23	19.79	age	-0.63	12.48
AST	-0.30	6.89	Cl_dif	-0.22	18.79	weight	0.62	12.36
T-Bil	-0.29	6.75	Na	0.21	17.95	FVC_dif	-0.58	11.46
AST_dif	-0.28	6.38	AST_dif	-0.21	17.30	Cl_dif	-0.52	10.39
Na	0.27	6.31	AST	-0.19	15.93	HDL-C	-0.50	9.99
Cl_dif	-0.27	6.20	P-FVC	0.19	15.71	ALB_dif	-0.43	8.50
Na_dif	0.26	5.94	body fat	-0.18	15.47	D-Bil_dif	0.41	8.11
A/G_dif	0.25	5.72	I-Bil_dif	-0.18	14.95	HDL-C_dif	0.39	7.77
BMI	0.25	5.71	ALT_dif	0.17	14.36	TG	-0.32	6.41
I-Bil	0.21	4.95	Ca	0.16	13.59	AST_dif	-0.32	6.40
CRE	-0.21	4.91	Smoke	0.16	13.30	FEV1_dif	0.32	6.40
ALT_dif	0.21	4.79	TC_dif	0.15	12.50	I-Bil_dif	-0.31	6.25
P-FVC	0.20	4.70	ALP_dif	0.14	11.95	TC_dif	0.30	6.06
body fat	-0.20	4.56	HDL-C_dif	0.14	11.67	S-BP	0.28	5.49
FVC	0.19	4.40	CRE	-0.13	11.18	ALP_dif	0.25	4.94
Ca	0.18	4.27	ChE	0.13	10.79	smoke	0.24	4.87
HDL-C_dif	0.15	3.47	Drink	-0.11	9.58	K_dif	0.23	4.63
D-Bil_dif	0.14	3.26	Ht_dif	0.11	9.53	Ca_dif	-0.23	4.63
CK	0.13	2.95	CK	0.11	9.13	A/G_dif	0.22	4.41
TC_dif	0.12	2.87	weight_dif	-0.10	8.84	CRE_dif	0.21	4.12
ALP_dif	0.12	2.84	MCV_dif	-0.10	8.62	D-BP	-0.20	4.05

smoke	0.11	2.63	LAP_dif	-0.10	8.28	FBG_dif	0.19	3.88
K	-0.11	2.53	T-Bil	-0.10	8.11	ALT_dif	0.19	3.75
P-FVC_dif	-0.11	2.52	FEV1_dif	0.09	7.87	ChE	0.19	3.73
GTP	0.10	2.26	body fat_dif	-0.09	7.55	ALT	0.18	3.54
TG_dif	0.09	2.14	LDH	-0.08	6.86	T-Bil	-0.18	3.54
I-Bil_dif	-0.09	2.07	CK_dif	0.08	6.86	LDH	-0.17	3.43
Ht	0.09	2.06	LDH_dif	0.08	6.63	TP	-0.17	3.38
P-FEV1_dif	0.09	1.99	MCHC_dif	-0.07	6.08	WBC	0.17	3.36
LDH_dif	0.08	1.96	RF_dif	-0.07	5.53	K	0.17	3.35
CK_dif	0.08	1.94	CRP_dif	-0.06	5.07	BMI_dif	-0.16	3.15
drink	-0.08	1.88	TG_dif	0.06	4.70	BUN_dif	-0.15	3.04
D-BP	-0.08	1.83	K	-0.05	4.59	LDH_dif	0.15	2.94
weight_dif	-0.08	1.82	CRP	-0.05	4.47	ChE_dif	-0.14	2.77
RF_dif	-0.08	1.82	GTP	0.05	4.41	TG_dif	0.13	2.54
GTP_dif	-0.07	1.58	WBC_dif	-0.04	3.70	drink	-0.12	2.49
body fat_dif	-0.05	1.23				GTP_dif	-0.12	2.32
ChE_dif	-0.05	1.23						
BUN	-0.05	1.21						

MLR model 4			MLR model 5			MLR model 6			Total	
Variables	SRC	%	Variables	SRC	%	Variables	SRC	%	Variables	%
MCH	25.98	100.00	MCH	78.88	100.00	Ht	-144.72	100.00	MCH	100.00

MCV	-16.09	61.93	MCV	-51.05	64.73	Hb	115.82	80.03	MCV	72.56
MCHC	-12.00	46.19	MCHC	-36.48	46.25	Hb_dif	47.55	32.86	MCHC	43.58
RBC	7.80	30.03	FEV1	26.49	33.58	Ht_dif	-44.73	30.91	Ht	43.22
Ht	-7.55	29.07	MCH_dif	26.01	32.97	RBC	42.88	29.63	HbA1c_dif	39.08
Hb_dif	6.38	24.55	FVC	-23.29	29.53	MCHC	-34.11	23.57	HbA1c	33.61
RBC_dif	-5.32	20.47	MCV_dif	-22.31	28.29	MCV	27.19	18.79	FBG	32.58
MCV_dif	-3.85	14.81	MCHC_dif	-20.43	25.90	MCHC_dif	-21.59	14.92	TC	29.48
HbA1c_dif	3.33	12.84	Ht	-19.21	24.36	HbA1c	11.89	8.21	RBC	27.06
Cl	-2.75	10.57	RBC	18.23	23.11	TC	-9.69	6.70	LDL-C	25.06
MCHC_dif	-2.73	10.51	FVC_dif	-10.61	13.46	LDL-C	9.04	6.24	ALB_dif	20.32
FBG	2.66	10.25	T-Bil	-8.28	10.49	weight	8.86	6.12	MCHC_dif	18.85
ALB	-1.71	6.58	FEV1_dif	7.65	9.70	height	-7.42	5.13	Cl	18.61
HbA1c	1.59	6.11	HbA1c	7.10	9.00	LAP	7.33	5.07	FVC	17.30
Cl_dif	-1.41	5.44	I-Bil	6.86	8.70	CRE_dif	5.46	3.77	HDL-C	17.23
Na_dif	1.39	5.35	P-FEV1	-6.83	8.66	FBG	5.32	3.67	Hb	17.13
Na	1.31	5.04	TC	-6.24	7.91	P-FVC	-4.66	3.22	FEV1	16.81
BUN_dif	-1.27	4.88	height	-5.51	6.98	GTP	-4.60	3.18	Ht_dif	15.70
HDL-C_dif	1.26	4.85	P-FVC	-4.87	6.17	Cl	-4.59	3.17	Hb_dif	15.32
age	-1.23	4.74	weight	4.73	6.00	S-BP_dif	-4.59	3.17	MCV_dif	13.31
AST_dif	-1.07	4.12	LDL-C	4.65	5.89	FEV1	4.50	3.11	ALB	12.44
FVC	-1.07	4.11	P-FEV1_dif	-4.54	5.75	PLAT	-3.94	2.72	A/G_dif	11.49
BMI	1.03	3.95	Cl	-4.33	5.49	BUN_dif	-3.75	2.59	P-FVC	11.28

I-Bil_dif	-0.92	3.56	HbA1c_dif	4.26	5.40	smoke	3.61	2.50	TG	10.56
Ca	-0.89	3.42	FBG	3.56	4.52	BUN	-3.60	2.49	Na_dif	10.48
smoke	0.89	3.42	BUN_dif	-3.38	4.28	HbA1c_dif	3.39	2.35	Na	9.50
Ca_dif	-0.77	2.98	BUN	-3.28	4.16	S-BP	-3.38	2.33	Cl_dif	9.37
BUN	-0.77	2.95	CRE_dif	3.26	4.14	ALT	-3.18	2.19	TP_dif	8.91
ALT_dif	0.77	2.95	LAP	3.08	3.91	AST	3.13	2.16	FBG_dif	8.78
UA_dif	0.76	2.93	Na_dif	2.77	3.52	TG	2.66	1.84	D-Bil_dif	8.05
ALB_dif	-0.66	2.53	AST_dif	-2.74	3.48	ALB_dif	-2.58	1.78	RBC_dif	7.85
D-BP	-0.65	2.48	ALT_dif	2.50	3.16	FVC_dif	-2.54	1.75	ALT	7.50
CRE_dif	0.64	2.47	TP	-2.49	3.16	D-Bil_dif	2.50	1.72	MCH_dif	7.06
D-Bil_dif	0.62	2.40	age	-2.38	3.02	PLAT_dif	2.44	1.68	AST_dif	6.69
S-BP	0.61	2.35	GTP	-2.37	3.00				BMI	6.30
BMI_dif	-0.60	2.32	Cl_dif	-2.34	2.97				ALT_dif	6.21
FVC_dif	-0.57	2.20	ChE	-2.31	2.93				T-Bil	6.18
FBG_dif	-0.57	2.19	PLAT	-2.15	2.73				FVC_dif	6.18
A/G	0.54	2.09	Na	1.97	2.50				HDL-C_dif	5.94
WBC	0.51	1.97	Ca_dif	-1.88	2.38				I-Bil_dif	5.74
PLAT	-0.50	1.92	Hb_dif	1.82	2.31				P-FVC_dif	5.63
ALP_dif	0.45	1.73	TG	1.66	2.10				AST	5.35
TG_dif	0.34	1.33	T-Bil_dif	-1.50	1.90				weight	5.24
			FBG_dif	-1.15	1.45				FEV1_dif	5.13
			RF	1.00	1.27				ALP_dif	4.59

									TC_dif	4.59
									Ca	4.55
									age	4.33
									gender	3.83
									ChE	3.73
									CRE	3.44
									BUN_dif	3.17
									CRE_dif	3.10
									TP	2.93
									I-Bil	2.92
									GTP	2.75
									height	2.59
									CK	2.59
									LDH_dif	2.47
									A/G	2.32
									BUN	2.31
									TG_dif	2.29
									weight_dif	2.28
									K	2.24
									LDH	2.20
									S-BP	2.18
									Ca_dif	2.14



									LAP	1.92
									CK_dif	1.88
									P-FEV1	1.85
									D-BP	1.79
									LAP_dif	1.77
									P-FEV1_dif	1.66
									PLAT	1.58
									RF_dif	1.57
									BMI_dif	1.17
									WBC	1.14
									CRP_dif	1.09
									K_dif	0.99
									CRP	0.96
									ChE_dif	0.86
									GTP_dif	0.84
									WBC_dif	0.79
									S-BP_dif	0.68
									UA_dif	0.63
									T-Bil_dif	0.41
									PLAT_dif	0.36
									RF	0.27

\*The definition of each variable's abbreviation can be seen in Table S1. \*\*"\_dif": Change value from previous year