

Supplement Table 1: Trajectory model selection

Number of groups	Selected (Yes/No)	Selection criteria for the group number			
		BIC	Parsimony	Group membership $\geq 1\%$ in all groups	Distinctive features
1	No		+	+	
2	No		+	+	
3	No		+	+	+
4	Yes	+		+	++
5	No	+		+	++
6	No	+		Cannot convergence	Cannot convergence

*Supplement Table 2: Number of cancer incidences during 2008-2015*

<b>Cancer types</b>	<b>ICD-10</b>	<b>N (%)</b>
Lip, oral cavity, and pharynx	C00-14	215(1.13)
Esophagus	C15	199(1.05)
Stomach	C16	3266(17.20)
Colon and rectum	C18-20	2548(13.44)
Liver	C22	1419(7.48)
Gallbladder and biliary tract	C23-24	483(2.54)
Pancreas	C25	511(2.69)
Larynx	C32	151(0.80)
Lung	C33-34	2055(10.82)
Kidney	C64	356(1.87)
Bladder	C67	529(2.78)
Brain	C70-72	189(1.00)
Thyroid gland	C73	2397(12.61)
Hodgkin lymphoma	C81	12(0.06)
Non-Hodgkin lymphoma	C82-86,96	360(1.90)
Multiple myeloma, malignant plasma cell neoplasms	C90	133(0.70)
Leukemia	C91-95	183(0.96)
Others	Others	3985(20.99)
<b>Total</b>	<b>C00-97</b>	<b>18991</b>

ICD-10, the International Classification of Diseases 10<sup>th</sup> Revision

Supplement Table 3: Adjusted hazard ratios<sup>a</sup> (95% confidence interval) for the association between FBG trajectories and the cancer risk.

Cancer types	Fasting blood glucose trajectories				
	Groups	Case	aHR (95% CI) <sup>1</sup>	aHR (95% CI) <sup>2</sup>	aHR (95% CI) <sup>3</sup>
Esophagus cancer	Low-stable	165	Reference	Reference	Reference
	Elevated-stable	22	1.17 (0.75,1.82)	1.12 (0.71,1.76)	1.60 (0.94,2.73)
	Elevated-high	3	0.67 (0.21,2.09)	0.23 (0.03,1.62)	0.29 (0.04,2.10)
	High-stable	9	1.12 (0.57,2.19)	1.12 (0.57,2.19)	1.49 (0.59,3.80)
Colorectal cancer	Low-stable	2115	Reference	Reference	Reference
	Elevated-stable	264	1.24 (1.09,1.41)	1.25 (1.10,1.42)	1.17 (0.99,1.38)
	Elevated-high	52	1.00 (0.76,1.32)	0.97 (0.73,1.30)	0.88 (0.64,1.21)
	High-stable	117	1.27 (1.05,1.53)	1.24 (1.03,1.51)	1.06 (0.81,1.38)
Gallbladder & biliary tract cancer	Low-stable	397	Reference	Reference	Reference
	Elevated-stable	56	1.35 (1.02,1.79)	1.26 (0.94,1.68)	1.2 (0.82,1.76)
	Elevated-high	13	1.32 (0.76,2.30)	1.25 (0.71,2.23)	1.47 (0.83,2.61)
	High-stable	17	0.97 (0.60,1.58)	0.99 (0.61,1.61)	0.72 (0.36,1.45)
Larynx cancer	Low-stable	126	Reference	Reference	Reference
	Elevated-stable	11	0.76 (0.41,1.42)	0.80 (0.43,1.47)	0.71 (0.32,1.57)
	Elevated-high	5	1.44 (0.59,3.52)	1.49 (0.61,3.65)	1.28 (0.45,3.63)
	High-stable	9	1.45 (0.74,2.85)	1.47 (0.75,2.89)	1.34 (0.51,3.50)
Lung cancer	Low-stable	1740	Reference	Reference	Reference
	Elevated-stable	192	1.00 (0.86,1.16)	1.00 (0.86,1.17)	0.96 (0.79,1.17)
	Elevated-high	40	0.88 (0.64,1.20)	0.86 (0.62,1.18)	0.86 (0.61,1.22)
	High-stable	83	1.03 (0.82,1.28)	1.01 (0.80,1.26)	0.94 (0.70,1.27)
Kidney cancer	Low-stable	305	Reference	Reference	Reference
	Elevated-stable	36	1.26 (0.89,1.78)	1.27 (0.89,1.80)	1.15 (0.73,1.81)
	Elevated-high	6	0.84 (0.37,1.89)	0.88 (0.39,1.98)	0.45 (0.14,1.44)
	High-stable	9	0.72 (0.37,1.39)	0.74 (0.38,1.44)	0.68 (0.29,1.58)

<b>Bladder cancer</b>	Low-stable	455	Reference	Reference	Reference
	Elevated-stable	44	0.86 (0.63,1.18)	0.80 (0.58,1.12)	0.90 (0.61,1.35)
	Elevated-high	10	0.82 (0.44,1.54)	0.87 (0.47,1.63)	0.64 (0.29,1.46)
	High-stable	20	0.93 (0.59,1.45)	0.92 (0.58,1.45)	1.33 (0.72,2.46)
<b>Brain cancer</b>	Low-stable	165	Reference	Reference	Reference
	Elevated-stable	16	1.01 (0.60,1.69)	1.06 (0.63,1.78)	1.34 (0.72,2.49)
	Elevated-high	5	1.29 (0.53,3.15)	1.38 (0.57,3.36)	1.65 (0.66,4.14)
	High-stable	3	0.44 (0.14,1.37)	0.47 (0.15,1.46)	0.44 (0.09,2.02)
<b>Thyroid cancer</b>	Low-stable	2204	Reference	Reference	Reference
	Elevated-stable	130	1.03 (0.86,1.23)	1.03 (0.86,1.24)	1.02 (0.81,1.29)
	Elevated-high	21	0.65 (0.42,0.99)	0.62 (0.39,0.97)	0.64 (0.40,1.03)
	High-stable	42	0.74 (0.55,1.01)	0.69 (0.50,0.96)	0.74 (0.50,1.11)
<b>Hodgkin lymphoma</b>	Low-stable	9	Reference	Reference	Reference
	Elevated-stable	2	2.36 (0.50,11.08)	2.35 (0.49,11.17)	2.88 (0.47,17.66)
	Elevated-high	0	n/a	n/a	n/a
	High-stable	1	2.72 (0.34,21.63)	2.65 (0.33,21.3)	2.05 (0.12,36.70)
<b>Non-Hodgkin lymphoma</b>	Low-stable	311	Reference	Reference	Reference
	Elevated-stable	26	0.90 (0.60,1.34)	0.94 (0.63,1.41)	0.81 (0.48,1.37)
	Elevated-high	9	1.26 (0.65,2.45)	1.33 (0.69,2.58)	1.37 (0.66,2.83)
	High-stable	14	1.11 (0.65,1.90)	1.08 (0.62,1.88)	0.93 (0.43,1.99)
<b>Leukemia</b>	Low-stable	157	Reference	Reference	Reference
	Elevated-stable	20	1.33(0.83,2.12)	1.32 (0.82,2.14)	1.38 (0.74,2.57)
	Elevated-high	4	1.09(0.40,2.93)	1.14 (0.42,3.08)	0.99 (0.31,3.19)
	High-stable	2	0.31(0.08,1.24)	0.16 (0.02,1.14)	0.19 (0.02,1.55)

aHR, adjusted hazard ratios.

CI, confidence interval.

<sup>1</sup> Adjusted for age, sex.

<sup>2</sup> Adjusted for age, sex, smoking behaviors, alcohol consumption.

<sup>3</sup> Adjusted for age, sex, income level, smoking behaviors, alcohol consumption, body mass index, physical activity, family history of diabetes, Charlson comorbidity index, diabetes mellitus diagnosis, and antidiabetic medications.

Supplementary Table 4: Adjusted hazard ratios<sup>a</sup> (95% confidence interval) for the association between fasting blood glucose trajectories and the cancer risk by diabetes diagnosis subgroup.

Diabetes diagnosis	Fasting blood glucose trajectories		
	Groups	Cases	aHR (95% CI)
<b>No diabetes mellitus</b>	Low-stable	220336	Reference
	Elevated-stable	9102	1.09 (1.01,1.18)
	Elevated-high	3188	0.99 (0.86,1.14)
	High-stable	787	0.92 (0.69,1.22)
<b>Diabetes mellitus type I</b>	Low-stable	480	Reference
	Elevated-stable	77	0.64 (0.22,1.85)
	Elevated-high	34	0.90 (0.26,3.18)
	High-stable	19	0.42 (0.05,3.27)
<b>Diabetes mellitus type II</b>	Low-stable	4141	Reference
	Elevated-stable	9206	1.09 (0.96,1.25)
	Elevated-high	1445	0.96 (0.77,1.20)
	High-stable	7456	1.09 (0.95,1.25)

aHR, adjusted hazard ratios.

CI, confidence interval.

<sup>a</sup>Adjusted for age, sex, income level, smoking behaviors, alcohol consumption, body mass index, physical activity, family history of diabetes, Charlson comorbidity index, and antidiabetic medications.

Supplementary Table 5: Adjusted hazard ratios<sup>a</sup> (95% confidence interval) for the association between fasting blood glucose trajectories and the cancer risk by medications subgroup.

Medication	Fasting blood glucose trajectories		
	Groups	Cases	aHR (95% CI)
Insulin	Low-stable	28	Reference
	Elevated-stable	41	1.49 (0.24,9.11)
	Elevated-high	18	0.86 (0.1,7.74)
	High-stable	96	0.43 (0.06,2.98)
Sulfonylureas	Low-stable	1610	Reference
	Elevated-stable	2542	1.12 (0.91,1.4)
	Elevated-high	753	0.97 (0.72,1.32)
	High-stable	3012	1.08 (0.87,1.35)
Metformin	Low-stable	552	Reference
	Elevated-stable	858	1.33 (0.9,1.96)
	Elevated-high	246	1.33 (0.79,2.23)
	High-stable	1094	1.13 (0.77,1.67)
Meglitinide	Low-stable	14	Reference
	Elevated-stable	22	n/a
	Elevated-high	8	n/a
	High-stable	23	n/a
Thiazolidinedione	Low-stable	48	Reference
	Elevated-stable	74	1.99 (0.29,13.88)
	Elevated-high	21	1.58 (0.08,29.87)
	High-stable	111	2.86 (0.38,21.41)
Acarbose	Low-stable	24	Reference
	Elevated-stable	43	1.47 (0.69,3.12)
	Elevated-high	18	2.54 (1.04,6.19)
	High-stable	48	1.82 (0.88,3.75)
Combined therapy	Low-stable	188	Reference
	Elevated-stable	273	0.54 (0.05,5.37)
	Elevated-high	91	n/a
	High-stable	357	0.21 (0.02,2.36)

aHR, adjusted hazard ratios.

CI, confidence interval.

<sup>a</sup>Adjusted for age, sex, income level, smoking behaviors, alcohol consumption, body mass index, physical activity, family history of diabetes, Charlson comorbidity index, and diabetes mellitus diagnosis.