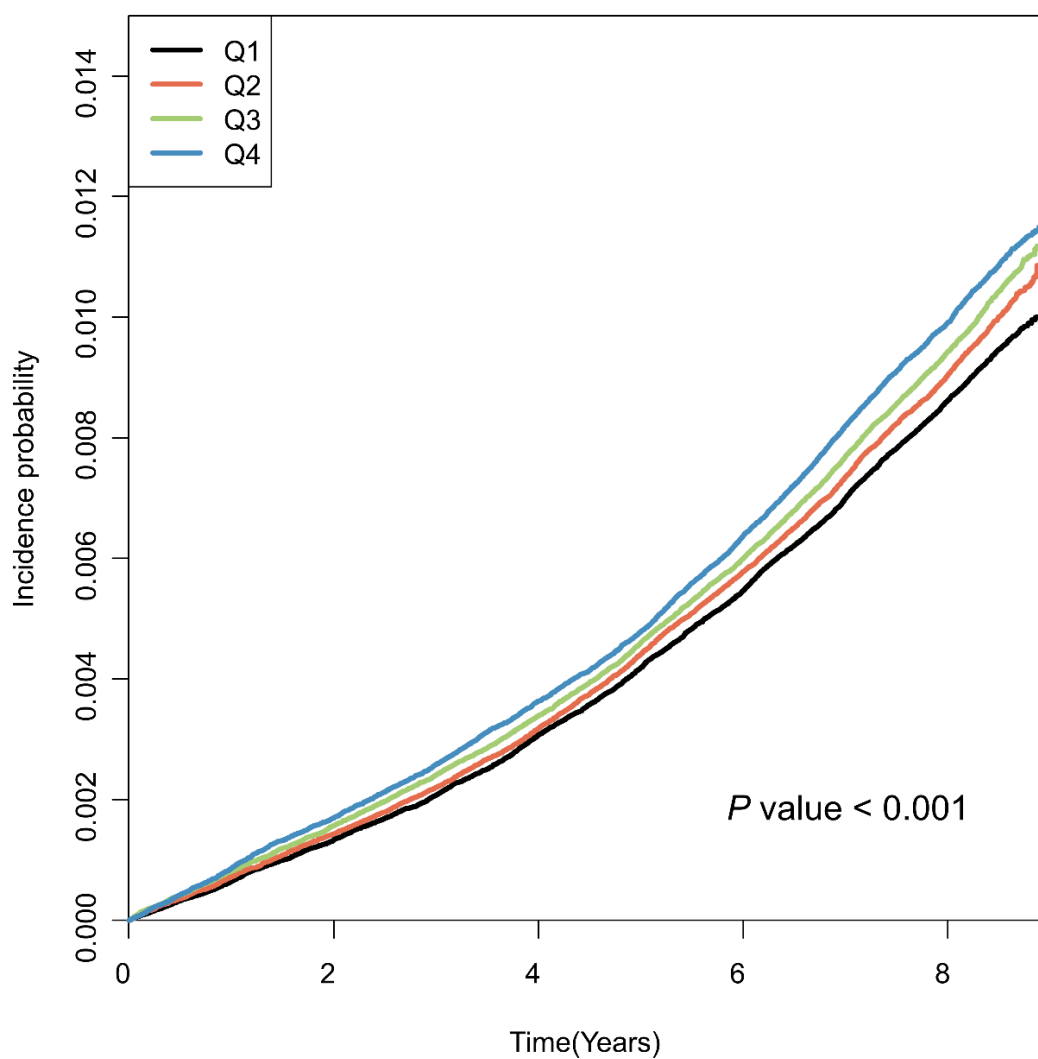
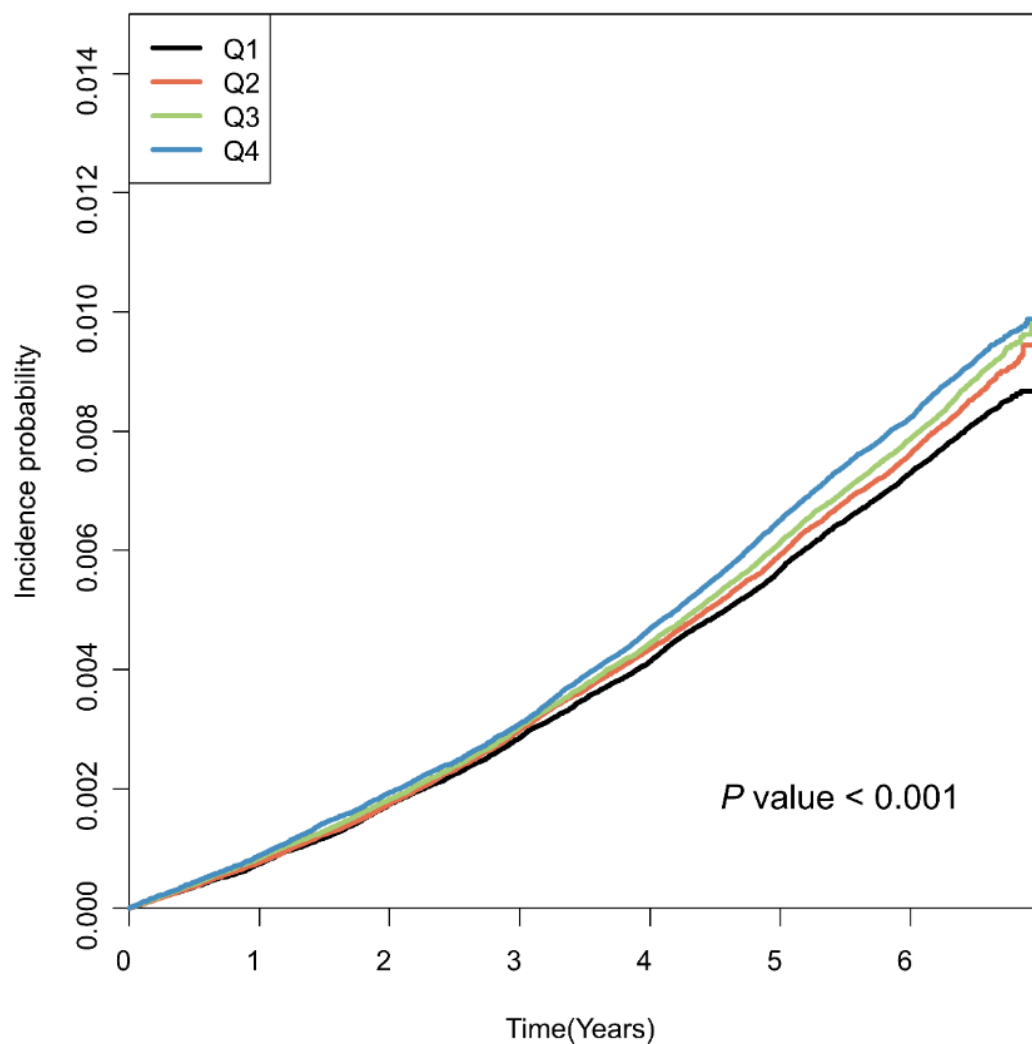




GGT	Year				
	0	2	4	6	8
Q1	670577	661681	651095	639012	625263
Q2	624620	616684	607374	596236	583623
Q3	676789	668335	658323	646255	632366
Q4	653823	643158	631102	617237	601980

Number at risk by GGT quartile

Supplementary Figure 1 Incidence probability of pancreatic cystic neoplasm stratified by gamma-glutamyl transferase level: 3-year lag period.



GGT	Year						
	0	1	2	3	4	5	6
Q1	661681	656602	651095	645285	639012	632390	625263
Q2	616684	612179	607374	602050	596236	590115	583623
Q3	668335	663452	658323	652554	646255	639543	632366
Q4	643158	637354	631102	624486	617237	609622	601980

Number at risk by GGT quartile

Supplementary Figure 2 Incidence probability of pancreatic cystic neoplasm stratified by gamma-glutamyl transferase level: 5-year lag period.

**Supplementary Table 1 International Classification of Diseases-10th Revision,
Clinical Modification diagnostic codes for pancreatic diseases**

		ICD-10-CM diagnostic codes
Pancreatitis		K85 Acute pancreatitis; K86.0 Alcoholic pancreatitis; K86.1 Chronic pancreatitis
Pseudocysts		K86.3 Pancreatic pseudocyst
Pancreatic cancer		C25 Malignant neoplasm of pancreas; C25.0 Malignant neoplasm of head of pancreas; C25.1 Malignant neoplasm of body of pancreas; C25.2 Malignant neoplasm of tail of pancreas; C25.3 Malignant neoplasm of pancreatic duct; C25.7 Malignant neoplasm of other parts of pancreas; C25.9 Malignant neoplasm of pancreas, unspecified
Pancreas neoplasms	cystic	K86.2 Pancreas cyst; D13.6 Cystic neoplasm of pancreas, benign; D37.7 Cystic neoplasm of pancreas, uncertain behavior

Supplementary Table 2 Definitions of comorbidities

	Definition
Diabetes mellitus	(1) ICD-10 codes E11–14 with prescriptions for anti-diabetic agents; or (2) fasting blood glucose level ≥ 126 mg/dL
Hypertension	(1) ICD-10 codes I10–I13 and I15 with prescriptions for anti-hypertensive agents; or (2) systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg
Dyslipidemia	(1) ICD-10 code E78 with prescriptions for lipid-lowering agents; or (2) total cholesterol level ≥ 240 mg/dL
Chronic kidney disease	(1) NHIS codes: V001 (hemodialysis), V003 (peritoneal dialysis), V005 (kidney transplantation); or (2) eGFR of < 60 mL/min/1.73m ² by Modification of Diet in Renal Disease (MDRD) equation

BP: Blood pressure; CKD: Chronic kidney disease; eGFR: Estimated glomerular filtration rate; ICD-10: International Classification of Diseases-Tenth Revision.

Supplementary Table 3 Multivariate regression analysis of the risk of pancreatic cystic neoplasm according to quartile: 3-year lag period

GGT	<i>n</i>	PCN	Duration, years	IR, per 1000 PY	HR (95% CI)		
					Model 1 ¹	Model 2 ²	Model 3 ³
Q1	670,577	6,003	5443795.06	1.10	1 (Ref.)	1 (Ref.)	1 (Ref.)
Q2	624,620	5,918	5074651.16	1.17	1.058 (1.02,1.096)	1.047 (1.011,1.086)	1.044 (1.007,1.082)
Q3	676,789	6,677	5499411.74	1.21	1.101 (1.063,1.14)	1.074 (1.038,1.113)	1.063 (1.025,1.102)
Q4	653,823	6,680	5268274.58	1.27	1.152 (1.113,1.193)	1.14 (1.101,1.18)	1.103 (1.061,1.147)

¹Model 1, Not adjusted.

²Model 2, Adjusted for age and sex.

³Model 3, Adjusted for age, sex, income, BMI, smoking, drinking, regular exercise, Diabetes mellitus, hypertension, dyslipidemia, Chronic kidney disease, AST, ALT
GGT: Gamma-glutamyl transferase; PCN: Pancreatic cystic neoplasm; IR: Incidence rate; HR: Hazard ratio.

Supplementary Table 4 Multivariate regression analysis of the risk of pancreatic cystic neoplasm according to quartile: 5-year lag period

GGT	<i>n</i>	PCN	Duration, years	IR, per 1,000 PY	HR (95% CI)		
					Model 1 ¹	Model 2 ²	Model 3 ³
Q1	661681	5113	4111293.33	1.24	1 (Ref.)	1 (Ref.)	1 (Ref.)
Q2	616684	5026	3833218.33	1.31	1.054 (1.014,1.096)	1.045 (1.005,1.086)	1.04 (1,1.082)
Q3	668335	5621	4154099.79	1.35	1.088 (1.048,1.13)	1.061 (1.022,1.102)	1.048 (1.007,1.09)
Q4	643158	5577	3971039.3	1.40	1.131 (1.089,1.175)	1.117 (1.076,1.161)	1.078 (1.033,1.124)

¹Model 1, Not adjusted.

²Model 2, Adjusted for age and sex.

³Model 3, Adjusted for age, sex, income, BMI, smoking, drinking, regular exercise, Diabetes mellitus, hypertension, dyslipidemia, Chronic kidney disease, AST, ALT.

Supplementary Table 5 Multivariate regression analysis of the risk of pancreatic cystic neoplasm according to four groups based on the normal range (Group 1) and tertiles above normal (Group 2-4)

GGT	<i>n</i>	PCN	Duration, years	IR, per 1,000 PY	HR (95% CI)			
					Model 1 ¹	Model 2 ²	Model 3 ³	
Group 1	2212248	24052	22189587	1.08	1 (Ref.)	1 (Ref.)	1 (Ref.)	Male: < 63; Female < 35
Group 2	148236	1632	1480225	1.10	1.019 (0.969,1.071)	1.078 (1.025,1.134)	1.05 (0.998,1.105)	Male: < 82; Female < 44
Group 3	146743	1541	1459729	1.06	0.976 (0.927,1.028)	1.053 (1,1.109)	1.018 (0.966,1.074)	Male: < 122; Female < 61
Group 4	148438	1715	1439257	1.19	1.108 (1.055,1.164)	1.182 (1.126,1.242)	1.113 (1.055,1.175)	Male: ≥ 122; Female ≥ 61

¹Model 1, Not adjusted.

²Model 2, Adjusted for age and sex.

³Model 3, Adjusted for age, sex, income, BMI, smoking, drinking, regular exercise, Diabetes mellitus, hypertension, dyslipidemia, Chronic kidney disease, AST, ALT.

Supplementary Table 6 Multivariate regression analysis of risk of pancreatic cystic neoplasm: Decile

GGT	<i>n</i>	PCN	Duration, years	IR, 1,000 PY	HR (95% CI)			
					Model 1 ¹	Model 2 ²	Model 3 ³	
D1	249126	2408	2487748	0.97	1 (Ref.)	1 (Ref.)	1 (Ref.)	Male: < 17; Female < 11
D2	277172	2859	2781081	1.03	1.061 (1.005,1.12)	1.06 (1.004,1.119)	1.069 (1.012,1.128)	Male: < 21; Female < 13
D3	302115	3126	3035014	1.03	1.063 (1.008,1.121)	1.047 (0.993,1.104)	1.062 (1.007,1.12)	Male: < 25; Female < 15
D4	205384	2125	2056767	1.03	1.067 (1.007,1.132)	1.077 (1.016,1.141)	1.064 (1.003,1.128)	Male: < 29; Female < 16
D5	275236	3082	2762638	1.12	1.152 (1.092,1.215)	1.125 (1.067,1.187)	1.142 (1.083,1.205)	Male: < 34; Female < 18
D6	259647	2769	2604856	1.06	1.098 (1.039,1.159)	1.087 (1.029,1.148)	1.093 (1.035,1.155)	Male: < 41; Female < 20
D7	306146	3513	3073771	1.14	1.18 (1.12,1.243)	1.134 (1.076,1.194)	1.162 (1.103,1.225)	Male: < 51; Female < 24
D8	258577	2969	2591226	1.15	1.184 (1.122,1.249)	1.159 (1.098,1.223)	1.178 (1.116,1.244)	Male: < 67; Female < 29
D9	259796	2981	2598319	1.15	1.186 (1.124,1.251)	1.167 (1.105,1.231)	1.19 (1.127,1.256)	Male: < 101; Female < 40

D10	262466	3108	2577377	1.21	1.251	1.244	1.268	Male: ≥ 101 ; Female ≥ 40
					(1.187,1.32)	(1.18,1.312)	(1.201,1.338)	

¹Model 1, Not adjusted.

²Model 2, Adjusted for age and sex.

³Model 3, Adjusted for age, sex, lowest income quartile, BMI, smoking, drinking, regular exercise, diabetes mellitus, hypertension, dyslipidemia, chronic kidney disease, AST and ALT.

