

Supplementary Table 1 Database information

Institution	Period	DB version	Number of patients
AUMC	1994/01~2022/02	DB6	2,873,443
DCMC	2005/01~2021/10	DB2	906,587
EUMC	2001/01~2021/12	DB2	1,667,671
GNUH	2009/10~2022/04	DB2	626,663
KDH	1986/10~2019/12	DB3	1,724,052
KNUH	2003/01~2022/01	DB4	567,439
WKUH	1988/03~2021/11	DB3	837,461

Abbreviations: AUMC, Ajou University Medical Center; DCMC, Daegu Catholic Medical Center; EUMC, Ewha Womans University Medical Center; GNUH, Gyeongsang National University Hospital; KDH, Kangdong Sacred Heart Hospital; KNUH, Kangwon National University Hospital; WKUH, Wonkwang University Hospital; DB, database.

Supplementary Table 2 Concept IDs included in the study

Concept set	Concept ID
Drug domain	
NSAID	19029393,1118084,1124300,19056645,19110711,1177480,1178663,1185922,19071936,19125097,1150345,1113648,1115008,43009024,1146810,19041220,19042155,43009072
Aspirin	1112807
Proton pump inhibitor	19039926,904453,929887,923645,948078,911735
Clarithromycin	1750500
Amoxicillin	1713332
Bismuth	19037706, 958134
Tetracycline	1836948
Metronidazole	1707164
Antiplatelet agent	1350310,1322184,40163718,40241186,1302398,19042778
Clopidogrel	1322184
Warfarin	1310149
NOAC	40241331, 45892847, 40228152, 43013024
Steroid	1518254,975125,1506270,1550557,903963
Antidepressant	21604686
Bisphosphonate	21604148
Immunosuppressant	21603891
Condition domain	
Peptic ulcer disease	4027663
Gastric ulcer	4265600
Ulcer of duodenum	4198381
Benign neoplasm of stomach	196061
Gastric cancer	200974,443387,197803,193422,432838,435751,437224,434292,438089,192255,196044
Hypertensive disorder	316866

Diabetes mellitus	201820
Hyperlipidemia	432867
Chronic kidney disease	46271022
Ischemic heart disease	4185932
Cerebrovascular disease	381591
Chronic liver disease	4212540
Alcoholic liver damage	201612
Cirrhosis of liver	4064161
Osteoarthritis	80180
Chronic obstructive lung disease	255573

Measurement domain

<i>H. pylori</i> serology test	3027491, 3023871
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Procedure domain

Rapid urease test	4056542
Esophagogastroduodenoscopy	4294382

Abbreviations: ID, identifier; NSAIDs, nonsteroidal anti-inflammatory drugs; NOAC, novel oral anticoagulant

Supplementary Table 3. Baseline characteristics of peptic ulcer disease in each hospital database

	AUMC (n=4629)	DCMC (n=4690)	EUMC (n=3118)	GNUH (n=2998)	KDH (n=6320)	KNUH (n=1854)	WKUH (N=3176)
Age, mean (SD)	58.7 (14.5)	60.3 (13.5)	57.1 (14.8)	61.3 (14.4)	58.1 (14.8)	65.8 (15.2)	62.9 (14.7)
Male, n (%)	2828 (61.1)	2626 (56.0)	1795 (57.6)	1880 (62.7)	3351 (53.0)	1132 (61.1)	1932 (60.8)
<i>H. pylori</i> -PUD	1502 (44.9)	1606 (38.3)	1033 (49.0)	1168 (46.3)	1751 (44.4)	472 (35.9)	670 (30.8)
Drug-PUD	1130 (33.8)	1446 (34.5)	645 (30.6)	797 (31.6)	1458 (37.0)	599 (45.6)	991 (45.5)
Idiopathic PUD	710 (21.3)	1143 (27.2)	429 (20.4)	558 (22.1)	733 (18.6)	243 (18.5)	517 (23.7)
Gastric ulcer, n (%)	3330 (71.9)	2876 (61.3)	1892 (60.7)	1797 (59.9)	5129 (81.2)	1126 (60.7)	2377 (74.8)
Duodenal ulcer, n (%)	1251 (27.0)	1531 (32.6)	1231 (39.5)	820 (27.4)	1992 (31.5)	645 (34.8)	907 (28.6)
Diagnosis, n (%)							
Hypertensive disorder	1349 (29.1)	1003 (21.4)	169 (5.4)	230 (7.7)	668 (10.6)	308 (16.6)	1046 (32.9)
Diabetes mellitus	687 (14.8)	481 (10.3)	172 (5.5)	97 (3.2)	277 (4.4)	50 (2.7)	475 (15.0)
Hyperlipidemia	124 (2.7)	743 (15.8)	195 (6.3)	57 (1.9)	332 (5.3)	247 (13.3)	340 (10.7)
Chronic kidney disease	296 (6.4)	200 (4.3)	116 (3.7)	140 (4.7)	221 (3.5)	58 (3.1)	251 (7.9)
Ischemic heart disease	399 (8.6)	500 (10.7)	168 (5.4)	257 (8.6)	389 (6.2)	205 (11.1)	303 (9.5)
Cerebrovascular disease	72 (1.6)	233 (5.0)	53 (1.7)	69 (2.3)	154 (2.4)	83 (4.5)	148 (4.7)

Chronic liver disease	291 (6.3)	320 (6.8)	71 (2.3)	202 (6.7)	248 (3.9)	84 (4.5)	220 (6.9)
Osteoarthritis	65 (1.4)	120 (2.6)	9 (0.3)	24 (0.8)	107 (1.7)	43 (2.3)	57 (1.8)
Chronic obstructive lung disease	74 (1.6)	93 (2.0)	44 (1.4)	99 (3.3)	78 (1.2)	53 (2.9)	74 (2.3)
Medication, n(%)							
Aspirin	759 (16.4)	653 (13.9)	408 (13.1)	496 (16.5)	843 (13.3)	456 (24.6)	453 (14.3)
Antiplatelet agent	585 (12.6)	627 (13.4)	302 (9.7)	359 (12.0)	540 (8.5)	224 (12.1)	428 (13.5)
Clopidogrel	479 (10.3)	534 (11.4)	255 (8.2)	291 (9.7)	376 (5.9)	172 (9.3)	279 (8.8)
NSAID	868 (18.8)	797 (17.0)	509 (16.3)	528 (17.6)	1615 (25.6)	444 (23.9)	581 (18.3)
Warfarin	115 (2.5)	87 (1.9)	54 (1.7)	79 (2.6)	104 (1.6)	46 (2.5)	94 (3.0)
NOAC	41 (0.9)	29 (0.6)	37 (1.2)	43 (1.4)	75 (1.2)	26 (1.4)	46 (1.4)
Steroid	672 (14.5)	509 (10.9)	360 (11.5)	358 (11.9)	795 (12.6)	256 (13.8)	454 (14.3)
Antidepressant	1570 (33.9)	584 (12.5)	752 (24.1)	807 (26.9)	734 (11.6)	523 (28.2)	1338 (42.1)
Bisphosphonate	98 (2.1)	53 (1.1)	77 (2.5)	51 (1.7)	89 (1.4)	39 (2.1)	81 (2.6)
Immunosuppressant	156 (3.4)	134 (2.9)	42 (1.3)	46 (1.5)	124 (2.0)	26 (1.4)	50 (1.6)

Abbreviations: AUMC, Ajou University Medical Center; DCMC, Daegu Catholic Medical Center; EUMC, Ewha Womans University Medical Center; GNUH, Gyeongsang National University Hospital; KDH, Kangdong Sacred Heart Hospital; KNUH, Kangwon National University Hospital; WKUH, Wonkwang University Hospital; PUD, peptic ulcer disease; NSAIDs,

nonsteroidal anti-inflammatory drugs; NOAC, novel oral anticoagulant

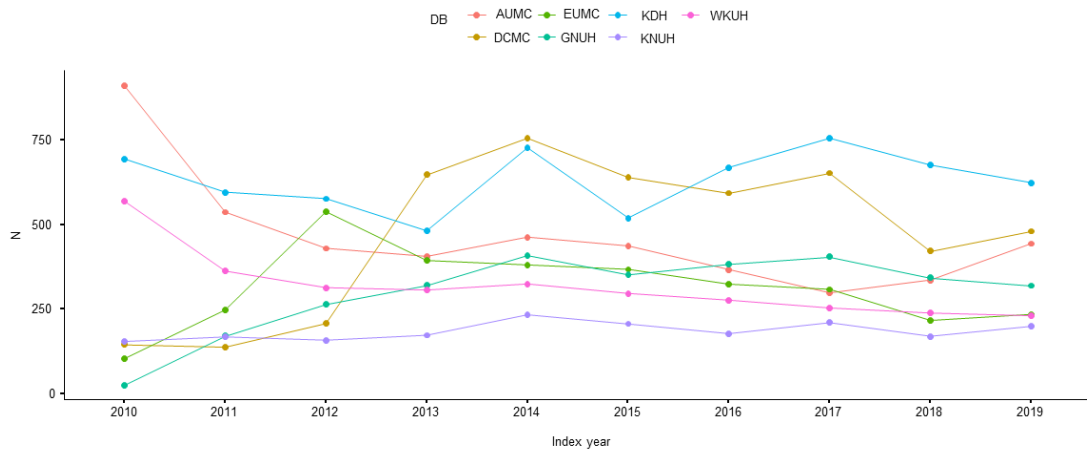
Supplementary Table 4. Subgroup analysis of characteristics of peptic ulcer disease according to sex

	Sex	<i>H. pylori</i> - related PUD (n=8202)	Drug- related PUD (n=7066)	Idiopathic PUD (n=4333)	P value
Gastric ulcer, n (%)	M	3298 (62.6)	2615 (69.3)	1713 (62.4)	<0.001
	W	1764 (60.1)	2437 (74.0)	1045 (65.9)	<0.001
Duodenal ulcer, n (%)	M	2130 (40.4)	1295 (34.3)	1067 (38.8)	<0.001
	W	1142 (38.9)	876 (26.6)	507 (32.0)	<0.001
Diagnosis, n (%)					
Hypertensive disorder	M	613 (11.6)	1041 (27.6)	324 (11.8)	<0.001
	W	315 (10.7)	995 (30.2)	205 (12.9)	<0.001
Diabetes mellitus	M	283 (5.4)	523 (13.9)	178 (6.5)	<0.001
	W	155 (5.3)	431 (13.1)	78 (4.9)	<0.001
Hyperlipidemia	M	382 (7.3)	392 (10.4)	77 (2.8)	<0.001
	W	205 (7.0)	437 (13.3)	52 (3.7)	<0.001
Chronic kidney disease	M	128 (2.4)	357 (9.5)	74 (2.9)	<0.001
	W	45 (1.5)	247 (7.5)	49 (3.1)	<0.001
Ischemic heart disease	M	344 (6.5)	640 (17.0)	34 (1.2)	<0.001
	W	139 (4.7)	458 (13.9)	15 (1.1)	<0.001
Cerebrovascular disease	M	104 (2.0)	192 (5.1)	22 (0.8)	<0.001
	W	57 (1.9)	180 (5.5)	13 (1.0)	<0.001
Chronic liver disease	M	171 (3.2)	316 (8.4)	266 (9.7)	<0.001
	W	53 (1.9)	131 (4.0)	83 (5.2)	<0.001
Alcoholic liver damage	M	150 (2.8)	220 (5.8)	210 (7.6)	<0.001
	W	14 (0.5)	33 (1.1)	24 (1.7)	0.001
Liver cirrhosis	M	139 (2.6)	278 (7.4)	250 (9.1)	<0.001
	W	36 (1.3)	103 (3.1)	75 (4.7)	<0.001

Osteoarthritis	M	25 (0.5)	57 (1.7)	4 (0.2)	<0.001
	W	55 (2.2)	131 (4.4)	9 (1.0)	<0.001
Chronic obstructive lung disease	M	63 (1.2)	163 (4.3)	66 (2.4)	<0.001
	W	13 (0.5)	46 (1.4)	8 (0.6)	<0.001
Medication, n (%)					
Antiplatelet agent	M	451 (8.6)	877 (23.2)	44 (1.7)	<0.001
	W	183 (6.2)	637 (19.3)	33 (2.1)	<0.001
Warfarin	M	62 (1.2)	140 (3.7)	20 (0.8)	<0.001
	W	22 (0.7)	118 (3.6)	14 (1.1)	<0.001
NOAC	M	20 (0.4)	59 (1.6)	9 (0.4)	<0.001
	W	13 (0.4)	70 (2.1)	11 (0.8)	<0.001
Steroid	M	382 (7.3)	662 (17.5)	145 (5.3)	<0.001
	W	308 (10.5)	761 (23.1)	82 (5.2)	<0.001
Antidepressant	M	798 (15.1)	1295 (34.3)	607 (22.1)	<0.001
	W	390 (13.3)	1113 (33.8)	261 (16.5)	<0.001
Bisphosphonate	M	16 (0.4)	40 (1.1)	5 (0.3)	<0.001
	W	78 (2.7)	183 (5.6)	13 (0.9)	<0.001
Immunosuppressant	M	59 (1.1)	106 (2.8)	22 (0.9)	<0.001
	W	66 (2.2)	169 (5.1)	13 (1.0)	<0.001

Abbreviations: PUD, peptic ulcer disease; NOAC, novel oral anticoagulant; M, men; W, women.

Supplementary Figure 1 Yearly trend of peptic ulcer disease in each database



Abbreviations: DB, database; AUMC, Ajou University Medical Center; DCMC, Daegu Catholic Medical Center; EUMC, Ewha Womans University Medical Center; GNUH, Gyeongsang National University Hospital; KDH, Kangdong Sacred Heart Hospital; KNUH, Kangwon National University Hospital; WKUH, Wonkwang University Hospital.