

Supplementary Material

Safety profiles of mRNA COVID-19 vaccines using World Health Organization global scale database (VigiBase) : A latent class analysis

Min-Taek Lee^{1,2}, Wonbin Choi^{1,2}, Seung-Hun You^{1,2}, Sewon Park^{1,2}, Jeong-Yeon Kim^{1,2},
Dal Ri Nam^{1,2}, Ju Won Lee^{1,2}, Sun-Young Jung^{1,2*}

¹ College of Pharmacy, Chung-Ang University, Seoul, Republic of Korea

² Department of Global Innovative Drugs, The Graduate School of Chung-Ang University, Seoul, Republic of Korea

*Corresponding author

Sun-Young Jung, PhD

College of Pharmacy, Chung-Ang University, Seoul, Republic of Korea

Department of Global Innovative Drugs, Graduate School of Chung-Ang University

Seoul, Republic of Korea

Phone: +82-2-820-5678

Email: jsyoung@cau.ac.kr

Table S1 Comparison of baseline model selection

Table S2 Serious AEs based on mRNA COVID-19 vaccination classified system organ class terms in VigiBase
AE, adverse event; mRNA COVID-19, messenger RNA (mRNA) coronavirus disease 2019

Table S3 The most frequently PTs by clusters for serious AEs after mRNA COVID-19 vaccination
PT, preferred term; AE, adverse event; mRNA COVID-19, messenger RNA (mRNA) coronavirus disease 2019

Table S1 Comparison of baseline model selection

Number of classes	maximum log-likelihood	AIC	BIC	G-squared (Likelihood ratio/deviance statistic)	X-squared (Chi-square goodness of fit)
2	492	-1196944	2393927	2394129	61471.68
3	482	-1189945	2379948	2380257	47472.62
4	472	-1187351	2374779	2375195	42284.23
5	462	-1172795	2345688	2346210	13172.55
6	452	-1170962	2342042	2342670	9506.628
7	442	-1170356	2340849	2341584	8293.831

AIC; Akaike's Information Criterion, BIC; Bayesian Information Criterion

Table S2 Serious AEs based on mRNA COVID-19 vaccination classified system organ class terms in VigiBase.

System organ class, n (%)	Total (n=312,878)	Cluster 1 (n=43,606)	Cluster 2 (n=25,301)	Cluster 3 (n=67,881)	Cluster 4 (n=25,529)	Cluster 5 (n=150,561)
Blood and lymphatic system disorders	14,972(4.8)	740(1.7)	328(1.3)	3,366(5.0)	2,162(8.5)	8,376(5.6)
Cardiac disorders	52,149(16.7)	0(0)	25,301(100)	16,757(24.7)	10,091(39.5)	0(0)
Congenital, familial and genetic disorders	757(0.2)	12(0)	46(0.2)	147(0.2)	97(0.4)	455(0.3)
Ear and labyrinth disorders	11,311(3.6)	291(0.7)	223(0.9)	975(1.4)	2016(7.9)	7,806(5.2)
Endocrine disorders	1,412(0.5)	36(0.1)	88(0.4)	255(0.4)	232(0.9)	801(0.5)
Eye disorders	14,655(4.7)	310(0.7)	243(1.0)	1,581(2.3)	2,697(10.6)	9,824(6.5)
Gastrointestinal disorders	53,049(17.0)	1,466(3.4)	0(0)	7,218(10.6)	15,933(62.4)	28,432(18.9)
General disorders and administration site conditions	159,598(51.0)	28,927(66.3)	7,503(29.7)	30,199(44.5)	20,714(81.1)	72,255(48)
Hepatobiliary disorders	2,826(0.9)	207(0.5)	74(0.3)	607(0.9)	406(1.6)	1,532(1)
Immune system disorders	10,747(3.4)	204(0.5)	181(0.7)	3,565(5.3)	1,874(7.3)	4,923(3.3)
Infections and infestations	59,334(19.0)	43,606(100)	0(0)	8,687(12.8)	6,770(26.5)	271(0.2)
Injury, poisoning and procedural complications	18,550(5.9)	857(2.0)	694(2.7)	3,454(5.1)	3,247(12.7)	10,298(6.8)
Investigations	94,702(30.3)	11,755(27.0)	8,077(31.9)	25,412(37.4)	12,808(50.2)	36,650(24.3)
Metabolism and nutrition disorders	10,266(3.3)	797(1.8)	235(0.9)	2,389(3.5)	2,467(9.7)	4,378(2.9)
Musculoskeletal and connective tissue disorders	59,266(18.9)	0(0)	0(0)	5,939(8.8)	15,340(60.1)	37,987(25.2)
Neoplasms benign, malignant and unspecified (incl cysts and polyps)	1,865(0.6)	131(0.3)	35(0.1)	378(0.6)	170(0.7)	1,151(0.8)
Nervous system disorders	118,530(37.9)	2,457(5.6)	3,620(14.3)	8,130(12.0)	23,634(92.6)	80,689(53.6)
Product issues	2,602(0.8)	69(0.2)	30(0.1)	150(0.2)	31(0.1)	2,322(1.5)

Pregnancy, puerperium and perinatal conditions	110(0)	12(0)	6(0)	26(0.0)	18(0.1)	48.0(0.0)
Psychiatric disorders	17,205(5.5)	774(1.8)	562(2.2)	3,003(4.4)	3,951(15.5)	8,915(5.9)
Renal and urinary disorders	7,467(2.4)	720(1.7)	181(0.7)	1,795(2.6)	1,481(5.8)	3,290(2.2)
Reproductive system and breast disorders	9,318(3)	257(0.6)	227(0.9)	1,044(1.5)	886(3.5)	6,904(4.6)
Respiratory, thoracic, and mediastinal disorders	59,644(19.1)	4,651(10.7)	0(0)	40,699(60.0)	14,294(56)	0(0)
Skin and subcutaneous tissue disorders	29,753(9.5)	0(0)	0(0)	13,961(20.6)	8,029(31.5)	7,763(5.2)
Social circumstances	4,700(1.5)	167(0.4)	146(0.6)	688(1.0)	1,086(4.3)	2,613(1.7)
Surgical and medical procedures	15,622(5)	1,644(3.8)	1,370(5.4)	4,709(6.9)	2,381(9.3)	5,518(3.7)
Vascular disorders	35,587(10.4)	0(0)	0(0)	20,512(30.2)	5,267(20.6)	6,808(4.5)

AE, adverse event; COVID-19; coronavirus disease 2019, cluster 1: infection AEs, cluster 2: cardiac AEs, cluster 3: respiratory AEs, cluster 4: systemic AEs, cluster 5: nervous system AEs

Table S3 The most frequently PTs by clusters for serious AEs after mRNA COVID-19 vaccination.

Abbreviation: PT, preferred term; AE, adverse event

Table S3-1 The most frequently PTs by cluster 1 (infection AEs)

	Gastrointestinal disorders			Infections and infestations			Injury, poisoning and procedural complications		
	PTs	N	%	PTs	N	%	PTs	N	%
1	Vomiting	384	(0.9)	COVID-19	29406	(67.4)	Inappropriate schedule of product administration	236	(0.5)
2	Abdominal pain	355	(0.8)	Herpes zoster	2541	(5.8)	Fall	168	(0.4)
3	Nausea	340	(0.8)	COVID-19 pneumonia	2273	(5.2)	Off label use	130	(0.3)
4	Diarrhoea	309	(0.7)	Pneumonia	1837	(4.2)	Exposure to SARS-CoV-2	60	(0.1)
5	Abdominal pain upper	132	(0.3)	Vaccine breakthrough infection	1158	(2.7)	Exposure during pregnancy	50	(0.1)
6	Abdominal pain lower	93	(0.2)	Appendicitis	901	(2.1)	Maternal exposure during pregnancy	33	(0.1)
7	Abdominal discomfort	42	(0.1)	Sepsis	517	(1.2)	Incomplete course of vaccination	28	(0.1)
8	Constipation	37	(0.1)	Influenza	513	(1.2)	Product use issue	20	(0.0)
9	Colitis	29	(0.1)	Asymptomatic COVID-19	481	(1.1)	Product dose omission issue	17	(0.0)
10	Gastrointestinal haemorrhage	27	(0.1)	Urinary tract infection	448	(1.0)	Extra administered dose	16	(0.0)
11	Abdominal distension	27	(0.1)	Nasopharyngitis	382	(0.9)	Incorrect route of product administration	14	(0.0)
12	Dysphagia	24	(0.1)	Infection	363	(0.8)	Hip fracture	9	(0.0)
13	Intestinal obstruction	19	(0.0)	Ophthalmic herpes zoster	348	(0.8)	Head injury	8	(0.0)
14	Rectal haemorrhage	16	(0.0)	Vestibular neuronitis	336	(0.8)	Vaccination complication	8	(0.0)
15	Colitis ulcerative	16	(0.0)	Encephalitis	297	(0.7)	Road traffic accident	7	(0.0)
16	Pancreatitis acute	15	(0.0)	Myelitis	244	(0.6)	Nerve injury	7	(0.0)
17	Gastrointestinal disorder	14	(0.0)	Suspected COVID-19	206	(0.5)	Contusion	7	(0.0)
18	Intestinal ischaemia	13	(0.0)	Cellulitis	199	(0.5)	Maternal exposure during breast feeding	7	(0.0)
19	Haematochezia	12	(0.0)	Septic shock	163	(0.4)	Wound	7	(0.0)
20	Flatulence	12	(0.0)	Erysipelas	163	(0.4)	Scar	6	(0.0)
21	Pancreatitis	12	(0.0)	Pneumonia aspiration	147	(0.3)	Fracture	5	(0.0)
22	Ileus	12	(0.0)	Diverticulitis	129	(0.3)	Arthropod bite	5	(0.0)

23	Gastritis	12	(0.0)	Oral herpes	119	(0.3)	Product administered to patient of inappropriate age	5	(0.0)
24	Large intestine perforation	11	(0.0)	Appendicitis perforated	118	(0.3)	Limb injury	4	(0.0)
25	Gastrointestinal pain	11	(0.0)	Bronchitis	115	(0.3)	Post procedural complication	4	(0.0)
26	Small intestinal obstruction	10	(0.0)	Pyelonephritis	106	(0.2)	Femur fracture	4	(0.0)
27	Stomatitis	10	(0.0)	Herpes zoster oticus	105	(0.2)	Rib fracture	4	(0.0)
28	Dyspepsia	10	(0.0)	Meningitis	104	(0.2)	Femoral neck fracture	4	(0.0)
29	Haematemesis	10	(0.0)	Gastroenteritis	91	(0.2)	Injury	4	(0.0)
30	Aphthous ulcer	9	(0.0)	Meningitis aseptic	87	(0.2)	Contraindicated product prescribed	3	(0.0)

Nervous system disorders				Respiratory, thoracic and mediastinal disorders		
	PTs	N	%	PTs	N	%
1	Headache	656	(1.5)	Dyspnoea	2053	(4.7)
2	Dizziness	218	(0.5)	Cough	1388	(3.2)
3	Facial paralysis	142	(0.3)	Hypoxia	596	(1.4)
4	Paraesthesia	128	(0.3)	Acute respiratory failure	532	(1.2)
5	Cerebrovascular accident	125	(0.3)	Pulmonary embolism	355	(0.8)
6	Neuralgia	105	(0.2)	Respiratory failure	311	(0.7)
7	Hypoaesthesia	99	(0.2)	Lung opacity	206	(0.5)
8	Seizure	92	(0.2)	Oropharyngeal pain	181	(0.4)
9	Syncope	74	(0.2)	Productive cough	137	(0.3)
10	Post herpetic neuralgia	61	(0.1)	Respiratory distress	129	(0.3)
11	Aphasia	61	(0.1)	Lung infiltration	128	(0.3)
12	Loss of consciousness	54	(0.1)	Dyspnoea exertional	124	(0.3)
13	Balance disorder	53	(0.1)	Acute respiratory distress syndrome	106	(0.2)
14	Tremor	52	(0.1)	Rhinorrhoea	102	(0.2)
15	Somnolence	51	(0.1)	Chronic obstructive pulmonary disease	101	(0.2)
16	Guillain-Barre syndrome	49	(0.1)	Pleural effusion	99	(0.2)

17	Ageusia	49	(0.1)	Respiratory tract congestion	91	(0.2)
18	Encephalopathy	48	(0.1)	Lung disorder	68	(0.2)
19	Facial paresis	46	(0.1)	Tachypnoea	66	(0.2)
20	Lethargy	45	(0.1)	Interstitial lung disease	61	(0.1)
21	Migraine	41	(0.1)	Asthma	60	(0.1)
22	Anosmia	37	(0.1)	Nasal congestion	57	(0.1)
23	Cerebral infarction	37	(0.1)	Respiratory disorder	49	(0.1)
24	Bell's palsy	37	(0.1)	Wheezing	47	(0.1)
25	Hemiparesis	35	(0.1)	Haemoptysis	46	(0.1)
26	Epilepsy	34	(0.1)	Respiratory symptom	42	(0.1)
27	Ischaemic stroke	33	(0.1)	Atelectasis	41	(0.1)
28	Memory impairment	30	(0.1)	Pneumonitis	39	(0.1)
29	Speech disorder	27	(0.1)	Pulmonary oedema	29	(0.1)
30	Unresponsive stimuli	27	(0.1)	Lung consolidation	28	(0.1)

Table S3-2 The most frequently PTs by cluster 2 (cardiac AEs)

Cardiac disorder			Injury, poisoning and procedural complications			Nervous system disorder		
PTs	N	%	PTs	N	%	PTs	N	%
1 Myocarditis	6327	(25.0)	Inappropriate schedule of product administration	303	(1.2)	Dizziness	855	(3.4)
2 Pericarditis	3719	(14.7)	Off label use	142	(0.6)	Headache	784	(3.1)
3 Palpitations	2068	(8.2)	Fall	50	(0.2)	Syncope	444	(1.8)
4 Myocardial infarction	2002	(7.9)	Maternal exposure during pregnancy	31	(0.1)	Paraesthesia	321	(1.3)
5 Atrial fibrillation	1942	(7.7)	Incorrect route of product administration	24	(0.1)	Loss of consciousness	273	(1.1)
6 Tachycardia	1754	(6.9)	Vaccination complication	23	(0.1)	Cerebrovascular accident	202	(0.8)
7 Arrhythmia	1727	(6.8)	Exposure during pregnancy	20	(0.1)	Hypoaesthesia	166	(0.7)
8 Acute myocardial infarction	1228	(4.9)	Product use issue	19	(0.1)	Tremor	134	(0.5)
9 Cardiac arrest	1199	(4.7)	Overdose	12	(0.0)	Presyncope	128	(0.5)
10 Myopericarditis	884	(3.5)	Product dose omission issue	9	(0.0)	Ischaemic stroke	115	(0.5)
11 Cardiac failure	758	(3.0)	Extra dose administered	8	(0.0)	Seizure	91	(0.4)
12 Angina pectoris	638	(2.5)	Contusion	7	(0.0)	Cerebral infarction	76	(0.3)
13 Pericardial effusion	566	(2.2)	Maternal exposure during breast feeding	5	(0.0)	Unresponsive to stimuli	72	(0.3)
14 Cardio-respiratory arrest	516	(2.0)	Foetal exposure during pregnancy	5	(0.0)	Somnolence	64	(0.3)
15 Acute coronary syndrome	332	(1.3)	Incorrect dose administered	4	(0.0)	Lethargy	60	(0.2)
16 Extrasystoles	277	(1.1)	Road traffic accident	3	(0.0)	Migraine	46	(0.2)
17 Bradycardia	266	(1.1)	Product administered to patient of inappropriate age	3	(0.0)	Transient ischaemic attack	44	(0.2)
18 Ventricular fibrillation	263	(1.0)	Accidental underdose	3	(0.0)	Burning sensation	39	(0.2)
19 Cardiovascular disorder	232	(0.9)	Traumatic lung injury	2	(0.0)	Disturbance in attention	38	(0.2)
20 Supraventricular tachycardia	227	(0.9)	Product preparation error	2	(0.0)	Hemiparesis	37	(0.1)

21	Cardiac disorder	223	(0.9)	Post procedural haemorrhage	2	(0.0)	Balance disorder	37	(0.1)
22	Ventricular tachycardia	199	(0.8)	Nerve injury	2	(0.0)	Aphasia	35	(0.1)
23	Atrial flutter	192	(0.8)	Muscle strain	2	(0.0)	Coma	33	(0.1)
24	Ventricular extrasystoles	187	(0.7)	Multiple injuries	2	(0.0)	Facial paralysis	31	(0.1)
25	Sinus tachycardia	173	(0.7)	Maternal exposure timing unspecified	2	(0.0)	Cerebral haemorrhage	31	(0.1)
26	Cardiac failure acute	157	(0.6)	Injury corneal	2	(0.0)	Head discomfort	30	(0.1)
27	Cardiogenic shock	127	(0.5)	Incomplete course of vaccination	2	(0.0)	Memory impairment	29	(0.1)
28	Cardiac failure congestive	124	(0.5)	Craniocerebral injury	2	(0.0)	Brain injury	29	(0.1)
29	Cardiomyopathy	123	(0.5)	Coronary artery reocclusion	2	(0.0)	Dysarthria	27	(0.1)
30	Cardiac flutter	119	(0.5)	Chest injury	2	(0.0)	Depressed level of consciousness	27	(0.1)

Table S3-3 The most frequently PTs by cluster 3 (respiratory/thrombotic AEs)

	Cardiac disorder			Gastrointestinal disorders			Infections and infestations		
	PTs	N	%	PTs	N	%	PTs	N	%
1	Tachycardia	3057	(4.5)	Nausea	2020	(3.0)	COVID-19	3180	(4.7)
2	Palpitations	2725	(4.0)	Vomiting	1694	(2.5)	Pneumonia	1341	(2.0)
3	Myocarditis	2260	(3.3)	Diarrhoea	1335	(2.0)	COVID-19 pneumonia	955	(1.4)
4	Pericarditis	1508	(2.2)	Abdominal pain	719	(1.1)	Herpes zoster	523	(0.8)
5	Atrial fibrillation	1365	(2.0)	Dysphagia	428	(0.6)	Sepsis	454	(0.7)
6	Arrhythmia	1091	(1.6)	Swollen tongue	403	(0.6)	Influenza	386	(0.6)
7	Cardiac failure	1081	(1.6)	Abdominal pain upper	352	(0.5)	Urinary tract infection	307	(0.5)
8	Cardiac arrest	866	(1.3)	Lip swelling	280	(0.4)	Nasopharyngitis	286	(0.4)
9	Myocardial infarction	823	(1.2)	Paraesthesia oral	245	(0.4)	Infection	205	(0.3)
10	Pericardial effusion	698	(1.0)	Abdominal discomfort	133	(0.2)	Septic shock	168	(0.2)
11	Acute myocardial infarction	586	(0.9)	Gastrointestinal haemorrhage	109	(0.2)	Cellulitis	165	(0.2)
12	Angina pectoris	560	(0.8)	Dyspepsia	106	(0.2)	Vaccine breakthrough infection	162	(0.2)
13	Cardiac failure congestive	409	(0.6)	Tongue oedema	95	(0.1)	Bronchitis	114	(0.2)
14	Cardio-respiratory arrest	366	(0.5)	Hypoaesthesia oral	90	(0.1)	Pneumonia aspiration	107	(0.2)
15	Bradycardia	354	(0.5)	Abdominal distension	88	(0.1)	Erysipelas	90	(0.1)
16	Cardiomegaly	307	(0.5)	Dry mouth	87	(0.1)	Suspected COVID-19	84	(0.1)
17	Cardiac disorder	287	(0.4)	Odynophagia	83	(0.1)	Asymptomatic COVID-19	78	(0.1)
18	Cardiovascular disorder	234	(0.3)	Abdominal pain lower	76	(0.1)	Rhinitis	76	(0.1)
19	Sinus tachycardia	227	(0.3)	Haematemesis	68	(0.1)	Viral infection	76	(0.1)
20	Extrasystoles	197	(0.3)	Lip oedema	67	(0.1)	Pneumonia bacterial	72	(0.1)
21	Cardiac failure acute	189	(0.3)	Constipation	67	(0.1)	Sinusitis	71	(0.1)
22	Cardiogenic shock	164	(0.2)	Mouth swelling	65	(0.1)	Conjunctivitis	68	(0.1)
23	Ventricular extrasystoles	156	(0.2)	Ascites	65	(0.1)	Oral herpes	58	(0.1)
24	Myopericarditis	151	(0.2)	Haematochezia	61	(0.1)	Appendicitis	58	(0.1)
25	Ventricular tachycardia	137	(0.2)	Retching	59	(0.1)	Lower respiratory tract infection	53	(0.1)
26	Cardiomyopathy	136	(0.2)	Gastrointestinal disorder	55	(0.1)	Pneumonia viral	50	(0.1)

27	Coronary disease	artery	132	(0.2)	Mouth haemorrhage	54	(0.1)	Respiratory infection	tract	50	(0.1)
28	Supraventricular tachycardia		123	(0.2)	Gingival bleeding	53	(0.1)	Endocarditis		45	(0.1)
29	Mitral incompetence	valve	116	(0.2)	Rectal haemorrhage	52	(0.1)	Upper respiratory tract infection		41	(0.1)
30	Acute syndrome	coronary	116	(0.2)	Gastrooesophageal reflux disease	49	(0.1)	Bacterial infection		41	(0.1)

Injury, poisoning and procedural complications				Nervous system disorders			Nervous system disorder				
			PTs	N	%	PTs	N	%	PTs	N	%
1	Inappropriate schedule of product administration		861	(1.3)	Pain in extremity	1634	(2.4)	Headache		2222	(3.3)
2	Fall		555	(0.8)	Myalgia	1482	(2.2)	Dizziness		1750	(2.6)
3	Off label use		550	(0.8)	Arthralgia	1269	(1.9)	Syncope		684	(1.0)
4	Contusion		284	(0.4)	Back pain	634	(0.9)	Paraesthesia		621	(0.9)
5	Exposure to SARS-CoV-2		207	(0.3)	Neck pain	242	(0.4)	Loss of consciousness		525	(0.8)
6	Incorrect route of product administration		136	(0.2)	Limb discomfort	231	(0.3)	Hypoaesthesia		385	(0.6)
7	Vaccination complication		103	(0.2)	Muscular weakness	218	(0.3)	Tremor		340	(0.5)
8	Exposure during pregnancy		96	(0.1)	Mobility decreased	184	(0.3)	Somnolence		295	(0.4)
9	Maternal exposure during pregnancy		96	(0.1)	Muscle spasms	163	(0.2)	Presyncope		284	(0.4)
10	Product use issue		75	(0.1)	Musculoskeletal chest pain	152	(0.2)	Lethargy		279	(0.4)
11	Extra administered dose		51	(0.1)	Joint swelling	122	(0.2)	Cerebrovascular accident		259	(0.4)
12	Head injury		42	(0.1)	Pain in jaw	102	(0.2)	Unresponsive stimuli	to	254	(0.4)
13	Overdose		40	(0.1)	Musculoskeletal pain	100	(0.1)	Seizure		239	(0.4)
14	Wound		34	(0.1)	Musculoskeletal stiffness	98	(0.1)	Anosmia		196	(0.3)
15	Incomplete course of vaccination		29	(0.0)	Flank pain	78	(0.1)	Ageusia		180	(0.3)
16	Product dose omission issue		25	(0.0)	Arthritis	61	(0.1)	Depressed level of consciousness	of	146	(0.2)

17	Muscle strain	23	(0.0)	Bone pain	59	(0.1)	Aphasia	136	(0.2)
18	Maternal exposure during breast feeding	23	(0.0)	Rheumatoid arthritis	52	(0.1)	Migraine	116	(0.2)
19	Rib fracture	23	(0.0)	Weight bearing difficulty	44	(0.1)	Speech disorder	115	(0.2)
20	Scar	21	(0.0)	Rhabdomyolysis	40	(0.1)	Ischaemic stroke	105	(0.2)
21	Injury	18	(0.0)	Costochondritis	40	(0.1)	Disturbance in attention	105	(0.2)
22	Hip fracture	18	(0.0)	Muscle tightness	39	(0.1)	Balance disorder	104	(0.2)
23	Limb injury	17	(0.0)	Musculoskeletal discomfort	37	(0.1)	Altered state of consciousness	89	(0.1)
24	Skin abrasion	17	(0.0)	Muscle twitching	36	(0.1)	Facial paralysis	87	(0.1)
25	Subdural haematoma	17	(0.0)	Groin pain	35	(0.1)	Cerebral infarction	87	(0.1)
26	Femur fracture	14	(0.0)	Spinal pain	34	(0.1)	Hemiparesis	86	(0.1)
27	Skin laceration	14	(0.0)	Myositis	34	(0.1)	Dysarthria	82	(0.1)
28	Exposure via breast milk	13	(0.0)	Polymyalgia rheumatica	25	(0.0)	Head discomfort	73	(0.1)
29	Traumatic lung injury	13	(0.0)	Systemic erythematosus lupus	24	(0.0)	Transient ischaemic attack	68	(0.1)
30	Road traffic accident	13	(0.0)	Joint stiffness	22	(0.0)	Coma	67	(0.1)

Respiratory, thoracic and mediastinal disorders			Skin and subcutaneous tissue disorders			Vascular disorders			
PTs	N	%	PTs	N	%	PTs	N	%	
1	Dyspnoea	18397	(27.1)	Rash	3131	(4.6)	Deep vein thrombosis	4562	(6.7)
2	Pulmonary embolism	10074	(14.8)	Pruritus	2409	(3.5)	Hypertension	3387	(5.0)
3	Cough	5023	(7.4)	Urticaria	2336	(3.4)	Thrombosis	2481	(3.7)
4	Hypoxia	1227	(1.8)	Erythema	1635	(2.4)	Hypotension	1651	(2.4)
5	Oropharyngeal pain	1168	(1.7)	Hyperhidrosis	1010	(1.5)	Hypertensive crisis	627	(0.9)
6	Dyspnoea exertional	1157	(1.7)	Angioedema	941	(1.4)	Venous thrombosis limb	544	(0.8)
7	Pleural effusion	870	(1.3)	Petechiae	600	(0.9)	Superficial thrombosis vein	538	(0.8)
8	Respiratory failure	860	(1.3)	Rash pruritic	486	(0.7)	Haemorrhage	536	(0.8)
9	Acute respiratory failure	848	(1.2)	Rash erythematous	450	(0.7)	Circulatory collapse	517	(0.8)
10	Throat tightness	825	(1.2)	Cold sweat	292	(0.4)	Haematoma	482	(0.7)
11	Asthma	791	(1.2)	Blister	230	(0.3)	Flushing	447	(0.7)

12	Epistaxis	788	(1.2)	Alopecia	203	(0.3)	Thrombophlebitis	424	(0.6)
13	Respiratory distress	758	(1.1)	Rash macular	201	(0.3)	Pallor	365	(0.5)
14	Wheezing	704	(1.0)	Purpura	199	(0.3)	Venous thrombosis	365	(0.5)
15	Pharyngeal swelling	657	(1.0)	Eczema	199	(0.3)	Hot flush	336	(0.5)
16	Pulmonary oedema	555	(0.8)	Rash maculo-papular	198	(0.3)	Cyanosis	314	(0.5)
17	Pulmonary thrombosis	549	(0.8)	Skin discolouration	190	(0.3)	Vasculitis	264	(0.4)
18	Lung opacity	532	(0.8)	Night sweats	188	(0.3)	Phlebitis	217	(0.3)
19	Rhinorrhoea	508	(0.7)	Skin disorder	178	(0.3)	Embolism	215	(0.3)
20	Dysphonia	482	(0.7)	Erythema multiforme	167	(0.2)	Shock	201	(0.3)
21	Throat irritation	474	(0.7)	Dermatitis allergic	157	(0.2)	Peripheral coldness	174	(0.3)
22	Tachypnoea	427	(0.6)	Skin reaction	147	(0.2)	Blood pressure fluctuation	163	(0.2)
23	Productive cough	419	(0.6)	Echymosis	142	(0.2)	Peripheral artery thrombosis	162	(0.2)
24	Respiratory arrest	379	(0.6)	Cutaneous vasculitis	142	(0.2)	Aortic dissection	149	(0.2)
25	Chronic obstructive pulmonary disease	366	(0.5)	Rash papular	132	(0.2)	Peripheral ischaemia	140	(0.2)
26	Lung infiltration	362	(0.5)	Pemphigoid	131	(0.2)	Infarction	136	(0.2)
27	Respiratory disorder	360	(0.5)	Psoriasis	127	(0.2)	Giant cell arteritis	131	(0.2)
28	Lung disorder	341	(0.5)	Skin warm	110	(0.2)	Ischaemia	121	(0.2)
29	Pulmonary infarction	339	(0.5)	Skin burning sensation	110	(0.2)	Pelvic venous thrombosis	115	(0.2)
30	Oropharyngeal discomfort	332	(0.5)	Dermatitis bullous	103	(0.2)	Lymphoedema	106	(0.2)

Table S3-4 The most frequently PTs by cluster 4 (systemic AEs)

	Cardiac disorder			Gastrointestinal disorders			Infections and infestations		
	PTs	N	%	PTs	N	%	PTs	N	%
1	Palpitations	3128	(12.3)	Nausea	8040	(31.5)	COVID-19	1669	(6.5)
2	Tachycardia	2542	(10.0)	Vomiting	3700	(14.5)	Pneumonia	635	(2.5)
3	Arrhythmia	838	(3.3)	Diarrhoea	2768	(10.8)	Influenza	567	(2.2)
4	Myocarditis	815	(3.2)	Abdominal pain	1391	(5.4)	COVID-19 pneumonia	484	(1.9)
5	Atrial fibrillation	602	(2.4)	Abdominal pain upper	858	(3.4)	Herpes zoster	417	(1.6)
6	Pericarditis	441	(1.7)	Dysphagia	842	(3.3)	Nasopharyngitis	409	(1.6)
7	Angina pectoris	424	(1.7)	Swollen tongue	509	(2.0)	Urinary tract infection	315	(1.2)
8	Cardiac arrest	394	(1.5)	Paraesthesia oral	455	(1.8)	Sepsis	309	(1.2)
9	Myocardial infarction	362	(1.4)	Hypoaesthesia oral	379	(1.5)	Infection	190	(0.7)
10	Bradycardia	285	(1.1)	Abdominal discomfort	367	(1.4)	Sinusitis	126	(0.5)
11	Cardiovascular disorder	277	(1.1)	Lip swelling	329	(1.3)	Appendicitis	116	(0.5)
12	Cardiac failure	222	(0.9)	Dry mouth	317	(1.2)	Vestibular neuronitis	111	(0.4)
13	Cardiac disorder	192	(0.8)	Dyspepsia	276	(1.1)	Oral herpes	109	(0.4)
14	Extrasystoles	182	(0.7)	Abdominal distension	235	(0.9)	Encephalitis	105	(0.4)
15	Acute myocardial infarction	182	(0.7)	Constipation	187	(0.7)	Vaccine breakthrough infection	100	(0.4)
16	Sinus tachycardia	178	(0.7)	Retching	178	(0.7)	Cellulitis	100	(0.4)
17	Cardiomegaly	168	(0.7)	Abdominal pain lower	144	(0.6)	Myelitis	95	(0.4)
18	Pericardial effusion	164	(0.6)	Gastrointestinal disorder	135	(0.5)	Septic shock	93	(0.4)
19	Cardio-respiratory arrest	133	(0.5)	Gastrooesophageal reflux disease	121	(0.5)	Meningitis	90	(0.4)
20	Cardiac discomfort	108	(0.4)	Toothache	107	(0.4)	Suspected COVID-19	87	(0.3)
21	Cardiac flutter	107	(0.4)	Odynophagia	101	(0.4)	Rhinitis	86	(0.3)
22	Ventricular extrasystoles	96	(0.4)	Mouth swelling	90	(0.4)	Dysentery	82	(0.3)
23	Mitral valve incompetence	94	(0.4)	Gastrointestinal pain	82	(0.3)	Pneumonia aspiration	80	(0.3)
24	Cardiac failure congestive	86	(0.3)	Flatulence	76	(0.3)	Viral infection	74	(0.3)
25	Postural orthostatic tachycardia syndrome	76	(0.3)	Oral discomfort	75	(0.3)	Conjunctivitis	69	(0.3)
26	Ventricular tachycardia	71	(0.3)	Anal incontinence	74	(0.3)	Bronchitis	65	(0.3)

27	Supraventricular tachycardia		66 (0.3)	Faeces discoloured	69 (0.3)	Cystitis	61 (0.2)
28	Coronary artery disease		63 (0.2)	Stomatitis	68 (0.3)	Pneumonia bacterial	48 (0.2)
29	Pulseless electrical activity		61 (0.2)	Tongue oedema	67 (0.3)	Sweating fever	48 (0.2)
30	Tricuspid valve incompetence		59 (0.2)	Haematochezia	65 (0.3)	Erysipelas	48 (0.2)

Injury, poisoning and procedural complications				Musculoskeletal and connective tissue disorders			Nervous system disorder			
		PTs	N	%	PTs	N	%	PTs	N	%
1	Fall		826	(3.2)	Myalgia	5504	(21.6)	Headache	11188	(43.8)
2	Inappropriate schedule of product administration		552	(2.2)	Arthralgia	4204	(16.5)	Dizziness	6563	(25.7)
3	Off label use		443	(1.7)	Pain in extremity	3778	(14.8)	Paraesthesia	2710	(10.6)
4	Contusion		308	(1.2)	Back pain	1469	(5.8)	Hypoaesthesia	2161	(8.5)
5	Exposure to SARS-CoV-2		152	(0.6)	Muscular weakness	1355	(5.3)	Syncope	1609	(6.3)
6	Head injury		144	(0.6)	Neck pain	1017	(4.0)	Tremor	1564	(6.1)
7	Vaccination complication		126	(0.5)	Muscle spasms	906	(3.5)	Loss of consciousness	1152	(4.5)
8	Incorrect route of product administration		78	(0.3)	Limb discomfort	753	(2.9)	Somnolence	806	(3.2)
9	Product use issue		69	(0.3)	Musculoskeletal stiffness	592	(2.3)	Migraine	804	(3.1)
10	Skin laceration		49	(0.2)	Mobility decreased	539	(2.1)	Lethargy	658	(2.6)
11	Maternal exposure during pregnancy		47	(0.2)	Muscle twitching	296	(1.2)	Presyncope	653	(2.6)
12	Limb injury		34	(0.1)	Pain in jaw	258	(1.0)	Burning sensation	565	(2.2)
13	Wound		32	(0.1)	Bone pain	247	(1.0)	Seizure	532	(2.1)
14	Subdural haematoma		31	(0.1)	Joint swelling	242	(0.9)	Balance disorder	482	(1.9)
15	Incomplete course of vaccination		31	(0.1)	Musculoskeletal pain	229	(0.9)	Disturbance in attention	462	(1.8)
16	Extra dose administered		31	(0.1)	Musculoskeletal chest pain	208	(0.8)	Ageusia	443	(1.7)
17	Nerve injury		29	(0.1)	Muscle tightness	154	(0.6)	Speech disorder	399	(1.6)
18	Concussion		29	(0.1)	Arthritis	125	(0.5)	Neuralgia	394	(1.5)

19	Rib fracture	28	(0.1)	Flank pain	122	(0.5)	Anosmia	358	(1.4)
20	Overdose	27	(0.1)	Spinal pain	109	(0.4)	Head discomfort	346	(1.4)
21	Road traffic accident	25	(0.1)	Musculoskeletal discomfort	106	(0.4)	Memory impairment	344	(1.3)
22	Maternal exposure during breast feeding	23	(0.1)	Joint stiffness	97	(0.4)	Unresponsive to stimuli	330	(1.3)
23	Injury	23	(0.1)	Muscle fatigue	87	(0.3)	Cerebrovascular accident	321	(1.3)
24	Brain herniation	23	(0.1)	Groin pain	69	(0.3)	Aphasia	316	(1.2)
25	Muscle strain	21	(0.1)	Rhabdomyolysis	61	(0.2)	Dysgeusia	314	(1.2)
26	Joint injury	20	(0.1)	Muscle rigidity	60	(0.2)	Depressed level of consciousness	309	(1.2)
27	Exposure during pregnancy	19	(0.1)	Spinal osteoarthritis	57	(0.2)	Dysarthria	299	(1.2)
28	Facial bones fracture	18	(0.1)	Joint range of motion decreased	57	(0.2)	Facial paralysis	290	(1.1)
29	Skin abrasion	16	(0.1)	Intervertebral disc degeneration	51	(0.2)	Dysstasia	290	(1.1)
30	Product administered at inappropriate site	16	(0.1)	Weight bearing difficulty	50	(0.2)	Amnesia	215	(0.8)

Respiratory, thoracic and mediastinal disorders			Skin and subcutaneous tissue disorders			Vascular disorders			
	PTs	N	%	PTs	N	%	PTs	N	%
1	Dyspnoea	7670	(30.0)	Hyperhidrosis	2090	(8.2)	Hypertension	1258	(4.9)
2	Cough	2676	(10.5)	Rash	1645	(6.4)	Hypotension	874	(3.4)
3	Oropharyngeal pain	1403	(5.5)	Pruritus	1249	(4.9)	Pallor	432	(1.7)
4	Pulmonary embolism	584	(2.3)	Erythema	969	(3.8)	Hot flush	431	(1.7)
5	Throat tightness	582	(2.3)	Urticaria	722	(2.8)	Peripheral coldness	320	(1.3)
6	Pharyngeal swelling	498	(2.0)	Cold sweat	524	(2.1)	Thrombosis	297	(1.2)
7	Rhinorrhoea	495	(1.9)	Night sweats	292	(1.1)	Flushing	290	(1.1)
8	Hypoxia	420	(1.6)	Skin disorder	290	(1.1)	Deep vein thrombosis	201	(0.8)
9	Dyspnoea exertional	402	(1.6)	Rash erythematous	207	(0.8)	Cyanosis	177	(0.7)
10	Dysphonia	385	(1.5)	Skin discolouration	192	(0.8)	Circulatory collapse	174	(0.7)
11	Wheezing	378	(1.5)	Skin burning sensation	184	(0.7)	Blood pressure fluctuation	149	(0.6)
12	Respiratory distress	360	(1.4)	Angioedema	178	(0.7)	Haematoma	145	(0.6)
13	Lung opacity	334	(1.3)	Pain of skin	174	(0.7)	Haemorrhage	122	(0.5)

14	Acute respiratory failure	328	(1.3)	Sensitive skin	171	(0.7)	Hypertensive crisis	101	(0.4)
15	Throat irritation	298	(1.2)	Rash pruritic	162	(0.6)	Shock	85	(0.3)
16	Productive cough	290	(1.1)	Rash macular	153	(0.6)	Arteriosclerosis	67	(0.3)
17	Nasal congestion	287	(1.1)	Petechiae	148	(0.6)	Peripheral vascular disorder	51	(0.2)
18	Epistaxis	283	(1.1)	Skin warm	130	(0.5)	Orthostatic hypotension	50	(0.2)
19	Pleural effusion	247	(1.0)	Alopecia	117	(0.5)	Aortic arteriosclerosis	48	(0.2)
20	Respiratory disorder	227	(0.9)	Blister	116	(0.5)	Vasculitis	46	(0.2)
21	Asthma	216	(0.8)	Photosensitivity reaction	57	(0.2)	Ischaemia	32	(0.1)
22	Respiratory failure	214	(0.8)	Skin exfoliation	48	(0.2)	Peripheral venous disease	30	(0.1)
23	Tachypnoea	210	(0.8)	Rash papular	48	(0.2)	Lymphoedema	30	(0.1)
24	Hyperventilation	186	(0.7)	Livedo reticularis	47	(0.2)	Vascular pain	29	(0.1)
25	Oropharyngeal discomfort	186	(0.7)	Acne	45	(0.2)	Poor peripheral circulation	29	(0.1)
26	Lung infiltration	180	(0.7)	Dry skin	44	(0.2)	Essential hypertension	29	(0.1)
27	Atelectasis	169	(0.7)	Skin reaction	43	(0.2)	Vasodilatation	28	(0.1)
28	Painful respiration	154	(0.6)	Eczema	43	(0.2)	Superficial vein thrombosis	27	(0.1)
29	Pulmonary oedema	153	(0.6)	Skin lesion	42	(0.2)	Varicose vein	24	(0.1)
30	Lung disorder	139	(0.5)	Dermatitis allergic	41	(0.2)	Giant cell arteritis	24	(0.1)

Table S3-5 The most frequently PTs by cluster 5 (nervous system AEs)

	Gastrointestinal disorders			Infections and infestations			Injury, poisoning and procedural complications		
	PTs	N	%	PTs	N	%	PTs	N	%
1	Nausea	13018	(8.6)	COVID-19	84	(0.1)	Fall	1960	(1.3)
2	Vomiting	6954	(4.6)	Herpes zoster	23	(0.0)	Inappropriate schedule of product administration	1952	(1.3)
3	Diarrhoea	4323	(2.9)	Urinary tract infection	20	(0.0)	Off label use	1435	(1.0)
4	Abdominal pain	2510	(1.7)	Influenza	17	(0.0)	Maternal exposure during pregnancy	711	(0.5)
5	Abdominal pain upper	1685	(1.1)	Pneumonia	13	(0.0)	Contusion	634	(0.4)
6	Dysphagia	677	(0.4)	Nasopharyngitis	12	(0.0)	Exposure during pregnancy	608	(0.4)
7	Paraesthesia oral	613	(0.4)	Encephalitis	12	(0.0)	Incorrect route of product administration	331	(0.2)
8	Hypoaesthesia oral	518	(0.3)	Vestibular neuronitis	8	(0.0)	Head injury	312	(0.2)
9	Swollen tongue	457	(0.3)	Infection	8	(0.0)	Product use issue	228	(0.2)
10	Lip swelling	448	(0.3)	Sepsis	7	(0.0)	Vaccination complication	203	(0.1)
11	Pancreatitis acute	447	(0.3)	Vaccine breakthrough infection	7	(0.0)	Subdural haematoma	197	(0.1)
12	Abdominal discomfort	443	(0.3)	Pneumonia aspiration	5	(0.0)	Maternal exposure during breast feeding	173	(0.1)
13	Abdominal pain lower	289	(0.2)	Myelitis	5	(0.0)	Nerve injury	169	(0.1)
14	Abdominal distension	278	(0.2)	Asymptomatic COVID-19	5	(0.0)	Limb injury	134	(0.1)
15	Dyspepsia	251	(0.2)	Sinusitis	4	(0.0)	Product administered at inappropriate site	116	(0.1)
16	Constipation	248	(0.2)	Meningitis aseptic	4	(0.0)	Overdose	99	(0.1)
17	Pancreatitis	235	(0.2)	Herpes simplex	4	(0.0)	Extra administered dose	96	(0.1)
18	Dry mouth	235	(0.2)	Ophthalmic herpes zoster	3	(0.0)	Injury	92	(0.1)
19	Colitis ulcerative	223	(0.1)	Meningitis bacterial	3	(0.0)	Road traffic accident	90	(0.1)
20	Haematochezia	202	(0.1)	Meningitis	3	(0.0)	Concussion	82	(0.1)
21	Gastrointestinal disorder	184	(0.1)	Labyrinthitis	3	(0.0)	Exposure via breast milk	65	(0.0)
22	Colitis	184	(0.1)	Kidney infection	3	(0.0)	Product dose omission issue	63	(0.0)

23	Rectal haemorrhage	180	(0.1)	Cystitis	3	(0.0)	Muscle strain	60	(0.0)
24	Gastrointestinal haemorrhage	178	(0.1)	COVID-19 pneumonia	3	(0.0)	Incomplete course of vaccination	57	(0.0)
25	Lip oedema	173	(0.1)	Appendicitis	3	(0.0)	Skin laceration	52	(0.0)
26	Retching	172	(0.1)	Tooth infection	2	(0.0)	Maternal exposure before pregnancy	52	(0.0)
27	Haematemesis	153	(0.1)	Subcutaneous abscess	2	(0.0)	Face injury	49	(0.0)
28	Mesenteric vein thrombosis	152	(0.1)	Pyelonephritis	2	(0.0)	Wound	47	(0.0)
29	Gastrointestinal pain	150	(0.1)	Post viral fatigue syndrome	2	(0.0)	Joint injury	46	(0.0)
30	Crohn's disease	120	(0.1)	Mastitis	2	(0.0)	Joint dislocation	45	(0.0)

Musculoskeletal and connective tissue disorders			Nervous system disorders			Skin and subcutaneous tissue disorders			
	PTs	N	%	PTs	N	%	PTs	N	%
1	Myalgia	13373	(8.9)	Headache	25427	(16.9)	Rash	1649	(1.1)
2	Arthralgia	11086	(7.4)	Dizziness	11050	(7.3)	Hyperhidrosis	1331	(0.9)
3	Pain in extremity	9465	(6.3)	Paraesthesia	7079	(4.7)	Pruritus	1232	(0.8)
4	Muscular weakness	3072	(2.0)	Hypoaesthesia	5470	(3.6)	Erythema	920	(0.6)
5	Back pain	2488	(1.7)	Cerebrovascular accident	5176	(3.4)	Urticaria	785	(0.5)
6	Neck pain	1633	(1.1)	Syncope	4518	(3.0)	Cold sweat	359	(0.2)
7	Muscle spasms	1584	(1.1)	Facial paralysis	3301	(2.2)	Rash erythematous	278	(0.2)
8	Musculoskeletal stiffness	1358	(0.9)	Loss of consciousness	3068	(2.0)	Night sweats	256	(0.2)
9	Limb discomfort	1294	(0.9)	Seizure	2444	(1.6)	Skin disorder	221	(0.1)
10	Mobility decreased	1237	(0.8)	Migraine	2125	(1.4)	Angioedema	221	(0.1)
11	Joint swelling	751	(0.5)	Ischaemic stroke	2093	(1.4)	Petechiae	213	(0.1)
12	Arthritis	584	(0.4)	Tremor	2066	(1.4)	Rash pruritic	213	(0.1)
13	Muscle twitching	493	(0.3)	Cerebral infarction	1894	(1.3)	Pain of skin	154	(0.1)
14	Rheumatoid arthritis	479	(0.3)	Transient ischaemic attack	1558	(1.0)	Skin burning sensation	149	(0.1)
15	Musculoskeletal pain	459	(0.3)	Guillain-Barre syndrome	1494	(1.0)	Rash macular	137	(0.1)
16	Polymyalgia rheumatica	458	(0.3)	Hemiparesis	1447	(1.0)	Skin discolouration	128	(0.1)
17	Bone pain	424	(0.3)	Balance disorder	1429	(0.9)	Blister	123	(0.1)

18	Joint range of motion decreased	341	(0.2)	Bell's palsy	1371	(0.9)	Alopecia	111	(0.1)
19	Rhabdomyolysis	289	(0.2)	Cerebral haemorrhage	1352	(0.9)	Skin warm	107	(0.1)
20	Periarthritis	273	(0.2)	Somnolence	1347	(0.9)	Sensitive skin	107	(0.1)
21	Joint stiffness	252	(0.2)	Aphasia	1245	(0.8)	Dermatitis allergic	73	(0.0)
22	Pain in jaw	250	(0.2)	Dysarthria	1230	(0.8)	Photosensitivity reaction	66	(0.0)
23	Muscle tightness	221	(0.1)	Presyncope	1212	(0.8)	Purpura	65	(0.0)
24	Spinal pain	202	(0.1)	Epilepsy	1187	(0.8)	Rash	1649	(1.1)
25	Bursitis	194	(0.1)	Facial paresis	1111	(0.7)	Hyperhidrosis	1331	(0.9)
26	Polyarthritis	169	(0.1)	Neuralgia	947	(0.6)	Pruritus	1232	(0.8)
27	Musculoskeletal chest pain	166	(0.1)	Speech disorder	924	(0.6)	Erythema	920	(0.6)
28	Musculoskeletal disorder	166	(0.1)	Disturbance attention	924	(0.6)	Urticaria	785	(0.5)
29	Musculoskeletal discomfort	162	(0.1)	Lethargy	889	(0.6)	Cold sweat	359	(0.2)
30	Fibromyalgia	155	(0.1)	Burning sensation	884	(0.6)	Rash erythematous	278	(0.2)

Vascular disorders

	PTs	N	%
1	Hypertension	1702	(1.1)
2	Thrombosis	757	(0.5)
3	Hypotension	702	(0.5)
4	Deep vein thrombosis	489	(0.3)
5	Hot flush	314	(0.2)
6	Pallor	293	(0.2)
7	Circulatory collapse	263	(0.2)
8	Hypertensive crisis	262	(0.2)
9	Peripheral coldness	217	(0.1)
10	Haematoma	186	(0.1)
11	Flushing	165	(0.1)
12	Haemorrhage	159	(0.1)
13	Cyanosis	116	(0.1)
14	Blood pressure fluctuation	91	(0.1)

15	Ischaemia	84	(0.1)
16	Giant cell arteritis	72	(0.0)
17	Venous thrombosis limb	70	(0.0)
18	Venous thrombosis	69	(0.0)
19	Vasculitis	69	(0.0)
20	Superficial vein thrombosis	60	(0.0)
21	Embolism	60	(0.0)
22	Orthostatic hypotension	56	(0.0)
23	Arteriosclerosis	52	(0.0)
24	Phlebitis	49	(0.0)
25	Thrombophlebitis	45	(0.0)
26	Jugular vein thrombosis	44	(0.0)
27	Peripheral artery thrombosis	40	(0.0)
28	Infarction	39	(0.0)
29	Vascular pain	36	(0.0)
30	Aneurysm	36	(0.0)
