

Table SI. ICD-9-CM and ICD-10-CM codes for serious infections

Serious infections	ICD-9-CM	ICD-10-CM
Any serious infection	All	All
Skin and soft tissue infections	006.6, 022.0, 031.1, 054, 054.0, 054.1, 054.2, 054.8, 054.9, 052, 052.8, 052.9, 053, 053.8, 053.9, 017.0*, 027.1, 035, 039.0, 039.3, 039.4, 117.1, 117.2, 117.8, 380.1, 680*, 681*, 682*, 683*, 684*, 686*, 728.86	A06.7, A22.0, B00, B00.0, B00.1, B00.2, B00.7, B00.9, B01, B01.9, B02, B02.7, B02.9, A18.4, A26, A26.0, A26.8, A26.9, A31.1, A32.0, A42.2, A43.1, A44.1, A46, B42.1, B43.0, B43.2, B45.2, B46.3, H60.0*, H60.1*, H60.2*, H60.3*, H60.9*, L00*, L01*, L02*, L03*, L04*, L08*, M72.6
Musculoskeletal infections	380.0*, 728.0, 040.0, 711, 711.0*, 711.4*, 711.5*, 711.6*, 711.7*, 711.8*, 711.9*, 003.23, 015*, 376.03, 730, 730.0*, 730.1*, 730.2*, 730.3*, 730.8*, 730.9*, 003.24	H61.0*, A48.0, M60.0*, M65.0*, M65.1*, M71.0*, M71.1*, M00*, M01*, A02.23, M46.2*, M46.3*, M46.5*, M86*, M90.0, M90.1, M90.2, H05.02*, A02.24, A18.0*
Upper respiratory tract infections	012.2*, 012.3*, 382.0*, 382.4, 382.9, 017.4*, 383.0*, 383.2*, 383.8*, 383.9*, 461*, 462*, 463*, 464*, 465*, 475, 478.21, 478.22, 478.24, 478.71	H66.0*, H66.4*, H66.9*, A18.6, H70.0*, H70.2*, H70.8*, H70.9*, J01*, J02*, J03*, J04*, J05*, J06*, A15.5, J36, J39.0, J39.1
Lower respiratory tract infections	487*, 488*, 466*, 480*, 481*, 482*, 483*, 484*, 485*, 486*, 011.0*, 011.6*, 003.22, 484.1, 022.1, 117.3, 031.0, 039.1, 052.1, 055.1, 112.4, 117.5, 117.7, 513*, 006.4, 510*, 10*, 011*, 012, 012.0*, 012.1*, 012.8*, 018*, 136.3	J9*, J10*, J11*, J20*, J21*, J22*, J12*, J13*, J14*, J15*, J16*, J17*, J18*, A15.0, A02.22, B25.0, A22.1, B44.0, B44.1, A31.0, A42.0, A43.0, A48.1, B01.2, B05.2, B37.1, B42.0, B45.0, B46.0, J44.0, J85*, A06.5, J86*, A15, A15.0, A15.4, A15.6, A15.7, A15.8, A15.9, A19*, B59
Heart infections	421*, 424.9*, 036.4*, 112.81, 391.1, 098.85, 093.2*, 422*, 391.2, 420*, 391.0	I01.1, I33*, I38, I39, A39.5*, B33.21, B37.6, A32.82, A54.83, A52.03, I40*, I41, I01.2, I30*, I32, I01.0, A18.84
Sepsis/septicemia	003.1, 022.3, 038*, 995.91, 995.92, 036.2, 112.5	A02.1, A22.7, A26.7, A32.7, A39.2-A39.4, A40*, A41*, A42.7, R65.2*, B37.7
Central nervous system infections	013*, 017.3*, 048, 049*, 053.1*, 056.0*, 003.21, 027.0, 036.0, 047*, 053.0, 054.72, 072.1, 100.81, 112.83, 320*, 321*, 036.1, 052.0, 052.2, 054.3, 054.74, 055.0, 058.2*, 062*, 063*, 064, 072.2, 130.0, 323.0*, 323.1, 323.2, 323.4*, 006.5, 324*	A17*, A18.5*, A88*, A89, B02.2*, B06.0*, A02.21, A27.81, A32.1, A32.11, A39.0, A42.81, A42.82, A52.13, A54.81, A69.21, A87*, B00.3, B01.0, B02.1, B05.1, B26.1, B27.02, B27.12, B27.82, B37.5, B38.4, B45.1, B72.92, G00*, G01, G02, A32.12, A39.81, A83*, A84*, A85*, A86, B00.4, B01.1*, B02.0, B05.0, B10.0*, B25.8,

		B26.2, B58.2, G04.2, G04.3*, G04.8*, G04.9*, G05*, A06.6, B43.1, B46.1, G06*, G07
Gastrointestinal infections	003.0, 003.8, 003.9, 004*, 006.0, 006.2, 006.9, 007*, 008*, 009*, 014*, 022.2, 039.2, 112.84, 112.85, 569.5, 008.45, 567, 567.0, 567.1, 567.2*, 567.3*, 567.9, 562.01, 562.03, 562.11, 562.13, 566, 575.0, 575.10, 575.12, 070.0, 070.1, 070.20, 070.21, 070.30, 070.31, 070.41, 070.42, 070.43, 070.51, 070.52, 070.53, 006.3, 572.0	A02.0, A02.8, A02.9, A03*, A04*, A06.0, A06.2, A06.3, A06.9, A07*, A08*, A09*, A18.3*, A22.2, A42.1, B05.4, B37.0, B37.81, B37.82, B46.2, K63.0, A04.7, K65, K65.0, K65.1, K65.2, K65.9, K67, K68.1*, K57.0, K57.12, K57.13, K57.2, K57.32, K57.33, K57.4, K57.52, K57.53, K57.8, K57.92, K57.93, K61*, K81.0, K81.2, K81.9, B15*, B16*, B17*, A06.4, L75.0
Urinary tract infections	016.0*, 016.1*, 016.2*, 098.0, 098.1, 098.10, 098.11, 098.19, 590*, 595.0, 597.0, 597.8, 597.80, 597.89, 599.0	A02.25, A18.11, A18.12, A54.0, A54.00, A54.01, A54.09, A54.1, A54.21, A54.24, A56.2, N10, N13.6, N15.1, N30.0, N34.0, N34.1, N34.2, N39.0

*represent any digit of any length.

ICD-9-CM, Ninth Edition of the International Classification of the Disease, Clinical Modification; ICD-10-CM, Tenth Edition of the International Classification of the Disease, Clinical Modification.

Table SII. ICD-9-CM and ICD-10-CM codes for the comorbidities

Comorbidities	ICD-9-CM	ICD-10-CM
Diabetes mellitus	250*	E10*, E11*, E13*
Heart failure	428*	I50*
CVD	430, 431, 432*, 433.01, 433.11, 433.21, 433.31, 433.81, 433.91, 434*, 435*, 436, 437.0, 437.1, 437.8, 437.9	I60*, I61*, I62*, I63*, I66*, I67.2, I67.8*, I67.9, G45*
COPD	491.2*, 492*	J43*, J44*
CLD or cirrhosis	070, 070.2*, 070.3*, 070.44, 070.54, 070.7, 070.9, 571*	B18*, K70*, K72*, K73*, K74*
CKD or renal failure	585*, 586	N18*, N19
Nephrotic syndrome	581*	N04*
CTD or systemic vasculitis ^a	710.0, 710.1, 710.2, 710.3, 710.4, 714.0, 714.1, 714.2, 446.0, 446.1, 446.2*, 446.4, 446.5, 446.7, 136.1	M05*, M06*, M30*, M31*, M32*, M33*, M34*, M35.0*, M35.2, M36.0
Psoriasis	696.1	L40*
Dementia	290, 290.0, 290.1*, 290.2*, 290.3, 290.4*, 294.1*, 294.2*, 331.0, 331.1*, 331.2, 331.82	F01*, F02*, F03*, G30*, G31.0*, G31.83
Parkinson's disease	332.0	G20
Depression	296.2*, 296.3*	F32*, F33*
Malignancy ^b	140*-209*	C00*-C96*

*represent any digit of any length.

^ainclude systemic lupus erythematosus, systemic sclerosis, Sjogren syndrome, dermatomyositis, rheumatoid arthritis, and systemic vasculitis; the diagnosis is confirmed by a record in Registry for Catastrophic Illness Patients (HV_TYPE=05).

^bthe diagnosis is confirmed by a record in Registry for Catastrophic Illness Patients (HV_TYPE=01).

CKD: chronic kidney disease; CLD: chronic liver disease; COPD: chronic obstructive pulmonary disease; CTD: connective tissue disease; CVD: cerebrovascular disease.

Table SIII. Incidence rate of serious infections in the bullous pemphigoid and reference cohorts (serious infections occurring within 4 weeks of index date were excluded from the analyses)

Serious infections	BP cohort (N=12,300)			Non-BP cohort (N=49,200)			IRR (95%CI)
	Events, N	PYs	IR ^a (95% CI)	Events, N	PYs	IR ^a (95% CI)	
All	4,780	12671.1	377.2 (368.8-385.7)	7,284	70989.3	102.6 (100.3-104.8)	3.68 (3.54-3.81)
Skin and soft tissue infections	816	15408.5	53.0 (49.5-56.6)	891	75369.8	11.8 (11.1-12.6)	4.48 (4.07-4.93)
Musculoskeletal infections	117	15966.5	7.3 (6.1-8.8)	138	75967.2	1.8 (1.5-2.1)	4.03 (3.15-5.16)
Upper respiratory tract infections	64	16008.1	4.0 (3.1-5.0)	128	75949.4	1.7 (1.4-2.0)	2.37 (1.76-3.20)
Lower respiratory tract infections	2,219	14673.8	151.2 (145.4-157.1)	3,598	73780.5	48.8 (47.2-50.3)	3.10 (2.94-3.27)
Heart infections	46	16030.5	2.9 (2.1-3.8)	115	7599.24	1.5 (1.2-1.8)	1.90 (1.35-2.67)
Sepsis/septicemia	2,158	14964.0	144.2 (138.6-149.9)	2,382	74947.4	31.8 (30.5-33.0)	4.54 (4.28-4.81)
Central nervous system infections	27	16045.9	1.7 (1.1-2.5)	47	76036.1	0.6 (0.4-0.8)	2.72 (1.70-4.37)
Gastrointestinal infections	292	15858.7	18.4 (16.4-20.6)	649	75605.3	8.6 (7.9-9.2)	2.14 (1.87-2.46)
Urinary tract infections	1,623	14787.7	109.8 (104.7-114.9)	2,546	74209.9	34.3 (33.0-35.6)	3.20 (3.00-3.40)
Infections leading to ICU admission	393	15913.3	24.7 (22.3-27.2)	720	75767.0	9.5 (8.8-10.2)	2.60 (2.30-2.94)

^aincidence rate per 1000 person-years.

BP: bullous pemphigoid; CI: confidence interval; ICU: intensive care unit; IR: incidence rate; IRR: incidence rate ratio; PYs: person-years.

Table SIV. Risk of serious infections in patients with bullous pemphigoid compared to those without bullous pemphigoid (serious infections occurring within 4 weeks of index date were excluded from the analyses)

Serious infections	cHR (95% CI)	<i>P</i>	aHR ^a (95% CI)	<i>P</i>
All	3.00 (2.89-3.11)	<0.001	2.06 (1.97-2.15)	<0.001
Skin and soft tissue infections	3.55 (3.22-3.90)	<0.001	2.54 (2.28-2.84)	<0.001
Musculoskeletal infections	3.21 (2.51-4.12)	<0.001	1.93 (1.45-2.57)	<0.001
Upper respiratory tract infections	1.87 (1.38-2.52)	<0.001	0.99 (0.70-1.41)	0.97
Lower respiratory tract infections	2.49 (2.36-2.62)	<0.001	1.83 (1.72-1.94)	<0.001
Heart infections	1.50 (1.07-2.11)	0.02	1.17 (0.81-1.71)	0.40
Sepsis/septicemia	3.69 (3.48-3.91)	<0.001	2.51 (2.34-2.69)	<0.001
Central nervous system infections	2.15 (1.34-3.46)	0.001	1.54 (0.87-2.71)	0.14
Gastrointestinal infections	1.69 (1.47-1.94)	<0.001	1.24 (1.05-1.47)	0.01
Urinary tract infections	2.52 (2.40-2.69)	<0.001	1.75 (1.63-1.89)	<0.001
Infections leading to ICU admission	2.08 (1.83-2.35)	<0.001	1.97 (1.71-2.28)	<0.001

^aadjusted for age, sex, monthly premium, annual number of outpatient visits, annual number of hospitalizations, and comorbidities including diabetes mellitus, heart failure, cerebrovascular disease, chronic obstructive pulmonary disease, chronic hepatic disease or cirrhosis, chronic kidney disease or renal failure, nephrotic syndrome, connective tissue disease or systemic vasculitis, psoriasis, dementia, Parkinson's disease, depression, and malignancies.

aHR: adjusted hazard ratio; BP: bullous pemphigoid; cHR: crude hazard ratio; CI: confidence interval; ICU: intensive care unit.