

Supplementary File - Using population-wide administrative and laboratory data to estimate type- and subtype-specific influenza vaccine effectiveness: a surveillance protocol

Appendix: List of CCP, CCI, and CMG codes utilized to define individuals who have had an organ transplant

CCP Code Description

495	Heart Transplantation
455	Lung Transplant
456	Combined Heart-Lung Transplantation
624	Liver Transplant
675	Transplant of Kidney
648	Transplant of Pancreas

CCI Code Description

1HY85	Transplant, Heart With Lung(S)
1HZ85	Transplant, Heart Nec
1GT85	Transplant, Lung Nec
1GR85	Transplant, Lobe of Lung
1OA85	Transplant, Liver
1PC85	Transplant, Kidney
1OJ85	Transplant, Pancreas
1OK85	Transplant, Pancreas With Duodenum
1NK85	Transplant, Small Intestine
1NP85	Transplant, Small And Large Intestine

CMG 1992 To 2005

175	Heart or Lung Transplant
253	Major Intestinal And Rectal Procedures
310	Liver Transplant
311	Major Pancreatic Procedures
500	Kidney Transplant

CMG 2007 To 2016

110	Lung Transplant
160	Heart Transplant
220	Major Upper Gastrointestinal Reconstruction/Excision
270	Liver/Pancreas/Duodenum Transplant
450	Kidney Transplant

Appendix: List of drug names and DINs utilized to define immunocompromising conditions

DIN	Drug Name	Route of Administration	Strength
00616192	ETOPOSIDE	CAP	50MG
00523410	ETOPOSIDE	IV SOL	20MG/ML
02080036	ETOPOSIDE	IV SOL	20MG/ML
02241182	ETOPOSIDE	IV SOL	20MG/ML
02231622	IRINOTECAN HCL	IV SOL	20MG/ML
02258218	IRINOTECAN HCL	IV SOL	20MG/ML
00015431	VINBLASTINE SULFATE	IV PWS	1MG/ML
00611182	VINCRISTINE SULFATE	IV SOL	1MG/ML
02143305	VINCRISTINE SULFATE	IV SOL	1MG/ML
00004618	BUSULFAN	TAB	2MG
00297763	CARMUSTINE	IV PWS	100MG
09851399	CARMUSTINE	TOP SOL	NOT AVLE
00004626	CHLORAMBUCIL	TAB	2MG
00344915	CYCLOPHOSPHAMIDE	INJ PWS	2GM
00013544	CYCLOPHOSPHAMIDE	IV PWS	200MG
00013552	CYCLOPHOSPHAMIDE	IV PWS	200MG
02241797	CYCLOPHOSPHAMIDE	IV PWS	200MG
02241799	CYCLOPHOSPHAMIDE	IV PWS	1000MG
00013749	CYCLOPHOSPHAMIDE	TAB	50MG
00262676	CYCLOPHOSPHAMIDE	TAB	25MG
00344877	CYCLOPHOSPHAMIDE	TAB	25MG
00344885	CYCLOPHOSPHAMIDE	TAB	50MG
02241795	CYCLOPHOSPHAMIDE	TAB	25MG
02241796	CYCLOPHOSPHAMIDE	TAB	50MG
02063794	ESTRAMUSTINE DISODIUM PHOSPHATE	CAP	140MG
00780278	ESTRAMUSTINE PHOSPHATE	CAP	140MG
00360414	LOMUSTINE	CAP	100MG
00360422	LOMUSTINE	CAP	40MG
00360430	LOMUSTINE	CAP	10MG
00016063	MECHLORETHAMINE	IV PWS	10MG
00004715	MELPHALAN	TAB	2MG
02312794	TEMOZOLOMIDE	CAP	140MG
02312816	TEMOZOLOMIDE	CAP	180MG
02395274	TEMOZOLOMIDE	CAP	20MG
02395282	TEMOZOLOMIDE	CAP	100MG
02395290	TEMOZOLOMIDE	CAP	140MG
02395312	TEMOZOLOMIDE	CAP	250MG
02443473	TEMOZOLOMIDE	CAP	5MG
02443481	TEMOZOLOMIDE	CAP	20MG

DIN	Drug Name	Route of Administration	Strength
02443511	TEMOZOLOMIDE	CAP	100MG
02443538	TEMOZOLOMIDE	CAP	140MG
02443554	TEMOZOLOMIDE	CAP	250MG
02241093	TEMOZOLOMIDE	CAP	5MG
02241094	TEMOZOLOMIDE	CAP	20MG
02241095	TEMOZOLOMIDE	CAP	100MG
02241096	TEMOZOLOMIDE	CAP	250MG
02441160	TEMOZOLOMIDE	CAPSULE	5MG
00237035	THIOTEPA	INJ PWS	15MG/ML
02421917	CAPECITABINE	FC TAB	150MG
02421925	CAPECITABINE	FC TAB	500MG
02426757	CAPECITABINE	FC TAB	150MG
02426765	CAPECITABINE	FC TAB	500MG
02400022	CAPECITABINE	TAB	150MG
02400030	CAPECITABINE	TAB	500MG
02238453	CAPECITABINE	TAB	150MG
02238454	CAPECITABINE	TAB	500MG
02022117	CLADRIBINE	IV SOL	1MG
00194727	CYTARABINE	INJ PWS	500MG
00386715	CYTARABINE	INJ PWS	100MG
02167867	CYTARABINE	INJ PWS	100MG
00646296	CYTARABINE	IV PWS	1GM
00646318	CYTARABINE	IV PWS	2GM
02246226	FLUDARABINE PHOSPHATE	TAB	10MG
00012882	FLUOROURACIL	IV SOL	
00330582	FLUOROURACIL	TOP CRM	5%
00465283	HYDROXYUREA	CAP	500MG
02242920	HYDROXYUREA	CAP	500MG
02247937	HYDROXYUREA	CAP	500MG
00004723	MERCAPTOPYRINE	TAB	50MG
02415275	MERCAPTOPYRINE	TABLET	50MG
09857520	METHOTREXATE	INJ SOL	50MG/2ML
02182777	METHOTREXATE	INJ SOL	25MG/ML
02182955	METHOTREXATE	INJ SOL	25MG/ML
00014915	METHOTREXATE	TAB	2.5MG
02170698	METHOTREXATE	TAB	2.5MG
02182750	METHOTREXATE	TAB	10MG
02182963	METHOTREXATE	TAB	2.5MG
02244798	METHOTREXATE	TAB	2.5MG
02398427	METHOTREXATE	VIAL	25MG/ML
00321397	METHOTREXATE DISODIUM	INJ SOL	2.5MG/ML
00321400	METHOTREXATE DISODIUM	INJ SOL	2.5MG/ML

DIN	Drug Name	Route of Administration	Strength
02170663	METHOTREXATE DISODIUM	INJ SOL	50MG/2ML
02170671	METHOTREXATE DISODIUM	INJ SOL	2.5MG/ML
02182947	METHOTREXATE SODIUM	INJ SOL	10MG/ML
00614335	METHOTREXATE SODIUM	IV SOL	10MG/ML
00874132	METHOTREXATE SODIUM	TAB	2.5MG
02171767	METHOTREXATE SODIUM	TAB	2.5MG
00282081	THIOGUANINE	TAB	40MG
02384256	CRIZOTINIB	CAP	200MG
02384264	CRIZOTINIB	CAP	250MG
02409607	DABRAFENIB	CAP	50MG
02409615	DABRAFENIB	CAP	75MG
02320193	DASATINIB	TAB	100MG
02293129	DASATINIB	TAB	20MG
02293137	DASATINIB	TAB	50MG
02293145	DASATINIB	TAB	70MG
02269007	ERLOTINIB HCL	TAB	25MG
02269015	ERLOTINIB HCL	TAB	100MG
02269023	ERLOTINIB HCL	TAB	150MG
02377705	ERLOTINIB HCL	TABLET	100MG
02377713	ERLOTINIB HCL	TABLET	150MG
02434407	IBRUTINIB	CAP	140MG
09857447	IMATINIB MESYLATE	TAB	100MG
02388006	RUXOLITINIB	TAB	5MG
02388014	RUXOLITINIB	TAB	15MG
02388022	RUXOLITINIB	TAB	20MG
02409658	TRAMETINIB RECOMBINANT	TAB	2MG
01926438	ASPARAGINASE	INJ PWS	10MU
02389649	AXITINIB	TAB	5MG
02389630	AXITINIB	TAB FC	1MG
02262452	BORTEZOMIB	IV PWS	3.5MG
00521183	DACARBAZINE	IV PWS	200MG/VIAL
02154854	DACARBAZINE	IV PWS	200MG
02248676	GEFITINIB	TAB	250MG
02244725	IMATINIB MESYLATE	CAP	100MG
02399806	IMATINIB MESYLATE	FC TAB	100MG
02355337	IMATINIB MESYLATE	TAB	100MG
02355345	IMATINIB MESYLATE	TAB	400MG
02397285	IMATINIB MESYLATE	TAB	100MG
02397293	IMATINIB MESYLATE	TAB	400MG
02399814	IMATINIB MESYLATE	TAB	400MG
02431114	IMATINIB MESYLATE	TAB	100MG
02431122	IMATINIB MESYLATE	TAB	400MG

DIN	Drug Name	Route of Administration	Strength
09857448	IMATINIB MESYLATE	TAB	400MG
02253275	IMATINIB MESYLATE	TAB	100MG
02253283	IMATINIB MESYLATE	TAB	400MG
02326442	LAPATINIB DITOSYLATE	TAB	250MG
02315874	NILOTINIB	CAP	200MG
02368250	NILOTINIB	CAP	150MG
02352303	PAZOPANIB HCL	TAB	200MG
00012750	PROCARBAZINE HCL	CAP	50MG
02403390	REGORAFENIB	TAB	40MG
02284227	SORAFENIB TOSYLATE	TAB	200MG
02280795	SUNITINIB MALATE	CAP	12.5MG
02280809	SUNITINIB MALATE	CAP	25MG
02280817	SUNITINIB MALATE	CAP	50MG
02258595	ADALIMUMAB	INJ-SC SOL	40MG
09854785	ADALIMUMAB	INJ-SC SOL	40MG
09857294	ADALIMUMAB	INJ-SC SOL	40MG
09857326	ADALIMUMAB	INJ-SC SOL	40MG
09857327	ADALIMUMAB	INJ-SC SOL	40MG
02130181	ALDESLEUKIN	IV PWS	1.3MG
02331675	CERTOLIZUMAB PEGOL	INJ-SC SOL	200MG/ML
09857394	ETANERCEPT RECOMBINANT	INJ SOL	50MG/ML
02242903	ETANERCEPT RECOMBINANT	INJ-SC PWS	25MG
02274728	ETANERCEPT RECOMBINANT	INJ-SC SOL	50MG/ML
09857322	ETANERCEPT RECOMBINANT	INJ-SC SOL	50MG/ML
02233014	GLATIRAMER	INJ-SC PWS	20MG
02245619	GLATIRAMER	INJ-SC SOL	20MG/ML
02324776	GOLIMUMAB RECOMBINANT	INJ-SC SOL	50MG/0.5ML
02324784	GOLIMUMAB RECOMBINANT	INJ-SC SOL	50MG/0.5ML
02244016	INFLIXIMAB	IV PWS	100MG
09852956	INFLIXIMAB	IV PWS	100MG
02419475	INFLIXIMAB	PWD VIAL	100MG
02239832	INTERFERON	INJ-SC SOL	0.03MG/ML
09852751	INTERFERON	OPH SOL	1MU/ML
02223384	INTERFERON ALFA 2B	INJ PWS	3MMU
02223392	INTERFERON ALFA 2B	INJ PWS	5MMU
02223406	INTERFERON ALFA 2B	INJ PWS	10MMU
02231651	INTERFERON ALFA 2B	INJ PWS	18MMU
00889067	INTERFERON ALFA 2B	INJ SOL	10MMU/2ML
02223414	INTERFERON ALFA 2B	INJ SOL	10MMU/2ML
02238674	INTERFERON ALFA 2B	INJ SOL	3MMU/0.5ML
02238675	INTERFERON ALFA 2B	INJ SOL	5MMU/0.5ML
09853995	INTERFERON ALFA 2B	INJ SOL	10MU/VIAL

DIN	Drug Name	Route of Administration	Strength
09854045	INTERFERON ALFA 2B	INJ SOL	3MMU/0.5ML
09854053	INTERFERON ALFA 2B	INJ SOL	5MMU/0.5ML
00705896	INTERFERON ALFA 2B	INJ-SC SOL	3MMU
00705918	INTERFERON ALFA 2B	INJ-SC SOL	5MMU
00705926	INTERFERON ALFA 2B	INJ-SC SOL	10MMU
02240693	INTERFERON ALFA 2B	INJ-SC SOL	18MMU/1.2ML
02240694	INTERFERON ALFA 2B	INJ-SC SOL	30MMU/1.2ML
02240695	INTERFERON ALFA 2B	INJ-SC SOL	60MMU/1.2ML
01911988	INTERFERON ALFA-2A	INJ PWS	3000MU/ML
01911996	INTERFERON ALFA-2A	INJ PWS	9000MU/ML
01912003	INTERFERON ALFA-2A	INJ PWS	6000MU/ML
00812471	INTERFERON ALFA-2A	INJ PWS	6000MU/ML
00812498	INTERFERON ALFA-2A	INJ SOL	6000MU/ML
00812501	INTERFERON ALFA-2A	INJ SOL	3000MU/ML
02217015	INTERFERON ALFA-2A	INJ SOL	3000MU/ML
02217031	INTERFERON ALFA-2A	INJ SOL	6000MU/ML
02217058	INTERFERON ALFA-2A	INJ SOL	9000MU/ML
02217066	INTERFERON ALFA-2A	INJ SOL	18000MU/ML
02019914	INTERFERON ALFA-2A	INJ SOL	9000MU/ML
01959069	INTERFERON ALPHA-N1	INJ SOL	10MU
01959077	INTERFERON ALPHA-N1	INJ SOL	3MU
00709042	INTERFERON ALPHA-N1	INJ SOL	3MU
00709050	INTERFERON ALPHA-N1	INJ SOL	10MU
02169649	INTERFERON BETA	INJ-SC PWS	0.3MG
02237317	INTERFERON BETA 1A	INJ PWS	11MCG
02237318	INTERFERON BETA 1A	INJ PWS	44MCG
02237770	INTERFERON BETA 1A	INJ-IM PWS	30MCG/1.1ML
02269201	INTERFERON BETA 1A	INJ-IM SOL	30MCG/0.5ML
02318253	INTERFERON BETA 1A	INJ-SC SOL	66MCG/1.5ML
02318261	INTERFERON BETA 1A	INJ-SC SOL	132MCG/1.5ML
02237319	INTERFERON BETA 1A	INJ-SC SOL	22MCG/0.5ML
02237320	INTERFERON BETA 1A	INJ-SC SOL	44MCG/0.5ML
09857395	INTERFERON BETA-1A	PREF AUTOINJ PEN	30MCG/0.5ML
	INTERFERON BETA-1B		
02337819	RECOMBINANT	INJ-SC PWS	0.3MG
00846368	LEVAMISOLE HCL	TAB	50MG
02234217	LEVAMISOLE HCL	TAB	50MG
	PEGINTERFERON ALFA 2A		
09857505	RECOMBINANT	INJ-SC SOL	180MCG/0.5ML
	PEGINTERFERON ALFA 2A		
02248077	RECOMBINANT	INJ-SC SOL	180MCG/0.5ML
	PEGINTERFERON ALFA 2A		
02248078	RECOMBINANT	INJ-SC SOL	180MCG/ML

DIN	Drug Name	Route of Administration	Strength
00258482	BLEOMYCIN SULFATE	INJ PWS	15U
00163899	DAUNORUBICIN HCL	INJ PD	20MG
01926683	DAUNORUBICIN HCL	IV PWS	20MG
00353078	DOXORUBICIN HCL	IV PWS	50MG
00357391	DOXORUBICIN HCL	IV PWS	10MG
00640050	EPIRUBICIN HCL	INJ PWS	10MG
00640069	EPIRUBICIN HCL	IV PWS	50MG
00381799	MITOMYCIN	IV PWS	5MG
00463221	MITOTANE	TAB	500MG
02415992	AFLIBERCEPT	VIAL	40MG/ML
02273993	ALEMTUZUMAB	IV SOL	10MG/ML
02290960	ALEMTUZUMAB	IV SOL	30MG/ML
02270994	BEVACIZUMAB	IV SOL	25MG/ML
09857407	RITUXIMAB	IV SOL	10MG/ML
02241927	RITUXIMAB	IV SOL	10MG/ML

Appendix: ICD-9 codes and ICD-10 codes utilized to define acute respiratory illness in physician, ER and hospital encounters.

Description	ICD-9 Code	ICD-10 Code
Viral infection, unspecified site	079	B34
Viral agents as the cause of diseases classified to other chapters	--	B97 (but not B973 or B977)
Acute nasopharyngitis (common cold)	460	J00
Acute sinusitis	461	J01
Acute pharyngitis	462	J02
Acute tonsillitis	463	J03
Acute laryngitis, tracheitis, epiglottitis, croup	464	J04, J05
Acute upper respiratory infections of multiple or unspecified sites	465	J06
Influenza due to identified novel influenza A virus	488	J09
Influenza	487	J10, J11
Pneumonia, organism unspecified	486	--
Viral pneumonia	480	J12
Bacterial pneumonia	481, 482	J13, J14, J15
Pneumonia due to other specified organism	483	J16
Pneumonia in infectious diseases classified elsewhere	484	J17
Bronchopneumonia, organism unspecified	485	J18
Acute bronchitis and bronchiolitis	466	J20, J21
Unspecified diseases respiratory system	519	J22, J39.8, J39.9
Bronchitis, not specified as acute or chronic	490	J40
Acute respiratory distress syndrome	518.82	J80
Pulmonary edema	518.4	J81
Pleural effusion	510.9, 511.0, 511.1, 511.89	J86.9, J90, R09.1
Respiratory failure	518.81	J96.0, J96.9
Atelectasis	--	J98.10
Pulmonary collapse	518.0	J98.19
Other respiratory disorders	786.00, 786.09	J98.0, J98.4, J98.8, J98.9
Hemoptysis	786.30	R04.2
Cough	786.2	R05
Shortness of breath (dyspnea)	786.02, 786.05, 786.09	R06.0
Stridor	786.1	R06.1
Wheezing	786.07	R06.2
Tachypnea	786.06	R06.4

Description	ICD-9 Code	ICD-10 Code
Chest pain on breathing	786.52	R07.1
Hypoxemia	799.02	R09.0
Respiratory arrest	799.1	R09.2
Abnormal sputum	786.4	R09.3
Nasal congestion	478.19	R09.81
Abnormal chest sounds	786.7	R09.89
Fever	780.60	R50
Chills (without fever)	780.64	R68.0
Sepsis, shock	669.11, 669.12, 669.14, 785.50, 785.52, 995.91, 995.92	A41.9, R57.9