

Supplemental Table 1. Code list.

Variable	Source	Diagnostic (D)/ Procedural (P)	Codes
Cancer of head and neck	CCS	D	11
History of cancer of head and neck	ICD-9	D	V1001, V1002, V1021
Cancer of esophagus	CCS	D	12
History of cancer of the esophagus	ICD-9	D	V1003
Cancer of stomach	CCS	D	13
History of cancer of stomach	ICD-9	D	V1004
Cancer of colon	CCS	D	14
History of cancer of colon	ICD-9	D	V1005
Cancer of rectum and anus	CCS	D	15
History of cancer of the rectum and anus	ICD-9	D	V1006
Cancer of liver and intrahepatic bile duct	CCS	D	16
History of cancer of the liver and intrahepatic bile duct	ICD-9	D	V1007
Cancer of pancreas	CCS	D	17
Cancer of other GI organs, peritoneum	CCS	D	18
History of cancer of other GI organs, peritoneum	ICD-9	D	V1000, V1009
Cancer of bronchus, lung	CCS	D	19
History of cancer of bronchus, lung	ICD-9	D	V1011
Cancer, other respiratory and intra thoracic	CCS	D	20
History of cancer, other respiratory and intra thoracic	ICD-9	D	V1012, V1020, V1022
Cancer of bone and connective tissue	CCS	D	21
Melanomas of skin	CCS	D	22
History of melanoma of skin	ICD-9	D	V1082
Other non-epithelial cancer of skin	CCS	D	23
Cancer of breast	CCS	D	24
History of cancer of breast	ICD-9	D	V103
Cancer of uterus	CCS	D	25

History of cancer of uterus	ICD-9	D	V1042
Cancer of cervix	ICD-9	D	1800, 1801, 1808, 1809, 2331, 7950, 79501, 79502, 79503, 79504, 79506, V1041
History of cancer of cervix	ICD-9	D	V1041
Cancer of ovary	CCS	D	27
History of cancer of ovary	ICD-9	D	V1043
Cancer of other female genital organs	CCS	D	28
History of cancer of other female genital organs	ICD-9	D	V1040, V1044
Cancer of bladder	CCS	D	32
History of bladder cancer	ICD-9	D	V1051
Cancer of kidney and renal pelvis	CCS	D	33
History of cancer of kidney and renal pelvis	ICD-9	D	V1052, V1053
Cancer of other urinary organs	CCS	D	34
History of cancer of other urinary organs	ICD-9	D	V1050, V1059
Cancer of brain and nervous system	CCS	D	35
History of cancer of brain and nervous system	ICD-9	D	V1085, V1086
Cancer of thyroid	CCS	D	36
History of cancer of thyroid	ICD-9	D	V1087
Hodgkin's disease	CCS	D	37
History of Hodgkin's disease	ICD-9	D	V1072
Non-Hodgkin's lymphoma	CCS	D	38
History of non-Hodgkin's lymphoma	ICD-9	D	V1071, V1079
Leukaemias	CCS	D	39
History of leukaemias	ICD-9	D	V1060, V1061, V1062, V1063, V1069
Multiple myeloma	CCS	D	40
Cancer, other and unspecified	CCS	D	41
Secondary malignancies	CCS	D	42
Neoplasms of unspecified site	CCS	D	43

History of cancer, other and unspecified	ICD-9	D	V1029, V1081, V1084, V1088, V1089, V1090, V1091, V711
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Supplemental Table 2. ICD-9-CM or DXCCS codes for conditions studied.

A. For in-hospital complications and outcomes.

Complications / outcomes	ICD-9-CM / ICD-9-CM PR / DXCCS codes
Acute kidney injury	6693x, 584x, 586
Arrhythmia	4270, 42731, 4271, 42732, 42741, 42742
Caesarean section	PR 740, 741, 742, 744, 7499
Mortality	7616 or DIED variable =1 in NIS dataset
Myocardial infarction	410x
Peripartum cardiomyopathy	425x, 6745x
Stroke	325, 430, 431, 432.x, 433.01, 433.11, 433.21, 433.31, 433.81, 433.91, 434.01, 434.11, 434.91, 435.x, 436, 437.6, 671.5x, 674.0x, 997.02
Fetal distress	6563
Placental abruption	6412x
Postpartum haemorrhage	666x
Preterm birth	644x
Stillbirth	6564x, v271x, v273x, v274x, v276x, v277x, 7680, 7681

B. For comorbidities.

Comorbidities	ICD-9-CM or DXCCS codes
Congenital heart disease	6485, 745x, 746x, 747x, DXCCS 213
Previous stroke	V1254
Smoker	V1582, 3051x, 6490x, 98984
Dyslipidaemia	DXCCS 53
Elixhauser comorbidities (Heart failure, Valvular disease, Pulmonary circulation disorders, Peripheral vascular disorders, Other neurological disorders, Chronic pulmonary disease, Diabetes (uncomplicated and with chronic complications), Hypothyroidism, Renal failure, Liver disease, Acquired immune deficiency syndrome, Rheumatoid arthritis/collagen vascular diseases, Obesity, Fluid and electrolyte disorders, Deficiency anaemia, Alcohol abuse, Drug abuse, Depression)	List of comorbidities and associated ICD-9-CM code can be found (Quan 2005 et al.) at: http://czresearch.com/dropbox/Quan_MedCare_2005v43p1130.pdf

Supplemental Table 3. Patient characteristics stratified by time periods and cancer subtypes. MI, myocardial infarction.

	No cancer			Any cancer					
				Historical			Current		
	2004- 2007	2008- 2011	2012- 2014	2004- 2007	2008- 2011	2012- 2014	2004- 2007	2008- 2011	2012- 2014
Age (years) median (IQR)	27 (22-32)	27 (23-32)	28 (23-32)	32 (27-36)	32 (27-36)	32 (28-36)	29 (24-34)	29 (24-34)	30 (26-34)
Race and ethnicity:									
White	37.80%	44.93%	50.16%	54.15%	62.70%	67.06%	44.96%	51.55%	56.72%
Black	9.56%	12.15%	13.81%	5.08%	6.53%	7.58%	9.67%	12.27%	12.82%
Hispanic	18.25%	19.35%	19.29%	7.20%	9.21%	9.57%	13.57%	15.15%	16.76%
Asian / Pacific Islander	3.14%	4.19%	4.97%	2.69%	3.69%	4.32%	1.80%	2.34%	2.85%
Native American	0.56%	0.74%	0.75%	0.54%	0.29%	0.43%	0.45%	0.58%	0.44%
Other	3.50%	4.17%	4.65%	2.57%	2.97%	3.72%	2.97%	2.46%	3.78%
Missing	27.19%	14.47%	6.37%	27.77%	14.61%	7.32%	26.58%	15.65%	6.63%
Median ZIP code income (quartile):									
1 st	14.03%	26.64%	27.91%	9.06%	17.24%	18.43%	15.85%	26.27%	28.58%
2 nd	12.72%	24.93%	25.27%	9.88%	20.44%	21.96%	11.84%	24.48%	23.07%
3 rd	11.94%	24.36%	24.08%	13.20%	27.72%	25.86%	11.18%	24.43%	23.47%
4 th	11.30%	22.11%	21.06%	17.43%	33.35%	32.49%	12.13%	23.13%	23.27%
Missing	50.01%	1.96%	1.68%	50.43%	1.25%	1.26%	49.00%	1.69%	1.61%
Admission type: Elective admission	48.55%	49.60%	49.91%	51.83%	52.73%	52.20%	45.51%	48.27%	47.39%
Admission day: Weekday	80.84%	80.95%	80.45%	82.84%	82.43%	81.34%	83.58%	83.20%	81.75%
Length of stay (days), median (IQR)	2 (2-3)	2 (2-3)	2 (2-3)	3 (2-3)	3 (2-3)	3 (2-3)	3 (2-3)	3 (2-4)	2 (2-3)
Total cost (\$), median (IQR)	3,192 (2,267- 4,653)	3,731 (2,607- 5,390)	3,727 (2,660- 5,313)	3,629 (2,557- 5,340)	4,298 (2,950- 6,387)	4,262 (3,006- 6,101)	3,758 (2,587- 5,770)	4,293 (2,894- 7,191)	4,321 (2,966- 6,647)

Expected primary payer:									
Medicare	0.52%	0.67%	0.76%	1.44%	2.17%	2.08%	1.59%	1.87%	1.73%
Medicaid	42.25%	44.02%	44.39%	20.61%	22.63%	25.11%	42.01%	43.90%	41.40%
Private insurance	50.80%	49.13%	49.03%	73.59%	70.19%	68.08%	49.94%	48.68%	51.53%
Self-pay	3.68%	3.22%	2.68%	1.76%	1.72%	1.48%	3.16%	2.23%	2.29%
No charge	0.25%	0.22%	0.09%	0.16%	0.14%	0.06%	0.19%	0.38%	0.20%
Other	2.5%	2.74%	3.05%	2.44%	3.15%	3.19%	3.11%	2.94%	2.85%
Hospital location / teaching status:									
Rural	11.24%	11.41%	10.59%	8.32%	8.31%	6.74%	11.19%	9.07%	6.95%
Urban nonteaching	43.99%	41.86%	34.24%	37.66%	36.44%	25.98%	35.51%	28.67%	21.66%
Urban teaching	44.77%	46.73%	55.17%	54.02%	55.25%	67.28%	53.30%	62.26%	71.39%
Hospital bed size:									
Small	11.48%	10.05%	13.42%	11.11%	8.68%	12.16%	9.15%	8.34%	10.17%
Medium	25.43%	26.16%	29.58%	20.93%	22.88%	25.86%	21.31%	21.75%	25.24%
Large	63.09%	63.79%	57.00%	67.96%	68.44%	61.98%	69.54%	69.91%	64.59%
Comorbidities									
Alcohol abuse	0.11%	0.11%	0.12%	0.12%	0.18%	0.30%	0.38%	0.30%	0.32%
Chronic pulmonary disease	2.50%	3.35%	3.90%	5.01%	6.53%	7.11%	5.43%	6.99%	6.59%
Coagulopathy	0.72%	1.34%	1.87%	1.37%	2.20%	3.08%	1.84%	3.64%	4.02%
Congenital heart disease	0.09%	0.11%	0.14%	0.26%	0.14%	0.41%	0.12%	0.21%	0.20%
Deficiency anaemia	5.39%	7.44%	8.87%	5.31%	8.21%	11.07%	9.52%	12.50%	14.91%
Depression	1.39%	1.95%	2.30%	3.11%	3.87%	5.03%	3.30%	4.67%	5.39%
Diabetes mellitus	0.92%	1.03%	1.15%	1.44%	1.49%	1.99%	1.31%	1.81%	1.77%
Drug abuse	1.24%	1.35%	1.90%	1.23%	1.58%	2.10%	2.06%	2.69%	3.01%
Dyslipidaemia	0.04%	0.09%	0.14%	0.09%	0.38%	0.41%	0.20%	0.34%	0.76%
Fluid and electrolyte disorders	0.44%	0.52%	0.58%	0.72%	1.29%	1.01%	2.00%	2.70%	2.81%
Heart failure	0.04%	0.05%	0.05%	0.14%	0.31%	0.24%	0.31%	0.34%	0.28%
HIV and AIDS	0.03%	0.03%	0.02%	0.04%	0.06%	0%	0.16%	0.35%	0.20%

Hypothyroidism	1.42%	2.00%	2.80%	16.28%	18.48%	23.24%	4.04%	4.86%	6.07%
Liver disease	0.10%	0.12%	0.17%	0.24%	0.43%	0.34%	0.16%	0.30%	0.44%
Obesity	1.60%	3.75%	6.06%	2.10%	4.41%	7.56%	2.20%	5.25%	9.12%
Other neurological disorders	0.45%	0.51%	0.60%	1.34%	1.56%	1.67%	1.86%	2.25%	2.01%
Paralysis	0.03%	0.03%	0.04%	0.10%	0.08%	0.04%	0.37%	0.33%	0.20%
Peptic ulcer disease	0.0004 %	0.0005 %	0.0004 %	0%	0%	0%	0%	0%	0%
Peripheral vascular disease	0.01%	0.01%	0.02%	0%	0.04%	0.02%	0.06%	0.04%	0.04%
Previous MI	0.01%	0.01%	0.01%	0.07%	0.08%	0.06%	0.05%	0.06%	0.16%
Previous stroke	0.0001 %	0.04%	0.06%	0%	0.25%	0.19%	0%	0.07%	0.36%
Psychoses	0.45%	0.76%	0.90%	0.77%	1.20%	1.33%	1.38%	1.81%	1.65%
Pulmonary circulation disorders	0.02%	0.03%	0.03%	0.05%	0.09%	0.06%	0.15%	0.10%	0.20%
Renal failure	0.03%	0.04%	0.06%	0.07%	0.20%	0.41%	0.16%	0.07%	0.20%
Rheumatoid arthritis/collagen vascular diseases	0.18%	0.23%	0.29%	0.46%	0.71%	0.79%	0.54%	0.67%	0.56%
Smoker	4.61%	6.27%	8.00%	6.53%	8.69%	12.26%	10.17%	12.69%	14.75%
Valvular disease	0.65%	0.36%	0.23%	1.89%	1.24%	0.98%	1.15%	0.63%	0.52%
Weight loss	0.02%	0.04%	0.04%	0.05%	0.07%	0.17%	0.33%	0.69%	0.72%
Complications / outcomes									
Mortality	0.008%	0.008%	0.006%	0.019%	0.021%	0.021%	0.448%	0.266%	0.201 %
Acute kidney injury	0.046%	0.072%	0.099%	0.075%	0.259%	0.278%	0.368%	0.461%	0.523 %
Arrhythmia	0.043%	0.049%	0.055%	0.105%	0.079%	0.128%	0.243%	0.279%	0.241 %
Myocardial infarction	0.003%	0.003%	0.004%	0%	0.018%	0.021%	0.043%	0%	0.040 %
Peripartum cardiomyopathy	0.046%	0.053%	0.058%	0.332%	0.372%	0.514%	0.462%	0.265%	0.563 %

Stroke	0.019%	0.018%	0.019%	0.065%	0.059%	0.043%	0.114%	0.166%	0.080%
Caesarean section	30.455%	32.211%	32.127%	38.210%	40.738%	39.469%	35.369%	36.863%	34.124%
Fetal distress	9.902%	10.185%	9.617%	9.298%	9.174%	9.011%	7.534%	9.237%	8.481%
Placental abruption	1.099%	1.078%	1.068%	1.063%	0.915%	1.284%	0.629%	1.389%	1.246%
Postpartum haemorrhage	2.840%	2.811%	3.130%	2.507%	2.983%	3.960%	3.688%	4.167%	5.024%
Preterm birth	8.429%	7.979%	6.951%	11.044%	10.484%	8.519%	16.056%	13.957%	10.812%
Stillbirth	0.633%	0.610%	0.625%	0.717%	0.604%	0.471%	0.651%	0.702%	0.443%

Supplemental Table 4. Sensitivity analysis of association between subgroups of cancer and in-hospital complications and outcomes, comparing the fully adjusted model with complete case analysis which excluded delivery hospitalisation episodes with missing information on race/ethnicity and median ZIP code income variables.

	Current Cancer	
	No metastases	Metastases
MATERNAL		
Mortality		
Unadjusted	25.13 (15.14, 41.71)	416.58 (224.94, 771.48)
Fully adjusted	12.05 (6.57, 22.11)	48.32 (12.74, 183.25)
Acute kidney injury		
Unadjusted	5.29 (3.65, 7.68)	37.72 (18.62, 76.39)
Fully adjusted	1.87 (1.15, 3.05)	1.89 (0.52, 6.84)
Arrhythmia		
Unadjusted	4.94 (3.03, 8.05)	13.97 (3.45, 56.56)
Fully adjusted	2.83 (1.65, 4.87)	2.99 (0.75, 12.01)
Myocardial infarction		
Unadjusted	4.46 (0.63, 31.62)	99.52 (13.87, 713.88)
Fully adjusted	1.52 (0.14, 17.07)	6.32 (0.18, 227.37)
Peripartum cardiomyopathy		
Unadjusted	8.26 (5.72, 11.91)	6.16 (0.86, 44.04)
Fully adjusted	4.61 (2.72, 7.81)	0.21 (0.003, 16.62)
Stroke		
Unadjusted	6.12 (3.21, 11.65)	16.49 (2.31, 117.84)
Fully adjusted	5.00 (2.58, 9.68)	0.69 (0.06, 7.82)
DELIVERY		
Caesarean section		
Unadjusted	1.17 (1.12, 1.23)	1.88 (1.50, 1.23)
Fully adjusted	1.02 (0.97, 1.08)	1.29 (1.02, 1.63)
Fetal distress		
Unadjusted	0.86 (0.79, 0.93)	0.34 (0.18, 0.61)
Fully adjusted	0.88 (0.81, 0.95)	0.36 (0.20, 0.66)
Placental abruption		
Unadjusted	1.00 (0.79, 1.26)	1.42 (0.59, 3.41)
Fully adjusted	0.84 (0.67, 1.06)	0.87 (0.36, 2.09)
Postpartum haemorrhage		
Unadjusted	1.45 (1.29, 1.63)	2.65 (1.73, 4.06)
Fully adjusted	1.22 (1.08, 1.37)	1.29 (0.79, 2.10)
Preterm birth		
Unadjusted	1.74 (1.63, 1.87)	4.79 (3.73, 6.16)
Fully adjusted	1.60 (1.49, 1.72)	3.56 (2.70, 4.68)
Stillbirth		
Unadjusted	0.87 (0.64, 1.18)	3.54 (1.68, 7.46)
Fully adjusted	0.79 (0.58, 1.07)	2.25 (1.04, 4.87)

^aData expressed as odds ratios and 95% confidence intervals.

Supplemental Table 5. Distribution of considered cancer types among current and historical diagnoses.

Cancer type	Current cancer	Historical cancer
Haematological (lymphoma, leukaemia)	0.05%	0.02%
Thyroid	0.04%	0.04%
Cervix	0.037%	0.02%
Melanomas and other non-epithelial skin	0.035%	0.02%
Breast	0.03%	0.02%
Unspecific	0.02%	0.01%
Ovary	0.01%	0.01%
Urological (bladder, kidney, renal pelvis, other urinary organs)	0.005%	0.005%
Colorectal (colon, rectum and anus)	0.005%	0.003%
Brain and nervous system	0.004%	0.003%
Secondary malignancies	0.004%	---
Other female genital organs	0.003%	0.001%
Head and neck	0.002%	0.002%
Respiratory tract (bronchus, lung, other respiratory and intrathoracic)	0.002%	0.001%
Gastrointestinal tract (oesophagus, stomach, other gastrointestinal organs and peritoneum)	0.002%	0.001%
Uterus	0.001%	0.001%
Bone and connective tissue	0.0009%	---
Liver and intrahepatic bile duct	0.0007%	0.0005%
Multiple myeloma	0.0002%	---
Pancreas	0.0001%	---

Supplemental Table 6. Patient characteristics in the five most prevalent cancers. MI, myocardial infarction.

Variable	Haematological	Thyroid	Cervical	Skin	Breast
Number of deliveries, weighted	20,648	17,399	16,085	15,311	12,987
Age (years), median (IQR)	29 (25-33)	32 (29-36)	29 (25-33)	32 (29-36)	36 (32-39)
Race and ethnicity:					
White	57.27%	60.04%	54.55%	77.00%	53.59%
Black	9.56%	4.38%	8.65%	0.89%	11.88%
Hispanic	10.98%	11.08%	12.85%	2.51%	9.19%
Asian / Pacific Islander	1.95%	5.76%	1.66%	0.55%	5.67%
Native American	0.30%	0.19%	0.67%	0.26%	0.63%
Other	2.90%	3.75%	2.69%	1.46%	4.05%
Missing	17.02%	14.80%	18.93%	17.34%	14.99%
Median ZIP code income (quartile):					
1 st	18.40%	13.66%	24.60%	9.54%	14.59%
2 nd	19.01%	18.09%	20.65%	17.23%	15.99%
3 rd	21.74%	23.80%	20.11%	24.66%	21.52%
4 th	23.75%	29.90%	15.85%	34.86%	30.08%
Missing	17.11%	14.56%	18.79%	13.72%	17.81%
Admission type: Elective admission	50.53%	53.09%	49.57%	54.66%	52.12%
Admission day: Weekday	82.63%	81.93%	83.64%	82.61%	82.87%
Length of stay (days), median (IQR)					
	2 (2-3)	2 (2-3)	2 (2-3)	2 (2-3)	3 (2-4)
Total cost (\$), median (IQR)	4,090 (2,840-6,130)	3,942 (2,760-5,713)	3,823 (2,662-5,777)	4,004 (2,876-5,791)	4,397 (2,988-6,811)
Expected primary payer:					
Medicare	2.90%	1.09%	1.33%	0.93%	1.78%
Medicaid	30.32%	18.56%	49.25%	11.18%	21.26%
Private insurance	61.99%	75.88%	43.30%	83.12%	72.54%
Self-pay	1.93%	1.60%	2.63%	0.93%	1.83%
No charge	0.09%	0.20%	0.27%	0.09%	0.07%
Other	2.77%	2.68%	3.21%	3.74%	2.52%
Hospital location / teaching status:					
Rural	8.34%	6.26%	12.38%	6.52%	5.62%
Urban nonteaching	31.98%	33.14%	31.89%	33.82%	31.71%
Urban teaching	59.68%	60.59%	55.73%	59.66%	62.67%
Hospital size:					

Small	9.52%	11.05%	10.63%	10.89%	8.85%
Medium	22.44%	24.27%	23.86%	22.51%	23.46%
Large	68.04%	60.59%	65.52%	66.59%	67.69%
Comorbidities					
Alcohol abuse	0.12%	0.22%	0.62%	0.10%	0.18%
Chronic pulmonary disease	5.96%	5.08%	7.63%	6.83%	5.05%
Coagulopathy	4.17%	1.66%	1.62%	2.25%	2.14%
Congenital heart disease	0.25%	0.10%	0.22%	0.32%	0.08%
Deficiency anaemia	9.98%	7.52%	10.82%	7.27%	8.83%
Depression	4.34%	3.16%	5.03%	4.79%	3.21%
Diabetes mellitus	1.72%	1.81%	1.35%	0.80%	1.61%
Drug abuse	1.71%	0.85%	4.18%	0.79%	0.90%
Dyslipidaemia	0.29%	0.38%	0.21%	0.43%	0.22%
Fluid and electrolyte disorders	2.13%	0.61%	1.44%	0.68%	1.19%
Heart failure	0.62%	0.03%	0.16%	0.06%	0.30%
HIV and AIDS	0.30%	0%	0.21%	0.03%	0.03%
Hypothyroidism	12.73%	55.27%	2.75%	5.46%	3.82%
Liver disease	0.51%	0.14%	0.24%	0.19%	0.26%
Obesity	5.59%	4.97%	4.70%	3.29%	3.26%
Other neurological disorders	1.20%	0.87%	1.27%	0.95%	0.94%
Paralysis	0.02%	0.03%	0.03%	0.06%	0.23%
Peptic ulcer disease	0%	0%	0%	0%	0%
Peripheral vascular disease	0%	0%	0.03%	0.05%	0.04%
Previous MI	0.09%	0.02%	0.09%	0.03%	0.07%
Previous stroke	0.22%	0.10%	0.15%	0.13%	0.11%
Psychoses	1.24%	0.83%	2.26%	0.83%	0.73%
Pulmonary circulation disorders	0.17%	0%	0.06%	0.03%	0.03%
Renal failure	0.27%	0.14%	0.12%	0.07%	0.04%
Rheumatoid arthritis/collagen vascular diseases	0.65%	0.67%	0.76%	0.58%	0.45%
Smoker	7.89%	5.23%	22.61%	7.83%	5.39%
Valvular disease	1.55%	0.97%	0.94%	1.35%	0.96%
Weight loss	0.33%	0.03%	0.06%	0.10%	0.11%