

Appendix 1 (as supplied by authors): Supplementary material

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eTable 1: Diagnostic Categories

Category	Clinical Classifications Software (CCS)³⁷ Components
Nonspecific abdominal pain	Abdominal pain
Acute coronary syndrome	Acute myocardial infarction
Acute renal failure	Acute and unspecified renal failure
Appendicitis	Appendicitis and other appendiceal conditions
Cardiac dysrhythmias	Conduction disorders Cardiac dysrhythmias
Biliary tract disease	Biliary tract disease
Cardiac arrest	Cardiac arrest and ventricular fibrillation
Cerebrovascular disease	Acute cerebrovascular disease Occlusion or stenosis of precerebral arteries Other and ill-defined cerebrovascular disease Transient cerebral ischemia Late effects of cerebrovascular disease
Nonspecific chest pain	Nonspecific chest pain
Chronic ischemic heart disease	Coronary atherosclerosis and other heart disease
Diabetes	Diabetes mellitus without complication Diabetes mellitus with complications
Diverticular disease	Diverticulosis and diverticulitis
Fluid and electrolyte imbalance	Fluid and electrolyte disorders
Gastrointestinal hemorrhage	Gastrointestinal hemorrhage Gastroduodenal ulcer (except hemorrhage)
Heart failure	Congestive heart failure; nonhypertensive
Infections of the skin	Skin and subcutaneous tissue infections
Inflammatory bowel disease	Regional enteritis and ulcerative colitis

eTable 1: Diagnostic Categories (continued)

Category	Clinical Classifications Software (CCS) ³⁷ Components
Injury	Joint disorders and dislocations; trauma-related Fracture of neck of femur (hip) Spinal cord injury Skull and face fractures Fracture of upper limb Fracture of lower limb Other fractures Sprains and strains Intracranial injury Crushing injury or internal injury Open wounds of head; neck; and trunk Open wounds of extremities Complication of device; implant or graft Complications of surgical procedures or medical care Superficial injury; contusion Burns Poisoning by psychotropic agents Poisoning by other medications and drugs Poisoning by nonmedicinal substances Suicide and intentional self-inflicted injury [ICD-9CM CCS only] Other injuries and conditions due to external causes E Codes: All (external causes of injury and poisoning) E Codes: Cut/pierce E Codes: Drowning/submersion E Codes: Fall E Codes: Fire/burn E Codes: Firearm E Codes: Machinery E Codes: Motor vehicle traffic (MVT) E Codes: Pedal cyclist; not MVT E Codes: Pedestrian; not MVT E Codes: Transport; not MVT E Codes: Natural/environment E Codes: Overexertion E Codes: Poisoning E Codes: Struck by; against E Codes: Suffocation E Codes: Adverse effects of medical care E Codes: Adverse effects of medical drugs E Codes: Other specified and classifiable E Codes: Other specified; NEC [ICD-9CM CCS only] E Codes: Unspecified [ICD-9CM CCS only] E Codes: Place of occurrence [ICD-9CM CCS only]

eTable 1: Diagnostic Categories (continued)

Category	Clinical Classifications Software (CCS)³⁷ Components
Intestinal obstruction	Intestinal obstruction without hernia Abdominal hernia [only those codes that specify intestinal obstruction]
Liver disease	Liver disease; alcohol-related Other liver diseases Hepatitis
Nephrolithiasis	Calculus of urinary tract
Obstructive lung disease	Chronic obstructive pulmonary disease and bronchiectasis Asthma
Pneumonia	Pneumonia (except that caused by tuberculosis or sexually transmitted disease) Influenza Aspiration pneumonitis; food/vomitus
Prostatic hypertrophy	Hyperplasia of prostate
Sepsis	Septicemia (except in labor)
Syncope	Syncope
Urinary tract infection	Urinary tract infections
Venous thromboembolism	Phlebitis; thrombophlebitis and thromboembolism
Malignant neoplasm	Cancer of head and neck Cancer of esophagus Cancer of stomach Cancer of colon Cancer of rectum and anus Cancer of liver and intrahepatic bile duct Cancer of pancreas Cancer of other GI organs; peritoneum Cancer of bronchus; lung Cancer; other respiratory and intrathoracic Cancer of bone and connective tissue Melanomas of skin Cancer of breast Cancer of uterus Cancer of cervix Cancer of ovary Cancer of other female genital organs Cancer of prostate Cancer of testis Cancer of other male genital organs Cancer of bladder Cancer of kidney and renal pelvis Cancer of other urinary organs Cancer of brain and nervous system

eTable 1: Diagnostic Categories (continued)

Category	Clinical Classifications Software (CCS) ³⁷ Components
Malignant neoplasm (continued)	Cancer of thyroid Hodgkin`s disease Non-Hodgkin`s lymphoma Leukemias Multiple myeloma Cancer; other and unspecified primary Secondary malignancies Malignant neoplasm without specification of site Neoplasms of unspecified nature or uncertain behavior Maintenance chemotherapy; radiotherapy
Miscellaneous	Overall No diagnosis Invalid diagnosis Tuberculosis Bacterial infection; unspecified site Mycoses HIV infection Viral infection Other infections; including parasitic Sexually transmitted infections (not HIV or hepatitis) Immunizations and screening for infectious disease Thyroid disorders Benign neoplasm of uterus Other and unspecified benign neoplasm Other endocrine disorders Nutritional deficiencies Disorders of lipid metabolism Gout and other crystal arthropathies Cystic fibrosis Immunity disorders Other nutritional; endocrine; and metabolic disorders Deficiency and other anemia Acute posthemorrhagic anemia Sickle cell anemia Coagulation and hemorrhagic disorders Diseases of white blood cells Other hematologic conditions

eTable 1: Diagnostic Categories (continued)

Category	Clinical Classifications Software (CCS) ³⁷ Components
Miscellaneous (continued)	Adjustment disorders [ICD-9CM CCS only] Anxiety disorders [ICD-9CM CCS only] Anxiety; somatoform; dissociative; and personality disorders [ICD-10-CM CCS only] Attention-deficit, conduct, and disruptive behavior disorders [ICD-9CM CCS only] Delirium, dementia, and amnesic and other cognitive disorders [ICD-9CM CCS only] Senility and organic mental disorders [ICD-10-CM CCS only] Developmental disorders [ICD-9CM CCS only] Mental retardation [ICD-10-CM CCS only] Disorders usually diagnosed in infancy, childhood, or adolescence [ICD-9CM CCS only] Preadult disorders [ICD-10-CM CCS only] Impulse control disorders, NEC [ICD-9CM CCS only] Mood disorders [ICD-9CM CCS only] Affective disorders [ICD-10-CM CCS only] Personality disorders [ICD-9CM CCS only] Schizophrenia and other psychotic disorders [ICD-9CM CCS only] Schizophrenia and related disorders [ICD-10-CM CCS only] Other psychoses [ICD-10-CM CCS only] Alcohol-related disorders [ICD-9CM CCS only] Alcohol-related mental disorders [ICD-10-CM CCS only] Substance-related disorders [ICD-9CM CCS only] Substance-related mental disorders [ICD-10-CM CCS only] Screening and history of mental health and substance abuse codes [ICD-9CM CCS only] Other mental conditions [ICD-10-CM CCS only] Personal history of mental disorder; mental and behavioral problems; observation and screening for mental condition [ICD-10-CM CCS only] Miscellaneous disorders [ICD-9CM CCS only] Meningitis (except that caused by tuberculosis or sexually transmitted disease) Encephalitis (except that caused by tuberculosis or sexually transmitted disease) Other CNS infection and poliomyelitis Parkinson`s disease Multiple sclerosis Other hereditary and degenerative nervous system conditions Paralysis Epilepsy; convulsions Headache; including migraine Coma; stupor; and brain damage

eTable 1: Diagnostic Categories (continued)

Category	Clinical Classifications Software (CCS) ³⁷ Components
Miscellaneous (continued)	Cataract Retinal detachments; defects; vascular occlusion; and retinopathy Glaucoma Blindness and vision defects Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease) Other eye disorders Otitis media and related conditions Conditions associated with dizziness or vertigo Other ear and sense organ disorders Other nervous system disorders Heart valve disorders Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease) Essential hypertension Hypertension with complications and secondary hypertension Pulmonary heart disease Other and ill-defined heart disease Peripheral and visceral atherosclerosis Aortic; peripheral; and visceral artery aneurysms Aortic and peripheral arterial embolism or thrombosis Other circulatory disease Varicose veins of lower extremity Hemorrhoids Other diseases of veins and lymphatics Acute and chronic tonsillitis Acute bronchitis Other upper respiratory infections Pleurisy; pneumothorax; pulmonary collapse Respiratory failure; insufficiency; arrest (adult) Lung disease due to external agents Other lower respiratory disease Other upper respiratory disease Intestinal infection Disorders of teeth and jaw Diseases of mouth; excluding dental Esophageal disorders Gastritis and duodenitis Other disorders of stomach and duodenum Anal and rectal conditions Peritonitis and intestinal abscess

eTable 1: Diagnostic Categories (continued)

Category	Clinical Classifications Software (CCS)³⁷ Components
Miscellaneous (continued)	Pancreatic disorders (not diabetes) Noninfectious gastroenteritis Other gastrointestinal disorders Nephritis; nephrosis; renal sclerosis Chronic renal failure Other diseases of kidney and ureters Other diseases of bladder and urethra Genitourinary symptoms and ill-defined conditions Inflammatory conditions of male genital organs Other male genital disorders Nonmalignant breast conditions Inflammatory diseases of female pelvic organs Endometriosis Prolapse of female genital organs Menstrual disorders Ovarian cyst Menopausal disorders Female infertility Other female genital disorders Contraceptive and procreative management Spontaneous abortion Induced abortion Postabortion complications Ectopic pregnancy Other complications of pregnancy Hemorrhage during pregnancy; abruptio placenta; placenta previa Hypertension complicating pregnancy; childbirth and the puerperium Early or threatened labor Prolonged pregnancy Diabetes or abnormal glucose tolerance complicating pregnancy; childbirth; or the puerperium Malposition; malpresentation Fetopelvic disproportion; obstruction Previous C-section Fetal distress and abnormal forces of labor Polyhydramnios and other problems of amniotic cavity Umbilical cord complication OB-related trauma to perineum and vulva Forceps delivery

eTable 1: Diagnostic Categories (continued)

Category	Clinical Classifications Software (CCS) ³⁷ Components
Miscellaneous (continued)	Other complications of birth; puerperium affecting management of mother Normal pregnancy and/or delivery Other inflammatory condition of skin Chronic ulcer of skin Other skin disorders Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease) Rheumatoid arthritis and related disease Osteoarthritis Other non-traumatic joint disorders Spondylosis; intervertebral disc disorders; other back problems Osteoporosis Pathological fracture Acquired foot deformities Other acquired deformities Systemic lupus erythematosus and connective tissue disorders Other connective tissue disease Other bone disease and musculoskeletal deformities Cardiac and circulatory congenital anomalies Digestive congenital anomalies Genitourinary congenital anomalies Nervous system congenital anomalies Other congenital anomalies Liveborn Short gestation; low birth weight; and fetal growth retardation Intrauterine hypoxia and birth asphyxia Respiratory distress syndrome Hemolytic jaundice and perinatal jaundice Birth trauma Other perinatal conditions Fever of unknown origin Lymphadenitis Gangrene Shock Nausea and vomiting Malaise and fatigue Allergic reactions Rehabilitation care; fitting of prostheses; and adjustment of devices Administrative/social admission Medical examination/evaluation Other aftercare Other screening for suspected conditions (not mental disorders or infectious disease) Residual codes; unclassified

eTable 2: Hospital Characteristics for Analysis^{29,44,45,46,56}

Hospital	Inpatient Acute-care Sites	Size* (beds)	Case Volume† (discharges/y)
Academic Sector			
Mt Sinai	Mount Sinai Hospital	222	24,738
St Joseph's (H)	St Joseph's Health Care System (Hamilton)	256	19,881
St Michael's	St Michael's Hospital	402	24,954
Sunnybrook	Sunnybrook Health Sciences Centre	438	29,049
University	University Health Network: Princess Margaret, Toronto General, and Toronto Western sites	639	29,072
Hamilton	Hamilton Health Sciences Corporation: General, Juravinski, and McMaster sites	559	39,849
Community Sector			
Markham	Markham Stouffville Hospital	111	11,479
Joseph Brant	Joseph Brant Memorial Hospital	167	13,152
Halton	Halton Healthcare Services Corporation: Milton and Oakville sites	188	16,731
York Central	York Central Hospital	167	14,677
Rouge Valley	Rouge Valley Health System: Centenary and Ajax sites	259	24,697
Credit Valley	Credit Valley Hospital	208	21,186
Southlake	Southlake Regional Health Centre	164	16,080
St Joseph's (T)	St Joseph's Health Centre (Toronto)	259	17,681
Toronto East	Toronto East General Hospital	249	18,801
Lakeridge	Lakeridge Health Corporation: Bowmanville, Oshawa, Port Perry, and Uxbridge sites	329	25,374
Scarborough	Scarborough Hospital: General and Grace sites	453	34,570
William Osler	William Osler Health System: Brampton, Etobicoke, and Georgetown sites	343	40,856
Trillium	Trillium Health Centre (Mississauga)	328	30,693
North York	North York General Hospital: General and Branson sites	255	27,137
Humber River	Humber River Regional Hospital: Humber Memorial, Northwestern, and York-Finch sites	433	29,138

* Size reflects the number of medical and surgical adult acute care in-patient beds reported for the hospital in 2002.

† Case volume reflects the total number of separations reported for the hospital in 2002.

eTable 3: Hospital Characteristics for Description* 29,44,45,46

Hospital	Established (year)	Religious Affiliation	Annual Budget (million \$CAD)	Average Length of Stay (days)	Myocardial Infarction 28-day Readmission Rate* (%)	Use of Clinical Information Technology† (%)	Patient Assessment of Quality of Care† (%)
Academic Sector							
Mt Sinai	1923	Yes	184	6.0	5.9	60.1	89.8
St Joseph's (H)	1890	Yes	158	6.7	7.5	60.1	89.8
St Michael's	1892	Yes	370	7.0	5.9	47.6	87.6
Sunnybrook	1948	No	400	8.0	3.8	74.8	87.6
University	1829	No	650	7.5	3.8	74.8	87.6
Hamilton	1848	No	530	7.9	5.9	47.6	89.8
Community Sector							
Markham	1990	No	60	6.0	7.5	60.1	89.8
Joseph Brant	1961	No	73	6.6	5.9	25.0	87.6
Halton	1949	No	132	5.8	10.1	60.1	89.8
York Central	1963	No	77	6.5	7.5	60.1	82.0
Rouge Valley	1954	No	189	6.4	7.5	47.6	87.6
Credit Valley	1985	No	170	7.5	10.1	74.8	87.6
Southlake	1922	No	98	5.0	10.1	47.6	92.2
St Joseph's (T)	1921	Yes	142	5.8	7.5	47.6	87.6
Toronto East	1929	No	127	7.2	5.9	60.1	85.8
Lakeridge	1946	No	183	5.6	7.5	74.8	85.8
Scarborough	1956	Yes	231	6.6	10.1	60.1	82.0
William Osler	1961	No	165	3.5	5.9	74.8	82.0
Trillium	1958	No	194	6.0	3.8	74.8	82.0
North York	1957	No	254	5.0	3.8	60.1	87.6
Humber River	1948	No	141	6.6	5.9	47.6	82.0

* Data from study midpoint (2002 where possible, 2004 otherwise).

†Data reported as a range in the source rather than a point estimate. The midpoint of the reported range is presented here.

eTable 4: Diagnostic Category Frequency for Primary Hospitalization

Most Responsible Diagnosis for Primary Hospitalization	Original Hospital Readmission (n = 161,974)	Alternate Hospital Readmission (n = 36,175)
Miscellaneous	49,237 (30.4%)	10,652 (29.4%)
Malignant neoplasm	19,590 (12.1%)	4,303 (11.9%)
Injury	10,666 (6.6%)	2,724 (7.5%)
Acute coronary syndrome	9,000 (5.6%)	2,115 (5.8%)
Heart failure	9,258 (5.7%)	1,856 (5.1%)
Pneumonia	6,696 (4.1%)	1,588 (4.4%)
Obstructive lung disease	6,742 (4.2%)	1,316 (3.6%)
Chronic ischemic heart disease	3,168 (2.0%)	2,440 (6.7%)
Cardiac arrhythmia	4,318 (2.7%)	824 (2.3%)
Cerebrovascular disease	3,708 (2.3%)	1,135 (3.1%)
Biliary tract disease	4,172 (2.6%)	463 (1.3%)
Intestinal obstruction	3,709 (2.3%)	465 (1.3%)
Gastrointestinal hemorrhage	3,202 (2.0%)	597 (1.7%)
Urinary tract infection	2,905 (1.8%)	761 (2.1%)
Diabetes	2,844 (1.8%)	674 (1.9%)
Liver disease	2,560 (1.6%)	531 (1.5%)
Fluid and electrolyte imbalance	2,223 (1.4%)	565 (1.6%)
Nonspecific chest pain	2,013 (1.2%)	498 (1.4%)
Nonspecific abdominal pain	1,868 (1.2%)	360 (1.0%)
Acute renal failure	1,448 (0.9%)	373 (1.0%)
Infections of the skin	1,484 (0.9%)	310 (0.9%)
Sepsis	1,491 (0.9%)	285 (0.8%)
Appendicitis	1,633 (1.0%)	97 (0.3%)
Diverticular disease	1,480 (0.9%)	150 (0.4%)
Venous thromboembolism	1,335 (0.8%)	221 (0.6%)
Nephrolithiasis	1,419 (0.9%)	135 (0.4%)
Inflammatory bowel disease	1,381 (0.9%)	172 (0.5%)
Prostatic hypertrophy	1,225 (0.8%)	173 (0.5%)
Syncope and collapse	947 (0.6%)	290 (0.8%)
Cardiac arrest	252 (0.2%)	102 (0.3%)

eTable 5: Diagnostic Category Frequency for Secondary Hospitalization

Most Responsible Diagnosis for Secondary Hospitalization	Original Hospital Readmission (n = 161,974)	Alternate Hospital Readmission (n = 36,175)
Miscellaneous	47,116 (29.1%)	10,362 (28.6%)
Malignant neoplasm	13,085 (8.1%)	2,802 (7.7%)
Injury	20,194 (12.5%)	2,888 (8.0%)
Acute coronary syndrome	6,648 (4.1%)	1,933 (5.3%)
Heart failure	10,193 (6.3%)	2,452 (6.8%)
Pneumonia	7,584 (4.7%)	2,264 (6.3%)
Obstructive lung disease	5,855 (3.6%)	1,177 (3.3%)
Chronic ischemic heart disease	1,599 (1.0%)	404 (1.1%)
Cardiac arrhythmia	554 (0.3%)	203 (0.6%)
Cerebrovascular disease	4,008 (2.5%)	1,398 (3.9%)
Biliary tract disease	3,213 (2.0%)	511 (1.4%)
Intestinal obstruction	4,830 (3.0%)	648 (1.8%)
Gastrointestinal hemorrhage	3,624 (2.2%)	960 (2.7%)
Urinary tract infection	3,370 (2.1%)	866 (2.4%)
Diabetes	2,606 (1.6%)	679 (1.9%)
Liver disease	2,618 (1.6%)	595 (1.6%)
Fluid and electrolyte imbalance	2,799 (1.7%)	651 (1.8%)
Nonspecific chest pain	3,149 (1.9%)	1,094 (3.0%)
Nonspecific abdominal pain	2,306 (1.4%)	320 (0.9%)
Acute renal failure	1,853 (1.1%)	490 (1.4%)
Infections of the skin	1,399 (0.9%)	277 (0.8%)
Sepsis	2,805 (1.7%)	788 (2.2%)
Appendicitis	336 (0.2%)	61 (0.2%)
Diverticular disease	1,033 (0.6%)	149 (0.4%)
Venous thromboembolism	2,426 (1.5%)	605 (1.7%)
Nephrolithiasis	1,053 (0.7%)	110 (0.3%)
Inflammatory bowel disease	909 (0.6%)	150 (0.4%)
Prostatic hypertrophy	201 (0.1%)	17 (0.0%)
Syncope and collapse	988 (0.6%)	373 (1.0%)
Cardiac arrest	554 (0.3%)	203 (0.6%)

eTable 6: Secondary Hospital Characteristics

Characteristic*	Original Hospital Readmission (n = 161,974)	Alternate Hospital Readmission (n = 36,175)
For Analysis		
Academic sector (percent)	36	33
Average adult acute-care medical and surgical beds (count)	328	328
Average annual case volume (patient discharges per year)	27,196	26,160
For Description		
Average year of establishment (year)	1948	1948
Religious affiliation (percent)	21	24
Average annual budget (million \$CAD)	183	183
Average length of stay (days)	7	7
Average 28-day readmission rate following discharge after acute myocardial infarction (rate per 100 patients)	5.9	5.9
Average use of clinical information technology (percent)	60	60
Average patient rating of global quality (percent)	88	88

* Data represent the distribution of characteristics within the population of readmissions, rather than the distribution of characteristics within all qualifying GTHA hospitals. Reported averages are medians.

eTable 7: Primary Outcome Stratified by Secondary Hospital

Hospital	Sample Size (count)	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio* (95% CI)
Academic Sector			
Mt Sinai	6,535	1.57 (1.36 – 1.80)	1.17 (1.00 – 1.38)
St Joseph's (H)	7,726	1.52 (1.31 – 1.77)	1.22 (1.02 – 1.45)
St Michael's	9,744	1.63 (1.43 – 1.85)	1.24 (1.07 – 1.44)
Sunnybrook	10,110	1.57 (1.40 – 1.77)	1.23 (1.08 – 1.41)
University	15,335	1.44 (1.30 – 1.60)	1.20 (1.07 – 1.35)
Hamilton	19,758	1.42 (1.26 – 1.60)	1.14 (0.99 – 1.31)
Community Sector			
Markham [†]	3,723	1.05 (0.88 – 1.27)	0.82 (0.66 – 1.03)
Joseph Brant [†]	6,397	0.92 (0.76 – 1.12)	0.90 (0.72 -1.13)
Halton [†]	6,736	1.03 (0.87 – 1.23)	0.98 (0.79 – 1.21)
York Central	6,913	1.32 (1.15 – 1.52)	1.15 (0.97 – 1.35)
Rouge Valley	7,096	1.06 (0.93 – 1.21)	0.89 (0.77 – 1.04)
Credit Valley	7,371	1.17 (1.02 – 1.35)	0.97 (0.83 – 1.14)
Southlake	8,405	0.92 (0.78 – 1.09)	0.88 (0.72 – 1.07)
St Joseph's (T)	9,057	1.19 (1.06 – 1.35)	1.06 (0.91 – 1.22)
Toronto East	9,455	1.21 (1.07 – 1.36)	1.10 (0.95 – 1.27)
Lakeridge	9,472	0.86 (0.74 – 1.00)	1.00 (0.84 – 1.18)
Scarborough	10,072	1.10 (0.99 – 1.23)	0.92 (0.81 – 1.04)
William Osler	10,534	1.20 (1.07 – 1.35)	0.97 (0.84 – 1.11)
Trillium	10,770	1.25 (1.11 – 1.41)	1.12 (0.97 – 1.29)
North York	10,965	1.28 (1.14 – 1.42)	1.11 (0.98 – 1.26)
Humber River	11,975	1.35 (1.22 – 1.49)	0.99 (0.88 – 1.11)
Overall	198,149	1.26 (1.23 – 1.30)	-

* Adjusted odds ratios for hospital-specific strata were generated using multivariate logistic regression and were adjusted for age, sex, neighborhood household income, rural residence, year of readmission, Charlson comorbidity score, primary length of stay, most responsible diagnosis at secondary hospitalization, arrival by ambulance at readmission, chronic care facility residency at readmission, hospitalizations in prior year, physician clinic visits in prior year, and hospital-free interval.

†Multivariate logistic regression produced unstable adjusted odds ratios for these hospitals due to model nonconvergence.

eTable 8: Diagnosis as Predictor of 30-day Mortality

Most Responsible Diagnosis for Secondary Hospitalization	Adjusted Odds Ratio* (95% CI)
Miscellaneous	Reference
Malignant neoplasm	3.57 (3.16 – 4.03)
Injury	0.45 (0.41 – 0.48)
Acute coronary syndrome	1.05 (0.94 – 1.16)
Heart failure	0.91 (0.83 – 1.01)
Pneumonia	1.87 (1.69 – 2.07)
Obstructive lung disease	0.93 (0.85 – 1.02)
Chronic ischemic heart disease	0.67 (0.59 – 0.76)
Cardiac arrhythmia	0.45 (0.41 – 0.50)
Cerebrovascular disease	1.27 (1.13 – 1.42)
Biliary tract disease	0.53 (0.49 – 0.58)
Intestinal obstruction	0.60 (0.55 – 0.65)
Gastrointestinal hemorrhage	0.76 (0.70 – 0.82)
Urinary tract infection	0.57 (0.52 – 0.62)
Diabetes	0.52 (0.47 – 0.58)
Liver disease	2.29 (2.03 – 2.59)
Fluid and electrolyte imbalance	0.81 (0.73 – 0.90)
Nonspecific chest pain	0.26 (0.24 – 0.28)
Nonspecific abdominal pain	0.40 (0.36 – 0.43)
Acute renal failure	1.40 (1.24 – 1.58)
Infections of the skin	0.43 (0.40 – 0.46)
Sepsis	3.10 (2.72 – 3.53)
Appendicitis	0.54 (0.46 – 0.63)
Diverticular disease	0.61 (0.55 – 0.68)
Venous thromboembolism	0.76 (0.69 – 0.85)
Nephrolithiasis	0.44 (0.41 – 0.47)
Inflammatory bowel disease	0.50 (0.46 – 0.55)
Prostatic hypertrophy	0.24 (0.20 – 0.29)
Syncope and collapse	0.24 (0.22 – 0.27)
Cardiac arrest	7.23 (5.70 – 9.18)

*As with Table 2, odds ratios were adjusted for age, sex, neighborhood household income, rural residence, year of readmission, Charlson comorbidity score, primary length of stay, most responsible diagnosis at secondary hospitalization, arrival by ambulance at readmission, chronic care facility residency at readmission, hospitalizations in prior year, physician clinic visits in prior year, hospital-free interval, and secondary hospital case volume and sector. Variables were treated as continuous for analysis.

eTable 9: Analysis of Sector Transitions and the Comparative Odds of 30-day Mortality Following Readmission

Hospital Sector Transition Comparison	Adjusted Odds Ratio (95% CI)
Relatively Simple Comparisons	
AA(alternate) vs AA(original) ^a	1.19 (1.12 – 1.26)
CC(alternate) vs CC(original) ^b	1.04 (1.00 – 1.07)
More Complicated Comparisons	
AC(alternate) vs AA(original) ^c	1.52 (1.31 – 1.75)
CA(alternate) vs CC(original) ^d	0.74 (0.63 – 0.86)
AA(original) vs CC(original) ^e	0.64 (0.55 – 0.75)

In the notation used here to express sector transitions, the first letter represents the sector of the primary hospital (A = Academic; C = Community), the second letter represents the sector of the secondary hospital, and the subscript indicates alternate- or original-hospital readmission. To perform the exploratory sector transition analysis, we created a six-level categorical term describing all possible sector transitions [i.e. AA(original), AA(alternate), AC(alternate), CA(alternate), CC(alternate), CC(original)]. The multivariate logistic regression model with generalized estimating equations used for the primary analysis was modified by removing the term for hospital sector and replacing the alternate-hospital readmission term used for the primary outcome with the categorical term for sector transition. The odds ratios listed for each comparison express the relative risk of 30-day mortality.

Within the academic sector (^a) alternate-hospital readmission is associated with an increased risk of death, but within the community sector (^b) the effect is only marginally significant. This finding is similar to the results of the analysis that stratified on secondary hospital sector (see page 10 of manuscript) and suggests that the association between alternate-hospital readmission and death is modified by hospital sector.

The remainder of the results listed above can be interpreted as follows: For patients initially admitted to an academic sector hospital, readmission to an alternate academic (^a) or community hospital (^c) is associated with an increased risk of death compared to readmission to the original academic hospital. For patients initially admitted to a community sector hospital, readmission to an alternate community hospital is associated with a risk of death that is not significantly different than the risk associated with readmission to the original hospital (^b), yet readmission to academic hospital is associated with lower risk than returning to the original hospital (^d). Original hospital readmissions within the academic sector are associated with a lower risk of death than original hospital readmissions within the community sector (^e).

Adjusted odds ratios presented here were adjusted for age, sex, neighborhood household income, rural residence, year of readmission, Charlson comorbidity score, primary length of stay, most responsible diagnosis at secondary hospitalization, arrival by ambulance at readmission, chronic care facility residency at readmission, hospitalizations in prior year, physician clinic visits in prior year, hospital-free interval, and secondary hospital case volume and sector.

eTable 10: Unadjusted Comparison of the Odds of 30-day Mortality Following Alternate-Hospital Readmission to the Odds of 30-day Mortality Following Original-Hospital Readmission, Stratified on Diagnosis

Most Responsible Diagnosis for Secondary Hospitalization	Unadjusted Odds Ratio (95% CI)
Miscellaneous	1.26 (1.19 - 1.33)
Malignant neoplasm	1.22 (1.10 - 1.36)
Injury	2.27 (1.72 - 2.99)
Acute coronary syndrome	0.93 (0.80 - 1.07)
Heart failure	0.96 (0.87 - 1.06)
Pneumonia	1.08 (0.97 - 1.19)
Obstructive lung disease	1.03 (0.87 - 1.22)
Chronic ischemic heart disease	0.52 (0.35 - 0.76)
Cardiac arrhythmia	0.97 (0.76 - 1.24)
Cerebrovascular disease	1.20 (1.01 - 1.43)
Biliary tract disease	1.00 (0.61 - 1.64)
Intestinal obstruction	1.80 (1.32 - 2.45)
Gastrointestinal hemorrhage	1.03 (0.79 - 1.33)
Urinary tract infection	1.38 (1.14 - 1.67)
Diabetes	0.93 (0.70 - 1.24)
Liver disease	1.12 (0.91 - 1.37)
Fluid and electrolyte imbalance	1.12 (0.91 - 1.38)
Nonspecific chest pain	0.75 (0.29 - 1.90)
Nonspecific abdominal pain	1.61 (0.61 - 4.23)
Acute renal failure	1.32 (1.08 - 1.60)
Infections of the skin	1.53 (1.00 - 2.35)
Sepsis	1.21 (1.02 - 1.43)
Appendicitis *	-
Diverticular disease	2.25 (1.43 - 3.55)
Venous thromboembolism	0.89 (0.67 - 1.19)
Nephrolithiasis *	-
Inflammatory bowel disease *	-
Prostatic hypertrophy *	-
Syncope and collapse	0.64 (0.25 - 1.63)
Cardiac arrest	1.12 (0.78 - 1.6)

* Effect estimates for these diagnoses could not be calculated as there were no deaths in the alternate-hospital group.

eTable 11: Adjusted Comparison of the Odds of Mortality Following Alternate-Hospital Readmission to the Odds of Mortality Following Original-Hospital Readmission at Additional Time Points

Outcome	Adjusted Odds Ratio* (95%CI)
Death during secondary hospitalization	1.05 (1.02 – 1.09)
Death within 90 days	1.04 (0.99 – 1.10)
Death within 180 days	1.03 (0.97 – 1.09)
Death within one year	1.01 (0.95 – 1.07)

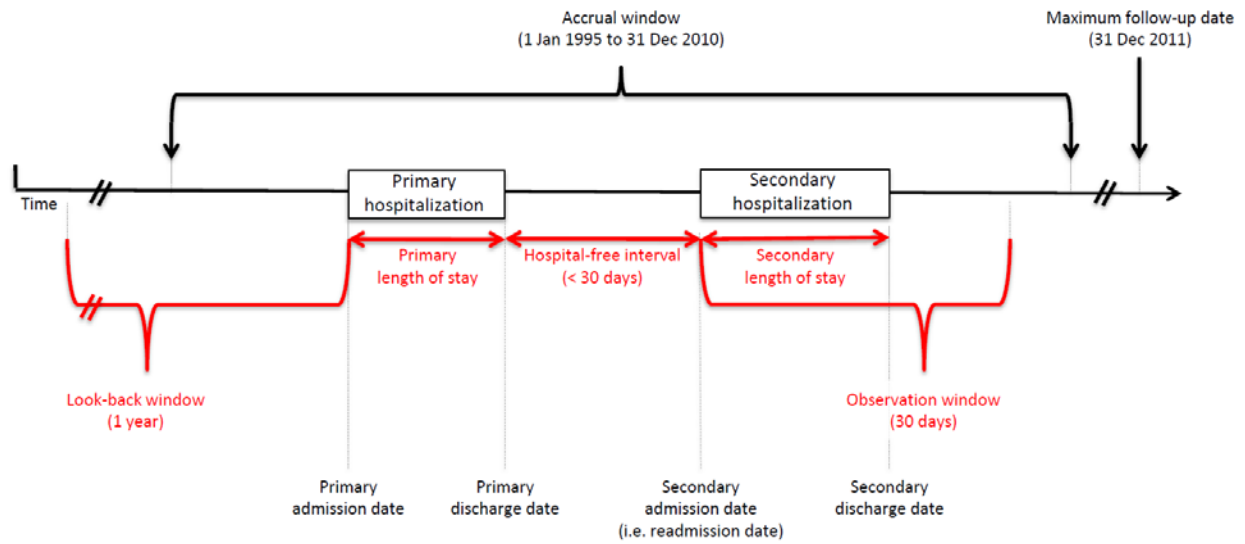
* Adjusted for age, sex, neighborhood household income, rural residence, year of readmission, Charlson comorbidity score, primary length of stay, most responsible diagnosis at secondary hospitalization, arrival by ambulance at readmission, chronic care facility residency at readmission , hospitalizations in prior year, physician clinic visits in prior year, hospital-free interval, and secondary hospital case volume and sector.

eTable 12: Odds Ratio for Death Within 30 Days of Readmission in the Presence of an Unmeasured Confounder With a Hazard Ratio of 2.0 for Death and Various Prevalence Levels of the Confounder, by Exposure Group

	Prevalence of Risk Factor in Original-Hospital Readmissions					
	0.0	0.1	0.2	0.3	0.4	0.5
Prevalence of Risk Factor in Alternate-Hospital Readmissions						
0.0	1.00	0.89	0.80	0.72	0.65	0.59
0.1	1.13	1.00	0.90	0.81	0.73	0.66
0.2	1.26	1.12	1.00	0.90	0.82	0.74
0.3	1.40	1.24	1.11	1.00	0.91	0.82
0.4	1.54	1.37	1.23	1.10	1.00	0.91
0.5	1.69	1.50	1.35	1.21	1.10	1.00
0.6	1.85	1.65	1.47	1.33	1.20	1.09
0.7	2.02	1.80	1.61	1.45	1.31	1.19
0.8	2.20	1.96	1.75	1.58	1.43	1.30
0.9	2.39	2.12	1.90	1.71	1.55	1.41
1.0	2.59	2.30	2.06	1.86	1.68	1.53

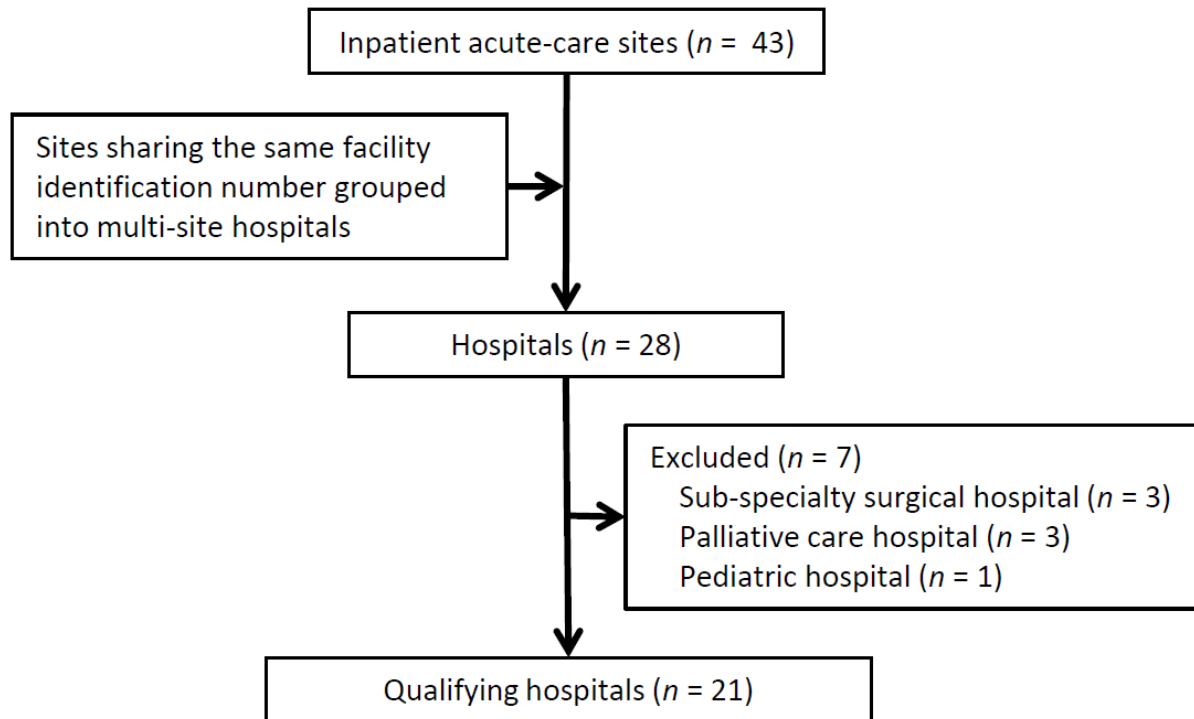
eFigure 1: Study Schematic

Appendix Figure 1: Study Schematic

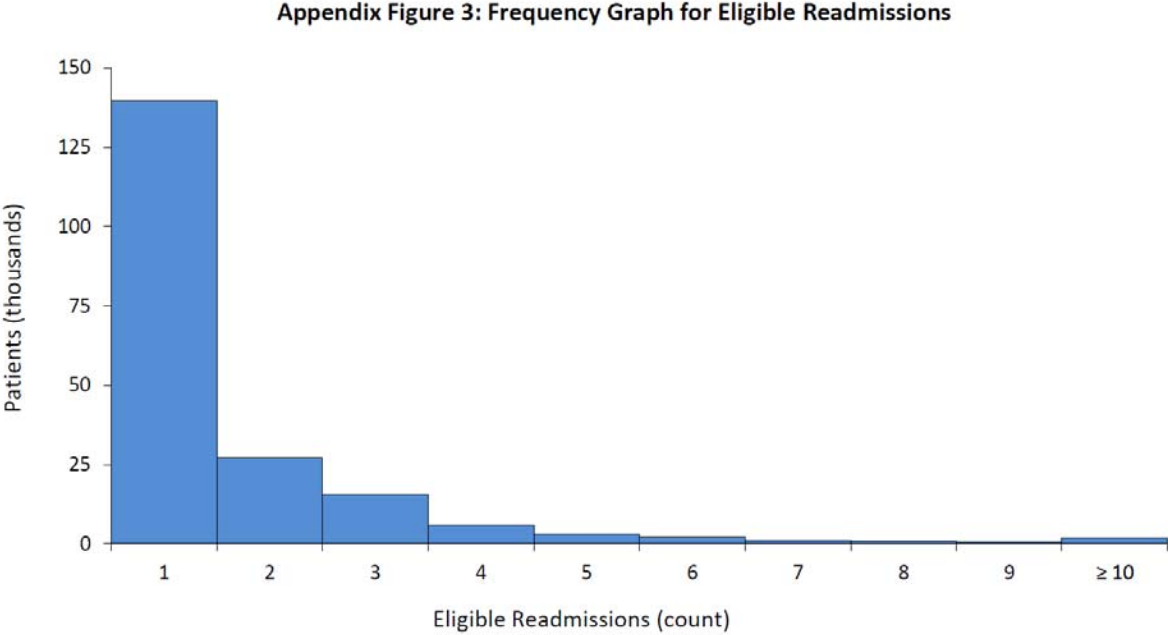


eFigure 2: Hospital Flow Diagram

Appendix Figure 2: Hospital Flow Diagram

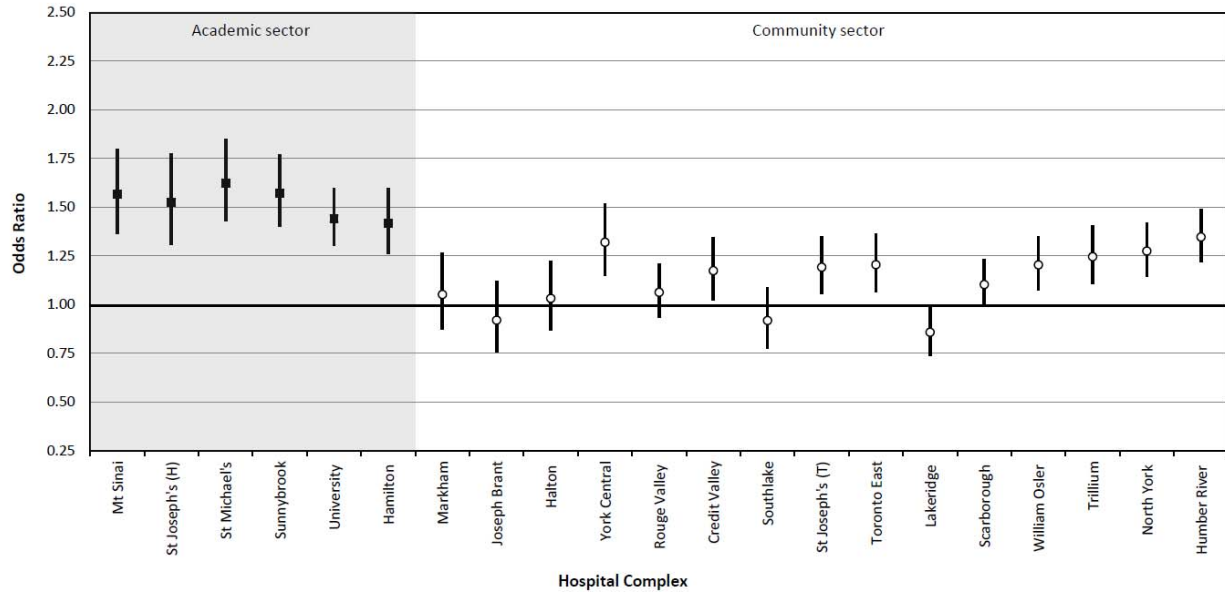


eFigure 3: Frequency Graph for Eligible Readmissions

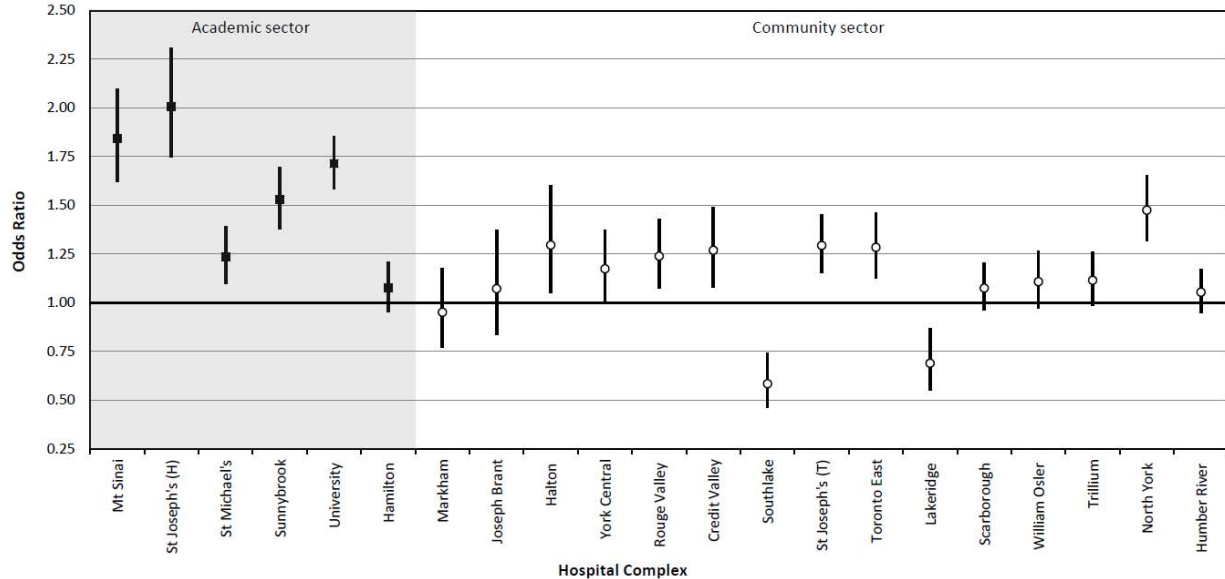


eFigure 4: Comparing Primary and Secondary Hospital Stratification

Appendix Figure 4a: Unadjusted Odds Ratio for 30-day Mortality, Stratified by Secondary Hospital



Appendix Figure 4b: Unadjusted Odds Ratio for 30-day Mortality, Stratified by Primary Hospital



Legend: Data points represent the hospital-specific odds ratio comparing the odds of death within 30 days of alternate-hospital readmission to the odds of death within 30 days of original-hospital readmission. In eFigure 3a, patients were assigned to their secondary (ie readmission) hospital. In eFigure 3b, patients were assigned to their primary (ie admission) hospital. Black square data points indicate academic sector hospitals. White circle data points indicate community sector hospitals. Vertical lines represent the 95% confidence interval for the associated data point.

Odds Ratios presented in Appendix Figure 4b were adjusted for age, sex, neighborhood household income, rural residence, year of readmission, Charlson comorbidity score, primary length of stay, most responsible diagnosis at secondary hospitalization, arrival by ambulance at readmission, chronic care facility residency at readmission, hospitalizations in prior year, physician clinic visits in prior year, and hospital-free interval.