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## **Supplementary Material**

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**Supplemental Table 1: States Included in the Nationwide Readmission Database**

<b>Region</b>	<b>States</b>
Northeast	Massachusetts, Vermont, New York
Midwest	Wisconsin, Iowa, Missouri, Nebraska, South Dakota
South	Arkansas, Florida, Georgia, Louisiana, South Carolina, Virginia, Tennessee
West	California, Hawaii, Nevada, New Mexico, Utah, Washington

**Supplemental Table 2: List of International Classification of Disease 9th Revisions, Clinical Modification (ICD-9-CM) and Clinical Classification Software (CCS) Codes used**

Study variable	ICD9 code	Description
End stage Renal Disease	585.6	End Stage Renal Disease
Dialysis procedures	39.95	Hemodialysis
Dialysis diagnosis	V45.11, V45.12, V56.0, V56.1	Hemodialysis
<b>Exclusions</b>		
Acute Kidney Injury	584.5, 584.6, 584.7, 584.8, 584.9	Acute kidney failure with lesion of tubular necrosis, Acute kidney failure with lesion of renal cortical necrosis, Acute kidney failure with lesion of renal medullary [papillary] necrosis, Acute kidney failure with other specified pathological lesion in kidney, Acute kidney failure, unspecified
Peritoneal Dialysis procedures	549.8, V56.2, V56.8, 996.68, V56.32	Peritoneal Dialysis, Fitting and adjustment of peritoneal dialysis catheter, Encounter for other dialysis, Infection and inflammatory reaction due to peritoneal dialysis catheter, Encounter for adequacy testing for peritoneal dialysis
Renal Transplant	V42.0, 996.81, 556.9, 556.1	Kidney transplant status (Kidney replaced by transplant), Kidney transplant (immune or non-immune cause), Other kidney transplantation, Renal autotransplantation
Pregnancy diagnosis	630-639, 640-649, 650-659, 660-669, 670-679, 720-759, V27.0, V27.1, V27.2, V27.3, V27.4, V27.5, V27.6, V27.7, V27.8, V27.9	Ectopic And Molar Pregnancy And Other Pregnancy With Abortive Outcome, Complications Mainly Related To Pregnancy, Normal Delivery, And Other Indications For Care In Pregnancy, Labor And Delivery, Complications Occurring Mainly In The Course Of Labor And Delivery, Complications Of The Puerperium, Other Maternal And Fetal Complications, Outcome of delivery (single liveborn, Single Stillborn, twins, both liveborn, twins, one liveborn and one stillborn, twins-both stillborn, other multiple birth-all liveborn, other multiple birth-some liveborn, other multiple birth, all stillborn, unspecified outcome of delivery
Neonatal Discharges	Major Diagnostic Category (MDC) 15	Newborns and Other Neonates with Conditions Originating in the Perinatal Period

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Maternal Discharges	Major Diagnostic Category (MDC) 14	Pregnancy, Childbirth and the Puerperium
Chemotherapies	CCS procedure code 224	Cancer Chemotherapy

<b>Complications</b>	<b>CCS code</b>	<b>Description</b>
Implant complications (Vascular Access)	237	Complication of device; implant or graft
Hypertension	99	Hypertension with complications and secondary hypertension
Fluid and electrolyte imbalance	55	Fluid and electrolyte disorders
Congestive heart failure	108	Congestive heart failure; nonhypertensive
Diabetes mellitus	50	Diabetes mellitus with complications
Pneumonia	122	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)
Septicemia	2	Septicemia (except in labor)
Cardiac Arrhythmia	106	Cardiac dysrhythmias
Acute myocardial infarction	100	Acute myocardial infarction
Chest pain	102	Nonspecific chest pain

**Supplemental Table 3: Frequency of hospitalizations and number of readmissions**

<b>Number of readmissions</b>	<b>Total number of hospitalizations</b>	<b>Percentage of hospitalizations<sup>a</sup></b>	<b>Cumulative Frequency</b>
<b>0</b>	303326	77.7	303326
<b>1</b>	73868	18.9	377194
<b>2</b>	11835	3.0	389029
<b>3</b>	1426	0.4	390455
<b>4</b>	139	0.04	390595
<b>5</b>	14	0	390609
<b>6</b>	9	0	390617
<b>7</b>	2	0	390620
<b>9</b>	3	0	390623
<b>10</b>	4	0	390627

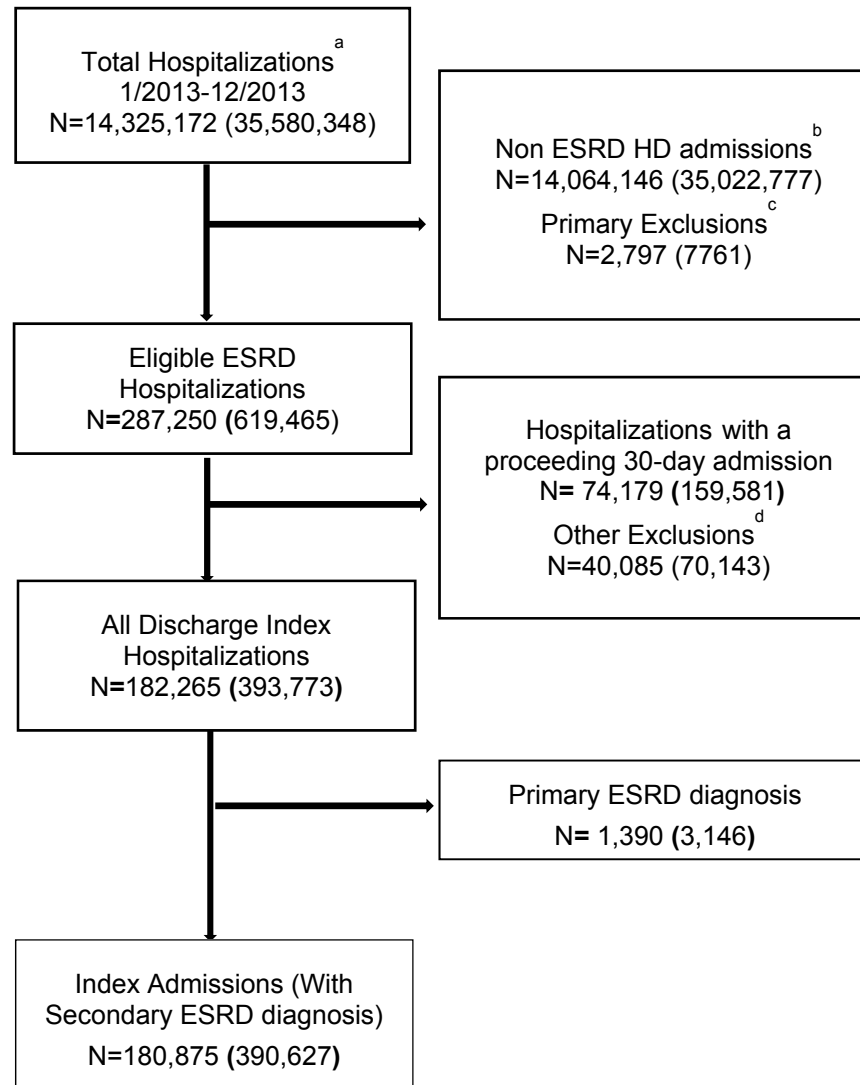
Total numbers and percentages may not add up to 100 due to rounding.

a. Percentage of hospitalizations was calculated per each readmission category from the overall group of hospitalizations with index admissions, both those with and without readmissions.

**Supplemental Table 4: Population attributable fraction for comorbidities**

<b>Comorbidity</b>	<b>Population attributable fraction (95% CI)%</b>
Drug Abuse	0.9 (0.7 – 1.1)
Acquired Immune deficiency syndrome	0.06 (-0.01 – 0.1)
Congestive Heart Failure	1.9 (1.3 – 2.5)
Chronic Pulmonary Disease	2.5 (2.0 - 3.0)
Depression	0.8 (0.4 – 1.1)
Diabetes Mellitus	0.9 (0.3 – 1.6)
Hypertension	3.7 (1.6 – 5.7)
Liver Disease	0.7 (0.5 – 1.0)
Peripheral Vascular Disease	1.1 (0.7 – 1.6)

## Supplemental Figure 1: Study flow chart



Abbreviations: ESRD: End stage renal disease; HD hemodialysis

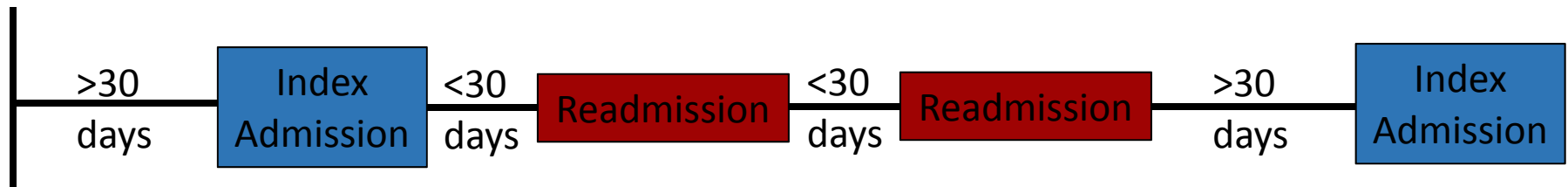
<sup>A</sup> Numbers reported are absolute admissions, and numbers in parenthesis are weighted admissions. As exclusions were not mutually exclusive, the numbers may not add up appropriately.

<sup>b</sup> AKI 1,483,496 (3,357,171), Peritoneal Dialysis n=17,769 (41,671), Transplant Patients 76,925 (181,882), Patients without maintenance Dialysis 12,485,956 (31,442,053)

<sup>c</sup> Admission age <= 18 474 (1553), maternal hospitalizations 385 (836), chemotherapy 466 (956), missing length of stay information 25 (40), Missing Discharge Disposition 40 (93)

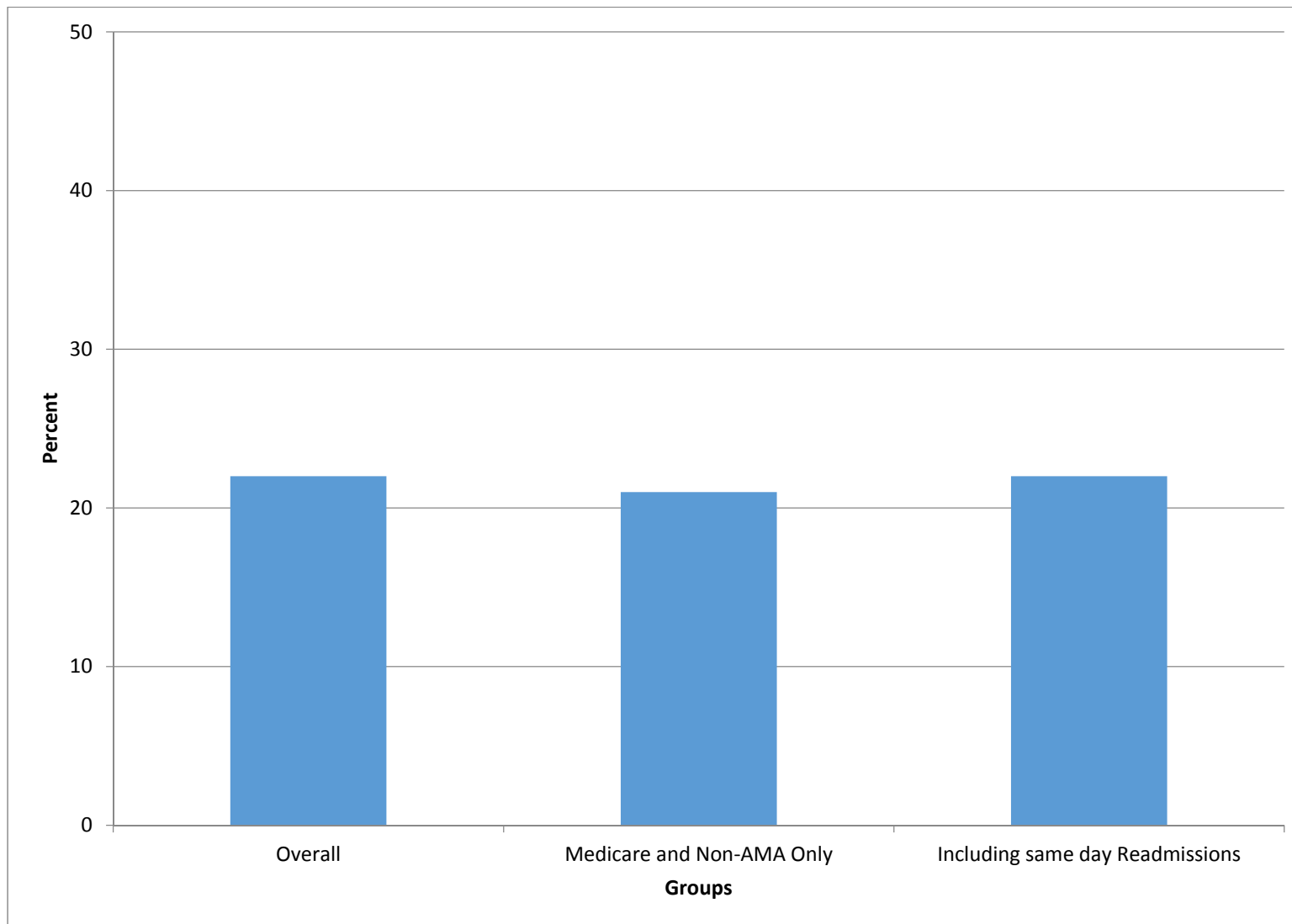
<sup>d</sup> Hospitalizations associated with patient death 8,481 (18,011), hospitalizations with missing discharge disposition 40 (93), index hospitalizations from 12th month 17,606 (38,081), same day events 6,588 (13,958)

## Supplemental Figure 2: Definition of index admission and readmission

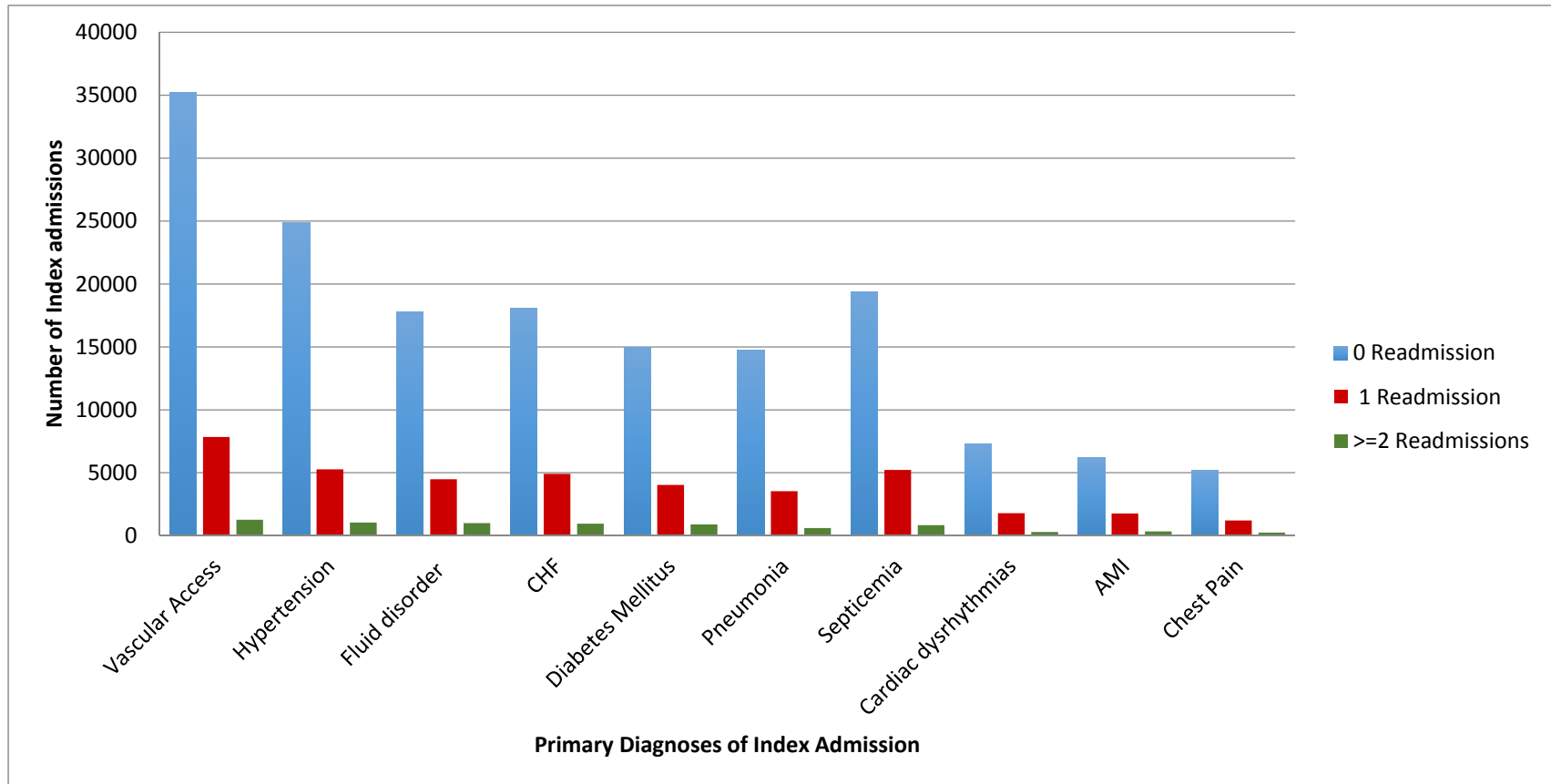




### Supplemental Figure 3: Readmission Rate on Sensitivity Analyses.



### Supplemental Figure 4. Absolute number of admissions for top 10 primary diagnosis of index admission and associated readmissions.



Blue bars represent number of admissions with no readmissions, red bars represent admissions with 1 readmission, and green bars represent admissions with at least 2 readmissions.

## Supplemental Figure 5: Number of Patients and Percent of Readmission by Readmission Category

