Supplemental Material:

Supplemental Methods

Supplemental Table 1: The defined list of concepts including visit type, race, ethnicity, comorbidities (AKI, diabetes mellitus, hypertension, cardiovascular disease, heart failure, kidney failure, Sepsis), procedures (Invasive Mechanical Ventilation), drugs (vasopressors, Dexamethasone, Remdesivir, Tocilizumab), and additional ICD codes for AKI diagnosis.

Supplemental Table 2: Descriptive characteristics of hospitalized COVID-positive patients with and without AKI by two different AKI definitions.

Supplemental Table 3: Descriptive characteristics of each region

Supplemental Table 4: Descriptive characteristics of each time period

Supplemental Table 5: Descriptive characteristics of each racial group.

Supplemental Table 6: Descriptive characteristics of deceased and survived AKI patients.

Supplemental Table 7: Association between acute kidney injury and mortality, adjusted for the severity of AKI, any code-based AKI, age, sex, race, ethnicity, severity markers, and timing of initial COVID infection: raw count and percentage of deaths, unadjusted and adjusted hazard ratios

Supplemental Figure 1: A bar chart visualizing site-level filtering visualizes the characteristics of each data partner and their status before and after filtering.

Supplemental Figure 2: (a) Venn diagrams showing patients meeting different SCr-based AKI definitions (b) Comparison between the time of onset of AKI from the date of hospitalization and the length of hospitalization of patients (code-based AKI for all patients with AKI onset longer than the length of hospitalization). Color means the number of patients, darker the more patients. (c) Comparison of severity between patients meeting both AKI criteria versus those meeting only serum creatinine criteria.

Supplemental Figure 3: (a) First 60-day survival for patients diagnosed with AKI, but with insufficient serum creatinine data to calculate a change. (b) Post-60-day survival for different AKI definitions. (c) First 60-day

survival by KDIGO-based AKI stages and Code-based AKI. (d) Post-60-day survival by KDIGO-based AKI stages and Code-based AKI.

Supplemental Figure 4: (a) Comparison of unadjusted mortality rates (and 95% confidence intervals), between regional ad time frames. (b) Observed mortality rates (and 95% confidence intervals), within different severities of AKI, for six time periods.

Supplemental Figure 5: Multivariable analysis of COVID-19-related AKI risk in patients with BMI

Supplemental Figure 6: (a) Multivariable survival analysis of 165,401 patients using the Cox Proportional Hazards (CoxPH) model BMI and comorbidity. (b) CoxPH multivariable analysis including only hypertension with BMI.

Supplemental Figure 7: (a) Follow-up comparison between Race groups. (b) Venn-diagram of comorbidities (hypertension, diabetes mellitus, heart failure, cardiovascular disease).

Supplemental Methods

N3C data: Ingestion & Harmonization

N3C brings together de-identified EHR data (dating back to January 1, 2018) from 72 healthcare institutions across the US into a centralized repository, allowing a detailed study of a geographically diverse population of patients with COVID-19 from each participating site as well as matched controls[1].

Institutions contributed EHR data to the N3C consortium using various source data models[2], i.e., PCORnet, PEDSnet, ACT, TriNetX, and OMOP. All data were harmonized, and mapped to the OMOP Common Data Model (V5.3.1)[3] in accordance with data quality and harmonization checks[4]. Characteristics of the adult and pediatric cohorts have previously been described[5,6].

Variable Definitions

Visit types

Relevant inpatient visits in the OMOP format are described by five visit-type concepts. To unite these terms semantically, we created concept sets defining inpatient visits, emergency department (ED), and outpatient visits (**Supplemental Table 1**). Furthermore, visits for a single patient of any type overlapping in time with inpatient visits were merged using the 'macrovisit' logic described previously[5].

Dates, survival, and length of stay

To construct the length of follow-up, i.e., censoring for survival analysis, we define the date of the last follow-up as each patient's most recent measurement date. The date of death was not available for 435 of 48,230 (<1%) deceased patients. When missing, the date of death was assumed to be the date of the last measurement data available. When the date of death or last follow-up was known to be after the study end date (March 6th, 2022), patients were treated as being alive at the study end date and censored accordingly (n=11,775; administrative censoring).

Race and Ethnicity

Data on race and ethnicity were obtained from the EHR, which may represent a mixture of self-reported and observed information. Heterogeneous OMOP concepts for race were combined into five racial groups as described in **Supplemental Table 1**.

Covariates

Conditions, medications, and laboratory values were defined using concept sets, i.e., sets of semantically similar OMOP concepts, that are freely available for re-use within the N3C enclave. Many concept sets have been previously defined and validated[5], but additional concept sets were built for this study (**Supplemental Table 1**). For laboratory values, all data were converted to a single unit of measurement prior to computation.

Missing data:

How missing data were handled throughout the manuscript is described in Figure 1. Race and ethnicity were the only two variables in which missing data "no race info", or "no ethnicity info" were included as categories in analysis. While this runs counter to best practices in general[7], in our particular application within N3C there are tacit data curation features that provide a rationale for this: 1) NIH/NCATS data governance agreement with American Indian / Alaska Native sovereign tribal nations to deterministically impute 'Unknown' for their participants (to mitigate re-identification risk given concurrent availability of ZIP codes), and 2) N3C consortial research on an increased risk for people of color to have incomplete mappings of race and/or ethnicity to an unambiguous harmonized OMOP set of fields when other populations studies have demonstrated that these same subgroups-within-incompletely-mapped sites are at likely disparate risk of COVID-19 sequelae like AKI and mortality[8]. This rationale supports use of the current approach as it corresponds with a pattern-mixture analysis under rationale-driven elicited priors, using model constraints tying specific race/ethnicity missingness patterns' regression effects together in the manner of Daniels & Hogan[9]. For every other variable, e.g., comorbidities, a complete-cases approach was used, which amounts to a missing-at-random assumption given simultaneous use of fully-observed covariates in the same models fitted using (partial) likelihood methods[10], the same assumptions conventionally adopted for primary analyses within studies submitted to regulatory bodies like the FDA[11]. We provide as supplemental figures the results of these corresponding subgroup analyses.

Inclusion and Exclusion Criteria

The following site-level data quality criteria was also applied to the cohort (**Figure 1**) One site out of 72 sites is excluded since they only provided outpatient data to us (**Supplemental Figure 1**).

1) *Long-term facilities*. We calculated the date difference between the date of the confirmed case of COVID-19 and the start date of the visit to determine the proportion of inpatients at each hospital with a date difference of more than 200 days (indicating a hospital-acquired infection). If the number of these long-term inpatients exceeded 5% of all inpatients, we classified the facility as 'long-term' and excluded such sites and their patients (n=1 site and n=43,212 patients) from the study **(Figure 1, Supplemental Figure 1)**.
2) *Availability of serum creatinine data*. Preliminary analysis of the N3C data suggested systematic missingness of serum creatinine data by site, and that while most sites had excellent (>90%) coverage of serum creatinine amongst inpatients, 4 sites were removed because no serum creatinine data were available, and 14 additional sites were removed for providing serum creatinine from fewer than <75% of inpatients **(Figure 1, Supplemental Figure 1)**.
3) *Availability of mortality data*. While most sites reported COVID-19-positive inpatient mortality above 8% (range of 4-22%), we dropped 1 site from survival endpoint studies that reported mortality below 1% **(Figure 1, Supplemental Figure 1)**.

Kidney Measures:

Definition of baseline serum creatinine

A patient's 'baseline' serum creatinine was established using the following procedure, with the most recent pre-hospitalization serum creatinine taking precedence if available in the last 180 days prior to the COVID visit: (1) If a patient had an outpatient serum creatinine before their COVID-19 inpatient visit (index visit), we selected the most recent outpatient serum creatinine value as a baseline for that patient. (2) If the patient did not have an outpatient serum creatinine prior to the index visit but had an emergency department (ED) visit serum creatinine prior to the COVID-19 visit, we selected the serum creatinine at discharge from the ED visit as the patient's baseline. (3) If a patient had neither an outpatient nor an ED visit serum creatinine, but they had an inpatient serum creatinine before their index visit, we selected the serum creatinine at discharge for that inpatient visit. (4) If a patient did not have any serum creatinine before the index visit, we selected the minimum serum creatinine of all the serum creatinine obtained during the index hospitalization as reported previously[12,13]. serum creatinine values provided by different institutions or labs were harmonized to the same unit of measure (mg/dL)[4].

Definition of AKI severity

The severity of AKI was defined as follows. First, a common feature is the use of a set of concepts for kidney replacement therapy (KRT), which defined all patients who received KRT or acute dialysis during the COVID-19 visit as “AKI stage 3 with KRT”. Among patients with "serum creatinine-based AKI”, Stage 1 AKI was defined as a serum creatinine fold-change of at least 1.5 but less than 2 from baseline, Stage 2 was defined as a change of at least 2-fold, but less than 3-fold. Stage 3 AKI without KRT was defined as serum creatinine fold change of at least 3 times the baseline but not requiring acute dialysis. In the case of an increase in serum creatinine of 0.3 or more within 48 hours, all differences greater than 0.3 were defined as AKI stage 1. When the same patient showed different AKI stages in different serum creatinine-based AKI definitions, the severity of the patients was defined by selecting the highest stage.

BMI Interpolation

BMI, height, and weight values were not consistently reported on the patient- nor site-level. For example, 8 of 53 (15%) sites were unable to transmit BMI data and 196,604 of 336,473 (58%) patients had ≥1 reported BMI value. To enrich the dataset and facilitate upstream analyses, a workflow was implemented to mitigate the degree at which BMI measurements were seemingly missing throughout the study cohort. Missing weight and height data were interpolated by inserting the most recent validated measurement within seven day. These criteria were pre-defined to ensure that interpolated values exhibited stability and to minimize the potential for data corruption as a source of bias. The aforementioned process by which serum creatinine units and other metrics were harmonized was also applied to these data. Missing BMI measurements were then calculated according to the following formula: BMI = weight [kg] / (height [m])^2. This workflow decreased the number of sites

without any BMI data to 1 /53 (2%), representing an 88% reduction in the number of sites missing this established COVID-19 risk factor. Additionally, the number of sites with >90% reported BMI data increased from 1/53 (2%) to 43/53 (81%) and the number of patients with ≥1 reported BMI value increased to 165,401/336,473 (49%).

Statistical Analysis

The AKI incidence probability is subdivided into regions and times, and the adjusted odds ratio (OR) values are shown based on basic demographic information (**Figure 4**). Multivariable Cox proportional hazards (CoxPH) regression was used to estimate hazard ratios (HRs) for survival endpoints (**Table 3**). Primary multivariable analyses were performed based on 336,426 patients, excluding 47 patients (0.01%) without sex information (**Figure 1**). There were no missing values in any of the primary multi-variable models that were designed using variables with complete data on the entire cohort: age [by decade], sex, race, ethnicity, and observation time periods (P1, P2, P3, P4, P5, P6) (**Table 2, 3, and Figure 4**) and for mortality prediction, the variables associated with severity of illness during hospitalization (the need for Invasive Mechanical Ventilation or vasopressors use or diagnosis of sepsis) were also included (**Table 3**). In the case of analysis to find out the risk of AKI (**Table 2, Figure 4, and Supplemental Figure 5**), modified Poisson regression was used.

Secondary multivariable analysis was done on a sub-group of patients with data on comorbidities and body mass index (BMI) (**Figure 1**). Comorbidities included hypertension, diabetes mellitus, heart failure, and cardiovascular disease. Secondary Multivariable analyses are shown in **Supplemental Figures 5 and 6** and included 165,401 patients, after excluding 171,025 patients without BMI records.

Follow-up visit analyses in **Supplemental Figure 7A** were based on Kaplan-Meier curves from the *survival* package in R[14]. The start date was the date of confirmed COVID-19, and the end date was the most recent date with measurement data. The design of N3C limits the potential to adjust for covariates that are not directly measurable. However, allowing for data-partner heterogeneity within survival analyses serves as a tractable yet informal assessment of how conclusions may be impacted by such latent factors in aggregate. The risk of AKI and Survival analyses were repeated using shared frailty models (as done for time-to-event analyses in other multi-site studies of COVID-19)[15,16] for assessing the robustness of modified Poisson regression model, the primary Cox regression model, and data-partner-specific Kaplan-Meier survival curves (not shown) to affirm that primary survival analyses' conclusions were similar. The patients included in the analysis were counted only once based on the start date of their index COVID-19 hospitalization.

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Supplemental Tables

Supplemental Table 1: The defined list of concepts includes visit type, race, ethnicity, comorbidities (AKI, diabetes mellitus, hypertension, cardiovascular disease, heart failure, kidney failure, sepsis), procedures (KRT, Invasive Mechanical Ventilation), drugs (vasopressors, Dexamethasone, Remdesivir, Tocilizumab), and additional ICD codes for AKI diagnosis.

Visit Type	**Concept name**
Inpatient	
	inpatient visit
	inpatient hospital
	emergency room and inpatient visit
	inpatient intensive care unit
	inpatient psychiatric facility
Visit Type	**Concept name**
Outpatient	
	Outpatient Visit
	Office Visit
	Laboratory Visit
	Observation Room
	Non-hospital institution Visit
	Ambulatory Surgical Center
	Ambulatory Clinic / Center, Ambulatory Infusion Therapy Clinic / Center
	Interactive Telemedicine Service
	Telehealth
	Ambulatory Oncology Clinic / Center, Ambulatory Radiology Clinic / Center
	Telephone call to a patient
	Ambulatory Endoscopy Clinic / Center
	Ambulatory Oncological Radiation Clinic / Center
	Ambulatory Dental Clinic / Center
	Ambulatory Magnetic Resonance Imaging (MRI) Clinic / Center
	Skilled Nursing Facility
Race	**Concept name**
White	
	White
Black	
	Black

	Black or African American
Asian	
	Asian
	Asian Indian
	Filipino
	Korean
	Chinese
	Vietnamese
	Japanese
Others	
	other
	different races
	multiple races
	two or more races
	Native Hawaiian or other Pacific Islander
	Other Pacific Islander
	Polynesian
	Hispanic
Ethnicity	
Not Hispanic or Latino Ethnicity	
	Not Hispanic or Latino Ethnicity
Hispanic or Latino	
	Hispanic or Latino
	Diagnostic concept name
Acute Kidney Injury (AKI)	
	Acute injury of kidney
	Acute tubular necrosis
	Hepatorenal syndrome
	Acute renal failure due to acute cortical necrosis
	Hemolytic uremic syndrome
	Acute-on-chronic renal failure
	Acute renal insufficiency
	Postpartum acute renal failure
	Acute nephritis
	Rapidly progressive nephritic syndrome

	Acute renal impairment
	Acute kidney injury due to sepsis
	Acute tubulointerstitial nephritis
	Rapidly progressive nephritic syndrome
	diffuse crescentic glomerulonephritis
	Acute nontraumatic kidney injury,
	Acute renal failure on dialysis
	Acute kidney failure stage 1-3
	Rapidly progressive glomerulonephritis
	Hemorrhagic fever with renal syndrome
	Acute renal cortical necrosis
	Rapidly progressive nephritic syndrome
	diffuse membranous glomerulonephritis
	Acute renal failure due to tubular necrosis
	Acute kidney injury due to hypovolemia.
	Diagnostic concept name
diabetes mellitus	
	Type 2 diabetes mellitus
	Type 2 diabetes mellitus without complication
	Hyperglycemia due to type 2 diabetes mellitus
	Chronic kidney disease due to type 2 diabetes mellitus
	Complication due to diabetes mellitus
	Polyneuropathy due to type 2 diabetes mellitus
	Disorder of nervous system due to type 2 diabetes mellitus
	Peripheral circulatory disorder due to type 2 diabetes mellitus
	Foot ulcer due to type 2 diabetes mellitus
	Renal disorder due to type 2 diabetes mellitus
	Type 1 diabetes mellitus
	Secondary diabetes mellitus
	Disorder due to type 2 diabetes mellitus
	Diabetic ketoacidosis without coma
	Proliferative retinopathy due to type 2 diabetes mellitus
	Diabetes mellitus without complication
	Hyperglycemia due to type 1 diabetes mellitus
	Disorder of eye due to type 2 diabetes mellitus
	Hypoglycemia due to type 2 diabetes mellitus
	Type 2 diabetes mellitus with ulcer

	Diabetes mellitus
	Mild nonproliferative retinopathy due to type 2 diabetes mellitus
	Type 1 diabetes mellitus without complication
	Macular edema due to diabetes mellitus
	Autonomic neuropathy due to type 2 diabetes mellitus
	Gestational diabetes mellitus
	Macular edema and retinopathy due to type 2 diabetes mellitus
	Disorder of nervous system due to diabetes mellitus
	Insulin treated type 2 diabetes mellitus
	Polyneuropathy due to diabetes mellitus
	Disorder of kidney due to diabetes mellitus
	Dermopathy due to type 2 diabetes mellitus
	Moderate nonproliferative retinopathy due to type 2 diabetes mellitus
	Drug-induced diabetes mellitus
	Type II diabetes mellitus uncontrolled
	Renal disorder due to type 1 diabetes mellitus
	Gangrene due to type 2 diabetes mellitus
	Peripheral angiopathy due to diabetes mellitus
	Pre-existing type 2 diabetes mellitus in pregnancy
	Cataract due to diabetes mellitus type 2
	Diabetic foot ulcer
	Disorder of eye due to diabetes mellitus
	Neuropathic arthropathy due to type 2 diabetes mellitus
	Diabetes insipidus
	Hypoglycemia due to type 1 diabetes mellitus
	Disorder of nervous system due to type 1 diabetes mellitus
	Pre-existing type 1 diabetes mellitus in pregnancy
	Autonomic neuropathy due to type 1 diabetes mellitus
	Polyneuropathy due to type 1 diabetes mellitus
	Type 2 diabetes mellitus well controlled
	Nonproliferative retinopathy due to type 2 diabetes mellitus
	Proliferative retinopathy due to diabetes mellitus
	Retinopathy due to type 2 diabetes mellitus
	Neuropathy due to diabetes mellitus
	Ulcer of lower limb due to type 1 diabetes mellitus
	Mononeuropathy due to type 2 diabetes mellitus
	Neuropathy due to type 2 diabetes mellitus
	Severe hyperglycemia due to diabetes mellitus
	Type 2 diabetes mellitus with peripheral angiopathy

	Peripheral vascular disorder due to diabetes mellitus
	Severe nonproliferative retinopathy with clinically significant macular edema due to diabetes mellitus
	Retinopathy due to type 1 diabetes mellitus
	Proliferative retinopathy due to type 1 diabetes mellitus
	Mild nonproliferative retinopathy due to diabetes mellitus
	Pre-existing diabetes mellitus in pregnancy
	Moderate nonproliferative retinopathy due to diabetes mellitus
	Diabetes mellitus during pregnancy, childbirth and the puerperium
	Type 1 diabetes mellitus uncontrolled
	Ketoacidosis due to type 2 diabetes mellitus
	Severe nonproliferative retinopathy without macular edema due to diabetes mellitus
	Autonomic neuropathy due to diabetes mellitus
	Retinopathy due to diabetes mellitus
	Nonproliferative retinopathy due to diabetes mellitus
	Ketoacidosis due to type 1 diabetes mellitus
	Peripheral circulatory disorder due to type 1 diabetes mellitus
	Hyperosmolar coma due to diabetes mellitus
	Hyperosmolar coma due to type 2 diabetes mellitus
	Diabetic ketoacidosis
	Latent autoimmune diabetes mellitus in adult
	Disorder due to type 1 diabetes mellitus
	Severe nonproliferative retinopathy due to diabetes mellitus
	Lumbosacral radiculoplexus neuropathy due to type 2 diabetes mellitus
	Arthropathy due to type 2 diabetes mellitus
	Diabetes mellitus in mother complicating pregnancy, childbirth AND/OR puerperium
	Disorder of eye due to type 1 diabetes mellitus
	Mild nonproliferative retinopathy due to type 1 diabetes mellitus
	Type 2 diabetes mellitus in obese
	Gestational diabetes mellitus in childbirth
	O/E - right eye proliferative diabetic retinopathy
	Infection of foot due to diabetes mellitus
	Proliferative retinopathy of right eye with diabetes mellitus
	Type 1 diabetes mellitus with ulcer
	Gastroparesis due to diabetes mellitus
	O/E - left eye proliferative diabetic retinopathy
	Cataract due to diabetes mellitus type 1
	Mild nonproliferative retinopathy of right eye due to diabetes mellitus

	Mild nonproliferative retinopathy of left eye due to diabetes mellitus
	Moderate nonproliferative retinopathy due to type 1 diabetes mellitus
	Traction detachment of retina due to type 2 diabetes mellitus
	Diabetic mononeuropathy
	Hypoglycemia due to diabetes mellitus
	Skin ulcer due to diabetes mellitus
	Nonproliferative diabetic retinopathy due to type 1 diabetes mellitus
	Pre-existing diabetes mellitus in mother complicating childbirth
	Nephrogenic diabetes insipidus
	Ketoacidotic coma due to type 1 diabetes mellitus
	Diabetic neuropathy with neurologic complication
	Diabetes mellitus type 2 without retinopathy
	Type 2 diabetes mellitus in nonobese
	Dermopathy due to type 1 diabetes mellitus
	Macular edema due to type 2 diabetes mellitus
	Cataract due to diabetes mellitus
	Ulcer of midfoot due to diabetes mellitus
	Hyperosmolar coma due to secondary diabetes mellitus
	Mononeuropathy due to type 1 diabetes mellitus
	Ulcer of toe due to type 2 diabetes mellitus
	Chronic kidney disease due to type 1 diabetes mellitus
	Moderate nonproliferative diabetic retinopathy of right eye
	Diabetes mellitus during pregnancy - baby not yet delivered
	Hypoglycemic coma due to type 2 diabetes mellitus
	Ketoacidotic coma due to type 2 diabetes mellitus
	Steroid-induced diabetes
	Neuropathic arthropathy due to type 1 diabetes mellitus
	Gestational diabetes mellitus, class A>2<
	Moderate nonproliferative diabetic retinopathy of left eye
	Dyslipidemia due to type 2 diabetes mellitus
	Ketoacidotic coma due to diabetes mellitus
	Coma due to diabetes mellitus
	Type 2 diabetes mellitus controlled by diet
	Chronic kidney disease stage 3 due to type 2 diabetes mellitus
	Chronic kidney disease stage 3 due to type 1 diabetes mellitus
	Mixed hyperlipidemia due to type 2 diabetes mellitus
	Gangrene due to type 1 diabetes mellitus
	Gestational diabetes mellitus complicating pregnancy
	Pregnancy and type 2 diabetes mellitus

	Posttransplant diabetes mellitus
	Pregnancy and type 1 diabetes mellitus
	Diabetic peripheral neuropathy
	Proliferative retinopathy of left eye due to diabetes mellitus
	Hypoglycemic coma due to type 1 diabetes mellitus
	Diabetic dermopathy
	Ulcer of heel due to diabetes mellitus
	Disorder due to well controlled type 2 diabetes mellitus
	Gestational diabetes mellitus, class A>1<
	Macular edema of right eye due to diabetes mellitus
	Diabetic foot
	Lumbosacral radiculoplexus neuropathy due to diabetes mellitus
	Proteinuric nephropathy due to diabetes mellitus
	Blindness due to type 1 diabetes mellitus
	Lesion of skin due to diabetes mellitus
	Pre-existing type 1 diabetes mellitus
	Neuropathic arthropathy due to diabetes mellitus
	Chronic kidney disease stage 2 due to type 2 diabetes mellitus
	Peripheral neuropathy due to type 2 diabetes mellitus
	Moderate nonproliferative retinopathy due to secondary diabetes mellitus
	Gangrene due to diabetes mellitus
	Hyperosmolar non-ketotic state due to type 2 diabetes mellitus
	Severe nonproliferative retinopathy of left eye due to diabetes mellitus
	Ulcer of heel due to type 2 diabetes mellitus
	Severe nonproliferative retinopathy of right eye due to diabetes mellitus
	Chronic kidney disease stage 4 due to type 2 diabetes mellitus
	Hyperlipidemia due to type 2 diabetes mellitus
	Postpartum gestational diabetes mellitus
	Vitreous hemorrhage due to diabetes mellitus
	Vitreous hemorrhage of left eye due to diabetes mellitus
	Mixed hyperlipidemia due to type 1 diabetes mellitus
	Diabetes mellitus in mother complicating childbirth
	Chronic kidney disease stage 4 due to type 1 diabetes mellitus
	Pre-existing type 2 diabetes mellitus
	Erectile dysfunction due to type 2 diabetes mellitus
	Mild nonproliferative retinopathy due to secondary diabetes mellitus
	Macroalbuminuric nephropathy due to diabetes mellitus
	Hypoglycemic coma due to diabetes mellitus
	Traction detachment of retina due to type 1 diabetes mellitus

	Microalbuminuria due to type 2 diabetes mellitus
	Lumbosacral radiculoplexus neuropathy due to type 1 diabetes mellitus
	Hyperglycemia due to diabetes mellitus
	Disorder of soft tissue due to diabetes mellitus
	Nonproliferative retinopathy of left eye due to diabetes mellitus
	Ulcer of right foot due to type 2 diabetes mellitus
	Abnormal metabolic state due to diabetes mellitus
	Hyperglycemic crisis due to diabetes mellitus
	Macular edema of left eye due to diabetes mellitus
	O/E - right eye stable treated proliferative diabetic retinopathy
	Peripheral angiopathy due to type 1 diabetes mellitus
	Proteinuria due to type 2 diabetes mellitus
	Ulcer of left foot due to type 2 diabetes mellitus
	Microalbuminuric diabetic nephropathy
	Chronic kidney disease stage 1 due to type 2 diabetes mellitus
	Ulcer of lower limb due to type 2 diabetes mellitus
	Diabetes mellitus associated with cystic fibrosis
	O/E - left eye stable treated proliferative diabetic retinopathy
	Cellulitis of foot due to diabetes mellitus
	Type 1 diabetes mellitus with arthropathy
	Glomerulopathy due to diabetes mellitus
	Hyperosmolar hyperglycemic coma due to diabetes mellitus without ketoacidosis
	Chronic painful neuropathy due to diabetes mellitus
	Diarrhea due to diabetes mellitus
	Skin ulcer of toe due to diabetes mellitus type 1
	Hyperosmolar coma due to type 1 diabetes mellitus
	Diabetes mellitus associated with hormonal etiology
	Retinopathy due to secondary diabetes mellitus
	Dermatitis due to drug induced diabetes mellitus
	Ulcer of foot due to type 1 diabetes mellitus
	Insulin dependent diabetes mellitus type 1A
	Acidosis due to type 2 diabetes mellitus
	Diabetes mellitus induced by non-steroid drugs
	Chronic kidney disease stage 5 due to type 2 diabetes mellitus
	Bullosis diabeticorum
	Hyperosmolar non-ketotic state due to diabetes mellitus
	Peripheral sensory neuropathy due to type 2 diabetes mellitus
	Skin ulcer due to type 2 diabetes mellitus

	Nephrotic syndrome due to diabetes mellitus
	Maturity-onset diabetes of the young, type 5
	Diabetes mellitus due to cystic fibrosis
	Microalbuminuria due to type 1 diabetes mellitus
	Diabetes mellitus in the puerperium - baby delivered during previous episode of care
	Diabetes mellitus associated with pancreatic disease
	Hypertension in chronic kidney disease stage 3 due to type 2 diabetes mellitus
	Hypoglycemic event due to diabetes
	O/E - left eye background diabetic retinopathy
	Coronary artery disease due to type 2 diabetes mellitus
	Glaucoma due to type 2 diabetes mellitus
	Diagnostic concept name
Hypertension	
	Essential hypertension
	Hypertensive heart failure
	Hypertensive heart and renal disease with (congestive) heart failure
	Benign essential hypertension
	Hypertensive urgency
	Hypertensive disorder
	Hypertensive heart disease without congestive heart failure
	Hypertensive emergency
	Hypertensive heart disease with congestive heart failure
	Hypertensive heart and chronic kidney disease
	Hypertensive renal disease
	Hypertensive heart AND renal disease
	Hypertensive retinopathy
	Benign hypertensive renal disease with renal failure
	Hypertensive heart disease
	Benign hypertension
	Hypertensive encephalopathy
	Hypertensive renal failure
	Malignant essential hypertension
	Hypertensive crisis
	Hypertensive heart AND chronic kidney disease with congestive heart failure
	Hypertensive heart and renal disease with renal failure
	Benign hypertensive heart disease without congestive heart failure

	Benign hypertensive renal disease
	Benign hypertensive heart AND renal disease
	Hypertensive heart AND chronic kidney disease stage 5
	Malignant hypertension
	Benign hypertensive heart disease with congestive cardiac failure
	Blind hypertensive eye
	Hypertensive heart AND chronic kidney disease stage 3
	Pre-existing hypertensive chronic kidney disease in mother complicating pregnancy
	Malignant hypertensive heart disease without congestive heart failure
	Pre-existing hypertensive heart disease complicating pregnancy, childbirth and the puerperium
	Hypertensive left ventricular hypertrophy
	Hypertensive complication
	Hypertensive heart AND chronic kidney disease stage 4
	Malignant hypertensive heart AND renal disease
	Pre-existing hypertensive heart disease in mother complicating pregnancy
	Labile essential hypertension
	Benign hypertensive heart disease
	Resistant hypertensive disorder
	Pre-existing hypertensive heart and chronic kidney disease in mother complicating childbirth
	Hypertensive heart AND chronic kidney disease stage 2
	Pre-existing hypertensive heart and chronic kidney disease in mother complicating pregnancy
	Hypertensive nephrosclerosis
	Hypertensive heart and renal disease with both (congestive) heart failure and renal failure
	Pre-existing hypertensive heart and renal disease complicating pregnancy, childbirth and the puerperium
	Malignant hypertensive heart disease
	Diagnostic concept name
Cardiovascular disease	
	Congestive heart failure
	Atherosclerosis of coronary artery without angina pectoris
	Atrial fibrillation
	Paroxysmal atrial fibrillation
	Heart failure
	Chronic systolic heart failure
	Chronic diastolic heart failure

	Chronic congestive heart failure
	Hypertensive heart failure
	Chronic atrial fibrillation
	Cardiomyopathy
	Hypertensive heart and renal disease with (congestive) heart failure
	Old myocardial infarction
	Generalized ischemic myocardial dysfunction
	Acute on chronic diastolic heart failure
	Cardiomegaly
	Acute on chronic systolic heart failure
	Non-rheumatic aortic sclerosis
	Chronic combined systolic and diastolic heart failure
	Cardiac arrhythmia
	Diastolic heart failure
	Persistent atrial fibrillation
	Acute non-ST segment elevation myocardial infarction
	Ventricular tachycardia
	Atrial flutter
	Non-rheumatic mitral valve stenosis with regurgitation
	Angina co-occurrent and due to coronary arteriosclerosis
	Supraventricular tachycardia
	Sick sinus syndrome
	Paralytic syndrome on one side of the body as late effect of cerebrovascular accident
	Acute on chronic combined systolic and diastolic heart failure
	Coronary arteriosclerosis
	Dilated cardiomyopathy
	Angina pectoris
	Systolic heart failure
	Ventricular premature complex
	Heart disease
	Right bundle branch block
	Coronary atherosclerosis
	Complete atrioventricular block
	Left bundle branch block
	First degree atrioventricular block
	Arteriosclerosis of coronary artery bypass graft
	Aortic incompetence, non-rheumatic
	Acute systolic heart failure

	Acute ST segment elevation myocardial infarction
	Tricuspid incompetence, non-rheumatic
	Acute ischemic heart disease
	Acute diastolic heart failure
	Cardiac transplant disorder
	Permanent atrial fibrillation
	Chronic ischemic heart disease
	Long QT syndrome
	Unstable angina co-occurrent and due to coronary arteriosclerosis
	Atrial premature complex
	Hypertensive heart disease without congestive heart failure
	Non-rheumatic heart valve disorder
	Rheumatic tricuspid valve regurgitation
	Cardiomyopathy associated with another disorder
	Typical atrial flutter
	Rheumatic disease of heart valve
	Late effects of cerebrovascular disease
	Preinfarction syndrome
	Second degree atrioventricular block
	Residual cognitive deficit as late effect of cerebrovascular accident
	Cardiac transplant rejection
	Mural thrombus of heart
	Hypertrophic cardiomyopathy
	Myocardial infarction due to demand ischemia
	Atrial septal defect
	Disorders of both mitral and tricuspid valves
	Aphasia as late effect of cerebrovascular disease
	Cardiac arrest
	Right ventricular failure
	Non-rheumatic mitral valve disease
	Atypical atrial flutter
	Conduction disorder of the heart
	Biventricular congestive heart failure
	Hypertensive heart disease with congestive heart failure
	Rheumatic disease of mitral AND aortic valves
	Valvular endocarditis
	Atrioventricular block
	Primary cardiomyopathy
	Dysphagia as a late effect of cerebrovascular accident

	Acute exacerbation of chronic congestive heart failure
	Hypertrophic obstructive cardiomyopathy
	Rheumatic disease of mitral valve
	Left anterior fascicular block
	Left heart failure
	Hypertensive heart and chronic kidney disease
	Bifascicular block
	Acute combined systolic and diastolic heart failure
	Combined disorders of mitral, aortic and tricuspid valves
	Ventricular fibrillation
	Chronic pulmonary heart disease
	Coronary arteriosclerosis in artery of transplanted heart
	Longstanding persistent atrial fibrillation
	Aortic valve disorder
	Acute myocardial infarction
	Congenital heart disease
	Paroxysmal ventricular tachycardia
	Infective endocarditis
	Myocardial infarction
	Acute cor pulmonale
	Mitral valve prolapse
	Hypertensive heart AND renal disease
	Takotsubo cardiomyopathy
	Congenital insufficiency of aortic valve
	Acute subendocardial infarction
	Dysarthria as late effects of cerebrovascular disease
	Mitral valve disorder
	Weakness of face muscles as sequela of stroke
	Chronic right-sided heart failure
	Sinus node dysfunction
	Rheumatic mitral stenosis
	Chronic total occlusion of coronary artery
	Pulmonary incompetence, non-rheumatic
	Non-rheumatic mitral regurgitation
	Aortic stenosis, non-rheumatic
	Acute on chronic right-sided congestive heart failure
	Chronic cor pulmonale
	Tetralogy of Fallot

	Acute ST segment elevation myocardial infarction involving left anterior descending coronary artery
	Hypertensive heart disease
	Ischemic myocardial dysfunction
	Intraventricular conduction defect
	Non-rheumatic mitral valve stenosis
	Sarcoid heart muscle disease
	Rheumatic heart disease
	Aortic valve stenosis
	Acute ST segment elevation myocardial infarction due to right coronary artery occlusion
	Congenital anomaly of coronary artery
	Ventricular tachyarrhythmia
	Coronary artery spasm
	Acute congestive heart failure
	Saddle embolus of pulmonary artery with acute cor pulmonale
	Heart failure with normal ejection fraction
	Multiple valve disease
	Cardiac transplant failure
	Heart block
	Ventricular septal defect
	Aortic valve stenosis with insufficiency
	Speech and language deficit as late effect of cerebrovascular accident
	Atrial fibrillation with rapid ventricular response
	Cardiovascular symptoms
	Disorders of both aortic and tricuspid valves
	Paroxysmal supraventricular tachycardia
	Arteriosclerosis of autologous vein coronary artery bypass graft
	Aortic valve regurgitation
	Restrictive cardiomyopathy
	Dilated cardiomyopathy secondary to peripartum heart disease
	Ataxia as sequela of cerebrovascular disease
	Dilated cardiomyopathy secondary to alcohol
	Acute right-sided heart failure
	Coronary thrombosis not resulting in myocardial infarction
	Pulmonary heart disease
	Dissection of coronary artery
	Premature beats
	Ventricular premature beats
	Discordant ventriculoarterial connection

	Mitral valve regurgitation
	Congestive heart failure due to left ventricular systolic dysfunction
	Symptomatic congestive heart failure
	Aneurysm of heart
	Cardiac tamponade
	Ebstein's anomaly
	Right heart failure secondary to left heart failure
	Aberrant premature complexes
	Accelerated atrioventricular conduction
	Paroxysmal tachycardia
	Myocarditis
	Chronic heart failure
	Disorder of transplanted heart
	Rheumatic mitral regurgitation
	Atrioventricular septal defect and common atrioventricular junction
	Rheumatic disease of tricuspid valve
	Disorder of coronary artery
	Hemiplegia of nondominant side as late effect of cerebrovascular disease
	Acute and subacute endocarditis
	Rheumatic mitral stenosis with regurgitation
	Chronic Chagas disease with heart involvement
	Postoperative cardiac complication
	Thrombosis of atrium, auricular appendage, and ventricle due to and following acute myocardial infarction
	Stable angina
	Acute heart failure
	Nonsustained ventricular tachycardia
	Cardiomyopathy due to viral infection
	Hemiplegia as late effect of cerebrovascular disease
	Tricuspid valve disorder, non-rheumatic
	Congenital stenosis of tricuspid valve
	Exacerbation of congestive heart failure
	Hypertensive heart AND chronic kidney disease with congestive heart failure
	Dextrocardia
	Cardiac arrest due to cardiac disorder
	Acute coronary syndrome
	Cardiovascular stress test abnormal
	Ostium secundum type atrial septal defect
	Common arterial trunk (truncus arteriosus)

	Left ventricular thrombus
	Pulmonary stenosis, non-rheumatic
	Mitral valve stenosis
	Chronic heart failure co-occurrent with normal ejection fraction
	Hemiplegia of dominant side as late effect of cerebrovascular disease
	Trifascicular block
	Decompensated cardiac failure
	Subsequent non-ST segment elevation myocardial infarction
	Rheumatic aortic stenosis
	Arteriosclerosis of autologous arterial coronary artery bypass graft
	Myocarditis due to infectious agent
	Cardiovascular sequelae of disorders
	Hemiparesis as late effect of cerebrovascular accident
	Left posterior fascicular block
	Aphasia as late effect of cerebrovascular accident
	Dysphasia as late effect of cerebrovascular disease
	Acute and subacute bacterial endocarditis
	Heart failure with reduced ejection fraction
	Recurrent coronary arteriosclerosis after percutaneous transluminal coronary angioplasty
	Monoplegia of nondominant upper limb as a late effect of cerebrovascular accident
	Double inlet ventricle
	Calcification of coronary artery
	Left ventricular hypertrophy
	Congenital stenosis of aortic valve
	Eisenmenger's syndrome
	Tricuspid valve disorder
	Endocarditis
	Postcardiotomy syndrome
	Left ventricular cardiac dysfunction
	Disorder of prosthetic cardiac valve
	Acute ST segment elevation myocardial infarction due to left coronary artery occlusion
	Congenital subaortic stenosis
	Hypertensive heart and renal disease with renal failure
	Benign hypertensive heart disease without congestive heart failure
	Acute on chronic heart failure co-occurrent with normal ejection fraction
	Heart valve disorder
	Ischemic heart disease

	Congenital anomaly of heart valve
	Bicuspid aortic valve
	Monoplegia of dominant upper limb as a late effect of cerebrovascular accident
	Non-rheumatic mitral valve prolapse
	Mobitz type II atrioventricular block
	Thallium stress test abnormal
	Pulmonary valve disorder
	Aneurysm of coronary vessels
	Atrial tachycardia
	Congenital stenosis of mitral valve
	Hemiplegia as late effect of cerebrovascular accident
	Monoplegia of dominant lower limb as a late effect of cerebrovascular accident
	Benign neoplasm of heart
	Prosthetic cardiac paravalvular leak
	Atresia of pulmonary valve
	Rapid atrial fibrillation
	Tricuspid valve regurgitation
	Cardiac sarcoidosis
	High output heart failure
	Atrial fibrillation and flutter
	Congenital anomaly of tricuspid valve
	Dysfunction of right cardiac ventricle
	Arteriosclerosis of coronary artery bypass graft of transplanted heart
	Mural thrombus of left ventricle
	Left ventricular systolic dysfunction
	Supraventricular premature beats
	Acute myocardial infarction of anterior wall
	Rheumatic endocarditis
	Mechanical complication of heart valve prosthesis
	Benign hypertensive heart AND renal disease
	Contusion to heart
	Injury of heart
	Hypertensive heart AND chronic kidney disease stage 5
	Junctional premature complex
	Monoplegia of nondominant lower limb as a late effect of cerebrovascular accident
	Tricuspid stenosis, non-rheumatic
	Acute rheumatic endocarditis

	Double outlet right ventricle
	Calcific coronary arteriosclerosis
	Thrombus of left atrium
	Chagas' disease with heart involvement
	Bundle branch block
	Cardiac insufficiency following cardiac surgery
	Paralytic syndrome as late effect of stroke
	Patent foramen ovale
	Left ventricular myocardial noncompaction cardiomyopathy
	Acute myocarditis
	Abnormality of fetal heart
	Abscess of aortic valve
	Arteriosclerosis of arterial coronary artery bypass graft
	Rheumatic disease of aortic valve
	Sinus bradycardia
	Premature atrial contraction
	Left bundle branch hemiblock
	Sudden cardiac death
	Decompensated chronic heart failure
	Congenital malposition of heart
	Aortic valve sclerosis
	Coronary graft stenosis
	Ostium primum defect
	Hypoplastic left heart syndrome
	Nutritional and metabolic cardiomyopathies
	Acute bacterial endocarditis
	Acquired cardiac septal defect
	Slow ventricular response
	Congenital atresia of pulmonary valve
	Acute myocardial infarction of inferior wall
	Atypical angina
	Benign hypertensive heart disease with congestive cardiac failure
	Sequela of cerebrovascular accident
	Injury of heart with hemopericardium
	Cleft leaflet of mitral valve
	Primary eosinophilic endomyocardial restrictive cardiomyopathy
	Candidal endocarditis
	Left ventricular diastolic dysfunction
	Subaortic stenosis

	Weakness as a late effect of stroke
	Tachycardia-bradycardia
	Angina co-occurrent and due to arteriosclerosis of coronary artery bypass graft
	Lipid-rich atherosclerosis of coronary artery
	Rheumatic aortic regurgitation
	Cardiac arrest during surgery
	Paroxysmal atrial flutter
	Atrial septal defect due to and following acute myocardial infarction
	Primary malignant neoplasm of heart
	Acute rejection of cardiac transplant
	Acute myocardial infarction of inferoposterior wall
	Heart transplant failure and rejection
	Ventricular flutter
	Subsequent ST segment elevation myocardial infarction
	Primary dilated cardiomyopathy
	Postpartum cardiomyopathy
	Discordant atrioventricular connection
	Hypertensive heart AND chronic kidney disease stage 3
	Congenital heart block
	Right bundle branch block AND left anterior fascicular block
	Exercise-induced angina
	Isolated (Fiedler's) myocarditis
	Endocardial fibroelastosis
	Congenital stenosis of pulmonary valve
	Malignant hypertensive heart disease without congestive heart failure
	Pre-existing hypertensive heart disease complicating pregnancy, childbirth and the puerperium
	Ventricular bigeminy
	Secondary nonischemic congestive cardiomyopathy
	Incomplete right bundle branch block
	Nonischemic congestive cardiomyopathy
	Endocarditis associated with another disorder
	Congenital insufficiency of mitral valve
	Wolff-Parkinson-White pattern
	Disorder of cardiac function
	Familial cardiomyopathy
	Hypertensive left ventricular hypertrophy
	Bilateral bundle branch block
	Left atrial enlargement

	Right cardiac ventricular dilatation
	Congenital septal defect of heart
	Atrial paroxysmal tachycardia
	Myocardial degeneration
	Hypertensive heart AND chronic kidney disease stage 4
	Cardiac complication of procedure
	Fetal heart disorder
	Monoplegia of lower limb as late effect of cerebrovascular disease
	Atrial arrhythmia
	Mitral stenosis with insufficiency
	Congenital cardiovascular disorder during pregnancy - baby not yet delivered
	Re-entry ventricular arrhythmia
	Pulmonic valve stenosis
	Post cardiac operation functional disturbance
	Viral myocarditis
	Torsades de pointes
	Malignant hypertensive heart AND renal disease
	Fetal dysrhythmia
	Rupture of chordae tendineae
	Mobitz type I incomplete atrioventricular block
	Coronary sinus abnormality
	Subsequent myocardial infarction of inferior wall
	Hypertrophic cardiomyopathy without obstruction
	Mechanical breakdown of prosthetic heart valve
	Atrial septal defect through coronary sinus orifice
	Senile cardiac amyloidosis
	Arteriosclerosis of nonautologous coronary artery bypass graft
	Ventricular arrhythmia
	Endocarditis due to systemic lupus erythematosus
	Acute myocardial infarction of inferolateral wall
	Mechanical complication due to heart valve prosthesis
	Sequelae of cardiovascular disorders
	Pre-existing hypertensive heart disease in mother complicating pregnancy
	Right ventricular hypertension
	Left ventricular outflow tract obstruction
	Wide QRS ventricular tachycardia
	Subsequent myocardial infarction of anterior wall
	Thrombus of cardiac chamber
	Carditis due to rheumatic fever

	Refractory heart failure
	Multi vessel coronary artery disease
	Congenital insufficiency of pulmonary valve
	Acute coronary artery occlusion not resulting in myocardial infarction
	Seizure disorder as sequela of stroke
	Mitral and aortic incompetence
	Subacute periendocarditis
	Angina, class I
	AV nodal re-entry tachycardia
	Congestive heart failure stage D
	Non-specific intraventricular conduction delay
	Disorder of right cardiac ventricle
	Sinus arrest
	AV-junctional (nodal) bradycardia
	Acute myocardial infarction of anterolateral wall
	AV junctional rhythm
	Post-infarction ventricular septal defect
	Benign hypertensive heart disease
	Primary hypertrophic cardiomyopathy
	Significant coronary bypass graft disease
	Nodular calcific aortic valve stenosis
	Fluency disorder as sequela of cerebrovascular disease
	Cor pulmonale
	Bacterial endocarditis
	Williams syndrome
	Vegetation of heart
	Post infarct angina
	Old inferior myocardial infarction
	Cardiac arrest as a complication of care
	Persistent sinus bradycardia
	Brugada syndrome
	Abnormality of left atrial appendage
	Myocardial ischemia
	Prinzmetal angina
	Abnormal vision as a late effect of cerebrovascular disease
	Heart-lung transplant failure and rejection
	Anomalous atrioventricular excitation
	Silent myocardial ischemia
	Primary endocardial fibroelastosis

	Visual disturbance as sequela of cerebrovascular disease
	Symptomatic sinus bradycardia
	Mitral valve vegetations
	Re-entrant atrioventricular node tachycardia
	Systolic heart failure stage B
	Cognitive deficit due to and following cerebrovascular disease
	Re-entrant atrioventricular tachycardia
	Papillary fibroelastoma of heart
	Papillary fibroelastoma
	Staphylococcal endocarditis
	Transthyretin related familial amyloid cardiomyopathy
	Pulmonic valve regurgitation
	Left ventricular aneurysm
	Myocardial bridge of coronary artery
	Rheumatic aortic stenosis with regurgitation
	Mural thrombus of left ventricle following acute myocardial infarction
	Persistent ostium secundum
	Atrial septal aneurysm
	Pre-existing hypertensive heart and chronic kidney disease in mother complicating childbirth
	Severe aortic valve stenosis
	Hemiparesis as late effect of cerebrovascular disease
	Post-phlebitic dermatosis of lower leg
	Rheumatic tricuspid valve stenosis
	Non-rheumatic pulmonary valve stenosis with regurgitation
	Acute rheumatic pericarditis
	Monoplegia of upper limb as late effect of cerebrovascular disease
	Congenital pulmonary valve abnormality
	Post-infarction mural thrombus
	Prosthetic valve endocarditis
	Cardiac volume overload
	Acute endocarditis
	Cardiac complication
	Severe sinus bradycardia
	Mitral insufficiency and aortic stenosis
	Coronary artery bypass graft occlusion
	Common ventricle
	Prosthetic cardiac valve displacement
	Idiopathic myocarditis

	Neonatal cardiac failure
	Congestive heart failure stage C
	Complete atrioventricular block as complication of atrioventricular nodal ablation
	Ectopic beats
	Sensory disorder as a late effect of cerebrovascular disease
	Hypertensive heart AND chronic kidney disease stage 2
	Ectopic atrial beats
	Spasticity as sequela of stroke
	Severe tricuspid valve regurgitation
	Non-rheumatic pulmonary valve disorder
	Myxoid transformation of mitral valve
	Neonatal tachycardia
	Rheumatic tricuspid stenosis and insufficiency
	Cardiac insufficiency during AND/OR resulting from a procedure
	Ataxia as sequela of cerebrovascular accident
	Right atrial dilatation
	Viral endocarditis
	Supraventricular arrhythmia
	Idiopathic hypertrophic subaortic stenosis
	Myxedema heart disease
	Angina decubitus
	Infundibular pulmonic stenosis
	Tachyarrhythmia
	Endocardial cushion defect
	Ventricular tachycardia with normal heart
	Eosinophilic myocarditis
	Masses on mitral apparatus
	Coronary artery fistula
	Valvular cardiomyopathy
	Acute Chagas' disease with heart involvement
	Prosthetic cardiac valve thrombosis
	Moderate aortic valve stenosis
	Acute heart failure co-occurrent with normal ejection fraction
	Atrioventricular dissociation
	Triple vessel disease of the heart
	Kyphoscoliotic heart disease
	Right hypoplastic heart syndrome
	Acute rheumatic heart disease

	Acute rheumatic myocarditis
	Coronary artery stent thrombosis
	Neonatal bradycardia
	Chronic right-sided congestive heart failure
	Ischemic congestive cardiomyopathy
	Pre-existing hypertensive heart and chronic kidney disease in mother complicating pregnancy
	Right atrial enlargement
	Mild aortic valve regurgitation
	Complete transposition of great vessels
	Arrhythmogenic right ventricular dysplasia
	Myocardial disease
	Progressive angina
	Typical angina
	Aortic valve calcification
	Congenital subaortic stenosis due to fibromuscular shelf
	Atrial hypertrophy
	Atrial thrombosis
	Cardiorenal syndrome
	Angina, class II
	Cardiac septal defects
	Injury of heart without open wound into thorax
	Heart disease in mother complicating pregnancy, childbirth AND/OR puerperium
	Right bundle branch block AND left posterior fascicular block
	Cor triatriatum
	Tachycardia-induced cardiomyopathy
	Disorder of cardiac ventricle
	Cardiac ventricular dilatation
	Cardiac disease in pregnancy
	Moderate left ventricular systolic dysfunction
	Controlled atrial fibrillation
	Prosthetic cardiac valve calcification
	Subacute endocarditis
	Moderate laceration of heart with hemopericardium
	Paralytic syndrome of nondominant side as late effect of stroke
	Holt-Oram syndrome
	Rheumatic myocarditis
	Unifocal PVCs
	Vertigo as sequela of cerebrovascular disease

	Coronary arteriosclerosis after percutaneous coronary angioplasty
	Acute right-sided congestive heart failure
	Thrombus of right atrium
	Myocardial dysfunction
	Primary idiopathic dilated cardiomyopathy
	Vertigo as late effect of stroke
	Paralytic syndrome of dominant side as late effect of stroke
	Atrial bigeminy
	Isomerism of atrial appendages
	Right ventricular diastolic dysfunction
	Severe mitral valve regurgitation
	Stokes-Adams syndrome
	Mitral valve prolapse syndrome
	Incomplete left bundle branch block
	Non-rheumatic tricuspid valve stenosis with insufficiency
	Common atrium
	Chronic bacterial endocarditis
	Severe mitral valve stenosis
	Moderate mitral valve regurgitation
	Hypertrophic cardiomegaly
	Acute myocardial infarction of inferior wall involving right ventricle
	Hyperkinetic heart disease
	Congenital cardiovascular disorders during pregnancy, childbirth and the puerperium
	Mitral and aortic stenosis
	Non-obstructive atherosclerosis of coronary artery
	Tuberculosis of heart
	Bulbus cordis and cardiac septal closure anomalies
	Prosthetic aortic valve regurgitation
	Sustained ventricular tachycardia
	Isolated diffuse granulomatous myocarditis
	New onset angina
	Cardiac arrest during AND/OR resulting from a procedure
	Hypertensive heart and renal disease with both (congestive) heart failure and renal failure
	Left main coronary artery disease
	Neurogenic bladder as late effect of cerebrovascular accident
	Atrial myxoma
	Acute ST segment elevation myocardial infarction due to occlusion of circumflex coronary artery

	Asystole
	Complete left bundle branch block
	Tricuspid valve vegetations
	D - transposition of the great vessels
	Congestive heart failure with right heart failure
	Mitral valve annular calcification
	Acute ST segment elevation myocardial infarction of inferior wall
	Acute left-sided congestive heart failure
	Myxoid transformation of cardiac valve
	Mild tricuspid valve regurgitation
	Myocarditis due to influenza virus
	Malignant hypertensive heart disease
	Atrial dilatation
	L - transposition of the great vessels
	Mixed myocardial ischemia and infarction
	Dysarthria due to and following cerebrovascular accident
	Bilateral enlargement of atria
	Ventricular tachycardia, polymorphic
	Acute myocarditis associated with another disorder
	Heart valve regurgitation
	Infection of cardiac graft
	Pre-existing hypertensive heart and renal disease complicating pregnancy, childbirth and the puerperium
	Coronary artery disease due to type 2 diabetes mellitus
	Low output heart failure
	Ventricular tachycardia, monomorphic
	Mild mitral valve regurgitation
	Syphilitic endocarditis
	Severe aortic valve regurgitation
	Right coronary artery occlusion
	Nonsustained paroxysmal ventricular tachycardia
	Laceration of heart
	Coronary arteriosclerosis following coronary artery bypass graft
	Nodal rhythm disorder
	Incomplete atrioventricular block with atrioventricular response
	Electromechanical dissociation
	Subacute bacterial endocarditis
	Diagnostic concept name

Heart Failure	
	Congestive heart failure
	Heart failure
	Chronic systolic heart failure
	Chronic diastolic heart failure
	Chronic congestive heart failure
	Hypertensive heart failure
	Hypertensive heart and renal disease with (congestive) heart failure
	Acute on chronic diastolic heart failure
	Acute on chronic systolic heart failure
	Chronic combined systolic and diastolic heart failure
	Diastolic heart failure
	Acute on chronic combined systolic and diastolic heart failure
	Systolic heart failure
	Acute systolic heart failure
	Acute diastolic heart failure
	Hypertensive heart disease without congestive heart failure
	Right ventricular failure
	Biventricular congestive heart failure
	Hypertensive heart disease with congestive heart failure
	Acute exacerbation of chronic congestive heart failure
	Left heart failure
	Acute combined systolic and diastolic heart failure
	Acute cor pulmonale
	Chronic right-sided heart failure
	Acute on chronic right-sided congestive heart failure
	Chronic cor pulmonale
	Acute congestive heart failure
	Saddle embolus of pulmonary artery with acute cor pulmonale
	Heart failure with normal ejection fraction
	Acute right-sided heart failure
	Congestive heart failure due to left ventricular systolic dysfunction
	Symptomatic congestive heart failure
	Right heart failure secondary to left heart failure
	Chronic heart failure
	Acute heart failure
	Exacerbation of congestive heart failure
	Hypertensive heart AND chronic kidney disease with congestive heart failure
	Chronic heart failure co-occurrent with normal ejection fraction

	Decompensated cardiac failure
	Heart failure with reduced ejection fraction
	Benign hypertensive heart disease without congestive heart failure
	Acute on chronic heart failure co-occurrent with normal ejection fraction
	High output heart failure
	Cardiac insufficiency following cardiac surgery
	Decompensated chronic heart failure
	Benign hypertensive heart disease with congestive cardiac failure
	Malignant hypertensive heart disease without congestive heart failure
	Refractory heart failure
	Congestive heart failure stage D
	Cor pulmonale
	Systolic heart failure stage B
	Congestive heart failure stage C
	Neonatal cardiac failure
	Cardiac insufficiency during AND/OR resulting from a procedure
	Chronic right-sided congestive heart failure
	Acute heart failure co-occurrent with normal ejection fraction
	Cardiorenal syndrome
	Acute right-sided congestive heart failure
	Hypertensive heart and renal disease with both (congestive) heart failure and renal failure
	Acute left-sided congestive heart failure
	Low output heart failure
	Congestive heart failure with right heart failure
	Diagnostic concept name
Sepsis	
	Sepsis caused by Staphylococcus without acute organ dysfunction Sepsis during labor, delivered Septic shock Postprocedural septic shock Intrauterine sepsis of fetus Sepsis caused by Acinetobacter baumannii Septic shock co-occurrent with acute organ dysfunction due to methicillin susceptible Staphylococcus aureus Sepsis Septic shock co-occurrent with acute organ dysfunction due to Haemophilus influenzae Amber flag sepsis

	Sepsis of newborn due to group B Streptococcus Sepsis due to ectopic pregnancy Sepsis due to Pseudomonas Meningococcemia Streptococcal toxic shock syndrome Septic shock co-occurrent with acute organ dysfunction due to Chromobacterium Late-onset neonatal sepsis Puerperal sepsis with postnatal complication Gonococcal arthritis dermatitis syndrome Sepsis due to disease caused by Severe acute respiratory syndrome coronavirus 2 Proteus septicemia Sepsis due to Streptococcus pyogenes Post-splenectomy sepsis Sepsis due to Staphylococcus Septic shock co-occurrent with acute organ dysfunction due to Streptococcus Septic shock co-occurrent with acute organ dysfunction due to Staphylococcus Gas gangrene septicemia Sepsis of newborn due to anaerobes Hyperdynamic septic shock Meningococcal meningitis with acute meningococcal septicemia Induced termination of pregnancy complicated by sepsis Septic shock co-occurrent with acute organ dysfunction due to Gonococcus Systemic inflammatory response syndrome Sepsis without septic shock Sepsis of fetus caused by Streptococcus pyogenes Septic shock co-occurrent with acute organ dysfunction due to coagulase-negative Staphylococcus Sepsis during labor with antenatal problem Sepsis without acute organ dysfunction caused by Streptococcus pneumoniae Coagulase negative staphylococcus bacteremia Sepsis without acute organ dysfunction Illegal termination of pregnancy with septic shock Sepsis of newborn due to Staphylococcus aureus Sepsis caused by Klebsiella pneumoniae Uncomplicated sepsis Brazilian purpuric fever Sepsis with cutaneous manifestations Septicemic pasteurellosis Endotoxic shock

	Sepsis caused by Peptostreptococcus Tracheostomy sepsis Puerperal pelvic sepsis Sepsis following infusion, injection, transfusion AND/OR vaccination Postoperative septic shock Postoperative endotoxic shock Sepsis due to Acinetobacter Toxic shock syndrome Sepsis associated with acquired immunodeficiency syndrome Sepsis due to Serratia Overwhelming infection in asplenic patient Sepsis of the newborn CLABSI - central line associated bloodstream infection Systemic inflammatory response syndrome of non-infectious origin without organ failure Induced termination of pregnancy complicated by septic shock Non-infectious systemic inflammatory response syndrome Sepsis associated with internal vascular access Sepsis due to Haemophilus influenzae type B Catheter related bloodstream infection Sepsis in asplenic subject Campylobacter bacteremia Neonatal sepsis due to Streptococcus Septic shock co-occurrent with acute organ dysfunction due to anaerobic bacteria Septicemia associated with vascular access catheter Sepsis following molar AND/OR ectopic pregnancy Sepsis due to Actinomyces Illegal termination of pregnancy with sepsis Dengue shock syndrome Sepsis without acute organ dysfunction caused by Serratia species Septicemia due to Erysipelothrix insidiosa Septicemic plague Neonatal sepsis caused by Malassezia Septicemic melioidosis Septic shock co-occurrent with acute organ dysfunction due to Pneumococcus Sepsis due to Streptococcus pneumoniae Infectious systemic inflammatory response syndrome with organ failure Septic shock co-occurrent with acute organ dysfunction due to Serratia Toxic shock syndrome due to methicillin resistant Staphylococcus aureus infection Bacterial sepsis

	Septic shock co-occurrent with acute organ dysfunction due to Pseudomonas Systemic inflammatory response syndrome without organ dysfunction Sepsis of neonate caused by Streptococcus pyogenes Pyemia Sepsis due to methicillin resistant Staphylococcus aureus Neonatal sepsis caused by Streptococcus Pyrogenic shock Bacteremia due to Salmonella Septic shock co-occurrent with acute organ dysfunction due to Group B streptococcus Systemic inflammatory response syndrome of non-infectious origin with organ failure Sepsis due to Escherichia coli Sepsis of newborn due to Streptococcus agalactiae Septicemic glanders Bacteremia associated with intravascular line Bacterial sepsis of newborn Failed attempted termination of pregnancy with septic shock Sepsis due to Streptococcus group D Perinatal sepsis caused by Streptococcus agalactiae Septicemia due to Bacteroides Gram positive sepsis Neutropenic sepsis Non-infectious systemic inflammatory response syndrome without acute organ failure Bacteremia caused by Gram-positive bacteria Sepsis due to Candida Sepsis due to incomplete miscarriage Legal termination of pregnancy with sepsis Perinatal sepsis Biliary sepsis Sepsis due to Gram negative bacteria Legal termination of pregnancy with septic shock Infectious systemic inflammatory response syndrome without organ failure Line sepsis associated with dialysis catheter Septic shock co-occurrent with acute organ dysfunction due to methicillin resistant Staphylococcus aureus Neonatal sepsis caused by Staphylococcus Miscarriage with sepsis Septic shock following molar AND/OR ectopic pregnancy Sepsis during labor Septic shock co-occurrent with acute organ dysfunction due to Group A streptococcus Sepsis due to Streptococcus

	Severe sepsis Failed attempted termination of pregnancy with sepsis Red flag sepsis Recurrent salmonella sepsis co-occurrent with human immunodeficiency virus infection Early-onset neonatal sepsis Neonatal sepsis due to Staphylococcus Gonococcemia Meningococcal meningitis with meningococcal septicemia Toxic shock syndrome due to methicillin susceptible Staphylococcus aureus Sepsis due to urinary tract infection Sepsis following obstructed labor Infection of hemodialysis tunneled catheter Septic shock co-occurrent with acute organ dysfunction due to Meningococcus Sepsis due to Streptococcus agalactiae Acute tubulointerstitial nephritis associated with systemic infection Septicemia due to Chromobacterium Sepsis due to methicillin-sensitive Staphylococcus aureus Sepsis due to Erysipelothrix Sepsis due to Haemophilus influenzae Sepsis due to oral infection Sepsis due to Staphylococcus aureus Acute meningococcemia Septic shock co-occurrent with acute organ dysfunction due to Gram-positive coccus Sepsis due to Streptococcus suis Staphylococcal toxic shock syndrome Sepsis due to Enterobacter Sepsis due to Salmonella Sepsis due to Listeria monocytogenes Bacteremia due to Staphylococcus aureus Sepsis caused by anaerobic streptococcus Perinatal sepsis caused by Escherichia coli Sepsis of newborn due to Escherichia coli Septic shock due to transfusion Sepsis due to fungus Bacteremia Pseudomonas septicemia with skin involvement Sepsis due to anaerobic bacteria Puerperal sepsis Coliform septicemia Vancomycin resistant enterococcal septicemia

	Postoperative sepsis Sepsis due to coagulase negative Staphylococcus Recurrent salmonella septicemia Bacteremia due to Methicillin resistant Staphylococcus aureus Septicemia due to enterococcus Hypodynamic septic shock Bacteremia caused by Gram-negative bacteria Septic shock co-occurrent with acute organ dysfunction due to Enterococcus Sepsis due to Bacillus anthracis Transient respiratory distress with sepsis Systemic inflammatory response syndrome associated with organ dysfunction Sepsis due to herpes simplex Sepsis caused by virus Sepsis caused by Pseudomonas aeruginosa
	Diagnostic concept name
Kidney failure	
	End-stage renal disease
	End stage renal failure on dialysis
	End stage renal disease due to hypertension
	Chronic kidney disease stage 5 on dialysis
	Anemia in end stage renal disease
	Malignant hypertensive end stage renal disease
	End stage renal failure with renal transplant
	Hypertension concurrent and due to end stage renal disease on dialysis
	End stage renal disease on dialysis due to type 2 diabetes mellitus
	Hypertensive end stage renal disease
	Hypertension concurrent and due to end stage renal disease on dialysis due to type 2 diabetes mellitus
	Malignant hypertensive end stage renal disease on dialysis
	End stage renal disease on dialysis due to type 1 diabetes mellitus
	End stage renal disease due to benign hypertension
	Procedure concept name
Invasive Mechanical Ventilation	
	Ventilation assist and management, initiation of pressure or volume preset ventilators for assisted or controlled breathing; hospital inpatient/observation, each subsequent day

	Intubation, endotracheal, emergency procedure
	Respiratory Ventilation, Greater than 96 Consecutive Hours
	Ventilation assist and management, initiation of pressure or volume preset ventilators for assisted or controlled breathing; hospital inpatient/observation, initial day
	Dependence on respirator
	Respiratory Ventilation, 24-96 Consecutive Hours
	Artificial respiration
	Respiratory Ventilation, Less than 24 Consecutive Hours
	Ventilator finding
	Assistance with Respiratory Ventilation, Less than 24 Consecutive Hours
	Provision of mechanical ventilator
	Assistance with Respiratory Ventilation, 24-96 Consecutive Hours
	Assistance with Respiratory Ventilation, Greater than 96 Consecutive Hours
	Dependence on ventilator
	Complication of ventilation therapy
	Endotracheal tube present
	Procedure concept name
Kidney Replacement Therapy (KRT)	
	Hemodialysis procedure with single evaluation by a physician or other qualified health care professional
	Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies), with single evaluation by a physician or other qualified health care professional
	Unlisted dialysis procedure, inpatient or outpatient
	Dialysis procedure other than hemodialysis (eg, peritoneal dialysis, hemofiltration, or other continuous renal replacement therapies) requiring repeated evaluations by a physician or other qualified health care professional, with or without substantial revision of dialysis prescription
	Hemodialysis procedure requiring repeated evaluation(s) with or without substantial revision of dialysis prescription
	Unscheduled or emergency dialysis treatment for an esrd patient in a hospital outpatient department that is not certified as an esrd facility
	Hemodialysis
	Dialysis procedure
	Continuous venovenous hemodiafiltration
	Automated peritoneal dialysis
	Peritoneal dialysis catheter maintenance
	Dialysis procedure at a medicare certified esrd facility for acute kidney injury without esrd

	Ultrafiltration
	Peritoneal dialysis
	Hemodialysis, maintenance at home
	Hemodialysis access flow study to determine blood flow in grafts and arteriovenous fistulae by an indicator method
	Renal dialysis
	Continuous cycling peritoneal dialysis
	Continuous ambulatory peritoneal dialysis
	Drug concept name
Vasopressors	
	phenylephrine
	norepinephrine
	epinephrine
	milrinone
	vasopressin (USP)
	dobutamine
	dopamine
Dexamethasone	Dexamethasone
Remdesivir	Remdesivir
Tocilizumab	Tocilizumab

Name of Diagnosis in the AKI concept set	Source	ICD code
Hemorrhagic fever with renal syndrome	ICD10CM	A98.5
Acute nephritic syndrome with focal and segmental glomerular lesions	ICD10CM	N00.1
Acute nephritic syndrome with diffuse mesangiocapillary glomerulonephritis	ICD10CM	N00.5
Rapidly progressive nephritic syndrome with dense deposit disease	ICD10CM	N01.6
Acute kidney failure with acute cortical necrosis	ICD10CM	N17.1
Other acute kidney failure	ICD10CM	N17.8
Acute pyelonephritis with lesion of renal medullary necrosis	ICD9CM	590.11
Hemorrhagic nephrosonephritis	ICD9CM	78.6
Hemolytic-uremic syndrome	ICD9CM	283.11
Acute kidney failure with lesion of tubular necrosis	ICD9CM	584.5

Acute kidney failure with lesion of tubular necrosis	ICD9CM	584.5
Acute kidney failure with lesion of renal cortical necrosis	ICD9CM	584.6
Acute nephritic syndrome, Minor glomerular abnormality	ICD10	N00.0
Rapidly progressive nephritic syndrome, dense deposit disease	ICD10	N01.6
Haemolytic-uraemic syndrome	ICD10	D59.3
Acute tubulo-interstitial nephritis	ICD10	N10
Postpartum acute renal failure	ICD10	O90.4
Acute nephritic syndrome, Diffuse endocapillary proliferative glomerulonephritis	ICD10	N00.4
Acute nephritic syndrome, Unspecified	ICD10	N00.9
Acute renal failure with acute cortical necrosis	ICD10	N17.1
Rapidly progressive nephritic syndrome, minor glomerular abnormality	ICD10	N01.0
Acute nephritic syndrome, Diffuse mesangiocapillary glomerulonephritis	ICD10	N00.5
Rapidly progressive nephritic syndrome, other	ICD10	N01.8
Rapidly progressive nephritic syndrome	ICD10	N01
Rapidly progressive nephritic syndrome, diffuse mesangial proliferative glomerulonephritis	ICD10	N01.3
Rapidly progressive nephritic syndrome with C3 glomerulonephritis	ICD10CM	N01.A
Acute nephritic syndrome	ICD10CM	N00
Rapidly progressive nephritic syndrome	ICD10CM	N01
Acute nephritic syndrome with diffuse mesangial proliferative glomerulonephritis	ICD10CM	N00.3
Acute nephritic syndrome with diffuse endocapillary proliferative glomerulonephritis	ICD10CM	N00.4
Acute nephritic syndrome with dense deposit disease	ICD10CM	N00.6
Acute nephritic syndrome with other morphologic changes	ICD10CM	N00.8
Rapidly progressive nephritic syndrome with diffuse crescentic glomerulonephritis	ICD10CM	N01.7
Rapidly progressive nephritic syndrome with other morphologic changes	ICD10CM	N01.8
Acute kidney failure with other specified pathological lesion in kidney	ICD9CM	584.8
Acute glomerulonephritis with lesion of rapidly progressive glomerulonephritis	ICD9CM	580.4
Haemorrhagic fever with renal syndrome	ICD10	A98.5
Acute nephritic syndrome	ICD10	N00

Rapidly progressive nephritic syndrome, diffuse crescentic glomerulonephritis	ICD10	N01.7
Acute nephritic syndrome, Other	ICD10	N00.8
Acute nephritic syndrome, Dense deposit disease	ICD10	N00.6
Rapidly progressive nephritic syndrome, diffuse membranous glomerulonephritis	ICD10	N01.2
Acute renal failure	ICD10	N17
Acute kidney failure	ICD10CM	N17
Hemolytic-uremic syndrome	ICD10CM	D59.3
Hepatorenal syndrome	ICD10CM	K76.7
Rapidly progressive nephritic syndrome with minor glomerular abnormality	ICD10CM	N01.0
Rapidly progressive nephritic syndrome with focal and segmental glomerular lesions	ICD10CM	N01.1
Acute kidney failure with tubular necrosis	ICD10CM	N17.0
Acute kidney failure, unspecified	ICD10CM	N17.9
Acute kidney failure, unspecified	ICD9CM	584.9
Hepatorenal syndrome	ICD10	K76.7
Acute renal failure with tubular necrosis	ICD10	N17.0
Acute renal failure, unspecified	ICD10	N17.9
Rapidly progressive nephritic syndrome, diffuse mesangiocapillary glomerulonephritis	ICD10	N01.5
Rapidly progressive nephritic syndrome, diffuse endocapillary proliferative glomerulonephritis	ICD10	N01.4
Acute nephritic syndrome, Diffuse membranous glomerulonephritis	ICD10	N00.2
Acute nephritic syndrome with C3 glomerulonephritis	ICD10CM	N00.A
Acute nephritic syndrome with minor glomerular abnormality	ICD10CM	N00.0
Acute nephritic syndrome with diffuse membranous glomerulonephritis	ICD10CM	N00.2
Acute nephritic syndrome with unspecified morphologic changes	ICD10CM	N00.9
Rapidly progressive nephritic syndrome with diffuse membranous glomerulonephritis	ICD10CM	N01.2
Rapidly progressive nephritic syndrome with diffuse mesangial proliferative glomerulonephritis	ICD10CM	N01.3
Rapidly progressive nephritic syndrome with diffuse endocapillary proliferative glomerulonephritis	ICD10CM	N01.4

Rapidly progressive nephritic syndrome with diffuse mesangiocapillary glomerulonephritis	ICD10CM	N01.5
Rapidly progressive nephritic syndrome with unspecified morphologic changes	ICD10CM	N01.9
Postpartum acute kidney failure	ICD10CM	O90.4
Acute kidney failure following labor and delivery	ICD9CM	669.3
Hepatorenal syndrome	ICD9CM	572.4
Acute kidney failure following labor and delivery, unspecified as to episode of care or not applicable	ICD9CM	669.3
Chronic glomerulonephritis with lesion of rapidly progressive glomerulonephritis	ICD9CM	582.4
Acute kidney failure	ICD9CM	584
Acute nephritic syndrome, Diffuse mesangial proliferative glomerulonephritis	ICD10	N00.3
Other acute renal failure	ICD10	N17.8
Postprocedural hepatorenal syndrome	ICD10CM	K91.83
Rapidly progressive nephritic syndrome, focal and segmental glomerular lesions	ICD10	N01.1
Rapidly progressive nephritic syndrome, unspecified	ICD10	N01.9
Acute nephritic syndrome, Focal and segmental glomerular lesions	ICD10	N00.1

Supplemental Table 2. Descriptive characteristics of hospitalized COVID positive patients with and without AKI by the two AKI definitions.

	AKI both criteria (N=51388)	**AKI – Code-based only (N=21466)**	**AKI – serum creatinine - based only (N=56322)**	**No AKI (by either criterion) (N=207297)**	**P-values**
Demographics					
Age, Mean (SD)	**66.0 (15.6)**	68.4 (16.0)	63.0 (17.4)	58.5 (19.9)	< 0.0001
sex **(N, %)**					
Female	21000 (41)	8455 (39)	27122 (48)	107657 (52)	< 0.0001
Male	30381 (59)	13009 (61)	29191 (52)	99611 (48)	
Race (N, %)					
White	29456 (57)	13194 (61)	35114 (62)	135015 (65)	< 0.0001
Black	13278 (26)	5486 (26)	9872 (18)	35125 (17)	
Asian	1381 (3)	402 (2)	1311 (2)	4524 (2)	
Others	902 (2)	317 (1)	1580 (3)	4855 (2)	

No Information	6371 (12)	2067 (10)	8445 (15)	27778 (13)	
Ethnicity (N, %)					
Not Hispanic or Latino	40692 (79)	17644 (82)	43594 (77)	161836 (78)	< 0.0001
Hispanic or Latino	5596 (11)	1684 (8)	8673 (15)	28981 (14)	
No Information	5100 (10)	2138 (10)	4055 (7)	16480 (8)	
Co-morbid conditions (N, %)					
History available	37491 (73)	17492 (81)	40009 (71)	166304 (80)	< 0.0001
Among those with histories available					
Cardiovascular disease	*19870 (53)*	9891 (57)	14499 (36)	57666 (35)	< 0.0001
Diabetes mellitus	16222 (43)	7383 (42)	11857 (30)	41896 (25)	< 0.0001
Heart failure	9619 (26)	4829 (28)	5988 (15)	20557 (12)	< 0.0001
Hypertension	25648 (68)	12549 (72)	18604 (46)	75889 (46)	< 0.0001
BMI, Mean (SD)	31.0 (8.8)	30.4 (8.3)	30.3 (8.6)	31.0 (8.6)	
Severity of illness (N, %)					
Sepsis	24333 (47)	4666 (22)	10726 (19)	19765 (10)	<0.0001
Invasive Mechanical Ventilation	18527 (36)	1290 (6)	8935 (16)	4180 (2)	<0.0001
Length of hospital stay, Mean, days (IQRs)	17.1 (18.9)	7.6 (8.1)	14.4 (15.2)	6.1 (7.0)	
vasopressors	18136 (35)	1706 (8)	10855 (19)	12427 (6)	< 0.0001
Medications (N, %)					
Dexamethasone	26496 (52)	9186 (43)	23157 (41)	75226 (36)	< 0.0001
Remdesivir	15314 (30)	5660 (26)	12491 (22)	41415 (20)	< 0.0001
Tocilizumab	2449 (5)	283 (1)	1645 (3)	1963 (1)	< 0.0001
Death (N, %)	18776 (37)	3832 (18)	11721 (21)	13901 (7)	< 0.0001

Abbreviations:
BMI (Body Mass Index, kg/m^2)

Supplemental Table 3. Descriptive characteristics of each region

Variables	**Midwest (N=183275)**	**South (N=62249)**	**Northeast (N=61728)**	**West (N=29221)**	**P-values**

Demographics					
Age, Mean (SD)	61.2 (19.7)	59.8 (17.9)	63.0 (17.9)	58.6 (18.1)	< 0.0001
Sex (N, %)					
Female	89903 (49)	30919 (50)	29765 (48)	13647 (47)	< 0.0001
Male	93361 (51)	31317 (50)	31957 (52)	15557 (53)	
Race (N, %)					
White	130102 (71)	39267 (63)	26168 (42)	17242 (59)	< 0.0001
Black	34591 (19)	15864 (25)	10259 (17)	3047 (10)	
Asian	3145 (2)	602 (1)	2564 (4)	1307 (4)	
Others	5118 (3)	649 (1)	220 (<1)	1667 (6)	
No Information	10319 (6)	5867 (9)	22517 (36)	5958 (20)	
Ethnicity (N, %)					
Not Hispanic or Latino	153317 (84)	51374 (83)	38743 (63)	20332 (70)	< 0.0001
Hispanic or Latino	18427 (10)	3576 (6)	15010 (24)	7921 (27)	
No Information	11531 (6)	7299 (12)	7975 (13)	968 (3)	
Co-morbid conditions (N, %)					
History available	145990 (80)	49140 (79)	44751 (72)	21415 (73)	< 0.0001
Among those with histories available					
cardiovascular disease	*51272 (35)*	23412 (48)	18711 (42)	8531 (40)	< 0.0001
diabetes mellitus	40463 (28)	17345 (35)	13070 (29)	6480 (30)	< 0.0001
heart failure	21458 (15)	9482 (19)	6784 (15)	3269 (15)	< 0.0001
hypertension	69496 (48)	29760 (61)	22287 (50)	11147 (52)	< 0.0001
Severity of illness (N, %)					
Sepsis	24432 (13)	15936 (26)	11600 (19)	7522 (26)	<0.0001
Invasive Mechanical Ventilation	12839 (7)	8615 (14)	6746 (11)	4732 (16)	<0.0001
vasopressors	16863 (9)	8543 (14)	10129 (16)	7589 (26)	< 0.0001
Medications (N, %)					

Dexamethasone	64297 (35)	30453 (49)	21323 (35)	17992 (62)	< 0.0001
Remdesivir	36982 (20)	21268 (34)	7009 (11)	9621 (33)	< 0.0001
Tocilizumab	2539 (1)	1772 (3)	931 (2)	1098 (4)	< 0.0001
AKI (N, %)	64831 (35)	27077 (43)	25140 (41)	12128 (42)	< 0.0001
Death (N, %)	23313 (13)	10710 (17)	9544 (15)	4663 (16)	< 0.0001

Abbreviations:
BMI (Body Mass Index, kg/m²), AKI (Acute Kidney Injury).

Supplemental Table 4. Descriptive characteristics of each time period

Variables	**P1 (N=48947)**	**P2 (N=32513)**	**P3 (N=107744)**	**P4 (N=41236)**	**P5 (N=41845)**	**P6 (N=64188)**	**P-values**
Demographics							
Age, Mean (SD)	**61.9 (17.7)**	60.2 (18.4)	64.4 (18.5)	59.0 (20.4)	57.0 (18.1)	59.1 (19.7)	< 0.0001
sex **(N, %)**							
Female	22654 (46)	16117 (50)	52027 (48)	20767 (50)	20859 (50)	31810 (50)	< 0.0001
Male	26284 (54)	16392 (50)	55705 (52)	20463 (50)	20981 (50)	32367 (50)	
Race (N, %)							
White	21060 (43)	18973 (58)	71931 (67)	24684 (60)	29119 (70)	47012 (73)	< 0.0001
Black	12532 (26)	7142 (22)	17388 (16)	8767 (21)	7764 (19)	10168 (16)	
Asian	1746 (4)	695 (2)	2904 (3)	1124 (3)	510 (1)	639 (1)	
Others	1117 (2)	1130 (3)	2496 (2)	809 (2)	847 (2)	1255 (2)	
No Information	12492 (26)	4573 (14)	13025 (12)	5852 (14)	3605 (9)	5114 (8)	
Ethnicity (N, %)							
Not Hispanic or Latino	32115 (66)	24771 (76)	86728 (80)	32030 (78)	34869 (83)	53253 (83)	< 0.0001
Hispanic or Latino	12639 (26)	5301 (16)	13759 (13)	5432 (13)	3456 (8)	4347 (7)	
No Information	4193 (9)	2441 (8)	7257 (7)	3774 (9)	3520 (8)	6588 (10)	
Co-morbid conditions (N, %)							
History available	33157 (68)	25171 (77)	85383 (79)	32164 (78)	32829 (78)	52592 (82)	< 0.0001
Among those with histories available							

cardiovascular disease	*12204 (37)*	9483 (38)	36070 (42)	12019 (37)	11427 (35)	20723 (39)	< 0.0001
diabetes mellitus	10148 (31)	7538 (30)	27045 (32)	9059 (28)	8681 (26)	14887 (28)	< 0.0001
heart failure	4938 (15)	3770 (15)	14771 (17)	4713 (15)	4426 (13)	8375 (16)	< 0.0001
hypertension	16482 (50)	12499 (50)	46400 (54)	15859 (49)	15191 (46)	26259 (50)	< 0.0001
Severity of illness (N, %)							
Sepsis	12457 (25)	6089 (19)	17498 (16)	6781 (16)	7193 (17)	9472 (15)	< 0.0001
Invasive Mechanical Ventilation	7624 (16)	2943 (9)	8541 (8)	3489 (8)	4215 (10)	6120 (10)	< 0.0001
vasopressors	8493 (17)	4215 (13)	11726 (11)	5461 (13)	5492 (13)	7737 (12)	< 0.0001
Medications (N, %)							
Dexamethasone	2888 (6)	12897 (40)	52041 (48)	19744 (48)	19596 (47)	26899 (42)	< 0.0001
Remdesivir	1200 (2)	4785 (15)	28038 (26)	10205 (25)	12867 (31)	17785 (28)	< 0.0001
Tocilizumab	**1136 (2)**	220 (1)	342 (<1)	1403 (3)	1662 (4)	1577 (2)	< 0.0001
AKI (N, %)	23097 (47)	12102 (37)	40583 (38)	14430 (35)	15103 (36)	23861 (37)	<0.0001
Death (N, %)	9666 (20)	4457 (14)	17210 (16)	4485 (11)	4961 (12)	7451 (12)	<0.0001

Abbreviations:

BMI (Body Mass Index, kg/m^2), AKI (Acute Kidney injury).

Supplemental Table 5. Descriptive characteristics of each racial group.

Variables	**White** (N=212779)	**Black** (N=63761)	**Asian** (N=7618)	**Others** (N=7654)	**P-values**

Demographics					
Age, Mean (SD)	**63.4 (19.1)**	56.9 (17.9)	61.0(18.0)	54.6 (18.0)	< 0.0001
sex **(N, %)**					
Female	101160 (48)	35189 (55)	3520 (46)	3443 (45)	< 0.0001
Male	111602 (52)	28566 (45)	4096 (54)	4205 (55)	
Ethnicity (N, %)					
Not Hispanic or Latino	182587 (86)	58763 (92)	6911 (91)	2735 (36)	< 0.0001
Hispanic or Latino	15078 (7)	980 (2)	95 (1)	3474 (45)	
No Information	15114 (7)	4018 (6)	612 (8)	1445 (19)	
Co-morbid conditions (N, %)					
History available	171924 (81)	50124 (79)	4807 (63)	4817 (63)	< 0.0001
Among those with histories available					
cardiovascular disease	*70864 (41)*	19199 (38)	1587 (33)	1252 (26)	< 0.0001
diabetes mellitus	47605 (28)	17760 (35)	1542 (32)	1352 (28)	< 0.0001
heart failure	27814 (16)	9069 (18)	483 (10)	450 (9)	< 0.0001
hypertension	87415 (51)	28626 (57)	2305 (48)	1724 (36)	< 0.0001
BMI, Mean (SD)	30.7 (8.4)	32.4 (10.0)	26.3 (5.8)	31.2 (7.8)	< 0.0001
Severity of illness (N, %)					
Sepsis	35976 (17)	11679 (18)	1986 (26)	1263 (17)	< 0.0001
Invasive Mechanical Ventilation	18942 (9)	6262 (10)	1102 (14)	732 (10)	<0.0001
vasopressors	25649 (12)	7747 (12)	1362 (18)	1023 (13)	<0.0001
Medications (N, %)					
Dexamethasone	88119 (41)	23257 (36)	3873 (51)	2294 (30)	<0.0001
Remdesivir	51485 (24)	12724 (20)	1760 (23)	1296 (17)	<0.0001

Tocilizumab	4117 (2)	998 (2)	172 (2)	92 (1)	<0.0001
AKI (N, %)	**77764 (37)**	28636 (45)	3094 (41)	2799 (37)	<0.0001
Death (N, %)	32876 (15)	7468 (12)	1147 (15)	756 (10)	< 0.0001

Abbreviations:
BMI (Body Mass Index, kg/m²), AKI (Acute Kidney Injury).

Supplemental Table 6: Descriptive characteristics of deceased and survived AKI patients.

Variables	**Total (N=129,176)**	**AKI deceased (N= 34,329)**	**AKI not deceased (N= 94,847)**	**P-value**
Demographics				
Age, Mean (SD)	65.1 (16.6)	71.0 (14.5)	63.0 (16.8)	p < 0.0001
Sex (N, %)				
Female	56,577 (44.0)	13,996 (41)	42,581 (45)	
Male	72,581 (56)	20,333 (59)	52,248 (55)	p < 0.0001
Race (N, %)				
White	77,764 (60)	22,219 (65)	55,545 (59)	
Black	28,636 (22)	6,022 (18)	22,614 (24)	
Asian	3,094 (2)	899 (3)	2,195 (2)	
Others	2,799 (2)	576 (2)	2,223 (2)	p < 0.0001
No Information	16,883 (13)	4,613 (13)	12,270 (13)	
Ethnicity (N, %)				
Not Hispanic or Latino	101,930 (79)	27,270 (79)	74,660 (79)	
Hispanic or Latino	15,953 (12)	3,931 (11)	12,022 (13)	p < 0.0001
No Information	11,293 (9)	3,128 (9)	8,165 (9)	

Co-morbid conditions (N, %)				
History available	94,992 (74)	25,345 (74)	25,345 (74)	p = 0.1532
Among those with histories available				
Cardiovascular disease	44,260 (47)	13,926 (55)	30,334 (44)	p < 0.0001
Diabetes Mellitus	35,462 (37)	9,657 (38)	25,805 (37)	p = 0.0031
Heart Failure	20,436 (22)	6,970 (28)	13,466 (19)	p < 0.0001
Hypertension	56,801 (60)	16,165 (64)	40,636 (58)	p < 0.0001
BMI, Mean (SD)	30.6 (8.7)	30.1 (8.5)	30.9 (8.7)	p = 1.0000
Severity of illness (N, %)				
Sepsis	39,725 (31)	16,456 (48)	23,269 (25)	p < 0.0001
Invasive Mechanical Ventilation	28,752 (22)	15,626 (46)	13,126 (14)	p < 0.0001
Length of hospital stay, Mean, days (IQRs)	14.35 (12.0)	15.69 (13.0)	13.86 (11.0)	p < 0.0001
Medications (N, %)				
vasopressors	30,697 (24.0)	15,349 (45)	15,348 (16)	p < 0.0001
Regions (N, %)				
West	12,128 (9)	3,359 (10)	8,769 (9)	
Midwest	64,831 (50)	15,791 (46)	49,040 (52)	
South	27,077 (21)	8,085 (24)	18,992 (20)	
Northeast	25,140 (19)	7,094 (21)	18,046 (19)	p < 0.0001

Time periods (N, %)				
P1	23,097 (18)	7,339 (21)	15,758 (17)	
P2	12,102 (9)	3,034 (9)	9,068 (10)	
P3	40,583 (31)	11,580 (34)	29,003 (31)	
P4	14,430 (11)	3,155 (9)	11,275 (12)	
P5	15,103 (12)	3,673 (11)	11,430 (12)	
P6	23,861 (18)	5,548 (16)	18,313 (19)	$p < 0.0001$

Abbreviations: BMI (Body Mass Index, kg/m²), IQR (Inter-quartile range), SD (standard deviation), P1-6: time period.

Supplemental Table 7. Association between acute kidney injury and mortality, adjusted for the severity of AKI, any code-based AKI, age, sex, race, ethnicity, severity markers, and timing of initial COVID infection: raw count and percentage of deaths, unadjusted and adjusted hazard ratios

Characteristic	**Deceased patients (N, %)**	**Hazard Ratio (95% CI)**	
		Unadjusted	**Adjusted**
Severity of AKI			
Not AKI by Serum creatinine	17,693 (8)	Reference	
AKI 1	11,836 (20)	2.64 (2.58 to 2.70)***	1.93 (1.88 to 1.98)***
AKI 2	7,557 (31)	4.40 (4.29 to 4.52)***	2.26 (2.19 to 2.33)***
AKI 3 without KRT	8,510 (47)	6.95 (6.77 to 7.13)***	2.65 (2.57 to 2.75)***
AKI 3 with KRT	2,497 (65)	9.64 (9.24 to 10.04)***	2.58 (2.45 to 2.71)***
Any Code-based AKI	22,524 (65)	3.49 (3.42 to 3.55)***	1.51 (1.47 to 1.54)***
Age – decade level[a]	48,093 (14)	1.03 (1.03 to 1.03)***	1.04 (1.04 to 1.04)***
Sex			
Female	20,631 (13)	Reference	

Male	27,462 (16)	1.35 (1.33 to 1.37)***	1.08 (1.06 to 1.10)***
Race			
White	32,774 (16)	Reference	
Asian	1,146 (15)	1.03 (0.97 to 1.10)	0.77 (0.73 to 0.82)***
Black	7,450 (12)	0.74 (0.72 to 0.76)***	0.67 (0.65 to 0.69)***
Other races	754 (10)	0.66 (0.61 to 0.70)***	0.72 (0.67 to 0.78)***
No race info	5,969 (13)	0.88 (0.85 to 0.90)***	0.94 (0.91 to 0.97)***
Ethnicity			
Not Hispanic	38,907 (15)	Reference	
Hispanic	4,968 (11)	0.75 (0.72 to 0.77)***	0.66 (0.64 to 0.69)***
Others / No ethnicity info	4,218 (15)	1.10 (1.06 to 1.13)***	0.94 (0.91 to 0.98)***
Severity markers			
Invasive mechanical ventilator	16,808 (52)	5.82 (5.71 to 5.93)***	2.13 (2.07 to 2.20)***
Vasopressor on the visit	16,913 (39)	3.91 (3.84 to 3.99)***	1.40 (1.36 to 1.43)***
Sepsis on the visit	18,819 (32)	3.19 (3.13 to 3.25)***	1.33 (1.30 to 1.36) ***
Time periods			
P1	9,663 (20)	Reference	
P2	4,446 (14)	0.65 (0.62 to 0.67)***	0.82 (0.79 to 0.85)***
P3	17,164 (16)	0.82 (0.79 to 0.84)***	1.03 (1.00 to 1.06)*
P4	4,468 (11)	0.59 (0.57 to 0.61)***	0.74 (0.71 to 0.76)***
P5	4,946 (12)	0.76 (0.73 to 0.79)***	0.88 (0.85 to 0.92)***
P6	7,406 (12)	1.11 (1.08 to 1.15)***	1.24 (1.20 to 1.28)***
CI = Confidence Interval, [a]Age was expressed in 10-year increments to better show the odds ratio, analysis excluded one site with a COVID inpatient mortality rate of less than 1%, p-value: < 0.05; *, < 0.01; **, < 0.001; ***.			

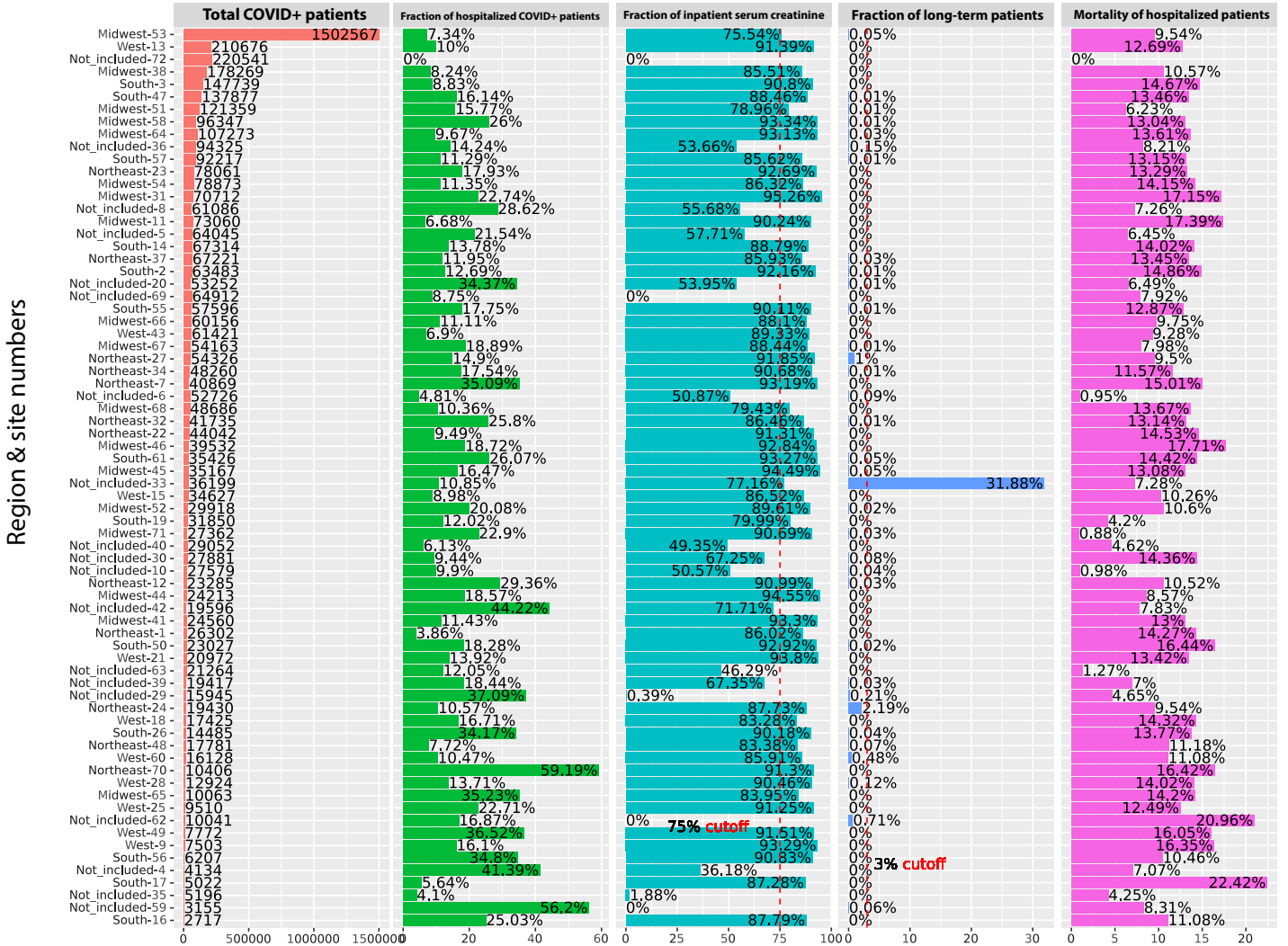
Abbreviations:

N = number of patients, % = percent of patients, P1-6 = time periods 1-6

Supplemental Figures

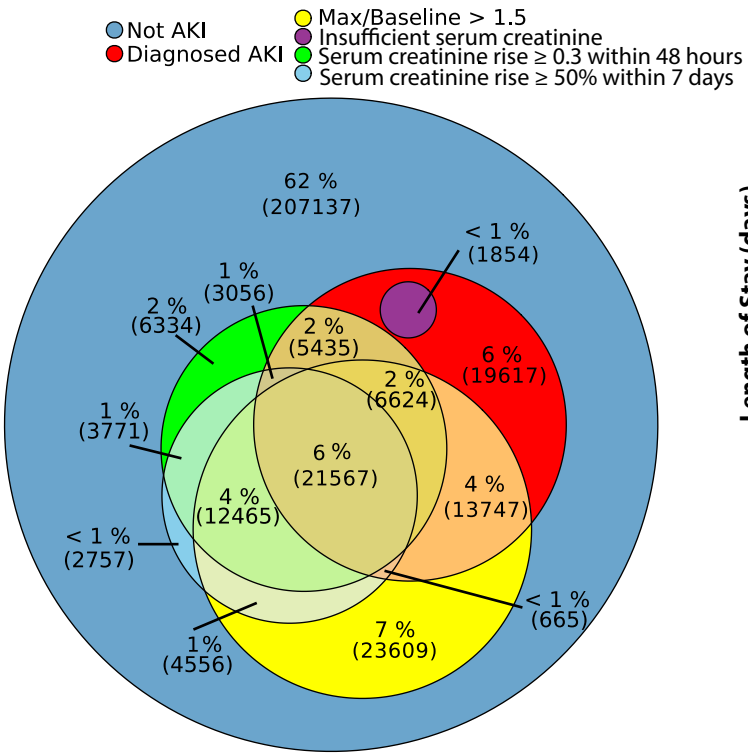
Supplemental Figure 1: A bar chart visualizing site-level filtering visualizes the characteristics of each data partner and their status before any filtering.

All 72 sites information



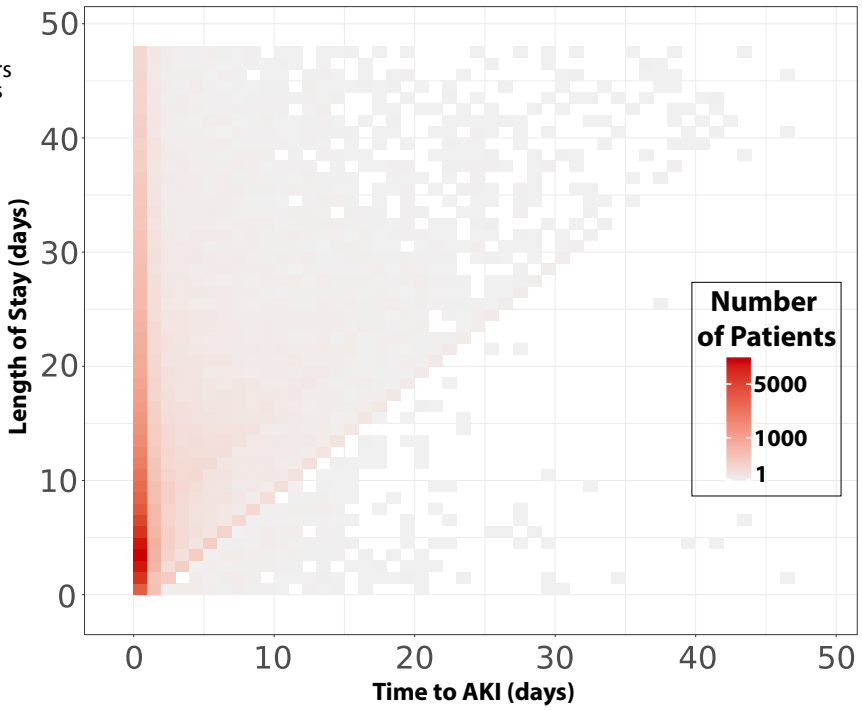
Supplemental Figure 2: (a) Venn diagrams showing patients meeting different serum creatinine-based AKI definitions **(b)** Comparison between the time of onset of AKI from the date of hospitalization and the length of hospitalization of patients (code-based AKI for all patients with AKI onset longer than the length of hospitalization). Color means the number of patients, the darker the more patients. **(c)** Comparison of severity between patients meeting both AKI criteria *versus* those meeting only serum creatinine criteria.

A Comparison of number of patients between different Serum creatinine-based AKI definitions



B Length of stay vs. Time to AKI on the visit

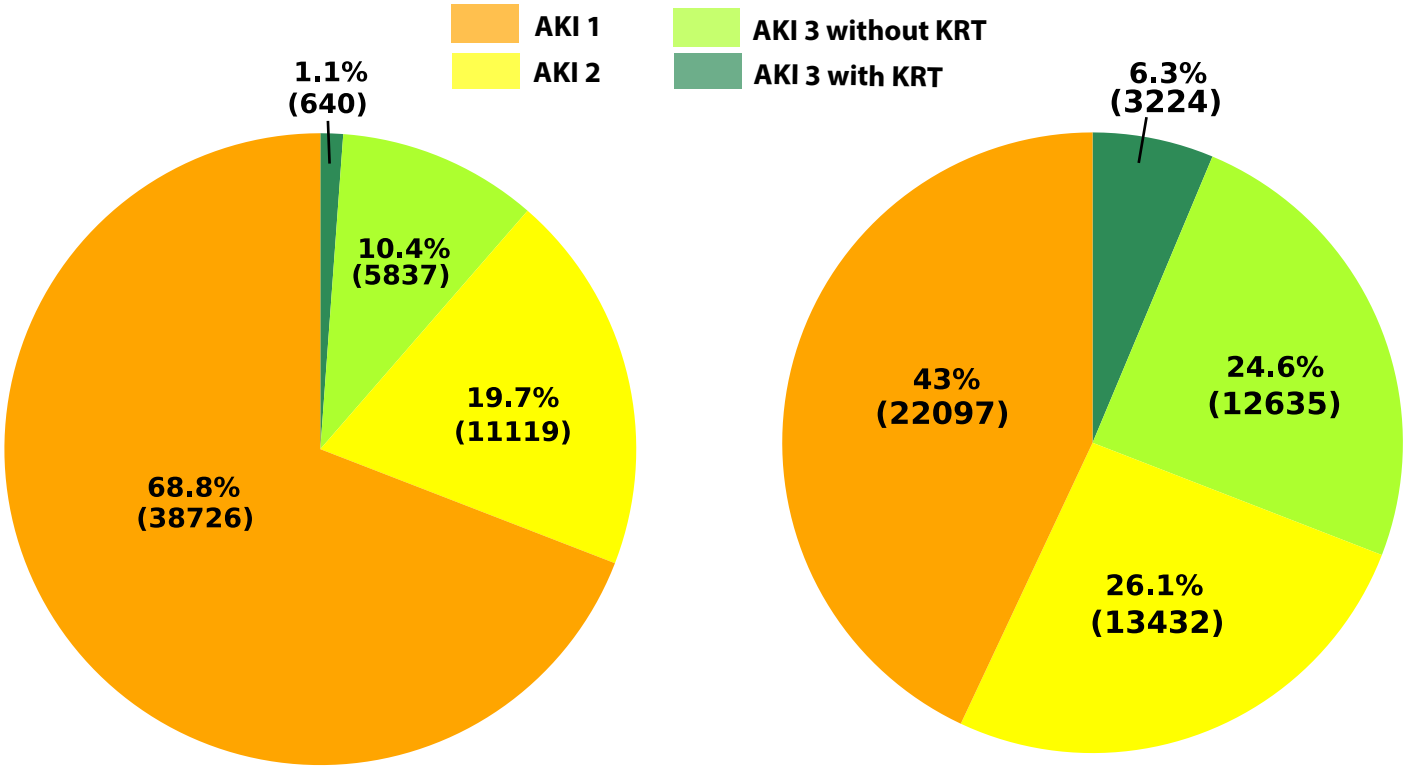
(All incidence of AKI after length of stay is from diagnosed date)



C

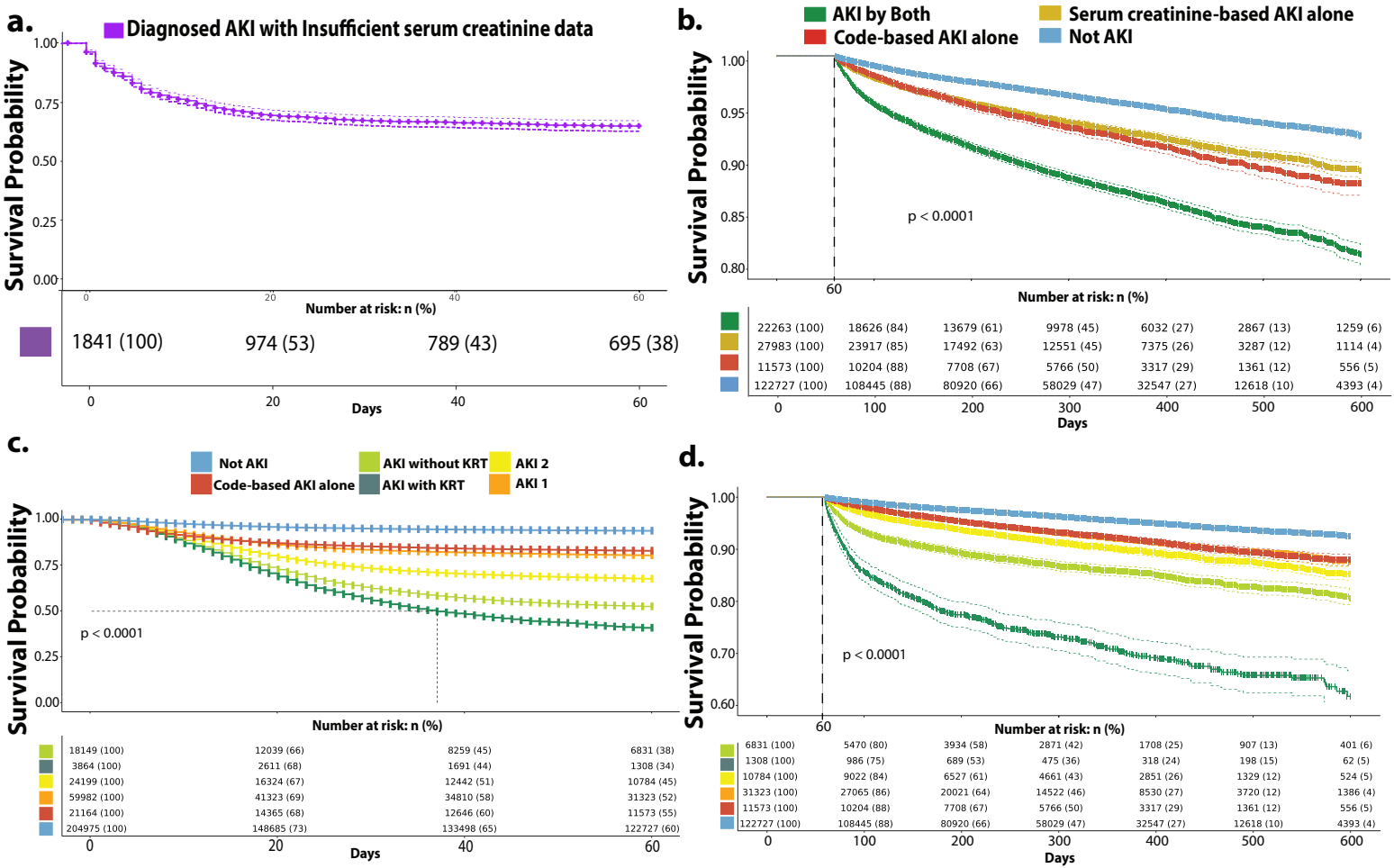
Severity of AKI (only by Serum creatinine definitions)

Severity of AKI (by Serum creatinine definitions and diagnosed)



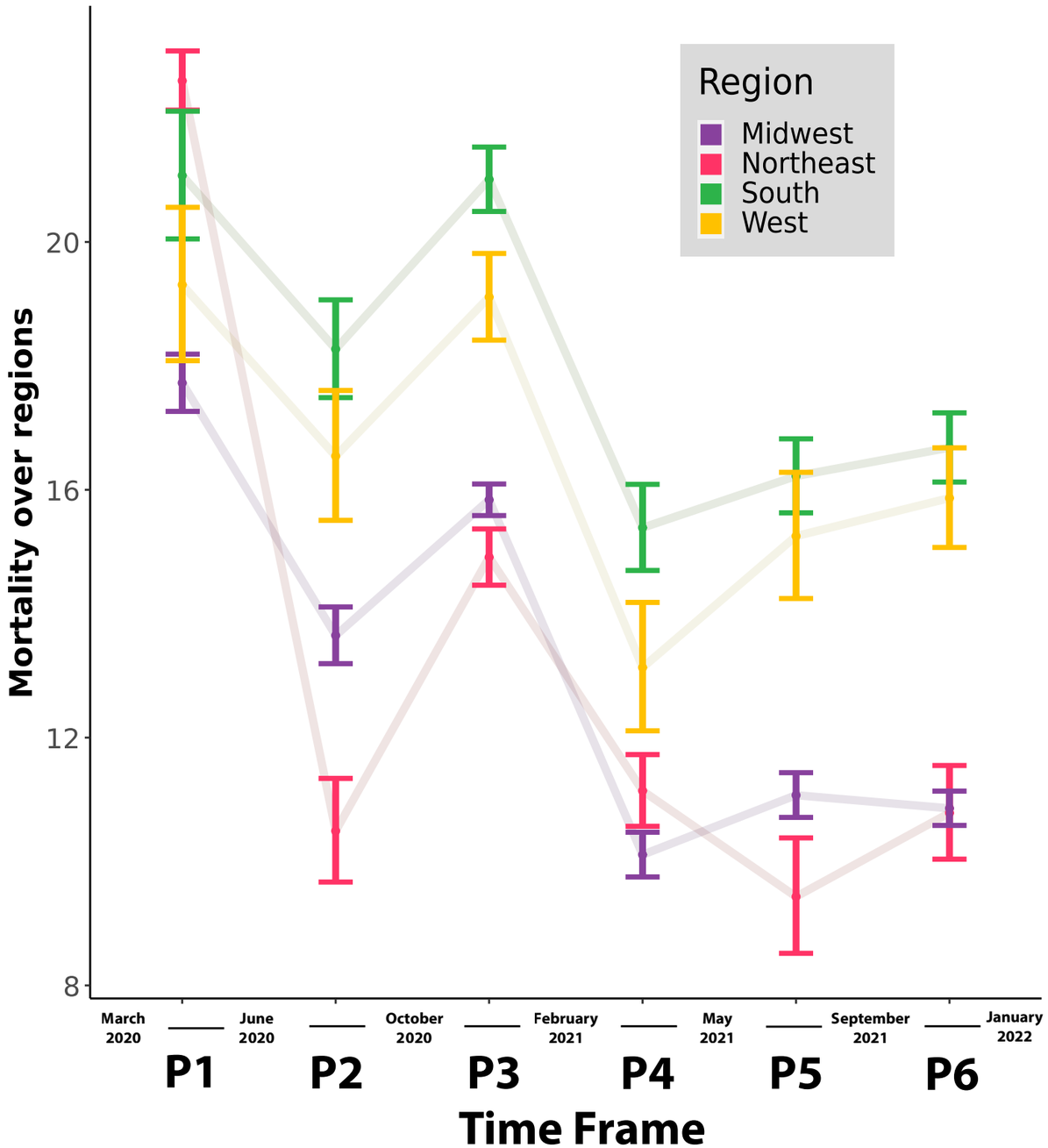
Supplemental Figure 3: Survival of patients with and without AKI

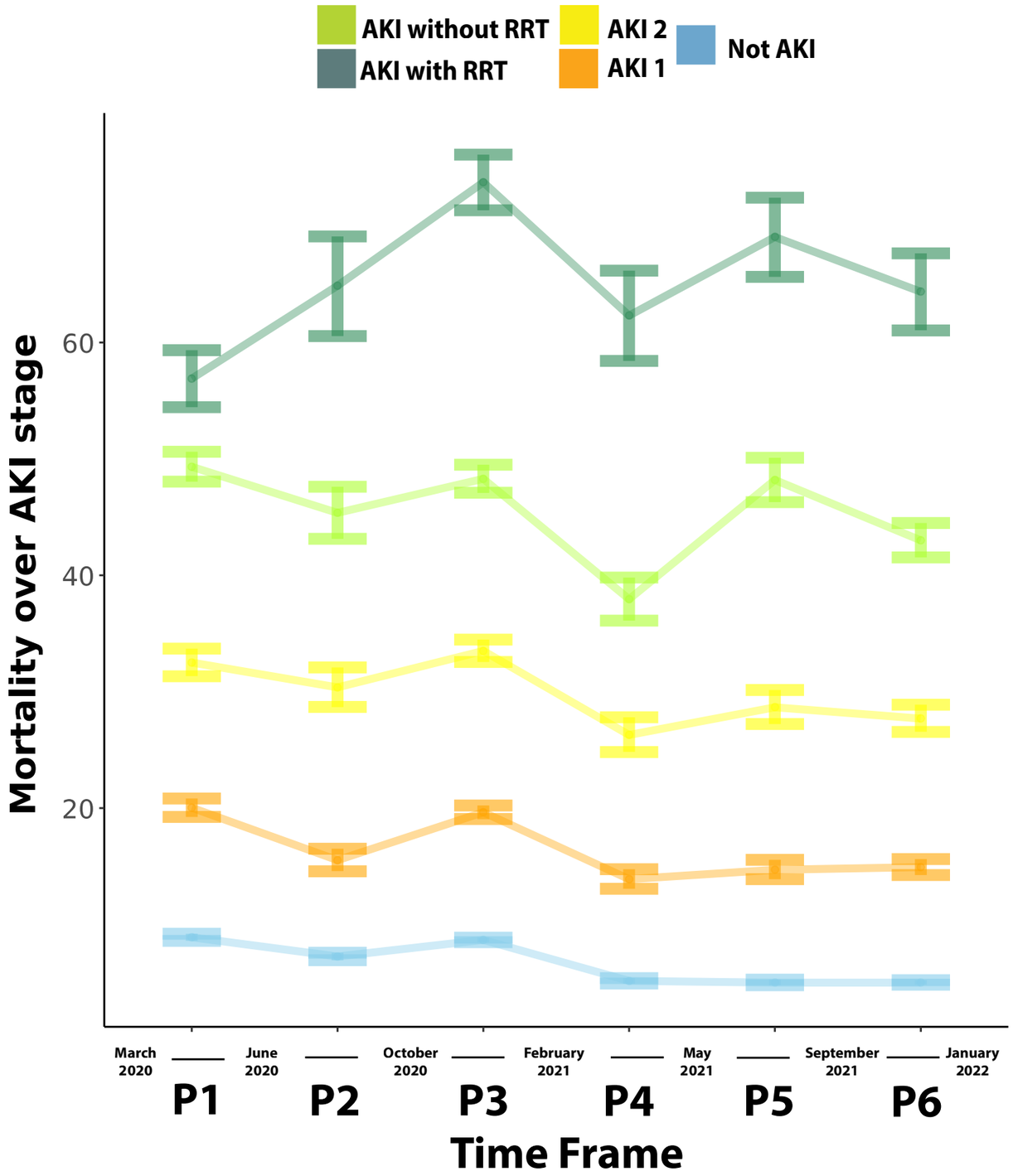
(a) First 60-day survival for patients diagnosed with AKI, but with insufficient serum creatinine data to calculate a change. **(b)** Post-60-day survival for different AKI definitions. **(c)** First 60-day survival by KDIGO-based AKI stages and Code-based AKI. **(d)** Post-60-day survival by KDIGO-based AKI stages and Code-based AKI.


a.
Diagnosed AKI with Insufficient serum creatinine data
Survival Probability
1.00
0.75
0.50
0.25
0.00
0
20
40
60
Number at risk: n (%)
1841 (100)
974 (53)
789 (43)
695 (38)
0
20
40
60
Days
b.
AKI by Both
Serum creatinine-based AKI alone
Code-based AKI alone
Not AKI
Survival Probability
1.00
0.95
0.90
0.85
0.80
p < 0.0001
60
Number at risk: n (%)
22263 (100) 18626 (84) 13679 (61) 9978 (45) 6032 (27) 2867 (13) 1259 (6)
27983 (100) 23917 (85) 17492 (63) 12551 (45) 7375 (26) 3287 (12) 1114 (4)
11573 (100) 10204 (88) 7708 (67) 5766 (50) 3317 (29) 1361 (12) 556 (5)
122727 (100) 108445 (88) 80920 (66) 58029 (47) 32547 (27) 12618 (10) 4393 (4)
0 100 200 300 400 500 600
Days
c.
Not AKI
AKI without KRT
AKI 2
Code-based AKI alone
AKI with KRT
AKI 1
Survival Probability
1.00
0.75
0.50
0.25
0.00
p < 0.0001
Number at risk: n (%)
18149 (100) 12039 (66) 8259 (45) 6831 (38)
3864 (100) 2611 (68) 1691 (44) 1308 (34)
24199 (100) 16324 (67) 12442 (51) 10784 (45)
59982 (100) 41323 (69) 34810 (58) 31323 (52)
21164 (100) 14365 (68) 12646 (60) 11573 (55)
204975 (100) 148685 (73) 133498 (65) 122727 (60)
0 20 40 60
Days
d.
Survival Probability
1.00
0.90
0.80
0.70
0.60
p < 0.0001
60
Number at risk: n (%)
6831 (100) 5470 (80) 3934 (58) 2871 (42) 1708 (25) 907 (13) 401 (6)
1308 (100) 986 (75) 689 (53) 475 (36) 318 (24) 198 (15) 62 (5)
10784 (100) 9022 (84) 6527 (61) 4661 (43) 2851 (26) 1329 (12) 524 (5)
31323 (100) 27065 (86) 20021 (64) 14522 (46) 8530 (27) 3720 (12) 1386 (4)
11573 (100) 10204 (88) 7708 (67) 5766 (50) 3317 (29) 1361 (12) 556 (5)
122727 (100) 108445 (88) 80920 (66) 58029 (47) 32547 (27) 12618 (10) 4393 (4)
0 100 200 300 400 500 600
Days

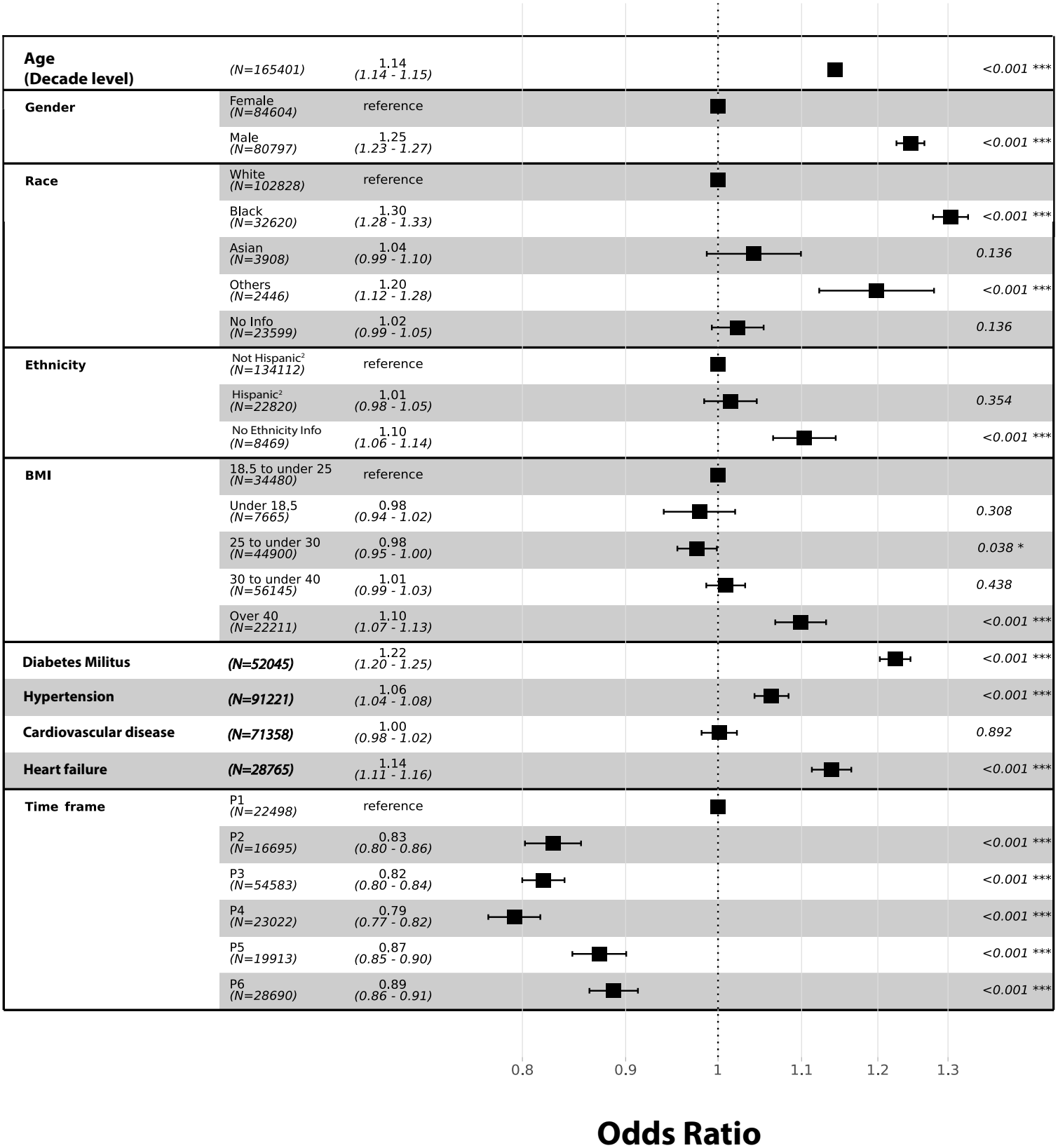
Supplemental Figure 4: Mortality across time periods and regions
(a) Comparison of unadjusted mortality rates (and 95% confidence intervals), between regional and time frames. **(b)** Observed mortality rates (and 95% confidence intervals), within different severities of AKI, for six time periods.

Comparison of univariate mortality rates between regions and time frames





Supplemental Figure 5: Multivariable analysis of COVID-19-related AKI risk in patients with BMI measurements available


Age (Decade level)
(N=165401)
1.14 (1.14 - 1.15)
<0.001 ***
Gender
Female (N=84604)
reference
Male (N=80797)
1.25 (1.23 - 1.27)
<0.001 ***
Race
White (N=102828)
reference
Black (N=32620)
1.30 (1.28 - 1.33)
<0.001 ***
Asian (N=3908)
1.04 (0.99 - 1.10)
0.136
Others (N=2446)
1.20 (1.12 - 1.28)
<0.001 ***
No Info (N=23599)
1.02 (0.99 - 1.05)
0.136
Ethnicity
Not Hispanic² (N=134112)
reference
Hispanic² (N=22820)
1.01 (0.98 - 1.05)
0.354
No Ethnicity Info (N=8469)
1.10 (1.06 - 1.14)
<0.001 ***
BMI
18.5 to under 25 (N=34480)
reference
Under 18.5 (N=7665)
0.98 (0.94 - 1.02)
0.308
25 to under 30 (N=44900)
0.98 (0.95 - 1.00)
0.038 *
30 to under 40 (N=56145)
1.01 (0.99 - 1.03)
0.438
Over 40 (N=22211)
1.10 (1.07 - 1.13)
<0.001 ***
Diabetes Militus
(N=52045)
1.22 (1.20 - 1.25)
<0.001 ***
Hypertension
(N=91221)
1.06 (1.04 - 1.08)
<0.001 ***
Cardiovascular disease
(N=71358)
1.00 (0.98 - 1.02)
0.892
Heart failure
(N=28765)
1.14 (1.11 - 1.16)
<0.001 ***
Time frame
P1 (N=22498)
reference
P2 (N=16695)
0.83 (0.80 - 0.86)
<0.001 ***
P3 (N=54583)
0.82 (0.80 - 0.84)
<0.001 ***
P4 (N=23022)
0.79 (0.77 - 0.82)
<0.001 ***
P5 (N=19913)
0.87 (0.85 - 0.90)
<0.001 ***
P6 (N=28690)
0.89 (0.86 - 0.91)
<0.001 ***
0.8
0.9
1
1.1
1.2
1.3
Odds Ratio

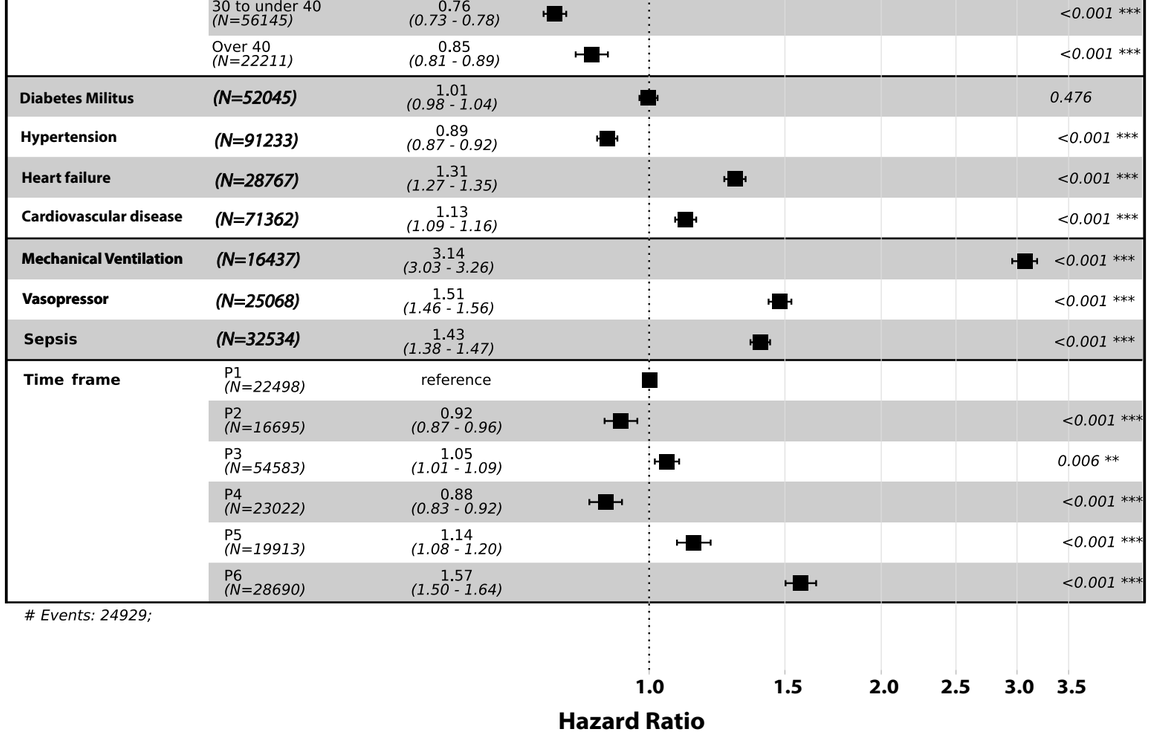
Supplemental Figure 6: Multivariable analysis of mortality in patients with BMI

(a) Multivariable survival analysis of 165,401 patients using the Cox Proportional Hazards (CoxPH) model, including BMI and comorbidity. **(b)** CoxPH multivariable analysis including only hypertension with BMI.

A

AKI	Not AKI *(N=102529)*	reference	
	Code based AKI Alone *(N=12231)*	1.60 *(1.53 - 1.68)*	*<0.001* ***
	Serum creatinine based AKI Alone *(N=22651)*	1.96 *(1.89 - 2.03)*	*<0.001* ***
	AKI by Both *(N=27990)*	2.28 *(2.20 - 2.36)*	*<0.001* ***
Age (Decade level)	*(N=165401)*	1.58 *(1.56 - 1.59)*	*<0.001* ***
Sex	Female *(N=84604)*	reference	
	Male *(N=80797)*	1.12 *(1.09 - 1.15)*	*<0.001* ***
Race	White *(N=102828)*	reference	
	Black *(N=32620)*	0.84 *(0.81 - 0.87)*	*<0.001* ***
	Asian *(N=3908)*	0.76 *(0.70 - 0.82)*	*<0.001* ***
	Others *(N=2446)*	0.93 *(0.83 - 1.04)*	*0.181*
	No Info *(N=23599)*	0.88 *(0.84 - 0.92)*	*<0.001* ***
Ethnicity	Not Hispanic[2] *(N=134112)*	reference	
	Hispanic[2] *(N=22820)*	0.95 *(0.91 - 1.00)*	*0.05*
	No Ethnicity Info *(N=8469)*	1.01 *(0.95 - 1.07)*	*0.768*
BMI	18.5 to under 25 *(N=34480)*	reference	
	Under 18.5 *(N=7665)*	1.41 *(1.33 - 1.48)*	*<0.001* ***
	25 to under 30 *(N=44900)*	0.81 *(0.78 - 0.84)*	*<0.001* ***
	30 to under 40 *(N=56145)*	0.76 *(0.73 - 0.78)*	*<0.001* ***
	Over 40 *(N=22211)*	0.85 *(0.81 - 0.89)*	*<0.001* ***
Diabetes Militus	***(N=52045)***	1.01 *(0.98 - 1.04)*	*0.476*
Hypertension	***(N=91233)***	0.89 *(0.87 - 0.92)*	*<0.001* ***
Heart failure	***(N=28767)***	1.31 *(1.27 - 1.35)*	*<0.001* ***
Cardiovascular disease	***(N=71362)***	1.13 *(1.09 - 1.16)*	*<0.001* ***
Mechanical Ventilation	***(N=16437)***	3.14 *(3.03 - 3.26)*	*<0.001* ***
Vasopressor	***(N=25068)***	1.51 *(1.46 - 1.56)*	*<0.001* ***
Sepsis	***(N=32534)***	1.43 *(1.38 - 1.47)*	*<0.001* ***
Time frame	P1 *(N=22498)*	reference	
	P2 *(N=16695)*	0.92 *(0.87 - 0.96)*	*<0.001* ***
	P3 *(N=54583)*	1.05 *(1.01 - 1.09)*	*0.006* **
	P4 *(N=23022)*	0.88 *(0.83 - 0.92)*	*<0.001* ***
	P5 *(N=19913)*	1.14 *(1.08 - 1.20)*	*<0.001* ***
	P6 *(N=28690)*	1.57 *(1.50 - 1.64)*	*<0.001* ***

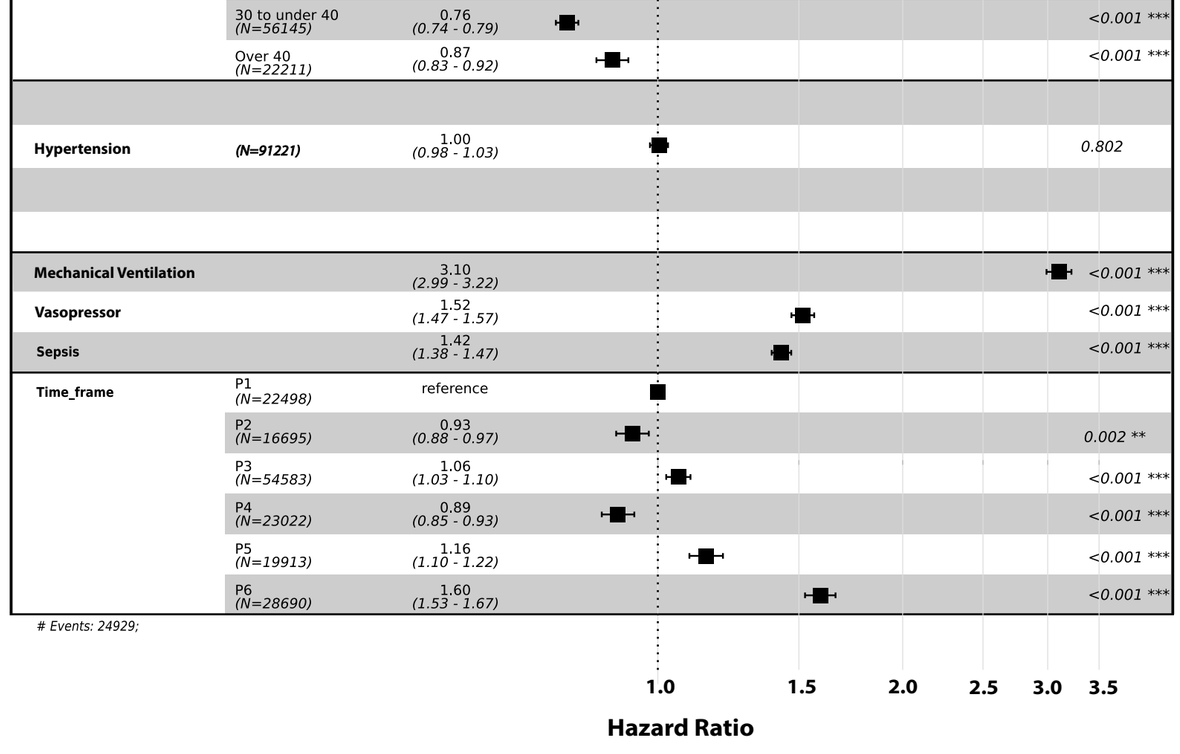
 # Events: 24929;



B

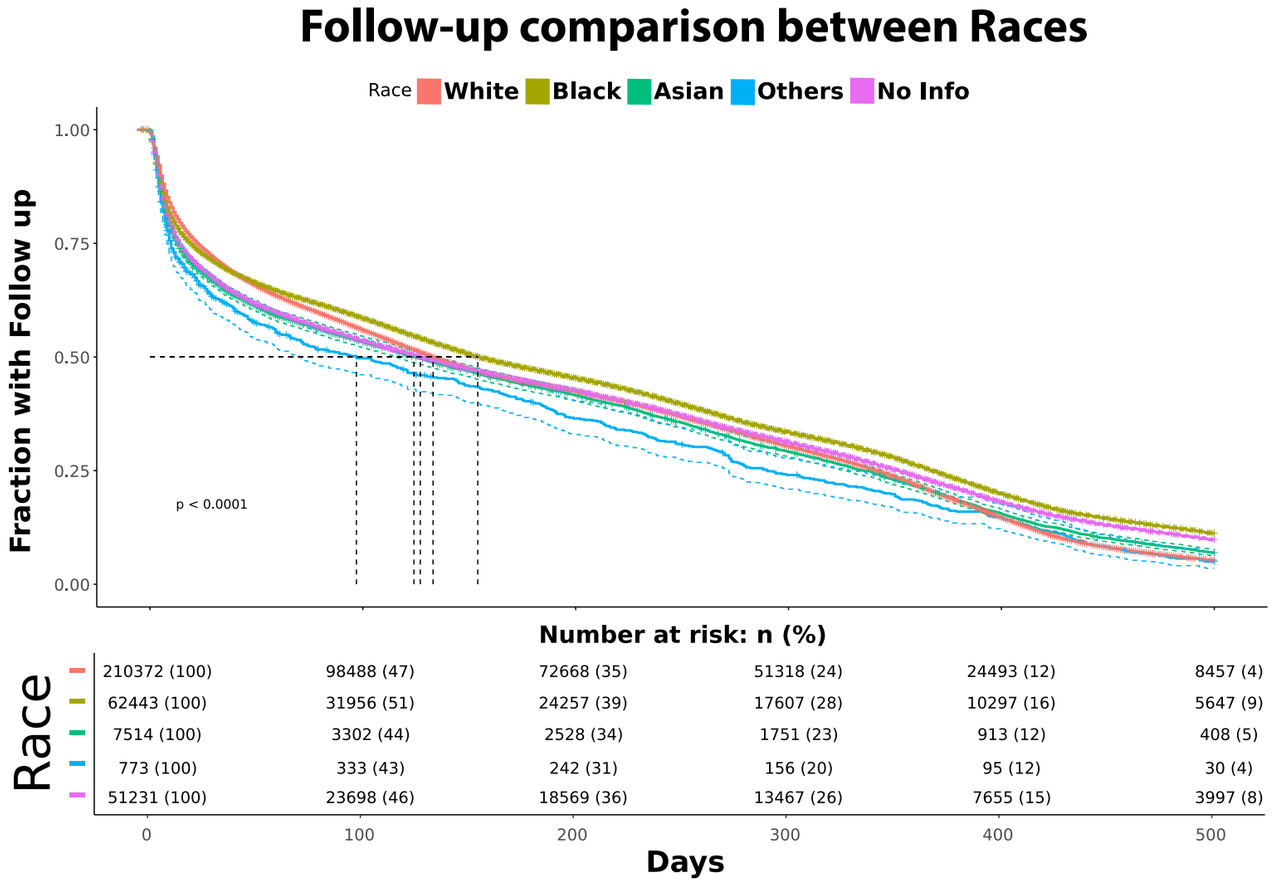
AKI	Not AKI *(N=102529)*	reference	
	Code based AKI Alone *(N=12231)*	1.65 *(1.57 - 1.73)*	*<0.001* ***
	Serum creatinine based AKI Alone *(N=22651)*	1.96 *(1.89 - 2.03)*	*<0.001* ***
	AKI by Both *(N=27990)*	2.31 *(2.23 - 2.39)*	*<0.001* ***
Age (Decade level)	*(N=165401)*	1.61 *(1.59 - 1.62)*	*<0.001* ***
Sex	Female *(N=84604)*	reference	
	Male *(N=80797)*	1.13 *(1.10 - 1.16)*	*<0.001* ***
Race	White *(N=102828)*	reference	
	Black *(N=32620)*	0.84 *(0.81 - 0.87)*	*<0.001* ***
	Asian *(N=3908)*	0.74 *(0.68 - 0.80)*	*<0.001* ***
	Others *(N=2446)*	0.93 *(0.83 - 1.04)*	*0.18*
	No Info *(N=23599)*	0.87 *(0.83 - 0.92)*	*<0.001* ***
Ethnicity	Not Hispanic[2] *(N=134112)*	reference	
	Hispanic[2] *(N=22820)*	0.94 *(0.89 - 0.98)*	*0.008* **
	No Ethnicity Info *(N=8469)*	1.00 *(0.95 - 1.06)*	*0.986*
BMI	Under 18.5 *(N=7665)*	1.40 *(1.32 - 1.48)*	
	18.5 to under 25 *(N=34480)*	reference	*<0.001* ***
	25 to under 30 *(N=44900)*	0.81 *(0.78 - 0.83)*	*<0.001* ***
	30 to under 40 *(N=56145)*	0.76 *(0.74 - 0.79)*	*<0.001* ***
	Over 40 *(N=22211)*	0.87 *(0.83 - 0.92)*	*<0.001* ***
Hypertension	***(N=91221)***	1.00 *(0.98 - 1.03)*	*0.802*
Mechanical Ventilation		3.10 *(2.99 - 3.22)*	*<0.001* ***
Vasopressor		1.52 *(1.47 - 1.57)*	*<0.001* ***
Sepsis		1.42 *(1.38 - 1.47)*	*<0.001* ***
Time_frame	P1 *(N=22498)*	reference	
	P2 *(N=16695)*	0.93 *(0.88 - 0.97)*	*0.002* **
	P3 *(N=54583)*	1.06 *(1.03 - 1.10)*	*<0.001* ***
	P4 *(N=23022)*	0.89 *(0.85 - 0.93)*	*<0.001* ***
	P5 *(N=19913)*	1.16 *(1.10 - 1.22)*	*<0.001* ***
	P6 *(N=28690)*	1.60 *(1.53 - 1.67)*	*<0.001* ***

 # Events: 24929;

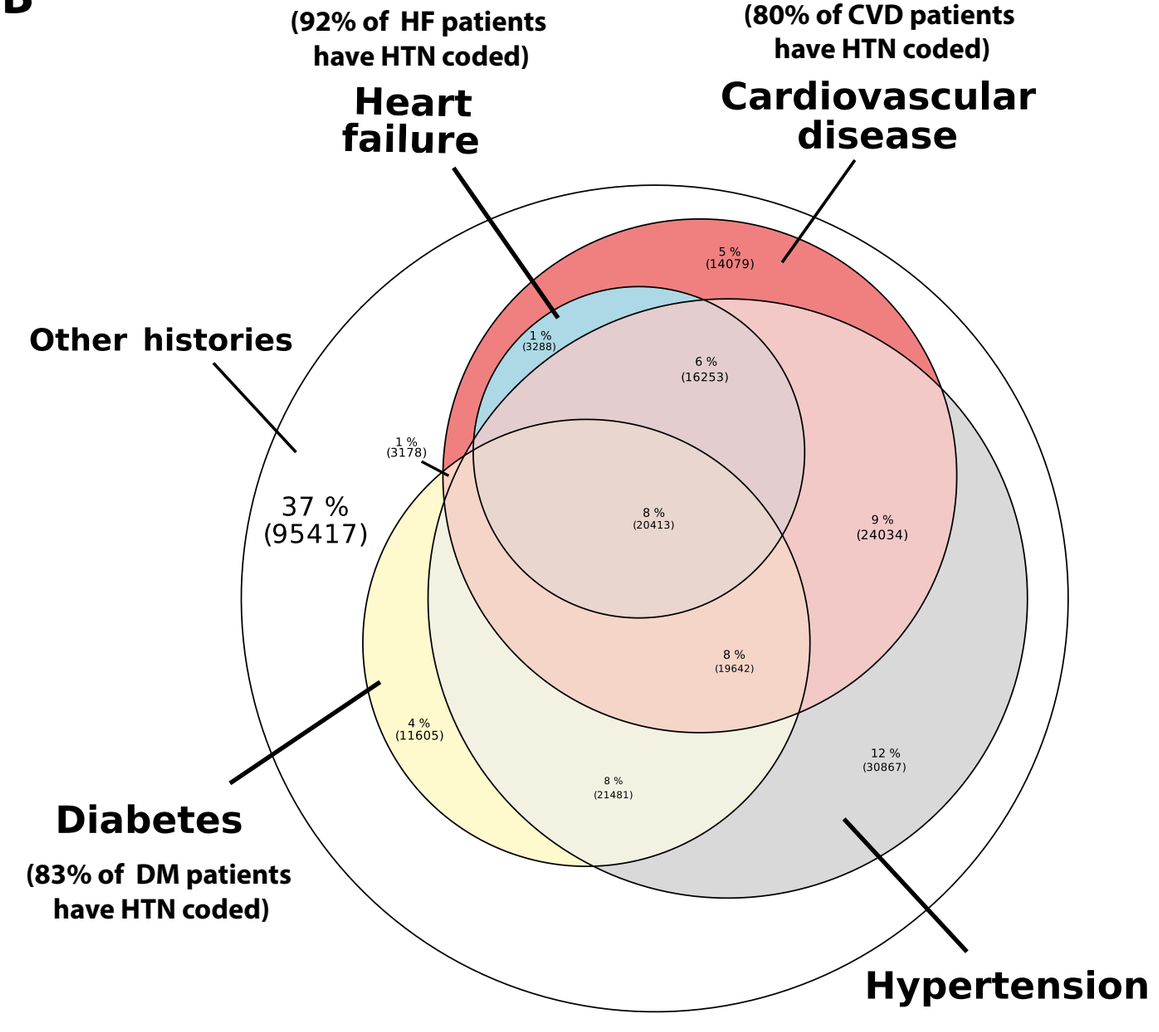


Supplemental Figure 7: Follow-up comparison between Race groups and Venn-diagram of comorbidities (hypertension, diabetes mellitus, heart failure, cardiovascular disease).

A


Follow-up comparison between Races
Race White Black Asian Others No Info
Fraction with Follow up
1.00
0.75
0.50
0.25
0.00
p < 0.0001
Number at risk: n (%)
Race
210372 (100) 98488 (47) 72668 (35) 51318 (24) 24493 (12) 8457 (4)
62443 (100) 31956 (51) 24257 (39) 17607 (28) 10297 (16) 5647 (9)
7514 (100) 3302 (44) 2528 (34) 1751 (23) 913 (12) 408 (5)
773 (100) 333 (43) 242 (31) 156 (20) 95 (12) 30 (4)
51231 (100) 23698 (46) 18569 (36) 13467 (26) 7655 (15) 3997 (8)
0 100 200 300 400 500
Days

B


(92% of HF patients have HTN coded)
Heart failure
(80% of CVD patients have HTN coded)
Cardiovascular disease
Other histories
37 % (95417)
Diabetes
(83% of DM patients have HTN coded)
Hypertension
5 % (14079)
1 % (3288)
6 % (16253)
1 % (3178)
8 % (20413)
9 % (24034)
8 % (19642)
4 % (11605)
8 % (21481)
12 % (30867)