

## Online Supplemental Material

- I. **Page 2** – List of STOP-COVID investigators
- II. **Page 7** – Table S1. List of participating sites
- III. **Page 8** – Table S2. Troponin reference limits for each site
- IV. **Page 9** – Table S3. Associations between pre-existing CVD and inflammatory biomarkers at ICU admission
- VI. **Page 10** – Table S4. Associations between CVD, CAD, and CHF with death and cardiovascular events
- VII. **Page 12** – Table S5. Associations between pre-existing CVD and outcomes by treatment with remdesivir or corticosteroids
- VIII. **Page 13** – Table S6. Baseline characteristics stratified by whether a patient had troponin measured at ICU admission
- IX. **Page 14** – Table S7. Multivariable risk model for myocardial injury
- X. **Page 15** – Table S8. Death and CV events according to myocardial injury status on ICU admission
- XI. **Page 16** – Table S9. Multivariable-adjusted associations between troponin categories with death and cardiovascular events
- XII. **Page 17** – Table S10. Associations between myocardial injury at ICU admission and troponin categories with outcomes adjusted for ICU beds
- XIII. **Page 18** – Table S11. Associations between myocardial injury at ICU admission and troponin categories with outcomes including patients with missing troponin
- XIV. **Page 19** – Table S12. Associations between myocardial injury and outcomes stratified by pre-existing CVD, CAD, and CHF
- XV. **Page 20** – Figure S1. Map of participating sites  
**Page 21** – Figure S2. Association between pre-existing CVD (A) and myocardial injury (B) with a composite of in-hospital death and cardiovascular events within 14 days
- XVI. **Page 22** – Figure S3. Variable importance in predicting 28-day mortality and CV events
- XVII. **Page 23** – Figure S4. Associations between myocardial injury and death and cardiovascular events

## STOP-COVID Investigators

**Baylor College of Medicine:** Carl P. Walther\*, Samaya J. Anumudu

**Baylor University Medical Center:** Justin Arunthamakun\*, Kathleen F. Kopeccky, Gregory P. Milligan, Peter A. McCullough, Thuy-Duyen Nguyen

**Beth Israel Deaconess Medical Center:** Shahzad Shaefi\*, Megan L. Krajewski, Sidharth Shankar, Aameeka Pannu, Juan D. Valencia, Kenneth A. Bauer

**Boston Medical Center:** Sushrut S. Waikar\*, Zoe A. Kibbelaar

**Cook County Health:** Ambarish M. Athavale\*, Peter Hart, Shristi Upadhyay, Ishaan Vohra, Ajiboye Oyintayo

**Cooper University Health Care:** Adam Green\*, Jean-Sebastien Rachoin, Christa A. Schorr, Lisa Shea

**Duke University Medical Center:** Daniel L. Edmonston\*, Christopher L. Mosher

**Hackensack Meridian Health Mountainside Medical Center:** Alexandre M. Shehata\*, Zaza Cohen, Valerie Allusson, Gabriela Bambrick-Santoyo, Noor ul aain Bhatti, Bijal Mehta, Aquino Williams

**Hackensack Meridian Health Hackensack University Medical Center:** Samantha K. Brenner\*, Patricia Walters, Ronaldo C. Go, Keith M. Rose

**Harvard T.H. Chan School of Public Health:** Miguel A. Hernán

**Harvard University:** Amy M. Zhou, Ethan C. Kim, Rebecca Lisk

**Icahn School of Medicine at Mount Sinai:** Lili Chan\*, Kusum S. Mathews\*, Steven G. Coca, Deena R. Altman, Aparna Saha, Howard Soh, Huei Hsun Wen, Sonali Bose, Emily A. Leven, Jing G. Wang, Gohar Mosoyan, Pattharawin Pattharanitima, Emily J. Gallagher

**Indiana University School of Medicine/Indiana University Health:** Allon N. Friedman\*, John Guirguis, Rajat Kapoor, Christopher Meshberger, Katherine J. Kelly

**Johns Hopkins Hospital:** Chirag R. Parikh\*, Brian T. Garibaldi, Celia P. Corona-Villalobos, Yumeng Wen, Steven Menez, Rubab F. Malik, Carmen Elena Cervantes, Samir C. Gautam

**Kings County Hospital Center:** Mary C. Mallappallil\*, Jie Ouyang, Sabu John, Ernie Yap, Yohannes Melaku, Ibrahim Mohamed, Siddhartha Bajracharya, Isha Puri, Mariah Thaxton, Jyotsna Bhattacharya, John Wagner, Leon Boudourakis

**Loma Linda University:** H. Bryant Nguyen\*, Afshin Ahoubim

**Mayo Clinic, Arizona:** Leslie F. Thomas\*, Dheeraj Reddy Sirganagari

**Mayo Clinic, Florida:** Pramod K. Guru\*

**Mayo Clinic, Rochester:** Kianoush Kashani\*, Shahrzad Tehranian

**Medical College of Wisconsin:** Yan Zhou,\* Paul A. Bergl, Jesus Rodriguez, Jatan A. Shah, Mrigank S. Gupta

**MedStar Georgetown University Hospital:** Princy N. Kumar\*, Deepa G. Lazarous, Seble G. Kassaye

**Montefiore Medical Center/Albert Einstein College of Medicine:** Michal L. Melamed\*, Tanya S. Johns. Ryan Mocerino, Kalyan Prudhvi, Denzel Zhu, Rebecca V. Levy, Yorg Azzi, Molly Fisher, Milagros Yunes, Kaltrina Sedaliu, Ladan Golestaneh, Maureen Brogan, Jyotsana Thakkar, Neelja Kumar, Michael J. Ross, Michael Chang

**New York-Presbyterian Queens Hospital:** Ritesh Raichoudhury\*, Akshay Athreya, Mohamed Farag

**New York-Presbyterian/Weill Cornell Medical Center:** Edward J. Schenck\*, Soo Jung Cho, Maria Plataki, Sergio L. Alvarez-Mulett, Luis G. Gomez-Escobar, Di Pan, Stefi Lee, Jamuna Krishnan, William Whalen

**New York University Langone Hospital:** David Charytan\*, Ashley Macina

**Northwestern Memorial Hospital:** Northwestern University Feinberg School of Medicine - Anand Srivastava\*, Alexander S. Leidner, Carlos Martinez, Jacqueline M. Kruser, Richard G. Wunderink, Alexander J. Hodakowski

**Ochsner Medical Center:** Juan Carlos Q. Velez\*, Eboni G. Price-Haywood, Luis A. Matute-Trochez, Anna E. Hasty, Muner MB. Mohamed

**Oregon Health and Science University Hospital:** Rupali S. Avasare\*, David Zonies\*

**Partners Healthcare:** Brigham and Women's Hospital, Brigham and Women's Faulkner Hospital, Massachusetts General Hospital, and Newton Wellesley Hospital – David E. Leaf\*, Shruti Gupta\*, Hanny Al-Samkari, Rebecca Karp Leaf, Rachel Rosovsky, Meghan E. Sise, Erik T. Newman, Samah Abu Omar, Kapil K. Pokharel, Shreyak Sharma, Harkarandeep Singh, Simon Correa, Tanveer Shaukat, Omer Kamal, Wei Wang, Meghan Lee, Ian A. Strohbahn, Jiahua Li, Ariel L. Mueller

**ProMedica Health System:** Roberta E. Redfern,\* Nicholas S. Cairl, Gabriel Naimy, Abeer Abu-Saif, Danyell Hall, Laura Bickley

**Renown Health:** Chris Rowan\*, Farah Madhani-Lovely\*

**Rush University Medical Center:** Vasil Peev\*, Jochen Reiser, John J. Byun, Andrew Vissing, Esha M. Kapania, Zoe Post, Nilam P. Patel, Joy-Marie Hermes

**Rutgers/New Jersey Medical School:** Anne K. Sutherland\*, Ameer Patrawalla, Diana G. Finkel, Barbara A. Danek, Sowminya Arikapudi, Jeffrey M. Paer, Peter Cangialosi, Mark Liotta

**Rutgers/Robert Wood Johnson Medical School:** Jared Radbel\*, Sonika Puri, Jag Sunderram, Matthew T. Scharf, Ayesha Ahmed, Ilya Berim, Jayanth S. Watson, George Karp

**Stanford Healthcare:** Stanford University School of Medicine – Shuchi Anand\*, Joseph E. Levitt, Pablo Garcia

**Temple University Hospital:** Suzanne M. Boyle\*, Rui Song

**Thomas Jefferson University Hospital:** Jingjing Zhang\*, Sang Hoon Woo, Xiaoying Deng, Goni Katz-Greenberg

**Tulane Medical Center:** Moh'd A. Sharshir\*, Vadym V. Rusnak

**United Health Services Hospitals:** Muhammad Imran Ali

**University of Colorado Anschutz Medical Campus:** Anip Bansal\*, Amber S. Podoll, Michel Chonchol, Sunita Sharma, Ellen L. Burnham

**University Hospitals Cleveland Medical Center:** Arash Rashidi\*, Rana Hejal

**University of Alabama-Birmingham Hospital:** Eric Judd\*, Laura Latta, Ashita Tolwani

**University of California-Davis Medical Center:** Timothy E. Albertson\*, Jason Y. Adams

**University of California-Los Angeles Medical Center:** Ronald Reagan-UCLA Medical Center - Steven Y. Chang\*, Rebecca M. Beutler; Santa Monica-UCLA Medical Center – Carl E. Schulze

**University of California-San Diego Medical Center:** Etienne Macedo\*, Harin Rhee

**University of California-San Francisco Medical Center:** Kathleen D. Liu\*, Vasantha K. Jotwani

**University of Chicago Medical Center:** Jay L. Koyner\*

**University of Florida Health-Gainesville:** Chintan V. Shah\*

**University of Florida-Health-Jacksonville:** Vishal Jaikaransingh\*

**University of Illinois Hospital and Health Sciences System:** Stephanie M. Toth-Manikowski\*, Min J. Joo\*, James P. Lash

**University of Kentucky Medical Center:** Javier A. Neyra\*, Nourhan Chaaban, Madona Elias, Yahya Ahmad

**University Medical Center of Southern Nevada:** Rajany Dy\*, Alfredo Iardino, Elizabeth H. Au, Jill H. Sharma

**University of Miami Health System:** Marie Anne Sosa\*, Sabrina Taldone, Gabriel Contreras, David De La Zerda, Hayley B. Gershengorn, Alessia Fornoni

**University of Michigan:** Salim S. Hayek\*, Pennelope Blakely, Hanna Berlin, Tariq U. Azam, Husam Shadid, Michael Pan, Patrick O' Hayer, Chelsea Meloche, Rafey Feroze, Kishan J. Padalia, Jeff Leya, John P. Donnelly, Andrew J. Admon

**University of North Carolina School of Medicine:** Jennifer E. Flythe\*, Matthew J. Tugman, Emily H. Chang

**University of Oklahoma Health Sciences Center:** Brent R. Brown\*

**University of Pennsylvania Health System:** Amanda K. Leonberg-Yoo\*, Ryan C. Spiardi, Todd A. Miano, Meaghan S. Roche, Charles R. Vasquez

**University of Pittsburgh Medical Center:** Amar D. Bansal\*, Natalie C. Ernecoff, Sanjana Kapoor, Siddharth Verma, Huiwen Chen

**University of Tennessee Health Science Center and Memphis VA Medical Center/Methodist University Hospital –** Csaba P. Kovesdy\*, Miklos Z. Molnar\*, Ambreen Azhar

**University of Texas Southwestern Medical Center and Parkland Health and Hospital System:** S. Susan Hedayati\*, Mridula V. Nadamuni, Shani Shastri, Duwayne L. Willett

**University of Vermont Larner College of Medicine:** Samuel A.P. Short

**University of Virginia Health System:** Amanda D. Renaghan\*, Kyle B. Enfield

**University of Washington Medical Center:** Pavan K. Bhatraju\*, A. Bilal Malik

**Vanderbilt University Medical Center:** Matthew W. Semler

**Washington University in St. Louis/Barnes Jewish Hospital:** Anitha Vijayan\*, Christina Mariyam Joy, Tingting Li, Seth Goldberg, Patricia F. Kao

**Wellforce Health System:** Lowell General Hospital - Greg L. Schumaker\*, Tufts Medical Center - Nitender Goyal\*, Anthony J. Faugno, Greg L. Schumaker, Caroline M. Hsu, Asma Tariq, Leah Meyer, Ravi K. Kshirsagar, Daniel E. Weiner

**Westchester Medical Center:** Marta Christov\*, Jennifer Griffiths, Sanjeev Gupta, Aromma Kapoor, Savneek Chugh

**Yale School of Medicine:** Perry Wilson,\* Tanim Arora, Ugochukwu Ugwuowo

\*Site Principal Investigator

**Table S1. List of participating sites**

<b>Northeast</b>
Beth Israel Deaconess Medical Center
Brigham and Women's Faulkner Hospital
Brigham and Women's Hospital
Cooper University Health Care
Hackensack Mountainside Hospital
Hackensack University Medical Center
Johns Hopkins Hospital
Kings County Hospital Center
Lowell General Hospital
Massachusetts General Hospital
MedStar Georgetown University Hospital
Montefiore Medical Center
Mount Sinai
Newton Wellesley Hospital
New York-Presbyterian Queens Hospital
New York-Presbyterian/Weill Cornell Medical Center
New York University Langone Hospital
Rutgers/New Jersey Medical School
Rutgers/Robert Wood Johnson Medical School
Temple University Hospital
Thomas Jefferson University Hospital
Tufts Medical Center
United Health Services Hospitals
University of Pennsylvania Health System
University of Pittsburgh Medical Center
Westchester Medical Center
Yale University Medical Center
<b>South</b>
Baylor College of Medicine, Houston
Baylor University Medical Center/Baylor Scott White and Health
Duke University Medical Center
Mayo Clinic, Florida
Memphis VA Medical Center
Methodist University Hospital
Ochsner Medical Center
Tulane Medical Center
University of Alabama-Birmingham Hospital
University of Florida Health-Gainesville
University of Florida Health-Jacksonville
University of Miami Health System
University of North Carolina Medical Center
University of Texas Southwestern Medical Center
University of Virginia Health System
<b>Midwest</b>
Barnes-Jewish Hospital
Cook County Health
Froedtert Hospital
Indiana University Health Methodist Hospital
Mayo Clinic, Rochester
Northwestern Memorial Hospital
Promedica Health System
Rush University Medical Center
University Hospitals Cleveland Medical Center
University of Chicago Medical Center
University of Illinois Hospital and Health Sciences System
University of Kentucky Hospital
University of Michigan Hospital
University of Oklahoma Health Sciences Center
<b>West</b>
Loma Linda University Medical Center
Mayo Clinic, Arizona
Oregon Health and Science University Hospital
Renown Health
Stanford Healthcare
University of California-Davis Medical Center
University of California-Los Angeles Medical Center
University of California-San Diego Medical Center
University of California-San Francisco Medical Center
UCHealth University of Colorado
University Medical Center of Southern Nevada
University of Washington Medical Center

**Table S2. Troponin Reference Limits for Each Site**

<b>Institution</b>	<b>Study ID Site Code</b>	<b>Troponin (Upper Reference Limit)</b>
Brigham and Women's Hospital, Brigham and Women's Faulkner, Newton Wellesley Hospital	BWH, BWF, NWH	0.014 ng/mL
MGH	MGH	0.014 ng/mL
Mount Sinai	MS	0.03 ng/mL
Northwestern	NW	0.04ng/mL
UCSF	UCSF	0.04 ng/mL
NYP/Columbia	NYP	0.02 ng/mL
Rush University Medical Center	RUSH	0.09 ng/mL
Baylor University Medical Center, Dallas	BUMC	0.05 ng/mL
Baylor College of Medicine, Houston	BCMh	0.04 ng/mL
Albert Einstein/Montefiore	AEM	0.10 ng/mL
Colorado	UCD	0.04ng/mL
Hackensack University Medical Center	HUMC	0.02 ng/mL
Hackensack Mountainside Hospital	MSH	0.028 ng/mL
Beth Israel Deaconess Medical Center	BID	0.01 ng/mL
Yale	YALE	1.5 ng/mL
University of Miami	MIA	0.034 ng/mL
Duke University	DUKE	0.019 ng/mL
Tufts	TUFT	0.03 ng/mL
University of Alabama, Birmingham	UAB	0.015 ng/mL
Rutgers/New Jersey Medical School	NJMS	0.30 ng/mL
Temple	TEMP	0.04 ng/mL
Cook County	COOK	0.039 ng/mL
Loma Linda University Medical Center in California	LOMA	0.03 ng/mL
UCLA	UCLA	0.1 ng/mL
University of Pennsylvania	PENN	0.03 ng/mL
Stanford	STAN	0.055 ng/mL
NYP/Cornell	CORN	0.04 ng/mL
Rutgers/Robert Wood Johnson Medical School	RUTG	0.02 ng/mL
Cooper Health	COOP	0.019 ng/mL
UC Davis	UCD	0.019 ng/mL
Medical College of Wisconsin	MCW	0.016 ng/mL
University of Kentucky	KTY	0.014 ng/mL
Oregon Health and Science University	OHSU	0.80 ng/mL
Georgetown	GTWN	0.047 ng/ml
Renown Health	RENO	0.019 ng/mL
Tennessee	TENN	0.047 ng/ml
Indiana University–Purdue University Indianapolis	IUPU	0.03 ng/mL
Oklahoma (Brent Brown)	OKLA	1.50 ng/mL
Tulane	TUL	0.045 ng/mL
University of Michigan	UMI	0.019 ng/mL
Johns Hopkins	JHU	0.04 ng/mL
University of Southern Nevada Medical Center	UMSN	0.04 ng/mL
University of Illinois Hospital	UIC	0.04 ng/mL
NYU	NYU	0.04 ng/mL
UCSD	UCSD	0.022 ng/ml
University of Washington	UWA	0.04 ng/mL
Washington University	WASU	0.03 ng/mL
Pittsburgh	UPMC	0.045 ng/mL
Mayo, Florida	MCF	0.015 ng/ml
Mayo, Arizona	MCA	0.01 ng/mL
University of North Carolina	UNC	0.034 ng/mL
University Hospitals Cleveland Medical Center	UHCM	0.03 ng/mL
University of Florida, Gainesville	UFAG	0.015 ng/ml
University of Florida, Jacksonville	UFAJ	0.03 ng/mL
University of Chicago	CHI	0.022 ng/ml
Ochsner	OCHS	0.026 ng/ml
University of Texas Southwestern	UTSW	0.022 ng/ml



**Table S3. Associations between pre-existing cardiovascular disease and inflammatory biomarkers at ICU admission**

<b>Cardiovascular disease</b>		
<b>Biomarker</b>	<b><math>\beta^*</math> (95% CI)</b>	<b>P-value</b>
White blood cell count	10.2 (-4.4, 24.9)	0.17
D-dimer	-413 (-2261, 1433)	0.66
C-reactive protein	-5.4 (-19.8, 9.0)	0.46

\* Adjusted for age, sex, race, body mass index, smoking status, diabetes mellitus, hypertension, chronic kidney disease

Abbreviations: ICU, intensive care unit

**Table S4. Associations between CVD, CAD, and CHF with death and cardiovascular events**

	Model 0*		Model 1†		Model 2‡		Model 3§	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
<b>Cardiovascular disease</b>								
<b>Death within 28 days</b>	1.81 (1.58, 2.06)	< 0.001	1.28 (1.11, 1.48)	<0.001	1.15 (0.99, 1.34)	0.07	1.15 (0.98, 1.34)	0.07
<b>Cardiovascular Events</b>	1.29 (1.10, 1.52)	0.002	0.98 (0.83, 1.17)	0.83	0.96 (0.80, 1.15)	0.65	0.95 (0.79, 1.14)	0.58
Ventricular fibrillation or sustained VT	1.68 (1.09, 2.58)	0.018	1.57 (1.00, 2.48)	0.05	1.51 (0.93, 2.44)	0.09	1.50 (0.93, 2.42)	0.10
Non-sustained VT	3.05 (1.96, 4.74)	<0.001	2.94 (1.83, 4.72)	<0.001	2.98 (1.81, 4.92)	<0.001	2.98 (1.80, 4.92)	<0.001
Atrial fibrillation or flutter	1.69 (1.36, 2.10)	<0.001	1.20 (0.96, 1.51)	0.11	1.18 (0.93, 1.49)	0.18	1.17 (0.92, 1.49)	0.21
New-onset heart failure	1.69 (1.14, 2.50)	0.009	1.55 (1.02, 2.35)	0.038	1.38 (0.88, 2.14)	0.16	1.38 (0.88, 2.14)	0.16
Myocarditis or pericarditis	1.31 (0.93, 1.83)	0.12	1.13 (0.79, 1.61)	0.50	1.10 (0.76, 1.60)	0.62	1.09 (0.75, 1.58)	0.66
Stroke	1.37 (0.75, 2.51)	0.30	1.31 (0.70, 2.47)	0.40	1.50 (0.75, 3.01)	0.25	1.34 (0.66, 2.76)	0.42
<b>Congestive heart failure</b>								
<b>Death within 28 days</b>	1.51 (1.26, 1.82)	< 0.001	1.22 (1.00, 1.48)	0.04	1.09 (0.88, 1.33)	0.43	1.10 (0.90, 1.36)	0.35
<b>Cardiovascular Events</b>	1.05 (0.83, 1.33)	0.66	0.91 (0.71, 1.15)	0.43	0.86 (0.67, 1.11)	0.25	0.86 (0.67, 1.11)	0.25
Ventricular fibrillation or sustained VT	1.64 (0.94, 2.86)	0.08	1.69 (0.96, 3.00)	0.07	1.67 (0.92, 3.03)	0.09	1.65 (0.91, 3.00)	0.10
Non-sustained VT	2.78 (1.65, 4.68)	<0.001	2.57 (1.50, 4.40)	<0.001	2.45 (1.39, 4.32)	0.002	2.44 (1.39, 4.30)	0.002
Atrial fibrillation or flutter	1.31 (0.96, 1.80)	0.09	1.10 (0.80, 1.53)	0.56	1.05 (0.75, 1.49)	0.77	1.05 (0.74, 1.48)	0.80
New-onset heart failure	-	-	-	-	-	-	-	-
Myocarditis or pericarditis	1.07 (0.66, 1.73)	0.80	1.01 (0.62, 1.66)	0.96	0.89 (0.52, 1.52)	0.68	0.89 (0.52, 1.51)	0.66
Stroke	1.38 (0.62, 3.08)	0.43	1.32 (0.58, 3.00)	0.50	1.27 (0.48, 3.36)	0.63	1.26 (0.47, 3.34)	0.64
<b>Coronary artery disease</b>								
<b>Death within 28 days</b>	1.79 (1.48, 2.16)	< 0.001	1.26 (1.03, 1.53)	0.022	1.16 (0.94, 1.42)	0.16	1.14 (0.93, 1.41)	0.21
<b>Cardiovascular Events</b>	1.75 (1.41, 2.17)	<0.001	1.33 (1.07, 1.66)	0.011	1.35 (1.07, 1.70)	0.010	1.33 (1.06, 1.68)	0.015
Ventricular fibrillation or sustained VT	1.34 (0.73, 2.47)	0.35	1.14 (0.61, 2.13)	0.68	1.04 (0.54, 2.02)	0.90	1.04 (0.53, 2.01)	0.92
Non-sustained VT	1.66 (0.89, 3.08)	0.11	1.48 (0.78, 2.80)	0.23	1.51 (0.79, 2.88)	0.22	1.58 (0.78, 2.87)	0.22
Atrial fibrillation or flutter	1.86 (1.43, 2.42)	<0.001	1.23 (0.94, 1.62)	0.13	1.21 (0.92, 1.61)	0.18	1.21 (0.91, 1.60)	0.20
New-onset heart failure	1.92 (1.26, 2.93)	0.002	1.77 (1.14, 2.74)	0.011	1.53 (0.95, 2.44)	0.08	1.52 (0.95, 2.44)	0.08
Myocarditis or pericarditis	1.75 (1.15, 2.67)	0.009	1.47 (0.95, 2.27)	0.08	1.54 (0.99, 2.41)	0.06	1.52 (0.98, 2.38)	0.06
Stroke	1.23 (0.52, 2.90)	0.63	1.15 (0.48, 2.76)	0.75	1.48 (0.60, 3.63)	0.40	1.21 (0.46, 3.20)	0.70
<b>Myocardial injury at ICU admission<sup>  </sup></b>								
<b>Death within 28 days</b>	2.55 (2.17, 2.99)	<0.001	2.03 (1.71, 2.41)	<0.001	1.94 (1.62, 2.33)	<0.001	1.93 (1.61, 2.31)	<0.001
<b>Cardiovascular Events</b>	2.09 (1.73, 2.53)	<0.001	1.81 (1.48, 2.21)	<0.001	1.88 (1.53, 2.33)	<0.001	1.88 (1.52, 2.32)	<0.001
Ventricular fibrillation or sustained VT	1.44 (0.86, 2.41)	0.16	1.36 (0.89, 2.34)	0.27	1.47 (0.83, 2.60)	0.18	1.44 (0.81, 2.54)	0.21
Non-sustained VT	1.45 (0.86, 2.45)	0.16	1.27 (0.73, 2.20)	0.40	0.94 (0.52, 1.67)	0.83	0.94 (0.52, 1.67)	0.83
Atrial fibrillation or flutter	1.89 (1.48, 2.41)	<0.001	1.35 (1.04, 1.75)	0.023	1.39 (1.06, 1.82)	0.017	1.40 (1.06, 1.83)	0.016
New-onset heart failure	2.96 (1.93, 4.55)	<0.001	3.10 (1.97, 4.85)	<0.001	3.11 (1.94, 4.99)	<0.001	3.14 (1.95, 5.06)	<0.001
Myocarditis or pericarditis	5.33 (3.42, 8.30)	<0.001	5.97 (3.76, 9.46)	<0.001	6.46 (3.99, 10.4)	<0.001	6.43 (3.97, 10.4)	<0.001
Stroke	1.43 (0.70, 2.91)	0.33	1.51 (0.72, 3.19)	0.28	1.29 (0.56, 2.96)	0.54	1.24 (0.54, 2.85)	0.61

\* Model 0 = Unadjusted

† Model 1 = Model 0 + age, sex, race

‡ Model 2 = Model 1 + BMI, smoking, diabetes mellitus, hypertension, chronic kidney disease

§ Model 3 = Model 2 + modified SOFA

¶Models 2 & 3 for myocardial injury adjust for cardiovascular disease

Abbreviations: CAD, coronary artery disease; CHF, congestive heart failure; CI, confidence interval; CVD, cardiovascular disease; ICU, intensive care unit; OR, odds ratio; SOFA, Sequential Organ Failure Assessment; VT, ventricular tachycardia

**Table S5. Associations between pre-existing cardiovascular disease and outcomes by treatment with remdesivir or corticosteroids**

	<b>28-Day Mortality*</b>	<b>Cardiovascular Outcomes*</b>
	P-interaction	P-interaction
<b>Remdesivir</b>	0.29	0.55
<b>Corticosteroids</b>	0.48	0.10

\*Model adjusted for age, sex, race, body mass index, smoking, diabetes mellitus, hypertension, chronic kidney disease, modified SOFA

Abbreviations: SOFA, Sequential Organ Failure Assessment

**Table S6. Baseline characteristics stratified by whether a patient had troponin measured at ICU admission**

	<b>Troponin measured at ICU admission (N=2,741)</b>	<b>Troponin not measured at ICU admission (N=2,392)</b>	<b>P-value</b>
<b>Baseline characteristics</b>			
Age, years, mean (SD)	62 (15)	60 (15)	0.001
Male, n (%)	1,012 (36.9)	890 (37.2)	0.86
Race/Ethnicity, n (%)			0.19
Hispanic/Latino	644 (23.5)	552 (23.1)	
Non-Hispanic Black	839 (30.6)	716 (29.9)	
Non-Hispanic White	1,039 (37.9)	953 (39.8)	
Other			
BMI, kg/m <sup>2</sup> , mean (SD)	34 (24)	33 (20)	0.043
Smoking Status, n (%)			0.002
Non-Smoker	1,507 (55.0)	1,407 (58.8)	
Former Smoker	685 (25.0)	562 (23.5)	
Current Smoker	130 (4.7)	132 (5.5)	
Hypertension	1,729 (63.1)	1,425 (59.6)	0.011
Diabetes mellitus	1,145 (41.8)	1,020 (42.6)	0.55
Chronic kidney disease	387 (14.1)	285 (11.9)	0.022
mSOFA score	13 (3)	13 (3)	0.28
<b>In-hospital outcomes, n (%)</b>			
Death within 28 days	980 (35.8)	798 (33.4)	<0.001
Cardiovascular events within 14 days	558 (20.4)	362 (15.1)	<0.001

Abbreviations: BMI, body mass index; ICU, intensive care unit; mSOFA, modified Sequential Organ Failure Assessment score; SD, standard deviation

**Table S7. Multivariable risk model for myocardial injury**

	OR (95% CI) for myocardial injury at ICU admission	P-value
Age group, years		
18 – 39	1 [reference]	
40 – 49	1.16 (0.77, 1.76)	0.48
50 – 59	1.56 (1.07, 2.27)	0.02
60 – 69	1.96 (1.34, 2.87)	<0.001
70 – 79	3.05 (2.04, 4.57)	<0.001
≥ 80	5.94 (3.48, 8.66)	<0.001
Female		0.028
Race		
Non-Hispanic White	1 [reference]	
Non-Hispanic Black	1.48 (1.17, 1.86)	0.001
Hispanic	0.83 (0.65, 1.07)	0.15
Other	1.17 (0.92, 1.49)	0.19
Body mass index group, kg/m <sup>2</sup>		
< 25	1 [reference]	
25 – 29.9	0.94 (0.75, 1.18)	0.60
30 – 34.9	0.90 (0.70, 1.16)	0.42
35 – 39.9	1.02 (0.75, 1.38)	0.92
≥ 40	1.00 (0.76, 1.32)	0.99
Smoking Status		
Non-Smoker	1 [reference]	
Former Smoker	0.94 (0.77, 1.16)	0.57
Current Smoker	1.32 (0.90, 1.94)	0.16
Cardiovascular disease	1.67 (1.33, 2.11)	<0.001
Hypertension	1.26 (1.02, 1.56)	0.03
Diabetes mellitus	1.17 (0.97, 1.41)	0.10
Chronic kidney disease	1.41 (1.09, 1.82)	0.008
ACE-I/ARB	0.94 (0.77, 1.15)	0.56
Mineralocorticoid receptor antagonist	1.35 (0.76, 2.40)	0.31
Beta-blocker	1.26 (1.02, 1.56)	0.030
Statin	0.97 (0.79, 1.19)	0.77
Aspirin	1.26 (1.01, 1.57)	0.039
Anticoagulation	1.28 (0.96, 1.70)	0.10

Abbreviations: ACE-I, angiotensin-converting enzyme inhibitor; ARB, angiotensin-II receptor blocker; CI, confidence interval; ICU, intensive care unit; OR, odds ratio

**Table S8. Death and cardiovascular events according to myocardial injury status on ICU admission**

	<b>No myocardial injury at ICU admission* (n = 1,478)</b>	<b>Myocardial injury at ICU admission* (n = 1,262)</b>	<b>P-value</b>
<b>Death within 28 days, n (%)</b>	384 (26.0)	596 (47.2)	<0.001
<b>Cardiovascular events within 14 days, n (%)</b>	220 (14.9)	338 (26.8)	<0.001
Ventricular fibrillation or sustained VT	27 (1.8)	33 (2.1)	0.20
Non-sustained VT	26 (1.8)	32 (15.1)	0.20
Atrial fibrillation or flutter	125 (9.0) <sup>†</sup>	174 (15.7) <sup>§</sup>	<0.001
New-onset heart failure	32 (2.4) <sup>‡</sup>	68 (6.7) <sup>  </sup>	<0.001
Myocarditis or pericarditis	25 (1.7)	106 (8.4)	<0.001
Stroke	14 (0.9)	17 (1.3)	0.42

\* Among those with troponin data at admission, n = 2,740

<sup>†</sup> Out of 1,396 patients without atrial fibrillation or flutter prior to hospital admission

<sup>‡</sup> Out of 1,349 patients without congestive heart failure prior to hospital admission

<sup>§</sup> Out of 1,110 patients without atrial fibrillation or flutter prior to hospital admission

<sup>||</sup> Out of 1,012 patients without congestive heart failure prior to hospital admission

Abbreviations: ICU, intensive care unit; VT, ventricular tachycardia

**Table S9. Multivariable-adjusted associations between troponin categories with death and cardiovascular events**

	Model 0*		Model 1†		Model 2‡		Model 3§	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
<b>Death within 28 days</b>								
Normal	1.0 [reference]		1.0 [reference]		1.0 [reference]		1.0 [reference]	
1 – 2 x URL	1.41 (1.09, 1.83)	0.008	1.14 (0.87, 1.50)	0.34	1.07 (0.81, 1.42)	0.64	1.06 (0.80, 1.40)	0.70
> 2 – 3 x URL	2.20 (1.64, 2.96)	<0.001	1.65 (1.21, 2.25)	0.002	1.58 (1.14, 2.19)	0.006	1.57 (1.13, 2.17)	0.007
> 3 – 4 x URL	2.91 (1.97, 4.28)	<0.001	2.47 (1.66, 3.69)	<0.001	2.40 (1.58, 3.63)	<0.001	2.41 (1.59, 3.66)	<0.001
> 4 x URL	3.60 (2.96, 4.40)	<0.001	2.87 (2.33, 3.54)	<0.001	2.78 (2.23, 3.47)	<0.001	2.77 (2.22, 3.45)	<0.001
<b>Cardiovascular events</b>								
Normal	1.0 [reference]		1.0 [reference]		1.0 [reference]		1.0 [reference]	
1 – 2 x URL	1.01 (0.73, 1.41)	0.94	0.89 (0.63, 1.25)	0.51	0.90 (0.63, 1.28)	0.55	0.90 (0.63, 1.28)	0.55
> 2 – 3 x URL	1.38 (0.96, 2.01)	0.08	1.17 (0.80, 1.70)	0.43	1.19 (0.80, 1.76)	0.39	1.19 (0.80, 1.76)	0.40
> 3 – 4 x URL	1.71 (1.08, 2.70)	0.23	1.53 (0.96, 2.44)	0.07	1.67 (1.03, 2.70)	0.038	1.67 (1.03, 2.70)	0.038
> 4 x URL	3.27 (2.62, 4.07)	<0.001	2.81 (2.23, 3.53)	<0.001	3.00 (2.35, 3.81)	<0.001	3.00 (2.35, 3.81)	<0.001

\* Model 0 = Unadjusted

† Model 1 = Model 0 + age, sex, race

‡ Model 2 = Model 1 + BMI, smoking, diabetes mellitus, hypertension, chronic kidney disease, cardiovascular disease

§ Model 3 = Model 2 + modified SOFA

Abbreviations: BMI, body mass index; CI, confidence interval; OR, odds ratio; SOFA, Sequential Organ Failure Assessment; URL, upper reference limit of normal



**Table S10. Associations between myocardial injury at ICU admission and troponin categories with outcomes adjusted for institution**

	Model*	
	OR (95% CI)	P-value
<b>Death within 28 days</b>		
<i>Myocardial injury at admission</i>	1.89 (1.57, 2.27)	<0.001
<i>Troponin elevation at admission</i>		
Normal	1.0 [reference]	
1 – 2 x URL	1.09 (0.81, 1.45)	0.58
> 2 – 3 x URL	1.56 (1.12, 2.19)	0.009
> 3 – 4 x URL	2.51 (1.63, 3.87)	<0.001
> 4 x URL	2.54 (2.02, 3.19)	<0.001
<b>Cardiovascular events</b>		
<i>Myocardial injury at admission</i>	1.79 (1.45, 2.21)	<0.001
<i>Troponin elevation at admission</i>		
Normal	1.0 [reference]	
1 – 2 x URL	0.89 (0.63, 1.28)	0.54
> 2 – 3 x URL	1.18 (0.79, 1.75)	0.41
> 3 – 4 x URL	1.67 (1.03, 2.72)	0.037
> 4 x URL	2.93 (2.30, 3.73)	<0.001

\*Model: Generalized linear mixed effects models adjusted for age sex, race, body mass index, smoking, diabetes mellitus, hypertension, chronic kidney disease, cardiovascular disease, modified SOFA, and participating institution (random effect)  
 Abbreviations: CI, confidence interval; OR, odds ratio; SOFA, Sequential Organ Failure Assessment; URL, upper reference limit of normal.

**Table S11. Associations between myocardial injury at ICU admission and troponin categories with outcomes including patients with missing troponin**

	Model*	
	OR (95% CI)	P-value
<b>Death within 28 days</b>		
<i>Myocardial injury at admission</i>	1.54 (1.34, 1.78)	<0.001
<i>Troponin elevation at admission</i>		
Normal	1.0 [reference]	
1 – 2 x URL	1.09 (0.81, 1.45)	0.58
> 2 – 3 x URL	1.56 (1.12, 2.19)	0.009
> 3 – 4 x URL	2.51 (1.63, 3.87)	<0.001
> 4 x URL	2.54 (2.02, 3.19)	<0.001
<b>Cardiovascular events</b>		
<i>Myocardial injury at admission</i>	1.75 (1.49, 2.06)	<0.001
<i>Troponin elevation at admission</i>		
Normal	1.0 [reference]	
1 – 2 x URL	0.89 (0.63, 1.28)	0.54
> 2 – 3 x URL	1.18 (0.79, 1.75)	0.41
> 3 – 4 x URL	1.67 (1.03, 2.72)	0.037
> 4 x URL	2.93 (2.30, 3.73)	<0.001

\*Model: adjusted for age sex, race, body mass index, smoking, diabetes mellitus, hypertension, chronic kidney disease, cardiovascular disease, modified SOFA  
Abbreviations: CI, confidence interval; OR, odds ratio; SOFA, Sequential Organ Failure Assessment; URL, upper reference limit of normal.

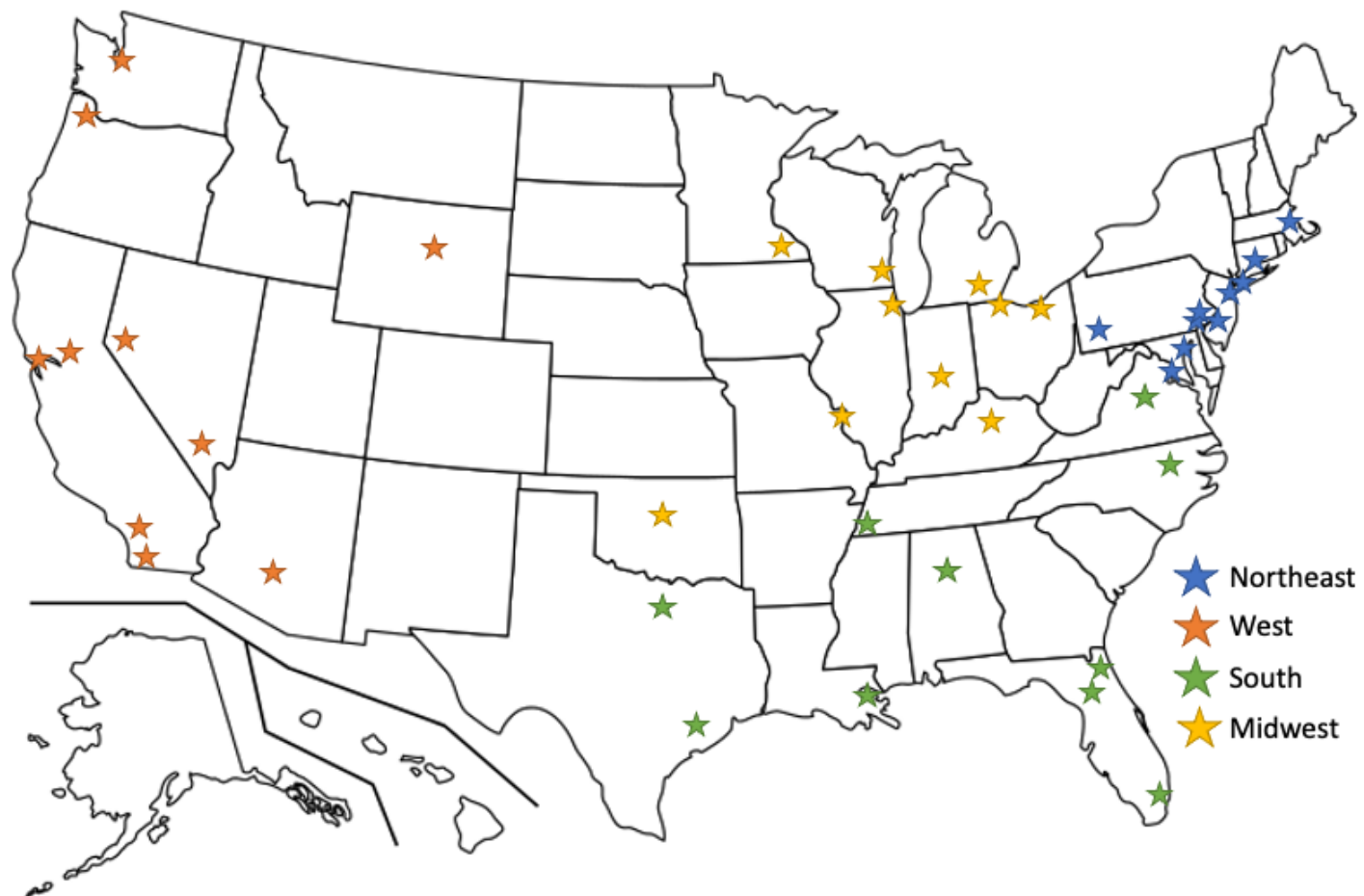
**Table S12. Associations between myocardial injury and outcomes stratified by pre-existing CVD, CAD, and CHF**

	Death within 28 days			Cardiovascular events		
	OR* (95% CI)	P-value	P-Int	OR* (95% CI)	P-value	P-Int
Cardiovascular disease			0.31			0.11
No	2.49 (2.06, 3.02)	<0.001		2.08 (1.64, 2.63)	<0.001	
Yes	2.05 (1.48, 2.85)	<0.001		1.36 (0.89, 2.07)	0.15	
Coronary artery disease			0.67			0.43
No	2.50 (2.11, 2.97)	<0.001		2.09 (1.71, 2.56)	<0.001	
Yes	2.23 (1.33, 3.72)	0.002		1.63 (0.91, 2.93)	0.10	
Congestive heart failure			0.10			0.06
Yes	2.64 (2.22, 3.13)	<0.001		2.28 (1.86, 2.78)	<0.001	
No	1.70 (1.03, 2.80)	0.037		1.20 (0.64, 2.26)	0.57	

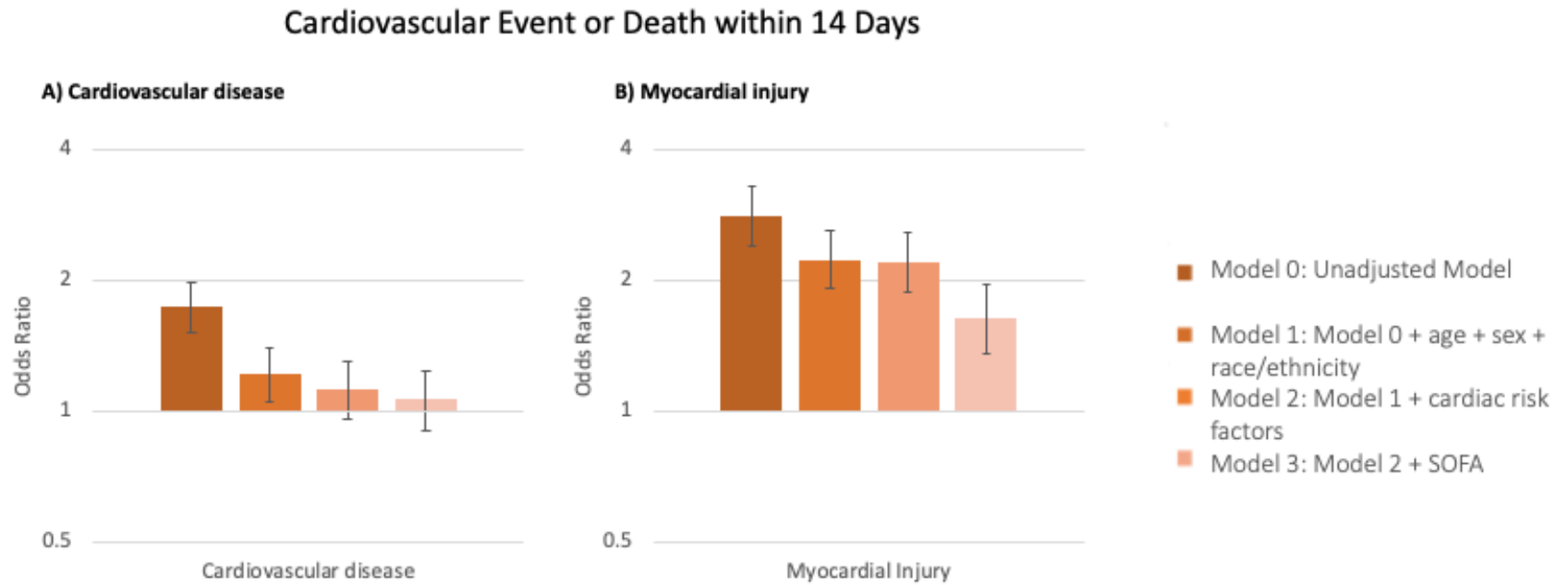
\*Based on unadjusted models

Abbreviations: CAD, coronary artery disease; CHF, congestive heart failure; CI, confidence interval; CVD, cardiovascular disease; OR, odds ratio; P-Int, P-value for interaction

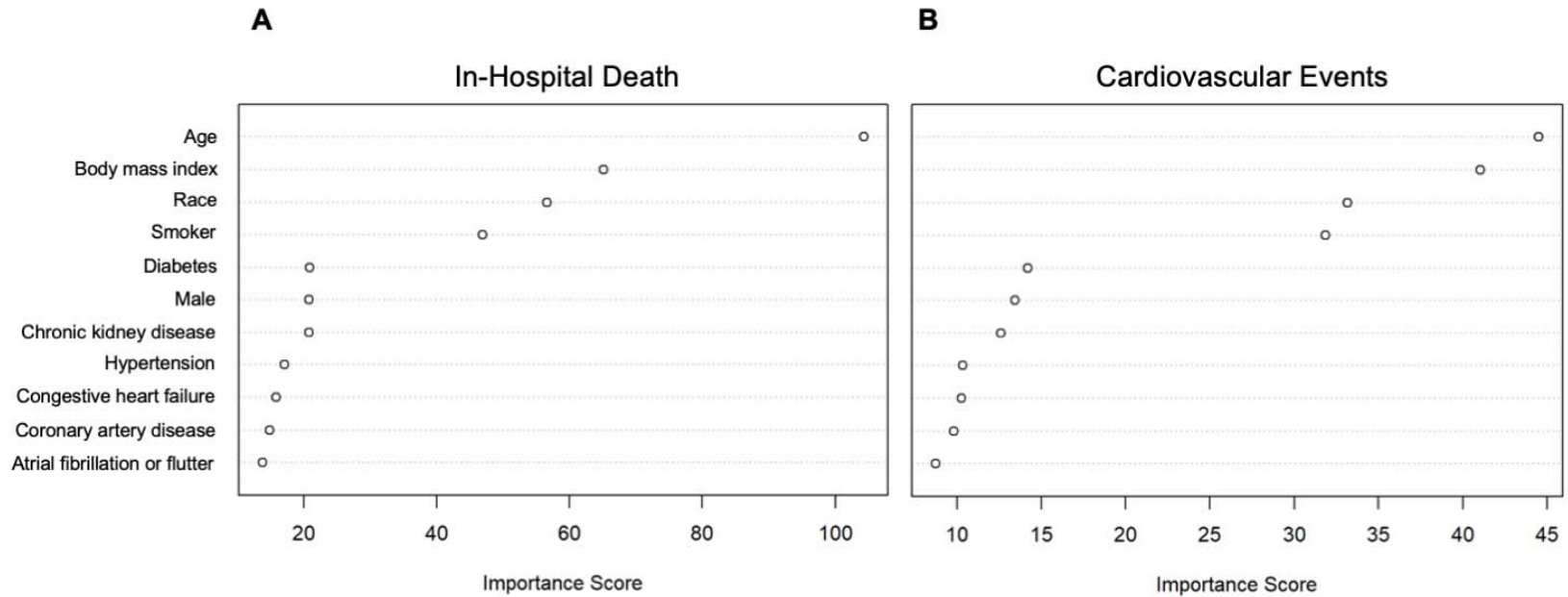
Figure S1. Map of participating sites



**Figure S2. Association between pre-existing CVD (A) and myocardial injury (B) with a composite of in-hospital death and cardiovascular events within 14 days.** Abbreviations: CVD, cardiovascular disease; SOFA, Sequential Organ Failure Assessment



**Figure S3. Variable importance in predicting 28-day mortality and cardiovascular events.** Variable importance plot based on Gini Index using random forest approach using model 2 (adjusted for age, race/ethnicity, sex, smoking status, body mass index, and history of pre-existing diabetes mellitus, hypertension, and chronic kidney disease) for predicting death (Panel A) and cardiovascular events (Panel B).



**Figure S4. Associations between myocardial injury and death and cardiovascular events.**  
Abbreviations: SOFA, Sequential Organ Failure Assessment

