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Piloting AI COVID -19 Prognostic Tool: COVID Explainable AI -Based Consortium

30 OCT 2020



National Artificial Intelligence Institute

EPIC-21-06-25-VA-FOIA-20210929-Production-COVID-Prognostic-Tool-Presentation

NAII@va.gov

Leveraging AI for COVID19 Prognosis: Approach

- **Problem**

- Given a positive genomic detection-based COVID viral test, what is prognosis? Will patient need hospitalization, be at risk for death, etc.?

- **Approach**

- Develop and apply AI models for prognosis of COVID-positive patients using clinical and non-clinical information.

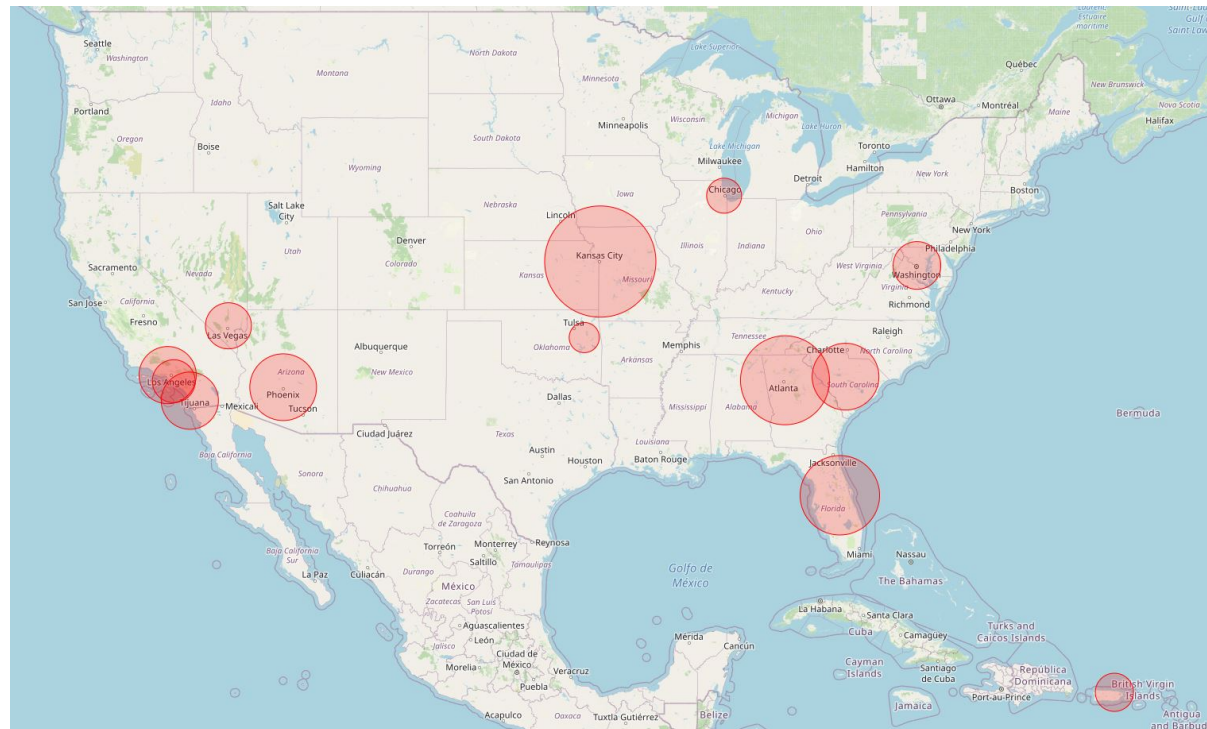
- **Methods**

- Collaboration with Wash DC VA (with access to all VA data sites)
- Customized AI/machine learning models based on information to pull of all patients with COVID+ test results across VA



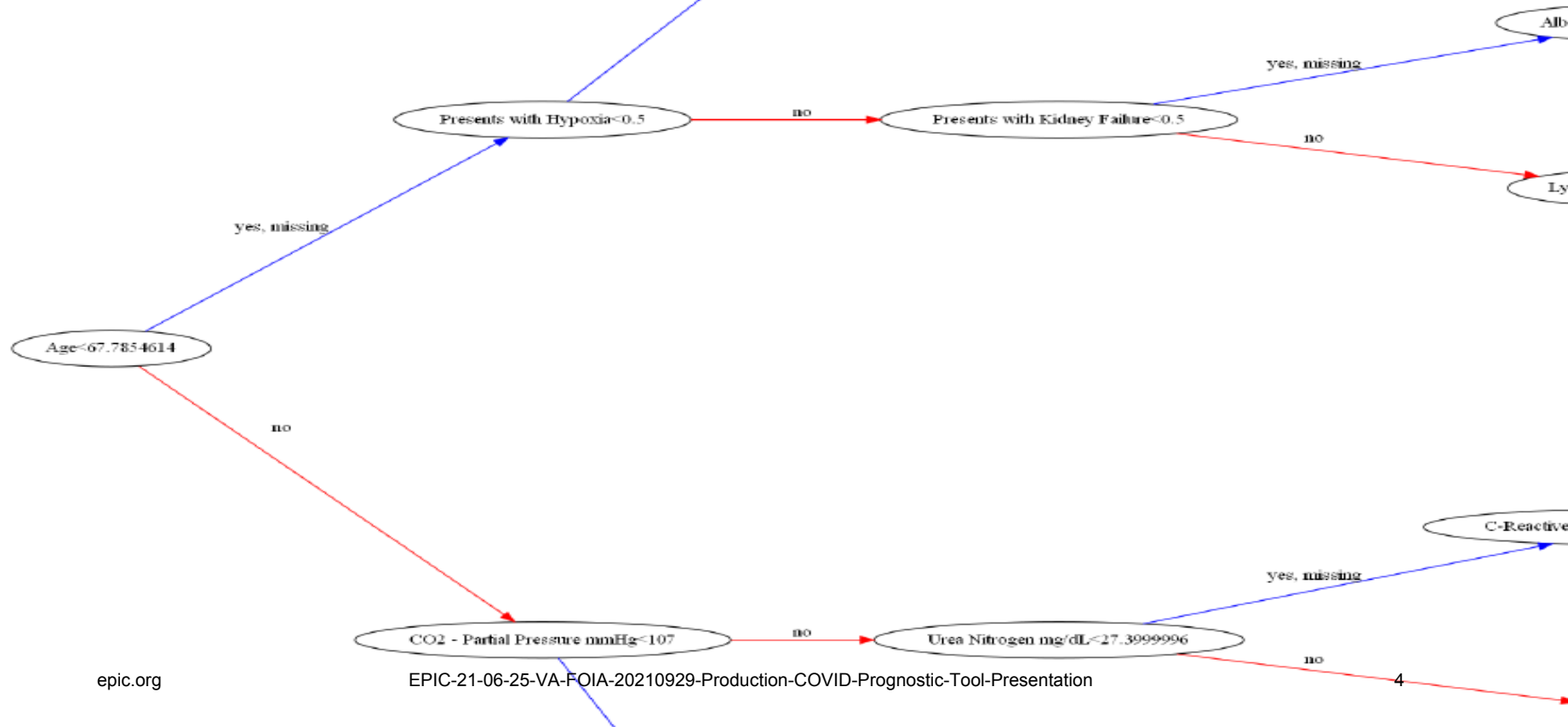
Source: <https://www.sacbee.com/news/local/health-and-medicine/article241790336.html>

Potential Pilot Sites and Enrollment



Site	Enrollment
Atlanta, GA	113,550
Chicago (Westside), IL	39,535
Columbia, SC	85,561
VA Heartland West (Kansas City MO)	132,507
Southern Nevada HCS (Las Vegas NV)	57,383
Long Beach HCS (Long Beach CA)	55,112
Muskogee, OK	37,644
Phoenix, AZ	84,903
San Diego HCS (San Diego CA)	72,863
VA Caribbean Healthcare System	55,411
Orlando, FL	108,076
Washington DC	56,846
Greater Los Angeles HCS (Los Angeles CA)	72,030
Total	971,421

Here's Part of the Decision Process



Redacted

Patient N000005

Age

M

Gender

71.00

Height

201.30

Weight

White

Race

Not Hispanic Or
Latino

Ethnicity

Redacted

Negative Covid-19

Covid 19 Status

9/21/2020 12:00:00 AM

C19 Positive/Negative/PUI Time

Mortality Risk Score

0.25

Feature - The name of the dependent variable used to calculate the patient risk score.

Explanation - the direction and magnitude to which the feature affected the risk score.

+ value = Increased probability

- value = Decreased Probability

Value - The numeric value of the feature used to calculate probability.

To denote the absence or presence of a disease or disease history, the values 0 (absence) and 1 (presence) are used.

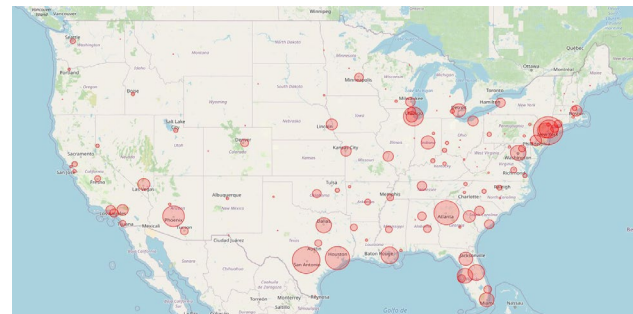
[Elixhauser Mortality Score](#) is a comorbidity-based mortality likelihood score.

Feature	Explanation	Value
Platelets 10 ⁹ /L	0.62	37.00
Red Blood Cell Count M/cmm	0.28	2.33
Lymphocytes %	0.13	11.00
Bilirubin - Total mg/dL	0.06	0.30
Diastolic	0.06	58.00
Pulse	0.04	88.00
Elix Mortality Score	0.04	10.00
History of Anemia	0.00	1.00
History of Prostate Problems	0.00	0.00
Presents with Pneumonia	0.00	0.00
BMI GTE 48	0.00	0.00
History of Atherosclerosis	0.00	0.00
Respiration	-0.01	20.00
Presents with Do Not Resuscitate	-0.02	0.00
Systolic	0.00	120.00
Present with Acute Renal Failure	0.00	0.00

MissingValues

C-Reactive Protein MG/DL, FIO2, CO2 -
Partial Pressure mmHg, D-Dimer ng/ml

- Feedback on dashboard at your institution on interface, etc regardless of pilot
- Feedback on decision tree/features to help explainable AI
- Look over accuracies/performance metrics of model at your medical center historically (available) and track over time.
- Need: Point-of-Contact for your pilot
- Outputs: new interface, handbook guideline for clinical decision support based on explainable AI, report on model applicability across sites and/or improvements needed.



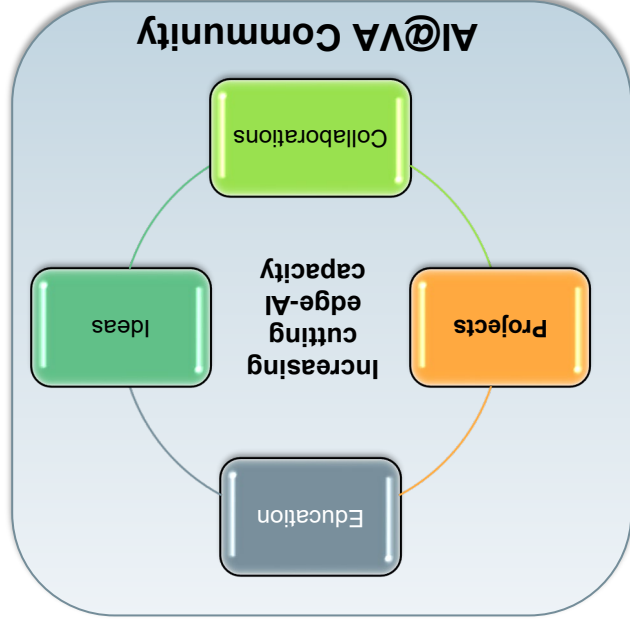
Timeline

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[Text]



The AI@VA community will connect those with interest in cutting-edge AI at every level of the organization with links to training, opportunities for collaboration, and one another.



If in VA, join the list here:

<https://www.research.va.gov/nail/join.cfm>

If outside VA, please contact:
NAIL@va.gov

Thank you

Contact: NAII@va.gov