Patient-level prediction #3: Amongst patients hospitalized with pneumonia, who are most likely to require intensive services or die?

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Background

- Lack of evidence of factors associated with disease severity
- Enables close monitoring of high risk patients
- Indicator for short-term demand of intensive services

Methods

- T [IV]: Hospitalization with pneumonia
- T [EV]: Hospitalization with COVID-19

- O1: Patients requiring intensive services* or death
- O2: Death

* Includes ventilation, intubation, tracheotomy, or ECMO.

Preliminary results

Analysis	Dev	Val	T	O	Model	TAR start	TAR end	AUC	AUPRC	T Size	O Count	O Incidence (%)
Analysis_1	optumDod	optumDod	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID27 V1] Hospitalizations with pneumonia or ARDS or sepsis or AKI requiring intensive services or resulting in death in 30d	Lasso Logistic Regression	0	30	0.642	0.322	37499	8062	21.499
Analysis_2	optumDod	optumDod	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID28 v1] persons who die	Lasso Logistic Regression	0	30	0.72077	0.1743	37500	2783	7.42133
Analysis_3	optumDod	optumDod	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID27 V1] Hospitalizations with pneumonia or ARDS or sepsis or AKI requiring intensive services or resulting in death in 30d	Lasso Logistic Regression	0	30	0.538	0.236	37499	8062	21.499
Analysis_4	optumDod	optumDod	[COVID19 ID29 V1] Hospitalizations with pneumonia, age>=18	[COVID19 ID28 v1] persons who die	Lasso Logistic Regression	0	30	0.6305	0.1106	37499	2782	7.4189

Discussion and next steps

- Developing more parsimonious models
  - easier to use and understand in practice
- External validation in COVID-19 data
- In the future: also train models in COVID-19 data