PRELIMINARY RESULTS FOR BRAZIL COVID-19 DATASET

Salomon Wollenstein-Betech, Christos G. Cassandras, Ioannis Ch. Paschalidis, Amanda Batista, Julia Fleck

1 Basic Analytics

	0
N	73649
N_Hosp	67042
N_Death	24524
Female	31368
Male	42262
Race	21636
Schooling	5451
Contracted At Hospital	1982
Contact Birds Pigs	615
Fever	54483
Cough	56681
Throat	15962
Dyspnea	51312
Respiratory Discomfort	42990
SpO2 less 95\%	40806
Diarrhea	10066
Vomiting	5669
Other Symptoms	23044
Postpartum	313
Cardiovascular Disease	23085
Hematologic Disease	708
Down Syndrome	180
Liver Chronic Disease	622
Asthma	2058
Diabetes	17271
Neurological Disease	2783
Another Chronic Pneumopathy	2725
Immunosuppression	2245
Renal Chronic Disease	2995
Obesity	2656
Other Risks	17778
Antiviral Use	24765
Hospitalization	67042
ICU	22332
Ventilator	13621
Xray Torax Result	2029
Result Final	0
Evolution	27934

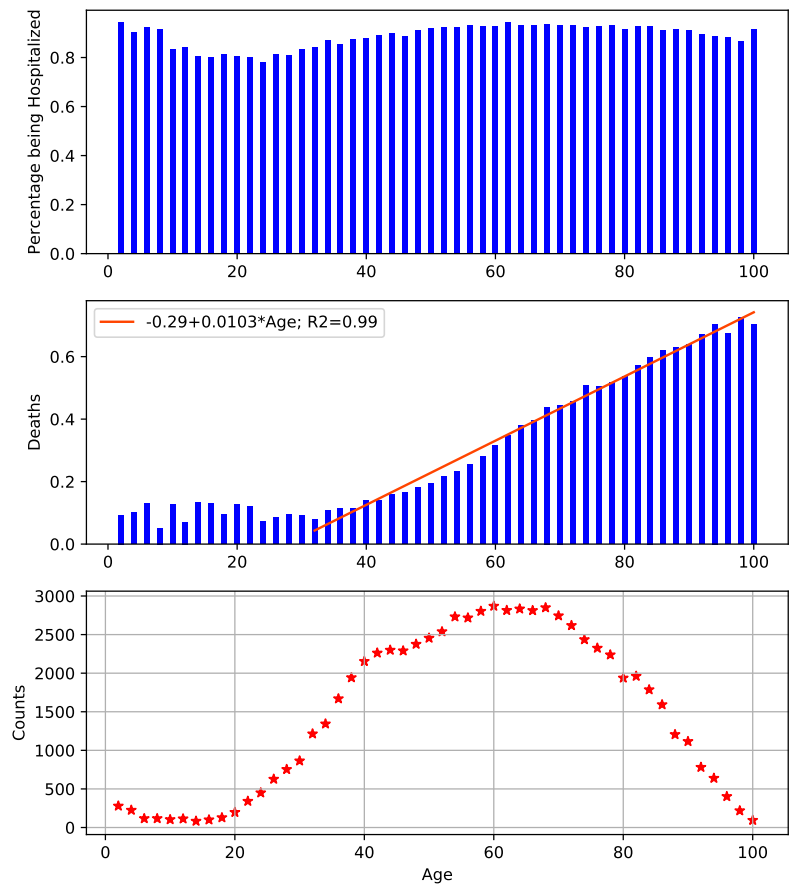**Table 1:** Number of observations with a specific observation

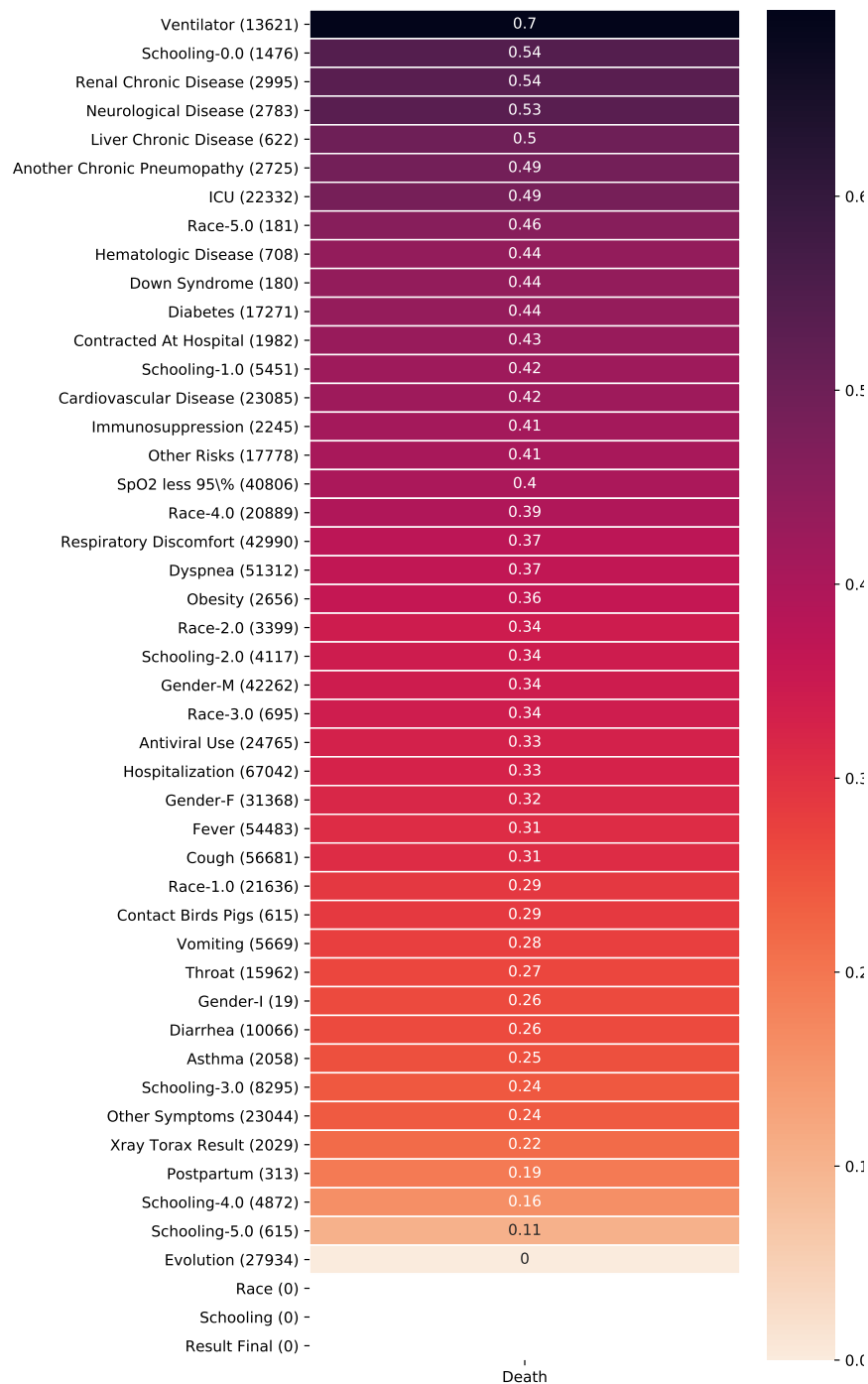**Figure 1:** Distribution of hospitalization and deaths by age group

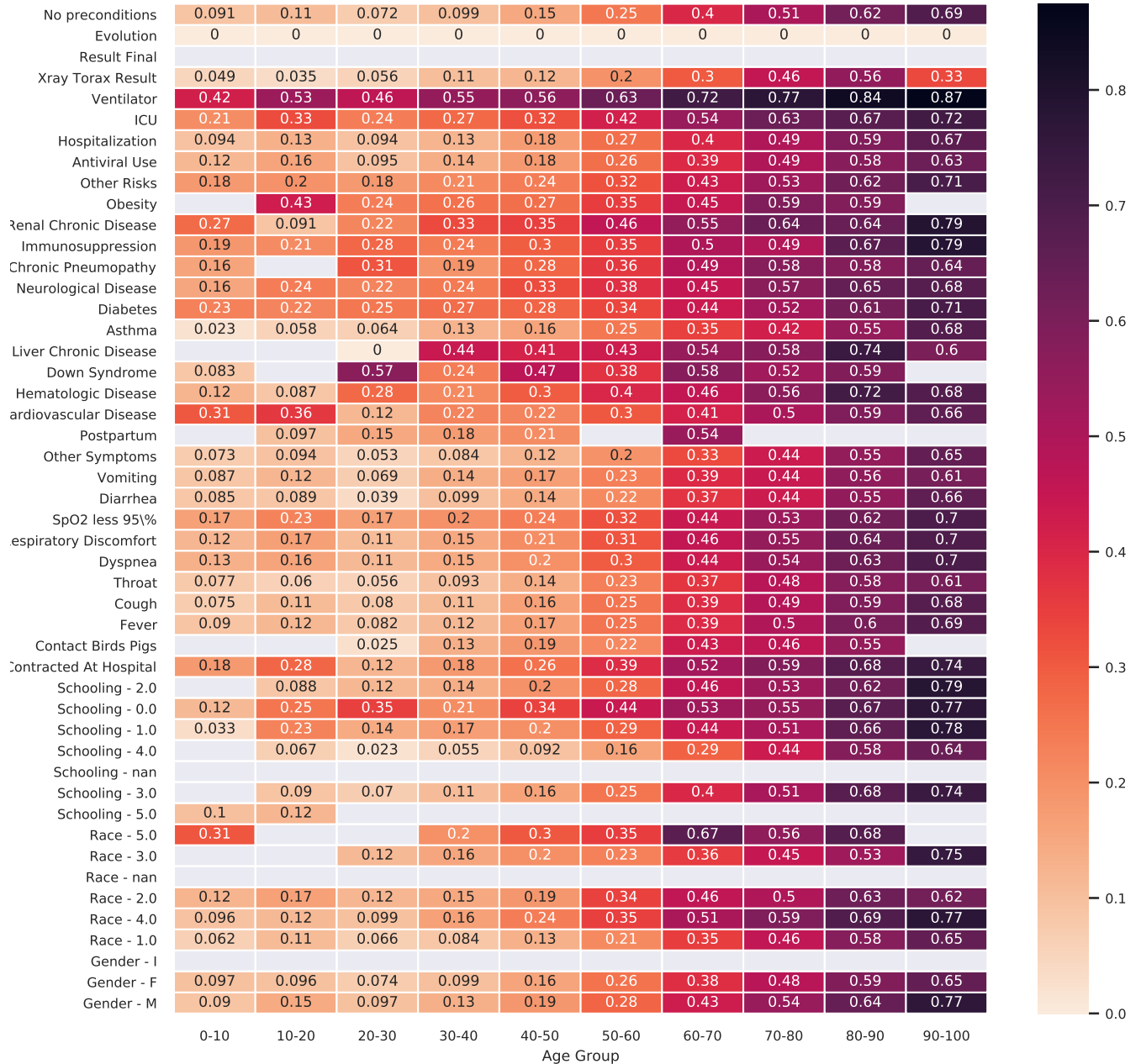**Figure 2:** Share of hospitalized and deaths patients given characteristics

Characteristic	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No preconditions	0.091	0.11	0.072	0.099	0.15	0.25	0.4	0.51	0.62	0.69
Evolution	0	0	0	0	0	0	0	0	0	0
Result Final										
Xray Torax Result	0.049	0.035	0.056	0.11	0.12	0.2	0.3	0.46	0.56	0.33
Ventilator	0.42	0.53	0.46	0.55	0.56	0.63	0.72	0.77	0.84	0.87
ICU	0.21	0.33	0.24	0.27	0.32	0.42	0.54	0.63	0.67	0.72
Hospitalization	0.094	0.13	0.094	0.13	0.18	0.27	0.4	0.49	0.59	0.67
Antiviral Use	0.12	0.16	0.095	0.14	0.18	0.26	0.39	0.49	0.58	0.63
Other Risks	0.18	0.2	0.18	0.21	0.24	0.32	0.43	0.53	0.62	0.71
Obesity		0.43	0.24	0.26	0.27	0.35	0.45	0.59	0.59	
Renal Chronic Disease	0.27	0.091	0.22	0.33	0.35	0.46	0.55	0.64	0.64	0.79
Immunosuppression	0.19	0.21	0.28	0.24	0.3	0.35	0.5	0.49	0.67	0.79
Chronic Pneumopathy	0.16		0.31	0.19	0.28	0.36	0.49	0.58	0.58	0.64
Neurological Disease	0.16	0.24	0.22	0.24	0.33	0.38	0.45	0.57	0.65	0.68
Diabetes	0.23	0.22	0.25	0.27	0.28	0.34	0.44	0.52	0.61	0.71
Asthma	0.023	0.058	0.064	0.13	0.16	0.25	0.35	0.42	0.55	0.68
Liver Chronic Disease			0	0.44	0.41	0.43	0.54	0.58	0.74	0.6
Down Syndrome	0.083		0.57	0.24	0.47	0.38	0.58	0.52	0.59	
Hematologic Disease	0.12	0.087	0.28	0.21	0.3	0.4	0.46	0.56	0.72	0.68
Cardiovascular Disease	0.31	0.36	0.12	0.22	0.22	0.3	0.41	0.5	0.59	0.66
Postpartum		0.097	0.15	0.18	0.21		0.54			
Other Symptoms	0.073	0.094	0.053	0.084	0.12	0.2	0.33	0.44	0.55	0.65
Vomiting	0.087	0.12	0.069	0.14	0.17	0.23	0.39	0.44	0.56	0.61
Diarrhea	0.085	0.089	0.039	0.099	0.14	0.22	0.37	0.44	0.55	0.66
SpO2 less 95\%	0.17	0.23	0.17	0.2	0.24	0.32	0.44	0.53	0.62	0.7
Respiratory Discomfort	0.12	0.17	0.11	0.15	0.21	0.31	0.46	0.55	0.64	0.7
Dyspnea	0.13	0.16	0.11	0.15	0.2	0.3	0.44	0.54	0.63	0.7
Throat	0.077	0.06	0.056	0.093	0.14	0.23	0.37	0.48	0.58	0.61
Cough	0.075	0.11	0.08	0.11	0.16	0.25	0.39	0.49	0.59	0.68
Fever	0.09	0.12	0.082	0.12	0.17	0.25	0.39	0.5	0.6	0.69
Contact Birds Pigs			0.025	0.13	0.19	0.22	0.43	0.46	0.55	
Contracted At Hospital	0.18	0.28	0.12	0.18	0.26	0.39	0.52	0.59	0.68	0.74
Schooling - 2.0		0.088	0.12	0.14	0.2	0.28	0.46	0.53	0.62	0.79
Schooling - 0.0	0.12	0.25	0.35	0.21	0.34	0.44	0.53	0.55	0.67	0.77
Schooling - 1.0	0.033	0.23	0.14	0.17	0.2	0.29	0.44	0.51	0.66	0.78
Schooling - 4.0		0.067	0.023	0.055	0.092	0.16	0.29	0.44	0.58	0.64
Schooling - nan										
Schooling - 3.0		0.09	0.07	0.11	0.16	0.25	0.4	0.51	0.68	0.74
Schooling - 5.0	0.1	0.12								
Race - 5.0	0.31			0.2	0.3	0.35	0.67	0.56	0.68	
Race - 3.0			0.12	0.16	0.2	0.23	0.36	0.45	0.53	0.75
Race - nan										
Race - 2.0	0.12	0.17	0.12	0.15	0.19	0.34	0.46	0.5	0.63	0.62
Race - 4.0	0.096	0.12	0.099	0.16	0.24	0.35	0.51	0.59	0.69	0.77
Race - 1.0	0.062	0.11	0.066	0.084	0.13	0.21	0.35	0.46	0.58	0.65
Gender - I										
Gender - F	0.097	0.096	0.074	0.099	0.16	0.26	0.38	0.48	0.59	0.65
Gender - M	0.09	0.15	0.097	0.13	0.19	0.28	0.43	0.54	0.64	0.77

Age Group

Figure 3: Share of hospitalized and deaths patients given characteristics and age group

2 Results

2.1 Mortality (previous)

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
Age 0-30	-1.600	-1.727	-1.474	0.202	0.178	0.229	0.342	0.104	0.000	0.000
Age 30-50	-1.184	-1.239	-1.128	0.306	0.290	0.324	0.396	0.152	0.000	0.000
Race Indigenous	0.801	0.396	1.206	2.227	1.485	3.339	0.327	0.495	0.004	0.000
Liver Chronic Disease	0.589	0.373	0.804	1.802	1.453	2.235	0.325	0.523	0.000	0.000
Cough	-0.581	-0.630	-0.531	0.559	0.532	0.588	0.408	0.305	0.000	0.000
Renal Chronic Disease	0.543	0.444	0.642	1.721	1.559	1.901	0.318	0.544	0.000	0.000
Other Symptoms	-0.535	-0.582	-0.488	0.585	0.559	0.614	0.365	0.245	0.000	0.000
Schooling Superior	-0.515	-0.623	-0.408	0.597	0.536	0.665	0.337	0.175	0.000	0.000
Neurological Disease	0.464	0.364	0.563	1.590	1.439	1.756	0.319	0.515	0.000	0.000
Postpartum	0.430	0.082	0.778	1.537	1.086	2.176	0.328	0.212	0.005	0.015
SpO2 less 95\%	0.390	0.343	0.437	1.478	1.410	1.549	0.230	0.395	0.000	0.000
Fever	-0.339	-0.386	-0.292	0.712	0.680	0.747	0.391	0.306	0.000	0.000
Race White	-0.319	-0.371	-0.267	0.727	0.690	0.766	0.347	0.282	0.000	0.000
Another Chronic Pneumopathy	0.290	0.189	0.391	1.336	1.208	1.478	0.320	0.492	0.000	0.000
Race Brown	0.271	0.220	0.322	1.312	1.247	1.380	0.304	0.389	0.000	0.000
Asthma	-0.268	-0.405	-0.132	0.765	0.667	0.876	0.330	0.249	0.000	0.000
Respiratory Discomfort	0.268	0.221	0.316	1.308	1.247	1.372	0.260	0.371	0.000	0.000
Throat	-0.241	-0.296	-0.186	0.786	0.744	0.831	0.342	0.271	0.000	0.000
Diarrhea	-0.238	-0.304	-0.172	0.788	0.738	0.842	0.338	0.263	0.000	0.000
Other Risks	0.224	0.177	0.271	1.251	1.193	1.312	0.304	0.396	0.000	0.000
Contracted At Hospital	0.221	0.095	0.348	1.248	1.100	1.416	0.324	0.454	0.000	0.001
Gender F	-0.217	-0.259	-0.175	0.805	0.772	0.839	0.334	0.318	0.005	0.000
Immunosuppression	0.208	0.089	0.327	1.232	1.093	1.387	0.325	0.408	0.000	0.001
Schooling Medium 1-3	-0.176	-0.251	-0.102	0.839	0.778	0.903	0.336	0.252	0.000	0.000
Dyspnea	0.168	0.118	0.217	1.183	1.125	1.243	0.249	0.357	0.000	0.000
Diabetes	0.159	0.110	0.208	1.172	1.116	1.231	0.296	0.425	0.000	0.000
Hematologic Disease	0.103	-0.103	0.308	1.108	0.902	1.360	0.326	0.416	0.001	0.327
Cardiovascular Disease	0.101	0.056	0.147	1.107	1.057	1.158	0.285	0.415	0.000	0.000
Xray Torax Result Consolidation	0.097	-0.023	0.217	1.102	0.978	1.242	0.326	0.368	0.015	0.112
Vomiting	-0.064	-0.148	0.020	0.938	0.863	1.020	0.331	0.280	0.000	0.135
Schooling Elem 1-5	0.043	-0.034	0.120	1.044	0.966	1.128	0.321	0.409	0.000	0.276

Recursive Feature Elimination:

Number of features selected
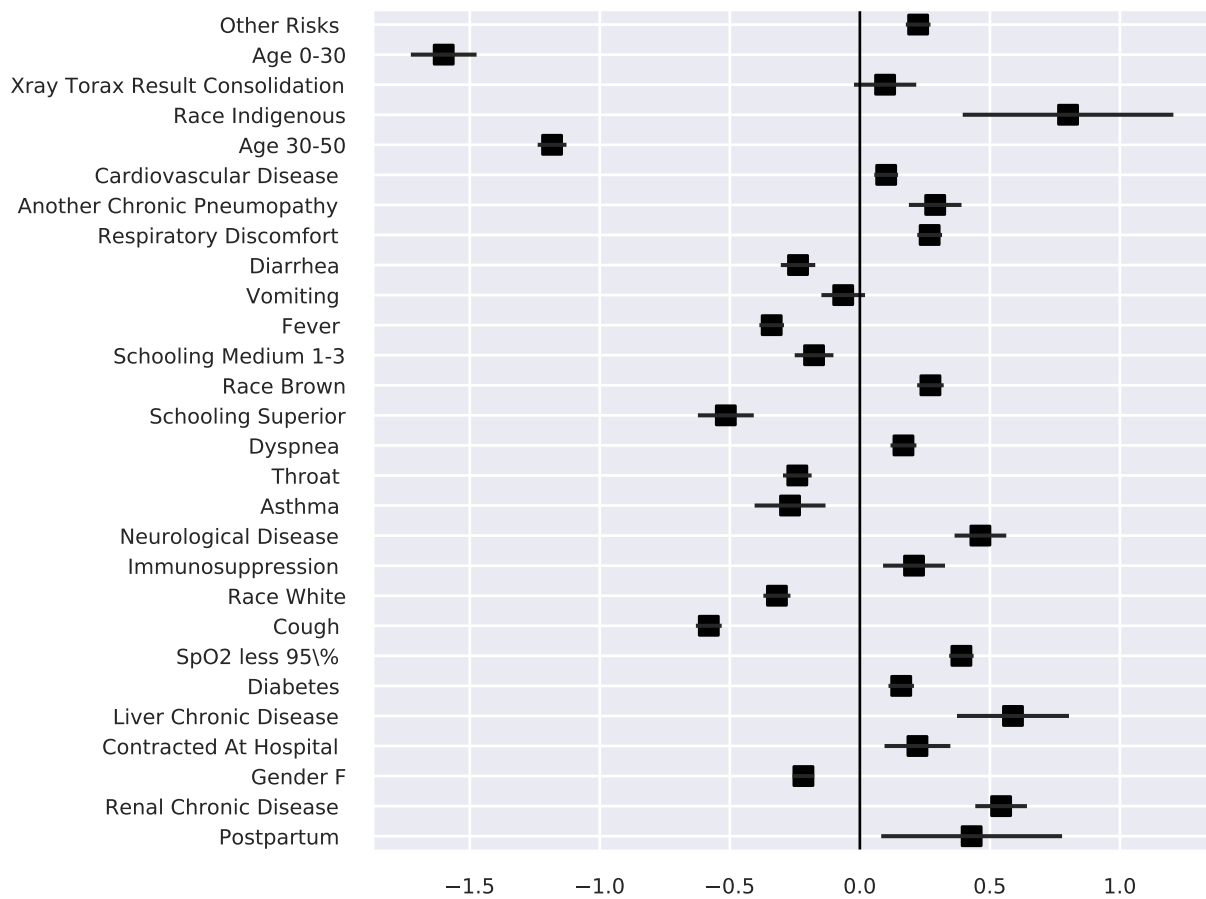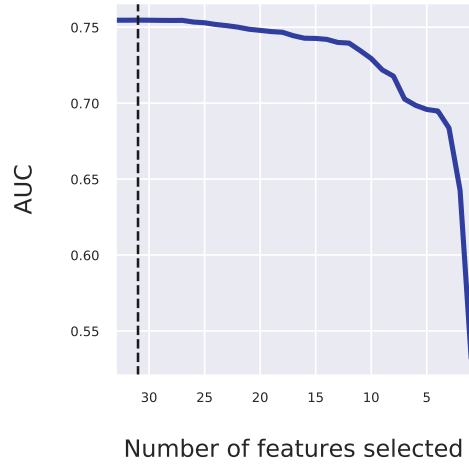
Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.675	0.674	0.644	0.673
F1w	0.651	0.649	0.509	0.645
AUC	0.706	0.706	0.694	0.709
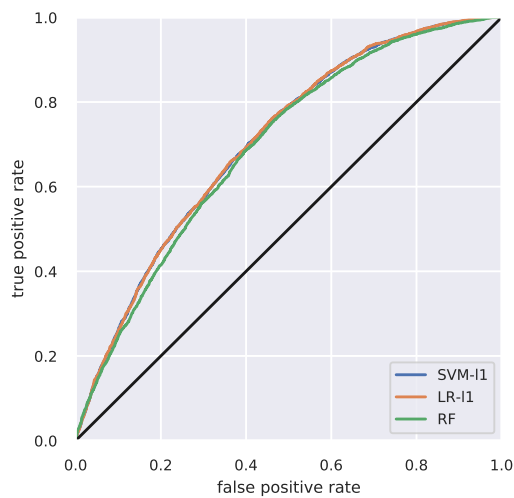
Coefficients:

	SVM-l1	LR-l1
Race Indigenous	0.728	0.562
Liver Chronic Disease	0.521	0.408
Renal Chronic Disease	0.525	0.384
Neurological Disease	0.448	0.331
SpO2 less 95\%	0.355	0.302
Postpartum	0.263	0.268
Race Brown	0.290	0.235
Respiratory Discomfort	0.261	0.211
Another Chronic Pneumopathy	0.297	0.210
Contracted At Hospital	0.249	0.195
Dyspnea	0.230	0.193
Other Risks	0.228	0.188
Immunosuppression	0.178	0.155
Diabetes	0.166	0.129
Cardiovascular Disease	0.137	0.109
Xray Torax Result Consolidation	0.100	0.080
Hematologic Disease	0.091	0.073
Schooling Elem 1-5	0.050	0.034
Vomiting	-0.050	-0.039
Gender F	-0.102	-0.088
Schooling Medium 1-3	-0.127	-0.110
Fever	-0.189	-0.143
Diarrhea	-0.172	-0.149
Race White	-0.187	-0.158
Throat	-0.195	-0.170
Asthma	-0.214	-0.180
Other Symptoms	-0.351	-0.301
Cough	-0.378	-0.301
Schooling Superior	-0.326	-0.327
Age 30-50	-0.809	-0.738
Age 0-30	-1.000	-1.000
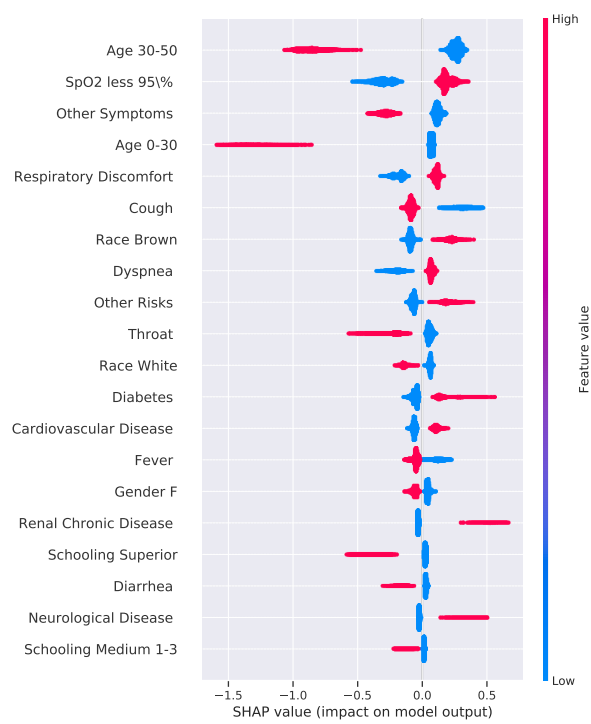
2.2 Mortality (previous) small

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
Age 0-30	-1.702	-1.829	-1.575	0.182	0.161	0.207	0.342	0.094	0.0	0.0
Fever	-0.936	-0.971	-0.901	0.392	0.379	0.406	0.392	0.305	0.0	0.0
Renal Chronic Disease	0.661	0.567	0.755	1.937	1.764	2.128	0.317	0.544	0.0	0.0
Schooling Medium 1-3	-0.544	-0.613	-0.474	0.581	0.542	0.622	0.336	0.245	0.0	0.0
Asthma	-0.527	-0.659	-0.394	0.591	0.517	0.674	0.329	0.249	0.0	0.0
Diarrhea	-0.427	-0.489	-0.364	0.653	0.613	0.695	0.336	0.263	0.0	0.0
Another Chronic Pneumopathy	0.340	0.242	0.438	1.405	1.274	1.549	0.320	0.480	0.0	0.0
Race Brown	0.271	0.228	0.314	1.311	1.256	1.370	0.302	0.390	0.0	0.0
Vomiting	-0.212	-0.293	-0.132	0.809	0.746	0.876	0.330	0.279	0.0	0.0
Cardiovascular Disease	0.191	0.150	0.231	1.210	1.162	1.259	0.284	0.413	0.0	0.0
Respiratory Discomfort	0.166	0.128	0.203	1.181	1.137	1.226	0.260	0.370	0.0	0.0
Other Risks	0.146	0.102	0.189	1.157	1.108	1.209	0.303	0.397	0.0	0.0

Recursive Feature Elimination:

Number of features selected
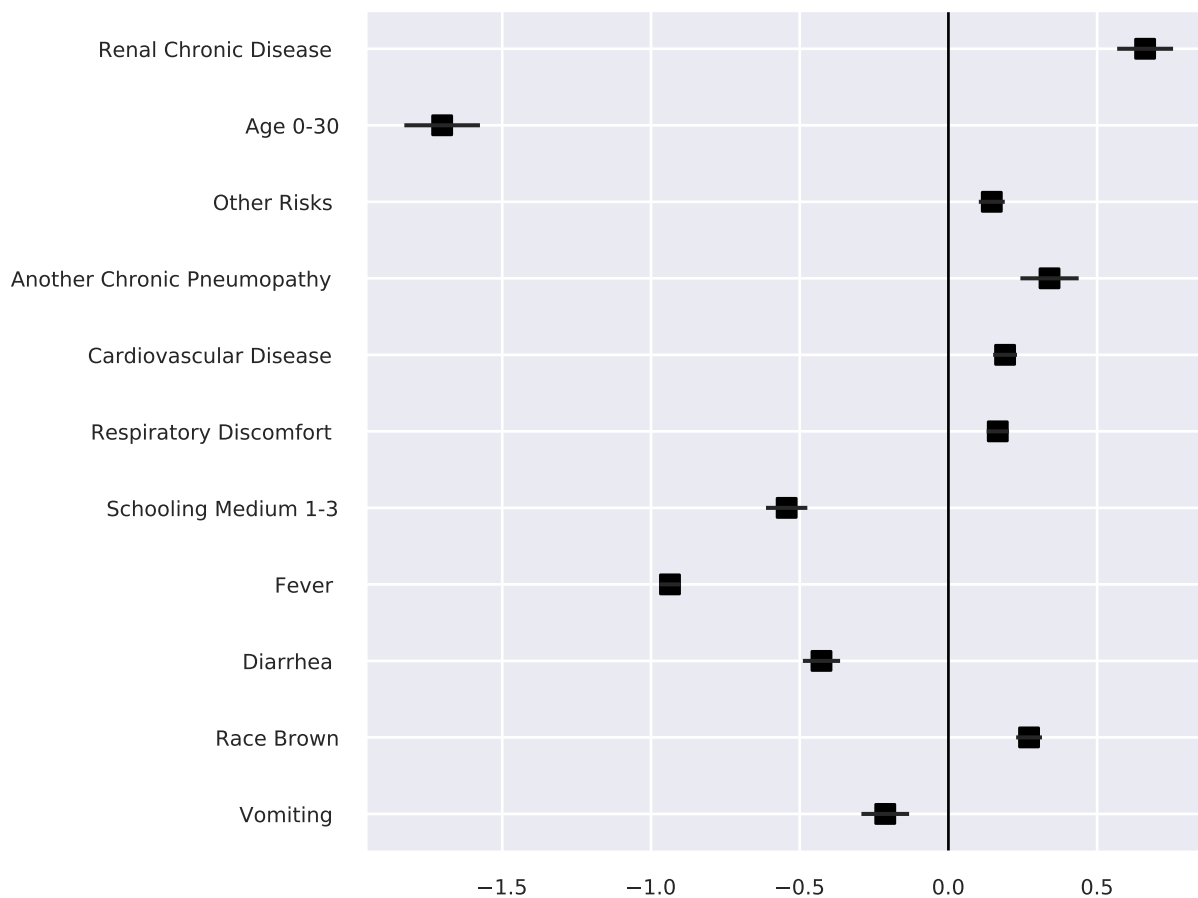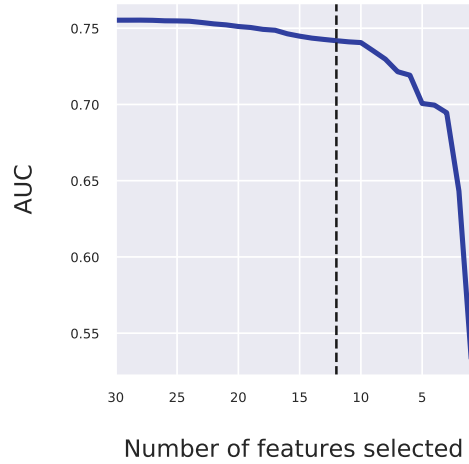
Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.646	0.645	0.640	0.646
F1w	0.578	0.574	0.518	0.571
AUC	0.638	0.638	0.628	0.637
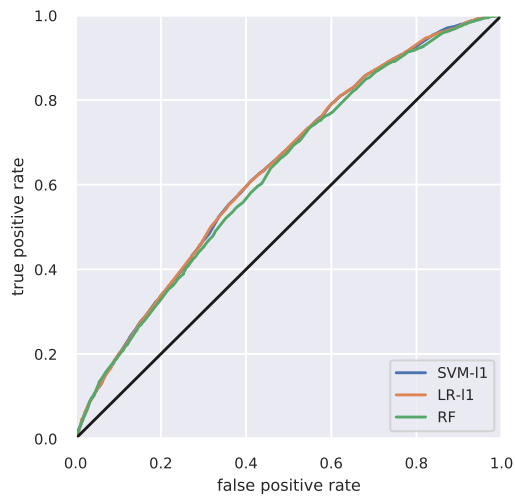
Coefficients:

	SVM-l1	LR-l1
Renal Chronic Disease	0.836	0.527
Respiratory Discomfort	0.510	0.363
Another Chronic Pneumopathy	0.507	0.322
Cardiovascular Disease	0.469	0.316
Race Brown	0.454	0.315
Other Risks	0.401	0.274
Vomiting	-0.123	-0.090
Diarrhea	-0.309	-0.228
Fever	-0.391	-0.268
Asthma	-0.382	-0.285
Schooling Medium 1-3	-0.406	-0.303
Age 0-30	-1.000	-1.000
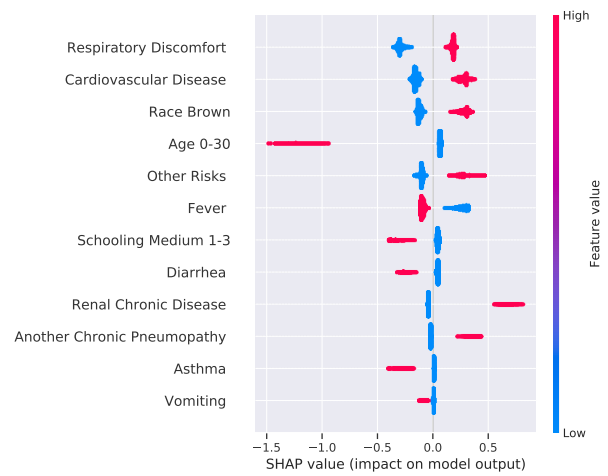
2.3 Mortality (advanced)

Include variables: Antiviral, ICU, Ventilator

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
Age 0-30	-1.814	-1.951	-1.677	0.163	0.142	0.187	0.342	0.096	0.000	0.000
Ventilator Invasive	1.691	1.628	1.753	5.422	5.094	5.771	0.235	0.695	0.000	0.000
Age 30-50	-1.234	-1.293	-1.175	0.291	0.274	0.309	0.396	0.150	0.000	0.000
Other Symptoms	-0.604	-0.654	-0.554	0.547	0.520	0.575	0.362	0.246	0.000	0.000
Schooling Superior	-0.598	-0.714	-0.482	0.550	0.490	0.617	0.336	0.174	0.000	0.000
Neurological Disease	0.591	0.486	0.696	1.806	1.626	2.006	0.318	0.532	0.000	0.000
Cough	-0.556	-0.609	-0.504	0.573	0.544	0.604	0.404	0.305	0.000	0.000
Renal Chronic Disease	0.408	0.303	0.513	1.504	1.354	1.670	0.318	0.524	0.000	0.000
Fever	-0.401	-0.451	-0.351	0.670	0.637	0.704	0.391	0.305	0.000	0.000
Race White	-0.312	-0.368	-0.257	0.732	0.692	0.773	0.344	0.285	0.000	0.000
Liver Chronic Disease	0.306	0.079	0.533	1.358	1.083	1.704	0.325	0.485	0.000	0.008
Race Brown	0.302	0.248	0.356	1.353	1.282	1.427	0.302	0.389	0.000	0.000
Asthma	-0.265	-0.409	-0.122	0.767	0.664	0.885	0.329	0.247	0.000	0.000
Gender F	-0.245	-0.289	-0.201	0.782	0.749	0.818	0.334	0.316	0.001	0.000
SpO2 less 95\%	0.205	0.154	0.255	1.227	1.167	1.290	0.230	0.395	0.000	0.000
Hematologic Disease	0.201	-0.016	0.417	1.223	0.985	1.518	0.325	0.431	0.000	0.069
Another Chronic Pneumopathy	0.199	0.089	0.308	1.220	1.093	1.361	0.320	0.485	0.000	0.000
ICU	0.193	0.140	0.246	1.213	1.150	1.279	0.247	0.486	0.000	0.000
Diarrhea	-0.184	-0.254	-0.114	0.832	0.775	0.892	0.337	0.260	0.000	0.000
Schooling Medium 1-3	-0.173	-0.253	-0.093	0.841	0.777	0.911	0.336	0.247	0.000	0.000
Immunosuppression	0.145	0.018	0.272	1.156	1.018	1.312	0.324	0.408	0.000	0.025
Respiratory Discomfort	0.141	0.090	0.191	1.151	1.094	1.211	0.261	0.370	0.000	0.000
Postpartum	0.127	-0.275	0.528	1.135	0.760	1.696	0.327	0.196	0.002	0.536
Throat	-0.123	-0.180	-0.065	0.885	0.835	0.937	0.341	0.273	0.000	0.000
Other Risks	0.117	0.067	0.168	1.124	1.069	1.183	0.303	0.396	0.000	0.000
Schooling Elem 1-5	0.111	0.030	0.193	1.118	1.030	1.213	0.320	0.407	0.000	0.008
Contracted At Hospital	0.073	-0.062	0.208	1.076	0.940	1.231	0.323	0.448	0.000	0.288
Diabetes	0.063	0.011	0.115	1.065	1.011	1.122	0.296	0.421	0.000	0.017
Cardiovascular Disease	0.016	-0.033	0.064	1.016	0.968	1.067	0.284	0.413	0.000	0.526
Dyspnea	0.014	-0.039	0.067	1.014	0.962	1.069	0.248	0.356	0.000	0.603
Vomiting	-0.006	-0.094	0.082	0.994	0.910	1.086	0.331	0.278	0.000	0.894

Recursive Feature Elimination:

Number of features selected
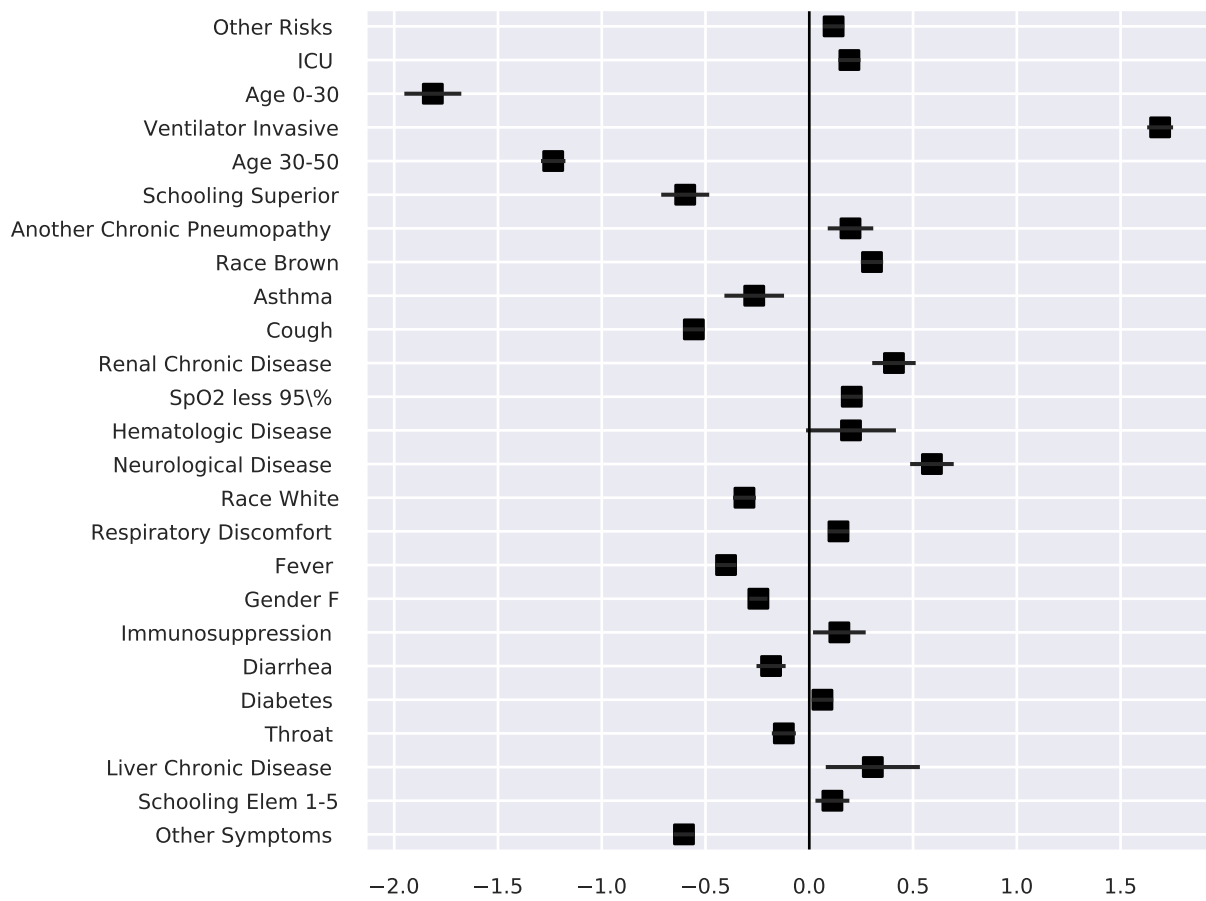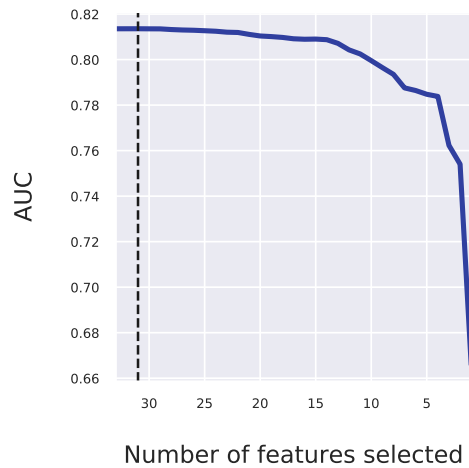
Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.727	0.727	0.720	0.733
F1w	0.711	0.711	0.693	0.719
AUC	0.778	0.777	0.763	0.780
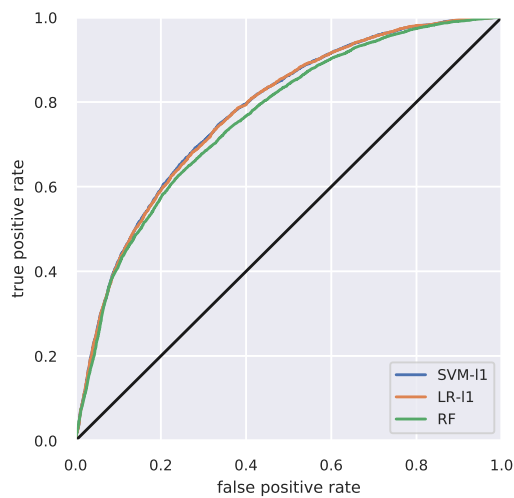
Coefficients:

	SVM-l1	LR-l1
Ventilator Invasive	1.000	1.000
Neurological Disease	0.358	0.384
Renal Chronic Disease	0.241	0.266
Race Brown	0.216	0.258
Liver Chronic Disease	0.185	0.202
ICU	0.140	0.173
SpO2 less 95\%	0.131	0.170
Hematologic Disease	0.120	0.138
Another Chronic Pneumopathy	0.127	0.135
Respiratory Discomfort	0.106	0.125
Other Risks	0.096	0.117
Immunosuppression	0.086	0.113
Dyspnea	0.089	0.109
Contracted At Hospital	0.093	0.105
Schooling Elem 1-5	0.075	0.084
Diabetes	0.058	0.065
Cardiovascular Disease	0.054	0.064
Postpartum	0.021	0.045
Vomiting	0.001	0.004
Gender F	-0.054	-0.068
Throat	-0.062	-0.080
Schooling Medium 1-3	-0.072	-0.094
Diarrhea	-0.076	-0.096
Race White	-0.092	-0.116
Fever	-0.113	-0.128
Asthma	-0.130	-0.160
Cough	-0.182	-0.215
Other Symptoms	-0.230	-0.289
Schooling Superior	-0.234	-0.338
Age 30-50	-0.498	-0.672
Age 0-30	-0.684	-0.999
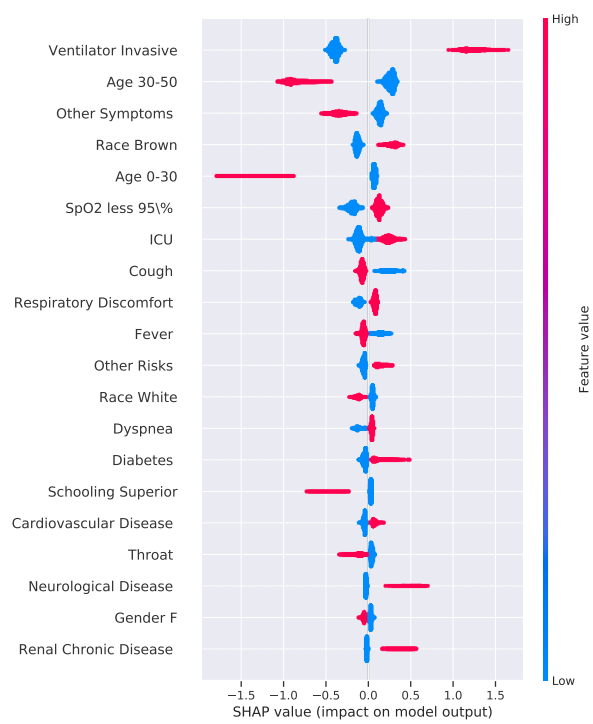
2.4 Mortality (advanced) small

Include variables: Antiviral, ICU, Ventilator

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
Ventilator Invasive	1.796	1.735	1.857	6.026	5.667	6.408	0.234	0.694	0.000	0.000
Fever	-1.220	-1.258	-1.182	0.295	0.284	0.307	0.394	0.305	0.000	0.000
Postpartum	-0.917	-1.271	-0.563	0.400	0.281	0.569	0.327	0.218	0.014	0.000
Age 70-100	0.811	0.766	0.855	2.249	2.151	2.352	0.239	0.537	0.000	0.000
Schooling Medium 1-3	-0.464	-0.537	-0.391	0.629	0.584	0.677	0.336	0.250	0.000	0.000
Diarrhea	-0.447	-0.512	-0.383	0.639	0.600	0.682	0.336	0.265	0.000	0.000
Renal Chronic Disease	0.442	0.341	0.542	1.555	1.406	1.720	0.317	0.535	0.000	0.000
Neurological Disease	0.317	0.212	0.421	1.372	1.236	1.524	0.318	0.524	0.000	0.000
Liver Chronic Disease	0.289	0.068	0.510	1.335	1.070	1.665	0.325	0.485	0.000	0.010
Respiratory Discomfort	-0.227	-0.268	-0.187	0.797	0.765	0.829	0.262	0.369	0.000	0.000
Other Risks	-0.153	-0.201	-0.105	0.858	0.818	0.900	0.303	0.396	0.000	0.000
Race Brown	0.125	0.078	0.171	1.133	1.081	1.187	0.305	0.382	0.000	0.000
ICU	-0.096	-0.147	-0.045	0.908	0.863	0.956	0.245	0.488	0.000	0.000
Immunosuppression	0.010	-0.110	0.129	1.010	0.896	1.138	0.323	0.420	0.000	0.876
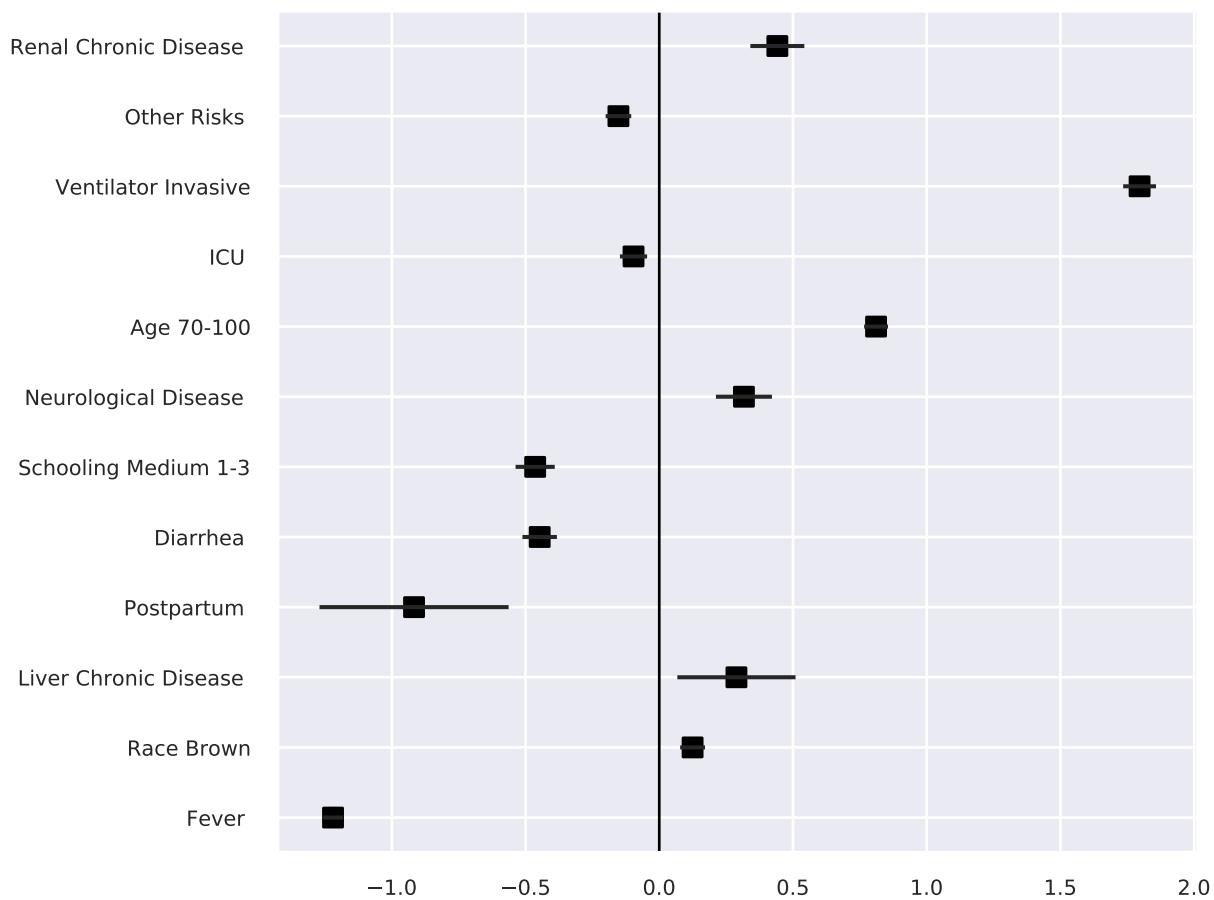
Recursive Feature Elimination:
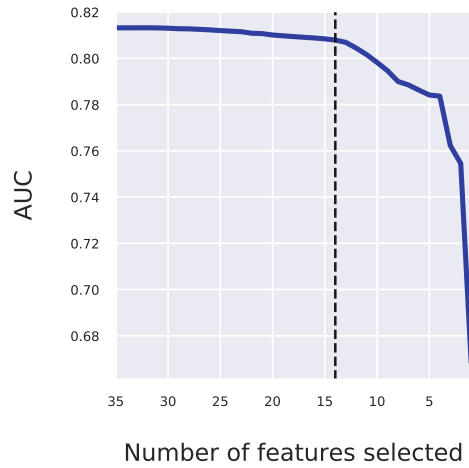
Coefficients:

	SVM-l1	LR-l1
Ventilator Invasive	1.000	1.000
Age 70-100	0.632	0.702
Renal Chronic Disease	0.310	0.347
Liver Chronic Disease	0.242	0.267
Race Brown	0.214	0.264
Neurological Disease	0.225	0.239
Respiratory Discomfort	0.151	0.194
ICU	0.135	0.166
Immunosuppression	0.113	0.133
Other Risks	0.089	0.106
Schooling Medium 1-3	-0.079	-0.106
Diarrhea	-0.088	-0.115
Fever	-0.121	-0.148
Postpartum	-0.175	-0.232

Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.726	0.725	0.722	0.728
F1w	0.713	0.712	0.703	0.720
AUC	0.765	0.765	0.759	0.765

21
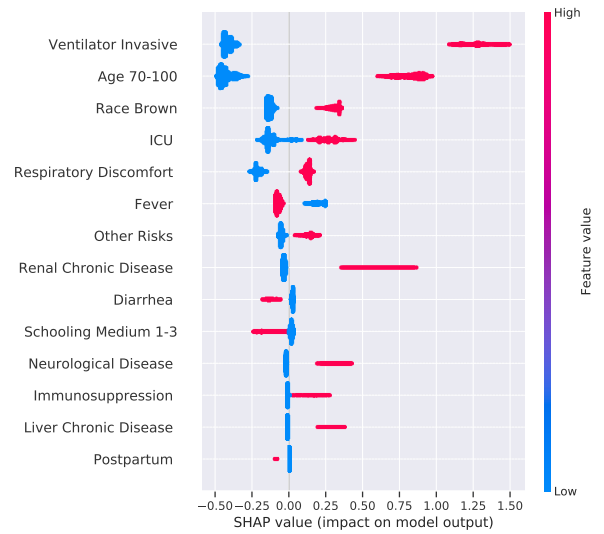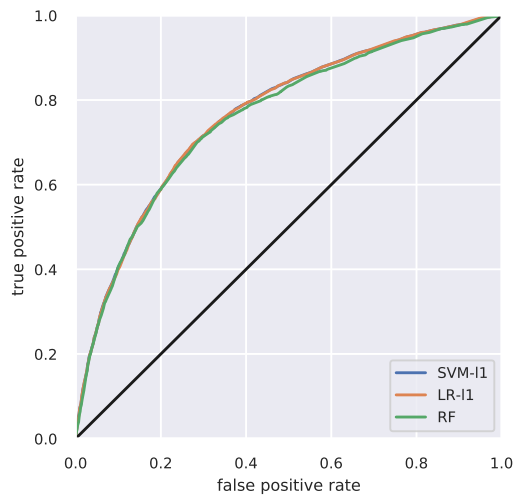
2.5 ICU

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
BMI 30-35	-0.769	-0.877	-0.662	0.463	0.416	0.516	0.467	0.327	0.000	0.000
Race Indigenous	-0.736	-1.206	-0.266	0.479	0.299	0.766	0.330	0.200	0.040	0.002
SpO2 less 95\%	0.455	0.410	0.501	1.576	1.506	1.650	0.257	0.382	0.000	0.000
Renal Chronic Disease	0.440	0.344	0.535	1.552	1.411	1.707	0.323	0.483	0.000	0.000
Schooling Elem 1-5	-0.439	-0.522	-0.355	0.645	0.594	0.701	0.335	0.265	0.000	0.000
BMI 18.5-25	0.431	-0.437	1.299	1.539	0.646	3.666	0.330	0.625	0.031	0.330
Xray Torax Result Consolidation	0.421	0.310	0.531	1.523	1.363	1.701	0.327	0.441	0.000	0.000
Throat	-0.365	-0.418	-0.312	0.694	0.658	0.732	0.351	0.254	0.000	0.000
Contracted At Hospital	0.352	0.232	0.471	1.421	1.261	1.601	0.327	0.442	0.000	0.000
Race Brown	-0.349	-0.402	-0.296	0.706	0.669	0.744	0.350	0.278	0.000	0.000
Cough	-0.347	-0.398	-0.297	0.707	0.672	0.743	0.394	0.313	0.000	0.000
Race Black	-0.342	-0.444	-0.239	0.711	0.642	0.787	0.332	0.290	0.001	0.000
BMI 40-100	-0.317	-0.553	-0.082	0.728	0.575	0.922	0.329	0.467	0.000	0.008
Other Risks	0.315	0.270	0.361	1.370	1.309	1.434	0.306	0.401	0.000	0.000
Antiviral Use	0.278	0.236	0.320	1.320	1.266	1.376	0.304	0.376	0.000	0.000
Another Chronic Pneumopathy	0.273	0.174	0.371	1.314	1.190	1.449	0.325	0.456	0.000	0.000
Schooling Elem 6-9	-0.250	-0.343	-0.156	0.779	0.710	0.855	0.333	0.284	0.000	0.000
Age 0-30	-0.245	-0.368	-0.122	0.783	0.692	0.886	0.336	0.241	0.000	0.000
Liver Chronic Disease	0.221	0.017	0.425	1.248	1.017	1.530	0.329	0.428	0.001	0.034
Cardiovascular Disease	0.216	0.170	0.261	1.240	1.186	1.298	0.297	0.398	0.000	0.000
Age 30-50	-0.211	-0.308	-0.114	0.810	0.735	0.893	0.354	0.270	0.000	0.000
Dyspnea	0.188	0.139	0.237	1.207	1.149	1.267	0.281	0.349	0.000	0.000
Immunosuppression	0.182	0.072	0.293	1.200	1.074	1.340	0.327	0.407	0.000	0.001
Vomiting	-0.172	-0.253	-0.091	0.842	0.777	0.913	0.335	0.273	0.000	0.000
Diabetes	0.166	0.118	0.214	1.181	1.125	1.238	0.308	0.397	0.000	0.000
Gender F	-0.154	-0.195	-0.113	0.857	0.823	0.893	0.339	0.317	0.000	0.000
Schooling Medium 1-3	-0.131	-0.200	-0.061	0.878	0.819	0.941	0.336	0.282	0.000	0.000
Diarrhea	-0.129	-0.192	-0.067	0.879	0.826	0.935	0.337	0.286	0.000	0.000
BMI 35-40	0.119	-0.078	0.315	1.126	0.925	1.370	0.328	0.486	0.000	0.236
Fever	-0.084	-0.132	-0.036	0.920	0.876	0.965	0.362	0.320	0.000	0.001
Neurological Disease	0.078	-0.021	0.176	1.081	0.979	1.193	0.326	0.418	0.000	0.123
Age 50-70	-0.064	-0.158	0.030	0.938	0.854	1.030	0.323	0.341	0.001	0.183
Respiratory Discomfort	0.060	0.015	0.106	1.062	1.015	1.111	0.305	0.346	0.000	0.009
Race White	-0.060	-0.110	-0.010	0.942	0.896	0.990	0.322	0.349	0.000	0.020
Age 70-100	0.027	-0.072	0.125	1.027	0.931	1.133	0.305	0.391	0.000	0.597

Recursive Feature Elimination:

Number of features selected
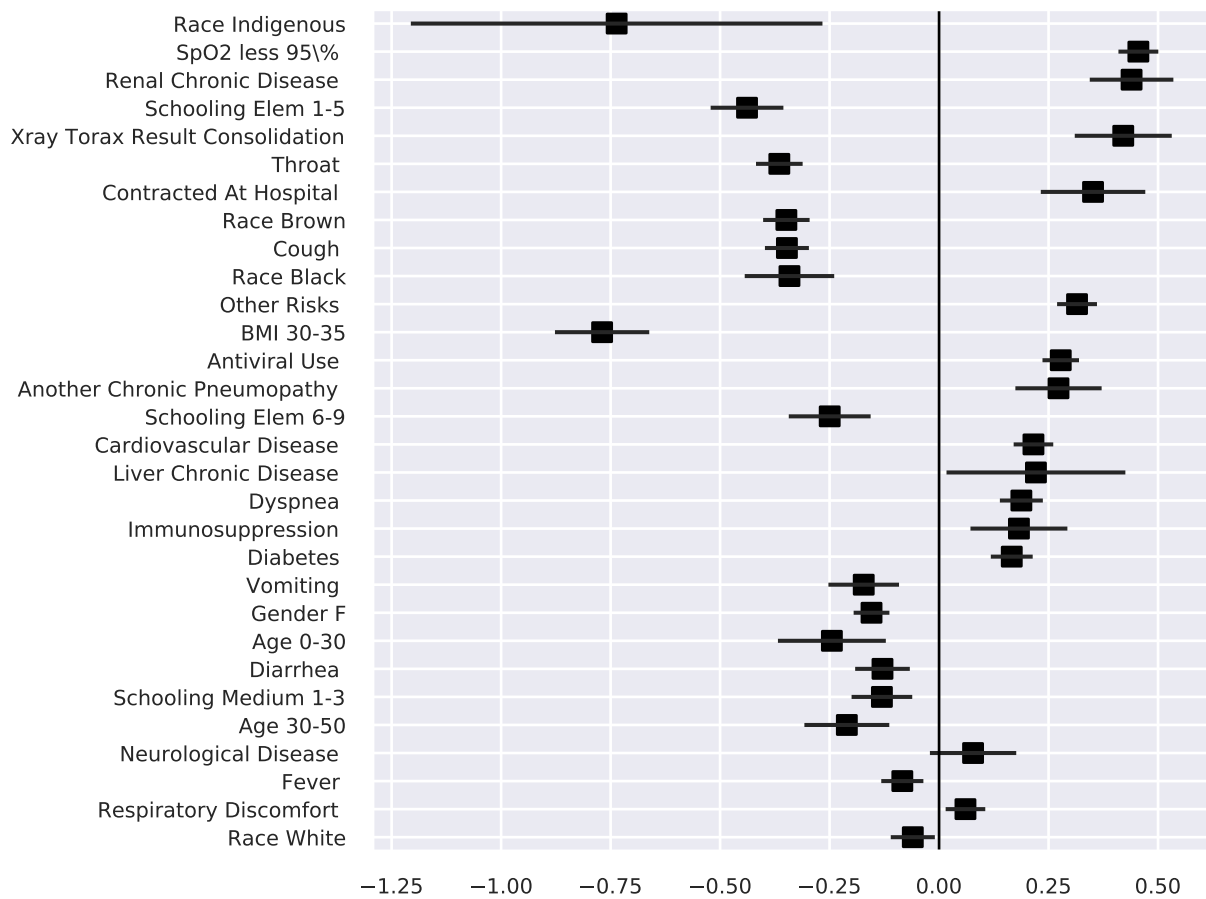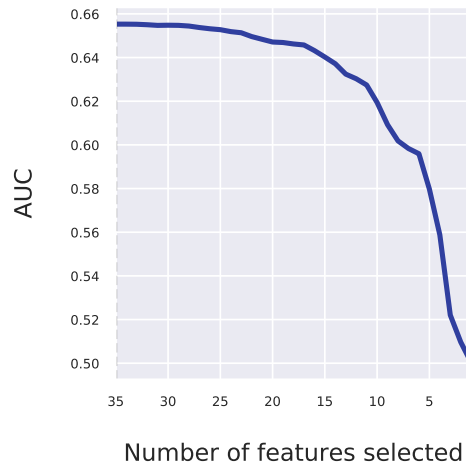
Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.645	0.646	0.629	0.646
F1w	0.587	0.588	0.486	0.583
AUC	0.649	0.650	0.634	0.653
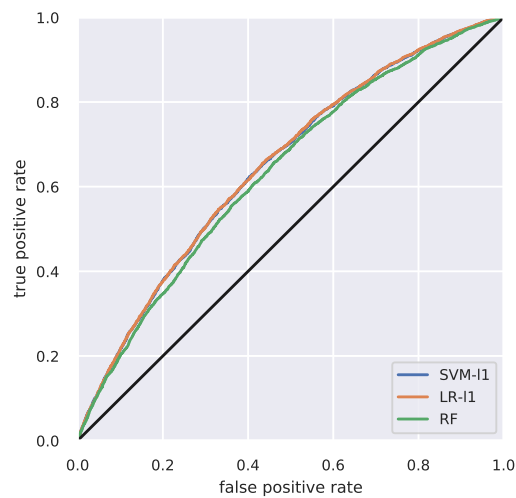
Coefficients:

	SVM-l1	LR-l1
BMI 18.5-25	1.000	1.000
SpO2 less 95\%	0.501	0.677
Renal Chronic Disease	0.539	0.646
Xray Torax Result Consolidation	0.496	0.615
BMI 35-40	0.443	0.524
Contracted At Hospital	0.421	0.520
Other Risks	0.368	0.471
Antiviral Use	0.309	0.410
Another Chronic Pneumopathy	0.339	0.398
Cardiovascular Disease	0.253	0.325
Liver Chronic Disease	0.256	0.313
Dyspnea	0.211	0.289
Immunosuppression	0.213	0.269
Diabetes	0.195	0.248
Age 70-100	0.144	0.186
Neurological Disease	0.099	0.115
Respiratory Discomfort	0.075	0.091
Age 50-70	0.035	0.053
BMI 40-100	0.064	0.051
Race White	-0.059	-0.073
Fever	-0.083	-0.106
Age 30-50	-0.109	-0.157
Schooling Medium 1-3	-0.131	-0.185
Diarrhea	-0.136	-0.186
Age 0-30	-0.125	-0.204
Gender F	-0.157	-0.213
Vomiting	-0.179	-0.248
Schooling Elem 6-9	-0.267	-0.364
BMI 30-35	-0.371	-0.470
Race Black	-0.365	-0.486
Cough	-0.384	-0.492
Race Brown	-0.371	-0.501
Throat	-0.371	-0.536
Schooling Elem 1-5	-0.469	-0.642
Race Indigenous	-0.707	-0.991
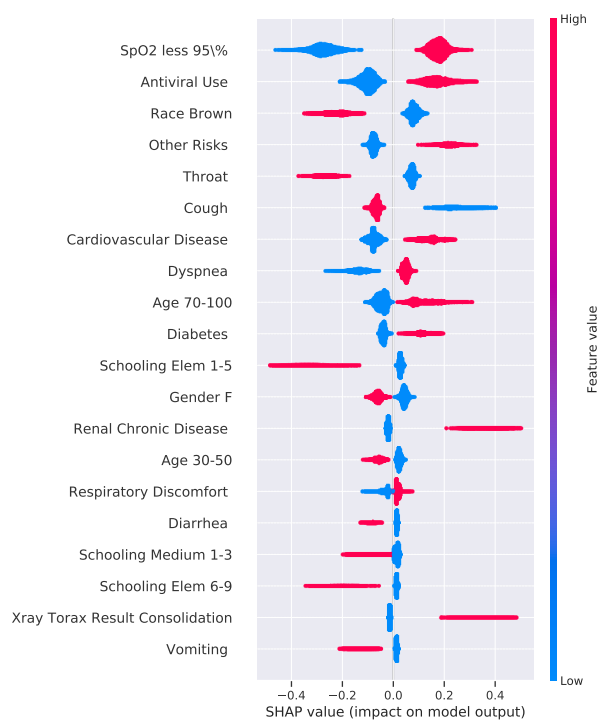
2.6 ICU small

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
BMI 30-35	-0.883	-0.933	-0.834	0.413	0.393	0.434	0.470	0.328	0.000	0.0
SpO2 less 95\%	0.584	0.543	0.626	1.794	1.721	1.869	0.254	0.384	0.000	0.0
Renal Chronic Disease	0.495	0.401	0.589	1.640	1.494	1.801	0.325	0.466	0.000	0.0
Schooling Elem 1-5	-0.484	-0.566	-0.402	0.616	0.568	0.669	0.337	0.254	0.000	0.0
Xray Torax Result Consolidation	0.447	0.338	0.556	1.564	1.403	1.743	0.327	0.449	0.000	0.0
Throat	-0.379	-0.431	-0.327	0.685	0.650	0.721	0.351	0.256	0.000	0.0
Contracted At Hospital	0.371	0.252	0.491	1.450	1.287	1.634	0.327	0.446	0.000	0.0
Cough	-0.363	-0.409	-0.316	0.696	0.664	0.729	0.394	0.313	0.000	0.0
Race Brown	-0.337	-0.383	-0.291	0.714	0.681	0.748	0.351	0.277	0.000	0.0
Other Risks	0.321	0.276	0.366	1.379	1.318	1.442	0.307	0.402	0.000	0.0
Race Black	-0.297	-0.397	-0.198	0.743	0.672	0.820	0.332	0.295	0.008	0.0
Antiviral Use	0.290	0.249	0.331	1.337	1.283	1.393	0.304	0.376	0.000	0.0
Age 70-100	0.239	0.196	0.283	1.270	1.217	1.327	0.306	0.390	0.000	0.0
Schooling Elem 6-9	-0.226	-0.317	-0.135	0.798	0.728	0.873	0.333	0.285	0.000	0.0

Recursive Feature Elimination:

Coefficients:

	SVM-l1	LR-l1
SpO2 less 95\%	1.000	1.000
Renal Chronic Disease	0.908	0.828
Xray Torax Result Consolidation	0.819	0.750
Contracted At Hospital	0.687	0.627
Other Risks	0.578	0.547
Antiviral Use	0.502	0.494
Age 70-100	0.426	0.403
Schooling Elem 6-9	-0.357	-0.363
Race Black	-0.470	-0.469
Race Brown	-0.538	-0.546
Cough	-0.574	-0.547
Throat	-0.590	-0.622
Schooling Elem 1-5	-0.771	-0.798
BMI 30-35	-0.988	-0.891
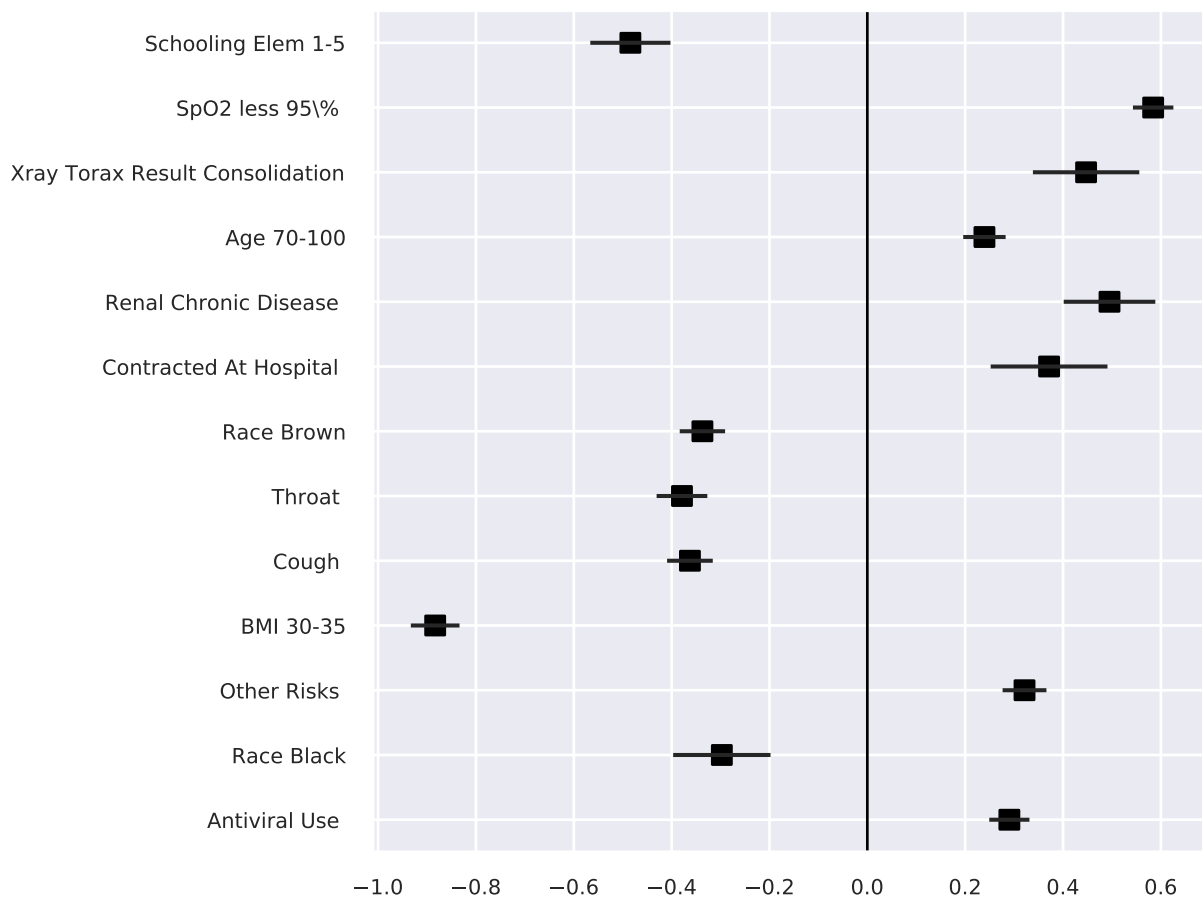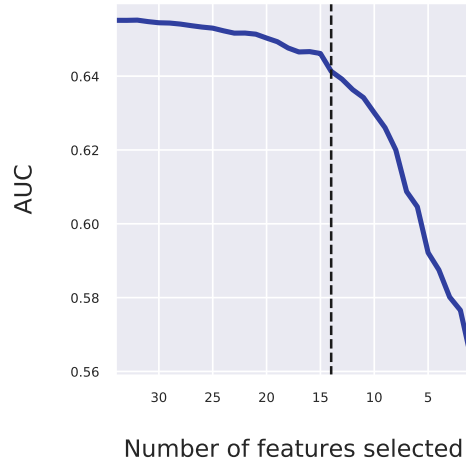
Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.647	0.647	0.632	0.647
F1w	0.576	0.579	0.490	0.573
AUC	0.630	0.630	0.622	0.631
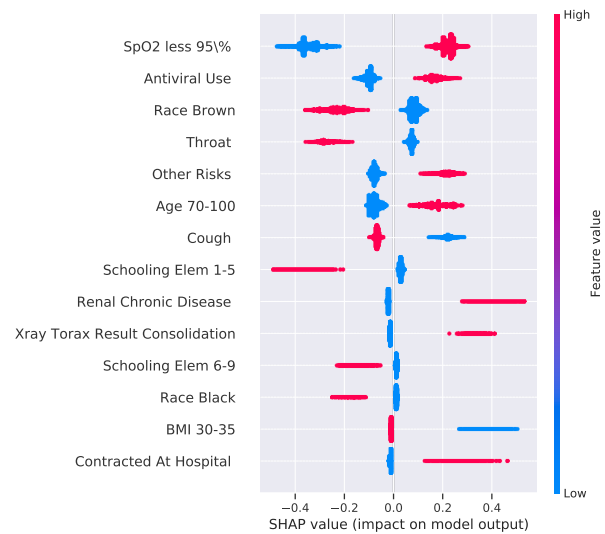
2.7 Ventilator

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
BMI 30-35	-1.499	-1.627	-1.371	0.223	0.197	0.254	0.301	0.198	0.000	0.000
Age 30-50	-0.769	-0.891	-0.647	0.463	0.410	0.524	0.228	0.127	0.000	0.000
BMI 40-100	-0.769	-1.027	-0.511	0.464	0.358	0.600	0.199	0.326	0.000	0.000
Age 0-30	-0.649	-0.809	-0.490	0.522	0.445	0.613	0.205	0.123	0.000	0.000
SpO2 less 95\%	0.616	0.559	0.672	1.851	1.749	1.958	0.116	0.259	0.000	0.000
Cough	-0.453	-0.511	-0.395	0.636	0.600	0.673	0.247	0.187	0.000	0.000
Renal Chronic Disease	0.371	0.267	0.474	1.449	1.306	1.607	0.195	0.321	0.000	0.000
Xray Torax Result Consolidation	0.369	0.247	0.492	1.447	1.280	1.636	0.197	0.281	0.000	0.000
Respiratory Discomfort	0.350	0.295	0.405	1.419	1.343	1.500	0.140	0.239	0.000	0.000
Dyspnea	0.347	0.285	0.409	1.415	1.330	1.505	0.129	0.228	0.000	0.000
Throat	-0.346	-0.410	-0.282	0.707	0.663	0.754	0.212	0.155	0.000	0.000
Age 50-70	-0.327	-0.444	-0.211	0.721	0.642	0.810	0.187	0.220	0.000	0.000
Antiviral Use	0.317	0.268	0.365	1.372	1.307	1.441	0.175	0.243	0.000	0.000
Contracted At Hospital	0.315	0.181	0.448	1.370	1.199	1.566	0.198	0.286	0.000	0.000
Other Risks	0.280	0.227	0.333	1.323	1.255	1.395	0.182	0.254	0.000	0.000
Another Chronic Pneumopathy	0.261	0.153	0.368	1.298	1.165	1.445	0.195	0.314	0.000	0.000
Diarrhea	-0.247	-0.324	-0.170	0.781	0.723	0.844	0.207	0.155	0.000	0.000
BMI 35-40	-0.241	-0.459	-0.023	0.786	0.632	0.977	0.198	0.337	0.000	0.030
Age 70-100	-0.241	-0.361	-0.121	0.786	0.697	0.886	0.176	0.257	0.000	0.000
Liver Chronic Disease	0.239	0.009	0.469	1.270	1.009	1.598	0.199	0.281	0.009	0.042
Vomiting	-0.215	-0.314	-0.116	0.807	0.731	0.891	0.204	0.154	0.000	0.000
Gender F	-0.212	-0.261	-0.164	0.809	0.770	0.849	0.209	0.188	0.000	0.000
Diabetes	0.200	0.146	0.255	1.221	1.157	1.290	0.179	0.263	0.000	0.000
Schooling Medium 1-3	-0.185	-0.268	-0.102	0.831	0.765	0.903	0.205	0.160	0.000	0.000
Fever	-0.166	-0.222	-0.110	0.847	0.801	0.896	0.229	0.191	0.000	0.000
Other Symptoms	-0.164	-0.218	-0.110	0.849	0.804	0.896	0.212	0.173	0.000	0.000
Schooling Superior	-0.148	-0.260	-0.036	0.863	0.771	0.964	0.203	0.148	0.000	0.009
Immunosuppression	0.145	0.017	0.274	1.156	1.017	1.315	0.198	0.259	0.000	0.027
Cardiovascular Disease	0.134	0.082	0.187	1.144	1.085	1.205	0.175	0.252	0.000	0.000
Neurological Disease	-0.106	-0.221	0.010	0.900	0.802	1.010	0.198	0.242	0.002	0.073
Race Brown	0.081	0.029	0.134	1.085	1.029	1.144	0.196	0.211	0.018	0.002

SpO2 less 95\%
BMI 35-40
Cough
Dyspnea
Renal Chronic Disease
Xray Torax Result Consolidation
Respiratory Discomfort
Throat
Contracted At Hospital
Age 30-50
Antiviral Use
Other Risks
Another Chronic Pneumopathy
Diarrhea
BMI 40-100
Liver Chronic Disease
Diabetes
Vomiting
Age 0-30
BMI 30-35
Gender F
Age 70-100
Schooling Medium 1-3
Immunosuppression
Cardiovascular Disease
Other Symptoms
Schooling Superior
Fever
Neurological Disease
Age 50-70

−1.5   −1.0   −0.5   0.0   0.5

Recursive Feature Elimination:

Coefficients:

	SVM-l1	LR-l1
SpO2 less 95\%	0.989	1.000
BMI 35-40	1.000	0.762
Dyspnea	0.599	0.610
Renal Chronic Disease	0.791	0.591
Xray Torax Result Consolidation	0.698	0.574
Respiratory Discomfort	0.621	0.569
Contracted At Hospital	0.654	0.526
Antiviral Use	0.549	0.505
Other Risks	0.533	0.469
Another Chronic Pneumopathy	0.582	0.400
BMI 40-100	0.516	0.375
Liver Chronic Disease	0.423	0.340
Diabetes	0.390	0.327
Age 70-100	0.324	0.275
Immunosuppression	0.280	0.236
Cardiovascular Disease	0.264	0.236
Age 50-70	0.154	0.140
Race Brown	0.143	0.137
Neurological Disease	-0.187	-0.148
Fever	-0.236	-0.188
Schooling Superior	-0.154	-0.193
Other Symptoms	-0.209	-0.199
Schooling Medium 1-3	-0.247	-0.248
Gender F	-0.291	-0.278
BMI 30-35	-0.330	-0.289
Age 0-30	-0.220	-0.312
Vomiting	-0.335	-0.319
Diarrhea	-0.385	-0.377
Age 30-50	-0.451	-0.520
Throat	-0.538	-0.537
Cough	-0.731	-0.633

Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.763	0.765	0.765	0.764
F1w	0.682	0.680	0.664	0.677
AUC	0.676	0.678	0.664	0.681
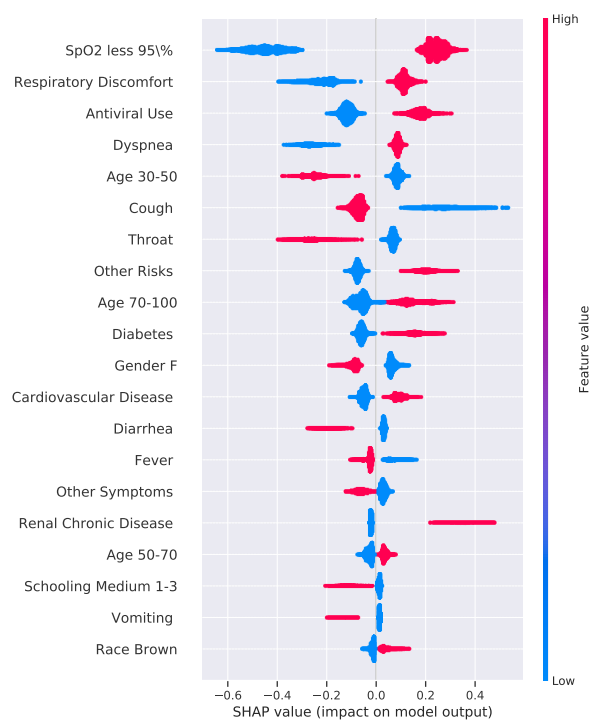
2.8 Ventilator small

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
Cough	-1.235	-1.279	-1.190	0.291	0.278	0.304	0.252	0.185	0.0	0.000
Age 30-50	-0.935	-0.992	-0.878	0.393	0.371	0.415	0.227	0.128	0.0	0.000
BMI 35-40	0.627	0.432	0.822	1.872	1.540	2.276	0.198	0.322	0.0	0.000
Throat	-0.433	-0.495	-0.371	0.649	0.610	0.690	0.211	0.154	0.0	0.000
SpO2 less 95\%	0.262	0.213	0.311	1.300	1.238	1.365	0.116	0.259	0.0	0.000
Dyspnea	-0.255	-0.305	-0.206	0.775	0.737	0.814	0.126	0.227	0.0	0.000
Xray Torax Result Consolidation	0.242	0.121	0.364	1.274	1.128	1.439	0.196	0.294	0.0	0.000
Another Chronic Pneumopathy	0.234	0.127	0.341	1.263	1.135	1.406	0.194	0.321	0.0	0.000
Renal Chronic Disease	0.199	0.098	0.300	1.220	1.103	1.351	0.194	0.319	0.0	0.000
Contracted At Hospital	-0.140	-0.272	-0.008	0.869	0.762	0.992	0.197	0.288	0.0	0.037
Antiviral Use	0.087	0.041	0.134	1.091	1.042	1.143	0.175	0.241	0.0	0.000
Respiratory Discomfort	0.037	-0.012	0.087	1.038	0.988	1.091	0.141	0.238	0.0	0.137

Recursive Feature Elimination:

Number of features selected

Coefficients:

	SVM-l1	LR-l1
SpO2 less 95\%	0.966	1.000
BMI 35-40	1.000	0.799
Renal Chronic Disease	0.893	0.699
Dyspnea	0.597	0.634
Xray Torax Result Consolidation	0.762	0.624
Contracted At Hospital	0.655	0.532
Another Chronic Pneumopathy	0.704	0.515
Respiratory Discomfort	0.529	0.504
Antiviral Use	0.515	0.482
Throat	-0.583	-0.581
Cough	-0.786	-0.705
Age 30-50	-0.694	-0.748
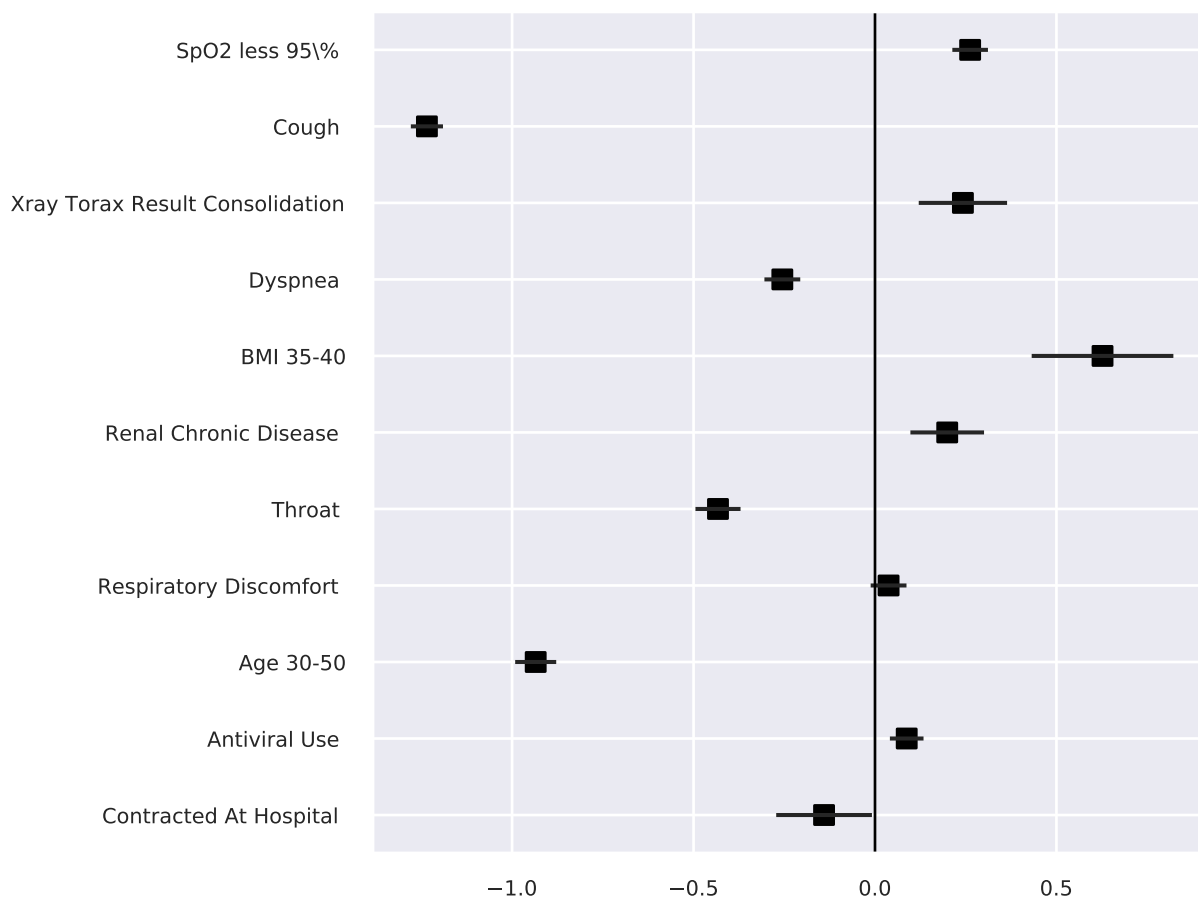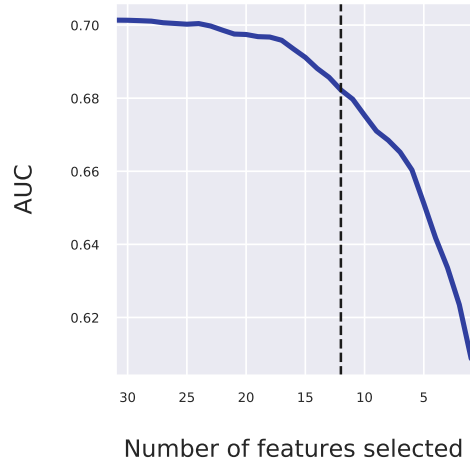
Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.762	0.762	0.762	0.762
F1w	0.673	0.668	0.659	0.664
AUC	0.657	0.659	0.661	0.662
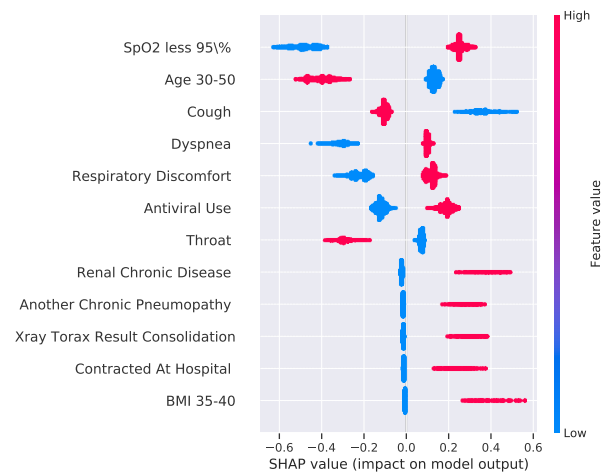
2.9   Ventilator with ICU

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
ICU	2.634	2.575	2.694	13.936	13.135	14.786	0.057	0.483	0.000	0.000
BMI 30-35	-2.305	-2.463	-2.148	0.100	0.085	0.117	0.295	0.196	0.000	0.000
BMI 40-100	-1.575	-1.881	-1.269	0.207	0.152	0.281	0.197	0.318	0.000	0.000
Age 30-50	-1.122	-1.268	-0.975	0.326	0.281	0.377	0.226	0.127	0.000	0.000
Age 0-30	-1.055	-1.243	-0.867	0.348	0.288	0.420	0.203	0.120	0.000	0.000
BMI 35-40	-0.798	-1.058	-0.539	0.450	0.347	0.583	0.196	0.333	0.000	0.000
Age 50-70	-0.652	-0.792	-0.512	0.521	0.453	0.599	0.185	0.218	0.000	0.000
Age 70-100	-0.588	-0.734	-0.443	0.555	0.480	0.642	0.175	0.254	0.000	0.000
SpO2 less 95\%	0.473	0.409	0.537	1.605	1.505	1.710	0.115	0.257	0.000	0.000
Respiratory Discomfort	0.417	0.353	0.480	1.517	1.424	1.616	0.139	0.237	0.000	0.000
Schooling Superior	-0.414	-0.539	-0.289	0.661	0.583	0.749	0.201	0.148	0.000	0.000
Cough	-0.382	-0.449	-0.315	0.683	0.638	0.730	0.248	0.184	0.000	0.000
Race Brown	0.326	0.258	0.394	1.385	1.295	1.482	0.192	0.213	0.001	0.000
Dyspnea	0.295	0.224	0.365	1.342	1.251	1.440	0.125	0.226	0.000	0.000
Other Symptoms	-0.257	-0.319	-0.196	0.773	0.727	0.822	0.211	0.169	0.000	0.000
Liver Chronic Disease	0.251	-0.020	0.522	1.285	0.980	1.685	0.197	0.267	0.043	0.069
Throat	-0.232	-0.307	-0.158	0.793	0.736	0.854	0.211	0.150	0.000	0.000
Antiviral Use	0.210	0.153	0.266	1.233	1.166	1.305	0.174	0.239	0.000	0.000
Diarrhea	-0.208	-0.296	-0.120	0.812	0.744	0.887	0.205	0.153	0.000	0.000
Fever	-0.194	-0.259	-0.129	0.824	0.772	0.879	0.227	0.189	0.000	0.000
Diabetes	0.193	0.130	0.256	1.213	1.139	1.291	0.177	0.263	0.000	0.000
Neurological Disease	-0.182	-0.312	-0.053	0.833	0.732	0.949	0.196	0.237	0.006	0.006
Gender F	-0.176	-0.232	-0.120	0.839	0.793	0.887	0.207	0.186	0.000	0.000
Race White	-0.169	-0.236	-0.102	0.845	0.790	0.903	0.202	0.188	0.041	0.000
Other Risks	0.136	0.075	0.197	1.146	1.078	1.218	0.180	0.252	0.000	0.000
Xray Torax Result Consolidation	0.129	-0.012	0.270	1.137	0.988	1.310	0.196	0.272	0.000	0.074
Renal Chronic Disease	0.125	0.004	0.246	1.133	1.004	1.279	0.193	0.308	0.000	0.042
Contracted At Hospital	0.116	-0.038	0.270	1.123	0.962	1.310	0.195	0.292	0.000	0.141
Schooling Medium 1-3	-0.109	-0.204	-0.013	0.897	0.815	0.987	0.202	0.166	0.000	0.026
Another Chronic Pneumopathy	0.108	-0.018	0.234	1.114	0.983	1.264	0.194	0.299	0.000	0.092
Immunosuppression	0.108	-0.037	0.253	1.114	0.963	1.288	0.196	0.255	0.000	0.145
Vomiting	-0.103	-0.215	0.010	0.903	0.806	1.010	0.201	0.159	0.000	0.074
Cardiovascular Disease	-0.020	-0.081	0.041	0.980	0.922	1.042	0.174	0.246	0.000	0.521
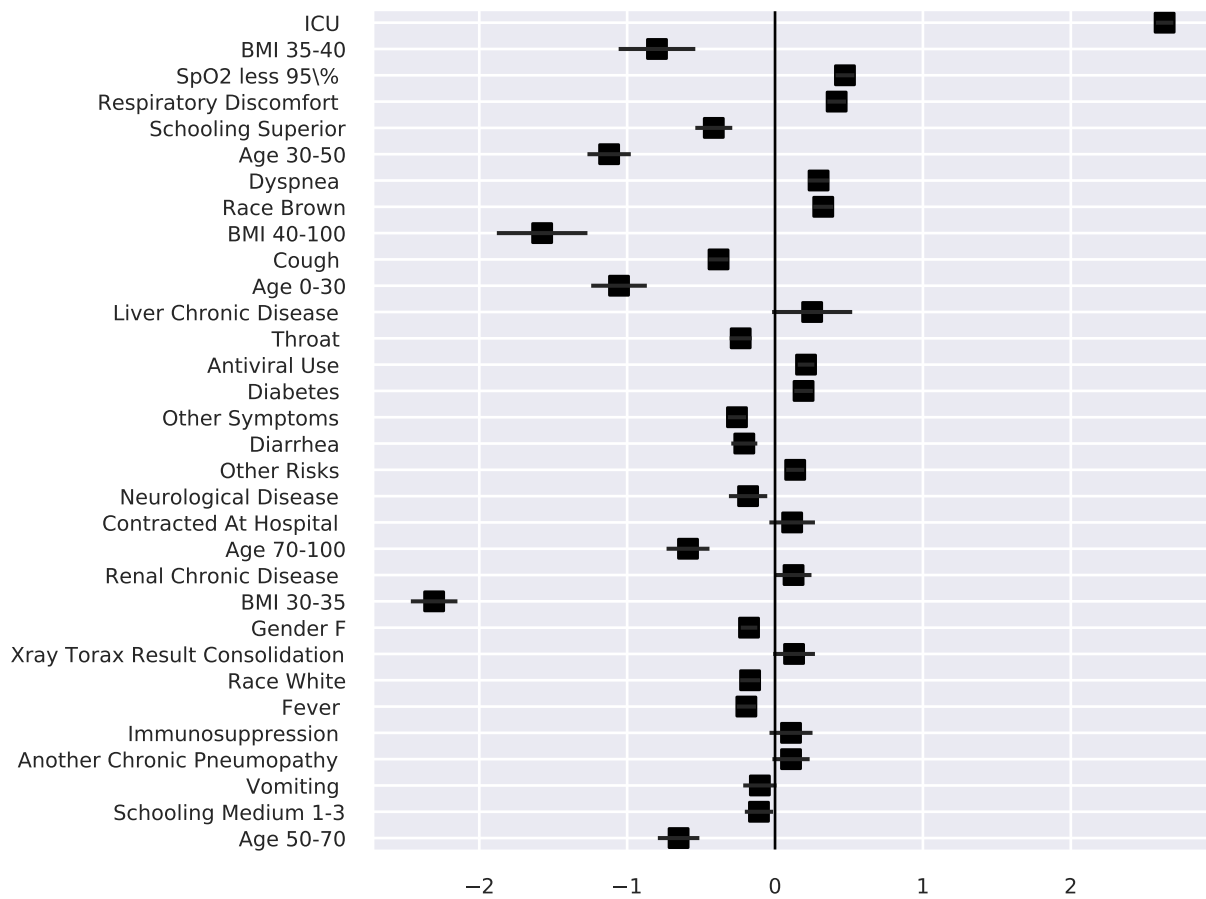
Recursive Feature Elimination:

Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.796	0.796	0.764	0.794
F1w	0.786	0.785	0.662	0.783
AUC	0.818	0.818	0.814	0.819
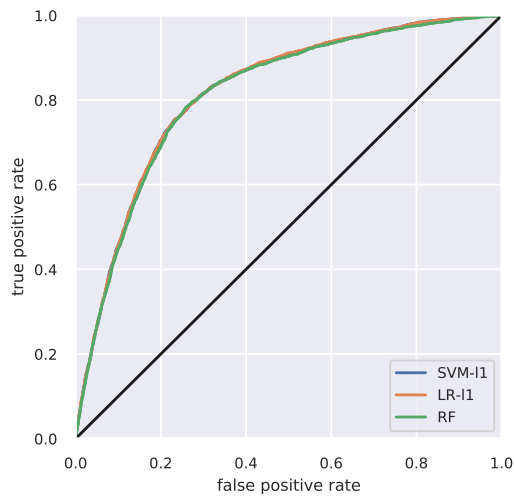
Coefficients:

	SVM-l1	LR-l1
ICU	1.000	1.000
BMI 35-40	0.220	0.205
SpO2 less 95\%	0.164	0.193
Respiratory Discomfort	0.158	0.165
Dyspnea	0.130	0.138
Race Brown	0.118	0.136
BMI 40-100	0.152	0.127
Liver Chronic Disease	0.088	0.095
Antiviral Use	0.082	0.082
Diabetes	0.075	0.078
Other Risks	0.064	0.064
Contracted At Hospital	0.082	0.056
Age 70-100	0.045	0.053
Renal Chronic Disease	0.061	0.052
BMI 30-35	0.064	0.049
Xray Torax Result Consolidation	0.050	0.047
Immunosuppression	0.042	0.040
Another Chronic Pneumopathy	0.049	0.037
Age 50-70	0.030	0.029
Cardiovascular Disease	0.010	0.006
Vomiting	-0.027	-0.032
Schooling Medium 1-3	-0.020	-0.032
Fever	-0.045	-0.044
Race White	-0.040	-0.046
Gender F	-0.045	-0.048
Neurological Disease	-0.074	-0.062
Diarrhea	-0.069	-0.074
Other Symptoms	-0.076	-0.076
Throat	-0.077	-0.087
Age 0-30	-0.081	-0.105
Cough	-0.115	-0.114
Age 30-50	-0.120	-0.139
Schooling Superior	-0.160	-0.146
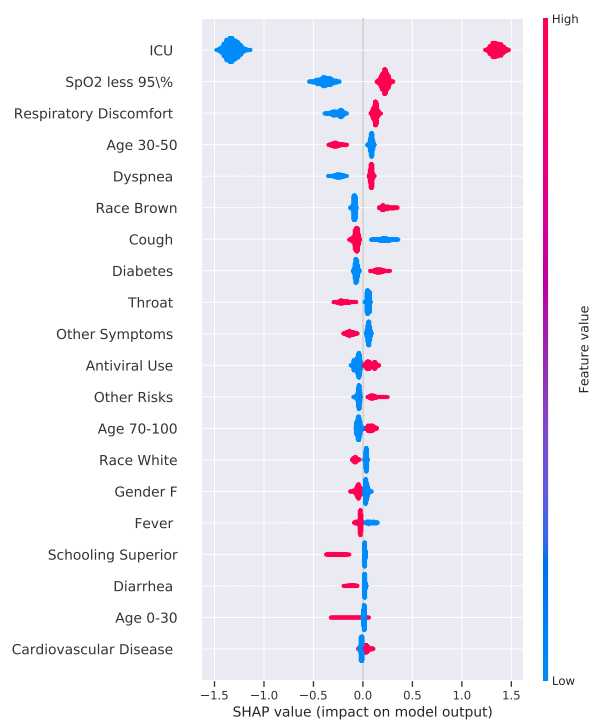
2.10   Ventilator with ICU small

	Coef	2.5	97.5	Odds Ratio	2.5	97.5	Avg-0	Avg-1	KS-pv	pvalue
Cough	-1.250	-1.295	-1.206	0.286	0.274	0.299	0.250	0.186	0.000	0.000
Age 0-30	-0.848	-0.964	-0.732	0.428	0.381	0.481	0.205	0.123	0.000	0.000
Other Symptoms	-0.658	-0.708	-0.607	0.518	0.493	0.545	0.213	0.170	0.000	0.000
Diarrhea	-0.558	-0.632	-0.484	0.573	0.532	0.616	0.207	0.150	0.000	0.000
Schooling Superior	-0.479	-0.587	-0.370	0.620	0.556	0.691	0.203	0.151	0.000	0.000
SpO2 less 95\%	0.345	0.295	0.394	1.411	1.343	1.484	0.116	0.258	0.000	0.000
Dyspnea	-0.227	-0.277	-0.177	0.797	0.758	0.838	0.125	0.228	0.000	0.000
Xray Torax Result Consolidation	0.224	0.101	0.346	1.251	1.107	1.414	0.197	0.274	0.000	0.000
Race Brown	-0.185	-0.236	-0.135	0.831	0.790	0.874	0.195	0.212	0.011	0.000
Antiviral Use	0.174	0.127	0.220	1.189	1.135	1.246	0.174	0.243	0.000	0.000
Age 70-100	-0.108	-0.156	-0.061	0.897	0.856	0.941	0.175	0.259	0.000	0.000
Other Risks	0.097	0.047	0.148	1.102	1.048	1.159	0.182	0.253	0.000	0.000
Respiratory Discomfort	0.009	-0.041	0.058	1.009	0.960	1.060	0.141	0.238	0.000	0.734

Recursive Feature Elimination:

Number of features selected

Coefficients:

	SVM-l1	LR-l1
SpO2 less 95\%	1.000	1.000
Dyspnea	0.581	0.614
Xray Torax Result Consolidation	0.636	0.526
Other Risks	0.591	0.513
Antiviral Use	0.525	0.474
Respiratory Discomfort	0.480	0.449
Age 70-100	0.520	0.443
Race Brown	0.081	0.074
Schooling Superior	-0.172	-0.197
Other Symptoms	-0.222	-0.213
Age 0-30	-0.333	-0.399
Diarrhea	-0.535	-0.526
Cough	-0.874	-0.771
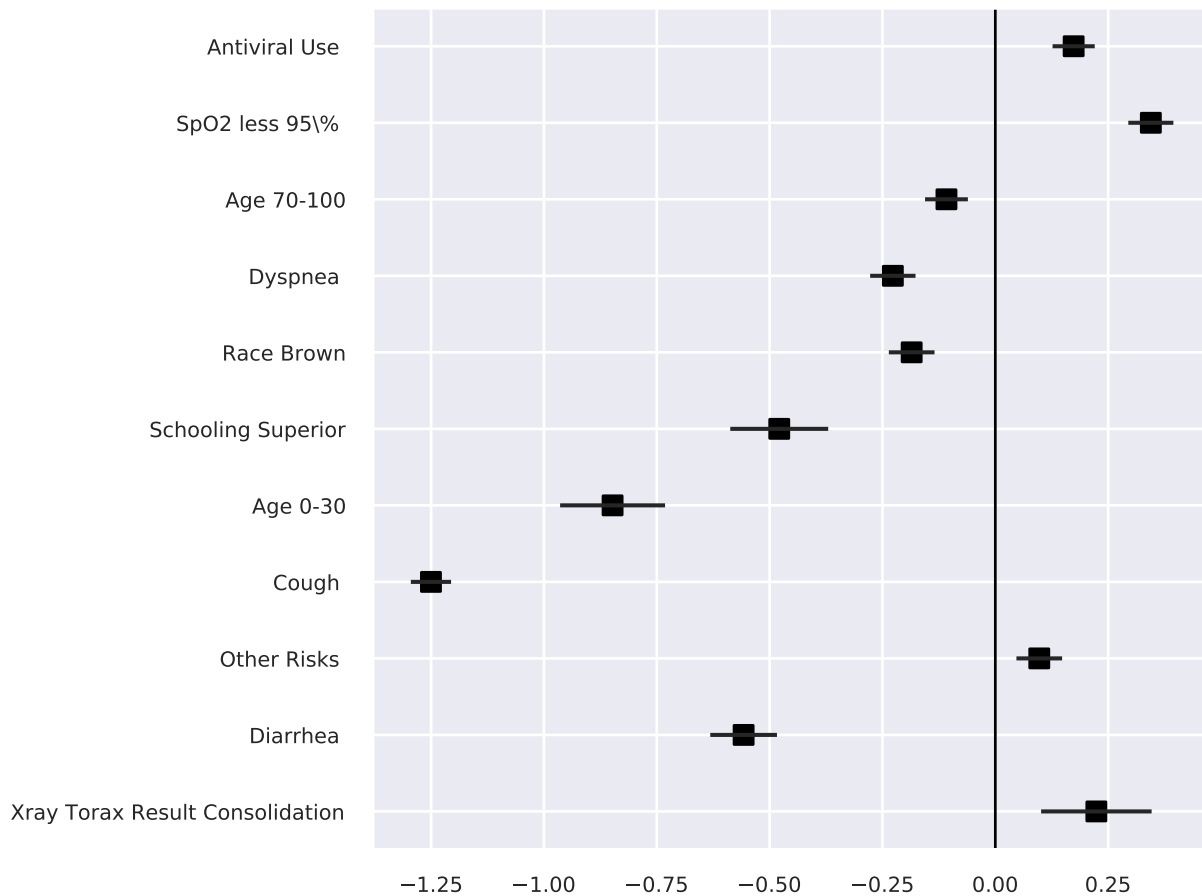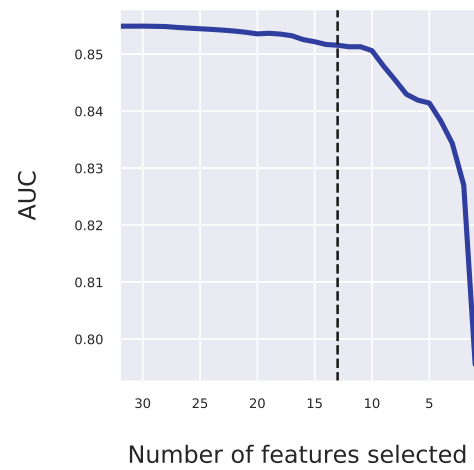
Performance:

	SVM-l1	LR-l1	RF	XGBoost
Accuracy	0.765	0.765	0.765	0.765
F1w	0.670	0.669	0.663	0.667
AUC	0.660	0.663	0.662	0.665