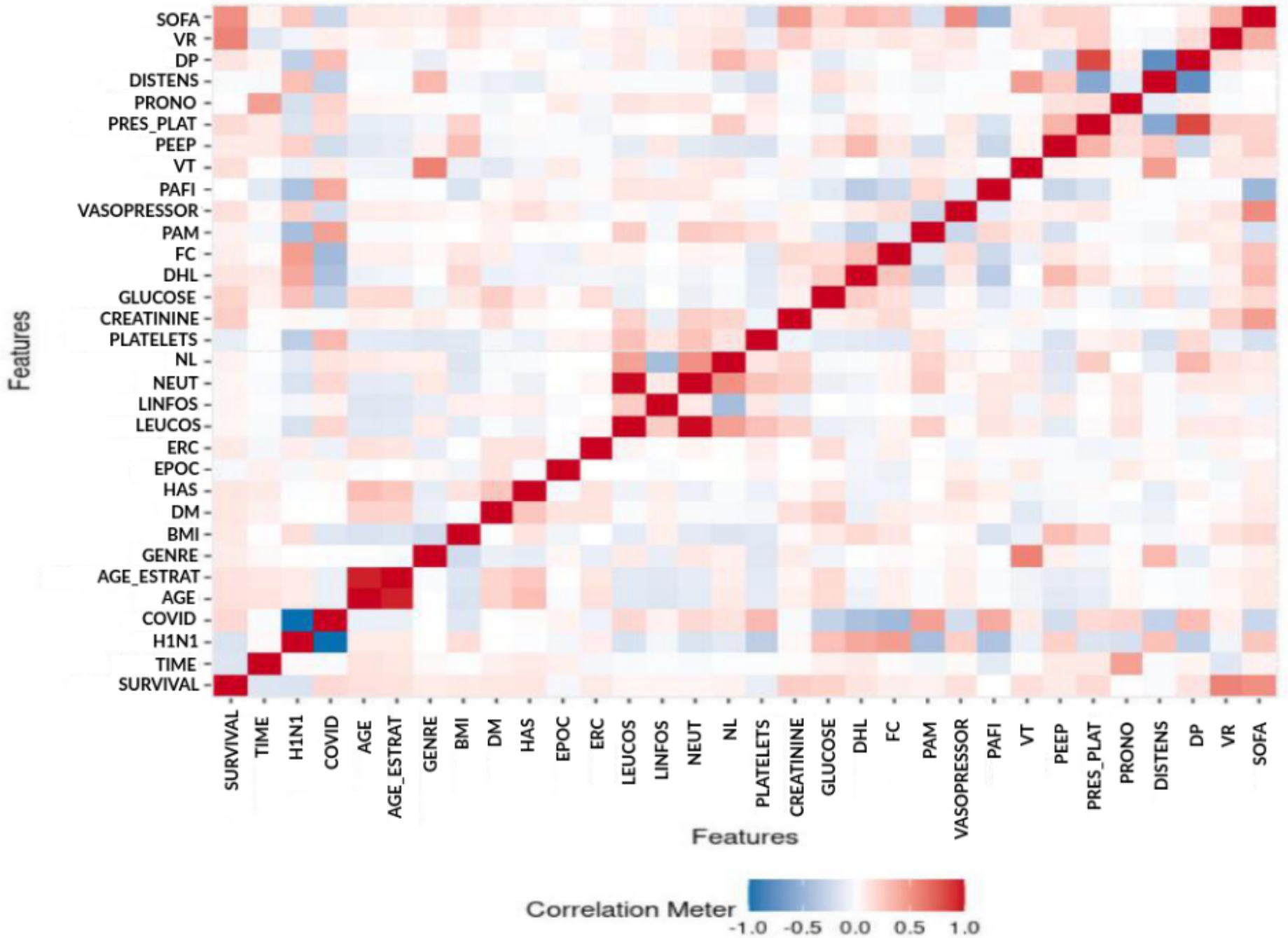


Fig. 7. Correlation matrix of dataset

DATASET VARIABLES DESCRIPTION

VARIABLE	DESCRIPTION	VARIABLE	DESCRIPTION
SURVIVAL	survival, 1=death, 0=alive	**PLATELETS**	platelets, thousands / deciliter
TIME	time,in days	**CREATININE**	creatinine, deciliter
H1N1	1=Yes, 0=No	**GLUCOSE**	glucose, /deciliter
COVID	1=Yes, 0=No	**DHL**	lactic dehydrogenase,units/decilter
AGE	age, in years	**FC**	heart rate, beats per minute
AGE ESTRAT	stratified age in years: 1:18 to 29, 2:30 to 39, 3:40 to 49, 4:50 to 59, 5: 60-	**PAM**	mean arterial pressure,
GENRE	genre, 1=Woman, 0=Man	**Vasopressor**	1=Yes, 0=No
BMI	body mass index,	**PAFI**	relation PO2 and FO2
DM	diabetes mellitus, 1=Yes, 0=No	**VT**	tidal volume, mililiter
HAS	systemic arterial hypertension, 1=Yes, 0=No	**PEEP**	positive end-expiratory pressure, cm of H20
EPOC	chronic obstructive disease,1= Yes, 0=No	**PRES_PLAT**	plateau pressure, cm of H20
ERC	chronic kidney disease, 1=Yes, 0=No	**PRONO**	pronation, 1=Yes, 0=No
LEUCOS	leukocytes, thousands / deciliter	**DISTENS**	distensibility,cm of H20 for mililiter
LINFOS	lymphocytes, thousands / deciliter	**DP**	driving pressure, cm of H20
NEUT	neutrophils, thousands / deciliter	**VR**	ventilatory ratio
NL	ratio neutrophil/leukocyte	**SOFA**	0 a 6: Low, 7 a 11: Medium, 12 a 24: High

STATISTICS SUMMARY OF VARIABLES

Variable	Median	Mean	Std. Deviation	Variable	Median	Mean	Std. Deviation
SURVIVAL	0	0.328	0.47	**PLATELETS**	228	242.631	103.372
TIME	12	15.627	11.152	**CREATININE**	0.96	1.322	1.246
H1N1	0	0.39	0.489	**GLUCOSE**	140	157.257	73.946
COVID	1	0.61	0.489	**DHL**	487	563.54	294.034
AGE	46	46.303	11.651	**FC**	89	89.071	16.988
AGE_ESTRAT	3	3.095	1.108	**PAM**	75	76.582	10.727
GENRE	1	0.73	0.445	**Vasopressor**	0	0.461	0.499
BMI	32.4	33.199	6.924	**PAFI**	119	125.515	57.787
DM	0	0.212	0.409	**VT**	400	402.187	57.856
HAS	0	0.195	0.397	**PEEP**	12	11.78	3.269
EPOC	0	0.004	0.064	**PRES_PLAT**	27	27.785	5.603
ERC	0	0.004	0.064	**PRONO**	1	3.079	3.838
LEUCOS	9.4	10.266	4.767	**DISTENS**	26.1	27.356	8.74
LINFOS	800	946.685	648.61	**DP**	15	16.005	5.397
NEUT	8500	9319.705	4658.78	**VR**	2.34	2.387	0.594
NL	10.7	12.941	10.37	**SOFA**	6	5.672	2.261

FEATURE IMPORTANCE AND ITS RESPECTIVE COEFFICIENT.

Random Forest		Naive Bayes		ANN		MRMR		Chi2		ReliefF		ANOVA		Kruskal-Wallis	
VR	100	VR	0.116527667	DHL	100	VR	0.1476	VR	22.8917	CREATININE	0.0451	VR	34.0081	VR	31.396
CREATININE	19.684	GLUCOSE	0.082385132	DP	96.63	COVID	0.0697	DHL	5.0759	VR	0.0417	CREATININE	6.7785	GLUCOSE	7.9517
GLUCOSE	13.731	NL	0.082339546	GLUCOSE	94.06	DM	0.0503	COVID	4.4842	GLUCOSE	0.0292	PRES_PLAT	5.293	CREATININE	7.6928
AGE	12.673	DP	0.082074152	GENRE	91.82	TIME	0.0178	PRES_PLAT	4.1853	TIME	0.0245	GLUCOSE	5.2581	PRES_PLAT	5.462
TIME	12.569	PRES_PLAT	0.081966159	VT	91.34	CREATININE	0.0094	CREATININE	3.969	DHL	0.019	COVID	4.4981	TIME	5.1801
PAFI	11.727	HAS	0.064282324	PRES_PLAT	88.42	HAS	0.0062	GLUCOSE	3.5944	AGE	0.0152	VT	4.2544	COVID	4.4654
DHL	11.472	CREATININE	0.063112755	PLATELETS	87.45	VT	0.0057	HAS	2.7244	PLATELETS	0.0134	TIME	4.0128	DHL	3.9019
PRES_PLAT	10.795	DHL	0.044864793	PEEP	78.61	DHL	0.0046	Vasopressor	2.3782	PEEP	0.0122	DP	3.3175	DP	3.25
DISTENS	9.38	TIME	0.04417583	VR	76.57	PRES_PLAT	0.0032	FC	2.2956	COVID	0.0119	AGE	3.1053	HAS	3.2448
PLATELETS	9.259	PEEP	0.042004424	PAM	75.86	GLUCOSE	0.0022	AGE	2.2296	BMI	0.0106	HAS	2.8858	VT	2.9295
FC	7.505	BMI	0.041539415	TIME	74.04	BMI	0.0011	DM	2.225	DP	0.0103	Vasopressor	2.3683	AGE	2.8086
NL	6.774	PAM	0.038394629	Vasopressor	72.29	PRONO	0.001	PLATELETS	2.2153	PRES_PLAT	0.0086	DM	2.2148	PAM	2.5256
VT	6.4	VT	0.036071414	DM	56.16	GENRE	0.0006	TIME	2.1443	FC	0.0075	BMI	2.0688	Vasopressor	2.3691
LEUCOS	6.115	AGE	0.034519098	AGE	56.01	DP	0.0006	PEEP	2.0622	HAS	0.0071	PAM	1.9284	DM	2.2166
DP	6.084	PRONO	0.030673493	BMI	50.08	PAM	0.0006	VT	1.6111	NL	0.0071	DHL	1.9207	BMI	2.1833
BMI	5.969	DM	0.022308461	COVID	49	PEEP	0.0006	NL	1.3941	PAFI	0.0028	PEEP	1.8359	PEEP	1.9367
PAM	5.357	COVID	0.018472575	LEUCOS	48.19	LEUCOS	0.0005	GENRE	1.1627	DM	0.0012	PLATELETS	1.584	PLATELETS	1.9028
PRONO	3.956	FC	0.015175386	CREATININE	45.23	AGE	0	PRONO	1.1471	GENRE	-0.0018	NL	1.4562	GENRE	1.1587
PEEP	3.256	PLATELETS	0.014553003	FC	38.47	FC	0	PAM	1.1471	PRONO	-0.002	GENRE	1.1547	NL	0.9049
COVID	3.146	GENRE	0.012939162	DISTENS	37.92	PLATELETS	0	BMI	1.1117	DISTENS	-0.0026	FC	0.6932	LEUCOS	0.8391
		Vasopressor	0.011395883			PAFI	0	DISTENS	0.7279	Vasopressor	-0.0102	DISTENS	0.6185	PAFI	0.659
		LEUCOS	0.011219569			DISTENS	0	DP	0.576	PAM	-0.011	LEUCOS	0.4787	DISTENS	0.6284
		DISTENS	0.004888517			Vasopressor	0	PAFI	0.5018	VT	-0.0133	PAFI	0.4298	FC	0.2284
		PAFI	0.004116617			NL	0	LEUCOS	0.0711	LEUCOS	-0.0144	PRONO	0.1782	PRONO	0.1848

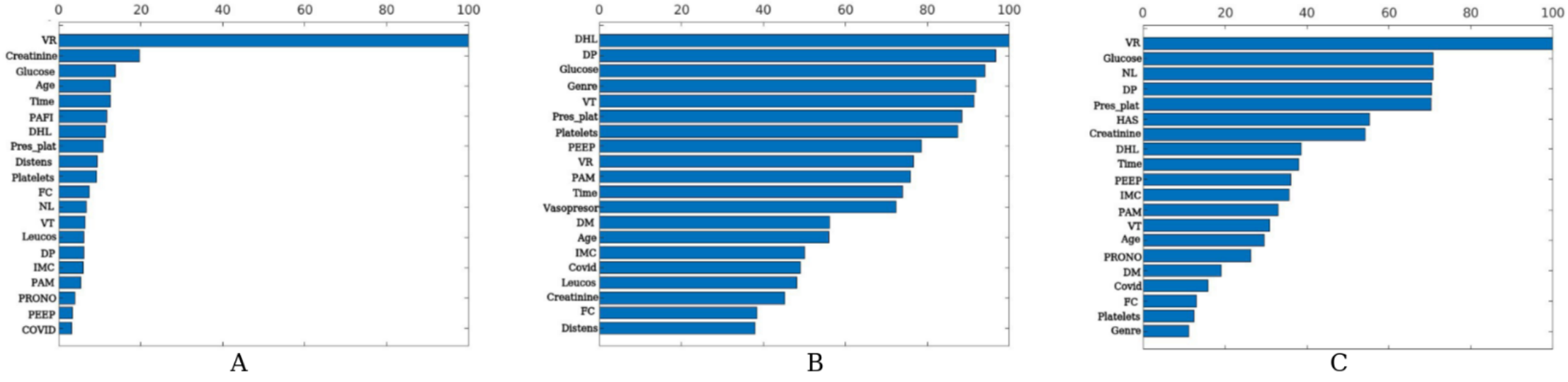
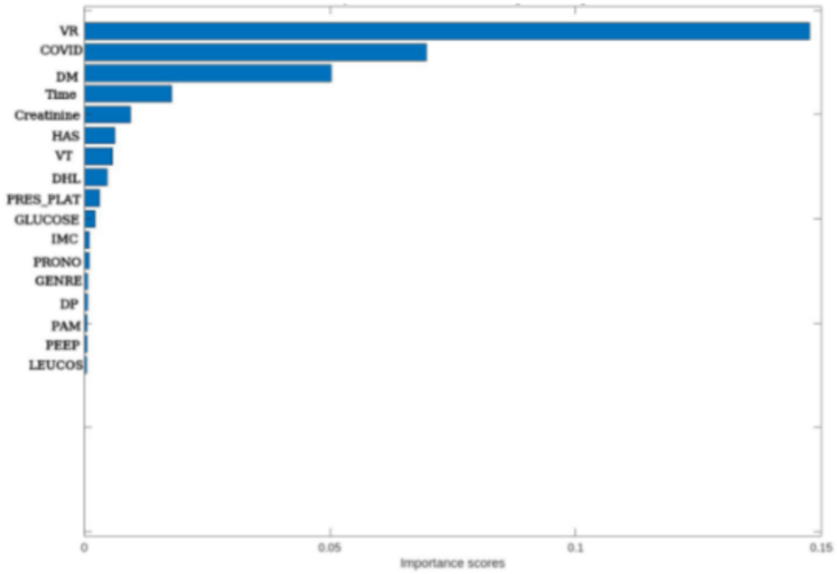
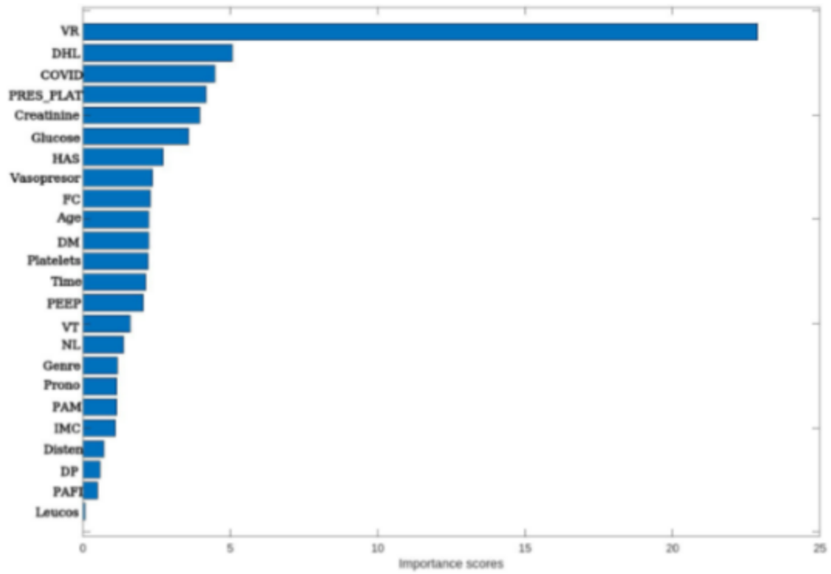


Fig. 5. Feature importance: a)Random Forest model,b) ANN model, c) Naive Bayes model



A



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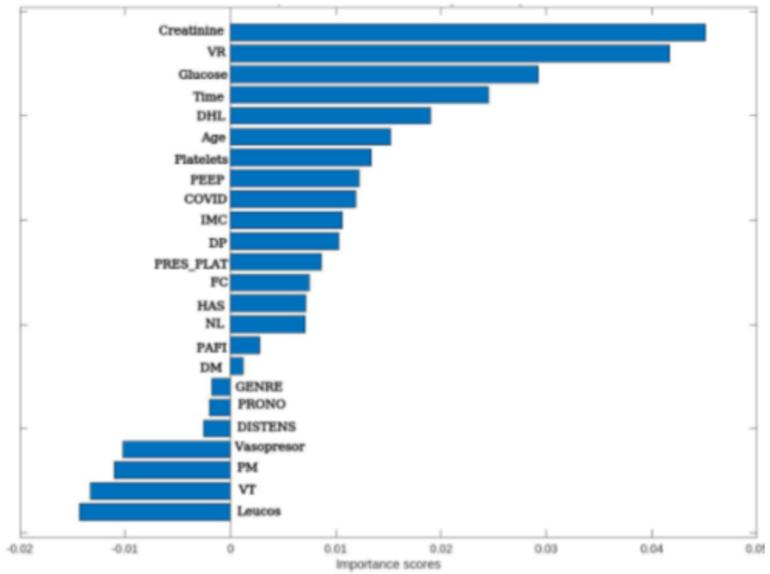

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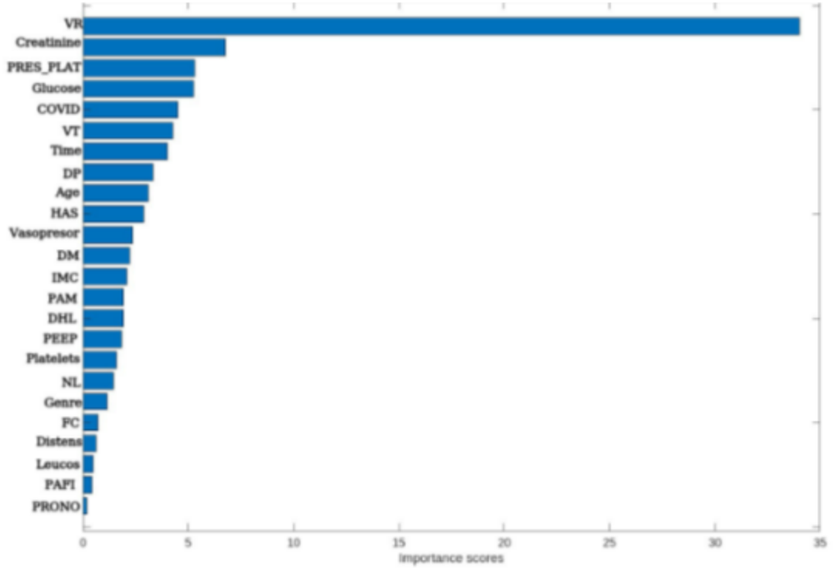
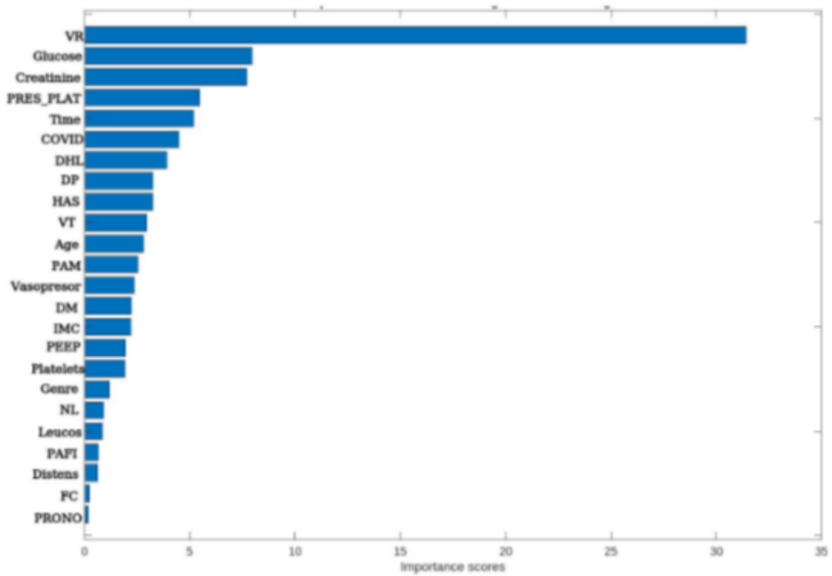


D



E

Fig. 6. Feature importance from: a) MRMR, b)Chi-square test, c) ReliefF algorithm, d)ANOVA, e)Kruskal-Wallis test

Best 5 Models with 1 variable					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR	-8.562, 3.142	1.9x10-4, 23.15	0.318	212.016	0.866
Creatinine	-1.291,0.429	0.275,1.536	0.04	296.64	0.635
DHL	-1.193,0.001	0.303,1.001	0.011	305.626	0.608
Time	-0.171,-0.037	0.843,0.964	0.023	301.838	0.609
Pres_plat	-2.581,0.066	0.076,1.069	0.023	302.036	0.606

Best 5 Models with 2 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,Glucose	-9.835,3.227, 0.006	5.356×10-5 , 25.195, 1.006	0.345	205.799	0.882
VR,HAS	-9.161, 3.28, 1.093	1.05x10-4, 26.692, 2.983	0.339	207.421	0.874
VR,Covid	-8.978, 3.119, 0.779	1.26x10-4, 22.618, 2.18	0.333	209.292	0.873
VR,VT	-11.171, 3.172, 0.006	1.4x10-5, 23.855, 1.006	0.331	209.993	0.869
VR,Age	-10, 3.159, 0.03	4.5x 10-5, 23.547, 1.03	0.331	210.058	0.869

Best 5 Models with 3 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,Covid,Pres_plat	-10.153, 3.113, 0.718, 0.044	3.8x10-5, 22.492, 2.05, 1.045	0.338	209.723	0.877
VR,Glucose,HAS	-10.412,3.374,0.006, 1.045	3.1x10-5, 29.2, 1.006, 2.844	0.363	202.183	0.887
VR,Glucose,VT	-12.758, 3.264, 0.007, 0.007	2.8x10-6, 26.158, 1.007, 1.007	0.36	203.19	0.885
VR,Covid,VT	-11.403, 3.147,0.737, 0.006	1.1x10-5, 23.258, 2.089, 1.006	0.344	207.875	0.874
VR,Glucose,Time	-9.321, 3.181, 0.007, -0.033	8.9x10-5, 24.063, 1.007, 0.968	0.356	204.494	0.884

Best 5 Models with 4 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,Covid,Glucose, DHL	-12.012, 3.169, 1.742, 0.009, 0.001	6x10-6, 23.77, 5.709, 1.009,1.001	0.397	193.733	0.905
VR,Covid,HAS, Glucose	-11.8, 3.376, 1.374, 1.075, 0.01	7.5x10-6, 29.254,3.95, 2.93, 1.01	0.4	193.091	0.906
VR,Covid,Glucose, Age	-12.76, 3.237, 1.494, 0.009, 0.033	2.8x10-6, 25.462, 4.456, 1.009, 1.003	0.394	194,733	0.902
VR,Covid,Glucose, Vasopressor	-11.426, 3.129,0.01, 1.534, 0.726	1.09x10-6, 22.858,1.01, 4.635, 2.067	0.393	195.062	0.905
VR,Covid,VT, Glucose	-13.652,3.236, 1.295,0.006, 0.01	1.1x10-6, 25.437, 3.651, 1.006, 1.01	0.393	195.173	0.905

Best 5 Models with 5 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,DHL,Covid, Glucose,Age	-14,72, 3.195, 0.002, 2.118, 0.008, 0.047	4x10-7, 24.408, 1.002, 8.315, 1.008, 1.048	0.42	188.859	0.91
VR,Covid,HAS, DHL,Glucose	-12.822, 3.33, 1.821,1.18, 0.002,0.009	2.7x10-6, 27.932,6.181,3.253,1.002,1.009	0.419	189.267	0.911
VR,DHL,Covid Glucose,Vasopressor	-12.487, 3.091, 0.002, 1.992, 0.009, 0.806	3.7x10-6, 22, 1.002, 7.329, 1.009, 2.239	0.412	191.44	0.911
VR,Covid,HAS, VT,Glucose	-14.251,3.417,1.344,1.153,0.007,0.01	4.3x10-7, 30.474,3.834,3.169,1.007,1.01	0.413	190.922	0.91
VR,Covid,Time, HAS,Glucose	-11.211,3.324,1.353,-0.039,1.193,0.01	1.3x10-5, 27.77, 3.867, 0.962, 3.298, 1.01	0.413	191.021	0.906

Best 5 Models with 6 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,Glucose,Time, DHL,Age,Covid	-14.403, 3.11, 0.009, -0.044, 0.002,0.053, 2.196	5.5x10-7, 22.412, 1.009, 0.957, 1.002, 1.054, 8.985	0.436	185.861	0.914
VR,DHL,Covid, Glucose,Vasopressor, Age	-15.248, 3.107, 0.002, 2.39, 0.009, 0.815, 0.047	2.3x10-7, 22.353, 1.002, 10.916, 1.009, 2.259, 1.048	0.434	186.677	0.916
VR,Covid,Time, HAS,DHL,Glucose	-12.333,3.291,1.853,-0.045,1.341,0.002,0.009	4.4x10-6,26.867,6.38,0.956,3.822,1.002,1.009	0.436	186.102	0.914
VR,Covid,HAS, VT,DHL,Glucose	-16.085,3.405,1.806,1.266,0.007,0.002,0.009	1.1x10-7, 30.121,6.085,3.546,1.007,1.002,1.009	0.434	186.576	0.916
VR,DHL,Covid, Glucose,HAS,Age	-15.018,3.339,0.002,2.138,0.009,0.968,0.039	3x10-7,28.184,1.002,8.481,1.009,2.633,1.04	0.433	186.865	0.914

Best 5 Models with 7 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,Covid,Time, HAS,VT,DHL, Glucose	-15.749,3.377,1.83,-0.046,1.433,0.008,0.002,0.009	1.4x10-7,29.281,6.232,0.955,4.192,1.008,1.002,1.009	0.452	183.093	0.919
VR,Glucose, Time, DHL,Age,Platelets, Covid	-13.79, 3.075,0.009, -0.044, 0.002, 0.052, -0.004,2.556	1x10-6, 21.64, 1.009, 0.957, 1.002, 1.053, 0.996, 12.889	0.447	184.594	0.916
VR,Glucose,Time, DHL,Age,PEEP, Covid	-15.578, 3.093, 0.009, -0.048, 0.002, 0.058, 0.088, 2.33	1.7x10-7, 22.05, 1.009, 0.953, 1.002, 1.06, 1.092, 10.279	0.443	185.87	0.915
VR,DHL,Covid, Glucose,HAS, Vasopressor,Age	-15.528,3.252,0.002,2.403,0.009,0.888,0.748,0.04	1.8x10-7,25.842,1.002,11.054,1.009,2.43,2.113,1.041	0.444	185.451	0.918
Creatinine,VR,Glucose, Time,DHL,Age, Covid	-14.343, 0.21, 3.023, 0.009, -0.043, 0.002, 0.05, 2.214	5.9x10-7, 1.233, 20.557, 1.009, 0.958, 1.002, 1.052, 9.154	0.442	186.964	0.916

Best 5 Models with 8 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,Covid, Time,Creatinine,HAS, VT,DHL,Glucose	-15.984,3.303,1.902,-0.045,0.233,1.424,0.008,0.002,0.009	1.1x10-7,27.198,6.696,0.956,1.262,4.152,1.008,1.002,1.009	0.46	182.764	0.923
VR,Covid,Time, Creatinine,HAS,Pres_plat, DHL,Glucose	-13.089,3.198,1.852,-0.046,0.233,1.274,0.027,0.002,0.009	2x10-6,24.476,6.375,0.955,1.262,3.575,1.028,1.002,1.01	0.445	183.31	0.919
Creatinine,VR,Glucose, Time,DHL,Age, Platelets,Covid	-13.745,0.21,2.987,0.009,-0.044,0.002,0.05,-0.004,2.593	1x10-6,1.234,19.816,1.009,0.957,1.002,1.051,0.996,13.367	0.453	184.762	0.92
VR,Glucose,Creatinine, Time,Covid,DHL, HAS,DP	,-12.487,3.216,0.009,0.233,-0.044,1.905,0.002,1.309,0.001	3.7x10-6,24.934,1.009,1.262,0.957,6.719,1.002,3.702,1.001	0.443	185.831	0.919
VR,Covid, Time,HAS,DM, DHL,Pres_plat,Glucose	-12.991,3.277,1.807,-0.047,1.202,0.453,0.002,0.026,0.009	2.2x10-6,26.508,6.093,0.954,3.326,1.574,1.002,1.027,1.009	0.44	186.752	0.917

Best 5 Models with 9 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,Covid,DM, Time,Creatinine,HAS, VT,DHL,Glucose	-16.224, 3.311,1.914,0.505,-0.047,0.196,1.314,0.008,0.002,0.009	9x10-8, 27.408,6.78,1.657,0.954,1.216,3.722,1.008,1.002,1.009	0.463	183.772	0.923
VR,Covid,Time, Creatinine,HAS,VT, DHL,Pres_plat,Glucose	-16.459,3.289,1.85,-0.047,0.232,1.386,0.008,0.002,0.023,0.009	7.1x10-8, 26.816,6.358,0.954,1.261,3.998,1.008,1.002,1.023,1.009	0.461	184.412	0.924
Creatinine,VR,Glucose, Time,DHL,Age, Platelets,PEEP,Covid	-14.981, 0.233, 2.96, 0.009, -0.048, 0.002, 0.055, -0.003, 0.086, 2.701	3.1x10-7, 1.249, 19.296, 1.009, 0.953, 1.002, 1.057, 0.997, 1.09, 14.895	0.459	184.974	0.922
VR,Glucose,Creatinine, Time,Covid,DHL, DP,HAS,VT	-15.969,3.303,0.009,0.233,-0.045,1.906,0.002,-0.001,1.426,0.008	1.2x10-7, 27.202,1.009,1.262,0.956,6.726,1.002,0.999,4.162,1.008	0.46	184.763	0.924
VR,Covid,DM, Time,HAS,VT, DHL,Pres_plat,Glucose	-16.514,3.37,1.794,0.621,-0.048,1.262,0.008,0.002,0.021,0.009	6.7x10-8, 29.082,6.013,1.86,0.953,3.532,1.008,1.002,1.002,1.009	0.458	185.218	0.921

Best 5 Models with 10 variables					
Variables	**Estimate**	**Odds Ratio**	**McFadden R2**	**AIC**	**AUC**
VR,Covid,DM, Time,Creatinine,HAS, VT,DHL,Pres_plat, Glucose	-16.681,3.295,1.863,0.502,-0.048,0.196,1.276,0.008,0.002,0.023,0.009	5.6x10-8, 26.986,6.441,1.652,0.953,1.216,3.581,1.008,1.002,1.023,1.009	0.464	185.437	0.924
VR,Glucose,Creatinine, Pres_plat,Time,Covid, DHL,DP,HAS,VT	-16.692,3.271,0.009,0.243,0.068,-0.048,1.966,0.002,-0.061,1.424,0.008	5.6x10-8,26.35,1.009,1.275,1.071,0.953,7.143,1.002,0.941,4.154,1.008	0.463	185.683	0.925
Creatinine,VR,Glucose, Time,DHL,Age, Platelets,PEEP,Covid, BMI	-15.784, 0.212, 2.952, 0.009, -0.046, 0.002, 0.058, -0.003, 0.08, 2.729, 0.021	1.3x10-7, 1.236, 19.141, 1.009, 0.955, 1.002, 1.06, 0.997, 1.083, 15.316, 1.021	0.46	186.505	0.923
VR,Creatinine,Pres_plat, Glucose,Covid,VT, Time,DP,Age,HAS	-18.107,3.245,0.266,0.128,0.01,1.669,0.008,-0.049,-0.105,0.038,1.051	1.3x10-8, 25.673,1.305,1.136,1.01,5.305,1.008,0.952,0.9,1.039,2.86	0.458	187.273	0.921
VR,DHL,Covid, Pres_plat,Creatinine,Glucose, HAS,Vasopressor,FC,Age	-16.783,3.12,0.002,2.538,0.017,0.195,0.009,0.853,0.731,0.01,0.039	5.1x10-8,22.64,1.002,12.656,1.017,1.215,1.009,2.346,2.077,1.01,1.04	0.453	188.702	0.922