

# Appendix

## Data sources

1. The “VA lung cancer trial” data (Kalbfleisch and Prentice, 2011) were obtained from the `randomForestSRC` R package (Ishwaran and Kogalur, 2019). No relevant pre-processing steps were taken.
2. The “Colon cancer” data (Moertel et al., 1995) were obtained from the `survival` R package (Therneau, 2022b). In pre-processing steps, the predictor, node4, which is an indicator for having more than 4 positive lymph nodes, was dropped, while the nodes predictor, which indicates the number of positive lymph nodes, was retained.
3. The “Primary biliary cholangitis” data (Therneau and Grambsch, 2000) were obtained from the `aorsf` R package (Jaeger, 2022). No relevant pre-processing steps were taken.
4. The “Movies released in 2015-2018” data were obtained from the `censored` R package (Hvitfeldt and Frick, Hvitfeldt and Frick). In pre-processing steps, text and date variables (movie title, release date, and distributor) were dropped..
5. The “GBSG II” data (Schumacher, 1994) were obtained from the `TH.data` R package (Hothorn, 2022). No relevant pre-processing steps were taken.
6. The “Systolic Heart Failure” data (Hsich et al., 2011) were obtained from the `randomForestSRC` R package (Ishwaran and Kogalur, 2019). No relevant pre-processing steps were taken.
7. The “Serum free light chain” data (Dispenzieri et al., 2012; Kyle et al., 2006) were obtained from the `survival` R package (Therneau, 2022b). In pre-processing steps, the chapter variable, which indicates death status, was removed, since death was the outcome. Outcomes occurring on day 0 were assumed to have a time of 1/2 day rather than 0 days.
8. The “Non-alcohol fatty liver disease” data (Allen et al., 2018) were obtained from the `survival` R package (Therneau, 2022b). In pre-processing steps, data from before or on the index date were used as predictors. The mean value prior to the index date for lab values in nafld2 was

- used as a predictor, and the number of days between the most recent lab test and the index date was also used as a predictor.
9. The “Rotterdam tumor bank” data (Royston and Altman, 2013) were obtained from the **survival** R package (Therneau, 2022b). No relevant pre-processing steps were taken.
  10. The “ACTG 320” data (Hosmer and Lemeshow, 2002) were obtained from the **mlr3proba** R package (Sonabend et al., 2021). In pre-processing steps, redundant predictors were dropped.
  11. The “GUIDE-IT” data (Felker et al., 2017) were obtained from BioLINCC. In pre-processing steps, baseline data including biomarkers, questionnaires, and randomized group were included as predictors.
  12. The “Early breast cancer” data (Desmedt et al., 2011; Hatzis et al., 2011; Ternès et al., 2017) were obtained from the **biospear** R package (Ternes et al., 2018). No relevant pre-processing steps were taken.
  13. The “SPRINT” data (SPRINT Research Group, 2015) were obtained from BioLINCC. In pre-processing steps, baseline data including biomarkers, cognitive questionnaires, medications, and randomization group were included as predictors. Predictors with over 40 percent missing data were dropped. Zero variance predictors were also dropped.
  14. The “NKI 70 gene signature” data (Van De Vijver et al., 2002) were obtained from the **OpenML** R package (Casalicchio et al., 2017). No relevant pre-processing steps were taken.
  15. The “Lung cancer” data (Director’s Challenge Consortium for the Molecular Classification of Lung Adenocarcinoma, 2008) were obtained from the **OpenML** R package (Casalicchio et al., 2017). In pre-processing steps, status was transformed to have values of 0 and 1 instead of 1 and 2.
  16. The “NCCTG Lung Cancer” data (Loprinzi et al., 1994) were obtained from the **survival** R package (Therneau, 2022b). In pre-processing steps, institution code was not used as a predictor, and values of both sex and event status were transformed to be 0 and 1 instead of 1 and 2.

17. The “FCL” data (Pintilie, 2006) were obtained from the `randomForestSRC` R package (Ishwaran and Kogalur, 2019). No relevant pre-processing steps were taken.
18. The “Monoclonal gammopathy” data (Kyle et al., 2002) were obtained from the `survival` R package (Therneau, 2022b). No relevant pre-processing steps were taken.
19. The “MESA” data (Bild et al., 2002) were obtained from BioLINCC. In pre-processing steps, visit 1 data including biomarkers, health behaviors, and comorbidities were included as predictors.
20. The “ARIC” data (ARIC Investigators, 1989) were obtained from BioLINCC. In pre-processing steps, visit 1 data including biomarkers, health behaviors, and comorbidities were included as predictors.
21. The “JHS” data (Taylor Jr et al., 2005) were obtained from BioLINCC. In pre-processing steps, visit 1 data including biomarkers, health behaviors, neighborhood characteristics, and comorbidities were included as predictors.

A.1: Data sets used for numeric experiments

Label	N observations	N predictors	Outcome	N Events	% Censored
VA lung cancer trial	137	8	Death	128	6.57
Colon cancer	929	12	Recurrence	468	49.6
Primary biliary cholangitis	276	19	Death	452	51.3
Movies released in 2015-2018	551	46	Gross 1M USD	522	5.26
GBSG II	686	10	Recurrence Or Death	299	56.4
Systolic Heart Failure	2,231	41	Death	726	67.5
Serum free light chain	7,874	10	Death	2,169	72.5
Non-alcohol fatty liver disease	17,549	24	Death	1,364	92.2
Rotterdam tumor bank	2,982	11	Recurrence	1,518	49.1
ACTG 320	1,151	12	Death	1,272	57.3
GUIDE-IT	894	59	AIDS Diagnosis	96	91.7
Early breast cancer	614	1,692	Cardiovascular Death	110	87.7
			Hf Hospitalization	288	67.8
			Recurrence Or Death	134	78.2

			Cardiovascular Death	521	94.4
SPPRINT	9,361	174	Death	1,644	82.4
NKI 70 gene signature	144	77	Death Or Metastasis	48	66.7
Lung cancer	442	24	Death	236	46.6
NCCTG Lung Cancer	228	9	Death	165	27.6
FCL	541	7	Death	76	86.0
			Relapse	272	49.7
Monoclonal gammopathy	1,384	8	Death	963	30.4
			Malignancy	115	91.7
			Heart Failure	339	95.0
MESA	6,783	48	Coronary Heart Disease	439	93.5
			Stroke	292	95.7
			Death	1,297	80.9
			Heart Failure	2,981	78.1
ARIC	13,623	41	Coronary Heart Disease	2,282	83.2
			Stroke	1,323	90.3
			Death	6,662	51.1
			Stroke	152	95.8

JHS	3,501	80	Coronary Heart Disease	190	94.6
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A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks.

	Performance metric (SD)		Computation time, seconds	
	Scaled Brier	C-Statistic	Model fitting	Risk prediction
<b><i>Overall</i></b>				
aorsf-fast	0.126 (0.109)	0.772 (0.071)	0.527	0.138
aorsf-cph	0.126 (0.109)	0.771 (0.070)	1.750	0.140
cif-standard	0.113 (0.098)	0.765 (0.071)	3.792	6.448
rsf-standard	0.113 (0.114)	0.755 (0.075)	1.945	0.196
cif-rotate	0.112 (0.124)	0.755 (0.081)	36.928	8.194
obliqueRSF-net	0.109 (0.081)	0.773 (0.069)	552.335	84.685
glmnet-cox	0.108 (0.119)	0.757 (0.077)	0.326	0.003
ranger-extratrees	0.099 (0.085)	0.762 (0.067)	0.790	1.109
cif-extension	0.095 (0.092)	0.761 (0.072)	21.977	6.922
aorsf-random	0.092 (0.079)	0.744 (0.065)	1.717	0.149
xgboost-cox	0.064 (0.100)	0.749 (0.094)	4.394	0.004
nn-cox	0.048 (0.106)	0.657 (0.136)	11.377	1.705
xgboost-aft	—	0.762 (0.076)	15.031	0.007
<b><i>ACTG 320; AIDS diagnosis, n = 1151, p = 12</i></b>				
obliqueRSF-net	0.029 (0.015)	0.753 (0.037)	115.320	18.196
ranger-extratrees	0.028 (0.017)	0.740 (0.036)	0.086	0.133
aorsf-random	0.027 (0.020)	0.756 (0.036)	0.465	0.035
cif-standard	0.024 (0.031)	0.744 (0.040)	1.657	4.377
aorsf-cph	0.024 (0.029)	0.750 (0.042)	0.436	0.036
aorsf-fast	0.024 (0.028)	0.745 (0.045)	0.141	0.036
cif-extension	0.023 (0.015)	0.722 (0.038)	9.010	4.189
glmnet-cox	0.016 (0.030)	0.746 (0.037)	0.197	0.002

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
rsf-standard	0.005 (0.041)	0.730 (0.042)	0.179	0.061
cif-rotate	0.004 (0.040)	0.731 (0.038)	14.549	3.604
nn-cox	0.000 (0.011)	0.564 (0.101)	7.755	0.811
xgboost-cox	-0.001 (0.052)	0.751 (0.033)	3.729	0.003
xgboost-aft	—	0.737 (0.035)	11.383	0.006
<b><i>ACTG 320; death, n = 1151, p = 12</i></b>				
aorsf-random	0.008 (0.012)	0.798 (0.073)	0.285	0.024
obliqueRSF-net	0.006 (0.009)	0.821 (0.049)	49.070	11.201
aorsf-fast	0.006 (0.019)	0.826 (0.057)	0.088	0.020
aorsf-cph	0.006 (0.018)	0.818 (0.062)	0.357	0.020
cif-extension	0.001 (0.020)	0.765 (0.066)	8.283	3.478
ranger-extratrees	0.001 (0.019)	0.777 (0.069)	0.041	0.122
xgboost-cox	-0.004 (0.004)	0.500 (0.000)	0.118	0.002
nn-cox	-0.004 (0.004)	0.547 (0.128)	7.487	0.717
cif-standard	-0.005 (0.025)	0.781 (0.062)	1.695	4.223
rsf-standard	-0.031 (0.051)	0.776 (0.073)	0.098	0.037
cif-rotate	-0.037 (0.049)	0.707 (0.090)	13.163	3.201
glmnet-cox	-0.065 (0.095)	0.746 (0.098)	0.286	0.002
xgboost-aft	—	0.774 (0.070)	10.124	0.005
<b><i>ARIC; coronary heart disease, n = 13623, p = 41</i></b>				
aorsf-fast	0.156 (0.007)	0.810 (0.007)	4.590	1.434
aorsf-cph	0.153 (0.006)	0.809 (0.007)	14.582	1.450
rsf-standard	0.150 (0.007)	0.801 (0.007)	8.222	0.981
obliqueRSF-net	0.133 (0.005)	0.811 (0.008)	4468.696	1359.275

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
cif-standard	0.132 (0.005)	0.809 (0.007)	70.462	358.273
glmnet-cox	0.129 (0.011)	0.795 (0.008)	1.873	0.010
nn-cox	0.126 (0.012)	0.795 (0.007)	43.144	86.104
ranger-extratrees	0.112 (0.005)	0.795 (0.009)	283.364	69.939
aorsf-random	0.104 (0.005)	0.771 (0.008)	11.343	1.420
cif-rotate	0.104 (0.004)	0.783 (0.009)	558.249	68.510
cif-extension	0.069 (0.002)	0.786 (0.009)	164.161	50.420
xgboost-cox	0.064 (0.017)	0.813 (0.006)	9.660	0.015
xgboost-aft	—	0.814 (0.006)	29.321	0.013
<b>ARIC; death, n = 13623, p = 41</b>				
rsf-standard	0.216 (0.006)	0.789 (0.004)	12.352	1.162
aorsf-fast	0.216 (0.006)	0.792 (0.004)	7.463	2.519
aorsf-cph	0.215 (0.006)	0.792 (0.004)	22.389	2.569
cif-standard	0.201 (0.004)	0.790 (0.004)	68.083	373.333
obliqueRSF-net	0.195 (0.004)	0.789 (0.004)	7373.936	1276.463
nn-cox	0.191 (0.008)	0.779 (0.005)	83.418	84.770
glmnet-cox	0.191 (0.015)	0.777 (0.007)	2.282	0.011
ranger-extratrees	0.181 (0.004)	0.780 (0.005)	356.276	61.525
cif-rotate	0.151 (0.007)	0.757 (0.006)	563.575	64.849
xgboost-cox	0.131 (0.012)	0.794 (0.004)	12.568	0.015
aorsf-random	0.128 (0.006)	0.725 (0.005)	20.291	2.298
cif-extension	0.113 (0.002)	0.775 (0.005)	176.867	50.345
xgboost-aft	—	0.794 (0.004)	35.380	0.013
<b>ARIC; heart failure, n = 13623, p = 41</b>				

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
aorsf-fast	0.233 (0.006)	0.841 (0.005)	5.478	1.709
rsf-standard	0.229 (0.006)	0.835 (0.005)	10.326	1.039
aorsf-cph	0.229 (0.006)	0.840 (0.005)	17.063	1.730
cif-standard	0.199 (0.005)	0.839 (0.005)	68.929	364.202
obliqueRSF-net	0.198 (0.005)	0.839 (0.005)	5341.195	1624.560
nn-cox	0.188 (0.018)	0.826 (0.006)	58.351	89.012
cif-rotate	0.172 (0.006)	0.806 (0.007)	569.166	67.654
ranger-extratrees	0.170 (0.004)	0.824 (0.005)	411.253	73.737
glmnet-cox	0.167 (0.044)	0.817 (0.018)	2.257	0.010
aorsf-random	0.151 (0.006)	0.792 (0.007)	14.023	1.686
xgboost-cox	0.122 (0.017)	0.845 (0.005)	11.985	0.015
cif-extension	0.109 (0.003)	0.808 (0.006)	169.620	49.957
xgboost-aft	—	0.844 (0.005)	30.837	0.012

**ARIC; stroke, n = 13623, p = 41**

aorsf-fast	0.093 (0.004)	0.793 (0.007)	3.625	1.205
aorsf-cph	0.090 (0.004)	0.792 (0.007)	12.691	1.331
rsf-standard	0.090 (0.006)	0.784 (0.006)	8.134	0.916
glmnet-cox	0.078 (0.004)	0.787 (0.007)	1.781	0.010
obliqueRSF-net	0.073 (0.003)	0.789 (0.008)	3058.459	2338.694
cif-standard	0.073 (0.003)	0.787 (0.007)	69.723	355.372
nn-cox	0.068 (0.016)	0.781 (0.012)	29.662	78.191
ranger-extratrees	0.067 (0.003)	0.779 (0.008)	219.331	61.397
aorsf-random	0.061 (0.005)	0.750 (0.009)	9.153	1.186
cif-rotate	0.052 (0.003)	0.768 (0.009)	573.621	66.723
xgboost-cox	0.047 (0.014)	0.794 (0.006)	7.662	0.014

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
cif-extension	0.036 (0.002)	0.769 (0.009)	167.033	51.074
xgboost-aft	—	0.793 (0.006)	25.321	0.012
<b><i>Colon cancer; death, n = 929, p = 12</i></b>				
aorsf-random	0.103 (0.011)	0.724 (0.012)	0.974	0.048
aorsf-cph	0.100 (0.015)	0.717 (0.011)	0.631	0.050
aorsf-fast	0.099 (0.014)	0.718 (0.012)	0.235	0.052
cif-standard	0.097 (0.013)	0.710 (0.012)	0.698	3.233
obliqueRSF-net	0.087 (0.006)	0.717 (0.011)	227.346	90.031
cif-rotate	0.086 (0.017)	0.705 (0.014)	12.581	3.222
rsf-standard	0.086 (0.019)	0.704 (0.011)	1.899	0.150
ranger-extratrees	0.083 (0.007)	0.710 (0.012)	0.079	0.231
cif-extension	0.080 (0.006)	0.709 (0.011)	7.680	3.708
glmnet-cox	0.075 (0.016)	0.711 (0.019)	0.133	0.002
xgboost-cox	0.063 (0.013)	0.701 (0.013)	3.694	0.003
nn-cox	-0.003 (0.003)	0.510 (0.045)	9.217	1.188
xgboost-aft	—	0.706 (0.013)	12.025	0.006
<b><i>Colon cancer; recurrence, n = 929, p = 12</i></b>				
aorsf-fast	0.099 (0.017)	0.713 (0.016)	0.235	0.051
aorsf-cph	0.099 (0.016)	0.712 (0.015)	0.641	0.050
aorsf-random	0.094 (0.014)	0.706 (0.015)	0.989	0.047
cif-standard	0.091 (0.016)	0.701 (0.017)	0.685	3.216
obliqueRSF-net	0.086 (0.008)	0.712 (0.015)	220.136	52.240
cif-rotate	0.084 (0.020)	0.694 (0.017)	12.394	3.355
cif-extension	0.081 (0.009)	0.706 (0.017)	7.829	3.620

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
rsf-standard	0.081 (0.020)	0.694 (0.015)	1.839	0.152
ranger-extratrees	0.079 (0.011)	0.700 (0.016)	0.081	0.273
glmnet-cox	0.073 (0.018)	0.706 (0.024)	0.136	0.002
xgboost-cox	0.060 (0.010)	0.695 (0.018)	3.234	0.003
nn-cox	-0.020 (0.074)	0.533 (0.044)	9.225	1.019
xgboost-aft	—	0.701 (0.019)	12.802	0.006
<b><i>Early breast cancer; recurrence or death, n = 614, p = 1692</i></b>				
obliqueRSF-net	0.072 (0.022)	0.751 (0.027)	1772.643	38.287
cif-rotate	0.070 (0.018)	0.747 (0.027)	6243.357	338.140
cif-standard	0.067 (0.019)	0.747 (0.030)	8.875	4.293
aorsf-cph	0.067 (0.029)	0.747 (0.026)	1.614	0.300
aorsf-fast	0.065 (0.028)	0.746 (0.026)	1.325	0.297
cif-extension	0.064 (0.016)	0.746 (0.028)	42.920	6.083
ranger-extratrees	0.061 (0.022)	0.742 (0.031)	0.219	0.311
glmnet-cox	0.041 (0.032)	0.724 (0.036)	5.782	0.005
xgboost-cox	0.028 (0.032)	0.742 (0.032)	2.472	0.006
aorsf-random	0.025 (0.016)	0.691 (0.042)	1.888	0.271
rsf-standard	0.024 (0.037)	0.695 (0.033)	0.883	0.169
nn-cox	-0.010 (0.071)	0.682 (0.067)	14.875	1.621
xgboost-aft	—	0.744 (0.027)	10.373	0.009
<b><i>FCL; death, n = 541, p = 7</i></b>				
glmnet-cox	0.117 (0.028)	0.787 (0.037)	0.105	0.002
aorsf-cph	0.100 (0.039)	0.769 (0.033)	0.165	0.018
aorsf-fast	0.100 (0.037)	0.768 (0.033)	0.079	0.018

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
obliqueRSF-net	0.091 (0.023)	0.769 (0.032)	78.242	6.014
cif-rotate	0.087 (0.048)	0.755 (0.027)	5.839	1.758
cif-extension	0.087 (0.036)	0.730 (0.034)	5.195	2.616
aorsf-random	0.085 (0.029)	0.754 (0.034)	0.258	0.019
cif-standard	0.084 (0.038)	0.743 (0.036)	0.281	1.194
ranger-extratrees	0.073 (0.016)	0.741 (0.037)	0.031	0.081
rsf-standard	0.072 (0.048)	0.732 (0.034)	0.113	0.039
xgboost-cox	0.026 (0.053)	0.679 (0.120)	0.330	0.002
nn-cox	0.001 (0.028)	0.553 (0.117)	7.201	0.403
xgboost-aft	—	0.754 (0.038)	7.320	0.005
<b>FCL; relapse, n = 541, p = 7</b>				
glmnet-cox	0.029 (0.017)	0.620 (0.024)	0.107	0.002
obliqueRSF-net	0.018 (0.014)	0.598 (0.024)	165.938	8.270
ranger-extratrees	0.017 (0.016)	0.596 (0.025)	0.031	0.080
aorsf-random	0.012 (0.017)	0.595 (0.023)	0.401	0.021
xgboost-cox	0.011 (0.016)	0.598 (0.032)	1.548	0.002
cif-standard	0.008 (0.021)	0.594 (0.023)	0.277	1.221
aorsf-cph	0.007 (0.021)	0.595 (0.026)	0.260	0.023
aorsf-fast	0.007 (0.019)	0.594 (0.025)	0.116	0.022
cif-extension	-0.005 (0.023)	0.580 (0.028)	5.912	2.183
nn-cox	-0.006 (0.014)	0.521 (0.059)	8.447	0.457
cif-rotate	-0.012 (0.025)	0.583 (0.030)	6.486	2.537
rsf-standard	-0.026 (0.032)	0.577 (0.024)	0.891	0.083
xgboost-aft	—	0.582 (0.034)	6.799	0.005

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
<b><i>GBSG II; recurrence or death, n = 686, p = 10</i></b>				
cif-standard	0.123 (0.020)	0.743 (0.020)	0.478	2.173
obliqueRSF-net	0.121 (0.014)	0.747 (0.018)	234.738	19.092
rsf-standard	0.120 (0.023)	0.738 (0.019)	1.362	0.114
aorsf-cph	0.117 (0.022)	0.733 (0.017)	0.404	0.038
cif-extension	0.114 (0.017)	0.743 (0.019)	7.544	3.429
aorsf-fast	0.112 (0.024)	0.730 (0.018)	0.180	0.040
aorsf-random	0.111 (0.017)	0.727 (0.018)	0.728	0.036
cif-rotate	0.107 (0.023)	0.729 (0.017)	10.139	2.954
ranger-extratrees	0.094 (0.018)	0.736 (0.025)	0.051	0.121
glmnet-cox	0.090 (0.019)	0.728 (0.021)	0.113	0.002
xgboost-cox	0.083 (0.015)	0.730 (0.020)	2.632	0.003
nn-cox	-0.015 (0.048)	0.504 (0.037)	8.139	0.727
xgboost-aft	—	0.729 (0.021)	12.179	0.006
<b><i>GUIDE-IT; CVD death, n = 894, p = 59</i></b>				
aorsf-fast	0.075 (0.018)	0.745 (0.028)	0.154	0.036
aorsf-cph	0.071 (0.018)	0.742 (0.027)	0.386	0.037
glmnet-cox	0.063 (0.041)	0.715 (0.091)	0.489	0.003
obliqueRSF-net	0.060 (0.013)	0.741 (0.027)	209.529	11.066
cif-rotate	0.059 (0.016)	0.721 (0.025)	34.549	4.966
cif-standard	0.058 (0.014)	0.738 (0.022)	1.380	3.350
ranger-extratrees	0.054 (0.013)	0.737 (0.029)	0.082	0.196
cif-extension	0.052 (0.011)	0.730 (0.022)	13.080	5.523
rsf-standard	0.046 (0.023)	0.705 (0.025)	0.174	0.061

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
xgboost-cox	0.044 (0.041)	0.747 (0.020)	3.880	0.003
aorsf-random	0.030 (0.011)	0.675 (0.035)	0.510	0.038
nn-cox	0.022 (0.036)	0.673 (0.089)	8.663	0.566
xgboost-aft	—	0.734 (0.020)	11.747	0.006
<b><i>GUIDE-IT; HF hospitalization, n = 894, p = 59</i></b>				
aorsf-fast	0.081 (0.019)	0.723 (0.024)	0.239	0.054
aorsf-cph	0.080 (0.018)	0.722 (0.024)	0.682	0.055
ranger-extratrees	0.073 (0.010)	0.722 (0.022)	0.243	0.187
obliqueRSF-net	0.071 (0.009)	0.721 (0.022)	354.417	22.308
cif-standard	0.070 (0.010)	0.716 (0.023)	1.282	3.415
cif-rotate	0.067 (0.019)	0.708 (0.029)	40.978	4.799
cif-extension	0.064 (0.009)	0.714 (0.022)	14.406	5.796
glmnet-cox	0.058 (0.020)	0.699 (0.025)	0.391	0.002
rsf-standard	0.058 (0.022)	0.694 (0.026)	1.601	0.122
nn-cox	0.051 (0.026)	0.701 (0.038)	9.103	0.579
xgboost-cox	0.040 (0.016)	0.699 (0.026)	3.449	0.003
aorsf-random	0.039 (0.012)	0.668 (0.028)	0.889	0.053
xgboost-aft	—	0.697 (0.025)	13.258	0.006
<b><i>JHS; coronary heart disease, n = 3501, p = 80</i></b>				
aorsf-cph	0.040 (0.007)	0.778 (0.014)	2.083	0.144
aorsf-fast	0.039 (0.007)	0.777 (0.015)	0.557	0.141
obliqueRSF-net	0.038 (0.005)	0.784 (0.017)	592.769	868.718
cif-standard	0.038 (0.006)	0.779 (0.017)	9.787	30.975
cif-extension	0.036 (0.004)	0.781 (0.019)	56.440	20.992

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
ranger-extratrees	0.035 (0.005)	0.777 (0.017)	3.678	2.536
cif-rotate	0.034 (0.010)	0.769 (0.018)	187.605	23.593
glmnet-cox	0.031 (0.010)	0.774 (0.020)	2.237	0.004
rsf-standard	0.031 (0.011)	0.752 (0.016)	2.011	0.215
nn-cox	0.025 (0.020)	0.745 (0.029)	10.189	6.685
aorsf-random	0.021 (0.004)	0.746 (0.021)	1.800	0.163
xgboost-cox	0.010 (0.023)	0.785 (0.022)	4.562	0.006
xgboost-aft	—	0.782 (0.017)	18.309	0.007
<b><i>JHS; stroke, n = 3639, p = 80</i></b>				
aorsf-cph	0.035 (0.006)	0.805 (0.017)	2.137	0.141
aorsf-fast	0.035 (0.007)	0.807 (0.018)	0.527	0.139
obliqueRSF-net	0.028 (0.004)	0.810 (0.016)	528.781	577.511
glmnet-cox	0.028 (0.008)	0.798 (0.017)	2.915	0.004
cif-standard	0.028 (0.005)	0.803 (0.016)	10.497	32.921
rsf-standard	0.027 (0.010)	0.782 (0.018)	1.632	0.159
cif-extension	0.025 (0.003)	0.797 (0.018)	56.277	22.158
aorsf-random	0.024 (0.005)	0.770 (0.023)	1.726	0.158
ranger-extratrees	0.023 (0.005)	0.791 (0.016)	3.510	2.689
cif-rotate	0.023 (0.009)	0.785 (0.017)	186.661	24.918
nn-cox	0.014 (0.022)	0.763 (0.045)	9.541	6.840
xgboost-cox	0.002 (0.028)	0.775 (0.023)	3.500	0.005
xgboost-aft	—	0.784 (0.018)	16.110	0.007
<b><i>Lung cancer; death, n = 442, p = 24</i></b>				
aorsf-cph	0.063 (0.031)	0.691 (0.019)	0.308	0.030

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
aorsf-fast	0.060 (0.033)	0.690 (0.019)	0.122	0.030
obliqueRSF-net	0.056 (0.018)	0.679 (0.021)	219.473	7.313
cif-extension	0.050 (0.018)	0.667 (0.019)	8.429	3.209
rsf-standard	0.050 (0.035)	0.673 (0.023)	1.081	0.072
cif-standard	0.050 (0.023)	0.667 (0.022)	0.318	0.924
ranger-extratrees	0.049 (0.016)	0.675 (0.019)	0.037	0.062
cif-rotate	0.047 (0.026)	0.664 (0.021)	16.753	2.820
aorsf-random	0.043 (0.021)	0.653 (0.024)	0.549	0.027
glmnet-cox	0.041 (0.024)	0.664 (0.034)	0.127	0.002
nn-cox	0.019 (0.038)	0.625 (0.062)	9.211	0.291
xgboost-cox	0.018 (0.019)	0.644 (0.027)	1.583	0.002
xgboost-aft	—	0.652 (0.026)	8.520	0.005
<b>MESA; coronary heart disease, n = 6785, p = 48</b>				
aorsf-fast	0.064 (0.010)	0.807 (0.011)	1.213	0.363
aorsf-cph	0.061 (0.010)	0.802 (0.012)	5.020	0.374
cif-standard	0.059 (0.007)	0.803 (0.013)	23.531	96.894
obliqueRSF-net	0.058 (0.006)	0.809 (0.012)	1296.402	747.185
cif-rotate	0.058 (0.009)	0.802 (0.013)	284.179	37.551
rsf-standard	0.057 (0.012)	0.795 (0.013)	3.455	1.337
ranger-extratrees	0.047 (0.004)	0.794 (0.011)	7.979	6.588
cif-extension	0.047 (0.003)	0.805 (0.013)	97.660	28.300
aorsf-random	0.041 (0.008)	0.760 (0.015)	2.930	0.404
glmnet-cox	0.038 (0.017)	0.775 (0.016)	4.514	0.006
nn-cox	0.035 (0.016)	0.766 (0.019)	13.123	15.303
xgboost-cox	0.014 (0.027)	0.802 (0.013)	5.344	0.008

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
xgboost-aft	—	0.802 (0.012)	20.582	0.009
<b><i>MESA; death, n = 6793, p = 48</i></b>				
aorsf-fast	0.144 (0.008)	0.792 (0.008)	1.725	0.541
aorsf-cph	0.143 (0.008)	0.791 (0.008)	6.596	0.543
rsf-standard	0.140 (0.008)	0.784 (0.009)	4.936	0.480
cif-standard	0.134 (0.007)	0.788 (0.009)	23.408	98.656
obliqueRSF-net	0.132 (0.006)	0.790 (0.009)	2468.159	526.499
glmnet-cox	0.131 (0.026)	0.789 (0.012)	1.373	0.006
nn-cox	0.129 (0.019)	0.788 (0.010)	24.110	17.345
cif-rotate	0.126 (0.007)	0.783 (0.010)	319.531	37.277
ranger-extratrees	0.113 (0.004)	0.784 (0.008)	9.502	6.313
cif-extension	0.092 (0.003)	0.781 (0.009)	108.674	28.132
aorsf-random	0.086 (0.006)	0.741 (0.009)	5.817	0.577
xgboost-cox	0.057 (0.029)	0.794 (0.009)	8.811	0.009
xgboost-aft	—	0.793 (0.009)	24.056	0.009
<b><i>MESA; heart failure, n = 6785, p = 48</i></b>				
aorsf-fast	0.115 (0.010)	0.866 (0.012)	1.118	0.321
aorsf-cph	0.109 (0.011)	0.858 (0.013)	4.817	0.334
rsf-standard	0.108 (0.012)	0.856 (0.012)	3.228	1.248
cif-rotate	0.105 (0.010)	0.869 (0.013)	254.592	36.536
cif-standard	0.102 (0.009)	0.864 (0.013)	23.983	97.903
obliqueRSF-net	0.099 (0.007)	0.870 (0.012)	1112.448	1225.449
aorsf-random	0.082 (0.009)	0.819 (0.016)	2.432	0.372
cif-extension	0.077 (0.005)	0.864 (0.011)	91.356	28.914

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
nn-cox	0.075 (0.021)	0.832 (0.015)	12.343	14.955
ranger-extratrees	0.075 (0.005)	0.849 (0.015)	7.105	6.412
glmnet-cox	0.043 (0.044)	0.767 (0.139)	3.485	0.006
xgboost-cox	-0.011 (0.019)	0.869 (0.011)	7.135	0.009
xgboost-aft	—	0.870 (0.012)	22.191	0.008
<b><i>MESA; stroke, n = 6783, p = 48</i></b>				
cif-rotate	0.025 (0.004)	0.764 (0.017)	267.261	37.143
aorsf-fast	0.025 (0.006)	0.764 (0.016)	1.087	0.318
cif-standard	0.025 (0.004)	0.762 (0.017)	23.820	97.317
obliqueRSF-net	0.024 (0.003)	0.772 (0.017)	975.645	1212.002
aorsf-cph	0.024 (0.006)	0.760 (0.018)	4.270	0.315
ranger-extratrees	0.022 (0.003)	0.759 (0.016)	7.125	6.067
glmnet-cox	0.021 (0.009)	0.765 (0.017)	3.417	0.006
cif-extension	0.021 (0.002)	0.768 (0.017)	93.628	27.983
rsf-standard	0.019 (0.009)	0.745 (0.018)	3.032	1.194
aorsf-random	0.016 (0.004)	0.725 (0.023)	2.309	0.342
nn-cox	0.016 (0.008)	0.734 (0.040)	11.686	18.015
xgboost-cox	0.000 (0.027)	0.763 (0.016)	4.469	0.008
xgboost-aft	—	0.764 (0.015)	20.407	0.008
<b><i>Monoclonal gammopathy; death, n = 1384, p = 8</i></b>				
cif-rotate	0.159 (0.019)	0.744 (0.014)	15.330	4.515
aorsf-cph	0.158 (0.016)	0.743 (0.011)	1.176	0.092
aorsf-fast	0.157 (0.016)	0.743 (0.011)	0.407	0.091
cif-standard	0.151 (0.015)	0.738 (0.012)	1.512	6.113

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
rsf-standard	0.151 (0.017)	0.737 (0.011)	2.305	0.203
obliqueRSF-net	0.148 (0.009)	0.748 (0.011)	543.632	42.863
aorsf-random	0.148 (0.013)	0.738 (0.012)	1.747	0.086
cif-extension	0.143 (0.009)	0.747 (0.013)	10.794	4.507
glmnet-cox	0.137 (0.021)	0.726 (0.014)	0.146	0.002
xgboost-cox	0.122 (0.012)	0.733 (0.012)	4.230	0.003
ranger-extratrees	0.115 (0.005)	0.744 (0.012)	0.052	0.169
nn-cox	0.026 (0.051)	0.598 (0.100)	11.948	0.652
xgboost-aft	—	0.733 (0.013)	13.595	0.006
<i>Monoclonal gammopathy; malignancy, n = 1384, p = 8</i>				
glmnet-cox	0.015 (0.011)	0.651 (0.055)	0.129	0.002
obliqueRSF-net	0.012 (0.008)	0.649 (0.032)	143.443	22.157
aorsf-cph	0.010 (0.013)	0.644 (0.036)	0.594	0.041
aorsf-fast	0.010 (0.014)	0.641 (0.036)	0.190	0.041
ranger-extratrees	0.008 (0.006)	0.642 (0.030)	0.054	0.156
cif-extension	0.008 (0.010)	0.625 (0.028)	8.632	4.411
aorsf-random	0.007 (0.013)	0.636 (0.032)	0.532	0.040
cif-standard	0.006 (0.011)	0.628 (0.033)	1.490	5.778
xgboost-cox	0.005 (0.019)	0.639 (0.040)	1.686	0.003
nn-cox	-0.003 (0.005)	0.515 (0.056)	7.746	0.606
rsf-standard	-0.009 (0.018)	0.616 (0.036)	0.745	0.069
cif-rotate	-0.024 (0.023)	0.553 (0.035)	12.670	4.047
xgboost-aft	—	0.629 (0.039)	11.326	0.006
<i>Movies released in 2015-2018; gross 1M USD, n = 551, p = 46</i>				

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
cif-rotate	0.636 (0.024)	0.943 (0.007)	19.882	3.487
glmnet-cox	0.618 (0.034)	0.940 (0.009)	0.205	0.002
nn-cox	0.544 (0.055)	0.909 (0.020)	13.922	0.580
aorsf-cph	0.523 (0.024)	0.926 (0.011)	0.783	0.043
rsf-standard	0.519 (0.022)	0.922 (0.010)	1.503	0.103
aorsf-fast	0.516 (0.028)	0.922 (0.012)	0.227	0.043
xgboost-cox	0.512 (0.029)	0.932 (0.009)	13.524	0.004
cif-standard	0.472 (0.029)	0.902 (0.018)	0.354	1.715
cif-extension	0.454 (0.025)	0.920 (0.013)	9.152	3.724
ranger-extratrees	0.430 (0.025)	0.900 (0.019)	0.045	0.090
obliqueRSF-net	0.309 (0.020)	0.912 (0.017)	124.706	10.004
aorsf-random	0.303 (0.029)	0.851 (0.026)	0.950	0.042
xgboost-aft	—	0.927 (0.010)	35.466	0.007

#### *NCCTG Lung Cancer; death, n = 228, p = 9*

ranger-extratrees	0.062 (0.028)	0.675 (0.033)	0.022	0.030
aorsf-random	0.061 (0.029)	0.676 (0.027)	0.324	0.015
aorsf-fast	0.061 (0.042)	0.672 (0.025)	0.066	0.017
aorsf-cph	0.059 (0.040)	0.671 (0.024)	0.153	0.016
obliqueRSF-net	0.056 (0.025)	0.678 (0.030)	88.165	3.793
cif-standard	0.055 (0.032)	0.670 (0.030)	0.128	0.254
cif-extension	0.051 (0.032)	0.664 (0.029)	3.845	1.378
glmnet-cox	0.033 (0.031)	0.638 (0.059)	0.097	0.002
rsf-standard	0.023 (0.039)	0.642 (0.025)	0.099	0.038
cif-rotate	0.017 (0.041)	0.632 (0.032)	4.906	1.275
xgboost-cox	0.012 (0.022)	0.648 (0.031)	1.076	0.002

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
nn-cox	-0.020 (0.019)	0.517 (0.110)	7.701	0.203
xgboost-aft	—	0.637 (0.034)	7.679	0.005
<b><i>NKI 70 gene signature; death or metastasis, n = 144, p = 77</i></b>				
aorsf-cph	0.124 (0.049)	0.802 (0.051)	0.074	0.014
aorsf-fast	0.121 (0.052)	0.802 (0.054)	0.049	0.015
cif-rotate	0.118 (0.059)	0.787 (0.049)	26.703	2.970
obliqueRSF-net	0.098 (0.049)	0.790 (0.062)	77.169	0.555
cif-extension	0.098 (0.055)	0.799 (0.061)	8.367	3.531
cif-standard	0.088 (0.051)	0.781 (0.065)	0.141	0.130
rsf-standard	0.087 (0.048)	0.755 (0.050)	0.066	0.025
ranger-extratrees	0.064 (0.044)	0.774 (0.054)	0.023	0.030
nn-cox	0.060 (0.065)	0.746 (0.059)	7.922	0.115
aorsf-random	0.051 (0.047)	0.733 (0.063)	0.150	0.015
glmnet-cox	0.049 (0.064)	0.726 (0.090)	0.271	0.002
xgboost-cox	-0.028 (0.029)	0.569 (0.094)	0.119	0.002
xgboost-aft	—	0.770 (0.056)	4.807	0.005
<b><i>Non-alcohol fatty liver disease; death, n = 17549, p = 24</i></b>				
aorsf-cph	0.213 (0.009)	0.869 (0.006)	17.803	1.370
aorsf-fast	0.212 (0.009)	0.869 (0.006)	4.902	1.336
rsf-standard	0.207 (0.009)	0.860 (0.005)	10.179	1.126
glmnet-cox	0.207 (0.011)	0.860 (0.005)	1.330	0.012
cif-standard	0.205 (0.007)	0.863 (0.006)	64.986	621.600
obliqueRSF-net	0.204 (0.008)	0.868 (0.006)	2703.887	9972.393
cif-rotate	0.190 (0.008)	0.865 (0.005)	259.239	60.313

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
ranger-extratrees	0.181 (0.007)	0.860 (0.005)	40.520	81.674
cif-extension	0.166 (0.003)	0.866 (0.006)	124.635	54.345
aorsf-random	0.141 (0.006)	0.839 (0.007)	9.973	1.490
xgboost-cox	0.022 (0.014)	0.876 (0.005)	9.315	0.017
nn-cox	0.000 (0.002)	0.557 (0.095)	19.415	103.251
xgboost-aft	—	0.875 (0.005)	31.562	0.014
<b><i>Primary biliary cholangitis; death, n = 276, p = 19</i></b>				
aorsf-fast	0.423 (0.035)	0.904 (0.021)	0.069	0.018
aorsf-cph	0.413 (0.034)	0.901 (0.022)	0.151	0.018
cif-rotate	0.405 (0.040)	0.899 (0.022)	9.295	2.069
rsf-standard	0.392 (0.034)	0.895 (0.023)	0.094	0.038
obliqueRSF-net	0.359 (0.030)	0.908 (0.022)	101.477	1.862
cif-standard	0.352 (0.034)	0.904 (0.025)	0.188	0.331
cif-extension	0.348 (0.033)	0.901 (0.023)	5.399	2.040
aorsf-random	0.344 (0.031)	0.891 (0.020)	0.277	0.019
glmnet-cox	0.342 (0.044)	0.886 (0.028)	0.117	0.002
ranger-extratrees	0.277 (0.027)	0.894 (0.027)	0.026	0.036
xgboost-cox	0.256 (0.103)	0.882 (0.026)	5.057	0.002
nn-cox	-0.024 (0.033)	0.556 (0.123)	8.423	0.195
xgboost-aft	—	0.883 (0.024)	9.373	0.006
<b><i>Rotterdam tumor bank; death, n = 2982, p = 11</i></b>				
aorsf-cph	0.163 (0.012)	0.759 (0.009)	2.494	0.205
aorsf-random	0.161 (0.011)	0.759 (0.010)	3.004	0.189
aorsf-fast	0.160 (0.012)	0.757 (0.009)	0.806	0.205

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
cif-standard	0.159 (0.010)	0.759 (0.009)	4.694	22.024
rsf-standard	0.159 (0.014)	0.756 (0.009)	2.995	0.391
obliqueRSF-net	0.156 (0.007)	0.759 (0.009)	931.931	64.305
cif-rotate	0.147 (0.011)	0.751 (0.011)	34.565	8.675
ranger-extratrees	0.139 (0.006)	0.749 (0.009)	3.211	2.477
xgboost-cox	0.130 (0.014)	0.753 (0.009)	4.472	0.004
cif-extension	0.129 (0.004)	0.751 (0.008)	22.084	8.110
glmnet-cox	0.118 (0.008)	0.731 (0.009)	0.247	0.003
nn-cox	-0.001 (0.001)	0.507 (0.049)	13.019	7.622
xgboost-aft	—	0.761 (0.009)	16.743	0.006

***Rotterdam tumor bank; recurrence, n = 2982, p = 11***

aorsf-random	0.145 (0.011)	0.734 (0.009)	3.327	0.197
aorsf-cph	0.145 (0.012)	0.734 (0.009)	2.801	0.221
cif-standard	0.144 (0.011)	0.734 (0.009)	4.829	22.205
aorsf-fast	0.143 (0.011)	0.733 (0.009)	0.883	0.217
obliqueRSF-net	0.142 (0.008)	0.737 (0.009)	870.086	81.412
rsf-standard	0.139 (0.012)	0.731 (0.008)	3.113	0.947
ranger-extratrees	0.135 (0.007)	0.734 (0.009)	3.100	2.527
cif-rotate	0.129 (0.010)	0.725 (0.009)	36.405	8.349
cif-extension	0.119 (0.006)	0.731 (0.008)	22.537	8.390
glmnet-cox	0.117 (0.008)	0.727 (0.008)	0.227	0.004
xgboost-cox	0.113 (0.008)	0.729 (0.009)	4.123	0.004
nn-cox	-0.002 (0.002)	0.515 (0.029)	13.602	8.901
xgboost-aft	—	0.735 (0.009)	16.138	0.006

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
<b><i>Serum free light chain; death, n = 7874, p = 10</i></b>				
aorsf-fast	0.250 (0.014)	0.825 (0.008)	2.063	0.635
aorsf-cph	0.250 (0.013)	0.825 (0.008)	6.461	0.629
glmnet-cox	0.248 (0.012)	0.820 (0.007)	0.503	0.006
obliqueRSF-net	0.247 (0.011)	0.824 (0.007)	2219.216	1284.916
ranger-extratrees	0.243 (0.009)	0.820 (0.007)	11.176	10.433
cif-standard	0.243 (0.011)	0.818 (0.008)	19.000	116.158
rsf-standard	0.243 (0.013)	0.815 (0.008)	5.643	0.562
cif-rotate	0.228 (0.009)	0.819 (0.007)	63.456	20.143
aorsf-random	0.209 (0.011)	0.813 (0.008)	6.607	0.610
cif-extension	0.201 (0.005)	0.820 (0.008)	40.190	19.948
xgboost-cox	0.095 (0.038)	0.824 (0.007)	6.464	0.008
nn-cox	0.001 (0.003)	0.576 (0.111)	19.271	22.093
xgboost-aft	—	0.823 (0.008)	21.594	0.008
<b><i>SPRINT; CVD death, n = 9361, p = 174</i></b>				
glmnet-cox	0.071 (0.011)	0.795 (0.011)	13.048	0.010
aorsf-cph	0.070 (0.006)	0.797 (0.011)	8.638	0.627
aorsf-fast	0.069 (0.006)	0.797 (0.011)	2.365	0.643
rsf-standard	0.065 (0.007)	0.788 (0.014)	4.277	1.394
obliqueRSF-net	0.064 (0.004)	0.799 (0.011)	2639.976	3402.983
cif-standard	0.061 (0.003)	0.798 (0.011)	49.621	182.059
cif-rotate	0.060 (0.005)	0.791 (0.012)	924.836	113.844
ranger-extratrees	0.054 (0.003)	0.791 (0.012)	8.222	7.874
nn-cox	0.040 (0.015)	0.763 (0.022)	16.891	22.686

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
aorsf-random	0.038 (0.003)	0.768 (0.013)	5.475	0.742
cif-extension	0.034 (0.002)	0.789 (0.011)	120.288	32.189
xgboost-cox	0.004 (0.019)	0.800 (0.011)	7.700	0.013
xgboost-aft	—	0.796 (0.012)	25.017	0.012
<b><i>SPRINT; death, n = 9361, p = 174</i></b>				
glmnet-cox	0.123 (0.012)	0.771 (0.009)	5.430	0.010
aorsf-cph	0.117 (0.008)	0.770 (0.008)	12.921	0.996
aorsf-fast	0.115 (0.008)	0.770 (0.008)	4.217	0.977
rsf-standard	0.110 (0.008)	0.763 (0.009)	7.137	0.691
obliqueRSF-net	0.108 (0.006)	0.766 (0.008)	4500.673	664.611
cif-standard	0.106 (0.006)	0.764 (0.008)	49.263	185.385
nn-cox	0.097 (0.012)	0.755 (0.011)	28.348	28.860
ranger-extratrees	0.096 (0.005)	0.756 (0.009)	9.647	8.153
cif-rotate	0.090 (0.007)	0.745 (0.009)	1039.879	113.336
aorsf-random	0.072 (0.003)	0.741 (0.009)	8.907	1.067
cif-extension	0.055 (0.002)	0.747 (0.009)	135.763	32.580
xgboost-cox	0.030 (0.022)	0.772 (0.008)	10.871	0.013
xgboost-aft	—	0.772 (0.007)	27.708	0.012
<b><i>Systolic Heart Failure; death, n = 2231, p = 41</i></b>				
glmnet-cox	0.113 (0.013)	0.745 (0.012)	0.268	0.003
cif-rotate	0.113 (0.013)	0.741 (0.011)	69.724	10.269
aorsf-cph	0.111 (0.014)	0.745 (0.012)	1.939	0.156
aorsf-fast	0.110 (0.015)	0.744 (0.012)	0.611	0.150
cif-standard	0.110 (0.011)	0.744 (0.011)	3.777	14.994

A.2: Index of prediction accuracy, time-dependent concordance statistic, and computational time required to fit and compute predictions for several learning algorithms across 35 risk prediction tasks. (*continued*)

	Scaled Brier	C-Statistic	Model fitting	Risk prediction
obliqueRSF-net	0.108 (0.009)	0.748 (0.012)	774.433	96.195
rsf-standard	0.105 (0.011)	0.735 (0.011)	2.783	0.272
aorsf-random	0.095 (0.008)	0.739 (0.012)	2.375	0.149
cif-extension	0.094 (0.006)	0.744 (0.012)	27.865	9.373
ranger-extratrees	0.091 (0.008)	0.738 (0.012)	3.445	1.214
xgboost-cox	0.091 (0.010)	0.744 (0.010)	4.688	0.004
nn-cox	0.076 (0.021)	0.710 (0.021)	14.766	4.725
xgboost-aft	—	0.741 (0.009)	14.633	0.006
<b>VA lung cancer trial; death, n = 137, p = 8</b>				
aorsf-cph	0.201 (0.052)	0.795 (0.034)	0.093	0.011
aorsf-fast	0.200 (0.050)	0.795 (0.034)	0.047	0.011
cif-rotate	0.198 (0.065)	0.789 (0.036)	4.005	1.004
rsf-standard	0.176 (0.048)	0.787 (0.037)	0.065	0.026
cif-extension	0.174 (0.048)	0.795 (0.034)	3.264	1.159
glmnet-cox	0.160 (0.036)	0.788 (0.037)	0.083	0.002
aorsf-random	0.151 (0.044)	0.777 (0.035)	0.205	0.012
cif-standard	0.128 (0.040)	0.770 (0.037)	0.093	0.119
obliqueRSF-net	0.114 (0.033)	0.799 (0.029)	53.069	0.734
ranger-extratrees	0.092 (0.033)	0.778 (0.038)	0.020	0.026
xgboost-cox	0.067 (0.076)	0.753 (0.045)	1.515	0.002
xgboost-aft	—	0.754 (0.047)	5.770	0.005
nn-cox	-0.030 (0.028)	0.521 (0.093)	7.791	0.118

A.3: Discrimination of relevant versus irrelevant variables for several techniques to estimate variable importance.

Max correlation	No. observations	Negation	ANOVA	accelerated oblique RSF		xgboost		RSF	
				Permutation	SHAP	Gain	Permutation		
Overall	Overall	75.9	73.9	73.2	69.6	64.6	67.7		
<i>Interactions</i>									
Overall	Overall	57.8	57.4	58.0	54.6	49.2	56.9		
30	500	54.3	54.1	54.8	48.2	42.7	54.9		
30	1,000	56.9	55.7	58.1	53.1	48.0	56.3		
30	2,500	61.9	58.9	64.1	61.5	60.7	60.0		
15	500	53.1	53.5	52.8	47.1	41.1	54.1		
15	1,000	55.9	55.4	56.3	52.2	45.8	55.4		
15	2,500	61.0	58.6	63.0	61.0	58.9	59.9		
0	500	52.5	53.9	52.4	44.5	40.7	53.6		
0	1,000	57.2	58.6	55.8	53.1	42.8	56.1		
0	2,500	67.6	68.2	64.4	71.0	62.2	62.1		
<i>Non-linear effects</i>									
Overall	Overall	71.7	69.3	67.9	66.1	60.1	61.8		
30	500	58.8	58.3	57.8	53.4	48.5	55.5		
30	1,000	61.1	59.4	59.0	57.1	52.0	56.3		
30	2,500	62.1	60.2	61.1	60.0	56.4	57.9		
15	500	63.8	61.5	60.7	55.3	49.4	57.7		

A.3: Discrimination of relevant versus irrelevant variables for several techniques to estimate variable importance. (*continued*)

Max correlation	No. observations	Negation	ANOVA	Permutation	SHAP	Gain	Permutation
15	1,000	67.5	65.1	64.6	62.5	56.0	59.8
15	2,500	70.2	67.2	69.1	66.8	62.3	62.3
0	500	75.5	72.3	68.5	60.1	55.8	61.1
0	1,000	88.3	83.9	78.0	81.5	68.6	67.6
0	2,500	98.4	96.3	91.8	97.7	91.6	78.3
<i>Combination effects</i>							
Overall	Overall	78.3	75.8	74.8	70.7	65.2	68.2
30	500	64.8	63.5	62.5	55.6	49.8	59.2
30	1,000	67.4	65.3	65.3	61.0	55.3	61.5
30	2,500	69.9	67.0	68.5	65.2	61.9	63.8
15	500	70.2	68.0	66.3	59.2	52.8	61.8
15	1,000	74.8	71.2	71.4	66.6	59.9	65.0
15	2,500	78.6	74.6	77.1	72.6	68.6	69.1
0	500	84.0	81.1	76.2	66.7	61.7	67.6
0	1,000	95.4	92.4	87.8	89.4	78.7	76.3
0	2,500	99.8	99.3	97.8	99.7	97.9	89.0
<i>Main effects</i>							
Overall	Overall	91.0	88.9	88.7	85.0	82.6	83.2
30	500	79.3	77.3	75.5	70.3	66.5	71.2
30	1,000	83.5	80.5	80.8	76.8	73.9	74.9

A.3: Discrimination of relevant versus irrelevant variables for several techniques to estimate variable importance. (*continued*)

Max correlation	No. observations	Negation	ANOVA	Permutation	SHAP	Gain	Permutation
30	2,500	86.5	83.5	85.1	81.7	80.4	79.3
15	500	86.3	83.3	81.8	75.7	71.3	75.3
15	1,000	91.3	88.1	88.5	84.6	81.3	81.1
15	2,500	94.5	91.6	93.7	90.2	89.0	86.5
0	500	97.8	96.3	94.0	86.5	83.4	85.9
0	1,000	100.0	99.7	99.4	99.4	98.0	95.2
0	2,500	100.0	100.0	100.0	100.0	100.0	99.8