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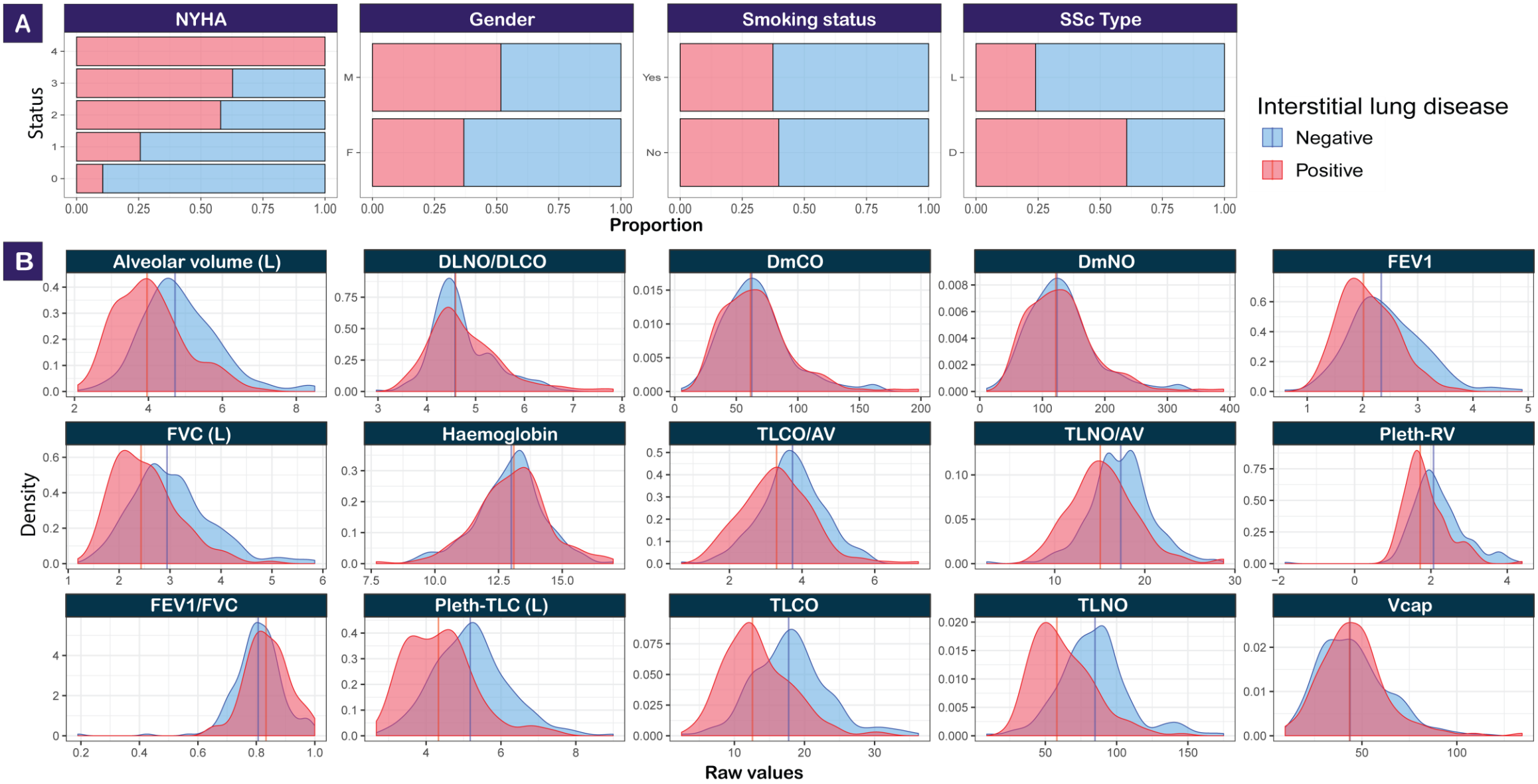
A new approach to interpret pulmonary function tests based on Deep learning and Game theory

Supplemental materials

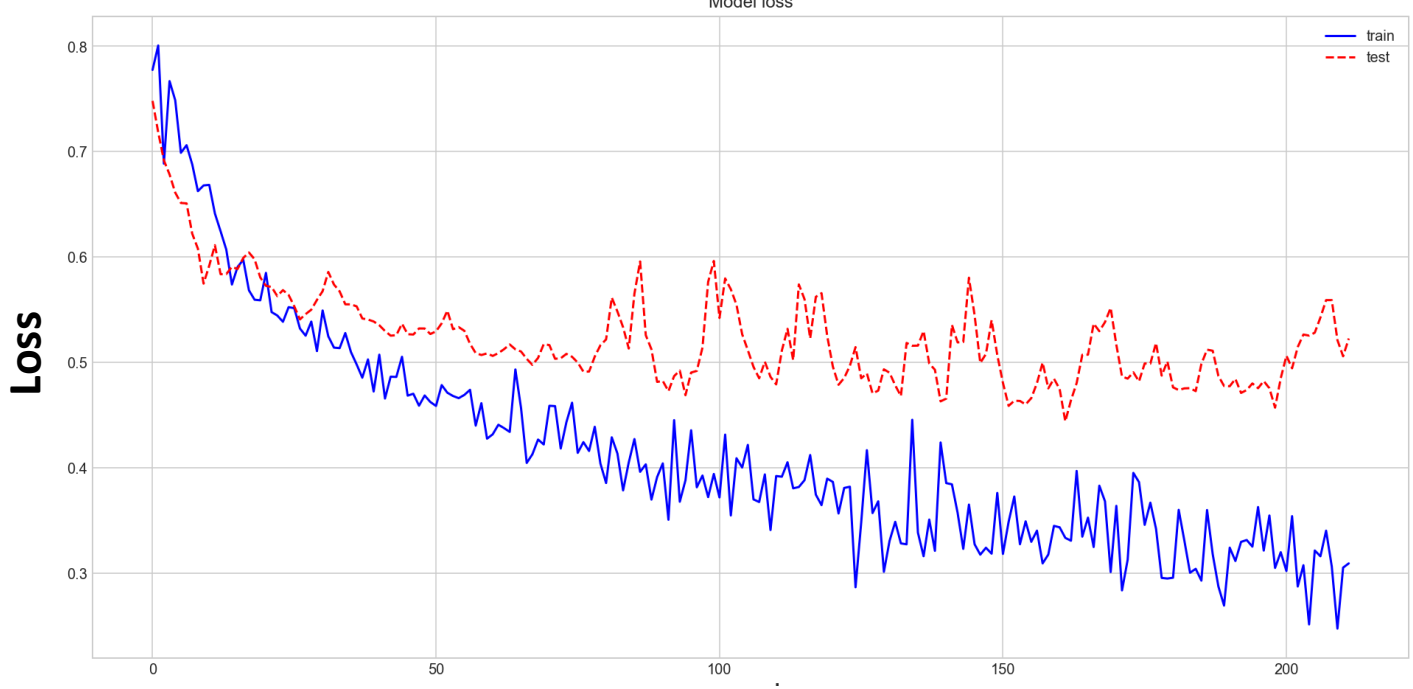
Authors: N. N. LE-DONG[1], **Martinot JB[2]*** , T. Hua-Huy[1], M. Topalovic[3], A. T. Dinh-Xuan[1]

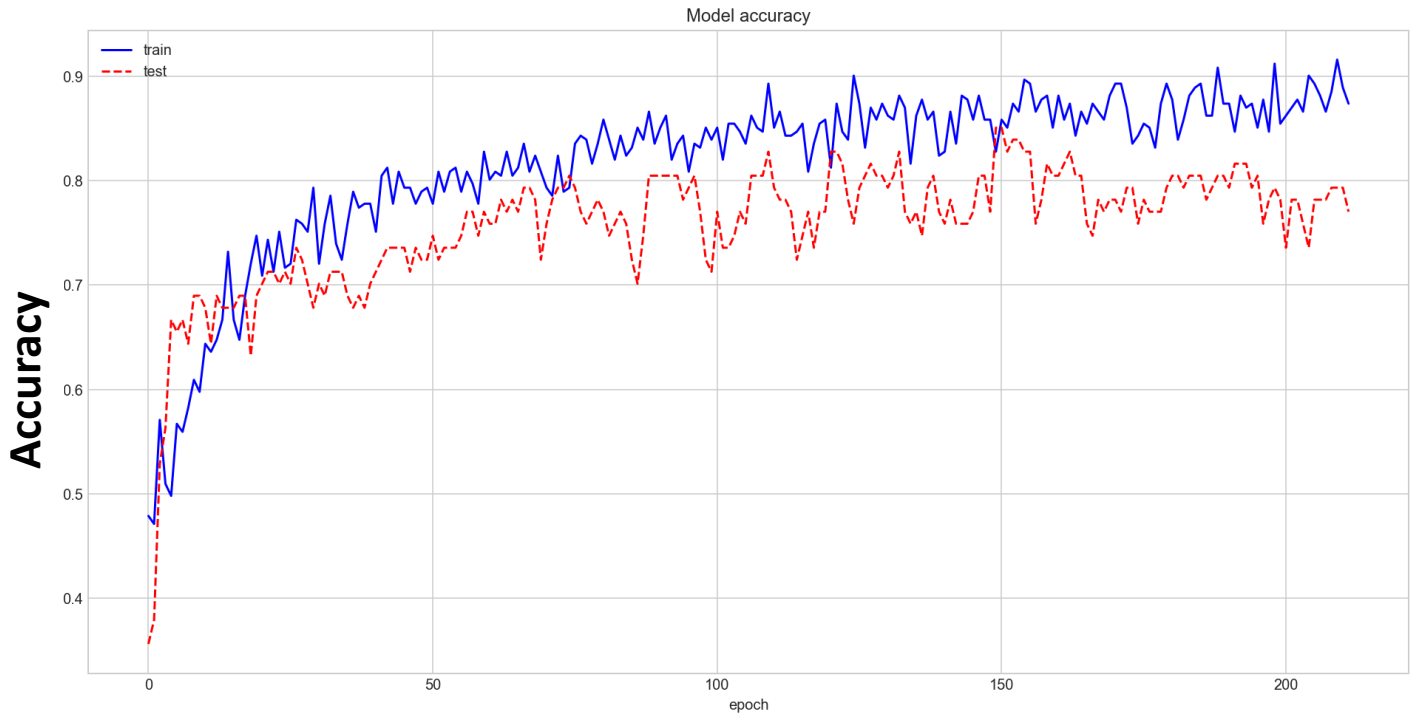
1)Cochin Hospital - Paris (France), 2) RespiSom, Erpent (Belgium), 3) Respiratory Medicine, University Hospital Leuven – Leuven (Belgium)

1) Data exploration

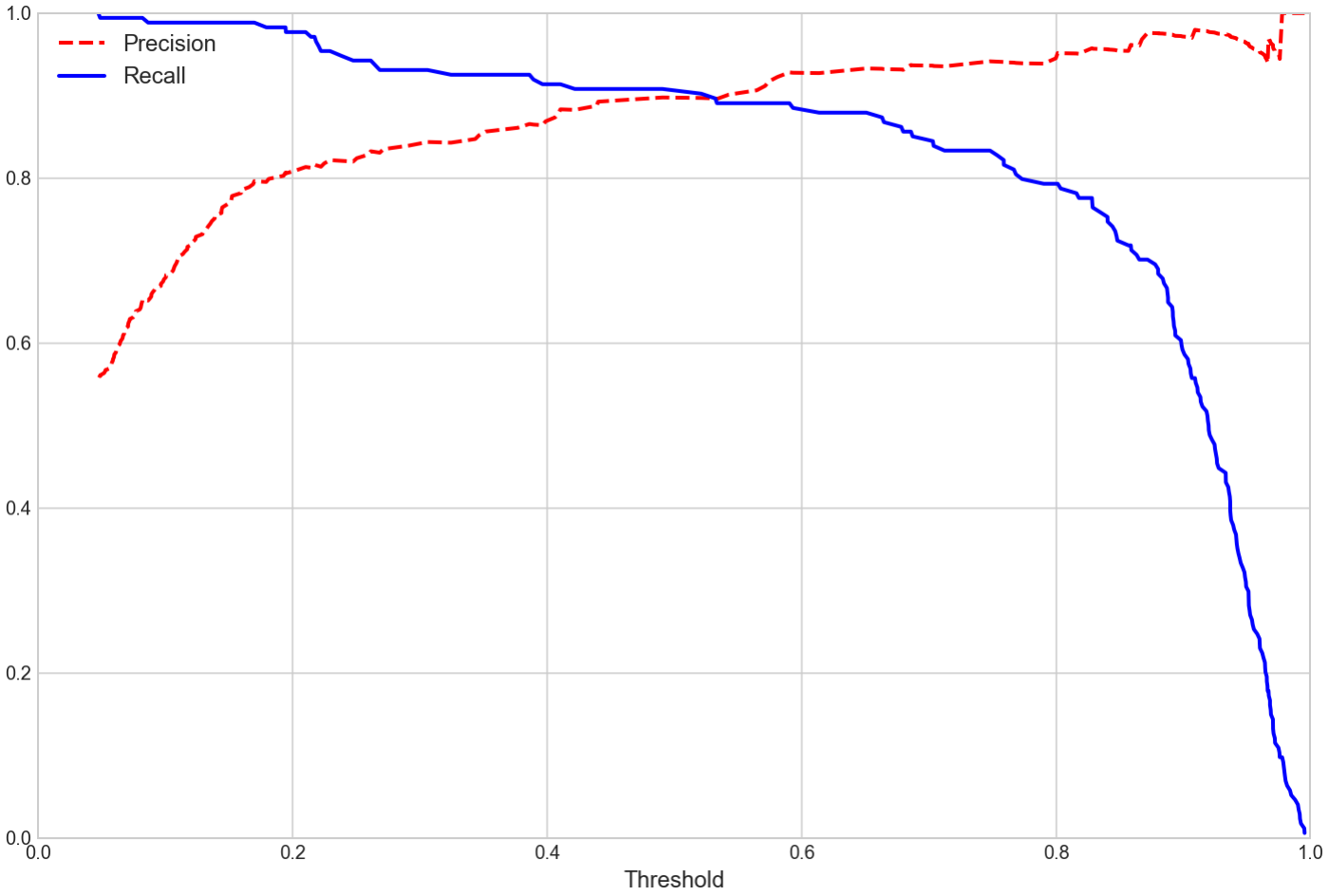


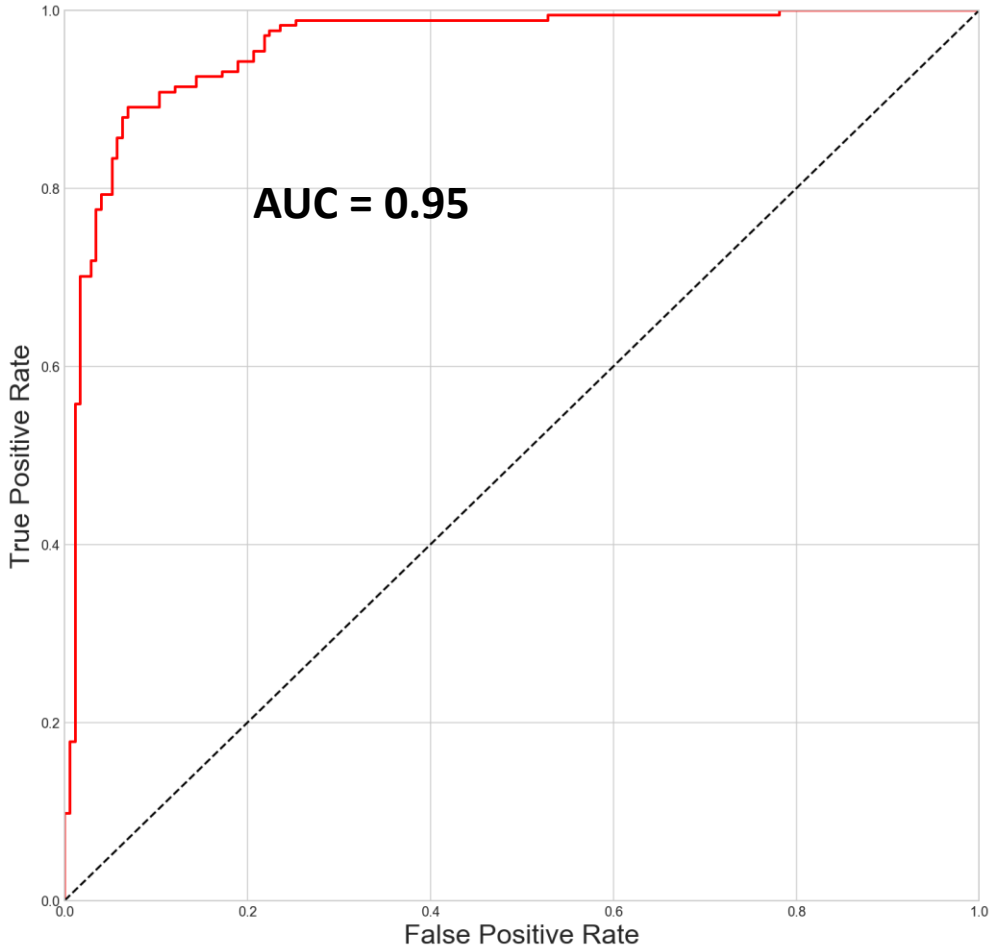
2) Deep learning training curve



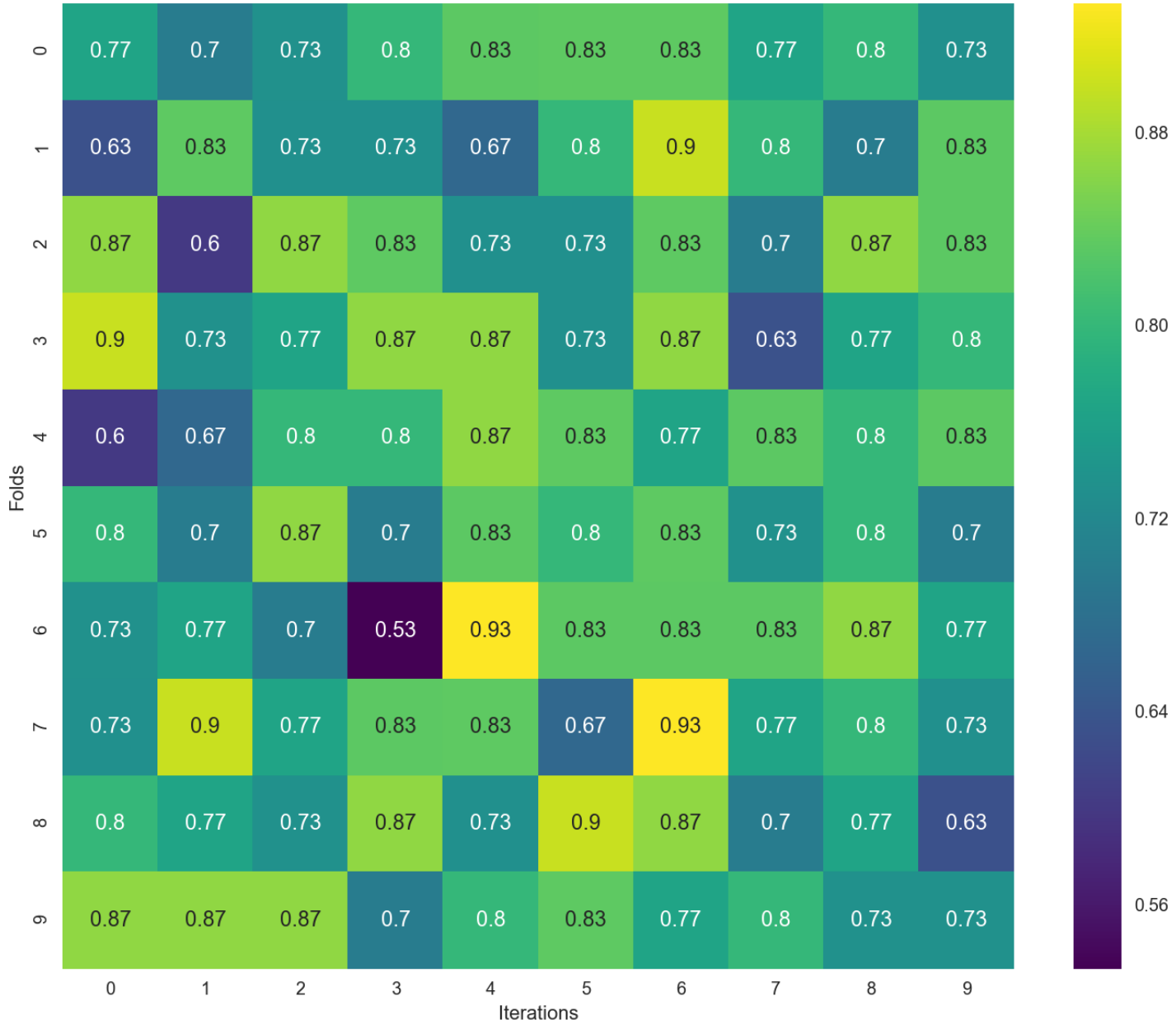


3) Diagnostic cut-off and ROC curve

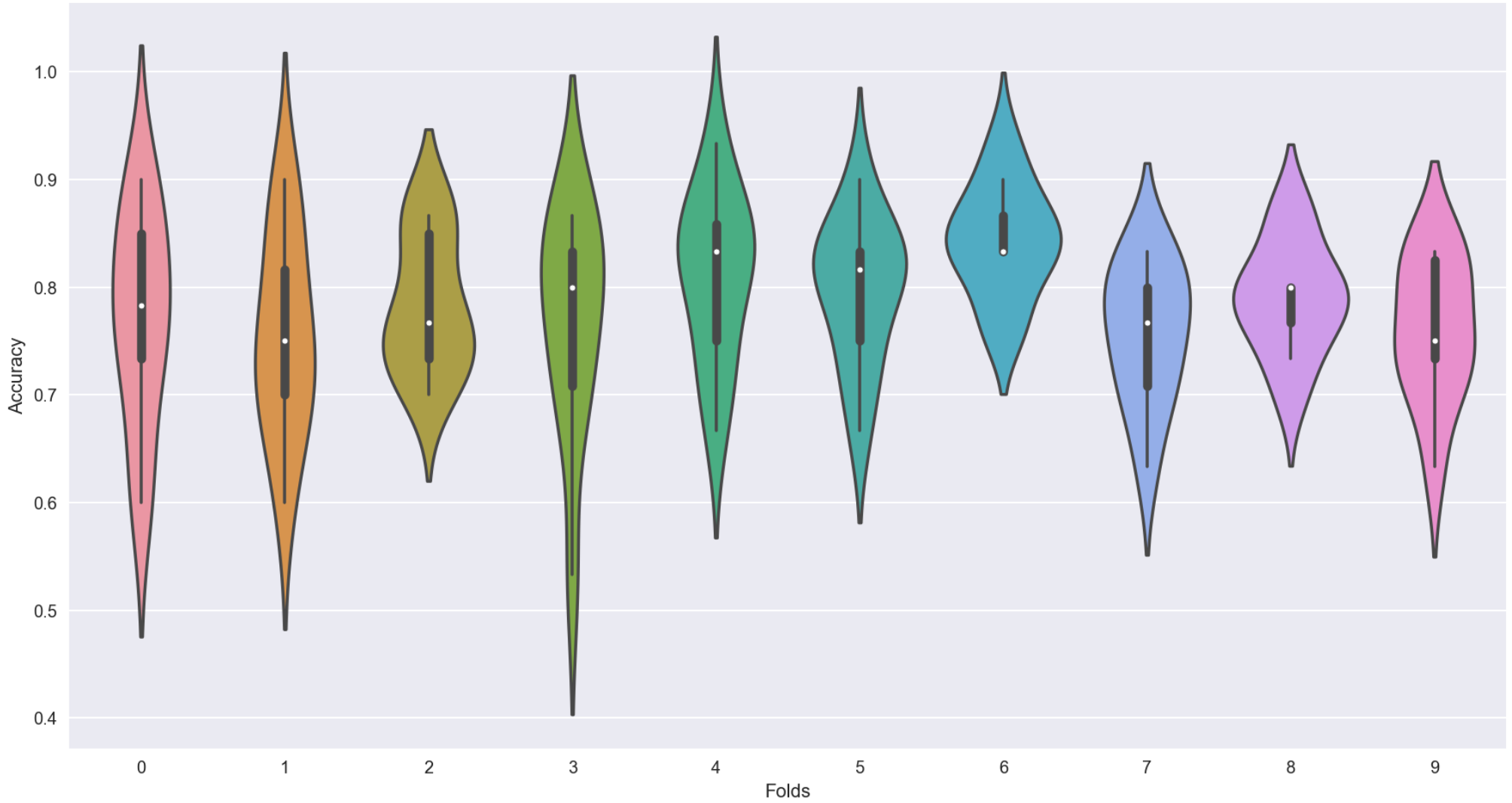




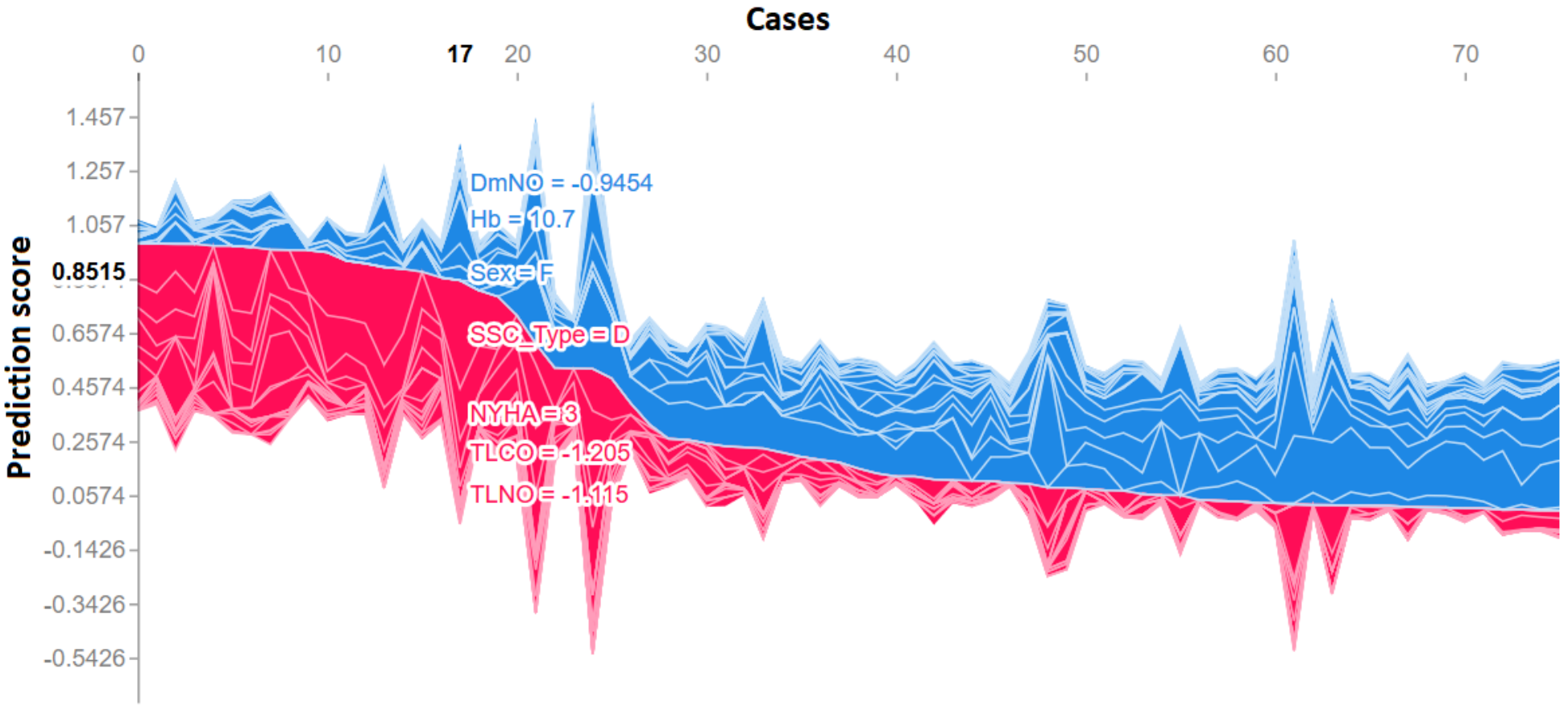
4) 10 x 10 folds cross-validation



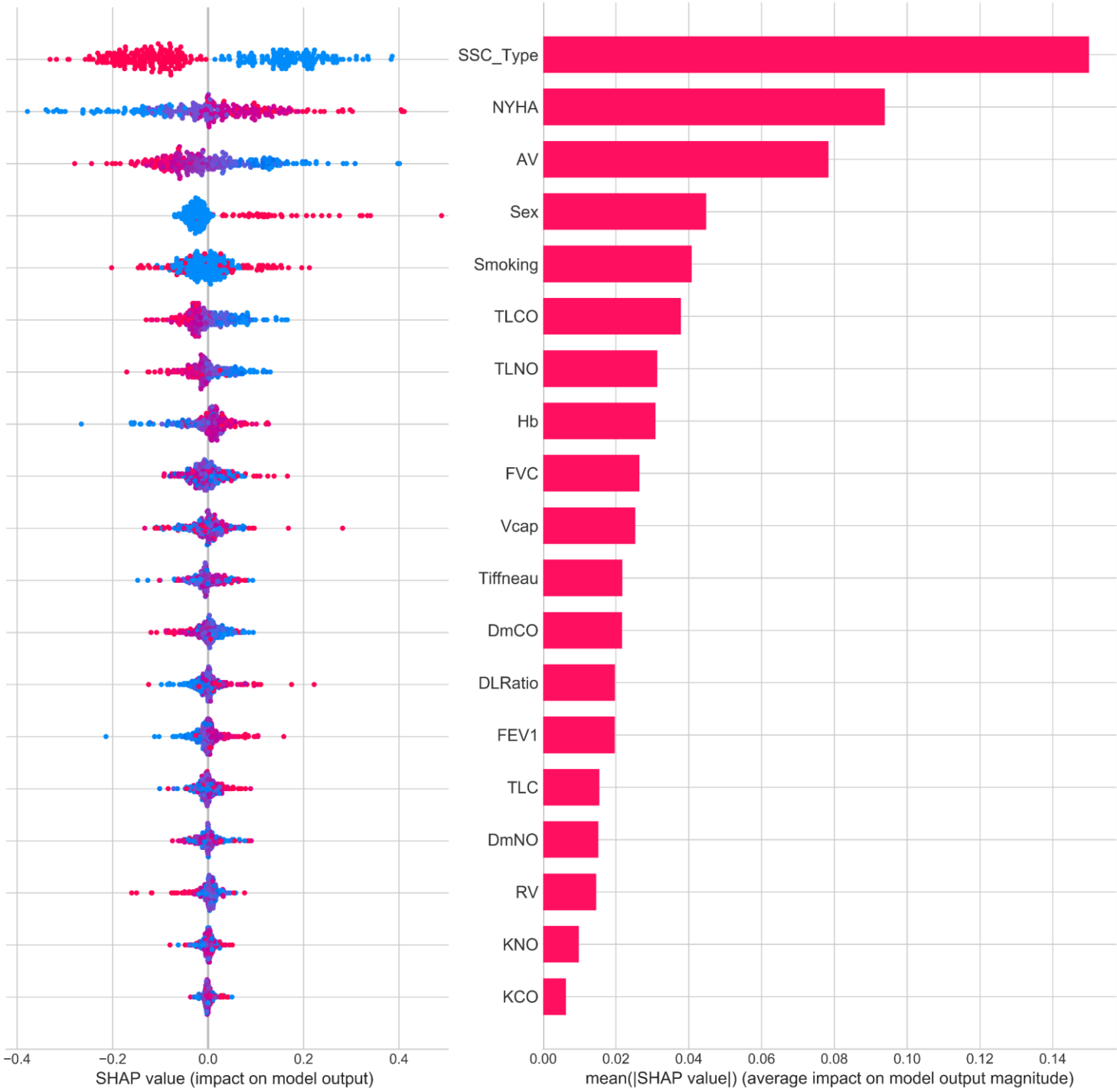
4) 10 x 10 folds cross-validation



5) Collective interpretation on a random sample of 78 patients

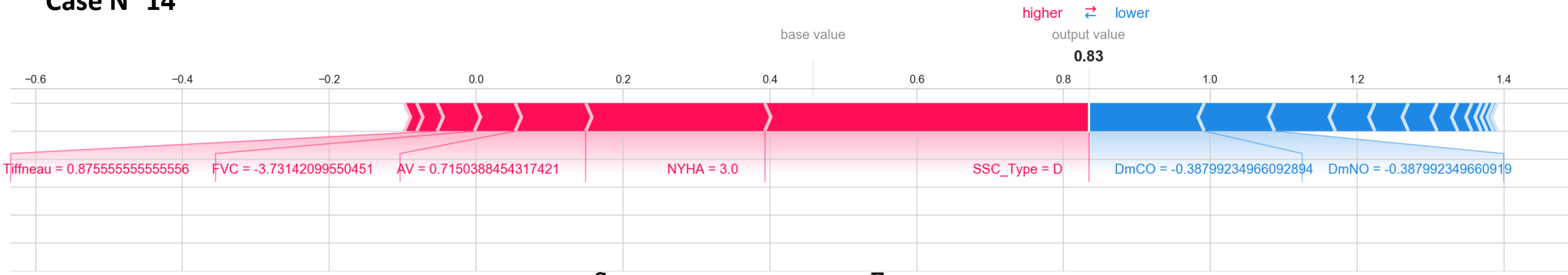


6) Contributions of input features to the model's prediction of ILD



Case N° 14

7) Interpretation at individual level



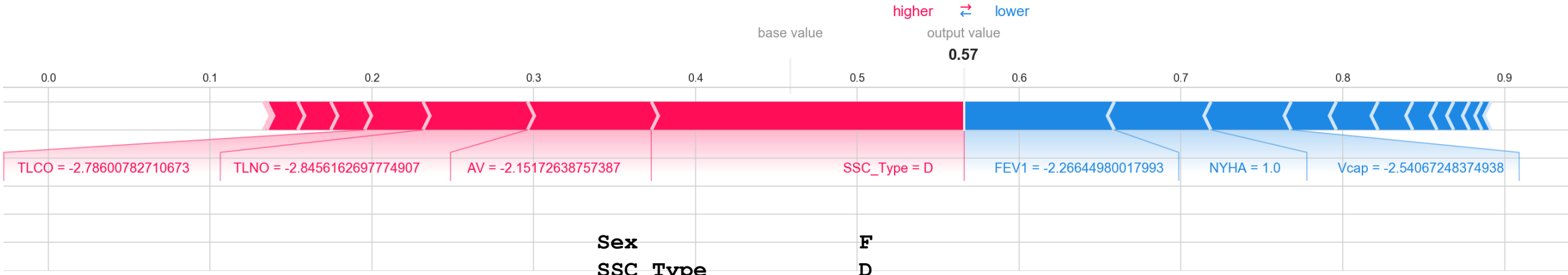
Truth: Positive
Prediction score = 0.83441275
Classified as: Positive

True Positive

Sex	F
SSC_Type	D
Smoking	No
NYHA	3
Hb	11.9
FVC	-3.73142
FEV1	-3.1921
Tiffneau	0.875556
TLC	-2.07333
RV	0.0371746
TLNO	-0.402395
TLCO	-0.621123
AV	0.715039
DmNO	-0.387992
DmCO	-0.387992
Vcap	-0.466258
DLRatio	4.40344
KCO	-1.64689
KNO	-1.39914

7) Interpretation at individual level

Case N° 27



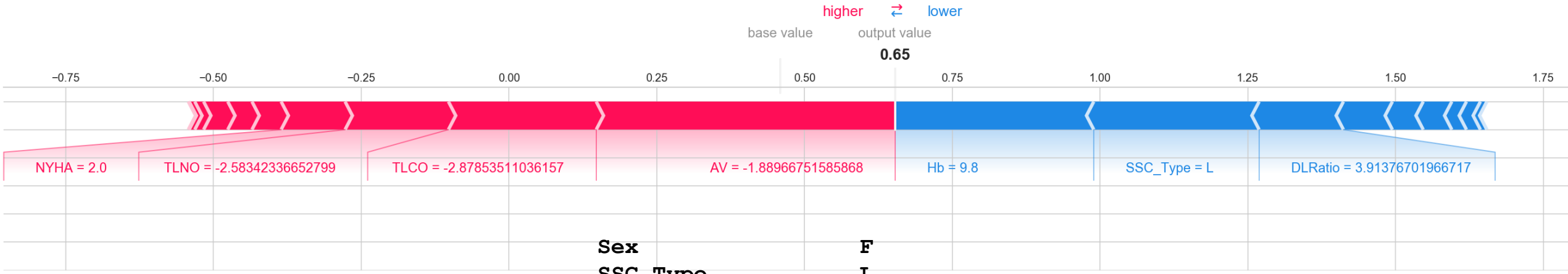
Truth: Negative
Prediction score = 0.5658814
Classified as: Positive

False Positive

Sex	F
SSC_Type	D
Smoking	No
NYHA	1
Hb	12.2
FVC	-2.2099
FEV1	-2.26645
Tiffneau	0.725118
TLC	-0.23
RV	1.21771
TLNO	-2.84562
TLCO	-2.78601
AV	-2.15173
DmNO	-2.44716
DmCO	-2.44716
Vcap	-2.54067
DLRatio	4.24399
KCO	-3.22047
KNO	-3.46642

7) Interpretation at individual level

Case N° 68



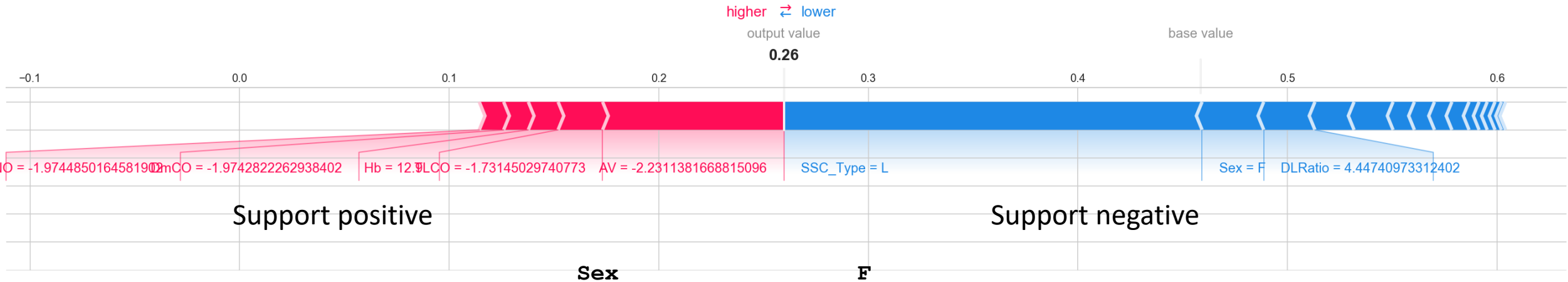
Truth: Negative
Prediction score = 0.6533524
Classified as: Positive

False Positive

Sex	F
SSC_Type	L
Smoking	No
NYHA	2
Hb	9.8
FVC	-3.44172
FEV1	-2.58484
Tiffneau	0.955556
TLC	-1.80667
RV	-0.506857
TLNO	-2.58342
TLCO	-2.87854
AV	-1.88967
DmNO	-1.68228
DmCO	-1.68228
Vcap	-2.99274
DLRatio	3.91377
KCO	-3.72018
KNO	-3.00214

7) Interpretation at individual level

Case N° 18: True negative



Truth: ILD Negative
Classified by model as: Negative
(Prediction score = 0.2597723)

Sex	**F**
SSC_Type	**L**
Smoking	**No**
NYHA	**1**
Hb	**12.9**
FVC	**-0.731028**
FEV1	**-0.292867**
Tiffneau	**0.826087**
TLC	**-0.106667**
RV	**-0.516286**
TLNO	**-1.97449**
TLCO	**-1.73145**
AV	**-2.23114**
DmNO	**-1.97428**
DmCO	**-1.97428**
Vcap	**-0.842201**
DLRatio	**4.44741**
KCO	**0.0371927**
KNO	**-0.653394**

For further information, please contact:
ledongnhatnam@yahoo.com
https://www.linkedin.com/in/nhat-nam-le-dong-b1137061/