**Table S2. Description of learning and screening algorithms in super learner (SL) library**

| | R package | Tuning parameters for instances of linear prediction (family = "gaussian") | Tuning parameters for instances of classification (family = "binomial") | Description |
|---|---|---|---|---|
| **I. Learning algorithms** | | | | |
| Generalized linear models | stats | none | none | Generalized linear regression model with a logit link (Nelder & Wedderburn, 1972) |
| Generalized additive models | gam | deg.gam = 2 (quadratically penalized likelihood)<br>cts.num = 4 (considers variables with four+ categories as continuous) | deg.gam = 2 (quadratically penalized likelihood)<br>cts.num = 4 (considers variables with four+ categoriesas continuous) | Model with a logit link that estimates a summed vector of (not necessarily linear) functions for the predictors (Hastie & Tibshirani, 1986) |
| Neural networks | nnet | size = 2 (number of units in a hidden layer); tested size = 5, 10 in a sensitivity analysis<br>decay = 0 (weight decay parameter)<br>rang = 0.5 (default[-rang, rang], initial random weights) | size = 2 (number of units in a hidden layer); tested size = 5, 10 in a sensitivity analysis<br>decay = 0 (weight decay parameter)<br>rang = 0.5 (default[-rang, rang], initial random weights) | Single-hidden-layer neural network algorithm (Cochocki & Unbehauen, 1993) |
| **II. Screening algorithms — applied to all classification algorithms** | | | | |
| corP | stats | Method = 'pearson'<br>minPvalue = 0.1<br>minscreen = 2 | Method = 'pearson'<br>minPvalue = 0.1<br>minscreen = 2 | Predictor variables that are associated with the outcome at p-value <0.1 are selected; requires a minimum of two predictors to enter the model (Pearson, 1895) |
| randomForest | randomForest | nVar = 10<br>ntree = 1000<br>mtry = (floor(sqrt(ncol(X)))<br>nodesize = 5 | nVar = 10<br>ntree = 1000<br>mtry = max(floor(sqrt(ncol(X)/3), 1))<br>nodesize = 1 | Random trees grown in bagged samples of data and validated on unbagged data to select the best-ranked predictors of the outcome, resulting in a forest of decision trees (Liaw & Wiener, 2002) |


References

Cochocki, A., & Unbehauen, R. (1993). *Neural networks for optimization and signal processing*. New York, NY. John Wiley & Sons, Inc.

Hastie, T., & Tibshirani, R. (1986). Generalized additive models. *Statistical Science*, *1*, 297-310, doi:10.1214/ss/1177013604

Liaw, A., & Wiener, M. (2002). Classification and regression by randomForest. *R News*, *2*, 18-22. Retrieved from https://www.r-project.org/doc/Rnews/Rnews_2002-3.pdf

Nelder, J., & Wedderburn, R. (1972). Generalized linear models. *Journal of the Royal Statistical Society. Series A (General)*, *135*, 370-384. doi:10.2307/2344614.

Pearson, K. (1895). Notes on regression and inheritance in the case of two parents. *Proceedings of the Royal Society of London*, *58*, 240-242.