

Appendix E: PROBAST checklist

Study	Appropriate data sources?	Appropriate inc and exc?	Similar health across participants?	Predictors defined/ass' d same for all?	Predictor assessments made without knowledge of outcome data?	Predictors all available at time model meant to be used?	All relevant predictors analysed?	Pre-specified outcome used?	Predictors excluded from outcome definition?	Outcome defined in same way for all?	Outcome determined without knowledge of predictor information?	Reasonable number of outcome events?	Time interval between baseline and outcome appropriate?	All enrolled included in analysis?	Missing data handled appropriately?	Non-binary predictors handled appropriately?	Complexities in data accounted for?	Relevant performance measures?	Model recalibrated or likely that calibration not needed?	Overall rating
Baker 2018 ¹¹	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	n/a	Y	Y	Y	Serious
Bennett-Guerrero 2003 ¹⁴	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	Y	n/a	n/a	Y	Y	Y	Low
Blair 2018 ¹⁷	Y	Y	Y	Y	U	Y	Y	Y	Y	Y	U	Y	Y	Y	n/a	n/a	Y	Y	Y	Serious
Bodea 2018 ¹⁸	Y	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	U	Y	n/a	n/a	Y	Y	Y	Serious
Bonventura 2019 ²⁰	Y	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	U	Y	n/a	n/a	Y	Y	Y	Serious
Boyd 2019 ²²	Y	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	U	U	U	n/a	n/a	Y	Y	Serious

	Overall rating
Model recalibrated or likely that calibration not needed?	Y
Relevant performance measures?	Y
Complexities in data accounted for?	Y
Non-binary predictors handled appropriately?	n/a
Missing data handled appropriately?	Y
All enrolled included in analysis?	Y
Time interval between baseline and outcome appropriate?	Y
Reasonable number of outcome events?	Y
Outcome determined without knowledge of predictor information?	Y
Outcome defined in same way for all?	Y
Predictors excluded from outcome definition?	Y
Pre-specified outcome used?	Y
All relevant predictors analysed?	Y
Predictors all available at time model meant to be used?	U
Predictor assessments made without knowledge of outcome data?	U
Predictors defined/class' d same for all?	Y
Similar health across participants?	Y
Appropriate inc and exc?	Y
Appropriate data sources?	Y
Study	
Bronheim 2018 ²⁴	Y
Brooks 2005 ²⁵	Y
Bulow 2019 ²⁷	Y
Cengiz 2014 ³²	Y
Chun 2018 ³³	N
Cologne 2015 ³⁷	Y
Dahlke 2014 ³⁹	Y
Donati 2004 ⁴³	Y

	Overall rating
Model recalibrated or likely that calibration not needed?	Y
Relevant performance measures?	Y
Complexities in data accounted for?	n/a
Non-binary predictors handled appropriately?	n/a
Missing data handled appropriately?	Y
All enrolled included in analysis?	Y
Time interval between baseline and outcome appropriate?	Y
Reasonable number of outcome events?	Y
Outcome determined without knowledge of predictor information?	Y
Outcome defined in same way for all?	Y
Predictors excluded from outcome definition?	Y
Pre-specified outcome used?	Y
All relevant predictors analysed?	Y
Predictors all available at time model meant to be used?	Y
Predictor assessments made without knowledge of outcome data?	U
Predictors defined/class' d same for all?	Y
Similar health across participants?	Y
Appropriate inc and exc?	Y
Appropriate data sources?	Y
Study	
Dutta 2011 ⁴⁵	Low
Egberts 2011 ⁴⁷	Serious
Egberts 2011 ⁴⁸	Low
Filip 2014 ⁵¹	Low
Fu 2019 ⁵⁴	Serious
Goffi 1999 ⁵⁶	Very serious
Golan 2018 ⁵⁷	Low
Haga 2011 ⁵⁹	Serious

	Overall rating
Model recalibrated or likely that calibration not needed?	Y
Relevant performance measures?	Y
Complexities in data accounted for?	Y
Non-binary predictors handled appropriately?	Y
Missing data handled appropriately?	Y
All enrolled included in analysis?	Y
Time interval between baseline and outcome appropriate?	Y
Reasonable number of outcome events?	Y
Outcome determined without knowledge of predictor information?	Y
Outcome defined in same way for all?	Y
Predictors excluded from outcome definition?	Y
Pre-specified outcome used?	Y
All relevant predictors analysed?	Y
Predictors all available at time model meant to be used?	Y
Predictor assessments made without knowledge of outcome data?	U
Predictors defined/class' d same for all?	Y
Similar health across participants?	Y
Appropriate inc and exc?	Y
Appropriate data sources?	Y
Study	
Hightower 2010 ⁶¹	Y
Hirose 2014 ⁶²	Y
Hirose 2015 ⁶³	Y
Hobson 2007 ⁶⁵	Y
Huisman 2014 ⁶⁹	Y
Igari 2013 ⁷⁰	Y
Jones 1992 ⁷⁴	Y
Katlic 2019 ⁷⁸	Y

	Overall rating
Model recalibrated or likely that calibration not needed?	Very serious
Relevant performance measures?	Very serious
Complexities in data accounted for?	Very serious
Non-binary predictors handled appropriately?	Serious
Missing data handled appropriately?	Serious
All enrolled included in analysis?	Serious
Time interval between baseline and outcome appropriate?	Serious
Reasonable number of outcome events?	Serious
Outcome determined without knowledge of predictor information?	Serious
Outcome defined in same way for all?	Serious
Predictors excluded from outcome definition?	Serious
Pre-specified outcome used?	Serious
All relevant predictors analysed?	Serious
Predictors all available at time model meant to be used?	Serious
Predictor assessments made without knowledge of outcome data?	Serious
Predictors defined/class' d same for all?	Serious
Similar health across participants?	Serious
Appropriate inc and exc?	Serious
Appropriate data sources?	Serious
Study	
Kim 2018 ⁸⁴	Very serious
Kong 2013 ⁸⁸	Very serious
Kong 2015 ⁸⁹	Very serious
Kwok 2011 ⁹³	Serious
Lakomkin 2018 ⁹⁴	Serious
Lima 2019 ¹⁰¹	Serious
Markovic 2018 ¹⁰⁵	Serious
Moonesinghe 2013 ¹¹⁰	Serious

	Overall rating
Model recalibrated or likely that calibration not needed?	Y
Relevant performance measures?	Y
Complexities in data accounted for?	Y
Non-binary predictors handled appropriately?	Y
Missing data handled appropriately?	Y
All enrolled included in analysis?	Y
Time interval between baseline and outcome appropriate?	Y
Reasonable number of outcome events?	Y
Outcome determined without knowledge of predictor information?	Y
Outcome defined in same way for all?	Y
Predictors excluded from outcome definition?	Y
Pre-specified outcome used?	Y
All relevant predictors analysed?	Y
Predictors all available at time model meant to be used?	Y
Predictor assessments made without knowledge of outcome data?	Y
Predictors defined/class' d same for all?	Y
Similar health across participants?	N
Appropriate inc and exc?	Y
Appropriate data sources?	Y
Study	
Neary 2007 ¹¹⁶	Y
Ngulube 2019 ¹¹⁸	Y
Organ 2002 ¹²⁰	Y
Reis 2019 ¹³⁷	Y
Rivard 2016 ¹³⁸	Y
Saafan 2019 ¹⁴²	Y
Shaker 2019 ¹⁴⁹	Y
Sharrock 2017 ¹⁵¹	Y

	Overall rating
Model recalibrated or likely that calibration not needed?	Y
Relevant performance measures?	Y
Complexities in data accounted for?	Y
Non-binary predictors handled appropriately?	Y
Missing data handled appropriately?	Y
All enrolled included in analysis?	Y
Time interval between baseline and outcome appropriate?	Y
Reasonable number of outcome events?	Y
Outcome determined without knowledge of predictor information?	Y
Outcome defined in same way for all?	Y
Predictors excluded from outcome definition?	Y
Pre-specified outcome used?	Y
All relevant predictors analysed?	Y
Predictors all available at time model meant to be used?	Y
Predictor assessments made without knowledge of outcome data?	Y
Predictors defined/class' d same for all?	Y
Similar health across participants?	Y
Appropriate inc and exc?	Y
Appropriate data sources?	Y
Study	
Simpson 2018 ¹⁵⁵	Y
Slim 2006 ¹⁵⁷	Y
Suresh 2019 ¹⁶¹	Y
Sutton 2002 ¹⁶²	Y
Teeuwen 2011 ¹⁶⁵	Y
Teoh 2017 ¹⁶⁶	Y
Tominaga 2016 ¹⁷⁰	Y
Tran Ba Loc 2010 ¹⁷¹	Y

	Overall rating
Model recalibrated or likely that calibration not needed?	Y
Relevant performance measures?	Y
Complexities in data accounted for?	Y
Non-binary predictors handled appropriately?	Y
Missing data handled appropriately?	Y
All enrolled included in analysis?	Y
Time interval between baseline and outcome appropriate?	U
Reasonable number of outcome events?	N
Outcome determined without knowledge of predictor information?	Y
Outcome defined in same way for all?	Y
Predictors excluded from outcome definition?	Y
Pre-specified outcome used?	Y
All relevant predictors analysed?	Y
Predictors all available at time model meant to be used?	Y
Predictor assessments made without knowledge of outcome data?	U
Predictors defined/class' d same for all?	Y
Similar health across participants?	Y
Appropriate inc and exc?	U
Appropriate data sources?	Y
Study	
Vather 2006 ¹⁷⁷	Y
Wang 2014 ¹⁷⁹	Y
Wang 2017 ¹⁸²	Y
Wani 2005 ¹⁸³	Y
Wolters 2006 ¹⁸⁶	Y
Yap 2018 ¹⁸⁷	Y
Zattoni 2019 ¹⁸⁹	Y