

Appendix for “Emergency Medicine Patient Wait Time Multivariable Prediction Models: A Multicentre Derivation and Validation Study”

Table of Contents

Appendix 1a. Collected and derived predictor variables.....	2
Appendix 1b. Incomplete data columns and number of episodes impacted	4
Appendix 1c. Full models: Internal validation of each site-specific, full model using its own hospital 2019 testing data; distributions of absolute errors for wait time predictions.....	5
Appendix 1d. Simplified models: Internal validation of each site-specific, simplified model using its own hospital 2019 testing data; distributions of absolute errors for wait time predictions	6
Appendix 1e. Cross-site, site-specific comparisons: distributions of absolute errors .	7
Appendix 1f. Distributions of absolute errors for wait time predictions before and during COVID19 reduced attendances in 2020.....	8

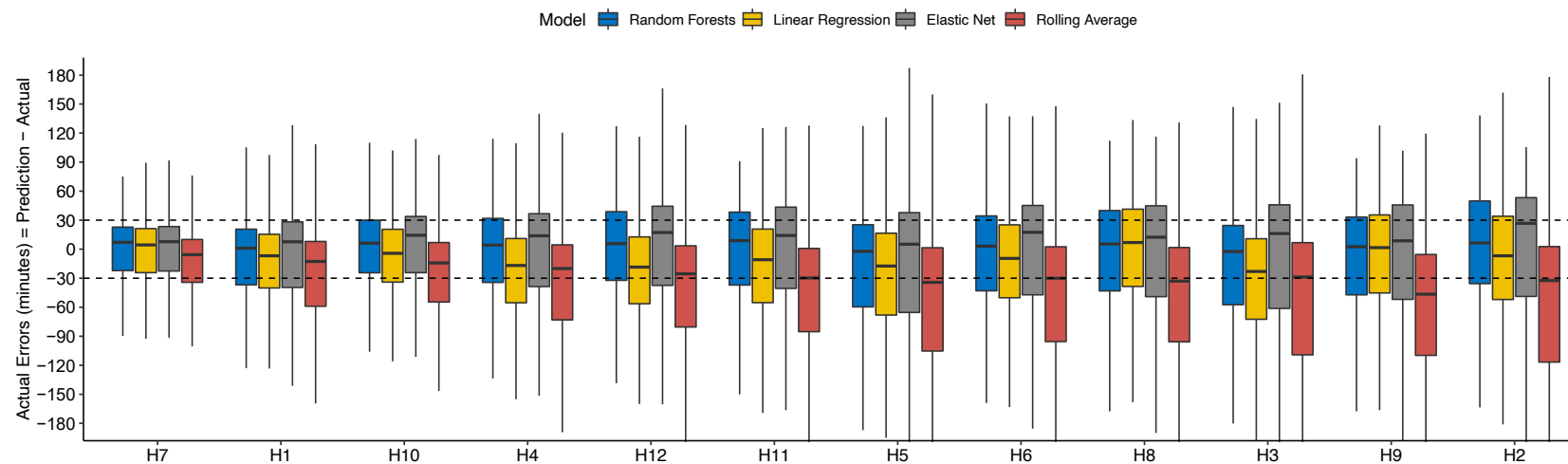
Appendix 1a. Collected and derived predictor variables.	
Collected predictor variables	Type of Variable
Required to calculate triage-to-provider time	
Triage time	Date/Time
First seen by provider time	Date/Time
Variables required to calculate proposed predictor variables	
Ambulance at destination/door (Front door time only available for ambulance patients)	Date/Time
Ambulance handover complete (Off stretcher time, only for ambulance patients)	Date/Time
Clinical decision to admit time (previous patients)	Date/Time
Date of Birth	Date/Time
Departure time (previous patients)	Date/Time
Other predictor variables available for model development	
Advanced care directive alert	Categorical
Arrival transport mode	Categorical
Campus code	Categorical
Compensable status	Categorical
Country of birth	Categorical
Indigenous status	Categorical
Interpreter required	Categorical
Preferred language	Categorical
Referred by	Categorical
Gender	Categorical
Triage category (Australasian Triage Scale)	Categorical
Type of usual accommodation	Categorical
Type of visit	Categorical
Calculated predictor variables	
Age (We used age rather than date of birth to preserve privacy)	Continuous
Patients in triage queue: The number of patients who arrived before the patient of interest but have not been triaged; requires Arrival and Triage date/time	Continuous
Patients awaiting a provider: The number of patients who have completed triage before the patient of interest, but have not yet seen a provider; requires Triage and First seen by provider Date/Time	Continuous
Admitted patients awaiting departure: The number of patients who have had an admission decision made and have not yet departed from the Emergency Department; requires Clinical decision to admit and departure date/time	Continuous

Ambulance offload queue: The number of ambulance patients arrived, but not yet off their stretcher; requires Ambulance at destination and Ambulance off-stretcher date/time	Continuous
Average wait-time of the last k-patients: The average calculation of the triage-to-provider time of the last k-patients that are seen by the provider prior to the patient of interest arriving; requires Triage-to-provider time of previous patients and First seen by provider of previous patients date/time plus the Triage date/time of the patient of interest	Continuous

Appendix 1b. Incomplete data columns and number of episodes impacted

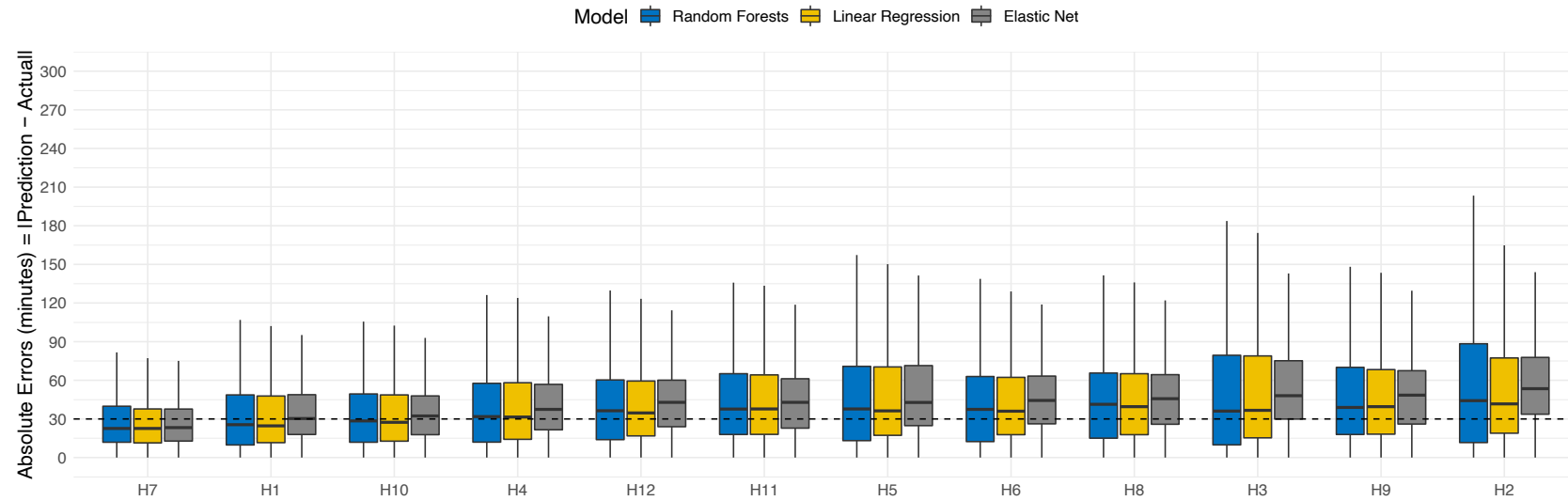
Predictor variable	Descriptor	Number of episodes
Type of usual accommodation	Unknown/unable to determine	613,474
Arrival transport mode	Other	1,349,317
Compensable status	Compensable status unknown	478,415
Country of birth	Not Stated	772,685
Interpreter required	Not Stated / Inadequately Described	2,942
Referred by	Other	232,848
Preferred language	Not Stated	1,040,001
Indigenous status	Question unable to asked	15,926

Appendix 1c. Full models: Internal validation of each site-specific, full model using its own hospital 2019 testing data; distributions of absolute errors for wait time predictions



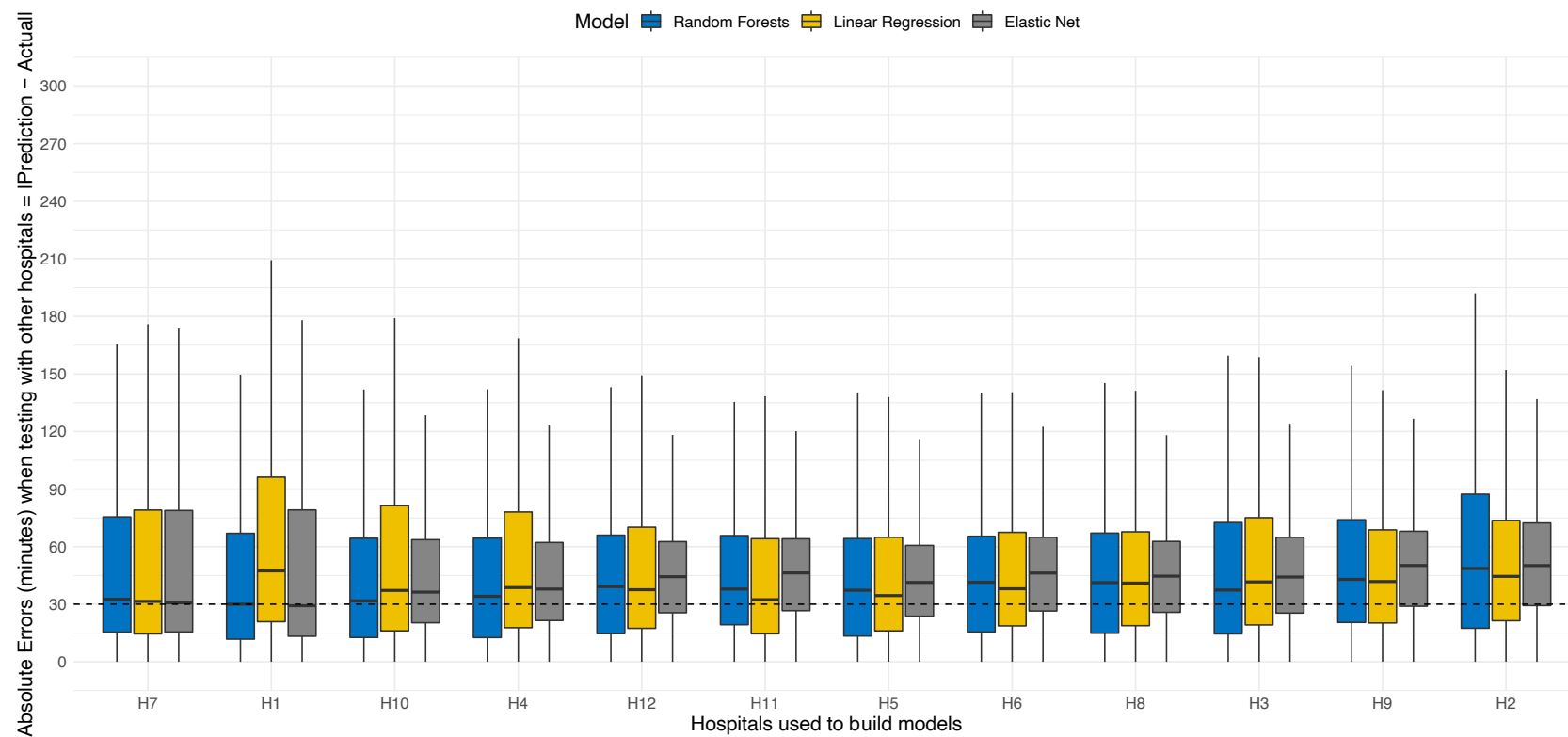
Box and whisker plots of median absolute errors of the wait-time estimates. The horizontal bold black line within each boxplot indicates the median value of the absolute errors. The box describes the interquartile range (IQR, Q1 and Q3). The lower whisker extends from Q1 to the lowest value at most $Q1 - 1.5 \times IQR$. The upper whisker extends from Q3 to the highest value at most $Q3 + 1.5 \times IQR$. The horizontal dashed line indicates the acceptable threshold of +/- 30 minute wait time estimate errors. Each box colour represents a different model generation technique.

Appendix 1d. Simplified models: Internal validation of each site-specific, simplified model using its own hospital 2019 testing data; distributions of absolute errors for wait time predictions

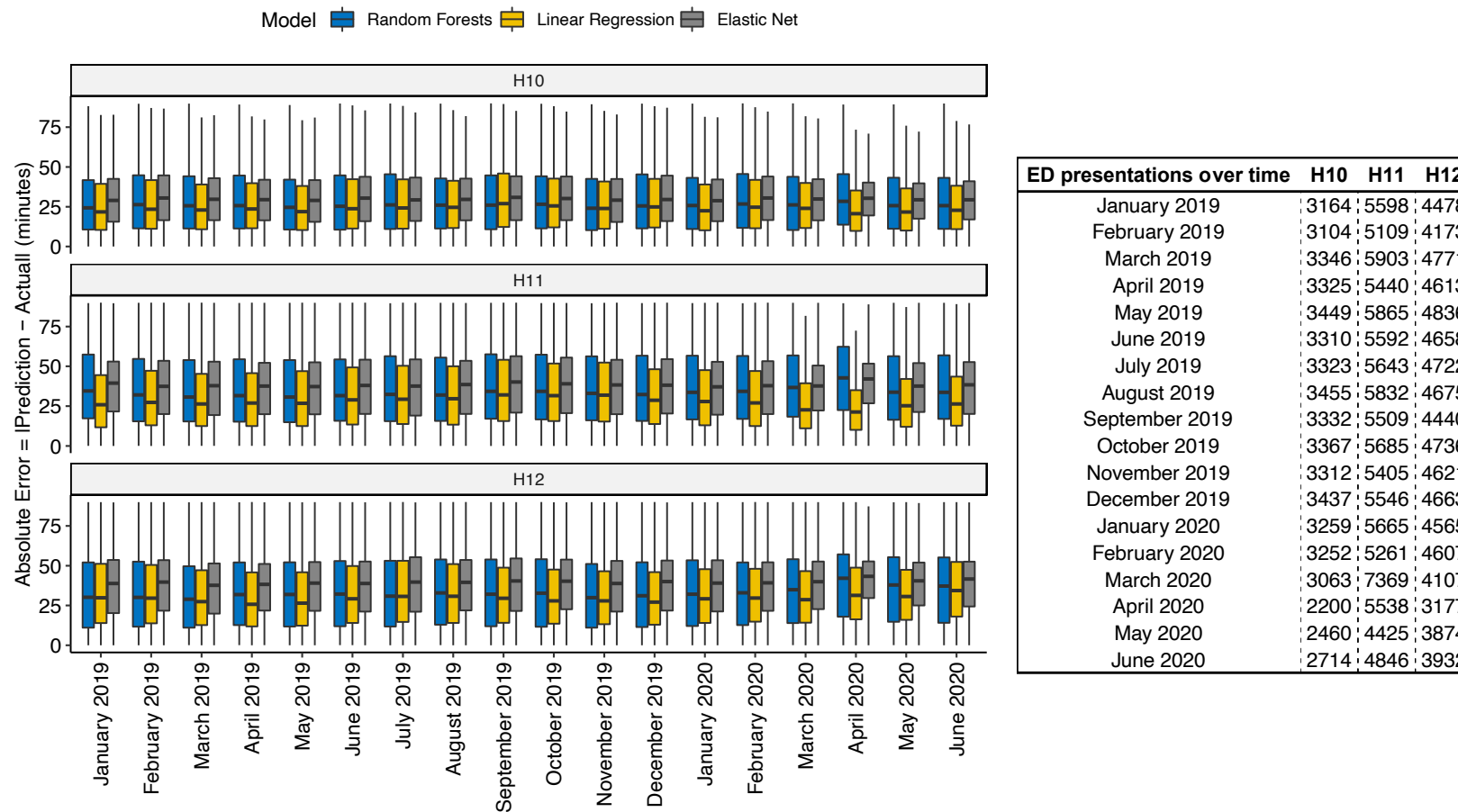


Simplified models built with top-ranked variables that account for 95% of the relative importance.

Appendix 1e. Cross-site, site-specific comparisons: distributions of absolute errors



Appendix 1f. Distributions of absolute errors for wait time predictions before and during COVID19 reduced attendances in 2020



*The first wave of COVID-19 in Victoria occurred from March 2020