

Modelling Uncertainty in the Risk of Intensive Care Unit Readmission I: Data Extraction and Modelling

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January 19, 2021

1 SCOPE AND AIMS

This document provides a written overview of the first phase of the project. The aims of this phase were twofold:

1. To extract a dataset from the MIMIC-III database of surgical ICU patients, consisting of a clearly defined outcome measure (ICU readmission), and a range of predictors.
2. To compare the performance of a range of published models for the prediction of ICU readmission risk and identify the best model to take forward. This will form the prediction model at the core of a system for quantifying uncertainty and dealing with missing data.

2 INTRODUCTION

2.1 ICU readmission

2.2 Readmission prediction models

3 METHODS

3.1 Data Source

3.2 Inclusion criteria

3.3 Outcome measure

3.4 Candidate models

3.5 Model comparisons

3.6 Recalibration

3.7 Novel model

4 RESULTS

4.1 Descriptive statistics

4.2 Discrimination

4.3 Calibration

5 DISCUSSION

5.1 Model performance

5.2 Next steps