

RDC model

Projections of intensive care (ICU) occupancy 3- and 7-days ahead based on RDC model are generated using a fully connected neural network (NN, Figure 1). The output layer consists of 1 neuron, representing the intensive care occupancy at 3- or 7-days ahead, respectively. The input layer consists of 5 neurons, representing covariates of ICU occupancy: 1) the oxford government stringency index, 2) mean daily temperature, 3) intensive care occupancy, 4) covid19 cases and 5) and proportion of infectious cases associated with the variant B117. Each covariate is lagged with respect to ICU occupancy, and the optimal lag is identified each day based on a correlogram. The number of neurons in the hidden layer, and the values of the hyperparameters (i.e. learning rate and dropout rate) of the NN are determined by Latin Hypercube Sampling. Concretely, our model tests 1,000 combinations of hyperparameters, and the optimal hyperparameters corresponds to those minimizing the mean absolute error between projection and observation for ICU occupancy in for the last week of available observations. All models used were build using R's Interface for 'Keras' (<https://keras.rstudio.com/>).

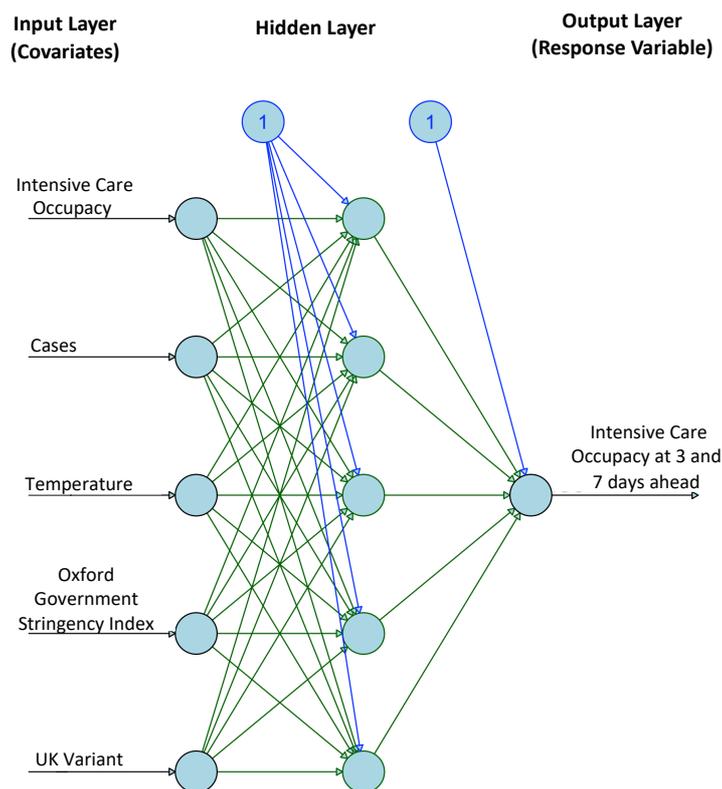


Figure 1: Structure of the Fully Connected Neural Network used by RDC model.