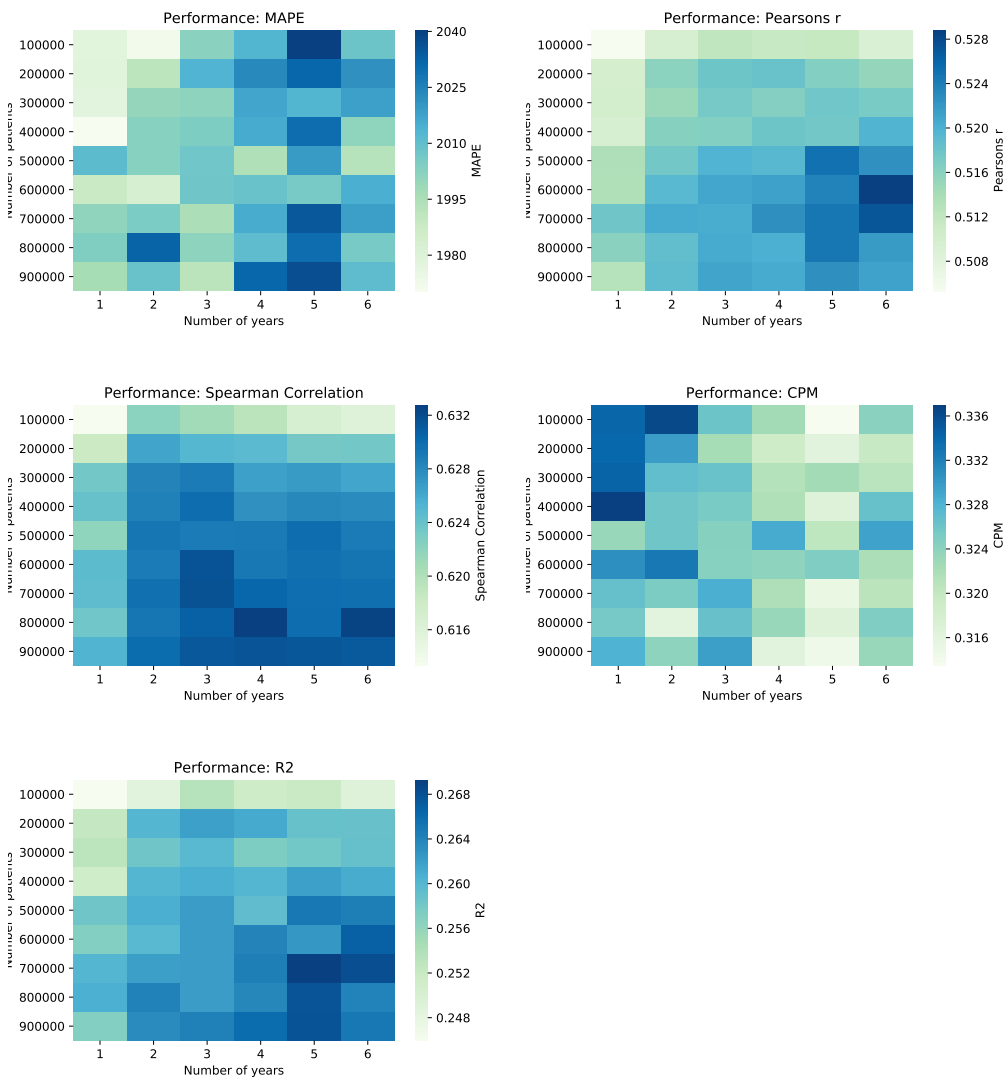


# 1 Supplement



**Figure 1: Dependence of performance on patient number and observation time:** Shown is the performance (Pearson's correlation ( $r$ ), Spearman's correlation ( $\rho$ ), mean absolute prediction error (MAPE), R squared ( $r^2$ ) and Cumming's Prediction Measure (CPM) of the neural network depending on the patient number and the length of the observation period in years.

## 1.1 Python code for deep learning model

```
import keras

from keras.layers import Input, Dense, Flatten
from keras.models import Model, Sequential
from keras import optimizers

model = Sequential()
inpt = Input(shape=(X_train.shape[1], X_train.shape[2]))
x_f = Flatten()(inpt)
x = Dense(50, input_shape=(X_train.shape[1] * X_train.shape[2],), activation='relu')(x)
x = keras.layers.Dropout(0.25)(x)
x = Dense(50, activation='relu')(x)
x = keras.layers.Dropout(0.25)(x)
x = Dense(50, activation='relu')(x)
x = keras.layers.Dropout(0.25)(x)
x = Dense(50, activation='relu')(x)
x = keras.layers.Concatenate(axis=-1)([x, x_f])
outs = Dense(y_train.shape[1], activation='linear')(x)

model = Model(inputs=inpt, outputs=outs)

Adam = optimizers.Adam(clipnorm=1., amsgrad=True)

model.compile(loss='mean_squared_error',
              optimizer=Adam,
              metrics=['mse', 'mae'])
```