

Flowchart of selection of the study sample

Initial feature setup of the Romanian national ICD-10 database of all hospitalised patients:

Case ID	Hospital ID (encrypted)	Admission date	Admission Type ID	Admission criteria ID	Admission ward ID	Discharge date	Type of discharge ID	State of discharge
Discharge ward ID	National Identification number (encrypted)	Age	Sex	Weight at Admission ID	Education level ID	Occupation ID	Citizenship ID	Insurance Type ID
National Health Insurance Type ID	Medical Specialist ID	Admission ICD-10 code	Principal diagnosis ICD-10 code	Other principal diagnosis ICD-10 code	Secondary diagnosis ICD-10 code	Code of principal procedure	Code of secondary procedure	Date of principal procedure
Accident ID	Insurance Validation ID	DRG	Relative value	NUTS region of hospital	NUTS region of patient	Acute		



Selection of ICD-10 codes for the ten deadliest diseases:
(see Supplementary Table 1)

Ischaemic heart disease, Stroke, Chronic obstructive pulmonary disease, Lower respiratory infections, Alzheimer disease, Lung cancer, Diabetes mellitus, Road injury, Diarrhoeal diseases, Tuberculosis



Extraction of ICD-10 codes of the ten deadliest diseases



Selection of necessary features to create a secondary time series database:

Case ID	Hospital ID (encrypted)	Admission date	Admission Type ID	Admission criteria ID	Admission ward ID	Discharge date	Type of discharge ID	State of discharge
Discharge ward ID	National Identification number (encrypted)	Age	Sex	Weight at Admission ID	Education level ID	Occupation ID	Citizenship ID	Insurance Type ID
National Health Insurance Type ID	Medical Specialist ID	Admission ICD-10 code	Principal diagnosis ICD-10 code	Other principal diagnosis ICD-10 code	Secondary diagnosis ICD-10 code	Code of principal procedure	Code of secondary procedure	Date of principal procedure
Accident ID	Insurance Validation ID	DRG	Relative value	NUTS region of hospital	NUTS region of patient	Acute		

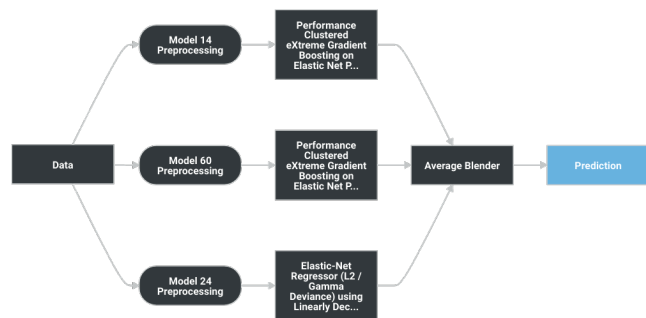


Preparation of secondary time series database for autoML analysis with model selection and prediction:

Dates	Disease-NUTS-2 Key	New cases
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Figure S1.

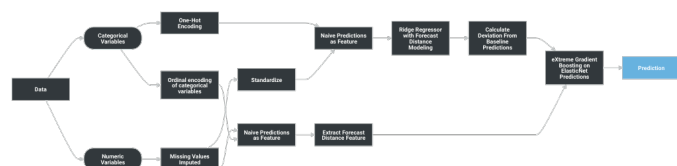
A Ischaemic heart diseases



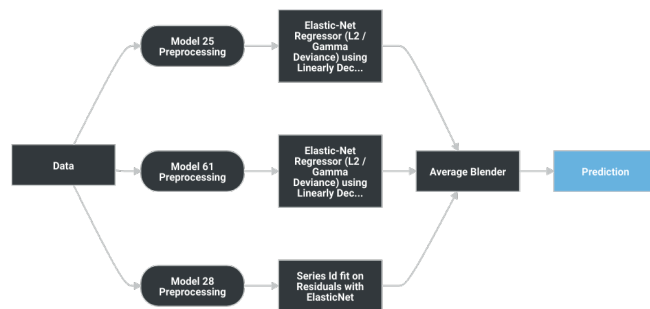
F Lung cancer



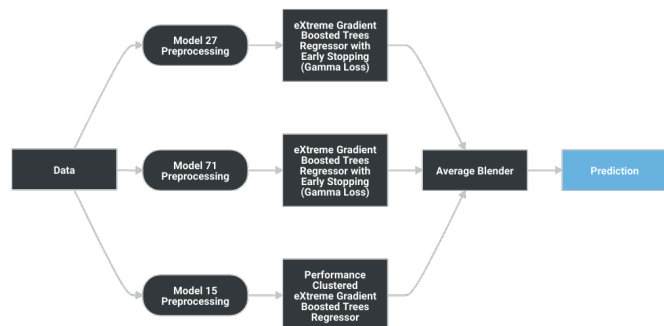
B Stroke



G Diabetes mellitus



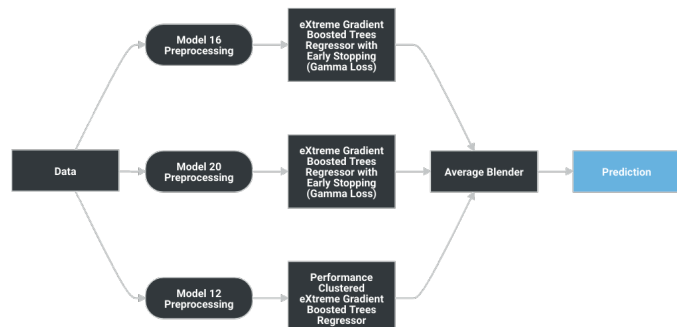
C Chronic obstructive pulmonary disease



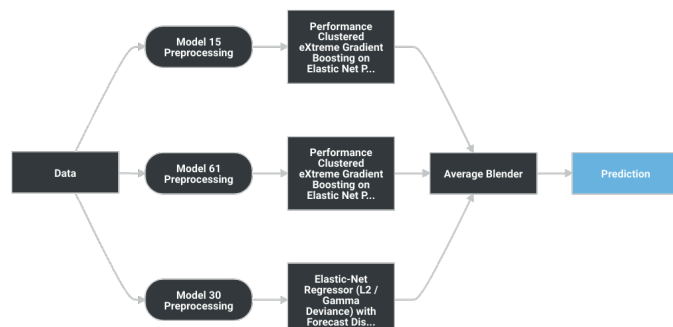
H Road injuries



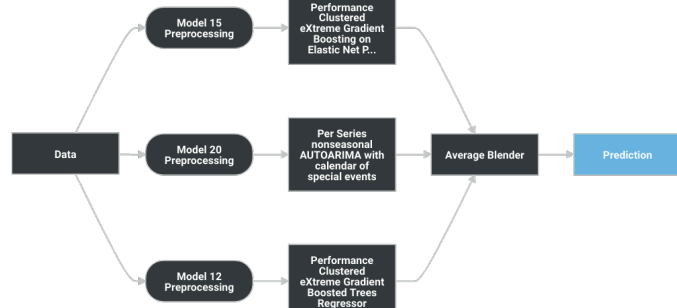
D Lower respiratory infections



I Diarrhoeal diseases



E Alzheimer's disease



J Tuberculosis



Figure S2.

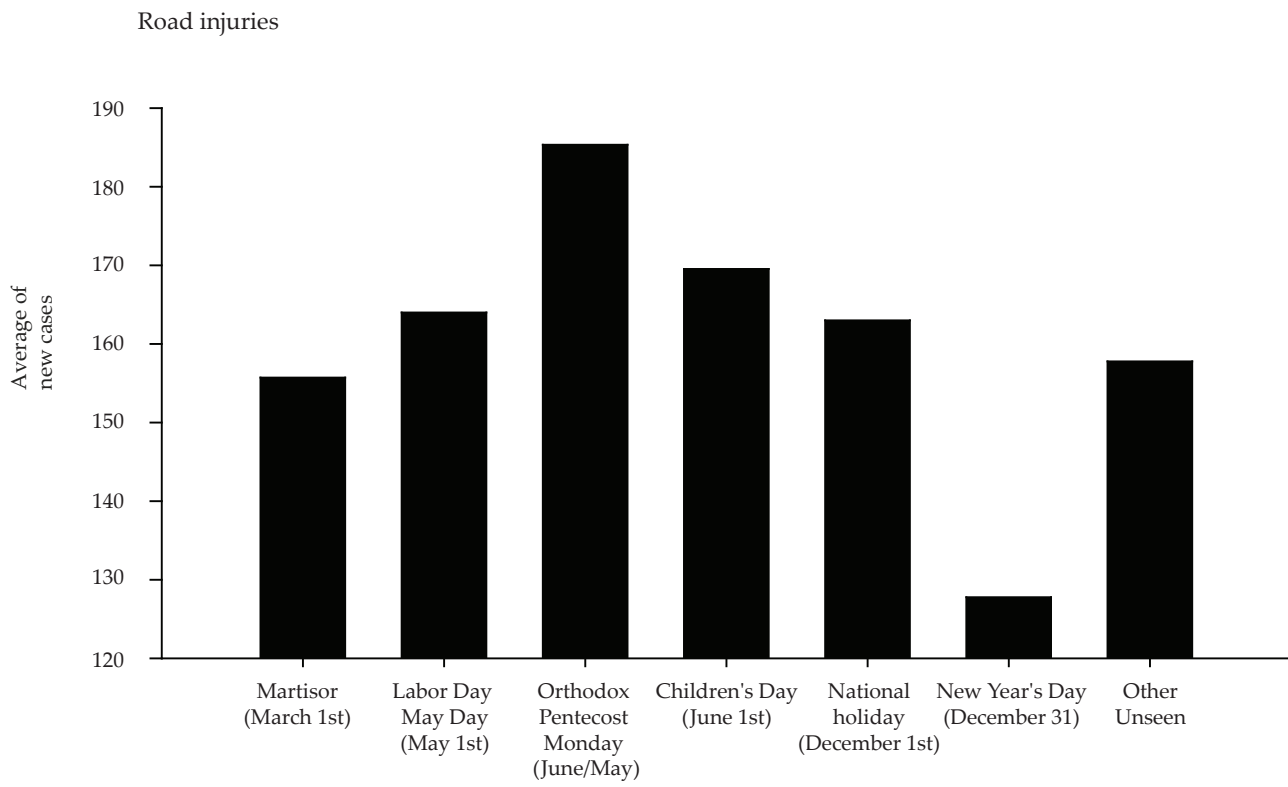


Figure S4.