

## Appendix A. Supplementary information

**Table A1: ICD9 codes used to select CVD patients.**

Name	ICD9-code
Acute myocardial infarction	D410
Other acute and subacute forms of ischemic heart disease	D411
Angina pectoris	D413
Angioplasty percutaneous coronary intervention	I360, I0066
Hypertensive disease	D401, D402, D403, D404, D405
Heart failure	D39891, D40211, D40201, D40291, D40401, D40403, D40411, D40413, D40491, D40493, D4280, D4281, D4289, D42820, D42821, D42823, D42830, D42831, D42833, D42840, D42841, D42843, D425, D5184, D51881, D7991, D78551, D429, DV421, DV422, DV432, DV433
Arrhythmias	D426, D427, I0050, I0051, I0052, I0053, I0054, D7802
Valvular Heart Diseases	D424, D394, D395, D396, D397, I35
Pulmonary embolism	D415
Perimyocarditis	D420, D421, D422, D423

**Table A2: Input variables.**

Variable	Distribution	Time varying	Type
Heart rate	continuous	yes	vital
Respiratory rate	continuous	yes	vital
BPDias	continuous	yes	vital
BPMean	continuous	yes	vital
BPSyst	continuous	yes	vital
SpO2	continuous	yes	vital
AtrialFib	binary	yes	vital
AtrialFlutter	binary	yes	vital
CardiacCath	binary	yes	vital
CompHeartBlock	binary	yes	vital
Intubation	binary	yes	vital
FirDegAVBlock	binary	yes	vital
Junctional	binary	yes	vital
MultFocalAtrTach	binary	yes	vital
NormalSinus	binary	yes	vital
Paced	binary	yes	vital
SecAVBmobitzI	binary	yes	vital

SecAVBMobitz2	binary	yes	vital
SinusArrhythmia	binary	yes	vital
SinusBrady	binary	yes	vital
SinusTachy	binary	yes	vital
SupraventTachy	binary	yes	vital
VentTachy	binary	yes	vital
Age	continuous	no	demographic
Weight	continuous	no	clinical
BUN	continuous	no	clinical
Chloride	continuous	no	clinical
Creatinine	continuous	no	clinical
Hematocrit	continuous	no	clinical
Hemoglobin	continuous	no	clinical
Potassium	continuous	no	clinical
Sodium	continuous	no	clinical
Temperature	continuous	no	clinical
Gender	binary	no	demographic
Asian	binary	no	demographic
Afroamerican	binary	no	demographic
Hispanic	binary	no	demographic
White	binary	no	demographic
Aspirin	binary	no	medication
Clopidogrel	binary	no	medication
Furosemide	binary	no	medication
Heparin	binary	no	medication
Nitroglycerin	binary	no	medication
Nitroprusside	Binary	No	medication
Norepinephrine	binary	no	medication
Phenylephrine	binary	no	medication
Vasopressin	binary	no	medication
Warfarin	binary	no	medication

**Table A3: Discharging ICD-9 diagnostic codes (the first three) for patient A and patient B.**

Patient	First diagnosis	Second diagnosis	Third diagnosis
A	3968	3811	4254
B	4280	51884	4258

**Figure A1: Model's structure.** The representation is focused on a general time-point  $t$  between  $1$  and  $T$ , length of the time-series.  $p$  denotes the number of predictors. The innovative component consists in the input time-level attention layer passed to a LSTM cell.

