

Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix

Methods

Search strategy

The PubMed literature search was filtered by the specific clinical study categories of “*prognosis*” and “*clinical prediction guides*”, which was further limited by the filter of a narrow and specific search (Narrow/Specific[filter]). The terms “*AUC OR area under the curve OR c statistic OR c index*” and “*death OR mortality OR survival*” were applied. We set no limits for publication type or language. All items were initially evaluated for eligibility based on title and abstract. Possibly eligible studies were retrieved and scrutinized in full-text.

Data extraction

When studies examined previously developed predictive tools, we extracted the AUC values of all previously developed tools corresponding to all-cause mortality. When studies developed and proposed new predictive tools, we extracted the AUC values of all examined tools (newly and previously developed) in the external validation set only. We gave preference to keep information on the whole study population over subgroups. For each eligible AUC we extracted the specific value and the respective 95% confidence interval (CI) whenever available.

For each eligible prognostic study we recorded the first author, journal, impact factor of the journal (according to Thomson Journal Citation Reports¹⁹), country of origin of the

corresponding author or group investigators (USA, Europe, other), the study design (assessment of overall death prediction in a prospectively collected study population or in a retrospectively evaluated dataset), whether the assessment of the variables included in the predictive tool was blinded, and the percentage of losses to follow-up.

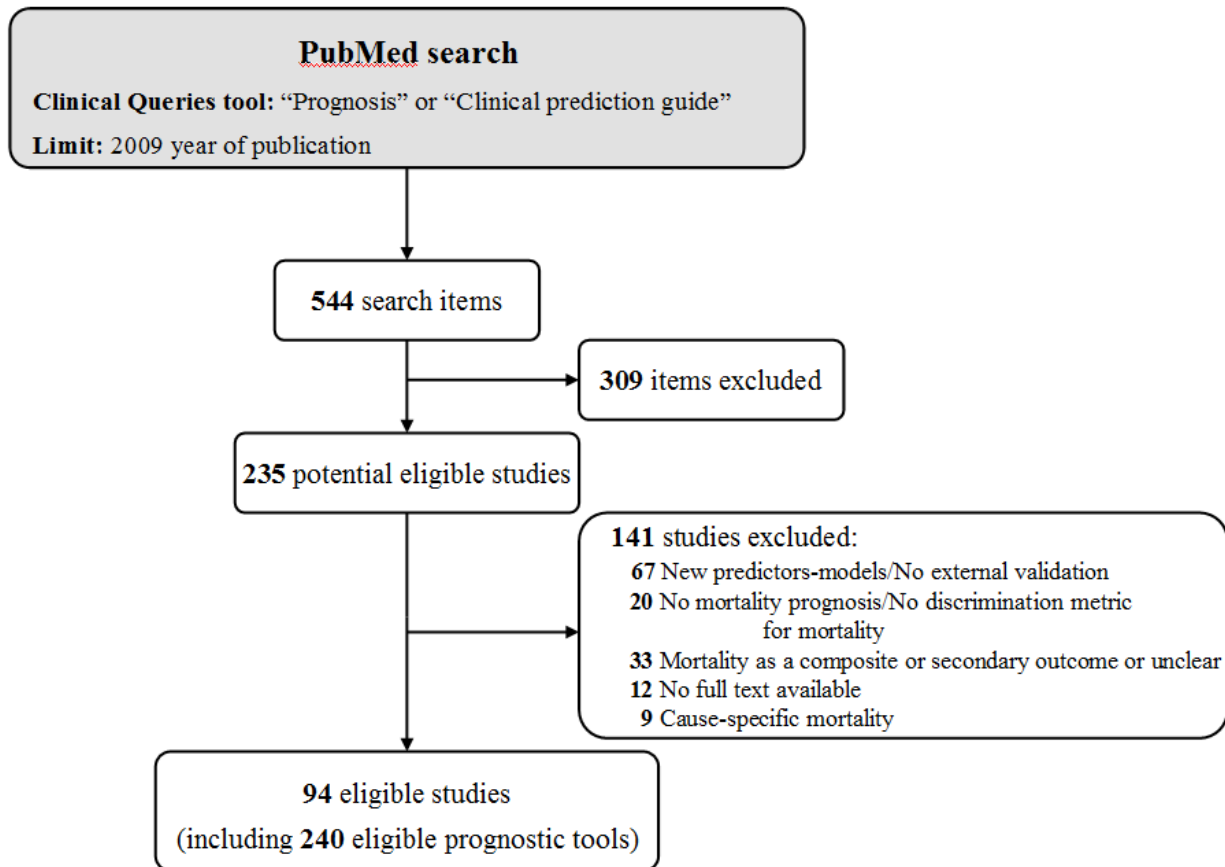
For each study and for each predictive tool, we recorded the total sample size and the number of deaths when a previously developed predictor/model was used and the sample size and number of deaths for the validation group, when a new tool was developed. Study populations were categorized according to their baseline status as healthy, acute disease (conditions that need acute evaluation and intervention e.g. trauma, sepsis, emergency surgery), chronic disease, or populations with both acute and chronic disease patients. Moreover, we recorded whether primarily adults or children were involved.

Studies were categorized into the following general fields based on the disease/clinical condition: cardiovascular diseases, critical illnesses, infectious diseases, gastroenterology-related diseases, malignancies, trauma, or other. We recorded the average follow-up corresponding to each of the extracted AUCs, giving preference to mean>median>in-hospital follow-up estimates. When no information was given in the text, duration of follow up was derived from Kaplan-Meier curves, where applicable. When only maximum follow-up duration under investigation was given, we approximated the mean follow-up by using the formula $mean\ follow-up = maximum\ follow-up * (1 - (0.5 * proportion\ of\ deaths))$ which assumes that each dying patient contributes on average half of the maximum follow-up. The *death rate* (per month of follow up) was calculated by the $number\ of\ events / (sample\ size * mean\ follow-up)$.

We noted whether a single predictor or a predictive model with multiple predictors was used. For each prognostic model we recorded the number and the included set of variables. Furthermore, we noted whether the accuracy of the prediction in each study was assessed by any measure of calibration¹⁵ and, if so, recorded the applied method, and whether the authors presented the calibration results. Finally, we identified the studies in which reclassification analysis¹⁶⁻¹⁸ was performed and recorded the respective metrics.

The selection of the eligible studies and data extraction was performed independently by two investigators (G.C.M.S. and I.T.). Any discrepancies were resolved by consensus and arbitration by a third investigator (J.P.A.I.).

eFigure. Selection of eligible studies of all-cause death prediction.



eTable 1. Characteristics of eligible studies and predictive tools

Characteristic		No. (%)	
		Prognostic studies (n=94)	Predictive tools (n=240)
Type of study			
	New externally validated tools	29 (31)	72 (30)
	Previously developed predictive tools	65 (69)	168 (70)
Area of origin			
	United States	21 (22)	49 (20)
	Europe	43 (46)	113 (47)
	Other	30 (32)	78 (33)
Study design			
	Prospective	53 (56)	139 (58)
	Retrospective	41 (44)	101 (42)
Disease status			
	Acute disease	55 (59)	130 (54)
	Chronic disease	29 (31)	91 (38)
	Mixed (acute/chronic)	10 (11)	19 (8)
Study population			
	Pediatric	5 (5)	7 (3)

	Adult	88 (94)	225 (94)
	Both	1 (1)	8 (3)
Disease/Clinical condition			
	Cardiovascular	18 (19)	40 (17)
	Critical illness	16 (17)	42 (18)
	Gastroenterology	14 (15)	50 (21)
	Infectious	15 (16)	37 (15)
	Malignancies	9 (10)	30 (13)
	Other	22 (23)	41 (17)
In-hospital mortality			
	Yes	44 (47)	99 (41)
	No	50 (53)	141 (59)
Predictive variables were assessed blinded to the outcome (all cause mortality)			
	Yes	1 (1)	1 (0.4)
	No	93 (99)	239 (99.6)
Information on loss to follow-up			
	Not available	16 (17)	40 (17)
	Available	78 (83)	200 (83)
	Loss of follow-up 0%	70 (90)	158 (79)
	Loss of follow-up >0%	8 (10)	42 (21)

eTable 2. Assessed prediction models and their variables

eRef	Disease/Clinical condition	Predictive model	Set of variables in each predictive model
S15	Cardiovascular disease	Acute Kidney Injury Network (AKIN)	serum creatinine criteria or urine output criteria
S67	Critical illness	Acute Lung Injury (ALI) score	chest X-ray, hypoxemia, PEEP, compliance
S94	Cardiovascular disease	Acute Myocardial Infarction in Switzerland (AMIS) model	age, Killip class, systolic blood pressure, heart rate, prehospital cardiopulmonary resuscitation, history of heart failure, history of cardiovascular disease
S1 S6 S8 S9 S17 S26 S29 S30 S33 S36 S50 S51 S53 S54 S64 S67 S71 S73 S82	Critical illness Gastroenterology-related Malignancies Infectious disease Other	Acute Physiology And Chronic Health Evaluation (APACHE) II	temperature, mean arterial pressure, heart rate, respiratory rate, oxygenation or PaO ₂ , arterial pH, serum sodium, serum potassium, serum creatinine, hematocrit, white blood cell (WBC) count, Glasgow Coma Score
S23	Critical illness	Acute Physiology And Chronic Health Evaluation (APACHE) III	pulse, mean blood pressure (BP), temperature, respiratory rate, PaO ₂ , A-aDO ₂ , Hct, WBC, Cr-No ARF, Cr-ARF, urine output, BUN (mmol/l), soium (mmol/l), albumin (g/l), bilirubin (mmol/l), Glu (mmol/l)
S31	Other	Prognostic model (unnamed)	age, burned surface area (BSA), inhalation injury
S41	Malignancies	American Joint Committee on Cancer/International Union Against Cancer (AJCC/UICC) TNM classification	Child-Pugh score, tumor morphology, serum a-fetoprotein (ng/dL), portal vein thrombosis
S64	Infectious disease	American Thoracic Society/Infectious Diseases Society of America (ATS/IDSA) major criteria	respiratory rate>30 breaths/min, PaO ₂ /FiO ₂ ratio<250, multilobar infiltrates, confusion/disorientation, uremia (BUN level > 20mg/dL, leukopenia (WBC count, <4000 cells/mm, thrombocytopenia (PLT<100000 cells/mm), hypothermia (core temperature <36 C), hypotension requiring aggressive fluid resuscitation, invasive mechanical ventilation, septic shock with the need for vasopressors

S78	Cardiovascular disease	Aristotle Basic Complexity (ABC) score	mortality component, morbidity component, technical difficulty component
S70	Gastroenterology-related	AST to platelet ratio index (APRI)	platelet count, aspartate aminotransferase (AST)
S21	Cardiovascular disease	AusSCORE	age, New York Heart Association (NYHA) class, urgency of procedure, ejection fraction estimate, previous cardiac surgery, hypercholesterolemia (lipid-lowering treatment), peripheral vascular disease, cardiogenic shock
S57	Malignancies	Barcelona Clinic Liver Cancer (BCLC)	early stage (A) includes patients with asymptomatic early tumors suitable for radical therapies, intermediate stage (B) comprises patients with asymptomatic multinodular HCC, advanced stage (C) includes patients with symptomatic tumors and/or an invasive tumoral pattern (vascular invasion/extrahepatic spread), end-stage disease (D) contain patients with extremely grim prognosis
S6 S54	Gastroenterology-related	Bedside Index for Severity in Acute Pancreatitis (BISAP) score	BUN>25 mg/dl, impaired mental status (Glasgow coma scale score<15), systematic inflammatory response syndrome (SIRS), age>60 years, pleural effusion detected on imaging
S93	Other	BODE index	BMI, airflow obstruction, dyspnea, exercise capacity
S20	Cardiovascular disease	British Columbia Percutaneous Coronary Intervention (PCI) risk score	age, gender, emergency, left main disease, triple vessel disease, left ventricular ejection fraction (LVEF), New York Heart Association (NYHA), critical preprocedural state, ST-elevation myocardial infarction (STEMI), other acute coronary syndrome (ACS), creatinine
S1	Critical illness	C4.5 classification tree	inotropic therapy (INOT), Glasgow value, (A-a)O ₂ gradient ((A-a)O ₂), age, chronic organ insufficiency (COI), mean arterial pressure (MAP)
S41 S57 S69	Malignancies	Cancer of the Liver Italian Program (CLIP)	Child-Pugh score, tumor morphology, serum alfa-fetoprotein (ng/dL) levels, portal vein thrombosis
S1	Critical illness	CHAID algorithm	inotropic therapy (INOT), Glasgow value, (A-a)O ₂ gradient ((A-a)O ₂), age, chronic organ insufficiency (COI), mechanical ventilation, trauma
S76 S82 S88	Critical illness Other	Charlson Comorbidity Index (CCI)	age, AIDS, cerebrovascular disease, chronic pulmonary disease, congestive heart failure, connective tissue disease, dementia, hemiplegia, leukemia, malignant lymphoma, myocardial infarction, peripheral vascular disease, ulcer disease, diabetes mellitus, liver disease, renal disease, malignant solid tumor
S7 S9 S12 S19 S22 S60 S87 S91	Critical illness Gastroenterology-related	Child–Turcotte–Pugh (CTP) score	bilirubin, albumin, prothrombin time prolong, ascites, encephalopathy
S60	Other	CHS index	shrinking, weakness, poor energy, slowness, low physical activity
S1	Critical illness	Classification And Regression Trees (CART)	inotropic therapy (INOT), Glasgow value, (A-a)O ₂ gradient ((A-a)O ₂), age, chronic organ insufficiency (COI)

S25	Other	Clinical Risk Index for Babies (CRIB)	birthweight, gestational age, maximum and minimum fraction of inspired oxygen and maximum base excess during the first 12 h, presence of congenital malformations
S25 S27	Other	Clinical Risk Index for Babies (CRIB) II	sex, birthweight, gestational age, temperature at admission, base excess
S59	Infectious disease	Community-acquired pneumonia-90 (CAP-90) index	pre-illness functional status, Charlson index (composite measure of co-morbid illnesses) and severity on admission
S6	Gastroenterology-related	Computed Tomography Severity Index (CTSI)	Balthazar grade and necrosis percentage
S63	Infectious disease	CRB65	new confusion, respiratory rate >30/min, systolic blood pressure <90 mmHg or diastolic blood pressure =<60 mmHg, age >65 years
S14	Malignancies	CR-POSSUM	age, pre-existing cardiac failure, systolic blood pressure, pulse, haemoglobin, serum urea nitrogen, operative severity, peritoneal soiling, cancer stage, mode of surgery, observed 30-day mortality
S2 S18 S42 S63 S80	Infectious disease	CURB-65 score	new confusion, urea>7 mM, respiratory rate >30/min, systolic blood pressure <90 mmHg or diastolic blood pressure =<60 mmHg, age >65 years
S13	Critical illness	customized Simplified Acute Physiology Score (SAPS) III	age, co-morbidities, length of stay before ICU admission, intra-hospital location before ICU admission, use of major therapeutic options before ICU admission, ICU admission: planned or unplanned, reasons for ICU admission, surgical status at ICU admission, anatomical site of surgery, acute infection at ICU admission, estimated GCS (lowest), total bilirubin (highest) in mg/dL, total bilirubin (highest) μmol/L, body temperature (highest), creatinine (highest) in mg/dL, creatinine (highest) μmol/L, heart rate (highest), leukocytes, hydrogen ion concentration (lowest), platelets, systolic blood pressure, oxygenation
S88	Other	Elixhauser comorbidity score	congestive heart failure, cardiac arrhythmias, valvular disease, pulmonary circulation disorders, peripheral vascular disorders, hypertension (uncomplicated and complicated), paralysis, other neurological disorders, chronic pulmonary disease, diabetes - uncomplicated, diabetes complicated, hypothyroidism, lymphoma, metastatic cancer, solid tumor without metastasis, rheumatoid arthritis/collagen vascular disease, coagulopathy, obesity, weight loss, fluid and electrolyte disorders, blood loss anemia, deficiency anemias, alcohol abuse, drug abuse, psychoses, depression
S40	Other	Emergency trauma score (EMTRAS)	age, Glasgow Coma Scale, base excess, prothrombin time
S21 S35 S45 S56 S74	Cardiovascular disease	European system for cardiac operative risk evaluation (EuroSCORE)	age (years), gender, chronic pulmonary disease, extracardiac arteriopathy, neurological dysfunction, previous cardiac surgery, creatinine > 200 Mmol/L, active endocarditis, critical preoperative state, unstable angina, LV function, recent MI, pulmonary hypertension, emergency, operation other than isolated CABG, surgery on thoracic aorta, post infarct septal rupture

S70	Gastroenterology-related	FIB4	platelet count, alanine aminotransferase (ALT), aspartate aminotransferase (AST)
S70	Gastroenterology-related	FibrometerA	prothrombin index (PI), α -2 macroglobulin, hyaluronic acid, age
S70	Gastroenterology-related	Fibrosis staging at biopsy	scale runs from 0 to 4
S70	Gastroenterology-related	FibroTest	α -2 macroglobulin, haptoglobin, gamma glutamyl transpeptidase (GGT), apolipoprotein A1, total bilirubin corrected for age, gender
S70	Gastroenterology-related	Forns	age, gamma-glutamyl transferase (GGT), cholesterol, platelet count, prothrombin time
S39	Cardiovascular disease	Glasgow Aneurysm Score (GAS)	age, shock, myocardial disease, cerebrovascular disease, renal insufficiency
S49	Critical illness	Glasgow Coma Scale (GCS)	eye opening, verbal response, motor response
S53	Gastroenterology-related	Glasgow criteria	on admission (age >55 yrs, WBC Count >15 x10 ⁹ /L, Blood Glucose >200 mg/dL (No Diabetic History), Serum Urea >16 mmol/L (No response to IV fluids), Arterial Oxygen Saturation <76 mmHg), within 48 hours (Serum Calcium <2 mmol/L, Serum Albumin <34 g/L, LDH >219 units/L, AST/ALT >96 units/L)
S81	Cardiovascular disease	Global Registry of Acute Coronary Events (GRACE) risk score	age (years), heart rate (bpm), systolic blood pressure (mmHg), creatinine (mg/dL), Killip class, cardiac arrest at admission, elevated cardiac markers, ST segment deviation
S26	Critical illness	Global Simplified Acute Physiology Score (SAPS) III	age (years), co-morbidities, length of stay before intensive care unit (ICU) admission, intra-hospital location before ICU admission, use of major therapeutic options before ICU admission, ICU admission (planned or unplanned), reasons for ICU admission, surgical status at ICU admission, anatomical site of surgery, acute infection at ICU admission, estimated Glasgow Coma Scale, total bilirubine (mg/dL), total bilirubine (μ mol/L), body temperature, degrees celcius, creatinine (mg/dL), creatinine (μ mol/L), heart rate (beats/min), leukocytes, hydrogen ion concentration, platelets, systolic blood pressure, oxygenation
S76	Other	Hematopoietic Cell Transplantation Comorbidity Index (HCT-CI)	arrhythmia, cardiac, inflammatory bowel disease, diabetes, cerebrovascular disease, psychiatric disturbance, hepatic (mild), obesity, infection, rheumatologic, peptic ulcer, moderate/severe renal, moderate pulmonary, prior solid tumor, heart valve disease, severe pulmonary, moderate/severe hepatic
S70	Gastroenterology-related	Hepascore	bilirubin, gamma glutamyl transpeptidase (GGT), hyaluronic acid, α -2 macroglobulin, age, gender
S79	Infectious disease	HIV biomarkers	CD4 cell count, HIV RNA, AIDS-defining conditions
S79	Infectious disease	HIV biomarkers + Non-HIV biomarkers	CD4 cell count, HIV RNA, AIDS-defining conditions, haemoglobin, transaminases, platelets, creatinine, hepatitis B and C serology
S30 S40	Other	Injury Severity Score (ISS)	regions of injury (head and neck, face, chest, abdomen, extremity, external)
S17	Malignancies	Intensive Care National Audit & Research Centre (ICNARC) physiology score	highest heart rate, lowest systolic blood pressure, highest temperature, lowest respiratory rate, PaO ₁ /FiO ₂ ratio, lowest arterial pH, highest serum urea, highest serum creatinine, highest serum sodium, urine output, lowest white

			blood count, sedated-paralyzed- Glasgow Coma Scale
S32	Other	Intermountain Risk Score	age, sex, hematocrit, white blood cell count, platelet count, mean corpuscular volume, mean corpuscular hemoglobin concentration, red cell distribution width, mean platelet volume, sodium, potassium, bicarbonate, calcium, glucose, creatinine
S61	Other	International Classification Injury Severity Score (ICISS)	simply determining the product of the survival risk ratios (SRRs) for each individual injury ICD-9 codes. Included variables not given.
S49	Critical illness	Intra Cerebral Haemorrhage (ICH) score	Glasgow Coma Scale, age over 80, ICH volume over 30 ml, intraventricular hemorrhage, infratentorial origin of hemorrhage
S41 S57 S69	Malignancies	Japan Integrated Staging (JIS)	Child-Pugh score, tumor morphology, serum a-fetoprotein (ng/dL), portal vein thrombosis
S90	Cardiovascular disease	Laboratory index (LI)	hemoglobin (Hb) levels and renal function (creatinine clearance)
S41	Malignancies	Liver Cancer Study Group of Japan (LCSGJ)	Child-Pugh score, tumor morphology, serum a-fetoprotein (ng/dL), portal vein thrombosis
S1	Critical illness	Logistic Regression model	Age, heart rate, Glasgow Coma Scale, (A-a)O ₂ gradient, inotropic therapy, mechanical ventilation, acute renal failure, COI, trauma
S7 S19	Gastroenterology-related	MESO index	MELD to SNa ratio x 10
S57 S60 S83	Gastroenterology-related Malignancies	Model for End-Stage Liver Disease (MELD) - Sodium score	serum creatinine, the international normalized ratio (INR) for prothrombin time, serum bilirubin, cirrhosis etiology (alcohol or cholestasis, other), sodium
S4 S7 S9 S12 S16 S19 S22 S38 S57 S60 S83 S87 S91	Critical illness Gastroenterology-related Infectious disease Malignancies Other	Model for End-Stage Liver Disease (MELD) score	serum creatinine, the international normalized ratio (INR) for prothrombin time, serum bilirubin, cirrhosis etiology (alcohol or cholestasis, other)
S5	Malignancies	Prognostic model for hepatocellular carcinoma	alpha-fetoprotein, total albumin concentration, venous infiltration, tumor size, new AJCC stage, number of tumor nodule
S11	Other	Mortality Probabilistic Model at 24-Hours (MPMHOS-24)	age, type of admission, chronic heart failure, chronic respiratory failure, chronic liver disease, cancer, dementia, haemoglobin <110 mg/dL, creatinine ≥2 mg/dL
S1 S36	Critical illness Infectious disease	Mortality Probability Models (MPM) II	age, prothrombin time, PaO ₂ <60 mmHg, vasoactive drugs>1 hour, mechanical ventilation, intracranial mass effect, confirmed infection, coma,

			urine output<150 mL/8 hours, creatinine >2.0 mg/dl, cirrhosis, metastatic neoplasm, medical or unscheduled surgery admission
S72	Gastroenterology-related	Mortality risk model among patients with bleeding peptic ulcers	age>70 y, presence of listed comorbidities, more than 1 listed comorbidity, hematemesis, initial systolic blood pressure<100 mmHg, in-hospital bleeders, presence of H. pylori, development of rebleeding, need of operation.
S47	Infectious disease	Multidimensional Prognostic Index (MPI)	age, sex, the presence of comorbid illnesses, vital sign abnormalities, and some laboratory and radiographic abnormalities
S40	Other	New Injury Severity Score (NISS)	sums the severity score for the three most severe injuries, regardless of body region (according to ISS)
S53	Gastroenterology-related	new Japanese severity score (JSS)	age>70 years, SIRS score>3, CRP>15 mg/dl, Ca<7.5 mg/dl, PLT<1 x 10000/mm ³ , LDH>2 folds of upper normal limit, BUN>40 mg/dl or creatinine>2 mg/dl, PaO ₂ <60 mmHg or respiratory failure, BE<-3 mEq/L or shock
S79	Infectious disease	Non-HIV biomarkers	haemoglobin, transaminases, platelets, creatinine, hepatitis B and C serology
S43	Other	Paediatric Logistic Organ Dysfunction (PELOD) score	heart rate, systolic blood pressure, PaO ₂ /FiO ₂ , PaCO ₂ , mechanical ventilation, creatinine, Glasgow Coma Scale, pupillary reactions, white blood cell count, platelet count, serum glutamic oxaloacetic transaminase, prothrombin time or international normalized ratio, pulmonary score, CVS score, hepatic score, neurologic score, renal score, hematologic score
S35	Cardiovascular disease	Parsonnet score 2000-version	age, gender, body weight, aortic stenosis, congenital heart defect, arterial hypertension, pulmonary hypertension, LV aneurysm, LV ejection fraction, asthma, dialysis, acute renal failure, diabetes, paraplegia, pacemaker, intra-aortic balloon pump, cardiogenic shock, combined surgery, urgent/emergency operation, reoperation
S92	Other	Pediatric death prediction model	Not given
S2 S42 S47 S63 S80	Infectious disease	Pneumonia Severity Index (PSI)	age of more than 50 years, five coexisting illnesses (neoplastic disease, congestive heart failure, cerebrovascular disease, renal disease, and liver disease), and five physical-examination findings (altered mental status; pulse, 125 per minute; respiratory rate, 30 per minute; systolic blood pressure, 90 mm Hg; and temperature, 35°C or 40°C), male sex, nursing home residence, blood urea nitrogen concentration (30 mg per deciliter [11 mmol per liter]), glucose concentration (250 mg per deciliter [14 mmol per liter]), hematocrit (30 percent), sodium concentration (130 mmol per liter), partial pressure of oxygen (60 mm Hg), arterial pH, pleural effusion
S3	Other	Predictors of Respiratory Insufficiency and Mortality (PRIM) score	severe injury (Asia impairment Scales A and B), hemodynamic instability, neurological deterioration, mechanical ventilation
S72	Gastroenterology-related	Pre-endoscopic prediction score	age>70 y, presence of listed comorbidities, more than 1 listed comorbidity, hematemesis, initial systolic blood pressure<100 mmHg, in-hospital bleeders
S76	Other	Pretransplantation Assessment of Mortality (PAM)	age, donor type (related matched, unrelated, related mismatched), disease risk category, conditioning regimens, pretransplant serum creatinine (mg/dL), serum glutamic pyruvic transaminase (mg/dL), percent of predicted forced expiratory volume in one second (FEV1), percent of predicted carbon

			monoxide diffusion capacity adjusted for hematocrit
S53	Gastroenterology-related	old Japanese severity score (JSS)	The included variables are not listed.
S70	Gastroenterology-related	Pugh prognostic score	Not given
S6 S53	Gastroenterology-related	Ranson's criteria	on admission (age in years > 55 years, white blood cell count > 16000 /mcL, blood glucose > 11 mmol/L (>200 mg/dL), serum AST > 250 IU/L, serum LDH > 350 IU/L); after 48 hours (Haematocrit fall > 11.3444%, increase in BUN by 1.8 or more mmol/L (5 or more mg/dL) after IV fluid hydration, hypocalcemia (serum calcium < 2.0 mmol/L (<8.0 mg/dL)), hypoxemia (PO ₂ < 60 mmHg), base deficit > 4 Meq/L, estimated fluid sequestration > 6 L)
S11	Other	Rapid Emergency Medicine Score (REMS)	Age, blood pressure, respiratory rate, heart rate, Glasgow coma scale, peripheral oxygen saturation
S40	Other	Revised Trauma Score (RTS)	Glasgow Coma Scale, systolic blood pressure, respiratory rate
S78	Cardiovascular disease	Risk Adjustment for Congenital Heart Surgery (RACHS-1) categories	scale runs from 1 to 6
S85	Infectious disease	Risk model for elderly emergency department (ED) patients	respiratory failure (respiratory rate>20, pulse oximetry<90%, pulse oximetry<94% on supplemental oxygen, or need for intubation), tachycardia, cardiac failure (systolic blood pressure<90 mmHg after a fluid challenge, need for vasopressors, or venous lactic acid level > 4 mmol/L), pre-existing terminal illness, platelets<150.000/ μ L
S58	Cardiovascular disease	risk model for perioperative mortality of endovascular vs open repair of Abdominal Aortic Aneurysm	age, sex, renal failure, congestive heart failure (CHF), peripheral vascular disease (PVD) or cerebrovascular disease (CBVD)
S36	Infectious disease	Risk model for short-term mortality of severe sepsis	logistic organ dysfunction, septic shock, multiple sites of infection, SAPS, fatal illness by McCabe Score, no chronic illness (one, two, or more)
S66	Malignancies	Risk model for survival of NSCLC patients	gender, World Health Organization performance status (WHO-PS), forced expiratory volume in 1 s (FEV1), number of positive lymph node stations (PLNSs), gross tumor volume (GTV)
S9 S15 S67	Critical illness Cardiovascular disease	Risk of renal failure, Injury to the kidney, Failure of kidney function, Loss of kidney function, and End-stage renal disease (RIFLE) classification	serum creatinine, glomerular filtration rate (GFR)
S84	Malignancies	Risk score for in-hospital mortality for Liver Resection for Metastases	age group, Charlson score, procedure type (RFA/enucleation, wedge resection, lobectomy), sex, hospital type (teaching, nonteaching)
S75	Cardiovascular disease	Risk score for in-hospital mortality in patients hospitalized with heart failure	age, systolic blood pressure, blood urea nitrogen, heart rate, sodium, chronic obstructive pulmonary disease, nonblack race
S77	Other	Risk score for mortality in Renal Transplant Recipients	age, pretransplant diabetes, positive Hepatitis C virus antibodies, new onset of diabetes after transplantation at the first year, serum creatinine at the first year (mg%), proteinuria>1 g at the first year, use of tacrolimus at the first year, use of mycophenolate mofetil at the first year
S72	Gastroenterology-related	Rockall score	age, shock, comorbidity, diagnosis, evidence of bleeding
S65	Other	Scoring system predicting mortality following acute burn injury	age (years), burned surface area (%), inhalation injury

S9 S22 S26 S46 S51 S52 S67 S68	Critical illness Gastroenterology-related Infectious disease Malignancies	Sequential Organ Failure Assessment (SOFA) score	respiratory system (PaO ₂ /FiO ₂), nervous system (Glasgow coma scale), cardio-vascular system (mean arterial pressure or administration of vasopressors required), liver (bilirubin (mg/dl)), coagulation (platelet count x1000/mcl), renal system (creatinine (mg/dl) (or urine output)
S2	Infectious disease	Severe Community Acquired Pneumonia (SCAP) score	systolic blood pressure <90 mm Hg, arterial pH<7.30, respiratory rate >30 breaths/min, blood urea nitrogen (BUN) >30 mg/dl, oxygen arterial pressure <54 mm Hg or PaO ₂ /FiO ₂ <250 mm Hg, altered mental status, age>80 yr, multilobar/bilateral lung affectation in X-rays
S35	Cardiovascular disease	Simple graphic pocket-card score for cardiac surgery	age, gender, indulin dependent, renal failure, peripheral vascular disease, reoperation, urgent-emergent-salvage status, preoperative intra-aortic balloon pump, aortic-mitral valve replacement, aortic-mitral valve repair, thoracic aorta replacement, aortic acute dissection, heart transplant, surgery combined, one-two-three vessel disease, moderate-severe left ventricular dysfunction
S94	Cardiovascular disease	Simple risk index	age, heart rate, systolic blood pressure
S10	Other	Simple risk score	serum urea nitrogen level>25mg/dL, acute mental status change, pulse>109/min, age<65 years
S1 S17 S29 S36 S37 S49 S71 S89	Critical illness Infectious disease Malignancies	Simplified Acute Physiology Score (SAPS) II	type of admission, chronic diseases, Glasgow coma scale, age, systolic blood pressure, heart rate, temperature, mechanical ventilation or CPAP PaO ₂ /FiO ₂ , urine output, serum urea or BUN, white blood cell count, potassium, sodium, HCO ₃ , bilirubin
S37 S89	Critical illness	Simplified Acute Physiology Score (SAPS) III	age, co-morbidities, use of vasoactive drugs before intensive care unit (ICU) admission, intrahospital location before ICU admission, length of stay in the hospital before ICU admission, reason(s) for ICU admission, planned/unplanned ICU admission, surgical status at ICU admission, anatomical site of surgery, presence of infection at ICU admission and place acquired, lowest estimated GCS, highest heart rate, kowest systolic blood pressure, highest bilirubine, highest body temperature, highest creatinine, highest leukocytes, lowest platelets, lowest hydrogen ion concentration (pH), ventilatory support and oxygenation
S78	Cardiovascular disease	Society of Thoracic Surgeons (STS)-European Association for Cardiothoracic Surgery (EACTS) categories	scale runs from 1 to 5
S78	Cardiovascular disease	Society of Thoracic Surgeons (STS)-European Association for Cardiothoracic	scale runs from 0.1 to 5

		Surgery (EACTS) score	
S86	Other	Thoracoscore	patient's age, gender, priority of the procedure, ASA class, Zubrod score, number of co-morbidities, presence of malignancy, dyspnea score, and type of procedure
S55 S90 S94	Cardiovascular disease	Thrombolysis In Myocardial Infarction (TIMI) risk score	age >75 and 65-74 years, systolic blood pressure <100mmHg, heart rate > 100 beats/min, Killip classes II-IV, anterior ST-elevation myocardial infarction or left-bundle branch block, history of diabetes, hypertension, or angina, body weight < 67 kg, time to start of intravenous thrombolysis of >4 h
S90	Cardiovascular disease	TIMI-risk score + Laboratory index	(age >75 and 65-74 years, systolic blood pressure <100mmHg, heart rate > 100 beats/min, Killip classes II-IV, anterior ST-elevation myocardial infarction or left-bundle branch block, history of diabetes, hypertension, or angina, body weight < 67 kg, time to start of intravenous thrombolysis of >4 h) and hemoglobin levels, baseline creatinine clearance
S57	Malignancies	TNM	size and number of tumors, node, metastasis
S57	Malignancies	Tokyo score	serum albumin, bilirubin, size and number of tumours
S34	Other	Trauma Injury Severity Score (TRISS)	Injury Severity Score (ISS), Revised Trauma Score (RTS) (including ISS, systolic blood pressure, respiratory rate, coma score), and age
S30 S40	Other	Trauma Revised Injury Severity Score	age, Glasgow Coma Scale, base excess, prothrombin time
S34	Other	Trauma Risk Adjustment Model (TRAM)	anatomic injury severity is represented by the AIS score of the 2 most severe injuries and the body region of the most severe injury, physiological response to injury by the Glasgow coma scale, systolic blood pressure and heart rate; and physiological reserve by age and number of comorbidities

eTable 3. Assessed single predictors

eRef	Disease/Clinical condition	Single predictor	Type of predictor
S44	Other	Base deficit	Biomarker
S24 S48 S68	Cardiovascular disease Infectious disease Other	B-type natriuretic peptide (BNP)	Biomarker
S68	Infectious disease	C2	Biomarker
S68	Critical illness Infectious disease	C-reactive protein (CRP)	Biomarker
S44	Other	lactate	Biomarker
S42	Infectious disease	Midregional proadrenomedullin (MR-proADM)	Biomarker
S24 S28 S48 S62 S73	Cardiovascular disease Critical illness Other	N-terminal-pro-B-type natriuretic peptide (NT-proBNP)	Biomarker
S42 S68	Infectious disease	procalcitonin	Biomarker

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