Table 1. Included models and predictor variables

Prediction model	Original publication	Variables	Lab y/n	Developed for diagnosis	Developed in population (age)	Age	Country	n	Dutch validation y/n	Validation publication(s)
Mahabee (2005)	Mahabee (2005)	Age ≥12 months; respiratory rate ≥50/min; oxygen saturation ≤96%; nasal flaring in age <12 months.	no	Pneumonia	2 months - 5 years	Cohort 1: median age 14 months (IQR 12-31), cohort 2: median age 19 months (IQR 12-31)	Cohort 1: the Netherlands, cohort 2: UK	Cohort 1: 766, cohort 2: 301	yes	van de Maat (2019)
Van den Bruel (2007)	Van den Bruel (2007)	Age; temperature; clinician's instinct something is wrong; dyspnoea; diarrhoea.	no	SBI (serious infection for which hospitalisation was necessary: pneumonia (infiltrate on chest X-ray); sepsis (pathogen in haemoculture); viral or bacterial meningitis (pleocytosis in cerebrospinal fluid and identification of bacteria or a virus); pyelonephritis (≥105/ml pathogens of a single species and white blood cells in urine and serum C-reactive protein elevation); cellulitis (acute, suppurative inflammation of the subcutaneous tissues); osteomyelitis (pathogen from bone aspirate); and bacterial gastroenteritis (bacterial pathogen in the stool).	0–16 years	Cohort 1: <3 months, cohort 2: <3 months, cohort 3: <3 months, cohort 4: 3-12 months	Cohort 1: Spain, cohort 2: France, cohort 3: the Netherlands, cohort 4: the Netherlands	Cohort 1: 2148, cohort 2: 2204, cohort 3: 159, cohort 4: 766	yes	van de Maat (2019), De Vos-Kerkhof (2018)
Neuman (2011)	Neuman (2011)	Oxygen saturation ≤92%; history of fever; wheezing; focal rales; chest pain; focal decreased breath sounds.	no	Pneumonia	< 21 years	Cohort 1: median age 14 months (IQR 12-31), cohort 2: median age 19 months (IQR 12-31)	Cohort 1: the Netherlands, cohort 2: UK	Cohort 1: 766, cohort 2: 301	yes	van de Maat (2019)

Craig (2010)	Craig (2010)	Age; temperature; general appearance; fluid intake; capillary refill time; chest crackles; chronic disease; elevated heart rate; focal bacterial infection; bulging fontanelle; crying; pneumococcal vaccine; rash; breathing difficulty; felt hot; cough; infectious contacts; male; urinary symptoms; meningococcal vaccine; respiratory symptoms; elevated respiratory rate; diarrhea; wheeze; abnormal ear, nose, and throat signs; abnormal chest sounds.	no	SBI (urinary tract infection, pneumonia, bacteraemia)	< 5 years	Cohort 1: <3 months	Cohort 1: France	Cohort 1: 2204	no	van de Maat (2019)
Thompson (2009)	Thompson (2009)	Temperature; oxygen saturation; tachypnoea; Tachycardia.	no	Serious infections - conditions that were likely to be life-threatening if untreated or with high chance of life-threatening complications or sequelae	3 months to 16 years	Cohort 1: <3 months, cohort 2: <3 months, cohort 3: 3-12 months	Cohort 1: France, cohort 2: the Netherlands, cohort 3: the Netherlands	Cohort 1: 2204, cohort 2: 159, cohort 3: 766	yes	De Vos-Kerkhof (2018)
Brent (2011)	Brent (2011)	Temperature; developmental delay; risk factor for infection (comorbidity); state variation; capillary refill time; hydration status; respiratory rate; hypoxia.	no	SBI (admission to hospital plus any of the following (in the absence of an alternative non-infective or non-bacterial diagnosis to explain the clinical and laboratory findings): positive bacterial cultures from blood or another normally sterile site in the appropriate clinical context, radiological signs of pneumonia, clinical meningitis plus a cerebrospinal fluid polymorphonuclear leukocytosis, acute febrile purpura, deep collection(s) requiring intravenous antibiotics±surgical drainage, a white blood cell count ≥20×10 9 /l, a C reactive protein ≥120 mg/l, or a fi nal	1 month to 15 years	Cohort 1: <3 months, cohort 2: <3 months, cohort 3: <3 months, cohort 4: 3-12 months	Cohort 1: Spain, cohort 2: France, cohort 3: the Netherlands, cohort 4: the Netherlands	Cohort 1: 2148, cohort 2: 2204, cohort 3: 159, cohort 4: 766	yes	van de Maat (2019), De Vos-Kerkhof (2018)

		diagnosis of septic arthritis, osteomyelitis, empyema or mastoiditis)								
5-stage Decision Tree	Van den Bruel (2007)	If yes to any of five sequential questions: 1) clinical instinct that something is wrong, 2) dyspnea, 3) temperature greater than 39.5°C, 4) diarrhea, 5) age 15 to 29 months.	no	Serious infections (sepsis, meningitis, pneumonia, pyelonephritis, osteomyelitis, cellulitis)	0–16 years	Cohort 1: mean age 2.2 years (range 0.3-5.9), cohort 2: mean age 2.9 years (range 0.1-15.7), cohort 3: mean age 0.9 years (range 0.0-3.0)	Cohort 1: the Netherlands, cohort 2: the Netherlands, cohort 3: the Netherlands	Cohort 1: 506, cohort 2: 1750, cohort 3: 595	yes	van de Maat (2019)
Pneumonia Rule	Van den Bruel (2007)	If yes to any of the following: 1) shortness of breath, 2) clinicians concern.	no	Pneumonia	0–16 years	Cohort 1: mean age 2.2 years (range 0.3-5.9), cohort 2: mean age 2.9 years (range 0.1-15.7), cohort 3: mean age 0.9 years (range 0.0-3.0)	Cohort 1: the Netherlands, cohort 2: the Netherlands, cohort 3: the Netherlands	Cohort 1: 506, cohort 2: 1750, cohort 3: 595	yes	De Vos-Kerkhof (2018)
Yale Observation Scale (cutoff > 8, cutoff >10)	McCarthy (1982)	Reaction to parents; state variation; color; hydration (normal 1point, moderate impairment 3 points, severe impairment 5 points).	no	serious illness	≤24 months	Cohort 1: mean age 2.2 years (range 0.3-5.9)	Cohort 1: the Netherlands	Cohort 1: 506	yes	Gomez (2016), De Vos-Kerkhof (2018)
NICE traffic light system	NICE	Colour; Activity; Respiratory; Hydration; Other (fever for temp ≥5 days; swelling of a limb or joint; non-weightbearing limb/not using extremity; a new lump >2 cm; age 0-3 months, temp ≥38°C; age 3-6 months, temp ≥39°C; non-blanching rash; bulging fontanelle; neck stiffness; status epilepticus; focal neurological signs; focal	no	serious illness	n/a	Cohort 1: mean age 2.2 years (range 0.3-5.9)	Cohort 1: the Netherlands	Cohort 1: 506	yes	De Vos-Kerkhof (2018)

		seizures; bile-stained vomiting).								
NHG alarm symptoms	NHG	If yes to any of these eight features: Seriously ill; Disturbed consciousness; Persistent vomiting; Petechiae; Tachypnoea or dyspnoea; Reduced peripheral circulation; Pallor or ashen or blue; Meningeal irritation.	no	ernstige infectie	n/a	Cohort 1: mean age 2.2 years (range 0.3-5.9)	Cohort 1: the Netherlands	Cohort 1: 506	yes	De Vos-Kerkhof (2018)
Oostenbrink (2013)	Oostenbrink (2013)	Ill appearance; tachypnea; O2 <94%; CRP.	yes	Pneumonia	1 month - 16 years	Cohort 1: median age 14 months (IQR 12-31), cohort 2: median age 19 months (IQR 12-31)	Cohort 1: the Netherlands, cohort 2: UK	Cohort 1: 766, cohort 2: 301	yes	De Vos-Kerkhof (2018)
Nijman (2013)	Nijman (2013)	Age; temperature; sex; duration fever; prolonged, capillary refill; chest wall retractions; Ill appearance; oxygen saturation; respiratory rate; heart rate; C-reactive protein.	yes	SBI (pneumonia, meningitis, septicaemia, urinary tract infections, erysipelas, cellulitis, bacterialgastroenteritis, orbital cellulitis, bacterial upper airway infection, ethmoiditis, arthritis, osteomyelitis)	1 month to 16 years	Cohort 1: <3 months, cohort 2: <3 months, cohort 3: 3-12 months, cohort 4: median age 14 months (IQR 12-31), cohort 5: median age 19 months (IQR 12-31),	Cohort 1: France, cohort 2: the Netherlands, cohort 3: the Netherlands, cohort 4: the Netherlands, cohort 5: UK	Cohort 1: 2204, cohort 2: 159, cohort 3: 766, cohort 4: 248, cohort 5: 301	yes	Aronson (2018), Gomez (2016)

Irwin (2017)	Irwin (2017)	CRP; respiratory rate; normal air entry; resistine; procalcitonin.	yes	SBI (pneumonia, bacteremia, urinary tract infection, meningitis, osteomyelitis, septic arthritis)	1 month - 16 years	Cohort 1: median age 14 months (IQR 12-31), cohort 2: median age 19 months (IQR 12-31)	Cohort 1: the Netherlands, cohort 2: UK	Cohort 1: 766, cohort 2: 301	yes	Aronson (2018)
Bachur and Harper (2001)	Bachur and Harper (2001)	Age; temperature; positive urine analysis; white cell count.	yes	SBI (defined as a positive culture of urine, blood, or cerebrospinal fluid)	≤3 months	Cohort 1: <3 months, cohort 2: <3 months, cohort 3: <3 months, cohort 4: 3-12 months	Cohort 1: Spain, cohort 2: France, cohort 3: the Netherlands, cohort 4: the Netherlands	Cohort 1: 2148, cohort 2: 2204, cohort 3: 159, cohort 4: 766	yes	Gomez (2016)
Galetto-Lacour/Lab-score	Galetto-Lacour (2010)	Urine dipstick analysis; PCT; CRP.	yes	SBI	7 days to 3 years	Cohort 1: median age 47 days (IQR 29–65), cohort 2: <3 months, cohort 3: <3 months, cohort 4: <3 months, cohort 5: 3-12 months	Cohort 1: multicenter (Spain, Italy, Switzerland), cohort 2: Spain, cohort 3: France, cohort 4: the Netherlands, cohort 5: the Netherlands	Cohort 1: 2635, cohort 2: 2148, cohort 3: 2204, cohort 4: 159, cohort 5: 766	yes	Verbakel (2013)
Bleeker (2007)	Bleeker (2007)	Ill clinical appearance; poor peripheral circulation; chest wall retractions; tachypnoea; duration of fever; history of vomiting; C-reactive protein; white cell count; positive urine analysis.	yes	SBI (bacterial meningitis, sepsis, bacteraemia, pneumonia, urinary tract infection, bacterial gastroenteritis, osteomyelitis/ ethmoiditis)	1 month to 3 years	Cohort 1: <3 months, cohort 2: <3 months, cohort 3: <3 months, cohort 4: 3-12 months	Cohort 1: Spain, cohort 2: France, cohort 3: the Netherlands, cohort 4: the Netherlands	Cohort 1: 2148, cohort 2: 2204, cohort 3: 159, cohort 4: 766	yes	Verbakel (2013)
Rochester criteria	Dagan (1985)	Previously healthy (Y/N); Well appearing (Y/N); Leukocyturia (Y/N); WBC count (≥5000 and ≤15 000); Absolute band count (≤1500 bands per μL).	yes	SBI	< 3 months	Cohort 1: median age 47 days (IQR 29–65), cohort 2: ≤60 days	Cohort 1: multicenter (Spain, Italy, Switzerland), cohort 2: USA	Cohort 1: 2635, cohort 2: 384	no	Verbakel (2013)

Modified Philadelphia criteria	Scarfone (2017)	Age >28 d (Y/N); Previously healthy (Y/N); Skin or soft tissue infection (Y/N); Normal uirinalysis (Y/N); Peripheral WBC count (≥5000 and ≤15 000); I/T ratio (<0.2d).	yes	bacterial meningitis	≤60 days	Cohort 1: ≤60 days	Cohort 1: USA	Cohort 1: 384	no	Verbakel (2013)
Step-by-step	Mintegi (2014)	Well-appearing (Y/N); >21 d old (Y/N); Leukocyturia (Y/N); PCT; CRP; ANC.	yes	IBI (isolation of a bacterial pathogen from the blood or cerebrospinal fluid)	< 3 months	Cohort 1: median age 47 days (IQR 29–65)	Cohort 1: multicenter (Spain, Italy, Switzerland)	Cohort 1: 2635	no	Verbakel (2013)