Additional file 2 – Comparative scoring systems

In this section, we described the details of other scoring systems used in this study and how they were implemented using the information included in datasets. We also detail the components and weightings of the individual scores, as they were implemented in this work.

The early warning score (EWS) systems evaluated in this study include the modified EWS, or MEWS (1), the standardised EWS, or SEWS (2), the National EWS, or NEWS (3, 4) and the centile-based EWS, or CEWS (5). Their components and weightings are shown in tables SM2-1, SM2-2, SM2-3 and SM2-4, respectively. The core set of variables that are used in these scoring systems comprises heart rate (measured in beats per minute), respiratory rate (in breaths per minute), systolic and diastolic blood pressure (in mmHg), body temperature (in °C), oxygen saturation (denoted "SpO₂", in %), an assessment of neurological status (using the Alert-Verbal-Painful-Unresponsive or AVPU scale), a flag for whether the patient was receiving supplementary oxygen at the time of the SpO₂ measurement (denoted "Inspired O₂"), and the age to the patient at admission to hospital. At each observation set (or measurement timestamp), in case of an incomplete vital-sign observation set, we used the most recent value of each variable. Remaining missing data were dealt with as with the proposed scoring system (see section 2 in the main manuscript).

Table SM2-1. Modified Early Warning Score (see main text for units of the variables included).

Table SM2-2. Standardised Early Warning Score (see main text for units of the variables included).

Table SM2-3. National Early Warning Score (see main text for units of the variables included).

Table SM2-4. Centile-based Early Warning Score (see main text for units of the variables included).

Table SM2-1.

| Modified Early Warning Score (MEWS) | | | | | | | | |
|-------------------------------------|-------|----------|----------|-------------|-----------|-------------|--------|--|
| | Score | | | | | | | |
| Variable | 3 | 2 | 1 | 0 | 1 | 2 | 3 | |
| Heart rate | ≤ 39 | 40 - 50 | 51 — 59 | 60 - 100 | 101 - 110 | 111 – 129 | ≥ 130 | |
| Resp. rate | | ≤ 8 | | 9 - 14 | 15 - 20 | 21 - 29 | ≥ 30 | |
| Temperature | | ≤ 35.0 | | 35.1 - 38.0 | | 38.1 - 39.5 | ≥ 39.6 | |
| Systolic BP | ≤ 69 | 70 - 80 | 81 - 100 | 101 - 149 | 150 - 169 | 170 - 179 | ≥ 180 | |
| AVPU scale | | | | А | V | Р | U | |

Table SM2-2.

| Standardised Early Warning Score (SEWS) | | | | | | | | |
|---|-----------|-------------|-------------|-------------|-------------|-----------|-------|--|
| | Score | | | | | | | |
| Variable | 3 | 2 | 1 | 0 | 1 | 2 | 3 | |
| Heart rate | ≤ 29 | 30 - 39 | 40 - 49 | 50 – 99 | 100 - 109 | 110 - 129 | ≥ 130 | |
| Resp. rate | ≤ 8 | | | 9 - 20 | 21 - 30 | 31 - 35 | ≥ 36 | |
| Temperature | ≤ 33.9 | 34.0 - 34.9 | 35.0 - 35.9 | 36.0 - 37.9 | 38.0 - 38.9 | ≥ 39.0 | | |
| Systolic BP | ≤ 69 | 70 - 79 | 80 - 99 | 100 - 199 | | ≥ 200 | | |
| SpO ₂ | ≤ 84 | 85 - 89 | 90 - 92 | ≥ 93 | | | | |
| AVPU scale | | | | А | V | Р | U | |

Table SM2-3.

National Early Warning Score (NEWS)

| I talleria =ally | in an ing et | | ·) | | | | | |
|-------------------------|--------------|--------------------|-------------|-------------|-------------|-----------|---------|--|
| | Score | | | | | | | |
| Variable | 3 | 2 | 1 | 0 | 1 | 2 | 3 | |
| Heart rate | ≤ 40 | | 41 - 50 | 51 - 90 | 91 - 110 | 111 - 130 | ≥ 131 | |
| Resp. rate | ≤ 8 | | 9 - 11 | 12 - 20 | | 21 - 24 | ≥ 25 | |
| Temperature | ≤ 35.0 | | 35.1 - 36.0 | 36.1 - 38.0 | 38.1 - 39.0 | ≥ 39.1 | | |
| Systolic BP | ≤ 90 | 91 - 100 | 101 - 110 | 111 - 219 | | | ≥ 220 | |
| SpO ₂ | ≤ 91 | 92 - 93 | 94 - 95 | ≥ 96 | | | | |
| Inspired O ₂ | | Any O ₂ | | Air | | | | |
| AVPU scale | | | | А | | | V, P, U | |

Table SM2-4.

| Centile-based Early Warning Score (CEWS) | | | | | | | | |
|--|-------------|--------------------|-------------|-------------|-------------|-----------|------------|--|
| | Score | | | | | | | |
| Variable | 3 | 2 | 1 | 0 | 1 | 2 | 3 | |
| Heart rate | ≤ 42 | 43 - 49 | 50 - 53 | 54 - 104 | 105 - 112 | 113 – 127 | ≥ 128 | |
| Resp. rate | ≤ 7 | 8 - 10 | 11 - 12 | 13 - 21 | 22 - 23 | 24 - 28 | ≥ 29 | |
| Temperature | ≤ 35.4 | | 35.5 - 35.9 | 36.0 - 37.3 | 37.4 - 38.3 | | ≥ 38.4 | |
| Systolic BP | ≤ 83 | 84 - 90 | 91 - 100 | 101 - 157 | 158 - 167 | 168 - 184 | ≥ 185 | |
| SpO ₂ | ≤ 84 | 85 - 90 | 91 - 93 | ≥ 94 | | | | |
| Inspired O ₂ | | Any O ₂ | | Air | | | | |
| AVPU scale | | | | А | V | | P, U | |

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