# 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 | $$\leq 39$$ | $$40-50$$ | $$51-59$$ | $$60-100$$ | $$101-110$$ | $$111-129$$ | $$\geq 130$$ |
| Resp. rate |  | $$\leq 8$$ |  | $$9-14$$ | $$15-20$$ | $$21-29$$ | $$\geq 30$$ |
| Temperature |  | $$\leq 35.0$$ |  | $$35.1-38.0$$ |  | $$38.1-39.5$$ | $$\geq 39.6$$ |
| Systolic BP | $$\leq 69$$ | $$70-80$$ | $$81-100$$ | $$101-149$$ | $$150-169$$ | $$170-179$$ | $$\geq 180$$ |
| AVPU scale |  |  |  | A | V | P | U |

**Table SM2-2.**

|  |
| --- |
| Standardised Early Warning Score (SEWS) |
|  | Score |
| Variable | 3 | 2 | 1 | 0 | 1 | 2 | 3 |
| Heart rate | $$\leq 29$$ | $$30-39$$ | $$40-49$$ | $$50-99$$ | $$100-109$$ | $$110-129$$ | $$\geq 130$$ |
| Resp. rate | $$\leq 8$$ |  |  | $$9-20$$ | $$21-30$$ | $$31-35$$ | $$\geq 36$$ |
| Temperature | $$\leq 33.9$$ | $$34.0-34.9$$ | $$35.0-35.9$$ | $$36.0-37.9$$ | $$38.0-38.9$$ | $$\geq 39.0$$ |  |
| Systolic BP | $$\leq 69$$ | $$70-79$$ | $$80-99$$ | $$100-199$$ |  | $$\geq 200$$ |  |
| SpO2 | $$\leq 84$$ | $$85-89$$ | $$90-92$$ | $$\geq 93$$ |  |  |  |
| AVPU scale |  |  |  | A | V | P | U |

**Table SM2-3.**

|  |
| --- |
| National Early Warning Score (NEWS) |
|  | Score |
| Variable | 3 | 2 | 1 | 0 | 1 | 2 | 3 |
| Heart rate | $$\leq 40$$ |  | $$41-50$$ | $$51-90$$ | $$91-110$$ | $$111-130$$ | $$\geq 131$$ |
| Resp. rate | $$\leq 8$$ |  | $$9-11$$ | $$12-20$$ |  | $$21-24$$ | $$\geq 25$$ |
| Temperature | $$\leq 35.0$$ |  | $$35.1-36.0$$ | $$36.1-38.0$$ | $$38.1-39.0$$ | $$\geq 39.1$$ |  |
| Systolic BP | $$\leq 90$$ | $$91-100$$ | $$101-110$$ | $$111-219$$ |  |  | $$\geq 220$$ |
| SpO2 | $$\leq 91$$ | $$92-93$$ | $$94-95$$ | $$\geq 96$$ |  |  |  |
| Inspired O2 |  | Any O2 |  | Air |  |  |  |
| AVPU scale |  |  |  | A |  |  | V, P, U |

**Table SM2-4.**

|  |
| --- |
| Centile-based Early Warning Score (CEWS) |
|  | Score |
| Variable | 3 | 2 | 1 | 0 | 1 | 2 | 3 |
| Heart rate | $$\leq 42$$ | $$43-49$$ | $$50-53$$ | $$54-104$$ | $$105-112$$ | $$113-127$$ | $$\geq 128$$ |
| Resp. rate | $$\leq 7$$ | $$8-10$$ | $$11-12$$ | $$13-21$$ | $$22-23$$ | $$24-28$$ | $$\geq 29$$ |
| Temperature | $$\leq 35.4$$ |  | $$35.5-35.9$$ | $$36.0-37.3$$ | $$37.4-38.3$$ |  | $$\geq 38.4$$ |
| Systolic BP | $$\leq 83$$ | $$84-90$$ | $$91-100$$ | $$101-157$$ | $$158-167$$ | $$168-184$$ | $$\geq 185$$ |
| SpO2 | $$\leq 84$$ | $$85-90$$ | $$91-93$$ | $$\geq 94$$ |  |  |  |
| Inspired O2 |  | Any O2 |  | Air |  |  |  |
| AVPU scale |  |  |  | A | V |  | P, U |

## References

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