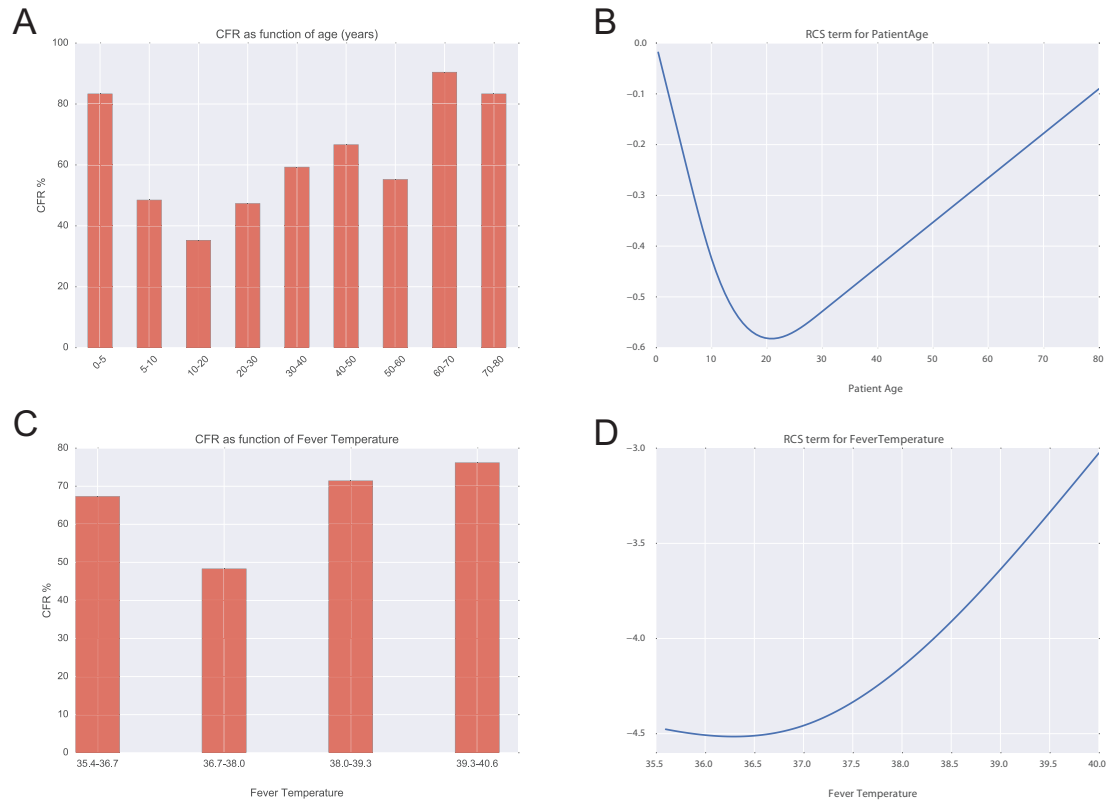


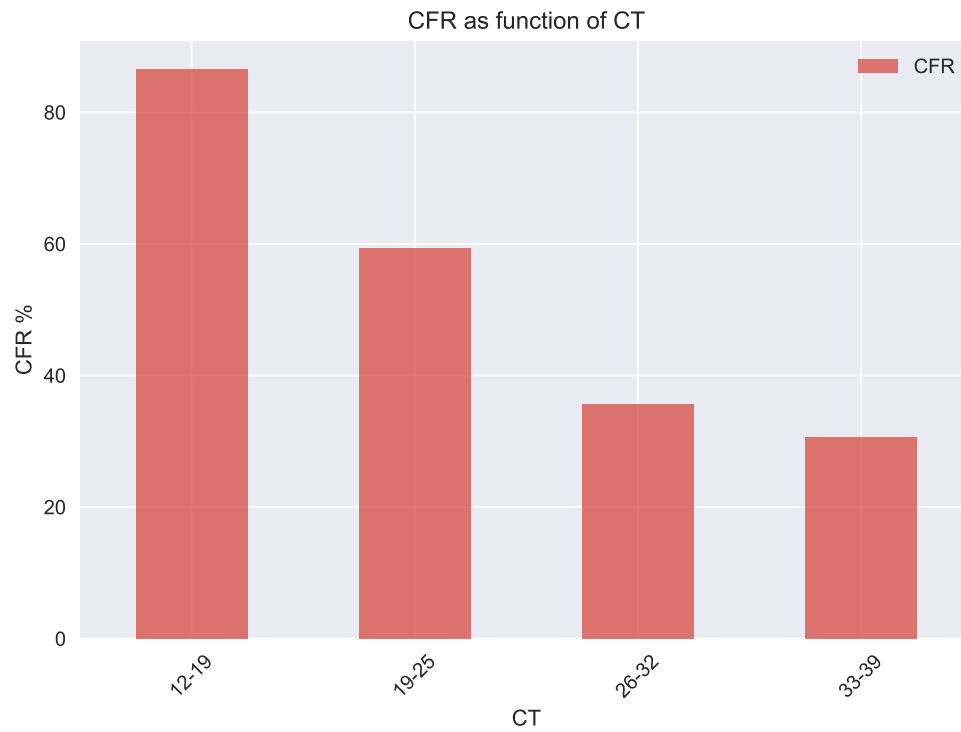
Supplementary materials

Figure S1: RCS terms for temperature and age



Case Fatality Rate as a function of patient age and fever temperature at admission (A, C). Fitted linear + restricted cubic spline terms for each variable, after applying logistic regression on the full model (B, D)

Figure S2: Mortality as a function of Cycle Threshold



Case Fatality Rate as a function of the measured RT-PCR Cycle Threshold values measured from the first or second blood draw.

Table S1: Model sensitivity and specificity on the validation datasets

Table S1A (KGH dataset, full model, complete data)

| <i>Risk Threshold</i> | <i>Sensitivity</i> | <i>Specificity</i> |
|-----------------------|--------------------|--------------------|
| 0.6 | 0.37 | 1 |
| 0.5 | 0.7 | 1 |
| 0.4 | 0.81 | 1 |
| 0.3 | 0.92 | 1 |

Table S1B (KGH dataset, minimal model, complete data)

| <i>Risk Threshold</i> | <i>Sensitivity</i> | <i>Specificity</i> |
|-----------------------|--------------------|--------------------|
| 0.6 | 0.31 | 0.89 |
| 0.5 | 0.62 | 0.78 |
| 0.4 | 0.82 | 0.61 |
| 0.3 | 0.93 | 0.55 |

Table S1C (KGH dataset, full model, imputed data)

| <i>Risk Threshold</i> | <i>Sensitivity</i> | <i>Specificity</i> |
|-----------------------|--------------------|--------------------|
| 0.6 | 0.45 +/- 0.03 | 0.89 +/- 0.05 |
| 0.5 | 0.66 +/- 0.03 | 0.82 +/- 0.06 |
| 0.4 | 0.79 +/- 0.04 | 0.65 +/- 0.05 |
| 0.3 | 0.92 +/- 0.02 | 0.55 +/- 0.06 |

Table S1D (KGH dataset, minimal model, imputed data)

| <i>Risk Threshold</i> | <i>Sensitivity</i> | <i>Specificity</i> |
|-----------------------|--------------------|--------------------|
| 0.6 | 0.39 +/- 0.04 | 0.89 +/- 0.04 |
| 0.5 | 0.63 +/- 0.04 | 0.80 +/- 0.05 |
| 0.4 | 0.81 +/- 0.03 | 0.63 +/- 0.06 |
| 0.3 | 0.92 +/- 0.03 | 0.51 +/- 0.06 |

Table S1E (GOAL dataset, full model, complete data)

| <i>Risk Threshold</i> | <i>Sensitivity</i> | <i>Specificity</i> |
|-----------------------|--------------------|--------------------|
|-----------------------|--------------------|--------------------|

| | | |
|-----|------|------|
| 0.6 | 0.84 | 0.83 |
| 0.5 | 0.95 | 0.42 |
| 0.4 | 0.99 | 0.16 |
| 0.3 | 1 | 0.07 |

Table S1F (GOAL dataset, minimal model, complete data)

| <i>Risk Threshold</i> | <i>Sensitivity</i> | <i>Specificity</i> |
|-----------------------|--------------------|--------------------|
| 0.6 | 0.82 | 0.76 |
| 0.5 | 0.92 | 0.4 |
| 0.4 | 0.94 | 0.19 |
| 0.3 | 1 | 0.12 |

Sensitivity and specificity for the full and minimal models for different risk thresholds used to define a fatal outcome (death is predicted if risk < 0.6, 0.5, 0.4, or 0.3), evaluated on the two validation datasets, KGH and the GOAL. Due to the high prevalence of missing data in the KGH set, we imputed missing values using MICE for evaluation on all the records, and calculated the mean and standard deviation over all the imputed copies (50).

Model formulas. Complete regression formulas for all the models presented in the paper (full and minimal):

A. Full model

Disposition (R^2 0.226, AUC 0.748): $8.70399 - 0.1523 \text{ CycleThreshold} - 0.04404 \text{ PatientAge} + 0.00014 \max(\text{PatientAge} - 5, 0)^3 - 0.00018 \max(\text{PatientAge} - 10, 0)^3 + 4 \times 10^{-5} \max(\text{PatientAge} - 30, 0)^3 - 0.1259 \text{ FeverTemperature} + 0.02513 \max(\text{FeverTemperature} - 35, 0)^3 - 0.04188 \max(\text{FeverTemperature} - 37, 0)^3 + 0.01675 \max(\text{FeverTemperature} - 40, 0)^3 - 0.12774 \text{ Headache} + 1.11214 \text{ Bleeding} + 0.08196 \text{ Diarrhoea} + 1.51627 \text{ Jaundice} - 0.19672 \text{ Vomit} - 0.05316 \text{ AbdominalPain} + 0.16714 \text{ AstheniaWeakness}$

B. Minimal model

Disposition (R^2 0.174, AUC 0.759): $4.72548 - 0.16335 \text{ CycleThreshold} - 0.05079 \text{ PatientAge} + 0.00015 \max(\text{PatientAge} - 5, 0)^3 - 0.00019 \max(\text{PatientAge} - 10, 0)^3 + 4 \times 10^{-5} \max(\text{PatientAge} - 30, 0)^3$