SUPPLEMENTARY FIGURES

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Supplementary eFigure 5: Country-level hazard ratio of the Cox model for mortality risk prediction (excluding Italy).

Supplementary eFigure 6. AUC of the Cox regression model for mortality risk prediction (excluding Italy).

Supplementary eFigure 7: Country-level risk model results w/ event rate information and risk stratification (excluding Italy).
**eTable 1: Participating healthcare systems.** The 170 US Veterans Affairs (VA) hospitals were grouped into 5 regional healthcare systems [1].

<table>
<thead>
<tr>
<th>Healthcare system</th>
<th>Acronym</th>
<th>Country</th>
<th>City</th>
<th>Hospitals</th>
<th>Beds</th>
<th>Inpatient discharges/ year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistance Publique - Hôpitaux de Paris</td>
<td>APHP</td>
<td>France</td>
<td>Paris</td>
<td>39</td>
<td>20 098</td>
<td>1 375 538</td>
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<tr>
<td>Beth Israel Deaconess Medical Center</td>
<td>BIDMC</td>
<td>USA</td>
<td>Boston, MA</td>
<td>1</td>
<td>673</td>
<td>40 752</td>
</tr>
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<td>Bordeaux University Hospital</td>
<td>FRBDX</td>
<td>France</td>
<td>Bordeaux</td>
<td>3</td>
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<td>130 033</td>
</tr>
<tr>
<td>Hospital Universitario 12 de Octubre</td>
<td>H12O</td>
<td>Spain</td>
<td>Madrid</td>
<td>1</td>
<td>1 256</td>
<td>45 035</td>
</tr>
<tr>
<td>ICSM Hospitals</td>
<td>ICSM</td>
<td>Italy</td>
<td>Pavia/Milan/Lumezzano/Brescia</td>
<td>3</td>
<td>775</td>
<td>12 344</td>
</tr>
<tr>
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<td>3 418</td>
<td>163 521</td>
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<td>USA</td>
<td>Chicago, IL</td>
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<td>2 234</td>
<td>103 279</td>
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<td>UCLA</td>
<td>USA</td>
<td>Los Angeles, CA</td>
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<td>786</td>
<td>40 526</td>
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<tr>
<td>University of Kansas Medical Center</td>
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<td>USA</td>
<td>Kansas City, KS</td>
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<td>794</td>
<td>54 659</td>
</tr>
<tr>
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<td>Germany</td>
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<td>71 500</td>
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<tr>
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<td>1000</td>
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<td>118 188</td>
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<td>USA</td>
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<td>369 300</td>
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<tr>
<td>VA North Atlantic</td>
<td>VA1</td>
<td>USA</td>
<td></td>
<td>49</td>
<td>3 594</td>
<td>151 075</td>
</tr>
<tr>
<td>VA Southwest</td>
<td>VA2</td>
<td>USA</td>
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<td>3 115</td>
<td>156 315</td>
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<tr>
<td>VA Midwest</td>
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<td>USA</td>
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<td>145 468</td>
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<tr>
<td>VA Continental</td>
<td>VA4</td>
<td>USA</td>
<td></td>
<td>24</td>
<td>2 110</td>
<td>113 260</td>
</tr>
<tr>
<td>VA Pacific</td>
<td>VA5</td>
<td>USA</td>
<td></td>
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<td>114 569</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>288</strong></td>
<td><strong>59 725</strong></td>
<td><strong>3 254 370</strong></td>
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</table>
eFigure 1. Schematic of the federated EHR-based study involving healthcare systems from five countries. (created with BioRender.com)

Remark: The hospitalization rate over time tends to differ across regions and across countries, in part due to heterogeneity in a wide range of regional factors including community morbidity and local social distancing policy. This results in different relative sample sizes across healthcare centers over time. To ensure that the temporal trends in clinical presentations summarized via meta-analysis combining all healthcare centers are not driven by the temporal change in the relative sample sizes, we used the same weight for each healthcare center across different calendar months.
eFigure 2. Country-level demographic shifts.

USA
- Number of Admitted Patients
- Demographics by Age
- Demographics by Sex
- Charlson Comorbidity Index
- Mortality Rate

FRANCE
- Number of Admitted Patients
- Demographics by Age
- Demographics by Sex
- Charlson Comorbidity Index
- Mortality Rate

GERMANY
- Number of Admitted Patients
- Demographics by Age
- Demographics by Sex
- Charlson Comorbidity Index
- Mortality Rate

ITALY
- Number of Admitted Patients
- Demographics by Age
- Demographics by Sex
- Charlson Comorbidity Index
- Mortality Rate

SPAIN
- Number of Admitted Patients
- Demographics by Age
- Demographics by Sex
- Charlson Comorbidity Index
- Mortality Rate
eFigure 3. Country-level Distribution of laboratory values at admission. The Italy site had a relatively low percentage of patients with laboratory measurements which may have led to less precise estimates in these laboratory changes.
eFigure 4. Patient-level laboratory recovery rate. (a) country-level changes in the recovery rates of laboratory measures (excluding Germany and Italy due to the small number of patients with longitudinal laboratory measurements available); (b) distribution of length of hospital stay among patients admitted in the first wave and in the second wave.

(a) country-level changes in the recovery rates of laboratory measures

(b) Distribution of length of hospital stay among patients admitted in the first wave and in the second wave

eFigure 5. Hazard ratio of the Cox model for mortality risk prediction (excluding Italy).
eFigure 6. AUC of the Cox regression model for mortality risk prediction (excluding Italy).

(a) Meta-analysis over all countries.

(b) Country-level AUC over time. AUC was not reported for May–June 2020, and July–August 2020 in Germany due to small counts of death occurring during these months.
eFigure 7. Country-level risk model results w/ event rate information and risk stratification (excluding Italy).