Main results:

We note that the estimated reproduction numbers in this period are subject to considerable uncertainty due to recent increase of the Omicron variant and changes in testing practise. New in this report is that we, in addition to the standard calibration, calibrate the national changepoint model separately on omicron hospitalisations, to estimate a reproduction number for the omicron variant separately. In the short-term projections of this week, we take into account the future trajectory of both the delta variant (showing a decreasing trend) and the omicron variant (showing an increasing trend). This week we have added a changepoint on January 1 2022, resulting in a rather uncertain latest reproduction number. We expect the estimate to be more stable next week with more data.

- National epidemiological situation:

  The most recent reproduction numbers:

<table>
<thead>
<tr>
<th>Model</th>
<th>Median</th>
<th>5%</th>
<th>95%</th>
<th>Prob&gt;1</th>
<th>period/day</th>
<th>More info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changepoint - Omicron only</td>
<td>1.51</td>
<td>1.44</td>
<td>1.55</td>
<td>0.99</td>
<td>Since 1 Jan</td>
<td>Section 1.2</td>
</tr>
<tr>
<td>EpiEstim</td>
<td>1.31</td>
<td>1.3</td>
<td>1.32</td>
<td></td>
<td>18 Jan</td>
<td>Table 16, Fig. 22</td>
</tr>
</tbody>
</table>

- National forecasting:

  One-week-ahead national forecasts from changepoint model:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Median/Mean</th>
<th>95% PI</th>
<th>day</th>
<th>Info 2-3 weeks forecasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital beds</td>
<td>284/280 (199-383)</td>
<td>31 Jan</td>
<td>Table 2</td>
<td></td>
</tr>
<tr>
<td>Ventilator beds</td>
<td>41/41 (26-59)</td>
<td>31 Jan</td>
<td>Table 2</td>
<td></td>
</tr>
</tbody>
</table>

* Age-specific hospital prevalence predictions are provided in Figures 5 and 6.

- Regional epidemiological situation:

  The newest regional reproduction numbers for Oslo:

<table>
<thead>
<tr>
<th>Model</th>
<th>Median</th>
<th>5%</th>
<th>95%</th>
<th>Prob&gt;1</th>
<th>period/day</th>
<th>Info other counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMC</td>
<td>1.39</td>
<td>0.84</td>
<td>2.3</td>
<td>0.9</td>
<td>4 Jan - 7 Jan</td>
<td>Fig. 3</td>
</tr>
<tr>
<td>EpiEstim</td>
<td>1.13</td>
<td>1.11</td>
<td>1.15</td>
<td></td>
<td>10 Jan</td>
<td>Table 16, Fig. 22</td>
</tr>
</tbody>
</table>

- Telenor mobility data and the number of foreign visitors: The most recent mobility development is found in Figures 16 and 17 for the largest municipality in each county and for each county, respectively. Figure 18 shows the total number of roamers per day per county.
1 Estimated national reproduction numbers

1.1 Combined variants

Calibration of our national changepoint model to hospitalisation incidence data leads to the following estimates provided in table 1. Figure 1 shows the estimated daily number of COVID-19 patients admitted to hospital, with blue medians and interquantile bands, which are compared to the actual true data, provided in red. The uncertainty captures the uncertainty in the calibrated parameters in addition to the stochastic elements of our model and the variability of other model parameters.

<table>
<thead>
<tr>
<th>Refd</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.49/2.47(1.92-2.89)</td>
<td>From Feb 17 to Mar 14</td>
</tr>
<tr>
<td>0.58/0.58(0.47-0.69)</td>
<td>From Mar 15 to Apr 19</td>
</tr>
<tr>
<td>0.76/0.75(0.19-1.21)</td>
<td>From Apr 20 to May 10</td>
</tr>
<tr>
<td>0.75/0.72(0.18-1.2)</td>
<td>From May 11 to Jun 30</td>
</tr>
<tr>
<td>0.99/0.97(0.2-1.62)</td>
<td>From Jul 01 to Jul 31</td>
</tr>
<tr>
<td>1.02/1(0.52-1.42)</td>
<td>From Aug 01 to Aug 31</td>
</tr>
<tr>
<td>0.94/0.94(0.57-1.32)</td>
<td>From Sep 01 to Sep 30</td>
</tr>
<tr>
<td>1.15/1.14(0.82-1.51)</td>
<td>From Oct 01 to Oct 25</td>
</tr>
<tr>
<td>1.25/1.26(0.77-1.77)</td>
<td>From Oct 26 to Nov 04</td>
</tr>
<tr>
<td>0.86/0.86(0.71-1.01)</td>
<td>From Nov 05 to Nov 30</td>
</tr>
<tr>
<td>1.03/1.03(0.89-1.15)</td>
<td>From Dec 01 to Jan 03</td>
</tr>
<tr>
<td>0.68/0.68(0.46-0.9)</td>
<td>From Jan 04 to Jan 21</td>
</tr>
<tr>
<td>0.75/0.76(0.48-1.06)</td>
<td>From Jan 22 to Feb 07</td>
</tr>
<tr>
<td>1.41/1.41(1.19-1.64)</td>
<td>From Feb 08 to Mar 01</td>
</tr>
<tr>
<td>1.12/1.12(0.98-1.26)</td>
<td>From Mar 02 to Mar 24</td>
</tr>
<tr>
<td>0.81/0.8(0.62-0.96)</td>
<td>From Mar 25 to Apr 12</td>
</tr>
<tr>
<td>0.83/0.83(0.65-1)</td>
<td>From Apr 13 to May 05</td>
</tr>
<tr>
<td>1.01/1.01(0.8-1.24)</td>
<td>From May 06 to May 26</td>
</tr>
<tr>
<td>0.78/0.78(0.53-1.02)</td>
<td>From May 27 to Jun 20</td>
</tr>
<tr>
<td>0.87/0.87(0.69-1.05)</td>
<td>From Jun 21 to Aug 04</td>
</tr>
<tr>
<td>1.24/1.24(1.04-1.43)</td>
<td>From Aug 05 to Aug 31</td>
</tr>
<tr>
<td>0.74/0.74(0.63-0.86)</td>
<td>From Sep 01 to Sep 24</td>
</tr>
<tr>
<td>1.1/1.1(1.06-1.14)</td>
<td>From Sep 25 to Dec 12</td>
</tr>
<tr>
<td>0.94/0.94(0.83-1.07)</td>
<td>From Dec 13 to Dec 31</td>
</tr>
<tr>
<td>1.07/1.06(0.72-1.36)</td>
<td>From Jan 01</td>
</tr>
</tbody>
</table>

Median/Mean (95% credible intervals)
1.1 Combined variants

Figure 1: A comparison of true data (red) and predicted values (blue) for hospital admissions. The last four data points (black) are assumed to be affected by reporting delay. The uncertainty captures the uncertainty in the calibrated parameters, in addition to the stochastic elements of our model and the variability of other model parameters.
In figure 3, we show how our national model fits the national hospital prevalence data (2a) and the daily number of patients receiving ventilator treatment (2b). Those data sources are not used to estimate the parameters, and can therefore be seen as a validation of the model assumptions.

This week, we calibrate our national changepoint model separately on only the omicron hospitalisation data. This calibration starts on the day of the first confirmed omicron case in Norway, and seeds with all known imported cases of omicron from abroad. We calibrate to the known hospitalised cases with omicron. As not all cases are screened to determine the variant, we scale up the omicron imported cases and the omicron hospitalisations with the factor of screened cases that were attributed to omicron. We assume an amplification factor of 1.9, and that the probability to be hospitalised if infected by omicron is 70% smaller than if infected by delta. This calibration results in an estimated reproduction number for omicron of 1.51 (1.44, 1.55). Note that since the amplification factor is here fixed, the uncertainty is likely underestimated.

Figure 3: A comparison of true data (red) and predicted values (blue) for hospital and incidence and prevalence. Prevalence data is scaled up from data based on NIPaR according to the proportion of Omicron cases screened. The last four data points (black) are assumed to be affected by reporting delay.
2 National 3-week predictions: Hospital beds and Ventilator bed taking into account increase due to omicron

As our calibration method is only based on hospital incidence, and until now most hospitalised cases have been of the delta variant, our most recently estimated reproduction number is more affected by delta than by omicron. We therefore include an additional analysis where we continue the omicron take-over in the predictions. This is done by first using our calibrated reproduction numbers until January 1 2022. Then, from January 1 2022, we assume that 75% of the disease prevalence is omicron cases, and that the remaining 25% can be attributed to delta. We assume a reproduction number for delta of 0.8 (similar to previously estimated reproduction number under interventions). For omicron, we calibrate the model separately and find a reproduction number with a mean of 1.5. We then show the three-week-ahead trajectories of these analyses, based on these numbers. Note that we do not know the exact proportion of the prevalence in the population that could be attributed to omicron on January 1 2022. The numbers 0.8 and 1.5 are uncertain, while we here apply them without uncertainty.

The table of hospital beds and ventilator beds is provided in Table 2. The corresponding figures are provided in Figure 4. Age-specific hospital prevalence predictions are provided in Figures 5 and 6.

Table 2: Estimated national prevalence of hospital beds and ventilator beds. Median/Mean (CI)

<table>
<thead>
<tr>
<th></th>
<th>1 week prediction (Jan 31)</th>
<th>2 week prediction (Feb 07)</th>
<th>3 week prediction (Feb 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital beds</td>
<td>284/280 (199-383)</td>
<td>344/342 (244-460)</td>
<td>433/426 (324-560)</td>
</tr>
<tr>
<td>Ventilator beds</td>
<td>41/41 (26-59)</td>
<td>41/41 (26-60)</td>
<td>45/45 (28-66)</td>
</tr>
</tbody>
</table>

Figure 4: National 3 week predictions for hospital beds (left) and ventilator beds (right) taking into account the omicron takeover.
Figure 5: Simulated hospital prevalence by age group taking into account the omicron takeover. Real data is shown as black dots.

Figure 6: Simulated respirator prevalence by age group taking into account the omicron takeover. Real data is shown as black dots.

3 Estimated regional reproduction numbers

Calibration of our regional SMC model to hospitalisation incidence data leads to the following estimates for current regional reproduction numbers by county (Table 3). Below we show the estimated daily number of COVID-19 patients admitted to hospital in each county. Model estimates are shown with blue medians and interquantile bands, which are compared to the actual true data, provided in red. The blue bands describe the uncertainty in the calibrated parameters, in
addition to the stochastic elements of our model. Last four data points are shown in black as they may be affected by reporting delay.

Table 3: Regional estimates, 4 Jan-7 Jan

<table>
<thead>
<tr>
<th>County</th>
<th>Median</th>
<th>95CI</th>
<th>Prob&gt;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oslo</td>
<td>1.39</td>
<td>0.84-2.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Rogaland</td>
<td>0.58</td>
<td>0.3-1.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Møre og Romsdal</td>
<td>0.70</td>
<td>0.36-1.22</td>
<td>0.11</td>
</tr>
<tr>
<td>Nordland</td>
<td>1.26</td>
<td>0.7-2.24</td>
<td>0.79</td>
</tr>
<tr>
<td>Viken</td>
<td>1.03</td>
<td>0.59-1.91</td>
<td>0.55</td>
</tr>
<tr>
<td>Innlandet</td>
<td>0.74</td>
<td>0.39-1.31</td>
<td>0.14</td>
</tr>
<tr>
<td>Vestfold og Telemark</td>
<td>0.84</td>
<td>0.46-1.47</td>
<td>0.26</td>
</tr>
<tr>
<td>Agder</td>
<td>0.74</td>
<td>0.39-1.27</td>
<td>0.14</td>
</tr>
<tr>
<td>Vestland</td>
<td>0.71</td>
<td>0.36-1.28</td>
<td>0.12</td>
</tr>
<tr>
<td>Trøndelag</td>
<td>0.99</td>
<td>0.59-1.7</td>
<td>0.48</td>
</tr>
<tr>
<td>Troms og Finnmark</td>
<td>0.83</td>
<td>0.42-1.49</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Figure 7: The map shows the direction of the trend in incidence in the counties based on the latest reproduction numbers shown in the other chart. The trend is increasing if the probability that the latest reproduction number is above one is above 95%, the trend is likely increasing if this probability is between 80% and 95%, the trend is uncertain if the probability is between 20% and 80%, the trend is likely decreasing if the probability is between 5% and 20% and is decreasing if the probability that the latest R is above one is less than 5%.
Estimated vs observed hospital incidence and 3 weeks forecast by county:
Forecasts are now based on the estimated reproduction numbers obtained by our regional SMC model, for each county. In the forecasted period of three weeks, we use the reproductive numbers showed on Table 3.
# Regional 3-week predictions: Cumulative (total) incidence and Prevalence

Below is shown the daily incidence (table 4) and prevalence (table 5) for each county.

**Table 4: Predicted incidence per day: Median/Mean (CI)**

<table>
<thead>
<tr>
<th>Region</th>
<th>1 week prediction (31 Jan)</th>
<th>2 weeks prediction (07 Feb)</th>
<th>3 weeks prediction (14 Feb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agder</td>
<td>51/109 (5-509)</td>
<td>36/101 (2-521)</td>
<td>28/95 (1-556)</td>
</tr>
<tr>
<td>Innlandet</td>
<td>43/90 (5-391)</td>
<td>34/100 (2-497)</td>
<td>25/108 (1-564)</td>
</tr>
<tr>
<td>Møre og Romsdal</td>
<td>28/50 (3-237)</td>
<td>24/53 (2-302)</td>
<td>21/58 (1-357)</td>
</tr>
<tr>
<td>Nordland</td>
<td>254/675 (18-4179)</td>
<td>284/834 (13-5289)</td>
<td>310/898 (9-4710)</td>
</tr>
<tr>
<td>Oslo</td>
<td>929/1687 (116-8095)</td>
<td>909/1800 (74-8959)</td>
<td>878/1753 (49-7721)</td>
</tr>
<tr>
<td>Rogaland</td>
<td>21/45 (2-212)</td>
<td>12/37 (0-182)</td>
<td>8/31 (0-161)</td>
</tr>
<tr>
<td>Troms og Finnmork</td>
<td>53/119 (5-632)</td>
<td>60/158 (4-933)</td>
<td>64/195 (3-1212)</td>
</tr>
<tr>
<td>Trøndelag</td>
<td>200/523 (20-3182)</td>
<td>175/600 (10-4373)</td>
<td>151/638 (5-5186)</td>
</tr>
<tr>
<td>Vestfold og Telemark</td>
<td>94/218 (9-1227)</td>
<td>82/238 (5-1475)</td>
<td>72/252 (3-1792)</td>
</tr>
<tr>
<td>Vestland</td>
<td>64/146 (7-787)</td>
<td>44/140 (3-866)</td>
<td>32/140 (1-958)</td>
</tr>
<tr>
<td>Viken</td>
<td>607/1280 (98-7074)</td>
<td>521/1388 (55-9582)</td>
<td>455/1412 (35-11111)</td>
</tr>
</tbody>
</table>

**Table 5: Predicted prevalence. Number of infectious individuals (asymptomatic plus pre-symptomatic plus symptomatic) per day. Median/Mean and 95 perc. CI for three weeks prediction.**

<table>
<thead>
<tr>
<th>Region</th>
<th>31 Jan</th>
<th>07 Feb</th>
<th>14 Feb</th>
<th>low CI, 14 Feb</th>
<th>high CI, 14 Feb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agder</td>
<td>244/493</td>
<td>177/451</td>
<td>133/425</td>
<td>8</td>
<td>2409</td>
</tr>
<tr>
<td>Innlandet</td>
<td>204/389</td>
<td>158/430</td>
<td>119/468</td>
<td>7</td>
<td>2423</td>
</tr>
<tr>
<td>Møre og Romsdal</td>
<td>129/223</td>
<td>109/232</td>
<td>94/250</td>
<td>6</td>
<td>1502</td>
</tr>
<tr>
<td>Nordland</td>
<td>1101/2768</td>
<td>1216/3518</td>
<td>1331/3894</td>
<td>46</td>
<td>21339</td>
</tr>
<tr>
<td>Oslo</td>
<td>4130/7196</td>
<td>4023/7822</td>
<td>3905/7770</td>
<td>249</td>
<td>35393</td>
</tr>
<tr>
<td>Rogaland</td>
<td>109/236</td>
<td>63/170</td>
<td>38/143</td>
<td>2</td>
<td>700</td>
</tr>
<tr>
<td>Troms og Finnmork</td>
<td>231/495</td>
<td>254/655</td>
<td>281/820</td>
<td>16</td>
<td>5112</td>
</tr>
<tr>
<td>Trøndelag</td>
<td>919/2212</td>
<td>794/2569</td>
<td>686/2777</td>
<td>29</td>
<td>22683</td>
</tr>
<tr>
<td>Vestfold og Telemark</td>
<td>439/949</td>
<td>372/1027</td>
<td>329/1095</td>
<td>20</td>
<td>7544</td>
</tr>
<tr>
<td>Vestland</td>
<td>313/658</td>
<td>215/623</td>
<td>157/616</td>
<td>10</td>
<td>4198</td>
</tr>
<tr>
<td>Viken</td>
<td>2759/5491</td>
<td>2381/6008</td>
<td>2068/6196</td>
<td>181</td>
<td>47662</td>
</tr>
</tbody>
</table>
5 Regional 3-week predictions: Hospital beds and ventilator beds

Below is shown the estimated short-term forecasting of expected hospital prevalence (table 6) and patients on ventilator treatment for each county (table 7).

Table 6: Number of hospitalisation beds occupied by Covid-19 patients: Median/Mean (CI)

<table>
<thead>
<tr>
<th>Region</th>
<th>1 week prediction (31 Jan)</th>
<th>2 weeks prediction (07 Feb)</th>
<th>3 weeks prediction (14 Feb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agder</td>
<td>4/5 (0-18)</td>
<td>3/4 (0-16)</td>
<td>1/3 (0-14)</td>
</tr>
<tr>
<td>Innlandet</td>
<td>3/4 (0-12)</td>
<td>2/3 (0-12)</td>
<td>1/3 (0-13)</td>
</tr>
<tr>
<td>Møre og Romsdal</td>
<td>2/3 (0-10)</td>
<td>1/2 (0-9)</td>
<td>1/2 (0-10)</td>
</tr>
<tr>
<td>Nordland</td>
<td>6/10 (0-44)</td>
<td>6/13 (0-73)</td>
<td>7/17 (0-103)</td>
</tr>
<tr>
<td>Oslo</td>
<td>23/30 (5-98)</td>
<td>21/33 (2-131)</td>
<td>21/35 (2-154)</td>
</tr>
<tr>
<td>Rogaland</td>
<td>4/5 (0-14)</td>
<td>3/3 (0-11)</td>
<td>1/2 (0-8)</td>
</tr>
<tr>
<td>Troms og Finnmark</td>
<td>3/3 (0-13)</td>
<td>2/3 (0-15)</td>
<td>2/4 (0-21)</td>
</tr>
<tr>
<td>Trøndelag</td>
<td>6/9 (0-37)</td>
<td>5/10 (0-50)</td>
<td>5/11 (0-70)</td>
</tr>
<tr>
<td>Vestfold og Telemark</td>
<td>6/8 (0-25)</td>
<td>4/7 (0-28)</td>
<td>4/6 (0-32)</td>
</tr>
<tr>
<td>Vestland</td>
<td>7/8 (0-25)</td>
<td>4/6 (0-23)</td>
<td>3/5 (0-22)</td>
</tr>
<tr>
<td>Viken</td>
<td>25/31 (7-98)</td>
<td>20/30 (4-126)</td>
<td>16/30 (2-158)</td>
</tr>
</tbody>
</table>

Table 7: Number of ICU beds occupied by Covid-19 patients: Median/Mean (CI)

<table>
<thead>
<tr>
<th>Region</th>
<th>1 week prediction (31 Jan)</th>
<th>2 weeks prediction (07 Feb)</th>
<th>3 weeks prediction (14 Feb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agder</td>
<td>1/1 (0-5)</td>
<td>1/1 (0-4)</td>
<td>0/1 (0-3)</td>
</tr>
<tr>
<td>Innlandet</td>
<td>1/1 (0-3)</td>
<td>0/1 (0-3)</td>
<td>0/0 (0-2)</td>
</tr>
<tr>
<td>Møre og Romsdal</td>
<td>0/1 (0-3)</td>
<td>0/0 (0-2)</td>
<td>0/0 (0-2)</td>
</tr>
<tr>
<td>Nordland</td>
<td>1/1 (0-4)</td>
<td>1/1 (0-6)</td>
<td>1/1 (0-8)</td>
</tr>
<tr>
<td>Oslo</td>
<td>5/5 (1-12)</td>
<td>4/5 (0-12)</td>
<td>4/5 (0-14)</td>
</tr>
<tr>
<td>Rogaland</td>
<td>1/2 (0-5)</td>
<td>1/1 (0-4)</td>
<td>0/1 (0-3)</td>
</tr>
<tr>
<td>Troms og Finnmark</td>
<td>1/1 (0-4)</td>
<td>0/1 (0-3)</td>
<td>0/0 (0-3)</td>
</tr>
<tr>
<td>Trøndelag</td>
<td>1/1 (0-5)</td>
<td>1/1 (0-5)</td>
<td>1/1 (0-6)</td>
</tr>
<tr>
<td>Vestfold og Telemark</td>
<td>2/2 (0-5)</td>
<td>1/1 (0-4)</td>
<td>1/1 (0-4)</td>
</tr>
<tr>
<td>Vestland</td>
<td>2/2 (0-7)</td>
<td>1/2 (0-6)</td>
<td>1/1 (0-4)</td>
</tr>
<tr>
<td>Viken</td>
<td>6/6 (1-15)</td>
<td>4/5 (0-13)</td>
<td>3/4 (0-14)</td>
</tr>
</tbody>
</table>
6 14-day trend analysis of confirmed cases and hospitalisations by county

To estimate recent trends in hospitalisation and number of positive tests, we present results in table 8 based on a negative binomial regression where we account for weekend effects. We exclude the last three days to avoid problems of reporting delay and fit the model using data from 17 days to 3 days before the current date. We fit a separate trend model for confirmed cases and for hospital incidence. We only fit a trend model if there has been more than 5 cases or hospitalisations in the 14-day period.

Table 8: Trend analysis for the last 14 days

<table>
<thead>
<tr>
<th>County</th>
<th>Average daily increase last 14 days</th>
<th>Doubling Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hospitalisations</td>
<td>Cases</td>
</tr>
<tr>
<td>Agder</td>
<td>4.3 (-6, 16) %</td>
<td>1.6 (-2.7, 6) %</td>
</tr>
<tr>
<td>Innlandet</td>
<td>1 (-12.4, 16.8) %</td>
<td>8.7 (3.8, 13.9) %</td>
</tr>
<tr>
<td>Møre og Romsdal</td>
<td>-3.5 (-17, 11.6) %</td>
<td>5.7 (0.6, 11) %</td>
</tr>
<tr>
<td>Nordland</td>
<td>-5.8 (-18.3, 7.9) %</td>
<td>3.9 (-1.6, 9.8) %</td>
</tr>
<tr>
<td>Norge</td>
<td>-3.1 (-5.7, -0.4) %</td>
<td>5.7 (2.5, 9) %</td>
</tr>
<tr>
<td>Oslo</td>
<td>0.3 (-5.5, 6.5) %</td>
<td>7.5 (4.8, 10.2) %</td>
</tr>
<tr>
<td>Rogaland</td>
<td>-3.5 (-11.9, 5.4) %</td>
<td>5.5 (2.2, 9) %</td>
</tr>
<tr>
<td>Troms og Finnmark</td>
<td>Not enough data</td>
<td>6.2 (1.6, 11) %</td>
</tr>
<tr>
<td>Trøndelag</td>
<td>Not enough data</td>
<td>9.7 (5.4, 14.1) %</td>
</tr>
<tr>
<td>Vestfold og Telemark</td>
<td>-0.2 (-11, 12) %</td>
<td>4.1 (1.4, 6.9) %</td>
</tr>
<tr>
<td>Vestland</td>
<td>-5.9 (-14.3, 2.9) %</td>
<td>4.2 (0.5, 8.1) %</td>
</tr>
<tr>
<td>Viken</td>
<td>-7.2 (-13, -1.3) %</td>
<td>4.8 (1.5, 8.2) %</td>
</tr>
</tbody>
</table>
7 Regional SMC-model: Estimated daily reproduction numbers

In the figures below we plot the 95% credibility interval and quantiles of the estimated posterior distribution of the regional, daily reproduction numbers. For some counties, uncertainty is large towards the most recent time, because there are very few data and possibly reporting delays which are different in each county.
8 Short-term predictions per health trust ("helseforetak"): number of occupied covid-19 beds and number of patients receiving ventilator treatment

In the table below we distribute our short-term predictions to the Norwegian health trusts ("helseforetak"), on the basis of their areas of responsibility.

### Table 9: Number of hospitalisation beds occupied by Covid-19 patients: Median/Mean (CI)

<table>
<thead>
<tr>
<th>Helseforetak</th>
<th>1 week prediction (31 Jan)</th>
<th>2 weeks prediction (07 Feb)</th>
<th>3 weeks prediction (14 Feb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akershus universitetssykehus</td>
<td>13/16 (5-44)</td>
<td>12/16 (4-58)</td>
<td>10/16 (3-68)</td>
</tr>
<tr>
<td>Finnmarkssykehuset</td>
<td>1/1 (0-4)</td>
<td>1/1 (0-4)</td>
<td>1/1 (0-6)</td>
</tr>
<tr>
<td>Helse Bergen</td>
<td>5/6 (1-16)</td>
<td>4/4 (0-14)</td>
<td>2/4 (0-14)</td>
</tr>
<tr>
<td>Helse Fonna</td>
<td>2/2 (1-5)</td>
<td>1/1 (0-4)</td>
<td>1/1 (0-3)</td>
</tr>
<tr>
<td>Helse Furde</td>
<td>1/1 (0-4)</td>
<td>1/1 (0-3)</td>
<td>1/1 (0-3)</td>
</tr>
<tr>
<td>Helse Møre og Romsdal</td>
<td>2/3 (0-8)</td>
<td>2/2 (0-8)</td>
<td>1/2 (0-8)</td>
</tr>
<tr>
<td>Helse Nord Trøndelag</td>
<td>2/3 (0-11)</td>
<td>2/3 (0-16)</td>
<td>1/3 (0-22)</td>
</tr>
<tr>
<td>Helse Stavanger</td>
<td>3/4 (0-10)</td>
<td>2/2 (0-7)</td>
<td>2/2 (0-5)</td>
</tr>
<tr>
<td>Nordlandssykehuset</td>
<td>3/6 (0-25)</td>
<td>5/7 (0-41)</td>
<td>4/10 (0-59)</td>
</tr>
<tr>
<td>Oslo universitetssykehus</td>
<td>19/25 (6-78)</td>
<td>18/27 (4-108)</td>
<td>17/29 (3-128)</td>
</tr>
<tr>
<td>St. Olavs hospital</td>
<td>4/6 (1-24)</td>
<td>3/7 (0-33)</td>
<td>3/7 (0-47)</td>
</tr>
<tr>
<td>Sykehuset Innlandet</td>
<td>3/3 (0-9)</td>
<td>2/3 (0-10)</td>
<td>2/3 (0-10)</td>
</tr>
<tr>
<td>Sykehuset Telemark</td>
<td>2/3 (0-10)</td>
<td>2/3 (0-11)</td>
<td>2/3 (0-13)</td>
</tr>
<tr>
<td>Sykehuset i Vestfold</td>
<td>4/5 (1-14)</td>
<td>3/4 (0-15)</td>
<td>2/4 (0-18)</td>
</tr>
<tr>
<td>Sørlandet sykehus</td>
<td>4/5 (0-16)</td>
<td>3/4 (0-14)</td>
<td>2/3 (0-13)</td>
</tr>
<tr>
<td>Sørlandet sykehus i Nord-Norge</td>
<td>3/3 (0-11)</td>
<td>2/4 (0-15)</td>
<td>2/4 (0-21)</td>
</tr>
<tr>
<td>Vestre Viken</td>
<td>10/12 (4-37)</td>
<td>8/12 (2-49)</td>
<td>6/12 (2-63)</td>
</tr>
</tbody>
</table>

### Table 10: Number of respirator beds occupied by Covid-19 patients: Median/Mean (CI)

<table>
<thead>
<tr>
<th>Helseforetak</th>
<th>1 week prediction (31 Jan)</th>
<th>2 weeks prediction (07 Feb)</th>
<th>3 weeks prediction (14 Feb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akershus universitetssykehus</td>
<td>3/3 (1-6)</td>
<td>2/2 (1-6)</td>
<td>2/2 (0-6)</td>
</tr>
<tr>
<td>Finnmarkssykehuset</td>
<td>0/0 (0-1)</td>
<td>0/0 (0-1)</td>
<td>0/0 (0-1)</td>
</tr>
<tr>
<td>Helse Bergen</td>
<td>1/2 (0-5)</td>
<td>1/1 (0-4)</td>
<td>1/1 (0-3)</td>
</tr>
<tr>
<td>Helse Fonna</td>
<td>1/1 (0-2)</td>
<td>0/0 (0-1)</td>
<td>0/0 (0-1)</td>
</tr>
<tr>
<td>Helse Furde</td>
<td>0/0 (0-1)</td>
<td>0/0 (0-1)</td>
<td>0/0 (0-1)</td>
</tr>
<tr>
<td>Helse Møre og Romsdal</td>
<td>0/1 (0-3)</td>
<td>0/0 (0-2)</td>
<td>0/0 (0-2)</td>
</tr>
<tr>
<td>Helse Nord Trøndelag</td>
<td>0/0 (0-2)</td>
<td>0/0 (0-2)</td>
<td>0/0 (0-2)</td>
</tr>
<tr>
<td>Helse Stavanger</td>
<td>1/1 (0-4)</td>
<td>1/1 (0-3)</td>
<td>0/1 (0-2)</td>
</tr>
<tr>
<td>Nordlandssykehuset</td>
<td>1/1 (0-2)</td>
<td>1/1 (0-3)</td>
<td>1/1 (0-5)</td>
</tr>
<tr>
<td>Oslo universitetssykehus</td>
<td>4/4 (1-10)</td>
<td>3/4 (0-10)</td>
<td>3/4 (0-12)</td>
</tr>
<tr>
<td>St. Olavs hospital</td>
<td>1/1 (0-3)</td>
<td>1/1 (0-3)</td>
<td>1/1 (0-4)</td>
</tr>
<tr>
<td>Sykehuset Innlandet</td>
<td>1/1 (0-3)</td>
<td>0/1 (0-3)</td>
<td>0/0 (0-2)</td>
</tr>
<tr>
<td>Sykehuset Telemark</td>
<td>1/1 (0-2)</td>
<td>0/1 (0-2)</td>
<td>0/0 (0-2)</td>
</tr>
<tr>
<td>Sykehuset i Vestfold</td>
<td>1/1 (0-3)</td>
<td>1/1 (0-2)</td>
<td>1/1 (0-2)</td>
</tr>
<tr>
<td>Sykehuset Østfold</td>
<td>2/2 (0-4)</td>
<td>1/1 (0-3)</td>
<td>1/1 (0-4)</td>
</tr>
<tr>
<td>Sørlandet sykehus</td>
<td>1/1 (0-5)</td>
<td>1/1 (0-4)</td>
<td>0/1 (0-3)</td>
</tr>
<tr>
<td>Sørlandet sykehus i Nord-Norge</td>
<td>1/1 (0-3)</td>
<td>0/1 (0-2)</td>
<td>0/0 (0-2)</td>
</tr>
<tr>
<td>Vestre Viken</td>
<td>2/2 (0-6)</td>
<td>2/2 (0-5)</td>
<td>1/2 (0-6)</td>
</tr>
</tbody>
</table>
In the figures below, we plot the 95% credibility interval and quantiles of the estimated posterior distribution of the daily number of occupied covid-19 beds and the number of patients receiving ventilator treatment for a few health trusts. The others are available on request. In blue are actual data, in green our median prediction and in gray the 95% credibility interval. For some counties, uncertainty is considerable towards the most recent time because there is little data and possibly reporting delays that are different in each county.
9 Mobility

Number of trips out from each municipality during each day is based on Telenor mobility data. The reference level is set to 100 on March 2nd 2020 for all the figures in this section, and we plot the seven-day, moving average of the daily mobility. Figure 14 shows an overview of the mobility since March 2020 for the largest municipalities in each county, and Figure 15 shows the total mobility out from all municipalities in each county, including Oslo. Figure 16 and 17, zooms in on mobility from August 16 2021, for municipalities and counties, respectively.

Figure 14: Mobility for selected municipalities since March 2020: Nationally (Norge), Stavanger (1103), Ålesund (1507), Bodø (1804), Bærum (3024), Ringsaker (3411), Sandefjord (3804), Kristiansand (4204), Bergen (4601), Trondheim (5001), Tromsø (5401).
Figure 15: Mobility for fylker since March 2020: Oslo (03), Rogaland (11), Møre og Romsdal (15), Nordland (18), Viken (30), Innlandet (34), Vestfold og Telemark (38), Agder (42), Vestland (46), Trøndelag (50), Troms og Finnmark (54).
Figure 16: Zoom: Mobility from August 16, 2021 and onwards: Nationally (Norge), Stavanger (1103), Ålesund (1507), Bodø (1804), Bærum (3024), Ringsaker (3411), Sandefjord (3804), Kristiansand (4204), Bergen (4601), Trondheim (5001), Tromsø (5401).
Figure 17: Zoom: Mobility from August 16, 2021 and onwards, per fylker: Oslo (03), Rogaland (11), Møre og Romsdal (15), Nordland (18), Viken (36), Innlandet (34), Vestfold og Telemark (38), Agder (42), Vestland (46), Trøndelag (50), Troms og Finnmark (54).
Weekly mobility for Norway and selected municipalities is displayed in Table 11 and mobility for counties is displayed in Table 12. The percentages in the tables are to be interpreted towards the reference level of 100 for week 10 in March 2020. The color-coding encodes the following: 'Green' monotonic decrease in mobility, 'Yellow' almost monotonic decrease or flat mobility trend, 'Red' increasing mobility.

### Table 11: Municipalities

<table>
<thead>
<tr>
<th>Municipality</th>
<th>53</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norge</td>
<td>69.7</td>
<td>62.7</td>
<td>68.8</td>
<td>65.4</td>
<td>71.3</td>
</tr>
<tr>
<td>Stavanger</td>
<td>60.6</td>
<td>51.0</td>
<td>60.9</td>
<td>58.6</td>
<td>63.6</td>
</tr>
<tr>
<td>Ålesund</td>
<td>75.4</td>
<td>68.7</td>
<td>76.2</td>
<td>66.2</td>
<td>75.4</td>
</tr>
<tr>
<td>Bodø</td>
<td>70.2</td>
<td>63.0</td>
<td>72.3</td>
<td>59.9</td>
<td>69.6</td>
</tr>
<tr>
<td>Bærum</td>
<td>47.7</td>
<td>37.0</td>
<td>49.5</td>
<td>48.5</td>
<td>52.2</td>
</tr>
<tr>
<td>Ringsaker</td>
<td>76.0</td>
<td>77.0</td>
<td>74.3</td>
<td>71.9</td>
<td>76.9</td>
</tr>
<tr>
<td>Sandefjord</td>
<td>61.4</td>
<td>49.0</td>
<td>59.0</td>
<td>58.2</td>
<td>63.9</td>
</tr>
<tr>
<td>Kristiansand</td>
<td>73.1</td>
<td>57.9</td>
<td>66.1</td>
<td>68.5</td>
<td>71.1</td>
</tr>
<tr>
<td>Bergen</td>
<td>75.5</td>
<td>62.1</td>
<td>72.0</td>
<td>67.6</td>
<td>72.6</td>
</tr>
<tr>
<td>Trondheim</td>
<td>76.3</td>
<td>62.2</td>
<td>73.0</td>
<td>63.9</td>
<td>75.1</td>
</tr>
<tr>
<td>Tromsø</td>
<td>83.3</td>
<td>70.5</td>
<td>79.1</td>
<td>67.9</td>
<td>70.3</td>
</tr>
</tbody>
</table>

### Table 12: Counties

<table>
<thead>
<tr>
<th>County</th>
<th>53</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oslo</td>
<td>48.5</td>
<td>35.6</td>
<td>46.6</td>
<td>46.7</td>
<td>50.8</td>
</tr>
<tr>
<td>Rogaland</td>
<td>66.2</td>
<td>56.9</td>
<td>66.8</td>
<td>63.9</td>
<td>68.7</td>
</tr>
<tr>
<td>Møre og Romsdal</td>
<td>80.3</td>
<td>74.4</td>
<td>80.9</td>
<td>70.9</td>
<td>80.8</td>
</tr>
<tr>
<td>Nordland</td>
<td>79.6</td>
<td>75.1</td>
<td>80.3</td>
<td>69.1</td>
<td>76.9</td>
</tr>
<tr>
<td>Viken</td>
<td>62.9</td>
<td>54.6</td>
<td>63.0</td>
<td>61.5</td>
<td>65.6</td>
</tr>
<tr>
<td>Innlandet</td>
<td>87.0</td>
<td>91.7</td>
<td>82.0</td>
<td>79.0</td>
<td>87.2</td>
</tr>
<tr>
<td>Vestfold og Telemark</td>
<td>67.9</td>
<td>59.9</td>
<td>66.9</td>
<td>65.4</td>
<td>71.5</td>
</tr>
<tr>
<td>Agder</td>
<td>76.4</td>
<td>68.8</td>
<td>74.2</td>
<td>74.9</td>
<td>81.3</td>
</tr>
<tr>
<td>Vestlandet</td>
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<td>78.3</td>
<td>72.2</td>
<td>77.9</td>
</tr>
<tr>
<td>Trøndelag</td>
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<td>73.7</td>
<td>80.3</td>
<td>69.7</td>
<td>81.6</td>
</tr>
<tr>
<td>Troms og Finnmark</td>
<td>79.5</td>
<td>75.8</td>
<td>80.4</td>
<td>73.6</td>
<td>78.4</td>
</tr>
</tbody>
</table>
9.1 Foreign roamers on Telenor’s network in Norway

An analysis of foreign roamers in Norway from January 2020 has been carried out, to better understand the potential virus importation. In Figure 18 the total number of roamers per day per county are displayed.

Figure 19 shows the levels of roamers from the following countries: Poland, Lithuania, Sweden, Netherlands, Denmark, Latvia, Germany, Spain, Finland and the rest of the world. These levels represent the total number of foreign, visiting roamers from each of the countries per day in Norway, since July 5 2021.

Figure 18: The total number of foreign roamers in Norway broken down on different fylker: Oslo (3), Rogaland (11), Møre og Romsdal (15), Nordland (18), Viken (30), Innlandet (34), Vestfold og Telemark (38), Agder (42), Vestland (46), Trøndelag (50), Troms og Finnmark (54).
9.1 Foreign roamers on Telenor’s network in Norway

Figure 19: National overview of total number of foreign, visiting roamers from Poland, Lithuania, Sweden, Netherlands, Denmark, Latvia, Germany, Spain, Finland and the rest of the world.
9.2 Foreign roamers per county (fylke) in Norway
9.2 Foreign roamers per county (fylke) in Norway
## 10 Estimated parameters

<table>
<thead>
<tr>
<th></th>
<th>Min.</th>
<th>1st Qu.</th>
<th>Median</th>
<th>Mean</th>
<th>3rd Qu.</th>
<th>Max.</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0s</td>
<td>1.588</td>
<td>2.3</td>
<td>2.486</td>
<td>2.467</td>
<td>2.646</td>
<td>3.119</td>
<td>Until March 14</td>
</tr>
<tr>
<td>R1s</td>
<td>0.395</td>
<td>0.537</td>
<td>0.576</td>
<td>0.576</td>
<td>0.614</td>
<td>0.765</td>
<td>From 15 March to 19 April</td>
</tr>
<tr>
<td>R2s</td>
<td>0.018</td>
<td>0.571</td>
<td>0.763</td>
<td>0.753</td>
<td>0.958</td>
<td>1.51</td>
<td>From 20 April to 10 May</td>
</tr>
<tr>
<td>R3s</td>
<td>0.002</td>
<td>0.545</td>
<td>0.749</td>
<td>0.724</td>
<td>0.915</td>
<td>1.409</td>
<td>From 11 May to 30 June</td>
</tr>
<tr>
<td>R4s</td>
<td>0.043</td>
<td>0.71</td>
<td>0.986</td>
<td>0.974</td>
<td>1.269</td>
<td>1.827</td>
<td>From 01 July to 31 July</td>
</tr>
<tr>
<td>R5s</td>
<td>0.128</td>
<td>0.868</td>
<td>1.016</td>
<td>1.001</td>
<td>1.156</td>
<td>1.571</td>
<td>From 01 August to 31 August</td>
</tr>
<tr>
<td>R6s</td>
<td>0.438</td>
<td>0.796</td>
<td>0.936</td>
<td>0.942</td>
<td>1.094</td>
<td>1.496</td>
<td>From 01 September to 30 September</td>
</tr>
<tr>
<td>R7s</td>
<td>0.677</td>
<td>0.995</td>
<td>1.147</td>
<td>1.144</td>
<td>1.268</td>
<td>1.737</td>
<td>From 01 October to 25 October</td>
</tr>
<tr>
<td>R8s</td>
<td>0.508</td>
<td>1.08</td>
<td>1.25</td>
<td>1.26</td>
<td>1.43</td>
<td>2.064</td>
<td>From 26 October to 04 November</td>
</tr>
<tr>
<td>R9s</td>
<td>0.629</td>
<td>0.805</td>
<td>0.862</td>
<td>0.861</td>
<td>0.918</td>
<td>1.086</td>
<td>From 05 November to 30 November</td>
</tr>
<tr>
<td>R10s</td>
<td>0.815</td>
<td>0.983</td>
<td>1.029</td>
<td>1.027</td>
<td>1.073</td>
<td>1.212</td>
<td>From 01 December to 03 January</td>
</tr>
<tr>
<td>R11s</td>
<td>0.347</td>
<td>0.599</td>
<td>0.681</td>
<td>0.68</td>
<td>0.761</td>
<td>1.085</td>
<td>From 04 January to 21 January</td>
</tr>
<tr>
<td>R12s</td>
<td>0.34</td>
<td>0.649</td>
<td>0.755</td>
<td>0.76</td>
<td>0.867</td>
<td>1.26</td>
<td>From 22 January to 07 February</td>
</tr>
<tr>
<td>R13s</td>
<td>1.037</td>
<td>1.333</td>
<td>1.406</td>
<td>1.409</td>
<td>1.482</td>
<td>1.752</td>
<td>From 08 February to 01 March</td>
</tr>
<tr>
<td>R14s</td>
<td>0.87</td>
<td>1.071</td>
<td>1.121</td>
<td>1.125</td>
<td>1.178</td>
<td>1.343</td>
<td>From 02 March to 24 March</td>
</tr>
<tr>
<td>R15s</td>
<td>0.554</td>
<td>0.73</td>
<td>0.806</td>
<td>0.798</td>
<td>0.868</td>
<td>1.018</td>
<td>From 25 March to 12 April</td>
</tr>
<tr>
<td>R16s</td>
<td>0.538</td>
<td>0.767</td>
<td>0.83</td>
<td>0.827</td>
<td>0.887</td>
<td>1.111</td>
<td>From 13 April to 05 May</td>
</tr>
<tr>
<td>R17s</td>
<td>0.685</td>
<td>0.943</td>
<td>1.012</td>
<td>1.015</td>
<td>1.085</td>
<td>1.46</td>
<td>From 06 May to 26 May</td>
</tr>
<tr>
<td>R18s</td>
<td>0.264</td>
<td>0.685</td>
<td>0.78</td>
<td>0.777</td>
<td>0.864</td>
<td>1.15</td>
<td>From 27 May to 20 June</td>
</tr>
<tr>
<td>R19s</td>
<td>0.57</td>
<td>0.806</td>
<td>0.871</td>
<td>0.871</td>
<td>0.936</td>
<td>1.163</td>
<td>From 21 June to 04 August</td>
</tr>
<tr>
<td>R20s</td>
<td>0.935</td>
<td>1.174</td>
<td>1.239</td>
<td>1.241</td>
<td>1.316</td>
<td>1.545</td>
<td>From 05 August to 31 August</td>
</tr>
<tr>
<td>R21s</td>
<td>0.557</td>
<td>0.699</td>
<td>0.742</td>
<td>0.743</td>
<td>0.785</td>
<td>0.94</td>
<td>From 01 September to 24 September</td>
</tr>
<tr>
<td>R22s</td>
<td>1.029</td>
<td>1.086</td>
<td>1.099</td>
<td>1.098</td>
<td>1.11</td>
<td>1.158</td>
<td>From 25 September to 12 December</td>
</tr>
<tr>
<td>R23s</td>
<td>0.775</td>
<td>0.898</td>
<td>0.945</td>
<td>0.945</td>
<td>0.989</td>
<td>1.127</td>
<td>From 13 December to 31 December</td>
</tr>
<tr>
<td>R24s</td>
<td>0.53</td>
<td>0.949</td>
<td>1.068</td>
<td>1.057</td>
<td>1.177</td>
<td>1.499</td>
<td>From 01 January</td>
</tr>
</tbody>
</table>
### Table 14: Assumptions

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Mean</th>
<th>Distribution</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mobile Mobility Data</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telenor coverage</td>
<td>48%</td>
<td></td>
<td><a href="https://ekomstatistikken.nkom.no/">https://ekomstatistikken.nkom.no/</a></td>
</tr>
<tr>
<td>Data updated</td>
<td>January 21th</td>
<td>Fixed</td>
<td>Corrected to preserve population</td>
</tr>
<tr>
<td><strong>Data used in the projections</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data updated</td>
<td>January 21th</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td><strong>Model parameters</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposed period ($1/\lambda_1$)</td>
<td>2 days</td>
<td>Exponential</td>
<td>Changed from Feretti et al. 2020</td>
</tr>
<tr>
<td>Pre-symptomatic period ($1/\lambda_2$)</td>
<td>2 days</td>
<td>Exponential</td>
<td>Feretti et al. 2020</td>
</tr>
<tr>
<td>Symptomatic infectious period ($1/\gamma_1$)</td>
<td>3 days</td>
<td>Exponential</td>
<td>Changed from Feretti et al. 2020</td>
</tr>
<tr>
<td>Asymptomatic, infectious period ($1/\gamma_2$)</td>
<td>3 days</td>
<td>Exponential</td>
<td>Changed from Feretti et al. 2020</td>
</tr>
<tr>
<td>Infectiousness asympt. ($r_{a}$)</td>
<td>0.1</td>
<td>Fixed</td>
<td>Feretti et al. 2020</td>
</tr>
<tr>
<td>Infectiousness presymp ($r_{E}$)</td>
<td>1.3</td>
<td>Fixed</td>
<td>Guided by Feretti et al. 2020</td>
</tr>
<tr>
<td>Prob. asymptomatic infection ($p_a$)</td>
<td>0.4</td>
<td>Fixed</td>
<td>Feretti et al. 2020</td>
</tr>
<tr>
<td><strong>Healthcare</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction asymptomatic infections</td>
<td>40%</td>
<td>Fixed</td>
<td>Alimonti et al. 2020</td>
</tr>
<tr>
<td>% asymptomatic and asymptomatic infections requiring hospitalization:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 9 years</td>
<td>0.1%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>10 - 19 years</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 - 29 years</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 - 39 years</td>
<td>1.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 - 49 years</td>
<td>1.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 - 59 years</td>
<td>2.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - 69 years</td>
<td>5.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 - 79 years</td>
<td>9.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80+ years</td>
<td>22.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probability that an admission has been reported on Monday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From Sunday</td>
<td>32%</td>
<td>Fixed</td>
<td>Estimated from &quot;Helsekrapregistrat BeredtC19&quot;</td>
</tr>
<tr>
<td>From Saturday</td>
<td>49%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>From Thursday</td>
<td>68%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>Probability that an admission has been reported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From one day before</td>
<td>63%</td>
<td>Fixed</td>
<td>Estimated from &quot;Helsekrapregistrat BeredtC19&quot;</td>
</tr>
<tr>
<td>From two days before</td>
<td>77%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>From three days before</td>
<td>82%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>Probability that a positive laboratory test has been reported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From one day before</td>
<td>6.7%</td>
<td>Fixed</td>
<td>Estimated from MSIS</td>
</tr>
<tr>
<td>From two days before</td>
<td>9.9%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>From three days before</td>
<td>90%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>From four days before</td>
<td>97%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>Probability that a negative laboratory test has been reported</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From one day before</td>
<td>16%</td>
<td>Fixed</td>
<td>Estimated from MSIS</td>
</tr>
<tr>
<td>From two days before</td>
<td>74%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>From three days before</td>
<td>92%</td>
<td>Fixed</td>
<td></td>
</tr>
<tr>
<td>From four days before</td>
<td>98%</td>
<td>Fixed</td>
<td></td>
</tr>
</tbody>
</table>
Supplementary analysis: EpiEstim estimation of reproduction number based on laboratory-confirmed cases

To complement the results of the metapopulation model, we present estimates of the temporal evolution of the reproduction number in Norway based on an analysis of laboratory-confirmed cases. The primary purpose of this analysis is to provide a more comprehensive perspective on the epidemic situation, taking into account several data sources.

Table 15: Estimated reproduction numbers 7 days ago

<table>
<thead>
<tr>
<th>Location</th>
<th>Reff</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>1.31(1.3 - 1.32)</td>
</tr>
<tr>
<td>Oslo</td>
<td>1.21(1.19 - 1.23)</td>
</tr>
<tr>
<td>Rogaland</td>
<td>1.36(1.33 - 1.4)</td>
</tr>
<tr>
<td>Møre og Romsdal</td>
<td>1.25(1.19 - 1.31)</td>
</tr>
<tr>
<td>Nordland</td>
<td>1.36(1.3 - 1.42)</td>
</tr>
<tr>
<td>Viken</td>
<td>1.33(1.31 - 1.35)</td>
</tr>
<tr>
<td>Innlandet</td>
<td>1.28(1.24 - 1.32)</td>
</tr>
<tr>
<td>Vestfold og Telemark</td>
<td>1.3(1.27 - 1.33)</td>
</tr>
<tr>
<td>Agder</td>
<td>1.29(1.25 - 1.33)</td>
</tr>
<tr>
<td>Vestland</td>
<td>1.41(1.37 - 1.44)</td>
</tr>
<tr>
<td>Trøndelag</td>
<td>1.32(1.29 - 1.35)</td>
</tr>
<tr>
<td>Troms og Finnmark</td>
<td>1.31(1.25 - 1.38)</td>
</tr>
</tbody>
</table>
Figure 22: Reproduction number estimated using the R package EpiEstim.
Figure 23: Regional hospitalisation probabilities per infection. The estimates are based on Salje et al., and regional data on the age distribution in the test data and the empirical case-hospitalisation rates.
Models and materials:

This report presents results based on a mathematical infectious disease model describing the geographical spread of COVID-19 in Norway. We use a metapopulation model for situational awareness and short-term forecasting and an individual-based model for long-term predictions. This report does not contain the long-term prediction results. Reproduction numbers of the metapopulation model are estimated in two ways: SMC-ABC is used to estimate a step-function in the transmissibility through prespecified changepoints, and SMC is used to estimate a daily varying reproduction number. We also provide estimates based on EpiEstim and a simple trend analysis. The models are described in previous reports and will not be explained here.

The metapopulation model takes daily varying Telenor mobility data as input. We also provide plots of the recent mobility for situational awareness.

How you should interpret the results: 3-week-ahead predictions and long-term scenarios

We provide both 3-week-ahead predictions and long-term scenarios. These are simulations of the disease spread into the future, under specific assumptions.

In the 3-week-ahead predictions, we assume that all parameters are as today, and simulate disease spread 3-weeks-ahead in time. Hence, these predictions are conditional on the current situation, and specifically on the most recently estimated reproduction number. The 3-week-ahead predictions thus do not take into account changes in transmissibility that are not yet captured by the available data, for example due to the delay between transmission and hospitalisation. Hence one of the conditions for the predictions to be valid is that the intervention policies do not change significantly in the next weeks. Hence, it does not make sense to evaluate or use the predictions if there are big changes in factors like

- new interventions
- relaxation of interventions
- a combination of new interventions and relaxations
- a significant change in vaccination coverage
- new variants with new properties
- a significant change in the contact behaviour of individuals.

As these factors are not likely to stay constant in the long-term future, we do not produce predictions for longer than three weeks ahead in time. Hence, our 3-week-ahead predictions are predictions of what may happen in the future, if there were no significant changes in the assumptions.

In this report, the term patient in ventilator treatment includes only those patients that require either invasive mechanical ventilation or ECMO (Extracorporeal membrane oxygenation).
FHI COVID-19 modelling team:

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- Arnoldo Frigessi - Oslo Centre for Biostatistics and Epidemiology, University of Oslo and Oslo University Hospital.
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- Chi Zhang - Department of Method Development and Analytics. Norwegian Institute of Public Health.
- Geir Storvik - Department of Mathematics. University of Oslo.