Informe de resultados de COVID-19

México

5 de agosto de 2021

Este documento contiene información resumida sobre las últimas proyecciones del modelo IHME sobre COVID-19 en México. El modelo se ejecutó el 3 de agosto de 2021, con datos hasta el 22 de julio de 2021 y en esta ocasión expande la proyección al 1 de diciembre de 2021.

Situación actual

• El censo hospitalario diario reportó 12,400 admisiones el 2 de agosto de 2021. Las infecciones diarias el 2 de agosto de 2021 fueron de 325,600 (Figura 1).

• Los casos reportados diariamente en la última semana (hasta el 22 de julio) aumentaron a 17,400 por día en promedio en comparación con 14,800 la semana anterior (Figura 2). Esta cifra supera lo observado en enero de 2021. Colocándose como el punto más alto de la pandemia.

• Las muertes reportadas por COVID-19 en la última semana aumentaron a 290 por día en promedio en comparación con 220 de la semana anterior (Figura 3).

• El exceso de muertes por COVID-19 en la última semana aumentó a 640 por día en promedio en comparación con 490 la semana anterior (Figura 3). Esto convierte a COVID-19 en la causa número 1 de muerte en México esta semana (Tabla 1). El exceso de muertes diarias estimado debido a COVID-19 fue 2.3 veces mayor que el número de muertes reportadas.

• La tasa diaria de mortalidad por COVID-19 reportada es superior a 4 por millón en Baja California Sur, Campeche, Colima, Guerrero, Hidalgo, Nayarit, Nuevo León, Quintana Roo y Sinaloa (Figura 4). En otras palabras, se mantienen con tasas altas de mortalidad en 3 de ellos, pero se suman seis más.

• La tasa diaria de exceso de muertes por COVID-19 es superior a 4 por millón en 15 estados (Figura 4).

• Estimamos que 62% de las personas en México han sido infectadas al 2 de agosto (Figura 6).

• La R efectiva, calculada usando casos, hospitalizaciones y muertes, es mayor que 1 en 27 estados (Figura 7). Los mismos que la semana pasada.

• La tasa de detección de infecciones en México fue cercana al 7% el 2 de agosto (Figura 8).

• Basándonos en el GISAID y varias bases de datos nacionales, combinado con nuestro modelo de dispersión de variantes, estimamos la prevalencia actual de variantes de interés (Figura 9). Estimamos que la variante B.1.617.2 está circulando en 31 estados y que P.1 está presente en 31 estados.

Tendencias en los impulsores de la transmisión

• La movilidad la semana pasada fue 1% más alta que la línea de base anterior a COVID-19 (Figura 11). La movilidad estuvo cerca de la línea de base (dentro del 10%) en 28 estados. La movilidad fue inferior 30% de la línea de base en Nayarit.

• Al 2 de agosto, en la Encuesta de Tendencias e Impacto de COVID-19, 80% de las personas informan que siempre usaban cubrebocas al salir de casa en comparación con el 79% de la semana pasada (Figura 13).

• Se realizaron 26 pruebas de diagnóstico por cada 100,000 personas el 2 de agosto (Figura 15).

• En México, el 84.6% de las personas dicen que aceptarían o probablemente aceptarían una vacuna para COVID-19. Esto es 0 puntos porcentuales más que la semana pasada. La fracción de la población que está dispuesta a recibir la vacuna COVID-19 oscila entre el 74% en Colima y el 93% en Tlaxcala (Figura 19).

• En nuestro escenario de referencia actual, esperamos que 76.6 millones de personas estén vacunadas con al menos una dosis para el 1 de diciembre.

• En nuestro escenario de referencia actual, esperamos que para el 1 de diciembre, el 83% de las personas sean inmunes a las variantes sin escape y el 73% de las personas serán inmunes a las variantes de escape (Figura 20).

Proyecciones

• En nuestro escenario de referencia, que representa lo que creemos que es más probable que suceda, nuestro modelo proyecta 283,000 muertes reportadas acumuladas debido a COVID-19 el 1 de diciembre. Esto representa 42,000 muertes adicionales del 2 de agosto al 1 de diciembre. Las muertes reportadas diarias aumentarán. a 580 para el 3 de septiembre de 2021 (Figura 21) y a partir de esa fecha desciende hasta 250 al 1 de diciembre.

• Bajo nuestro escenario de referencia, nuestro modelo proyecta 656,000 muertes en exceso acumuladas debido a COVID-19 el 1 de diciembre. Esto representa 98,000 muertes adicionales del 2 de agosto al 1 de diciembre. El exceso de muertes diarias debido a COVID-19 aumentará a 1,370 para el 4 de septiembre 2021 para mostrar un descenso a 575 el 1 de diciembre (Figura 21).

• Si se alcanzara la cobertura universal de mascarillas (95%) en la próxima semana, nuestro modelo proyecta 7,200 muertes reportadas menos en comparación con el escenario de referencia el 1 de diciembre.

• Si se alcanzara la cobertura universal de mascarillas (95%) en la próxima semana, nuestro modelo proyecta 17,000 muertes en exceso menos debido a COVID-19 en comparación con el escenario de referencia del 1 de diciembre.

• Bajo nuestro peor escenario, nuestro modelo proyecta 305,000 muertes acumuladas reportadas el 1 de diciembre, 22,000 muertes adicionales en comparación con nuestro escenario de referencia. Las muertes reportadas diariamente en el peor escenario aumentarán a 890 para el 18 de septiembre de 2021 (Figura 21).

• En nuestro peor escenario, nuestro modelo proyecta 708,000 muertes en exceso acumuladas debido al COVID-19 el 1 de diciembre, 52,000 muertes adicionales en comparación con nuestro escenario de referencia. El exceso diario de muertes por COVID-19 en el peor escenario aumentará a 2,130 para el 18 de septiembre de 2021 (Figura 21).

• Las infecciones diarias en el escenario de referencia se elevarán a 337,700 al 8 de agosto de 2021 (Figura 22). Las infecciones diarias en el peor escenario aumentarán a 497,540 para el 25 de agosto de 2021 (Figura 22).

• Los casos diarios en el escenario de referencia subirán a 21,190 al 17 de agosto de 2021 (Figura 23). Los casos diarios en el peor escenario aumentarán a 31,880 para el 6 de septiembre de 2021 (Figura 23).

• La Figura 24 compara nuestros pronósticos de escenarios de referencia con otros modelos archivados públicamente. Los pronósticos son muy divergentes.

• En algún momento, desde agosto hasta el 1 de diciembre, 23 estados tendrán una presión alta o extrema en las camas de hospital (Figura 25). En algún momento, desde agosto hasta el 1 de diciembre, 23 estados tendrán una presión alta o extrema en la capacidad de la unidad de cuidados intensivos (UCI) (Figura 26).

Actualizaciones de modelos

En las estimaciones de esta semana, hemos modificado la efectividad de las vacunas de ARNm (Pfizer y Moderna) y AstraZeneca en base a estudios que muestran una mayor eficacia de la vacuna para prevenir enfermedades graves, hospitalización y muerte, en comparación con todas las enfermedades sintomáticas. Este ajuste refleja con mayor precisión cómo se utilizan estas estimaciones de la eficacia de la vacuna en nuestro modelo; es decir, reducir la tasa de infección-letalidad (IFR) y la tasa de infección-hospitalización (RSI). Usamos la proporción promedio de efectividad de la vacuna para la hospitalización en comparación con la enfermedad sintomática de estudios en el Reino Unido y Canadá[1,2,3,4] para modificar la efectividad estimada de los ensayos clínicos para estas vacunas. Esto se hizo por separado para las variantes ancestrales (basadas en B.1.1.7) y las variantes actuales de interés (basadas en B.1.617.2). El cambio más grande, basado en estos datos, fue para la vacuna AstraZeneca, como se muestra en nuestra tabla actualizada de efectividad de la vacuna. Para ser coherentes con este nuevo enfoque, también utilizamos la eficacia de la vacuna contra la enfermedad grave para la vacuna de Janssen (Johnson & Johnson) en lugar de la eficacia contra todas las enfermedades sintomáticas, utilizando los resultados del ensayo clínico.[5,6,7]

1. https://khub.net/web/phe-national/public-library/-/document_library/v2WsRK3ZlEig/view/479607266
2. https://www.nejm.org/doi/full/10.1056/NEJMoa2108891
3. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01358-1/fulltext#supplementaryMaterial
4. https://www.medrxiv.org/content/10.1101/2021.06.28.21259420v2
5. https://www.fda.gov/media/146218/download
6. https://www.fda.gov/media/146217/download

7. https://www.fda.gov/media/146219/download

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COVID-19 Results Briefing

Mexico

August 5, 2021

This document contains summary information on the latest projections from the IHME model on COVID-19 in Mexico. The model was run on August 3, 2021, with data through July 22, 2021.

Current situation

- Daily hospital census reported 12,400 admissions on August 2, 2021. Daily infections on August 2, 2021 were 325,600 (Figure 1).

- Daily reported cases in the last week (through July 22) increased to 17,400 per day on average compared to 14,800 the week before (Figure 2).

- Reported deaths due to COVID-19 in the last week increased to 290 per day on average compared to 220 the week before (Figure 3).

- Excess deaths due to COVID-19 in the last week increased to 640 per day on average compared to 490 the week before (Figure 3). This makes COVID-19 the number 1 cause of death in Mexico this week (Table 1). Estimated excess daily deaths due to COVID-19 were 2.3 times larger than the reported number of deaths.

- The daily reported COVID-19 death rate is greater than 4 per million in Baja California Sur, Campeche, Colima, Guerrero, Hidalgo, Nayarit, Nuevo León, Quintana Roo, and Sinaloa (Figure 4).

- The daily rate of excess deaths due to COVID-19 is greater than 4 per million in 15 states (Figure 4).

- We estimated that 62% of people in Mexico have been infected as of August 2 (Figure 6).

- Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in 27 states (Figure 7).

- The infection-detection rate in Mexico was close to 7% on August 2 (Figure 8).

- Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figure 9). We estimate that B.1.617.2 is circulating in 31 states, and that P.1 is circulating in 31 states.

Trends in drivers of transmission

- Mobility last week was 1% higher than the pre-COVID-19 baseline (Figure 11). Mobility was near baseline (within 10%) in 28 states. Mobility was lower than 30% of baseline in Nayarit.

- As of August 2, in the COVID-19 Trends and Impact Survey, 80% of people self-report that they always wore a mask when leaving their home compared to 79% last week (Figure 13).

- There were 26 diagnostic tests per 100,000 people on August 2 (Figure 15).

- In Mexico 84.6% of people say they would accept or would probably accept a vaccine for COVID-19. This is up by 0 percentage points from last week. The fraction of the population who are open to receiving a COVID-19 vaccine ranges from 74% in Colima to 93% in Tlaxcala (Figure 19).

- In our current reference scenario, we expect that 76.6 million people will be vaccinated with at least one dose by December 1.

- In our current reference scenario, we expect that by December 1, 83% of people will be immune to non-escape variants and 73% of people will be immune to escape variants (Figure 20).

Projections

- In our **reference scenario**, which represents what we think is most likely to happen, our model projects 283,000 cumulative reported deaths due to COVID-19 on December 1. This represents 42,000 additional deaths from August 2 to December 1. Daily reported deaths will rise to 580 by September 3, 2021 (Figure 21).

- Under our **reference scenario**, our model projects 656,000 cumulative excess deaths due to COVID-19 on December 1. This represents 98,000 additional deaths from August 2 to December 1. Daily excess deaths due to COVID-19 will rise to 1,370 by September 4, 2021 (Figure 21).

- If **universal mask coverage (95%)** were attained in the next week, our model projects 7,200 fewer cumulative reported deaths compared to the reference scenario on December 1.

- If **universal mask coverage (95%)** were attained in the next week, our model projects 17,000 fewer cumulative excess deaths due to COVID-19 compared to the reference scenario on December 1.

- Under our **worse scenario**, our model projects 305,000 cumulative reported deaths on December 1, an additional 22,000 deaths compared to our reference scenario. Daily reported deaths in the worse scenario will rise to 890 by September 18, 2021 (Figure 21).

- Under our **worse scenario**, our model projects 708,000 cumulative excess deaths due to COVID-19 on December 1, an additional 52,000 deaths compared to our reference scenario. Daily excess deaths due to COVID-19 in the worse scenario will rise to 2,130 by September 18, 2021 (Figure 21).

- Daily infections in the reference scenario will rise to 337,700 by August 8, 2021 (Figure 22). Daily infections in the worse scenario will rise to 497,540 by August 25, 2021 (Figure 22).

- Daily cases in the reference scenario will rise to 21,190 by August 17, 2021 (Figure 23). Daily cases in the worse scenario will rise to 31,880 by September 6, 2021 (Figure 23).

- Figure 24 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.

- At some point from August through December 1, 23 states will have high or extreme stress on hospital beds (Figure 25). At some point from August through December 1, 23 states will have high or extreme stress on intensive care unit (ICU) capacity (Figure 26).

Model updates

In this week's estimates, we have modified the effectiveness of the mRNA vaccines (Pfizer and Moderna) and AstraZeneca based on studies that show higher vaccine efficacy for preventing severe disease, hospitalization, and death, compared to all symptomatic disease. This adjustment more accurately reflects how these estimates of vaccine effectiveness are used in our model; that is, to reduce the infection-fatality rate (IFR) and the infection-hospitalization rate (IHR). We used the average ratio of vaccine effectiveness for hospitalization compared to symptomatic disease from studies in the United Kingdom and Canada[1,2,3,4] to modify the estimated effectiveness from the clinical trials for these vaccines. This was done separately for ancestral variants (based on B.1.1.7) and current variants of concern (based on B.1.617.2). The largest change, based on these data, was for the AstraZeneca vaccine, as shown in our updated vaccine effectiveness table. To be consistent with this new approach, we also used the vaccine effectiveness against severe disease for the Janssen (Johnson & Johnson) vaccine instead of the efficacy against all symptomatic disease, using results from the clinical trial.[5,6,7]

1. https://khub.net/web/phe-national/public-library/-/document_library/v2WsRK3ZlEig/view/479607266
2. https://www.nejm.org/doi/full/10.1056/NEJMoa2108891
3. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01358-1/fulltext#supplementaryMaterial
4. https://www.medrxiv.org/content/10.1101/2021.06.28.21259420v2
5. https://www.fda.gov/media/146218/download
6. https://www.fda.gov/media/146217/download

7. https://www.fda.gov/media/146219/download

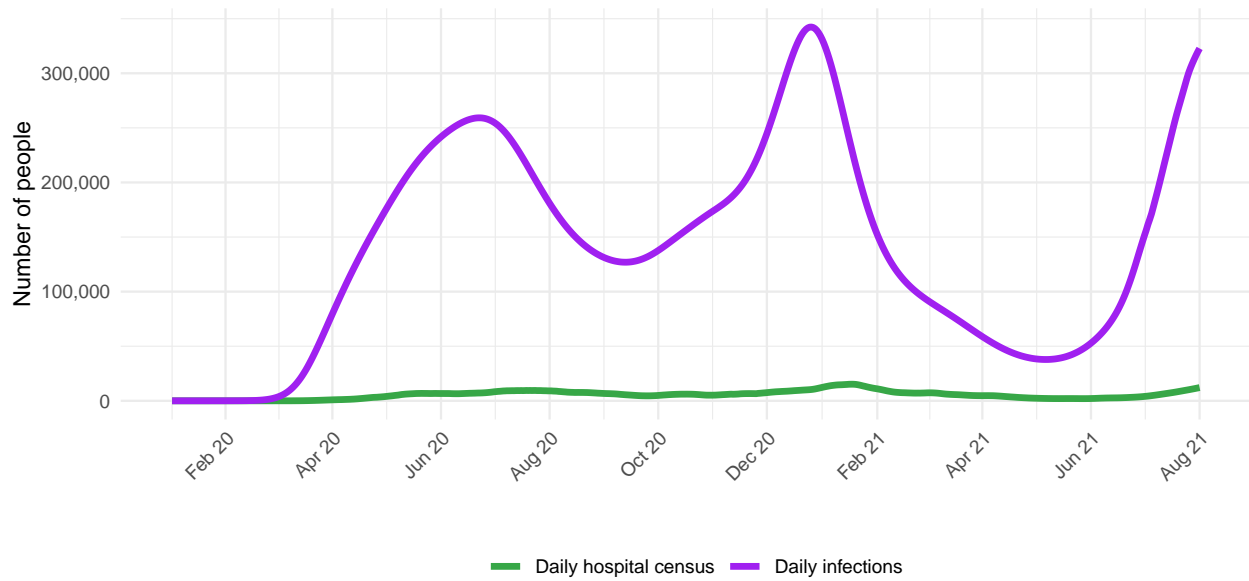**Figure 1.** Daily COVID-19 hospital census and infections

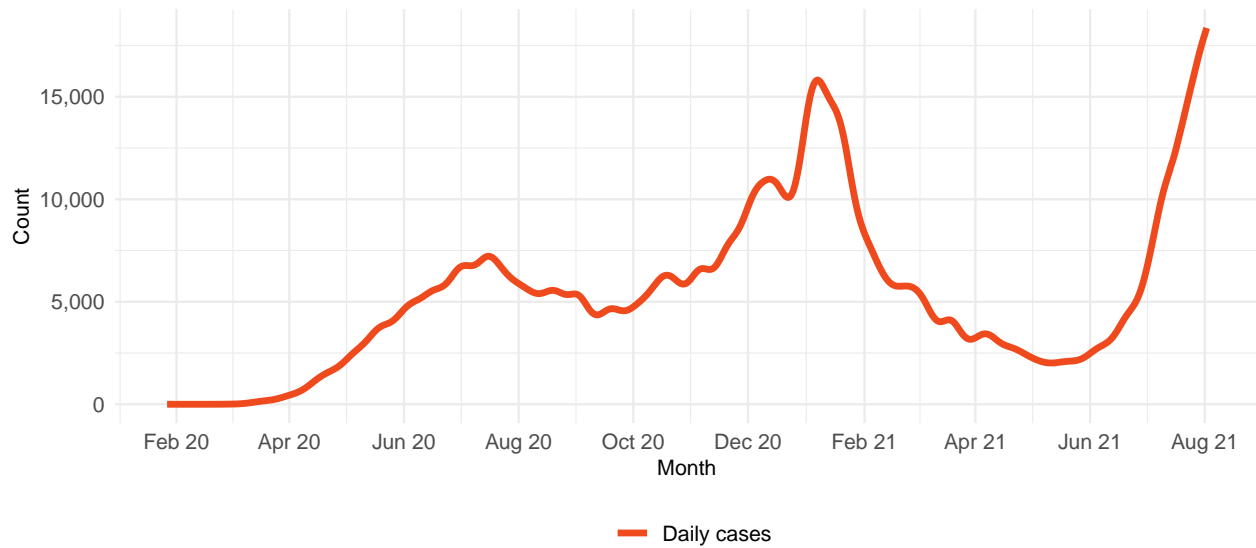**Figure 2.** Reported daily COVID-19 cases, moving average

Table 1. Ranking of excess deaths due to COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
COVID-19	4,498	1
Ischemic heart disease	2,044	2
Diabetes mellitus	1,420	3
Chronic kidney disease	1,395	4
Cirrhosis and other chronic liver diseases	891	5
Stroke	729	6
Chronic obstructive pulmonary disease	630	7
Interpersonal violence	590	8
Alzheimer's disease and other dementias	455	9
Lower respiratory infections	434	10

Figure 3. Smoothed trend estimate of reported daily COVID-19 deaths (blue) and excess daily deaths due to COVID-19 (orange)
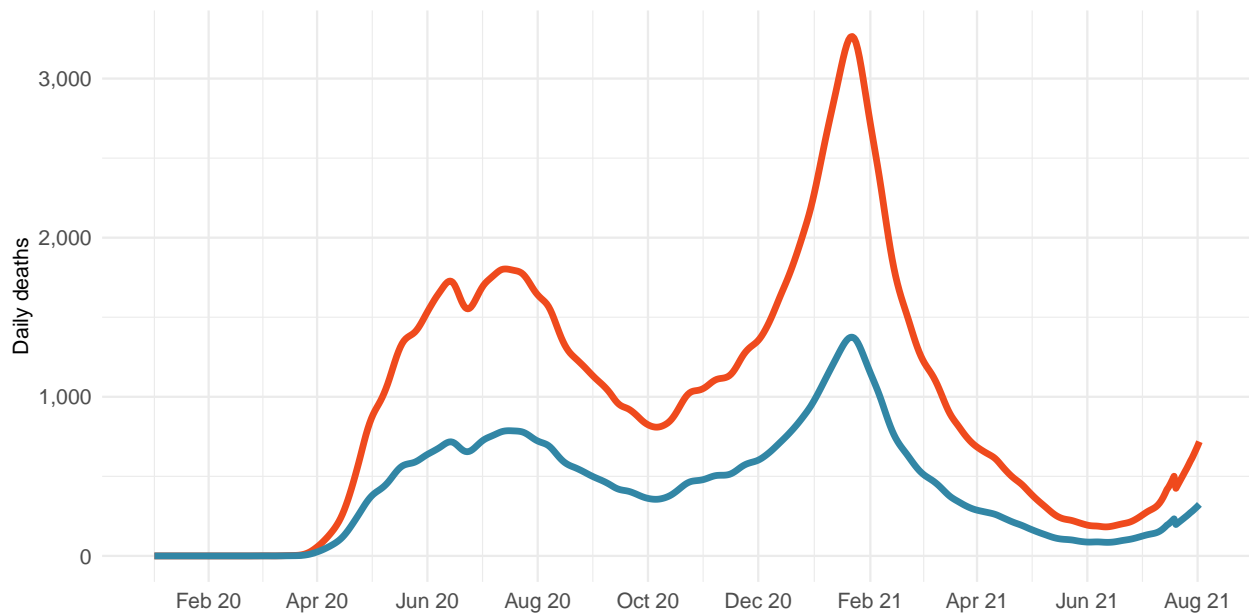
Figure 4. Daily COVID-19 death rate per 1 million on August 2, 2021

A. Daily reported COVID-19 death rate per 1 million
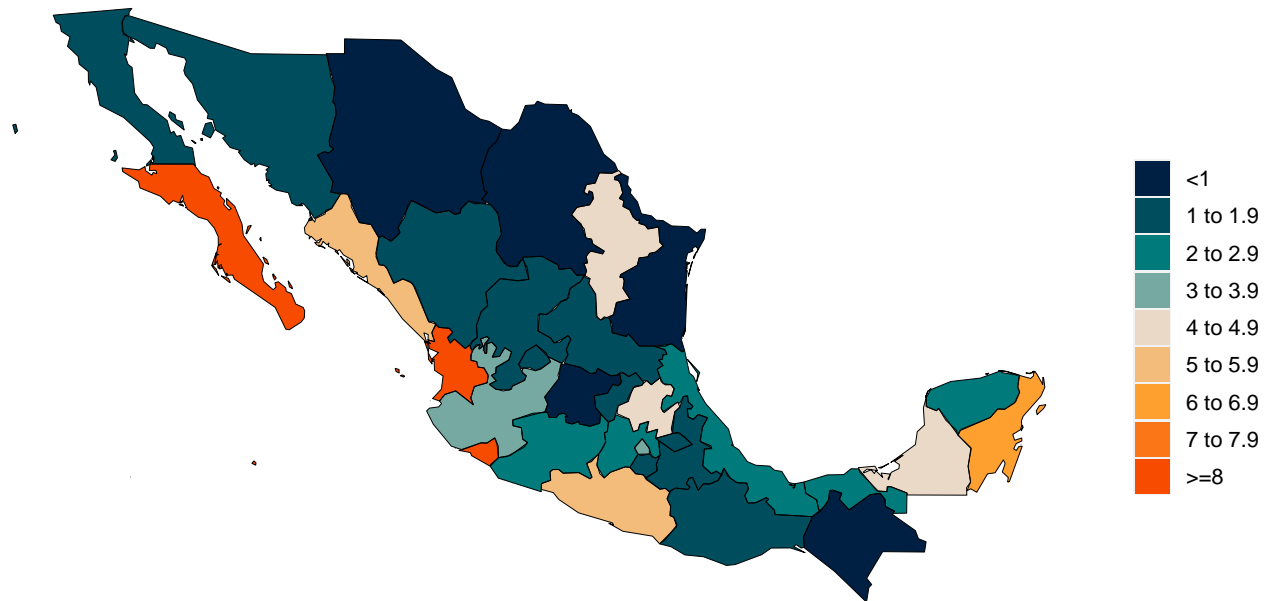
B. Daily excess COVID-19 death rate per 1 million
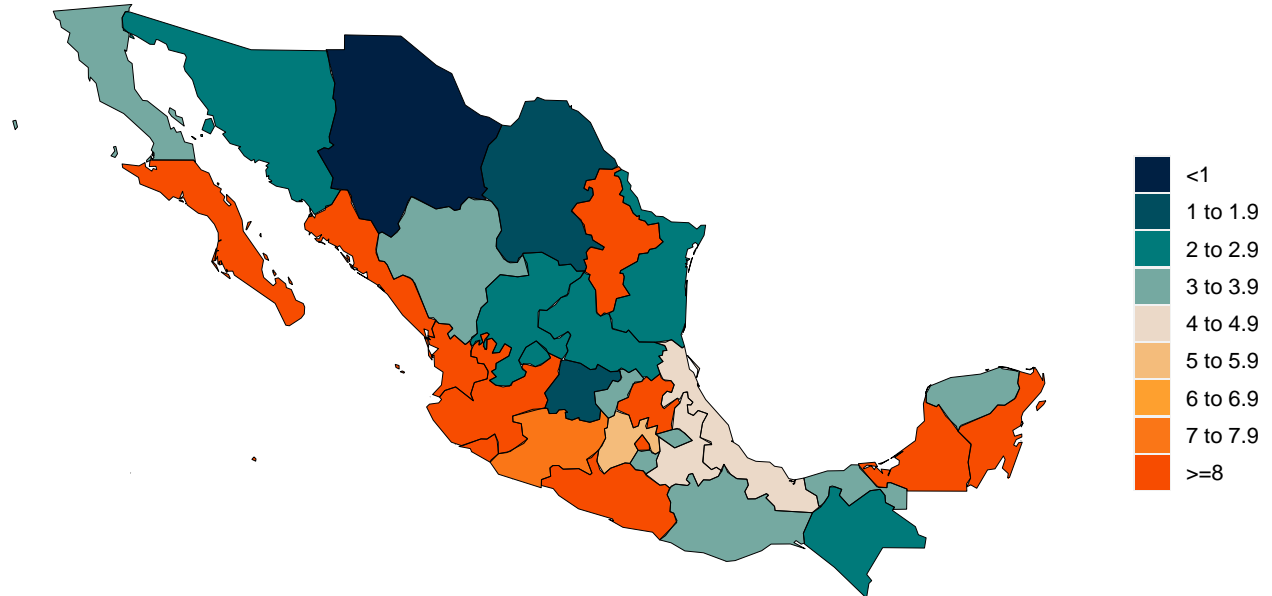
Figure 5. Cumulative COVID-19 deaths per 100,000 on August 2, 2021

A. Reported cumulative COVID-19 deaths per 100,000
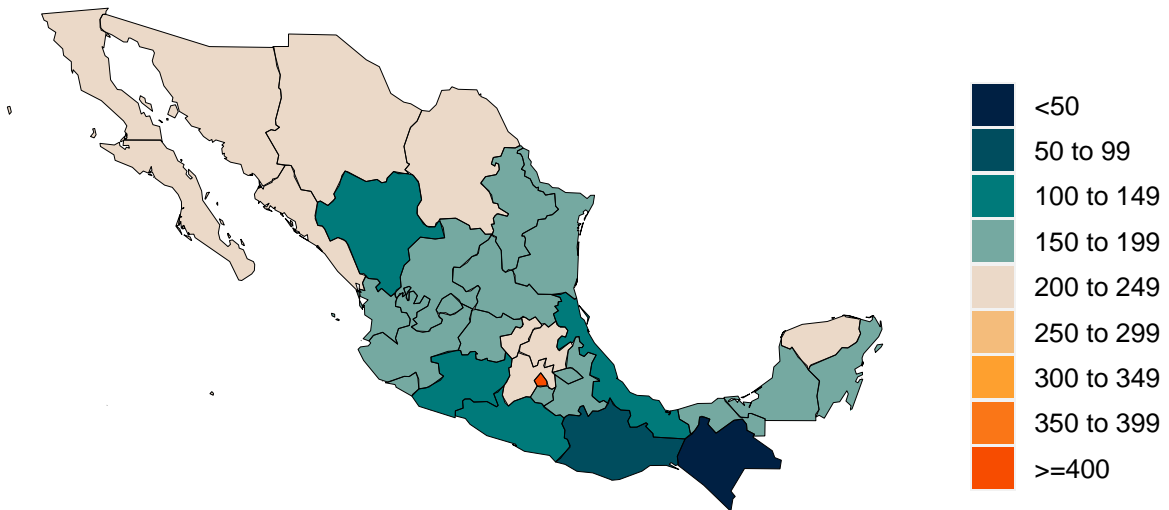
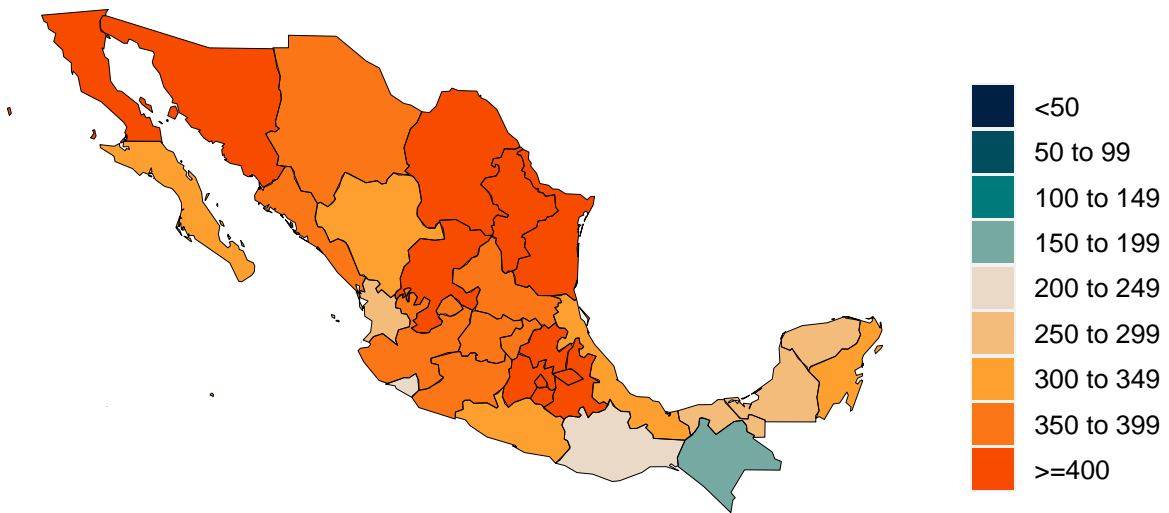
B. Excess cumulative COVID-19 deaths per 100,000

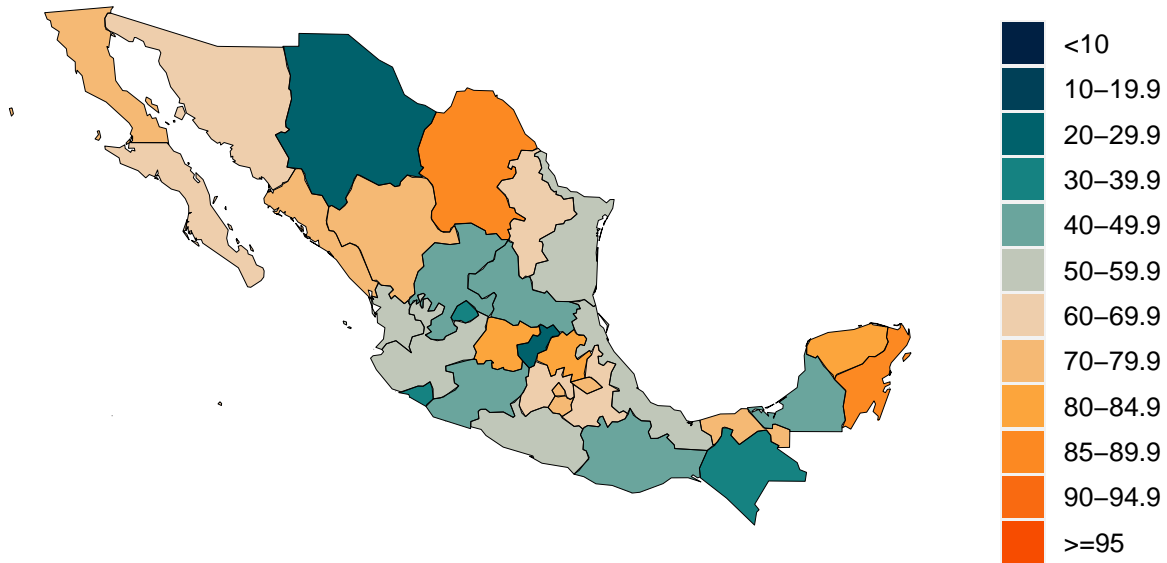**Figure 6.** Estimated percent of the population infected with COVID-19 on August 2, 2021

	<10
	10–19.9
	20–29.9
	30–39.9
	40–49.9
	50–59.9
	60–69.9
	70–79.9
	80–84.9
	85–89.9
	90–94.9
	>=95

Figure 7. Mean effective R on July 22, 2021. The estimate of effective R is based on the combined analysis of deaths, case reporting, and hospitalizations where available. Current reported cases reflect infections 11-13 days prior, so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline, all other things being held the same.

	<0.57
	0.57–0.67
	0.68–0.78
	0.79–0.88
	0.89–0.99
	1–1.1
	1.11–1.2
	1.21–1.31
	1.32–1.42
	>=1.43
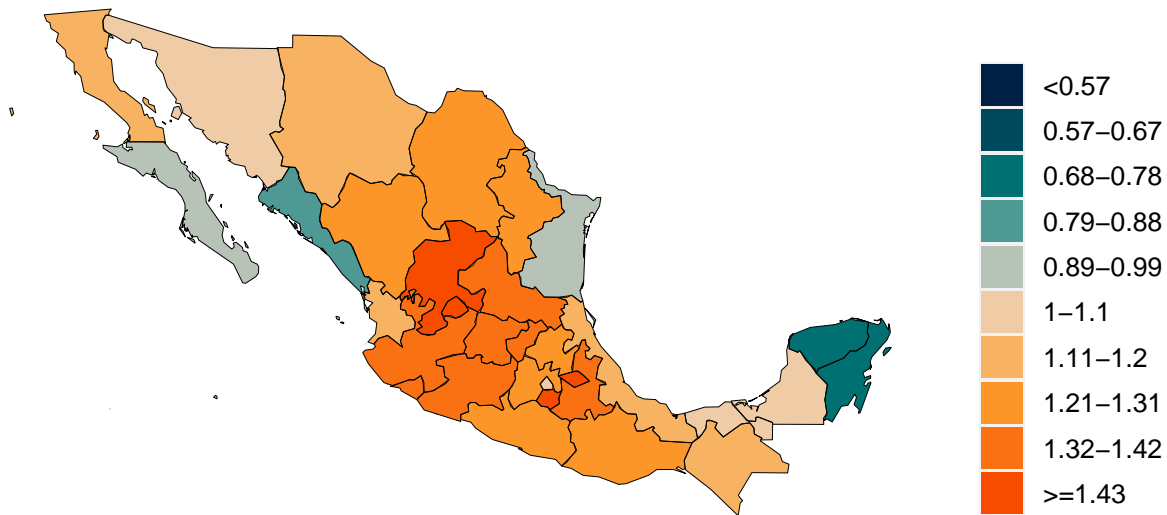
Figure 8. Percent of COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.
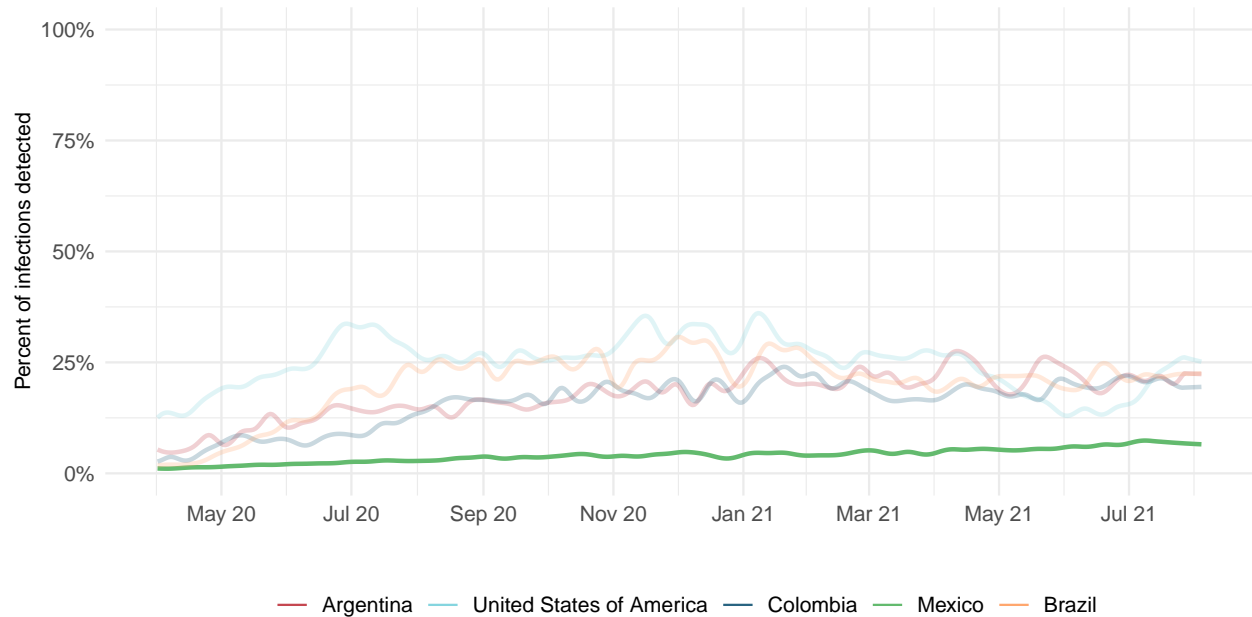
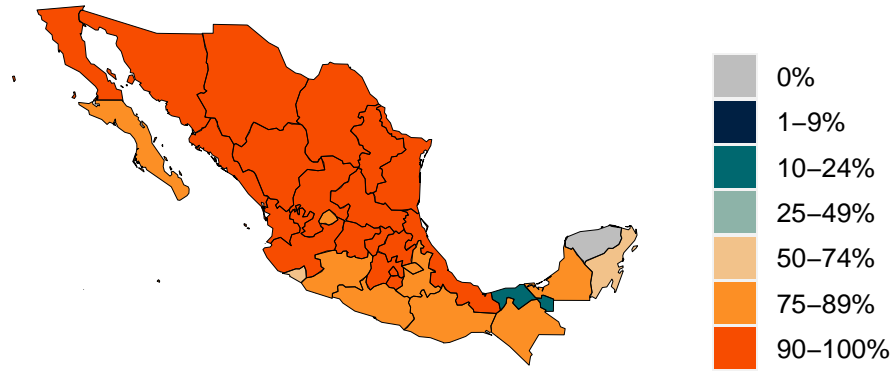**Figure 9.** Estimated percent of circulating SARS-CoV-2 for primary variant families on August 2, 2021

A. Estimated percent B.1.1.7 variant

☐	0%
☐	1–9%
☐	10–24%
☐	25–49%
☐	50–74%
☐	75–89%
☐	90–100%

B. Estimated percent B.1.351 variant

☐	0%
☐	1–9%
☐	10–24%
☐	25–49%
☐	50–74%
☐	75–89%
☐	90–100%

C. Estimated percent B.1.617 variant

⬜	0%
🟦	1–9%
🟩	10–24%
🟢	25–49%
🟧	50–74%
🟧	75–89%
🟥	90–100%

D. Estimated percent P.1 variant

⬜	0%
🟦	1–9%
🟩	10–24%
🟢	25–49%
🟧	50–74%
🟧	75–89%
🟥	90–100%
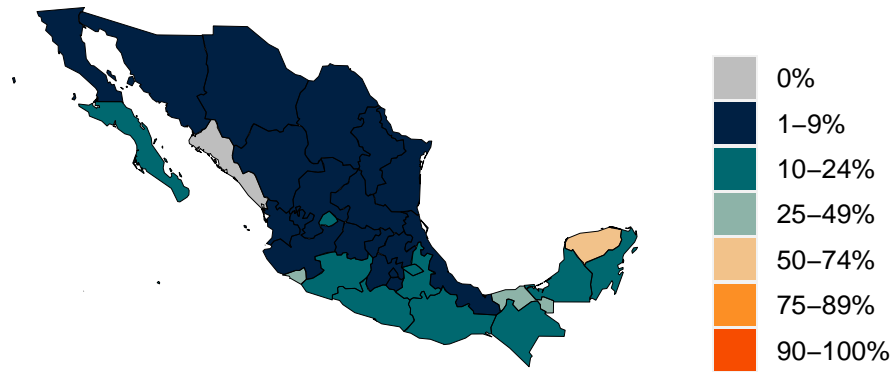
Figure 10. Infection-fatality ratio on August 2, 2021
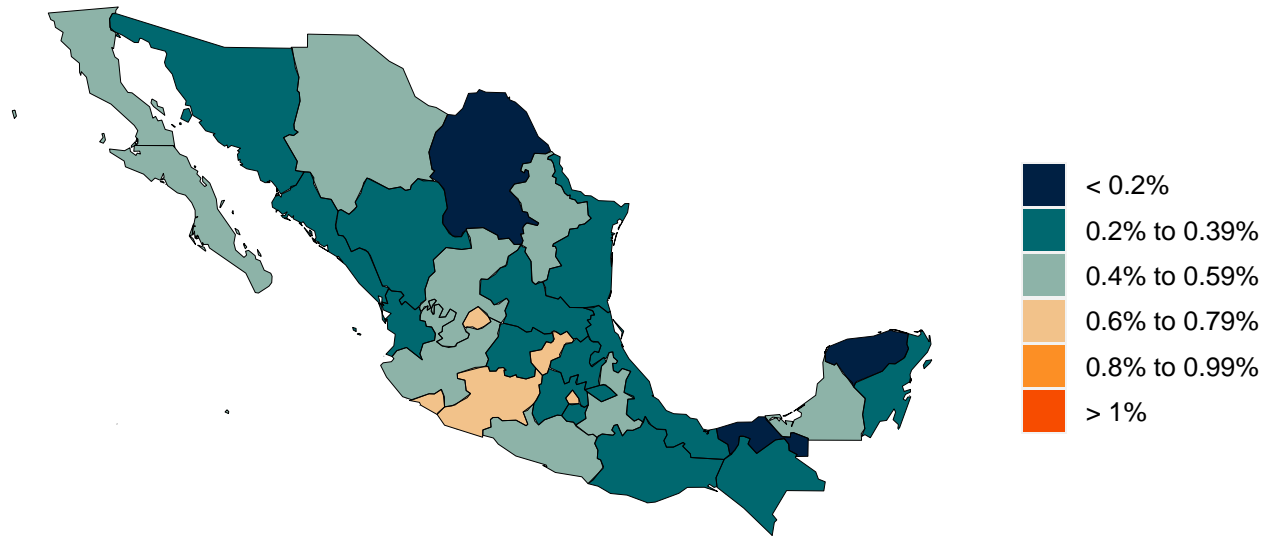
Critical drivers

Table 2. Current mandate implementation

Figure 11. Trend in mobility as measured through smartphone app use compared to January 2020 baseline
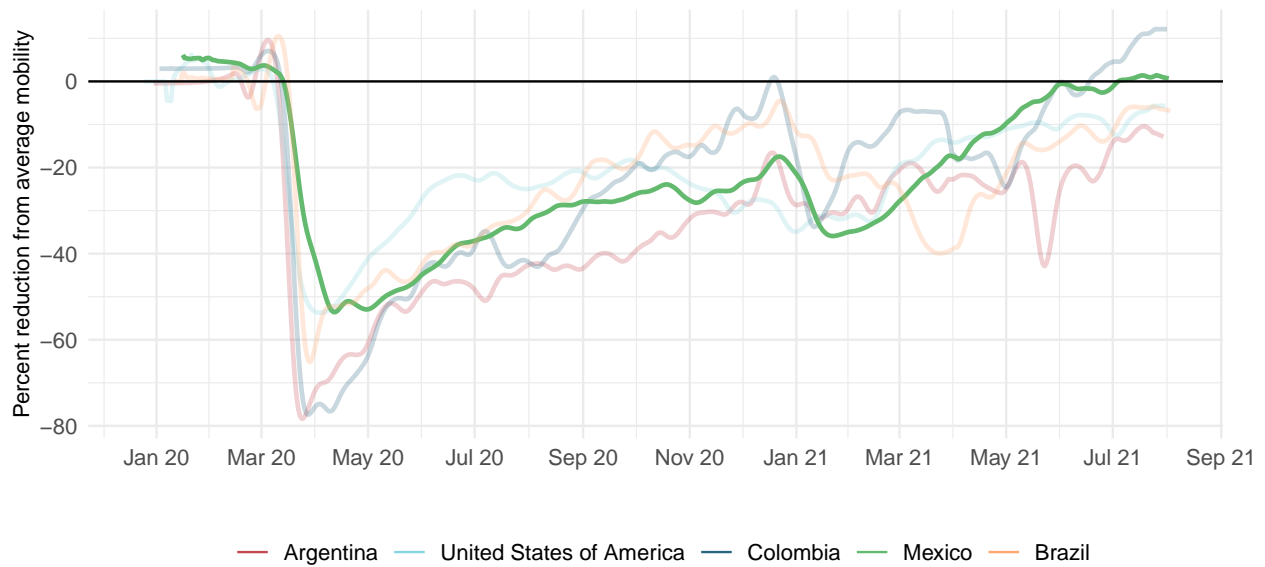
Figure 12. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent) on August 2, 2021
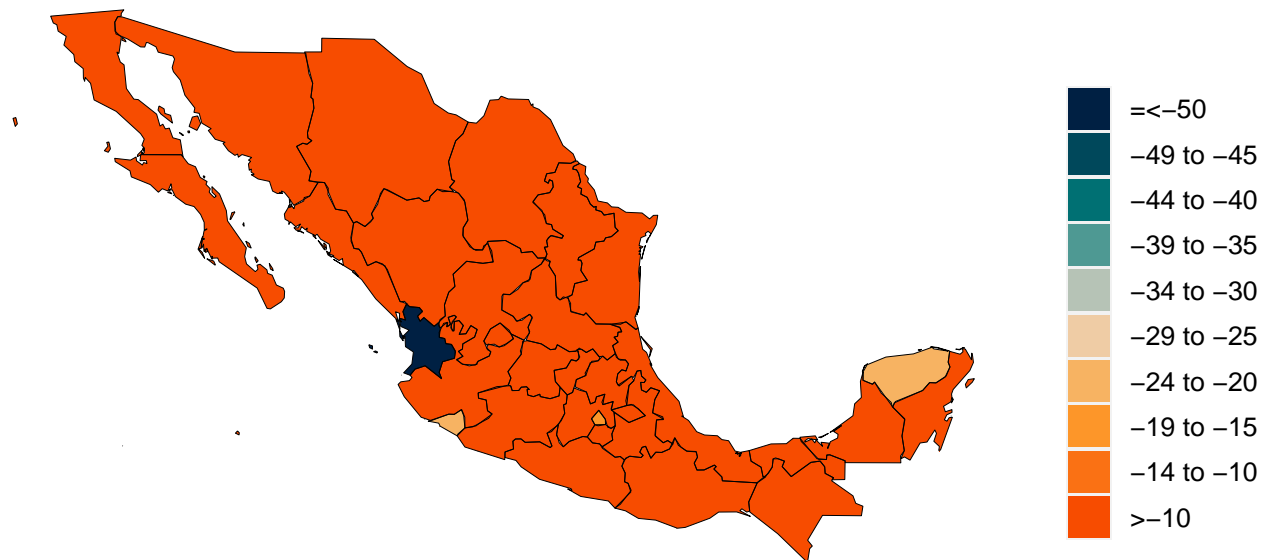
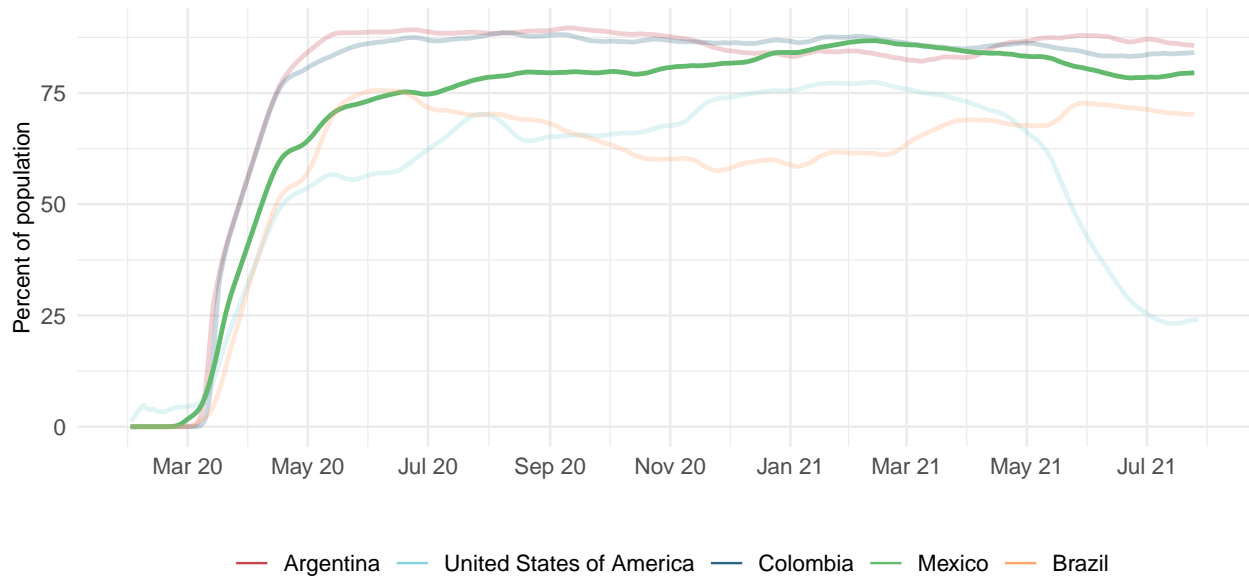**Figure 13.** Trend in the proportion of the population reporting always wearing a mask when leaving home

Figure 14. Proportion of the population reporting always wearing a mask when leaving home on August 2, 2021
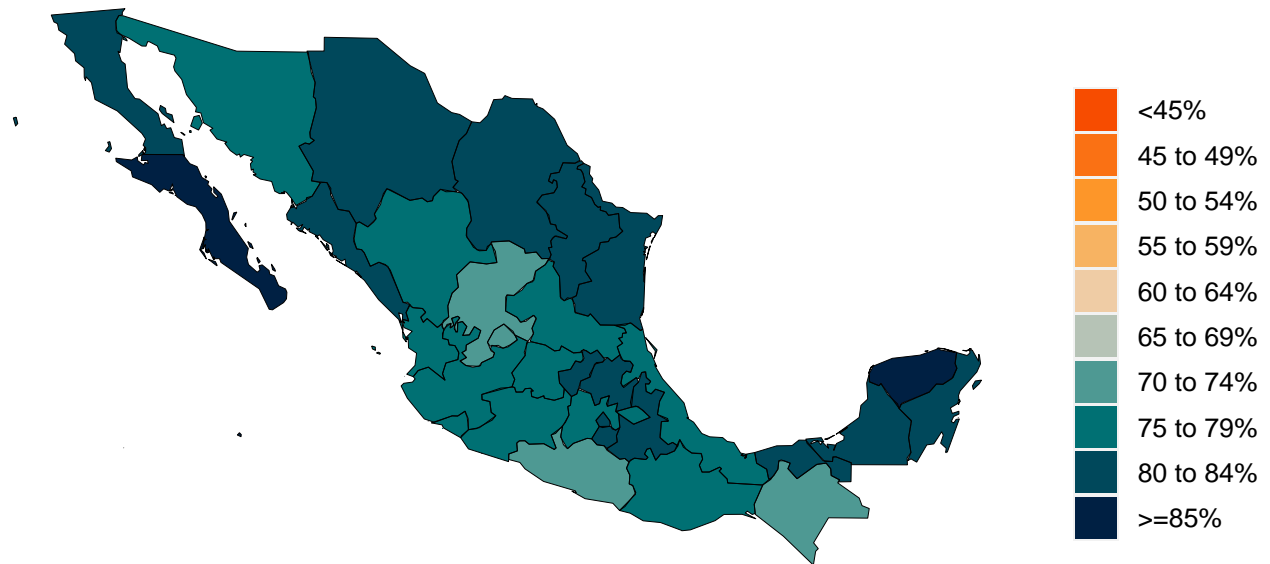
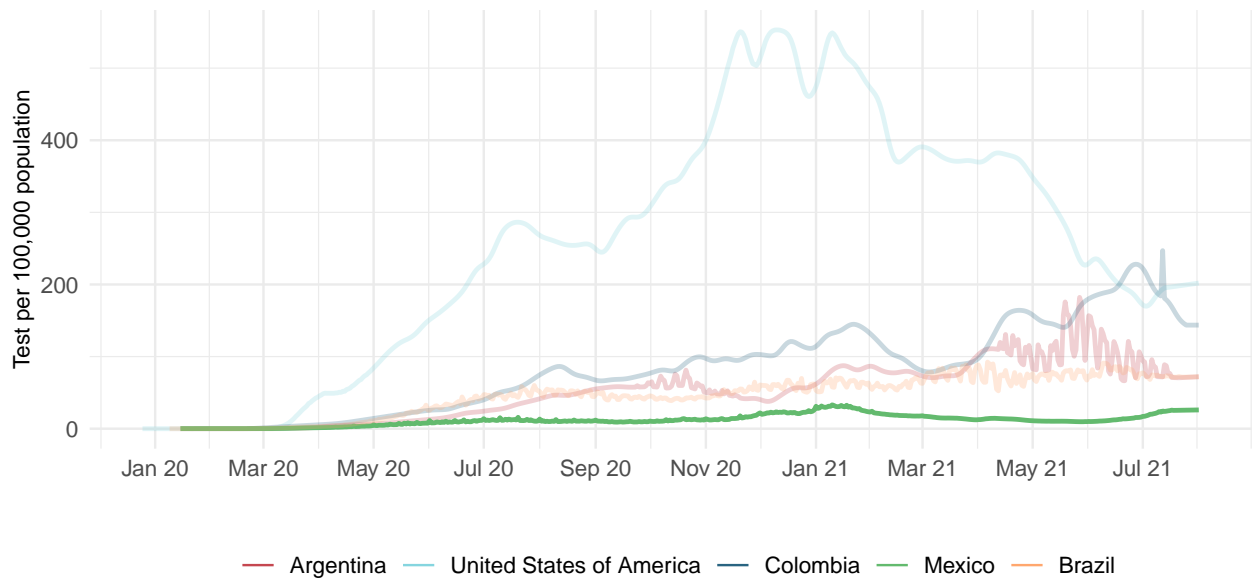**Figure 15.** Trend in COVID-19 diagnostic tests per 100,000 people

Argentina — United States of America — Colombia — Mexico — Brazil

Figure 16. COVID-19 diagnostic tests per 100,000 people on August 2, 2021

■	<5
■	5 to 9.9
■	10 to 24.9
■	25 to 49
■	50 to 149
■	150 to 249
■	250 to 349
■	350 to 449
■	450 to 499
■	>=500
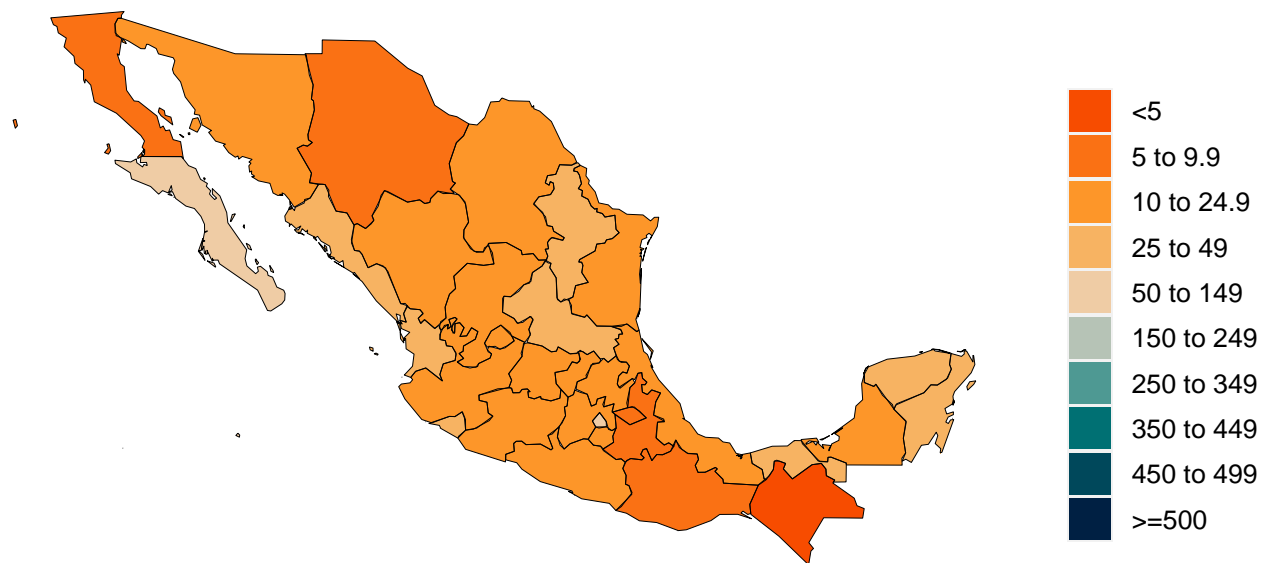
Figure 17. Increase in the risk of death due to pneumonia on February 1 compared to August 1

Table 3. Estimates of vaccine efficacy for specific vaccines used in the model at preventing disease and infection. The SEIR model uses variant-specific estimates of vaccine efficacy at preventing symptomatic disease and at preventing infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our website.

Vaccine	Efficacy at preventing disease: D614G & B.1.1.7	Efficacy at preventing infection: D614G & B.1.1.7	Efficacy at preventing disease: B.1.351, B.1.617, & P.1	Efficacy at preventing infection: B.1.351, B.1.617, & P.1
AstraZeneca	85%	52%	83%	51%
CoronaVac	50%	44%	43%	38%
Covaxin	78%	69%	68%	60%
Janssen	86%	72%	85%	56%
Moderna	94%	89%	93%	80%
Novavax	89%	79%	79%	69%
Pfizer/BioNTech	92%	86%	90%	78%
Sinopharm	73%	65%	63%	56%
Sputnik-V	92%	81%	80%	70%
Tianjin CanSino	66%	58%	57%	50%
Other vaccines	75%	66%	65%	57%
Other vaccines (mRNA)	91%	86%	89%	78%

Figure 18. Trend in the estimated proportion of the adult (18+) population that have been vaccinated or would probably or definitely receive the COVID-19 vaccine if available
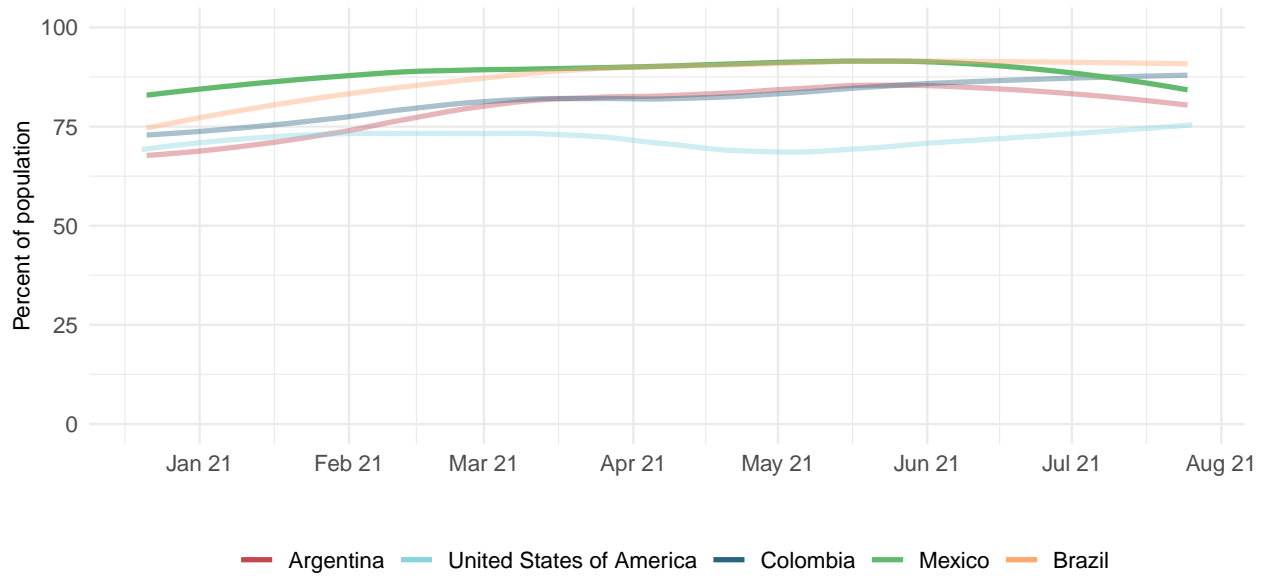

Figure 19. This figure shows the estimated proportion of the adult (18+) population that has been vaccinated or would probably or definitely receive the COVID-19 vaccine if available
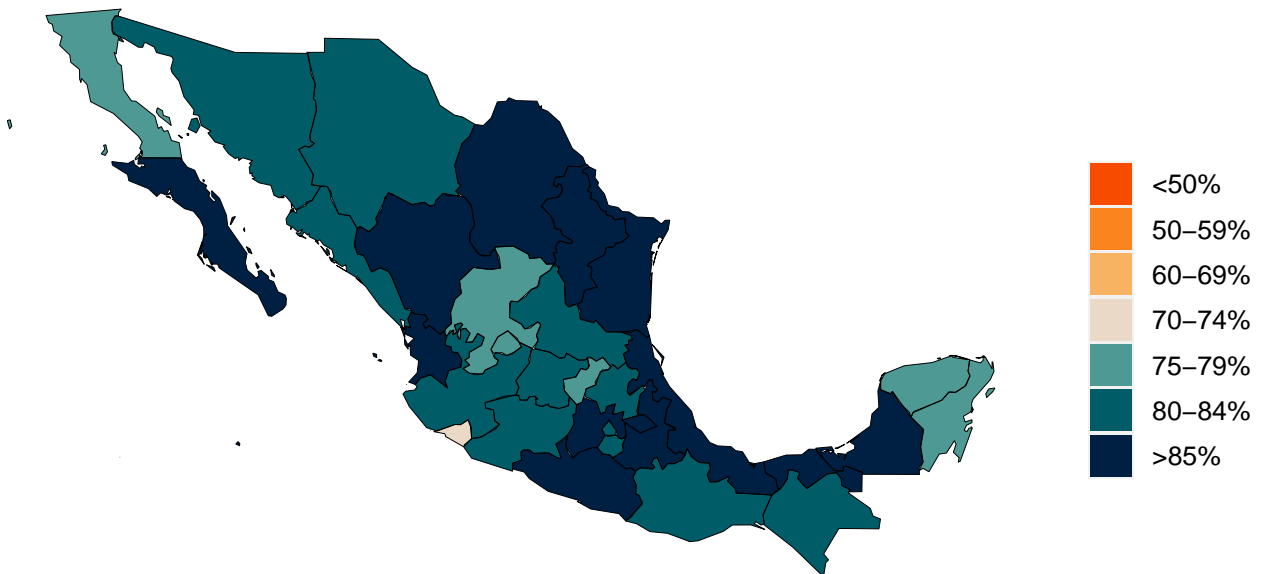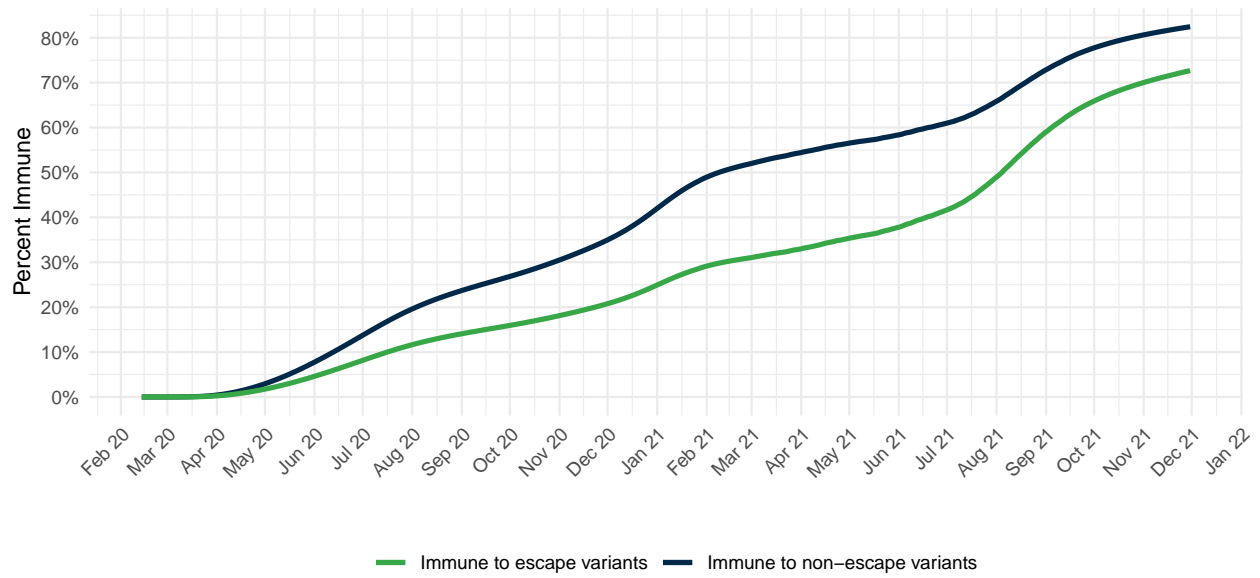
Figure 20. Percentage of people who are immune to non-escape variants and the percentage of people who are immune to escape variants

Projections and scenarios

We produce three scenarios when projecting COVID-19. The **reference scenario** is our forecast of what we think is most likely to happen:

- Vaccines are distributed at the expected pace.
- Governments adapt their response by re-imposing social distancing mandates for 6 weeks whenever daily deaths reach 8 per million, unless a location has already spent at least 7 of the last 14 days with daily deaths above this rate and not yet re-imposed social distancing mandates. In this case, the scenario assumes that mandates are re-imposed when daily deaths reach 15 per million.
- Variants B.1.1.7 (first identified in the UK), B.1.351 (first identified in South Africa), and P1 (first identified in Brazil) continue to spread from locations with (a) more than 5 sequenced variants, and (b) reports of community transmission, to adjacent locations following the speed of variant scale-up observed in the regions of the United Kingdom.

The **worse scenario** modifies the reference scenario assumptions in two ways:

- First, it assumes that variants B.1.351 or P.1 begin to spread within three weeks in adjacent locations that do not already have B.1.351 or P.1 community transmission.
- Second, it assumes that all those vaccinated increase their mobility toward pre-COVID-19 levels.

The **universal masks scenario** makes all the same assumptions as the reference scenario but also assumes 95% of the population wear masks in public in every location.

Figure 21. Daily COVID-19 deaths until December 01, 2021 for three scenarios

A. Reported daily COVID-19 death per 100,000
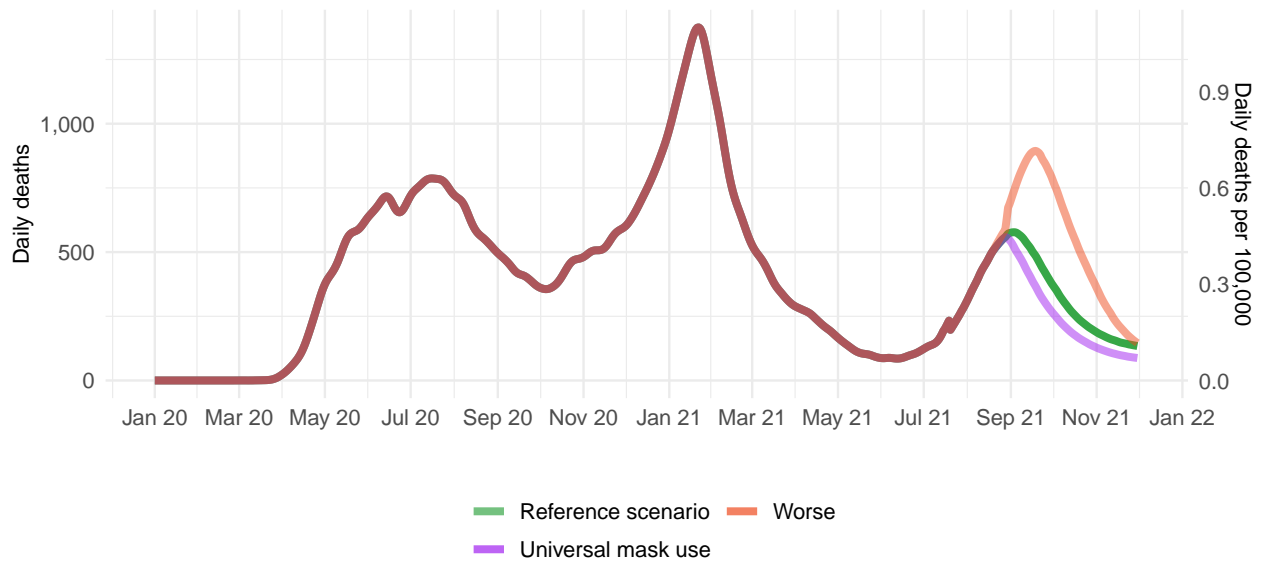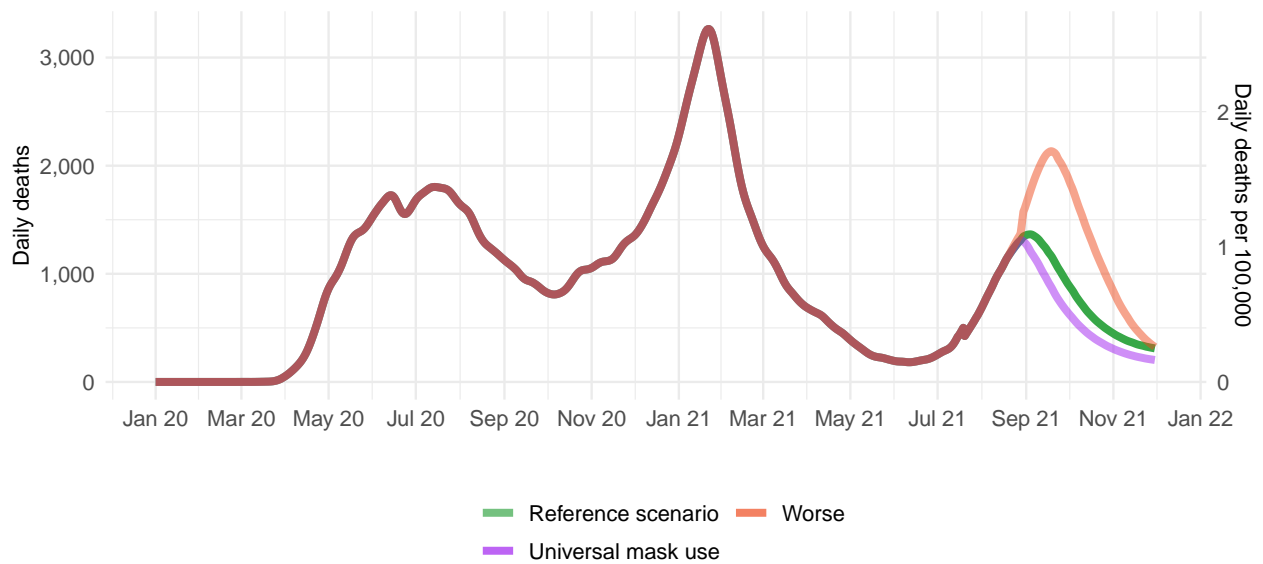

B. Excess daily COVID-19 deaths per 100,000

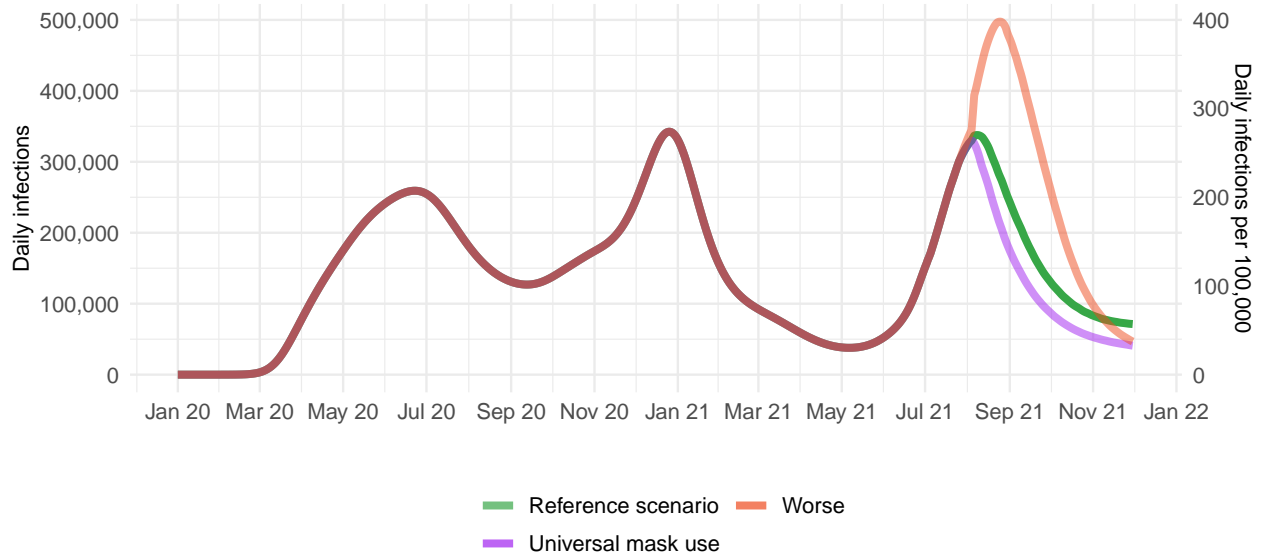**Figure 22.** Daily COVID-19 infections until December 01, 2021 for three scenarios

Reference scenario   Worse
Universal mask use

Figure 23. Daily COVID-19 reported cases until December 01, 2021 for three scenarios

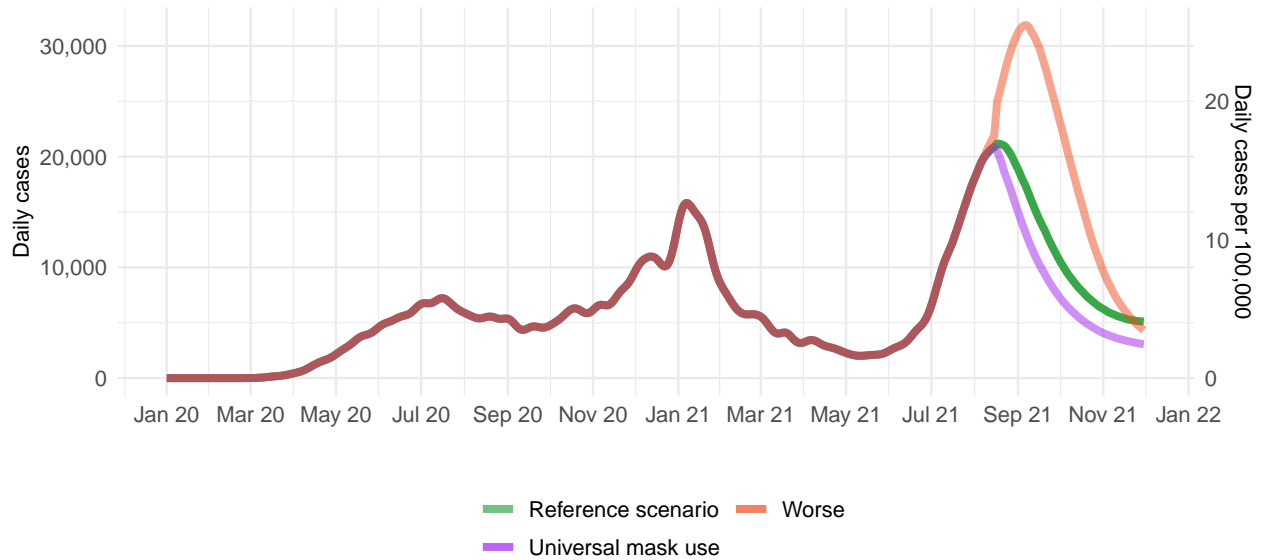Reference scenario   Worse
Universal mask use

Figure 24. Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available: Delphi from the Massachusetts Institute of Technology (Delphi), Imperial College London (Imperial), The Los Alamos National Laboratory (LANL), and the SI-KJalpha model from the University of Southern California (SIKJalpha). Daily deaths from other modeling groups are smoothed to remove inconsistencies with rounding. Regional values are aggregates from available locations in that region.
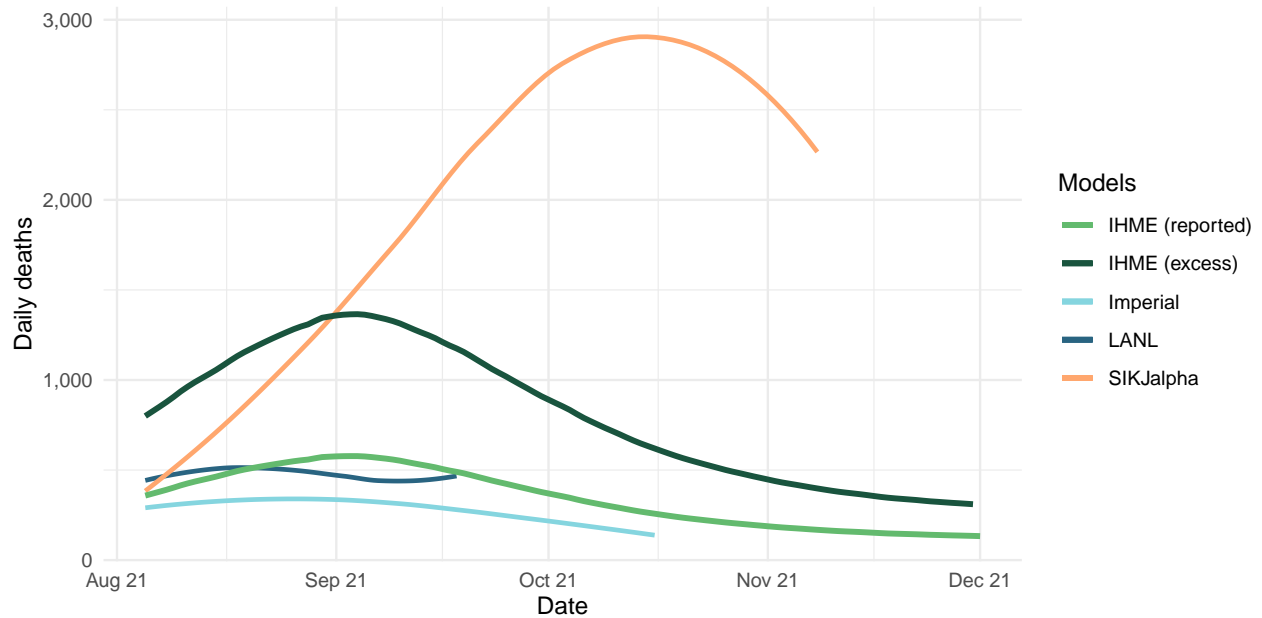
Figure 25. The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and 20% or greater is considered *extreme stress*.
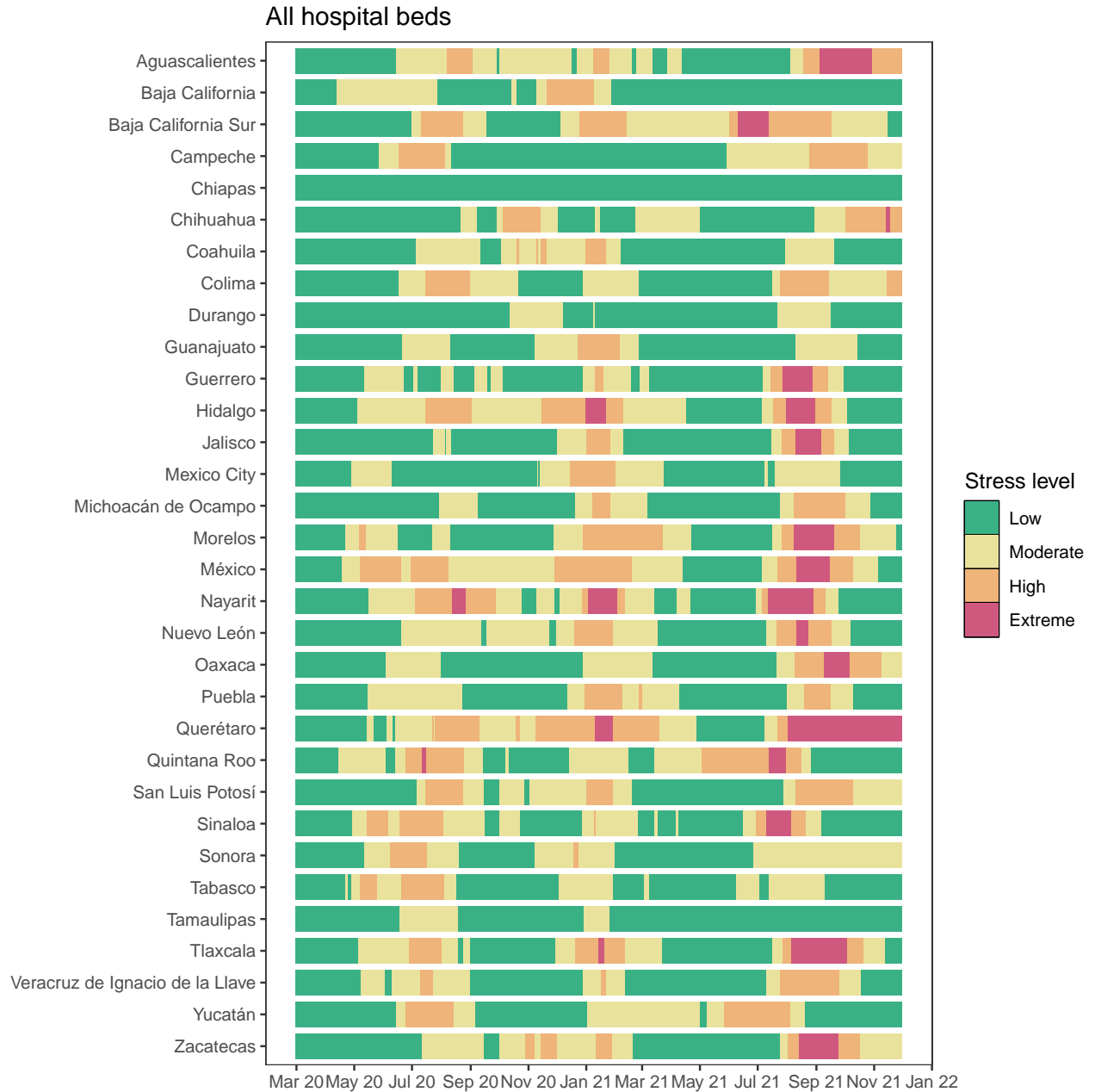

All hospital beds

Figure 26. The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *moderate stress*, 30-59% is considered *high stress*, and 60% or greater is considered *extreme stress*.

More information

Data sources:

Mask use and vaccine confidence data are from the The Delphi Group at Carnegie Mellon University and University of Maryland COVID-19 Trends and Impact Surveys, in partnership with Facebook. Mask use data are also from Premise, the Kaiser Family Foundation, and the YouGov COVID-19 Behaviour Tracker survey.

Genetic sequence and metadata are primarily from the GISAID Initiative. Further details available on the COVID-19 model FAQ page.

A note of thanks:

We wish to warmly acknowledge the support of these and others who have made our COVID-19 estimation efforts possible.

More information:

For all COVID-19 resources at IHME, visit http://www.healthdata.org/covid.

Questions? Requests? Feedback? Please contact us at https://www.healthdata.org/covid/contact-us.