Informe de resultados de COVID-19

México

9 de septiembre de 2022

Este documento contiene información resumida sobre las últimas proyecciones del modelo IHME sobre el COVID-19 en México. El modelo se ejecutó el 9 de septiembre de 2022, con datos hasta el 29 de agosto de 2022.

Las infecciones estimadas y los casos reportados están disminuyendo en el país. El descenso es del 12.4% de casos infectados y del 22.5% en casos. Sin embargo, dado el uso generalizado de pruebas rápidas de antígenos que no se capturan en los datos oficiales, estimamos que la tasa de detección de infecciones no ha disminuido más del 5% en el país. Con una tasa de detección de infecciones tan baja, el aumento de BA.5 que alcanzó su punto máximo en agosto puede haber infectado a una fracción sustancial de la población. Este aumento combinado con la vacunación sugiere que existe una inmunidad considerable a Omicron en la población. Nuestros pronósticos en el escenario de referencia sugieren que la disminución de esta inmunidad combinada con una mayor probabilidad de transmisión en el otoño y el invierno conducirá a un aumento sustancial de infecciones a fines del otoño y el invierno. Este aumento de infecciones, sin embargo, no se asociará con un gran aumento en los casos notificados. Las admisiones hospitalarias incidentales con una prueba de COVID positiva deberían aumentar más que los casos informados, ya que las admisiones hospitalarias se han convertido en una medida más precisa de los niveles de transmisión de la población. Con niveles sustanciales de vacunación y/o infección reciente, no esperamos que el aumento de la transmisión en el otoño y el invierno provoque una muerte sustancial en la región.

El escenario de referencia no incluye la posibilidad de que surja una variante más grave que BA.5 con escape inmunitario sustancial. Una nueva variante con escape inmune podría conducir a estimaciones de mortalidad mucho mayores que en nuestro escenario de referencia. No se puede cuantificar el grado de riesgo de una nueva variante con un escape inmunitario sustancial. Dado que existen dos escenarios muy distintos que son posibles dependiendo de la aparición de nuevas variantes, sugerimos que los gobiernos sigan varias estrategias. En primer lugar, mantener la vigilancia a nivel mundial para detectar precozmente la posible aparición de una nueva variante más grave con escape inmunitario. En ausencia de una muestra comunitaria de infección, la mejor métrica es el seguimiento de los ingresos hospitalarios positivos para COVID-19. En segundo lugar, se deben realizar esfuerzos para mantener la protección contra enfermedades graves mediante el uso de refuerzos en las poblaciones más vulnerables. En tercer lugar, se deben hacer esfuerzos para garantizar el acceso a los antivirales para las personas en riesgo. Finalmente, las personas que están en riesgo, como las personas mayores de 65 años o con comorbilidades importantes, deben considerar el uso de máscaras o el distanciamiento social cuando la transmisión se intensifica en el otoño y el invierno. A menos que surja una nueva variante que sea más grave y tenga un escape inmunológico, parece que los mandatos de distanciamiento social tienen poco papel.

Situación actual

• Las infecciones diarias en la última semana disminuyeron a 276,000 por día en promedio en comparación con las 315,000 de la semana anterior (Figura 1.1). El censo diario de hospitales en la última semana (hasta el 29 de agosto) disminuyó a 1,400 por día en promedio en comparación con los 1,900 de la semana anterior.

• Los casos diarios notificados en la última semana disminuyeron a 3,100 por día en promedio en comparación con los 4,000 de la semana anterior (Figura 2.1).

• Las muertes reportadas por COVID-19 en la última semana disminuyeron a 30 por día en promedio en comparación con las 43 de la semana anterior (Figura 3.1).

• El total de muertes por COVID-19 en la última semana disminuyó a 50 por día en promedio en comparación con las 72 de la semana anterior (Figura 3.1). Esto convierte al COVID-19 en la causa número 11 de muerte en México esta semana (Cuadro 1). El total estimado de muertes diarias debido a COVID-19 en la última semana fue 1.7 veces mayor que el número de muertes informado.

• La tasa diaria de muertes reportadas por COVID-19 no supera 4 por millón en ningún estado (Figura 4.1).

• La tasa diaria de muertes totales por COVID-19 no supera 4 por millón en ningún estado (Figura 4.2).

• Estimamos que todas las personas en México se han infectado al menos una vez al 29 de agosto (Figura 6.1). La tasa de R efectiva, calculado usando casos, hospitalizaciones y muertes, es mayor que 1 en un Quintana Roo (Figura 7.1).

• La tasa de detección de infecciones en México fue cercana al 1% el 29 de agosto (Figura 8.1).

• Con base en GISAID y varias bases de datos nacionales, combinados con nuestro modelo de dispersión de variantes, estimamos la prevalencia actual de las variantes de interés (Figuras 9.1-9.5). Para la variante Alfa estimamos que circula en siete estados, que la variante Beta no circula en ningún estado, que la variante Delta circula en 28 estados, que la variante Gamma circula en 10 estados y que la variante Omicron se mantiene en los 32 estados.

Tendencias en los impulsores de la transmisión

• La movilidad de la semana pasada fue 27% más alta que la línea de base anterior a la COVID-19 (Figura 11.1). La movilidad estuvo 15% o más por debajo de la línea de base en ningún estado (Figura 12.1).

• Se realizaron 14 pruebas diagnósticas por cada 100,000 habitantes el 29 de agosto (Figura 15.1).

• Con la información disponible al 29 de agosto, ocho estados han alcanzado 70% o más de la población que ha recibido al menos una dosis de vacuna, y un estado ha alcanzado el 70%

o más de la población que está completamente vacunada (Figuras 17.1 y 17.2). El 73% de las personas en México ha recibido al menos una dosis de vacuna y el 68% está completamente vacunado.

• En nuestro escenario de referencia actual, esperamos que 90.9 millones de personas estén vacunadas con al menos una dosis para el 1 de enero de 2023 (Figura 19.1). Esperamos que 68% de la población esté completamente vacunada para el 1 de enero de 2023.

Proyecciones y escenarios

Producimos tres escenarios al proyectar COVID-19. El **escenario de referencia** es nuestro pronóstico de lo que creemos que es más probable que suceda:

• Las vacunas se distribuyen al ritmo esperado. La eficacia de la vacuna específica de marca y variante se actualiza utilizando la última información disponible de publicaciones revisadas por pares y otros informes.

• El uso futuro de mascarillas disminuirá 50% del nivel mínimo que alcanzó entre el 1 de enero de 2021 y el 1 de mayo de 2022. Esta disminución comienza después del último punto de datos observado en cada ubicación y pasa linealmente al mínimo durante un período de seis semanas.

• La movilidad aumenta a medida que aumenta la cobertura de vacunación.

• 80 % de los que están completamente vacunados (dos dosis para la mayoría de las vacunas o una dosis para Johnson & Johnson) reciben una dosis adicional seis meses después de haberse vacunado por completo, y el 80 % de los que reciben una dosis adicional reciben una segunda dosis adicional seis meses después.

• La utilización de antivirales para la prevención del riesgo de COVID-19 alcanzó 80% en las poblaciones de alto riesgo y 50% en las poblaciones de bajo riesgo entre el 1 de marzo de 2022 y el 1 de junio de 2022. Esto se aplica en países de ingresos altos, pero no en países de bajos ingresos. y países de ingresos medios, y esta suposición de implementación sigue un patrón similar a las implementaciones de vacunas a nivel mundial.

El escenario de uso de mascarillas del 80% hace las mismas suposiciones que el escenario de referencia, pero asume que todas las ubicaciones alcanzan el uso de mascarillas del 80% en siete días. Si una ubicación actualmente tiene un uso superior al 80%, el uso de mascarillas permanece en el nivel actual.

El escenario de acceso a antivirales hace todos los mismos supuestos que el escenario de referencia, pero asume antivirales distribuidos globalmente y extiende la cobertura a todos los países de ingresos bajos y medianos entre el 15 de agosto de 2022 y el 15 de septiembre de 2022.

Infecciones

• Los contagios diarios estimados en el **escenario de referencia** ascenderán a 1,264,330 al 30 de noviembre de 2022 (Figura 21.1).

• Las infecciones diarias estimadas en el escenario de uso de máscaras del 80% aumentarán a 1,160,050 para el 22 de diciembre de 2022 (Figura 21.1).

• Las infecciones diarias estimadas en el **escenario de acceso a antivirales** ascenderán a 1,264,330 al 30 de noviembre de 2022 (Figura 21.1).

Casos

• Los casos diarios estimados en el **escenario de referencia** ascenderán a 12,380 al 8 de diciembre de 2022 (Figura 21.2).

• Los casos diarios estimados en el **escenario de uso de mascarillas del 80%** aumentarán a 11,610 para el 30 de diciembre de 2022 (Figura 21.2).

• Los casos diarios estimados en el **escenario de acceso a antivirales** aumentarán a 12,380 para el 8 de diciembre de 2022 (Figura 21.2).

Hospitalizaciones

• El censo hospitalario diario en el **escenario de referencia** ascenderá a 5,210 al 17 de diciembre de 2022 (Figura 21.3). En ningún momento desde agosto hasta el 1 de enero de 2023, ningún estado tendrá presión alta o extrema en las camas de los hospitales (Figura 23.1). En ningún momento desde agosto hasta el 1 de enero, ningún estado tendrá una presión alta o extrema en la capacidad de la unidad de cuidados intensivos (UCI) (Figura 24.1).

• El censo hospitalario diario en el **escenario de uso de mascarillas del 80%** aumentará a 4,930 para el 1 de enero de 2023 (Figura 21.3).

• El censo diario de hospitales en el **escenario de acceso a antivirales** ascenderá a 4,370 al 17 de diciembre de 2022 (Figura 21.3).

Fallecidos

• En nuestro **escenario de referencia**, nuestro modelo proyecta 466,000 muertes acumuladas reportadas debido a COVID-19 el 1 de enero. Esto representa 5,400 muertes adicionales del 29 de agosto al 1 de enero. Las muertes diarias reportadas de COVID-19 en el escenario de referencia aumentarán a 90 para diciembre 28, 2022 (Figura 21.4).

• Bajo nuestro **escenario de referencia**, nuestro modelo proyecta 764,000 muertes totales acumuladas por COVID-19 el 1 de enero. Esto representa 8,700 muertes adicionales del 29 de agosto al 1 de enero (Figura 21.5).

• En nuestro **escenario de uso de mascarillas del 80%**, nuestro modelo proyecta 464,000 muertes acumuladas notificadas debido a la COVID-19 el 1 de enero. Esto representa 3,600 muertes adicionales del 29 de agosto al 1 de enero. Las muertes diarias reportadas de COVID-19 en el escenario de uso de mascarillas del 80% aumentará a 80 el 1 de enero de 2023 (Figura 21.4).

• En nuestro **escenario de acceso a antivirales**, nuestro modelo proyecta 465,000 muertes acumuladas reportadas debido a COVID-19 el 1 de enero. Esto representa 4,400

muertes adicionales del 29 de agosto al 1 de enero. Las muertes diarias reportadas por COVID-19 en el escenario de acceso antiviral aumentarán a 70 para el 28 de diciembre de 2022 (Figura 21.4).

Actualizaciones del modelo

Para estimar la inmunidad a la infección derivada de la vacuna, compilamos sistemáticamente datos de varios estudios que estiman la eficacia de la vacuna en función del tiempo transcurrido desde la segunda dosis. Para cada vacuna y resultado por separado (síntomas de infección y enfermedad grave, definida como hospitalización o muerte), utilizamos una metarregresión bayesiana con un spline monótonamente decreciente en el tiempo desde la segunda dosis para estimar las curvas menguantes por vacuna y resultado. Ajustamos estos modelos en un espacio logit (eficacia) acotado con la restricción de que la eficacia no puede disminuir por debajo del 10 %. Usamos un spline en el tiempo desde la vacunación y el tiempo desde el análisis de la dosis de refuerzo. Los valores que no eran biológicamente plausibles se excluyeron de este análisis (p. ej., valores negativos para la efectividad de la vacuna). Para estimar la disminución de la inmunidad derivada de la infección, se extrajeron medidas de riesgo de infección por SARS-CoV-2 en personas con infección previa en comparación con personas sin infección previa de los datos relevantes del estudio. Utilizamos un enfoque de metarregresión bayesiano similar a la estimación de la protección de la vacuna menguante para estimar el tiempo desde la infección e incluyeron estudios basados en el tiempo medio de la población de estudio desde la infección. Estimamos intervalos de incertidumbre (IU) del 95% a partir de efectos fijos y heterogeneidad entre estudios mediante análisis de simulación (1000 extracciones). Previamente, modelamos todas las variantes de Omicron como una sola, sin diferenciar entre las oleadas de variantes. El modelo ahora se actualiza para distinguir entre las fechas de invasión BA.1/BA.2 y BA.5 de Omicron

COVID-19 Results Briefing

Mexico

September 9, 2022

This document contains summary information on the latest projections from the IHME model on COVID-19 in Mexico. The model was run on September 9, 2022, with data through August 29, 2022.

Estimated infections and reported cases are declining in the country. The decline is 12.4% of infected cases and 22.5% in cases. However, given the widespread use of rapid antigen tests that are not captured in official data, we estimate the infection-detection rate has declined no more than 5% in the country. With such a low infection-detection rate, the BA.5 surge that peaked in August may have infected a substantial fraction of the population. This surge combined with vaccination suggests that there is considerable immunity to Omicron in the population. Our forecasts in the reference scenario suggest that waning of this immunity combined with increased probability of transmission in the fall and winter will lead to a substantial surge in infections in the late fall and winter. This surge in infections, however, will not be associated with a large increase in reported cases. Incidental hospital admissions with a positive COVID test should increase more than reported cases, as hospital admissions have become a more accurate measure of population levels of transmission. With substantial levels of vaccination and/or recent infection, we do not expect the increase in transmission in the fall and winter to lead to substantial death in the region.

The reference scenario does not include the possibility of the emergence of a more severe variant than BA.5 with substantial immune escape. A new variant with immune escape could lead to much larger estimates of mortality than in our reference scenario. The degree of risk of a new variant with substantial immune escape cannot be quantified. Given that there are **two very distinct scenarios** that are possible depending on the emergence of new variants, we suggest governments should pursue several strategies. First, maintain surveillance globally to detect early the possible emergence of a new, more severe variant with immune escape. In the absence of a community sample of infection, the best metric is tracking hospital admissions positive for COVID-19. Second, measures should be taken to maintain protection against severe disease through the use of boosters in the most vulnerable populations. Third, efforts should be made to ensure access to antivirals for those at risk. Finally, individuals who are at risk, such as those over 65 or with major comorbidities, should consider using masks or social distancing when transmission intensifies in the fall and winter. Unless a new variant that is more severe and has immune escape emerges, there appears to be little role for social distancing mandates.

Current situation

- Daily infections in the last week decreased to 276,000 per day on average compared to 315,000 the week before (Figure 1.1). Daily hospital census in the last week (through August 29) decreased to 1,400 per day on average compared to 1,900 the week before.
- Daily reported cases in the last week decreased to 3,100 per day on average compared to 4,000 the week before (Figure 2.1).

- Reported deaths due to COVID-19 in the last week decreased to 30 per day on average compared to 43 the week before (Figure 3.1).
- Total deaths due to COVID-19 in the last week decreased to 50 per day on average compared to 72 the week before (Figure 3.1). This makes COVID-19 the number 11 cause of death in Mexico this week (Table 1). Estimated total daily deaths due to COVID-19 in the past week were 1.7 times larger than the reported number of deaths.
- The daily rate of reported deaths due to COVID-19 is greater than 4 per million in no states (Figure 4.1).
- The daily rate of total deaths due to COVID-19 is greater than 4 per million in no states (Figure 4.2).
- We estimate that 100% of people in Mexico have been infected at least once as of August 29 (Figure 6.1). Effective R, computed using cases, hospitalizations, and deaths, is greater than 1 in one state (Figure 7.1).
- The infection-detection rate in Mexico was close to 1% on August 29 (Figure 8.1).
- Based on the GISAID and various national databases, combined with our variant spread model, we estimate the current prevalence of variants of concern (Figures 9.1–9.5). We estimate that the Alpha variant is circulating in seven states, that the Beta variant is circulating in no states, that the Delta variant is circulating in 28 states, that the Gamma variant is circulating in 10 states, and that the Omicron variant is circulating in 32 states.

Trends in drivers of transmission

- Mobility last week was 27% higher than the pre-COVID-19 baseline (Figure 11.1). Mobility was 15% or more below baseline in no states (Figure 12.1).
- There were 14 diagnostic tests per 100,000 people on August 29 (Figure 15.1).
- As of August 29, eight states have reached 70% or more of the population who have received at least one vaccine dose, and one state has reached 70% or more of the population who are fully vaccinated (Figures 17.1 and 17.2). 73% of people in Mexico have received at least one vaccine dose, and 68% are fully vaccinated.
- In our current reference scenario, we expect that 90.9 million people will be vaccinated with at least one dose by January 1 (Figure 19.1). We expect that 68% of the population will be fully vaccinated by January 1.

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. Brand- and variant-specific vaccine efficacy is updated using the latest available information from peer-reviewed publications and other reports.

- Future mask use will decline to 50% of the minimum level it reached between January 1, 2021, and May 1, 2022. This decline begins after the last observed data point in each location and transitions linearly to the minimum over a period of six weeks.
- Mobility increases as vaccine coverage increases.
- 80% of those who are fully vaccinated (two doses for most vaccines, or one dose for Johnson & Johnson) receive an additional dose six months after becoming fully vaccinated, and 80% of those who receive an additional dose receive a second additional dose six months later.
- Antiviral utilization for COVID-19 risk prevention has reached 80% in high-risk populations and 50% in low-risk populations between March 1, 2022, and June 1, 2022. This applies in high-income countries, but not low- and middle-income countries, and this rollout assumption follows a similar pattern to global vaccine rollouts.

The **80% mask use scenario** makes all the same assumptions as the reference scenario but assumes all locations reach 80% mask use within seven days. If a location currently has higher than 80% use, mask use remains at the current level.

The **antiviral access scenario** makes all the same assumptions as the reference scenario but assumes globally distributed antivirals and extends coverage to all low- and middle-income countries between August 15, 2022, and September 15, 2022.

Infections

- Daily estimated infections in the **reference scenario** will rise to 1,264,330 by November 30, 2022 (Figure 21.1).
- Daily estimated infections in the **80% mask use scenario** will rise to 1,160,050 by December 22, 2022 (Figure 21.1).
- Daily estimated infections in the **antiviral access scenario** will rise to 1,264,330 by November 30, 2022 (Figure 21.1).

Cases

- Daily estimated cases in the **reference scenario** will rise to 12,380 by December 8, 2022 (Figure 21.2).
- Daily estimated cases in the **80% mask use scenario** will rise to 11,610 by December 30, 2022 (Figure 21.2).
- Daily estimated cases in the **antiviral access scenario** will rise to 12,380 by December 8, 2022 (Figure 21.2).

Hospitalizations

- Daily hospital census in the **reference scenario** will rise to 5,210 by December 17, 2022 (Figure 21.3). No states will have high or extreme stress on hospital beds from August through January 1 (Figure 23.1). No states will have high or extreme stress on intensive care unit (ICU) capacity from August through January 1 (Figure 24.1).

- Daily hospital census in the **80% mask use scenario** will rise to 4,930 by January 1, 2023 (Figure 21.3).
- Daily hospital census in the **antiviral access scenario** will rise to 4,370 by December 17, 2022 (Figure 21.3).

Deaths

- In our **reference scenario**, our model projects 466,000 cumulative reported deaths due to COVID-19 on January 1. This represents 5,400 additional deaths from August 29 to January 1. Daily reported COVID-19 deaths in the **reference scenario** will rise to 90 by December 28, 2022 (Figure 21.4).
- Under our **reference scenario**, our model projects 764,000 cumulative total deaths due to COVID-19 on January 1. This represents 8,700 additional deaths from August 29 to January 1 (Figure 21.5).
- In our **80% mask use scenario**, our model projects 464,000 cumulative reported deaths due to COVID-19 on January 1. This represents 3,600 additional deaths from August 29 to January 1. Daily reported COVID-19 deaths in the **80% mask use scenario** will rise to 80 by January 1, 2023 (Figure 21.4).
- In our **antiviral access scenario**, our model projects 465,000 cumulative reported deaths due to COVID-19 on January 1. This represents 4,400 additional deaths from August 29 to January 1. Daily reported COVID-19 deaths in the **antiviral access scenario** will rise to 70 by December 28, 2022 (Figure 21.4).
- Figure 22.1 compares our reference scenario forecasts to other publicly archived models. Forecasts are widely divergent.

Model updates

To estimate vaccine-derived immunity to infection we systematically compiled data from several studies estimating vaccine efficacy as a function of time since the second dose. For each vaccine and outcome separately (infection symptoms and severe disease, defined as hospitalization or death), we used Bayesian meta-regression with a monotonically decreasing spline on time since second dose to estimate waning curves by vaccine and outcome. We fit these models in bounded logit (efficacy) space with a constraint that efficacy cannot decline below 10%. We used a spline on time since vaccination and time since booster dose analysis. Values that were not biologically plausible were excluded from this analysis (e.g., negative values for vaccine effectiveness). To estimate infection-derived waning immunity, risk measures of SARS-CoV-2 infection in individuals with previous infection compared with infection-naïve individuals were extracted from relevant study data. We used a Bayesian meta-regression approach similar to estimating waning vaccine protection to estimate time since infection and including studies based on the study population's mean time since infection. We estimated 95% uncertainty intervals (UI) from fixed effects and between-study heterogeneity using simulation analysis (1,000 draws). We previously modeled all Omicron variants as one, without differentiating between variant surges. The model is now updated to distinguish between the BA.1/BA.2 and BA.5 invasion dates of Omicron.

Figure 1.1: Daily COVID-19 hospital census and estimated infections

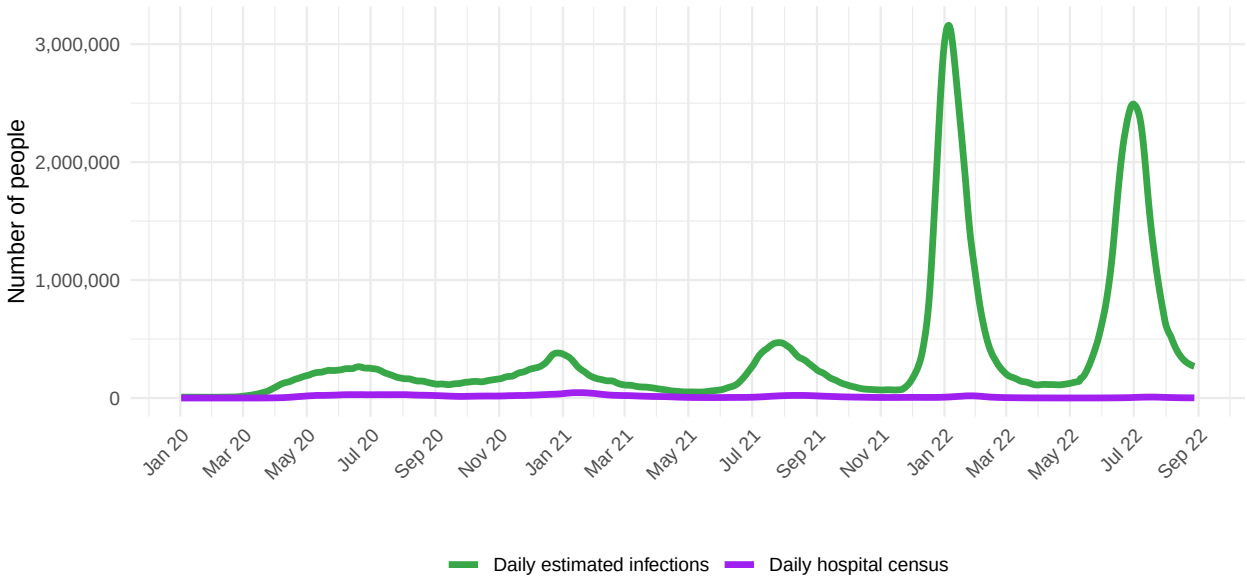


Figure 2.1: Reported daily COVID-19 cases, moving average

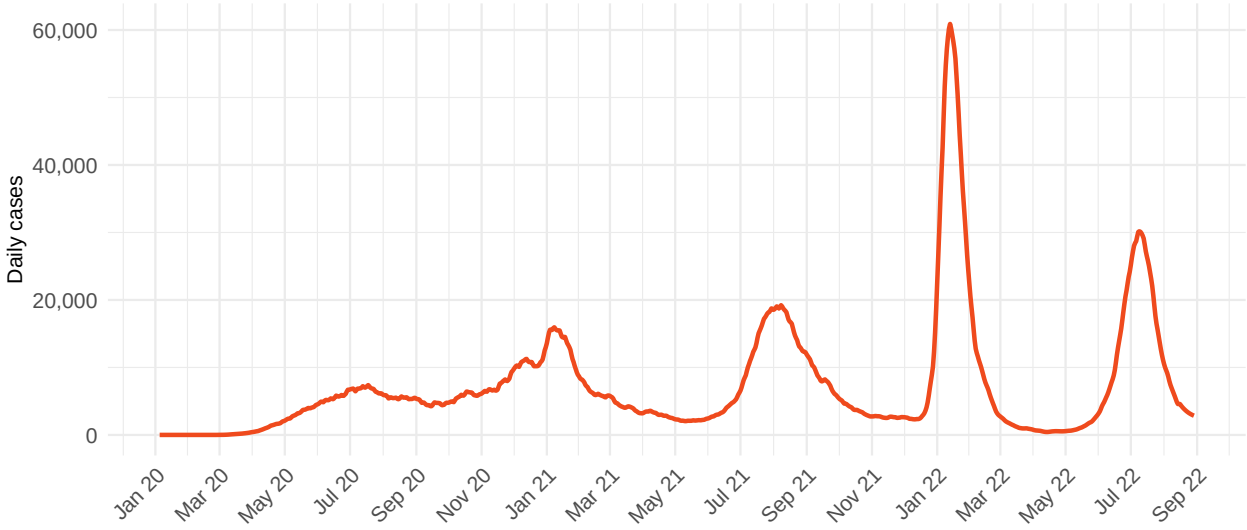
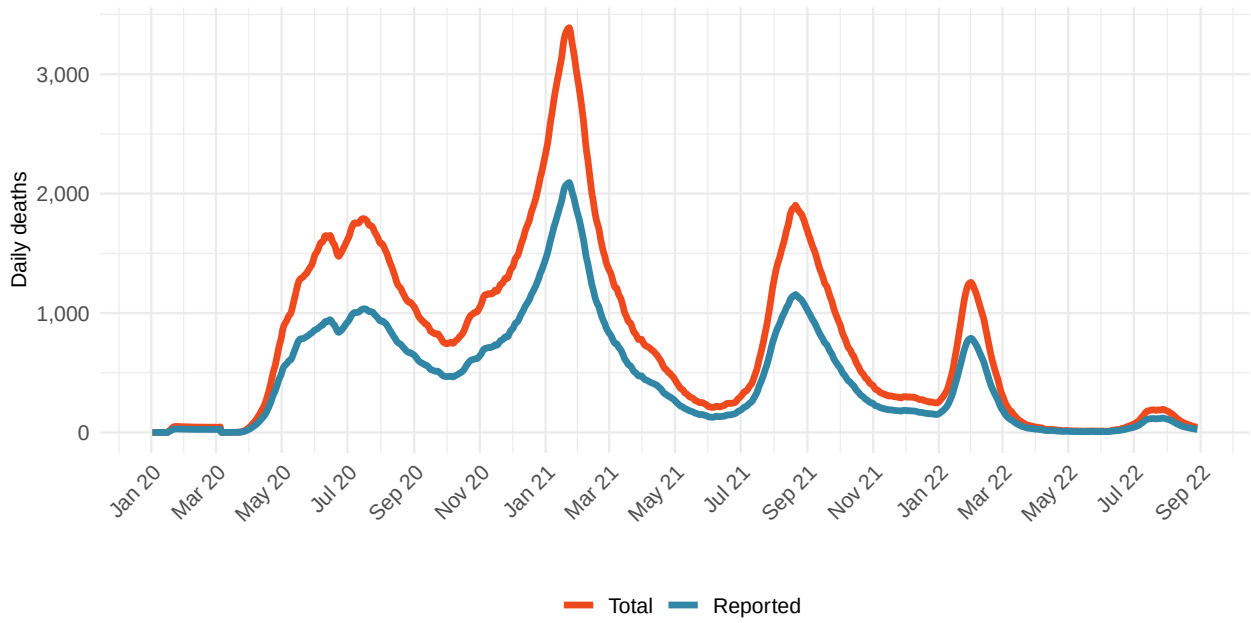


Table 1: Ranking of total deaths due to COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	2,044	1
Diabetes mellitus	1,420	2
Chronic kidney disease	1,395	3
Cirrhosis and other chronic liver diseases	891	4
Stroke	729	5
Chronic obstructive pulmonary disease	630	6
Interpersonal violence	590	7
Alzheimer's disease and other dementias	455	8
Lower respiratory infections	434	9
Road injuries	406	10
COVID-19	353	11

Figure 3.1: Smoothed trend estimate of daily COVID-19 deaths



Daily COVID-19 death rate per 1 million on August 29, 2022

Figure 4.1: Daily reported COVID-19 death rate per 1 million

Figure 4.2: Daily total COVID-19 death rate per 1 million

Cumulative COVID-19 deaths per 100,000 on August 29, 2022

Figure 5.1: Reported cumulative COVID-19 deaths per 100,000

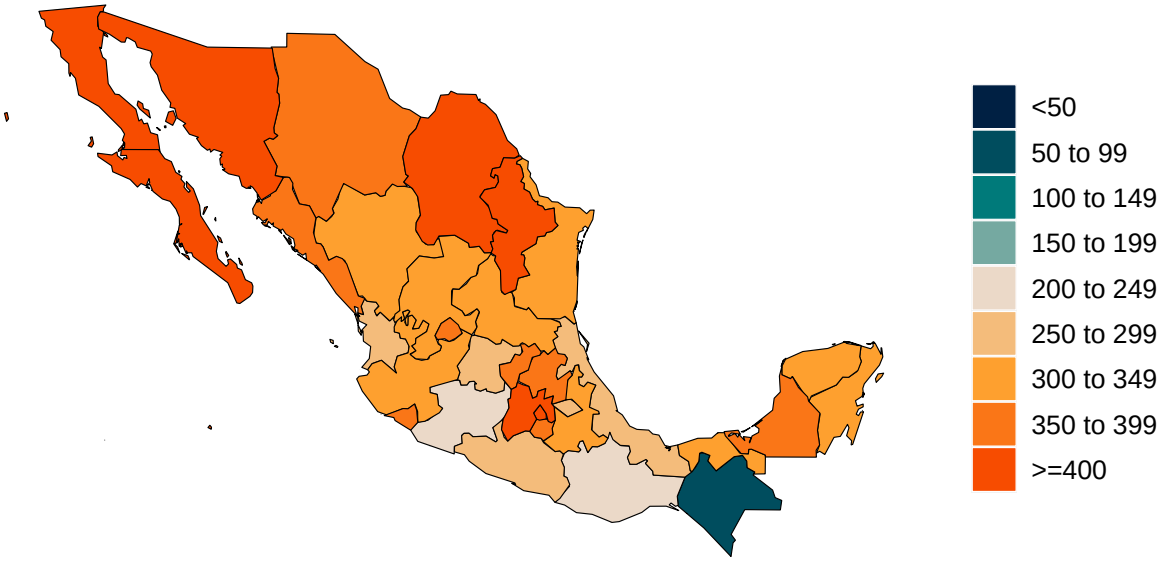


Figure 5.2: Total cumulative COVID-19 deaths per 100,000

Figure 6.1: Estimated percent of the population infected with COVID-19 on August 29, 2022

Figure 7.1: Mean effective R on August 18, 2022. Effective R less than 1 means that transmission should decline, all other things being held the same. 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.

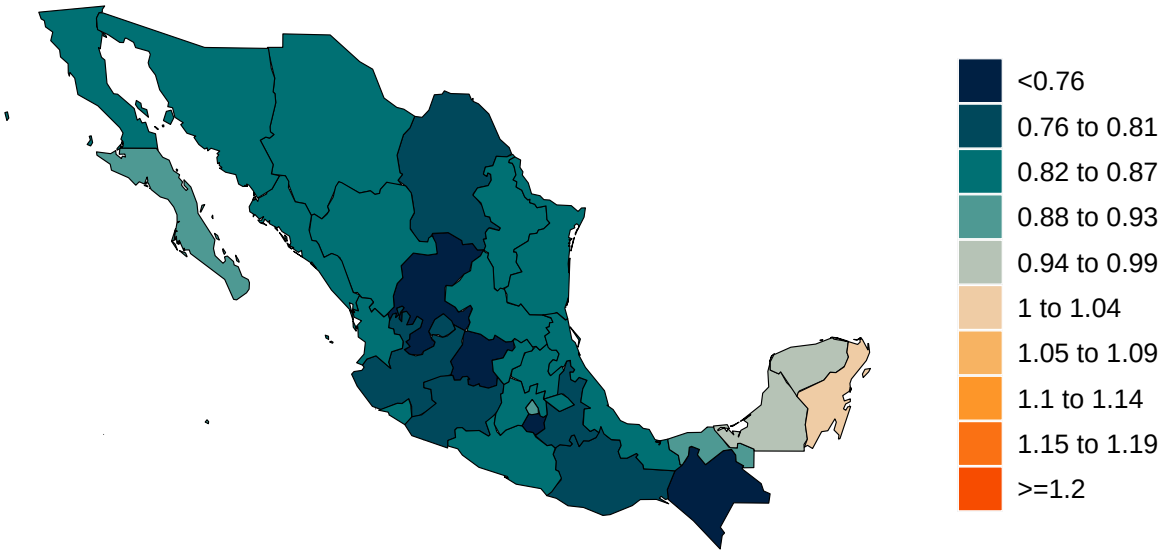
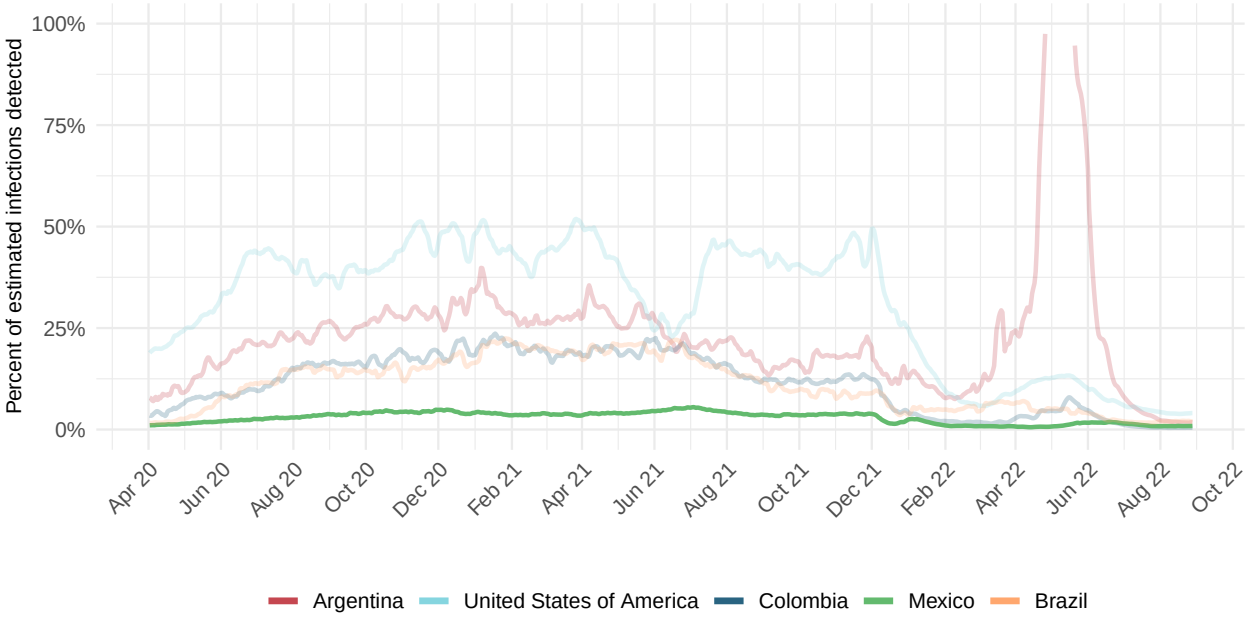


Figure 8.1: Percent of estimated COVID-19 infections detected. This is estimated as the ratio of reported daily COVID-19 cases to estimated daily COVID-19 infections based on the SEIR disease transmission model. Due to measurement errors in cases and testing rates, the infection-detection rate can exceed 100% at particular points in time.



Estimated percent of circulating SARS-CoV-2 for primary variant families on August 29, 2022

Figure 9.1: Estimated percent of new infections that are Alpha variant

Figure 9.2: Estimated percent of new infections that are Beta variant

Figure 9.3: Estimated percent of new infections that are Delta variant

Figure 9.4: Estimated percent of new infections that are Gamma variant

Figure 9.5: Estimated percent of new infections that are Omicron variant

Figure 10.1: Infection-fatality rate on August 29, 2022. This is estimated as the ratio of COVID-19 deaths to estimated daily COVID-19 infections.

Critical drivers

Table 2: Current mandate implementation

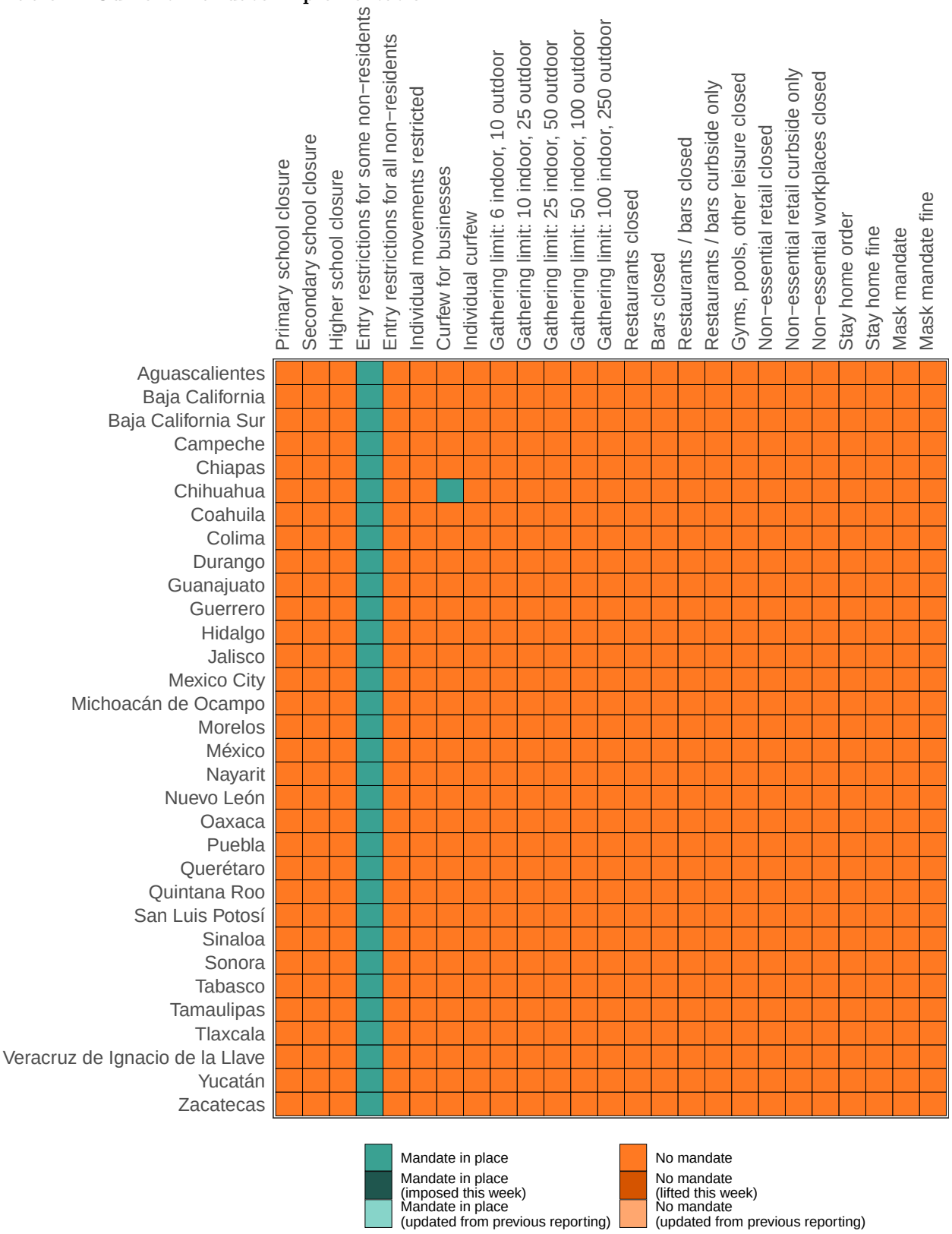


Figure 11.1: Trend in mobility as measured through smartphone app use, compared to January 2020 baseline

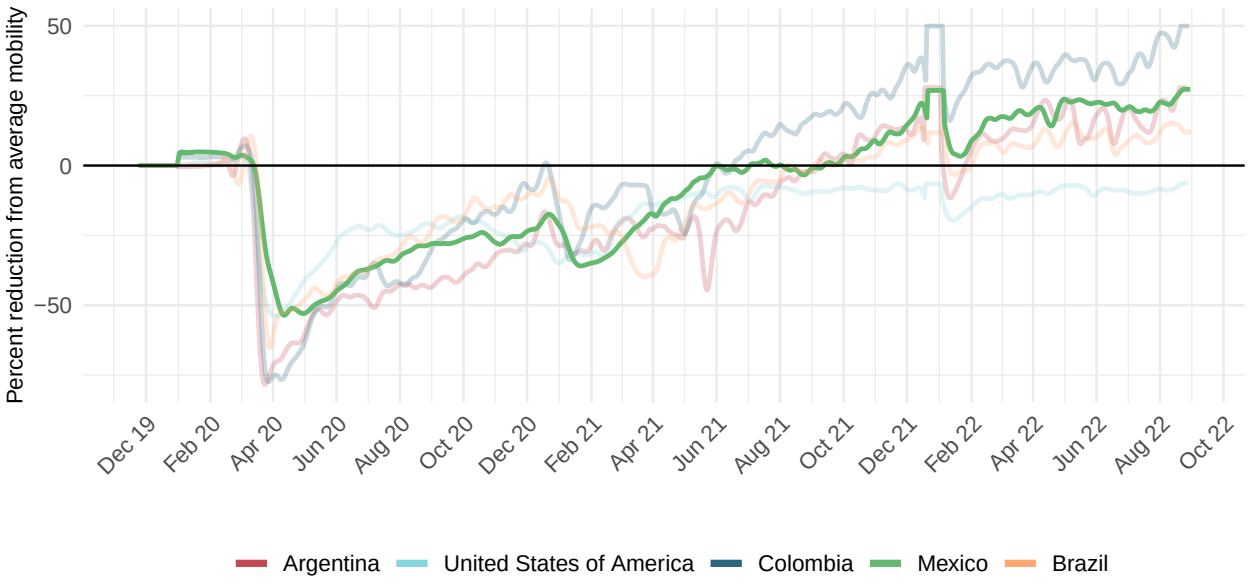


Figure 12.1: Mobility level as measured through smartphone app use, compared to January 2020 baseline (percent) on August 29, 2022

Figure 13.1: Trend in the proportion of the population reporting always wearing a mask when leaving home

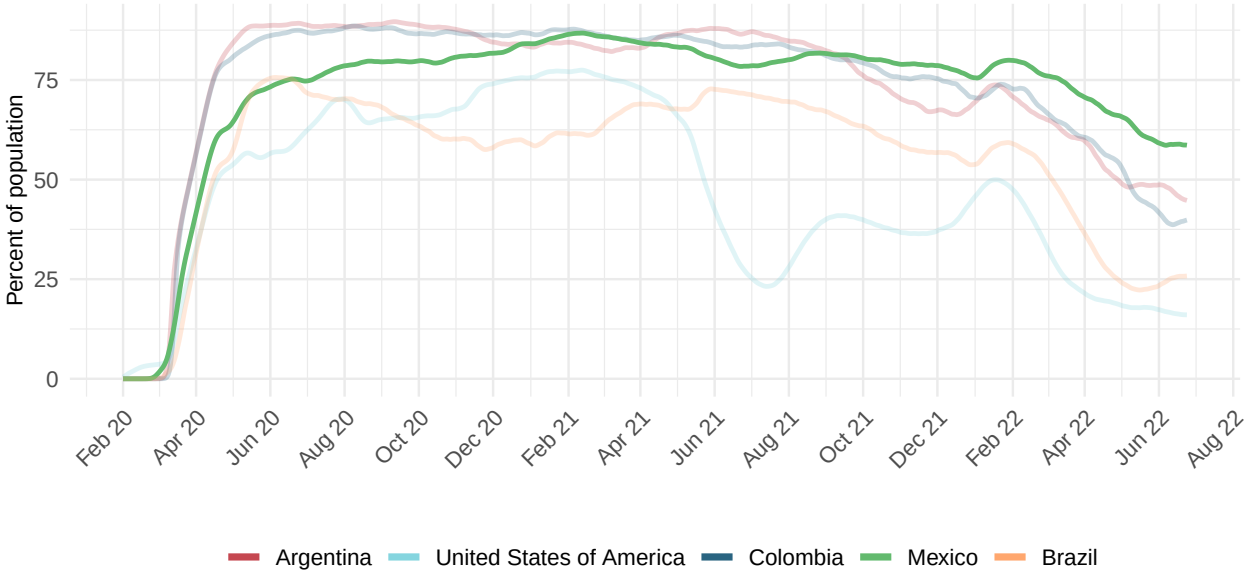


Figure 14.1: Proportion of the population reporting always wearing a mask when leaving home on August 29, 2022

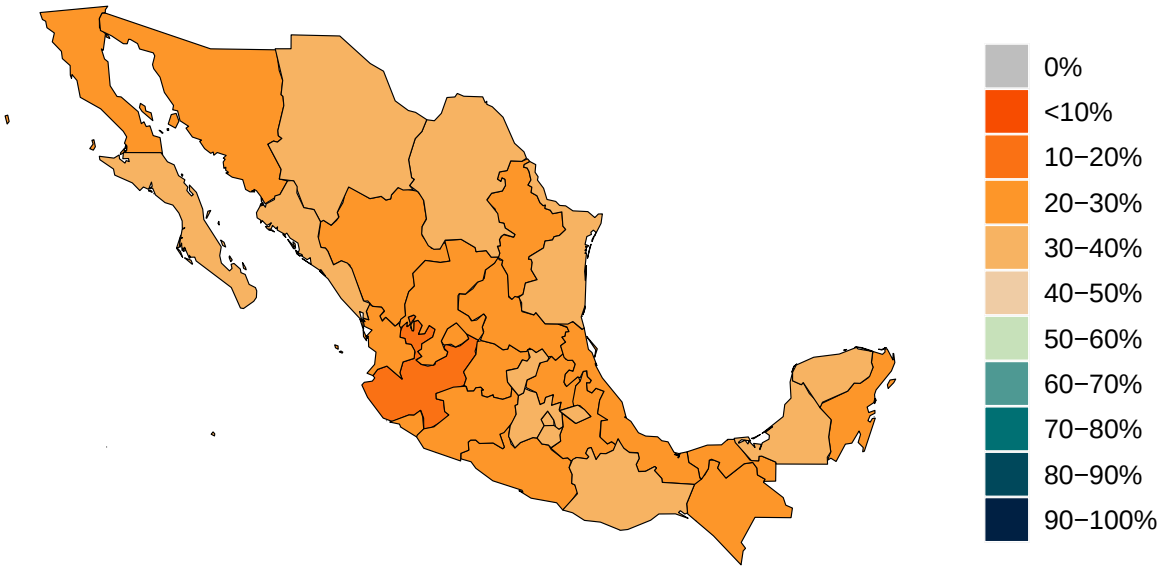


Figure 15.1: Trend in COVID-19 diagnostic tests per 100,000 people

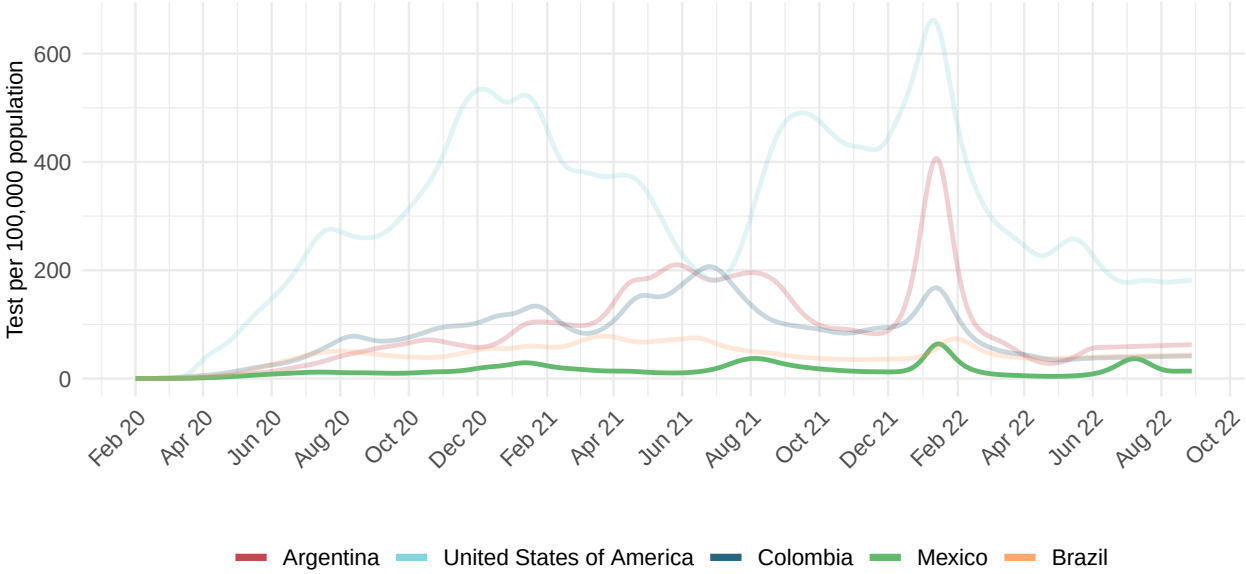


Figure 16.1: COVID-19 diagnostic tests per 100,000 people on August 29, 2022

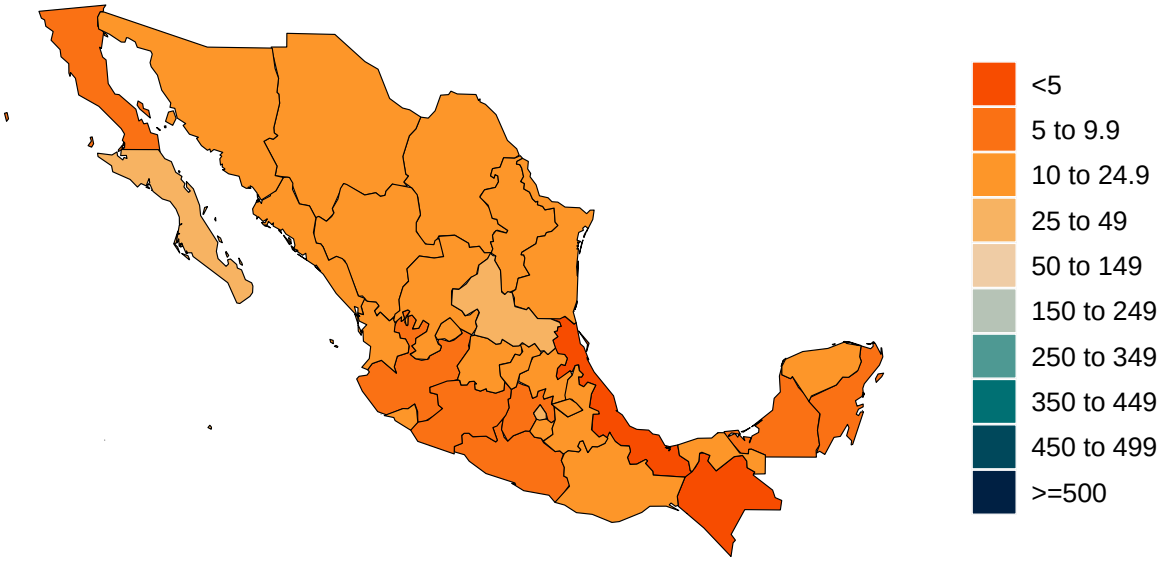


Table 3: Estimates of vaccine effectiveness for specific vaccines used in the model at preventing severe disease and infection. We use data from clinical trials directly, where available, and make estimates otherwise. More information can be found on our website.

	Effectiveness at preventing											
	Ancestral		Alpha		Beta		Gamma		Delta		Omicron	
Vaccine	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection	Severe disease	Infection
AstraZeneca	94%	63%	94%	63%	0.9400000	69%	0.9400000	69%	94%	69%	71%	36%
CanSino	66%	62%	66%	62%	0.6408140	61%	0.6408140	61%	64%	61%	48%	32%
CoronaVac	50%	47%	50%	47%	0.4854651	46%	0.4854651	46%	49%	46%	37%	24%
Covaxin	78%	73%	78%	73%	0.7573256	72%	0.7573256	72%	76%	72%	57%	38%
Johnson & Johnson	86%	72%	86%	72%	0.7600000	64%	0.7600000	64%	76%	64%	57%	33%
Moderna	97%	92%	97%	92%	0.9700000	91%	0.9700000	91%	97%	91%	73%	48%
Novavax	89%	83%	89%	83%	0.8641279	82%	0.8641279	82%	86%	82%	65%	43%
Pfizer/BioNTech	95%	86%	95%	86%	0.9500000	84%	0.9500000	84%	95%	84%	72%	44%
Sinopharm	73%	68%	73%	68%	0.7087791	67%	0.7087791	67%	71%	67%	53%	35%
Sputnik-V	92%	86%	92%	86%	0.8932558	85%	0.8932558	85%	89%	85%	67%	44%
Other vaccines	75%	70%	75%	70%	0.7281977	69%	0.7281977	69%	73%	69%	55%	36%
Other vaccines (mRNA)	91%	86%	91%	86%	0.8835465	85%	0.8835465	85%	88%	85%	67%	45%

Percent of the population having received at least one dose (17.1) and fully vaccinated against SARS-CoV-2 (17.2) by August 29, 2022

Figure 17.1: Percent of the population having received one dose of a COVID-19 vaccine

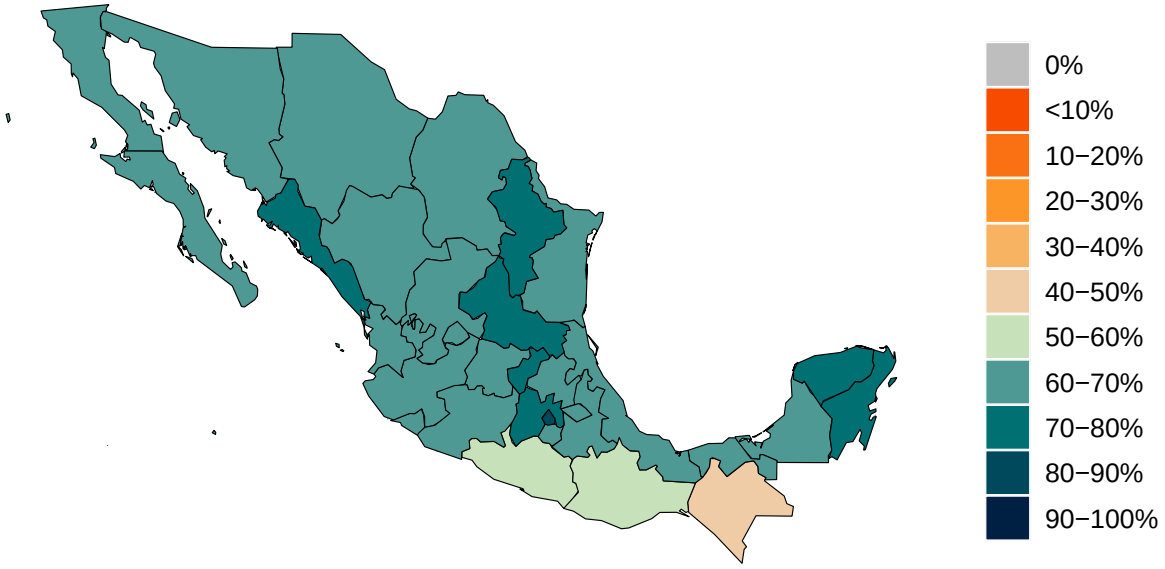


Figure 17.2: Percent of the population fully vaccinated against SARS-CoV-2

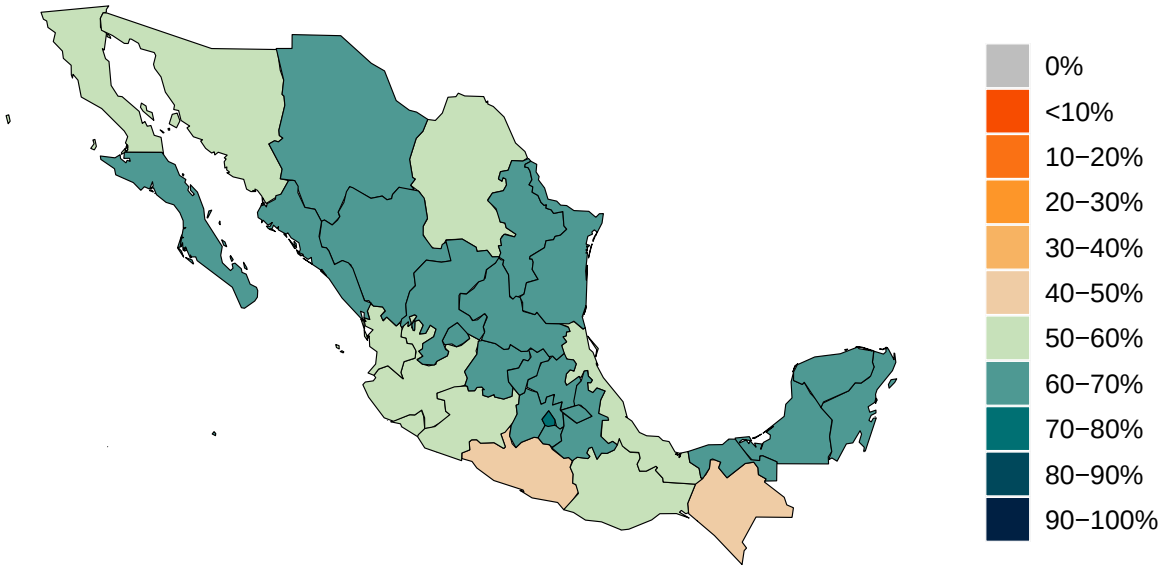


Figure 18.1: Estimated proportion of the total population that is not vaccinated but willing to be vaccinated as of June 24, 2022

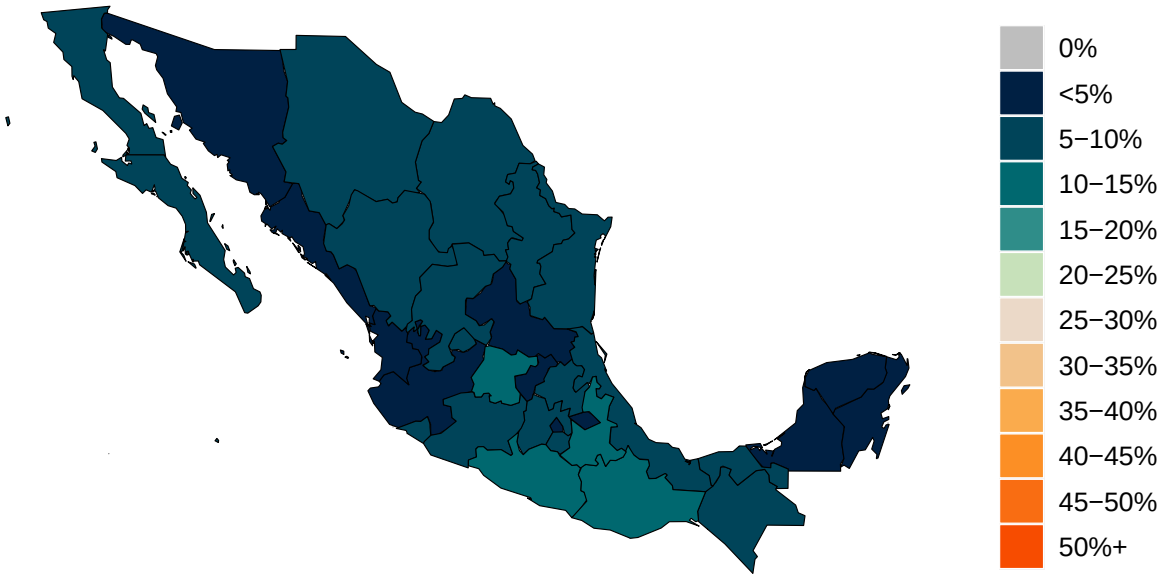


Figure 19.1: Percent of people who receive at least one dose of a COVID-19 vaccine and those who are fully vaccinated

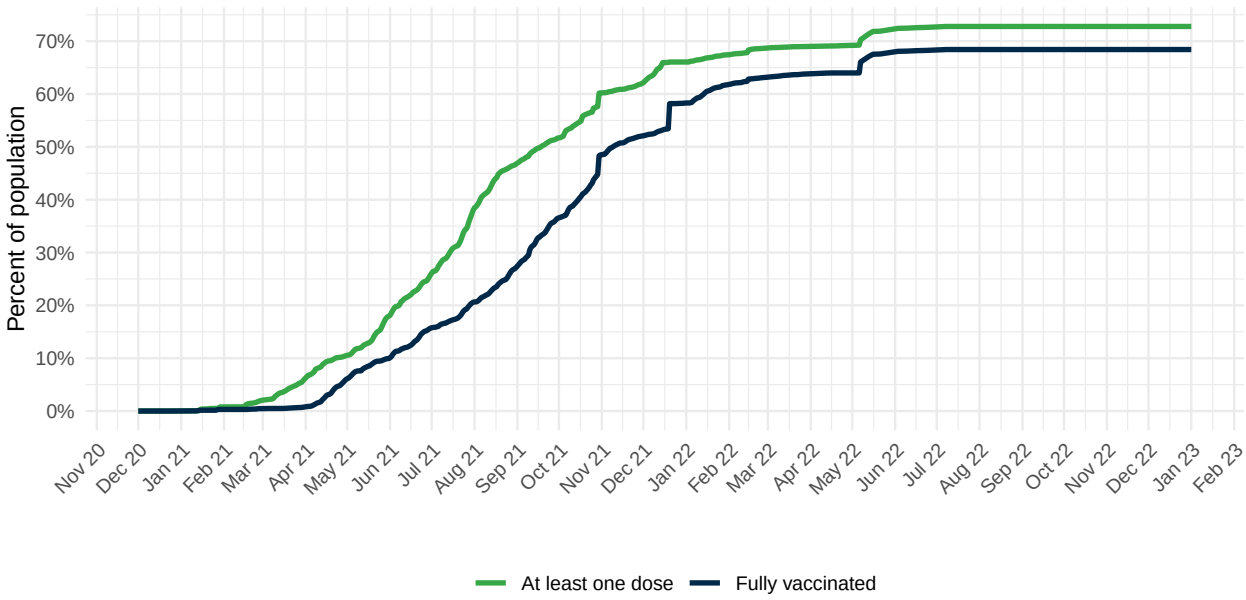
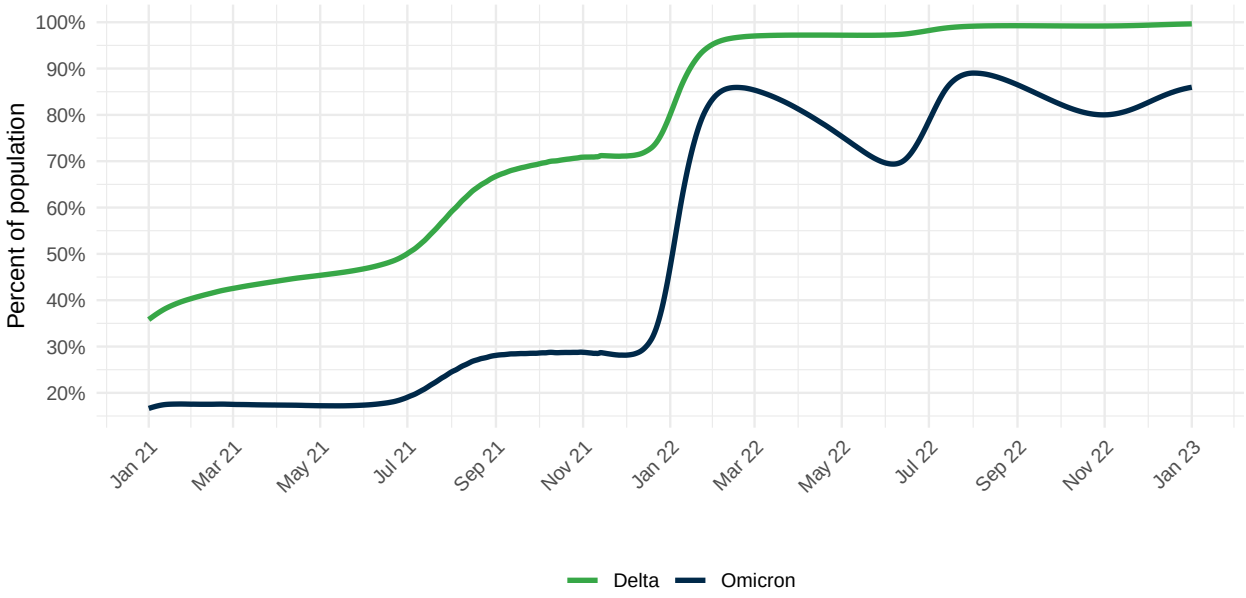


Figure 20.1: Percent of people who are immune to Delta or Omicron. Immunity is based on protection due to prior vaccination and infection(s). Moreover, variant-specific immunity is also based on variant-variant specific protection.



Projections and scenarios

Figure 21.1: Daily COVID-19 infections until January 01, 2023 for three scenarios

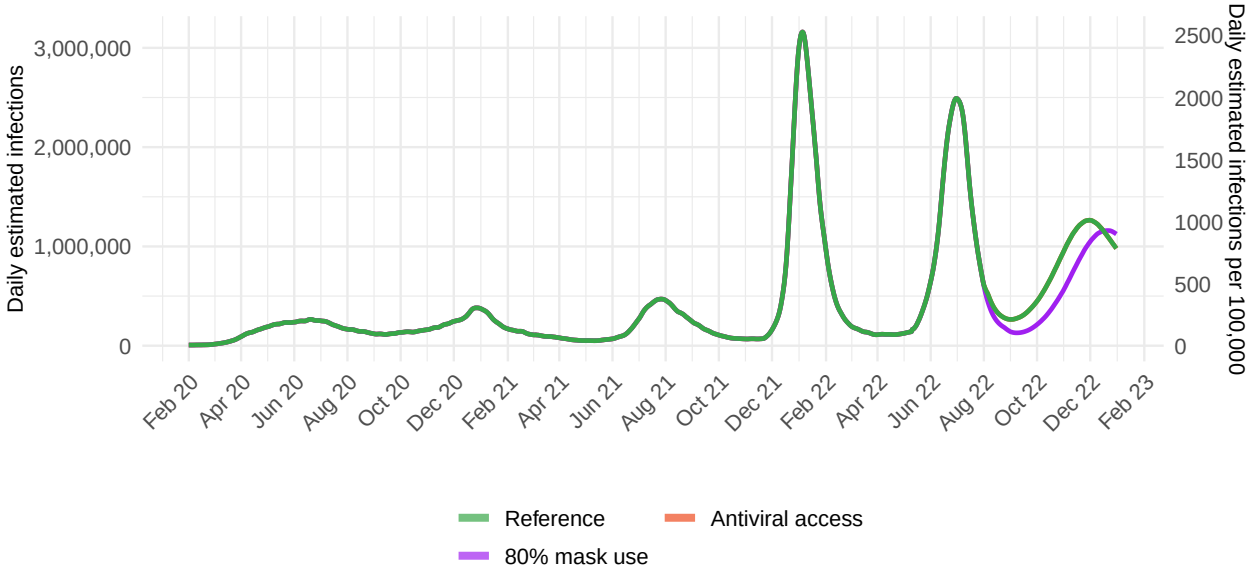


Figure 21.2: Daily COVID-19 reported cases until January 01, 2023 for three scenarios

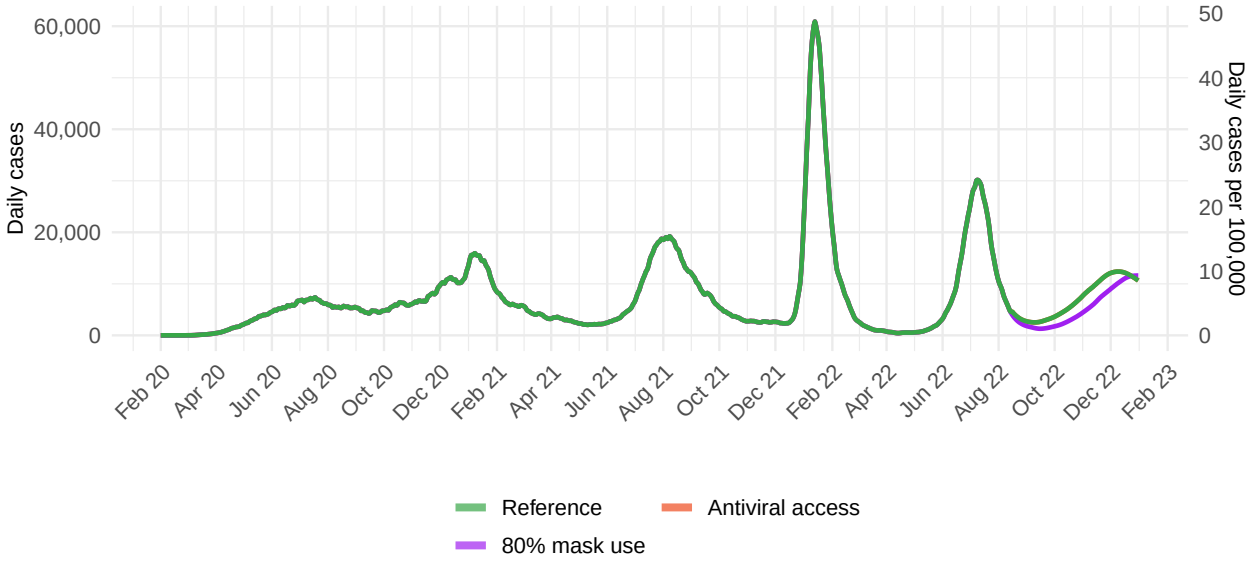


Figure 21.3: Daily COVID-19 hospital census until January 01, 2023 for three scenarios

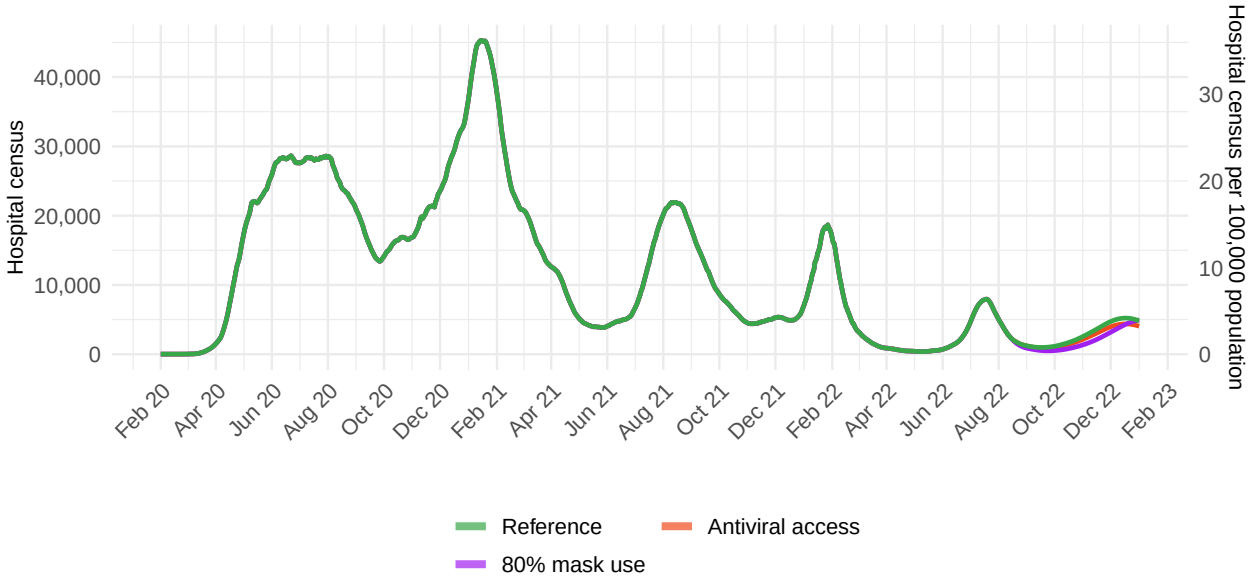


Figure 21.4: Reported daily COVID-19 deaths per 100,000

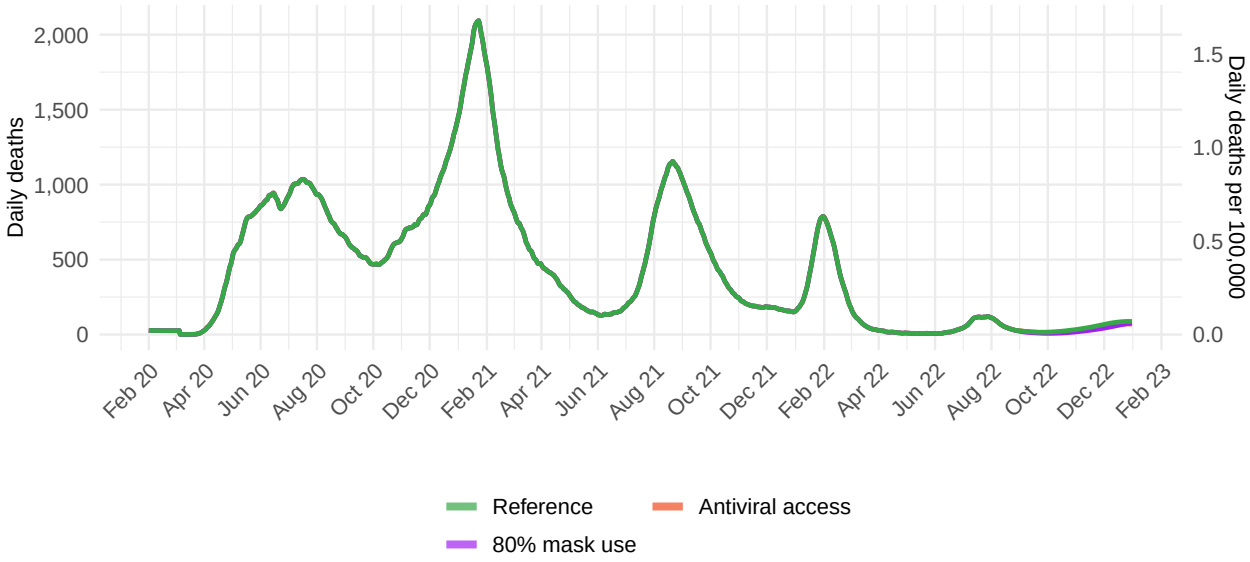


Figure 21.5: Total daily COVID-19 deaths per 100,000

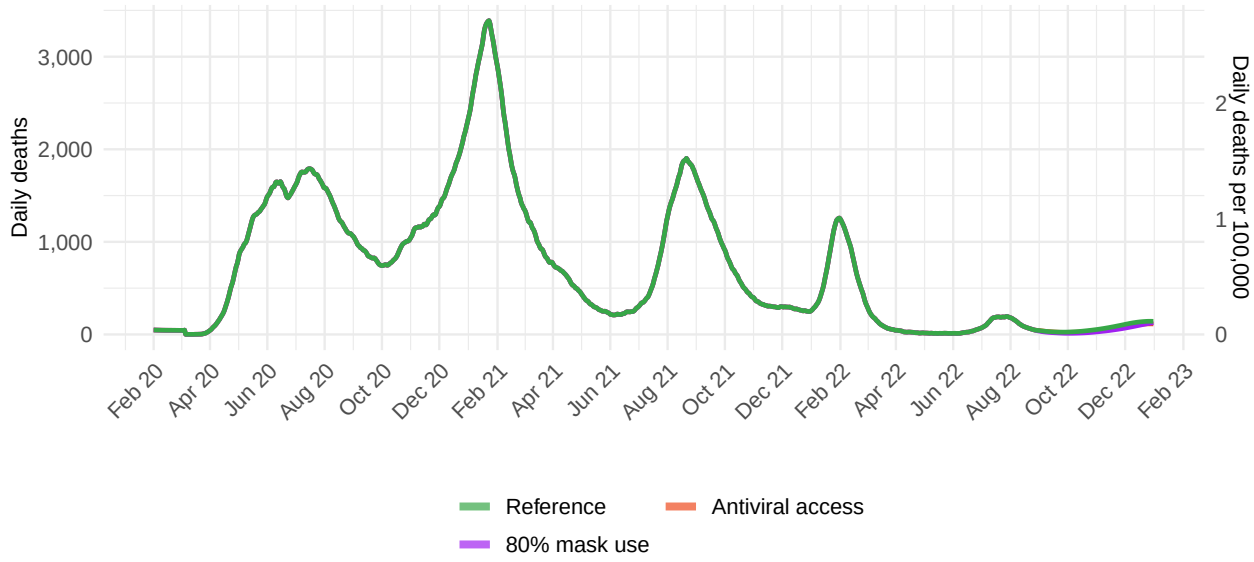


Figure 22.1: Comparison of reference model projections with other COVID modeling groups. For this comparison, we are including projections of daily COVID-19 deaths from other modeling groups when available, last model update in brackets: the SI-KJalpha model from the University of Southern California (SIKJalpha) [August 28, 2022]. Regional values are aggregates from available locations in that region.

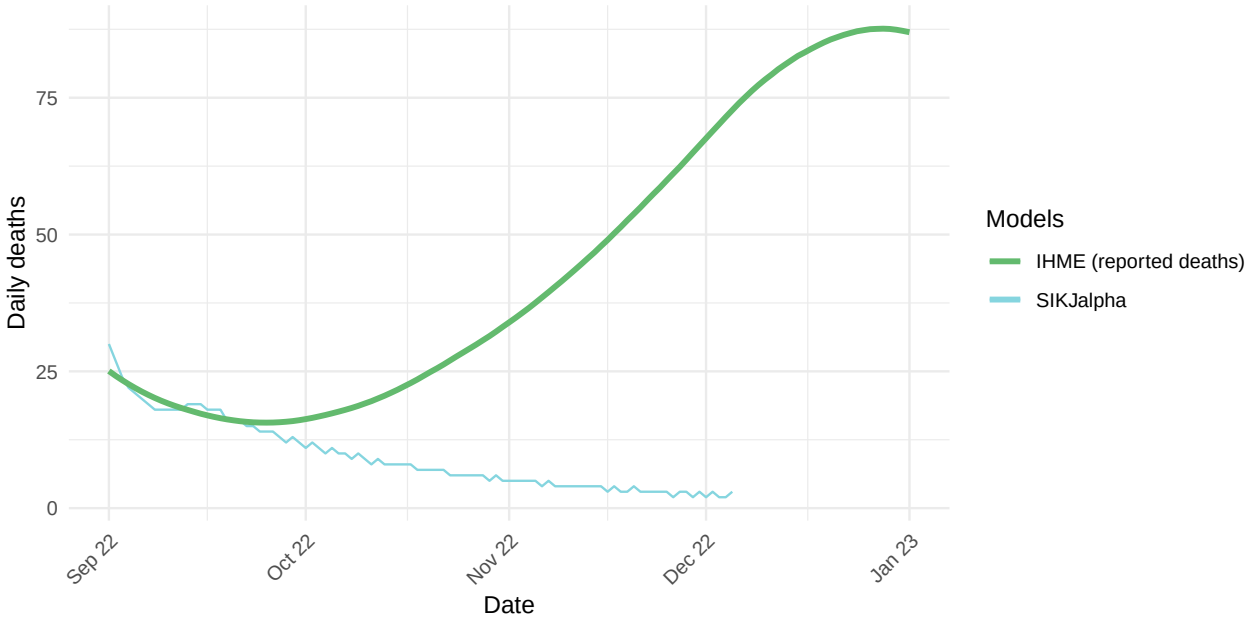


Figure 23.1: The estimated inpatient hospital usage is shown over time. The percent of hospital beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of beds occupied by COVID-19 patients. Less than 5% is considered *low stress*, 5-9% is considered *moderate stress*, 10-19% is considered *high stress*, and 20% or greater is considered *extreme stress*.

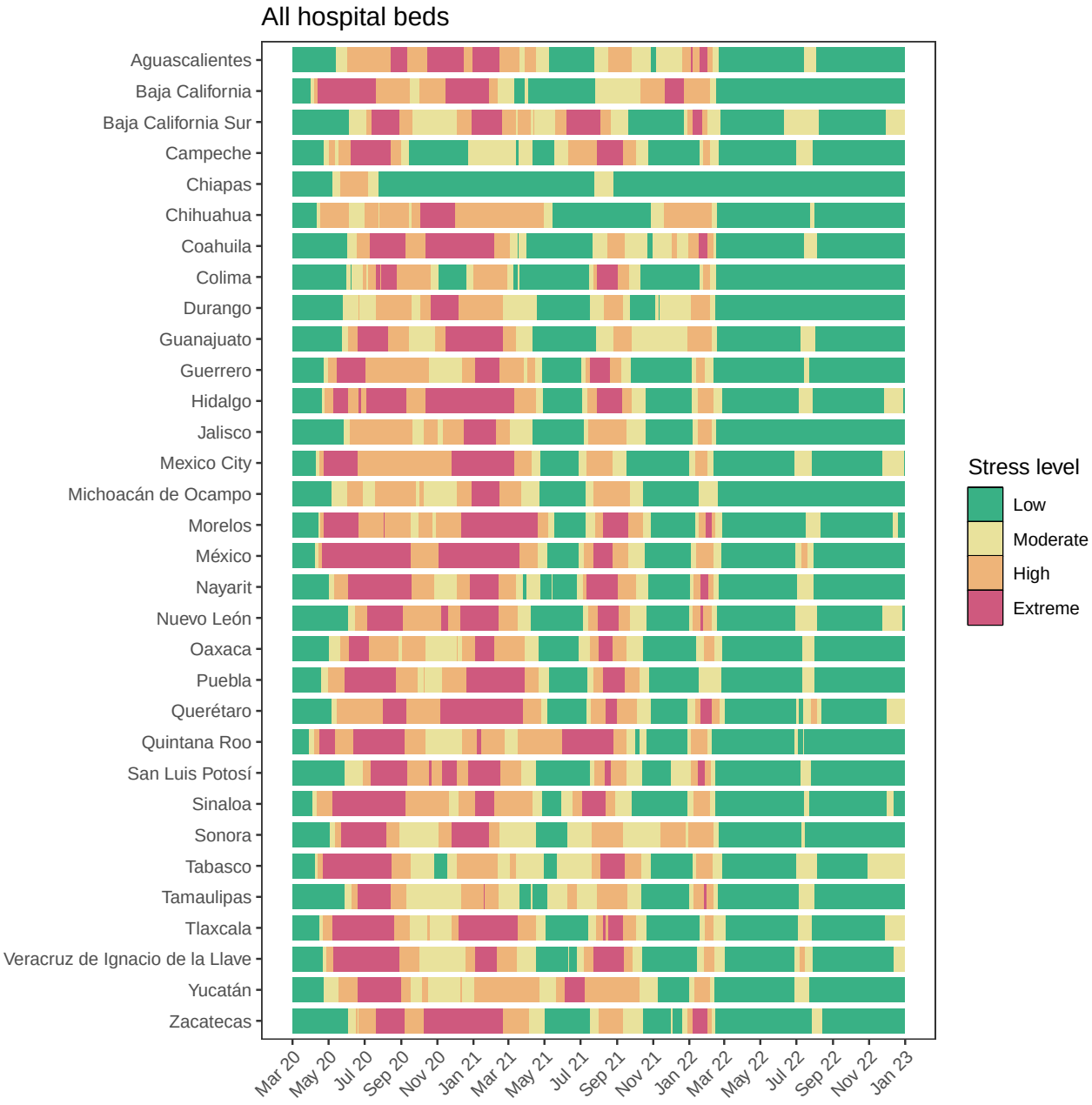
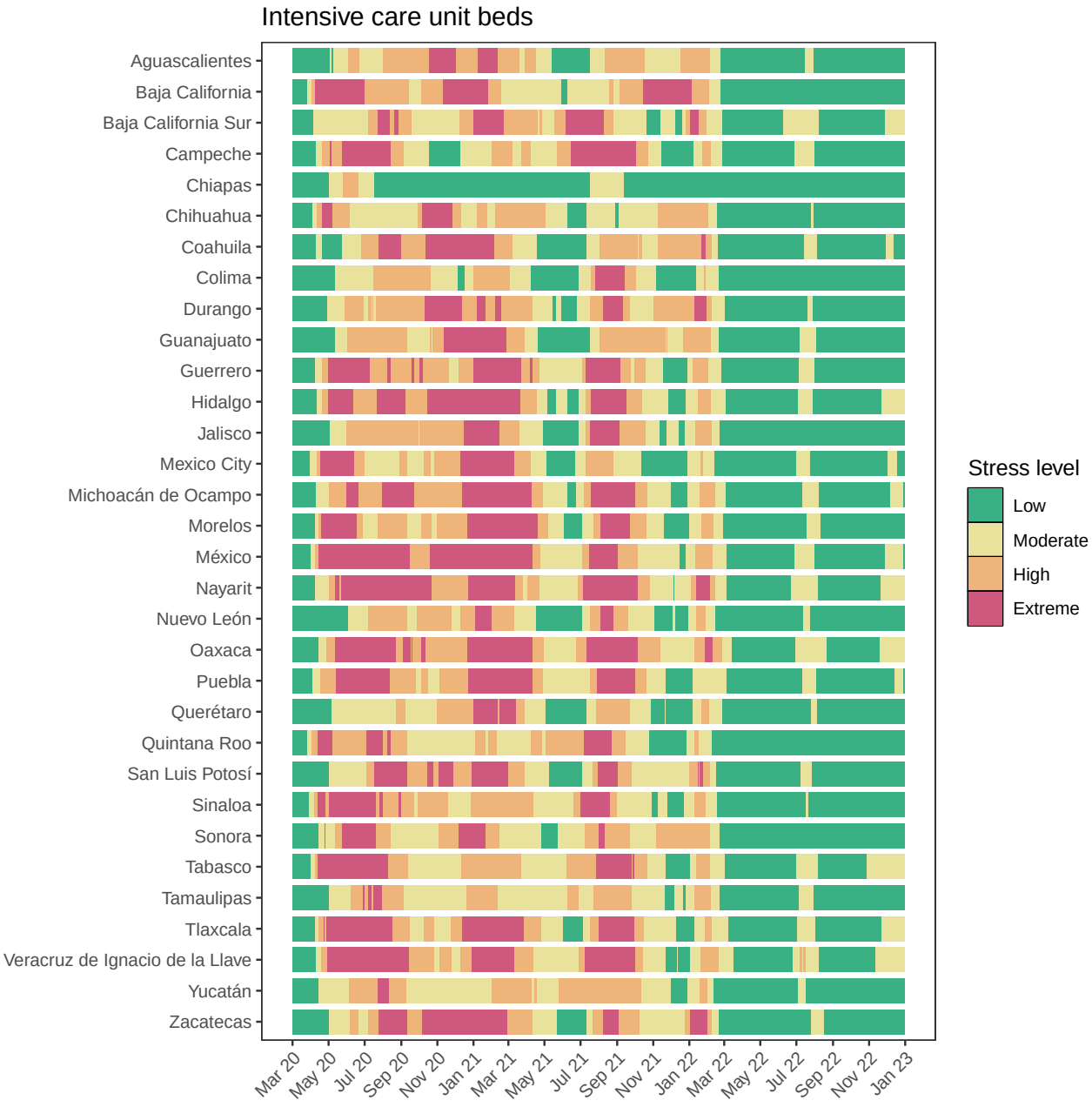


Figure 24.1: The estimated intensive care unit (ICU) usage is shown over time. The percent of ICU beds occupied by COVID-19 patients is color-coded based on observed quantiles of the maximum proportion of ICU beds occupied by COVID-19 patients. Less than 10% is considered *low stress*, 10-29% is considered *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.

To download our most recent results, visit our Data downloads page.

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