ESPAÑOL

Los casos se han mantenido constantes, pero las muertes han disminuido durante las últimas semanas. Las proyecciones que hace IHME de muertes acumuladas para el 1 de enero aumentaron a 139,894. Si la inmunidad colectiva se presentara a un nivel bajo, como el 40% de personas infectadas, para el 1 de enero también aumentaría a 159,385 muertes.

Situación actual

- Los casos confirmados se mantienen relativamente constantes desde finales de agosto (Figura 1).
- Las muertes diarias han ido disminuyendo constantemente hasta llegar a 520 por día en la última semana (Figura 2) El COVID-19 sigue siendo la primera causa de muerte en la nación (Tabla 1).
- La R efectiva basada en el análisis combinado de casos, hospitalizaciones y muertes permanece por encima de 1 en Michoacán, Ciudad de México, Morelos, Tamaulipas, Coahuila y Chihuahua (Figura 3).
- Aunque en México no se ha abierto una discusión como en EEUU sobre inmunidad colectiva. Observamos que 7 estados presentan cifras por encima de 27% y menor a 36%: Campeche, Tlaxcala, Sinaloa, Sonora, Baja California, Yucatán y Tabasco; todavía debajo de los niveles superiores a 40% observados en la Ciudad de México, Ecuador y partes de Brasil (Figura 4).
- La mortalidad diaria por COVID-19 es mayor a cinco por un millón de habitantes en Sinaloa, Coahuila, Nuevo León, Zacatecas, Aguascalientes, Guanajuato, Ciudad de México, Quintana Roo, y Yucatán, y por arriba de 7 por un millón en San Luis Potosí (Figura 6).

Factores impulsores de las tendencias de transmisión (movilidad, uso de cubrebocas, pruebas y estacionalidad)

- La movilidad se ha mantenido bastante parecida a la última semana en algunos estados. Otros presentan movilidad similar a la que había la segunda semana de marzo cuando empezaban las medidas de contención, entre otros: Durango, Zacatecas, Coahuila, Guanajuato, Querétaro, Michoacán, Estado de México y Tlaxcala (Figura 8)
- No hay cambios en el uso de mascarillas en comparación con la semana anterior. En promedio el 82% usa mascarilla al salir de casa en el país (Figura 9).

Proyecciones

- Nuestro pronóstico de muertes acumuladas para el 1 de enero ha aumentado de 138,416 hace una semana a 139,894 ahora. En gran medida se explica por el incremento en las defunciones en Coahuila y Nuevo León. (Figura 12)
- Entre ahora y el 1 de enero si se incrementarán 67,164 muertes. De aumentar el uso de mascarillas al 95% puede salvar 5,592 vidas si se compara con el escenario de referencia y hasta 25,083 si se compara con el peor escenario o de inmunidad colectiva. En el primer caso reduciendo ese número esperado de muertes en 4% y en el segundo escenario 16% (Figura 13).
- Los estados que de acuerdo a las proyecciones necesitan re-imponer mandatos para octubre Durango, Ciudad de México, Nuevo León y Guanajuato. En noviembre, 10 estados y 10 más en el mes de diciembre. Quedando fuera de estas reimposiciones en lo que resta del año Chiapas, Tabasco, Campeche, Colima, Tlaxcala, Aguascalientes, Baja California Sur, y Tamaulipas (Figura 15).
- Con excepción de Chiapas, el resto del país presentará más 20% de la población infectada, destacando en el sentido opuesto que 11estados rebasaran 40% de la población infectada para el 1 de enero de 2021 (Figura 16)

- La tasa de mortalidad diaria para el 1 de enero de 2021 en el país es muy heterogénea. Por abajo de 2 por 1 millón de habitantes se ubican Chiapas, Ciudad de México,. En contraste por arriba de 8 por un millón de habitantes estarán Oaxaca, Puebla, Veracruz, Coahuila y Baja California (Figura 17).
- Al terminar 2020, de acuerdo con las estimaciones de IHME, la primera causa de muere será COVID19 en México (tabla 2).

Notas metodológicas

- Con cada reestimación de los coeficientes de regresión durante los últimos 3 meses para predecir b (t), el parámetro de transmisión, el coeficiente de pruebas per cápita ha tendido a acercarse a 0. En muchos de los 1000 modelos, el coeficiente es ahora 0. Este papel cada vez menor de las pruebas en la reducción de la transmisión visto empíricamente puede tener varias explicaciones. Primero, se están realizando muchas pruebas en algunos países, pero los resultados no se devuelven lo suficientemente rápido como para afectar la transmisión. En segundo lugar, dado que la mayoría de las pruebas todavía se realizan en individuos sintomáticos, las pruebas per cápita pueden estar poco correlacionadas con las pruebas reales de los contactos que pueden tener un mayor impacto en la reducción de la transmisión. En tercer lugar, cuando la epidemia comienza a aumentar, aumentan las pruebas de síntomas y viceversa.
- Dada la considerable discusión pública sobre el papel de la inmunidad colectiva en la explicación de los picos y posteriores disminuciones en la tasa diaria de muertes y casos, hemos explorado la tasa de muerte total implícita en función de la tasa de mortalidad por infección y diferentes suposiciones sobre el nivel de Infección acumulada que se asociará con la inmunidad colectiva. El experimento natural del portaaviones Charles de Gaulle sugiere que hasta el 70% de las personas pueden infectarse en una situación de mezcla casi aleatoria. Pero varias teorías, incluido el papel de los super-propagadores, la mezcla no aleatoria en poblaciones menos densas, las redes sociales que no se superponen y alguna inmunidad anterior al coronavirus, han llevado a teorías de que la inmunidad colectiva puede tener lugar en niveles mucho más bajos de casos infectados. En las redes sociales, hay desafortunadas afirmaciones de que la inmunidad colectiva puede ocurrir a niveles inferiores a 20% de infección acumulada. Sin embargo, en la Ciudad de México ya superan 40% y no se observa efecto alguno. Nuestro TLI basado en el análisis de datos de seroprevalencia e inmunidad de grupo al 40% de infección acumulada sugeriría que México se llegaría a 164 mil muertes (actualmente tiene 19.6%), la inmunidad de grupo al 50% de infección acumulada la cifra sería de 183 mil muertes y al 65% serán 238 mil muertes. La ampliación de una vacuna o la mejora de los tratamientos podrían reducir sustancialmente estas cifras. Estos cálculos solo sirven para sugerir que la epidemia en México está lejos de ser completa y puede que incluso en el escenario optimista de que la inmunidad colectiva se active con 40% de infección acumulada sea menos de la mitad de la epidemia el 1 de enero.

IHME desea agradecer calurosamente el apoyo de estos y otros que han hecho posible nuestros esfuerzos de estimación de COVID-19. Gracias.

Para ver todos los recursos de COVID-19 en IHME, visite http://www.healthdata.org/covid.

Preguntas? ¿Peticiones? ¿Realimentación? Comuníquese con nosotros en https://www.healthdata.org/covid/contact-us.

ENGLISH

Cases have remained constant, but deaths have decreased over the past few weeks. IHME projections of cumulative deaths for January 1 increased to 139,894. If herd immunity were to occur at a low level, such as 40% of the population infected, by January 1 the cumulative deaths would also increase to 159,385.

Current situation

- Confirmed cases have remained relatively constant since the end of August (Figure 1).
- Daily deaths have been steadily decreasing to 520 per day in the last week (Figure 2). COVID-19 remains the leading cause of death in the nation (Table 1).
- The effective R based on the combined analysis of cases, hospitalizations, and deaths remains above 1 in Michoacán, Mexico City, Morelos, Tamaulipas, Coahuila, and Chihuahua (Figure 3).
- Although Mexico has not opened a discussion as in the US about herd immunity, we observe that seven states present cumulative infections above 27% and below 36%: Campeche, Tlaxcala, Sinaloa, Sonora, Baja California, Yucatan, and Tabasco; still below the levels above 40% observed in Mexico City, Ecuador, and parts of Brazil (Figure 4).
- Daily mortality from COVID-19 is greater than five per one million inhabitants in Sinaloa, Coahuila, Nuevo Leon, Zacatecas, Aguascalientes, Guanajuato, Mexico City, Quintana Roo, and Yucatan, and greater than seven per one million in San Luis Potosi (Figure 6).

Trends in key drivers of transmission (mobility, mask use, testing, and seasonality)

- Mobility has remained quite similar to last week in some states. Others show similar mobility to that which existed in the second week of March when containment measures began, including: Durango, Zacatecas, Coahuila, Guanajuato, Querétaro, Michoacán, State of México, and Tlaxcala (Figure 8).
- No change was observed in mask usage compared to the previous week. On average, 82% wear masks when leaving home in the country (Figure 9).

Projections

- Our forecast of cumulative deaths for January 1 has increased from 138,416 a week ago to 139,894 now. This is largely explained by the increase in deaths in Coahuila and Nuevo Leon. (Figure 12).
- Between now and January 1, there will be an increase of 67,164 deaths. Increasing mask use to 95% can save 5,592 lives compared to the baseline scenario and up to 25,083 lives compared to the worst-case or herd immunity scenario. In the first scenario the expected number of deaths could be reduced by 4% and in the second scenario by 16% (Figure 13).
- The states that according to the projections need to re-impose mandates by October are Durango, Mexico City, Nuevo Leon, and Guanajuato. In November, ten states will need to re-impose mandates, and ten more will need to do so in December. States that will not need to re-impose mandates for the rest of the year are Chiapas, Tabasco, Campeche, Colima, Tlaxcala, Aguascalientes, Baja California Sur, and Tamaulipas (Figure 15).
- With the exception of Chiapas, the rest of the country will have more than 20% of the population infected, with 11 states exceeding 40% of the population by January 1, 2021 (Figure 16).
- The daily mortality rate projected for January 1, 2021 in the country is very heterogeneous. Below two per 1 million inhabitants are located Chiapas, Mexico City. In contrast, Oaxaca, Puebla, Hidalgo, Veracruz, Sonora, Coahuila, and Baja California are all above eight per million inhabitants (Figure 17).

- At the end of 2020, according to IHME estimates, the leading cause of death in Mexico will be COVID-19 (Table 2).

Model updates

- With each re-estimate of the regression coefficients over the past three months to predict b (t), the transmission parameter, the per capita test coefficient has tended to approach 0. In many of the 1000 models, the coefficient is now 0. This decreasing role of tests in reducing transmission seen empirically may have several explanations. First, many tests are being conducted in some countries, but the results are not being returned quickly enough to affect transmission. Second, because most testing is still done on symptomatic individuals, per capita testing may be poorly correlated with actual contact testing that can have a greater impact on reducing transmission. Third, when the epidemic begins to grow, evidence of symptoms increases and vice versa.
- Given the considerable public discussion about the role of herd immunity in explaining spikes and subsequent declines in daily death and case rates, we have explored the implied total death rate as a function of the infection mortality rate and different assumptions about the level of cumulative infection that will be associated with herd immunity. The natural experiment on the Charles de Gaulle aircraft carrier suggests that up to 70% of people can be infected in an almost random mixing situation. But several theories, including the role of super-spreaders, non-random mixing in less dense populations, non-overlapping social networks, and some pre-coronavirus immunity, have led to theories that herd immunity may occur at much lower levels of infected cases. In social networks, there are unfortunate claims that herd immunity can occur at levels below 20% of cumulative infection. However, in Mexico City the cumulative infections already exceed 40% and no effect is observed. Our IFR based on the analysis of seroprevalence data and group immunity at 40% cumulative infection suggests that Mexico would reach 164,000 deaths (it is currently at 19.6%). For herd immunity at 50% cumulative infection, the number of deaths would be 183,000 and at 65% would be 238,000 deaths. Introducing a vaccine or improving treatments could substantially reduce these figures. These calculations only serve to suggest that the epidemic in Mexico is far from complete and perhaps even in the optimistic scenario that herd immunity is activated with 40% cumulative infection, the epidemic will still only be half over by January 1.

IHME wishes to warmly acknowledge the support of these and others who have made our COVID-19 estimation efforts possible. Thank you.

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.

COVID-19 Results Briefing: Mexico

Institute for Health Metrics and Evaluation (IHME)

September 17, 2020

This briefing contains summary information on the latest projections from the IHME model on COVID-19 in Mexico. The model was run on September 16, 2020.

Model updates

Updates to the model this week include additional data on deaths, cases, and updates on covariates.

Current situation

Figure 1. Reported daily COVID-19 cases

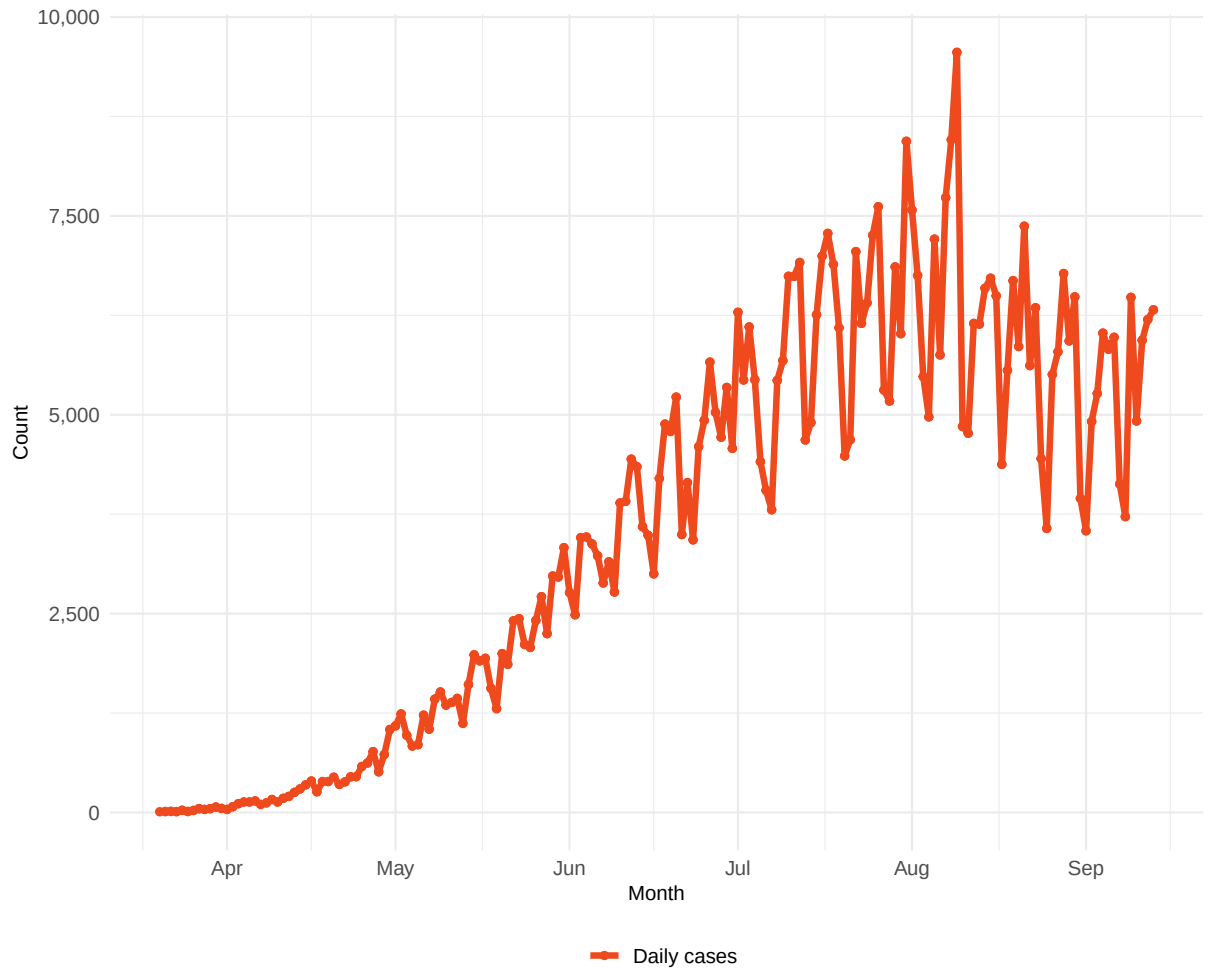


Table 1. Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
COVID-19	3,382	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 2a. Reported daily COVID-19 deaths and smoothed trend estimate

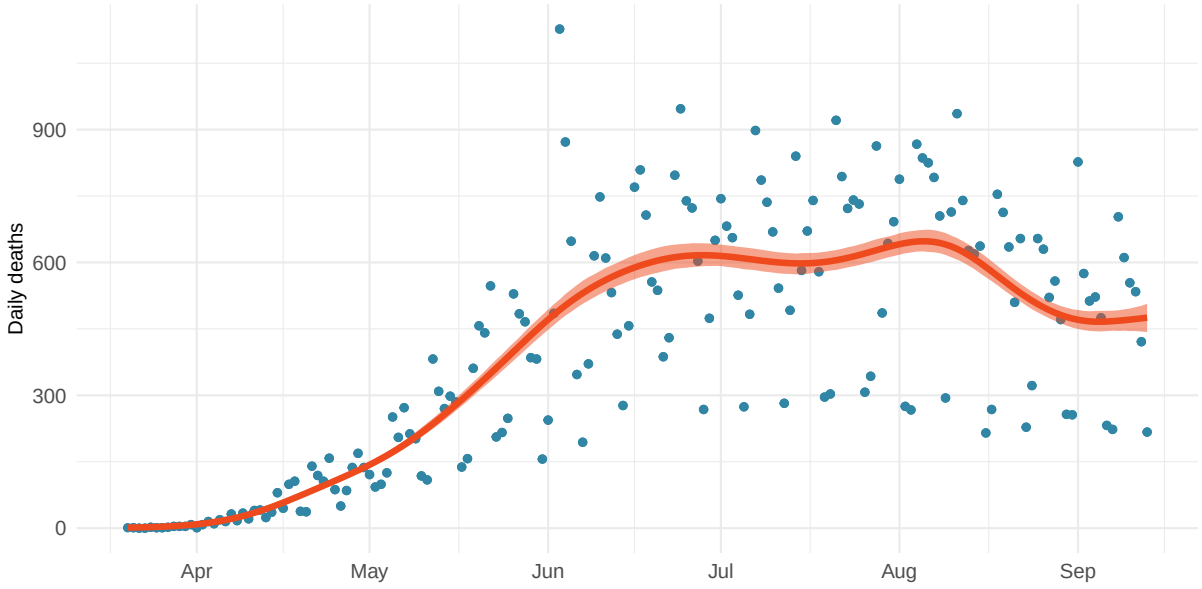


Figure 2b. Estimated cumulative deaths by age group

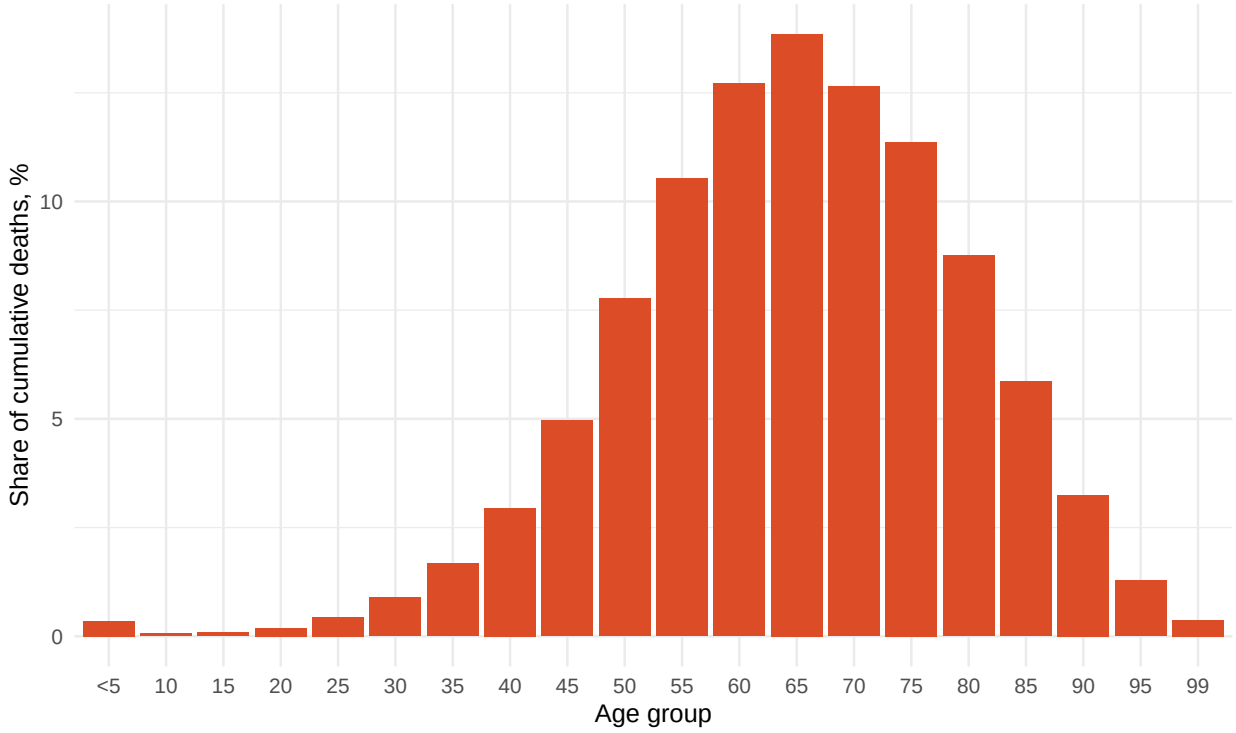


Figure 3. Mean effective R on September 03, 2020. The estimate of effective R is based on the combined analysis of deaths, case reporting and hospitalizations where available. Current reported cases reflect infections 11-13 days prior so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline all other things being held the same.

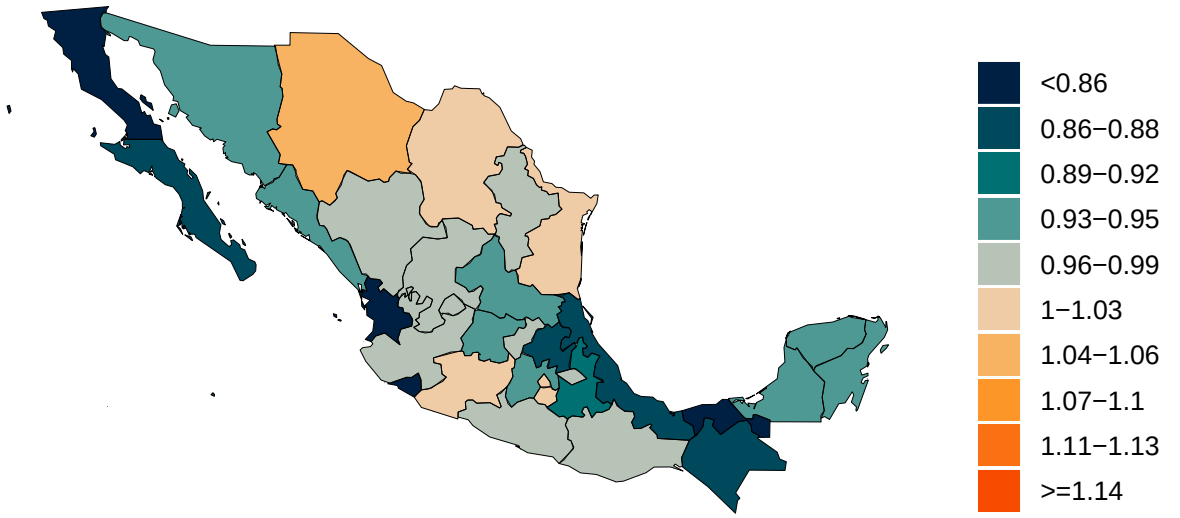


Figure 4. Estimated percent infected with COVID-19 on September 14, 2020

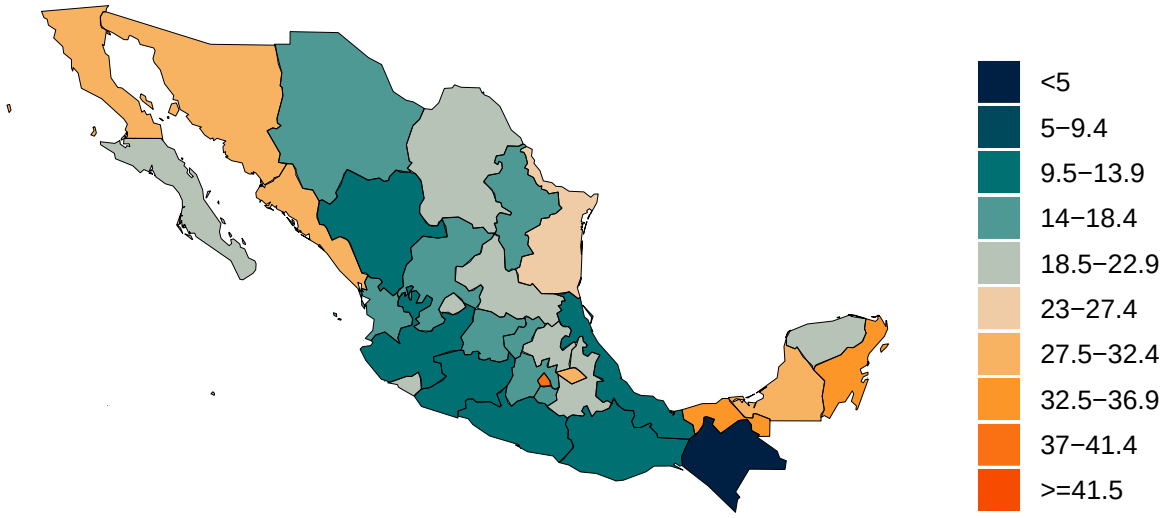


Figure 5. Percent of COVID-19 infections detected. This is estimated as the ratio of reported COVID-19 cases to estimated COVID-19 infections based on the SEIR model.

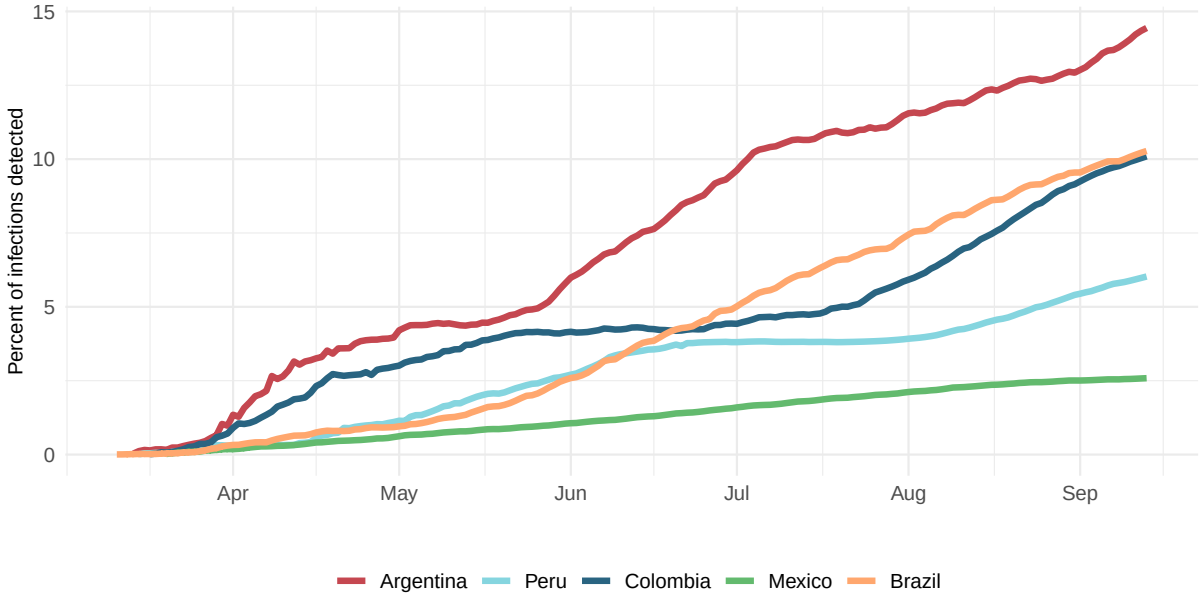
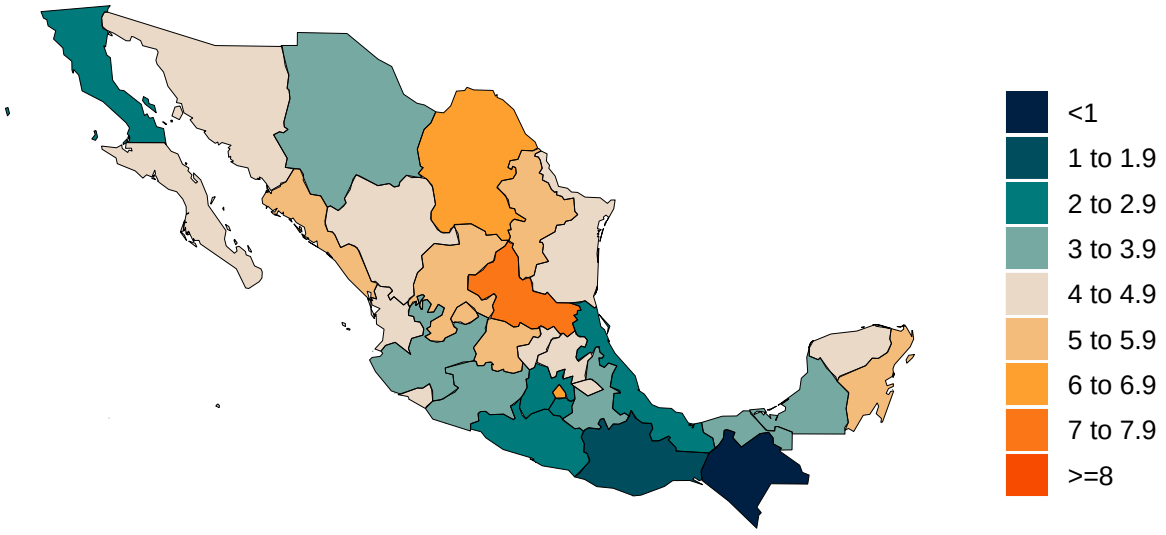


Figure 6. Daily COVID-19 death rate per 1 million on September 14, 2020



Critical drivers

Table 2. Current mandate implementation

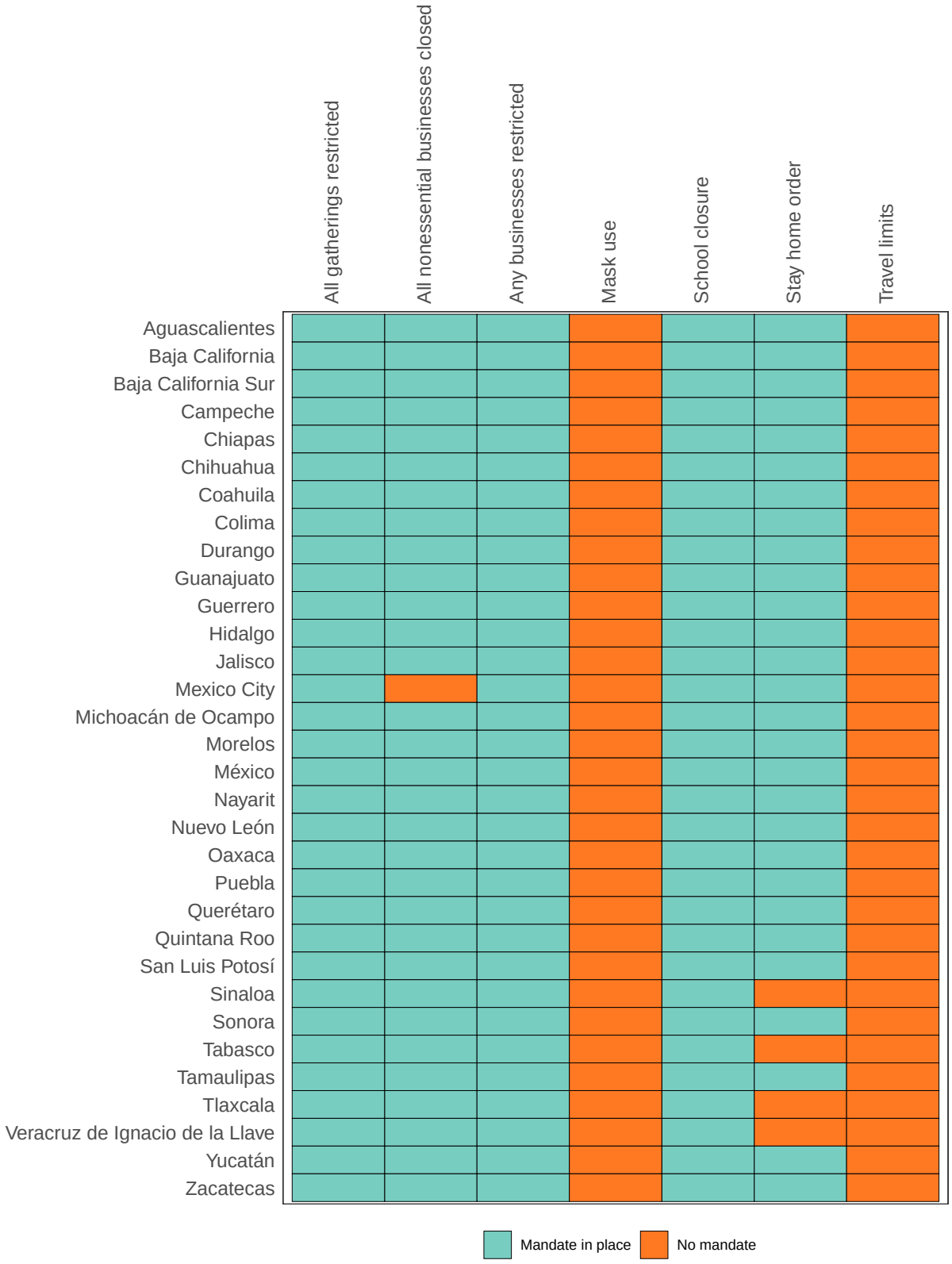


Figure 7. Total number of social distancing mandates (not including mask use)

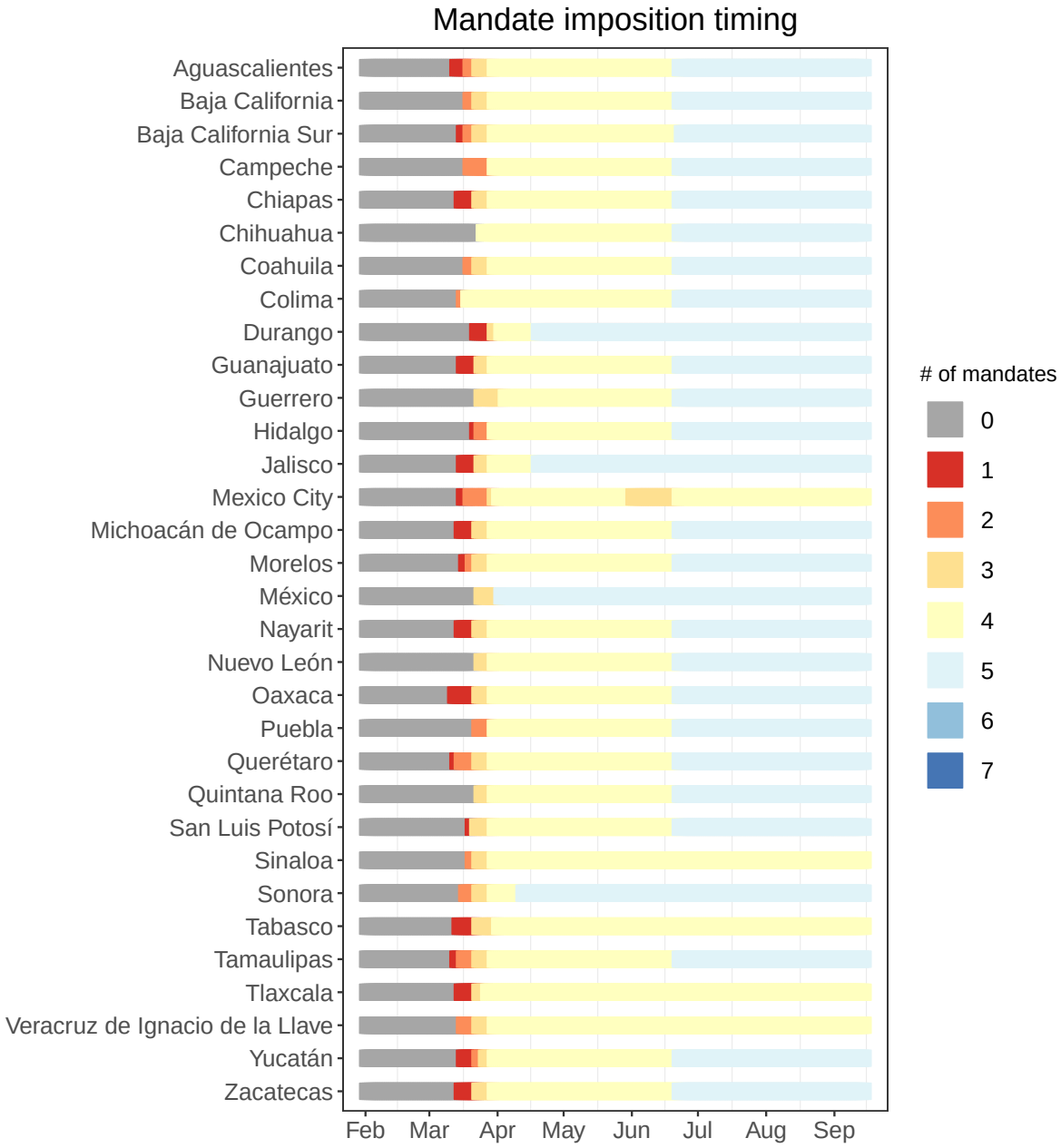


Figure 8a. Trend in mobility as measured through smartphone app use compared to January 2020 baseline

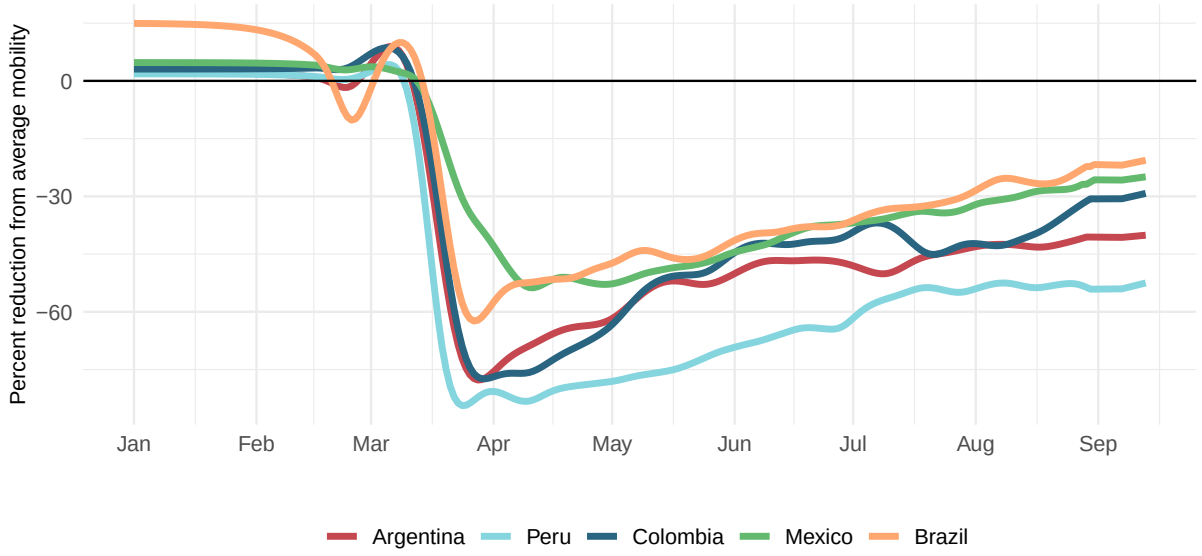


Figure 8b. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent)

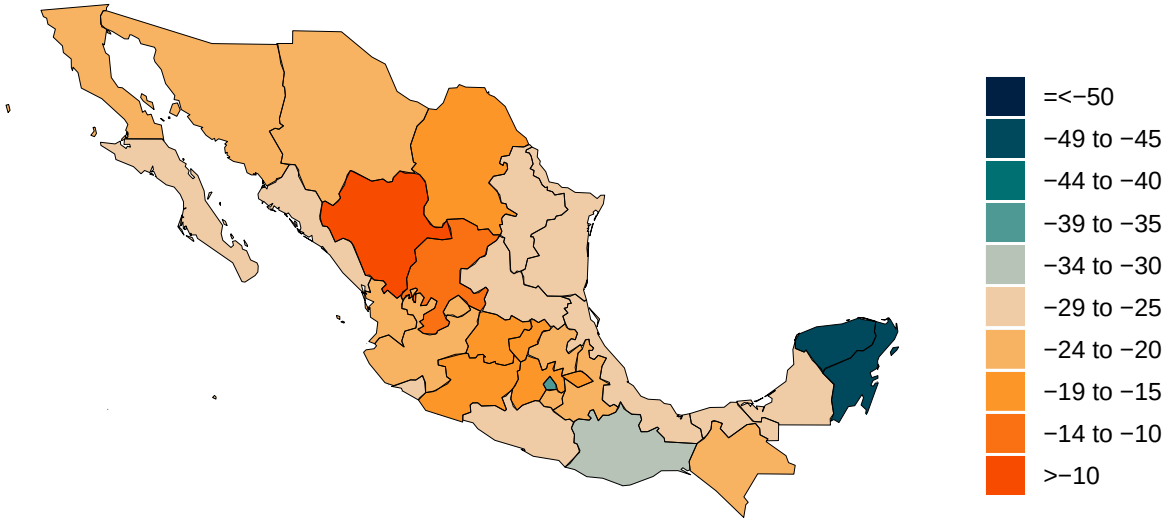


Figure 9a. Trend in the proportion of the population reporting always wearing a mask when leaving home

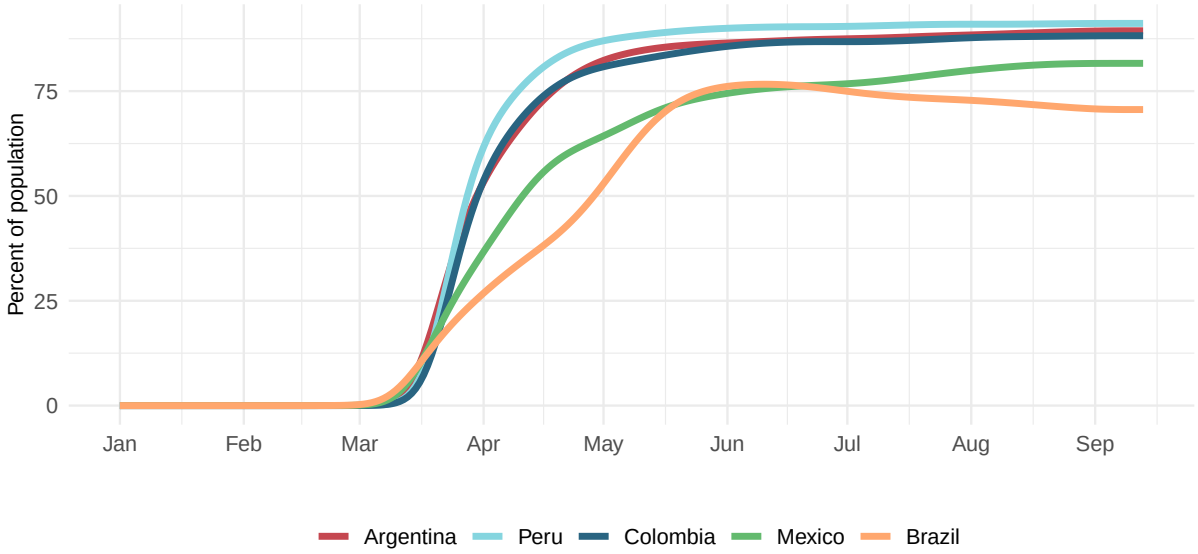


Figure 9b. Proportion of the population reporting always wearing a mask when leaving home on September 14, 2020

Figure 10a. Trend in COVID-19 diagnostic tests per 100,000 people

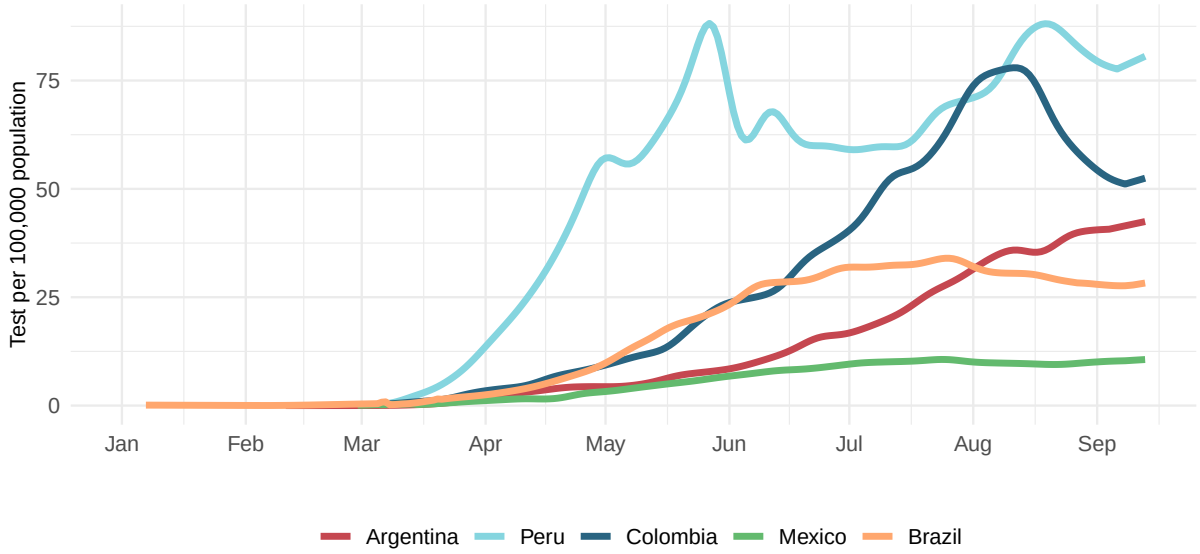


Figure 10b. COVID-19 diagnostic tests per 100,000 people on September 08, 2020

Figure 11. Increase in the risk of death due to pneumonia on February 1 compared to August 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. We assume that if the daily mortality rate from COVID-19 reaches 8 per million, social distancing (SD) mandates will be re-imposed. The mandate easing scenario is what would happen if governments continue to ease social distancing mandates with no re-imposition. The universal mask mandate scenario is what would happen if mask use increased immediately to 95% and social distancing mandates were re-imposed at 8 deaths per million.

Figure 12. Cumulative COVID-19 deaths until January 01, 2021 for three scenarios.

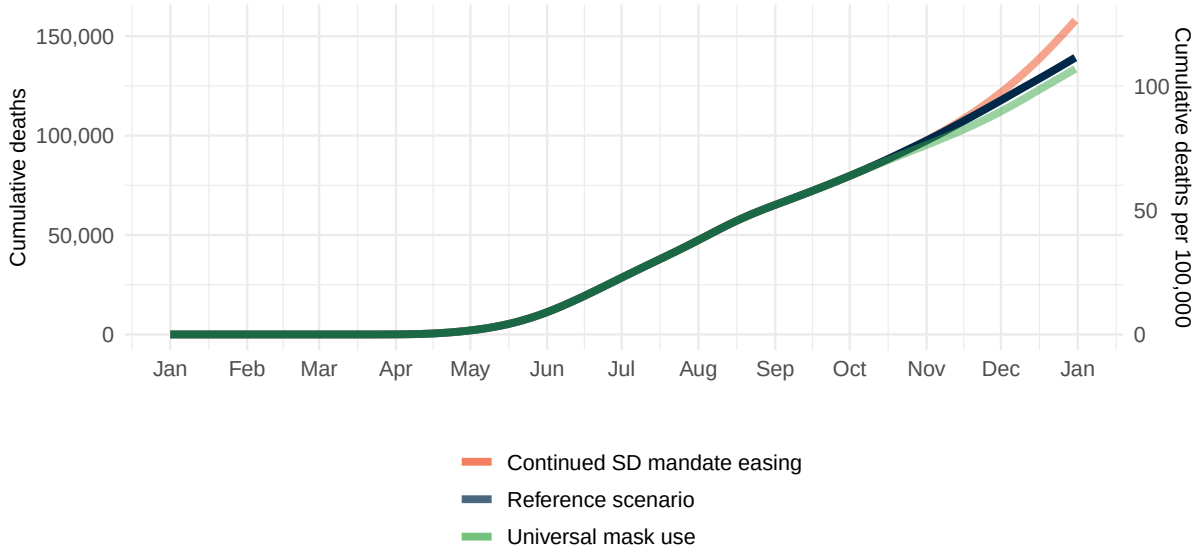


Fig 13. Daily COVID-19 deaths until January 01, 2021 for three scenarios.

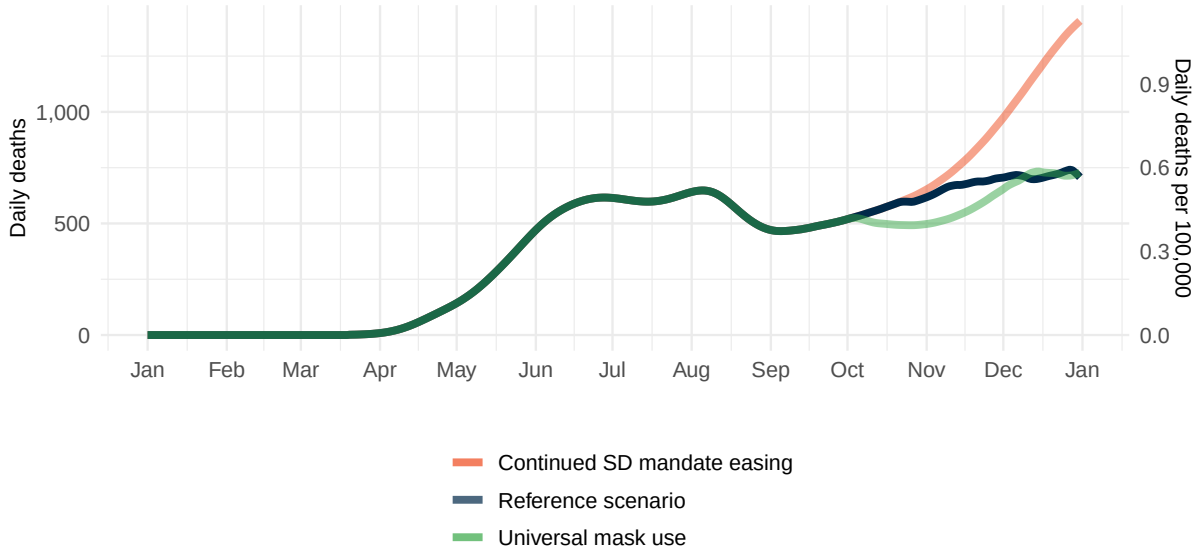


Fig 14. Daily COVID-19 infections until January 01, 2021 for three scenarios.

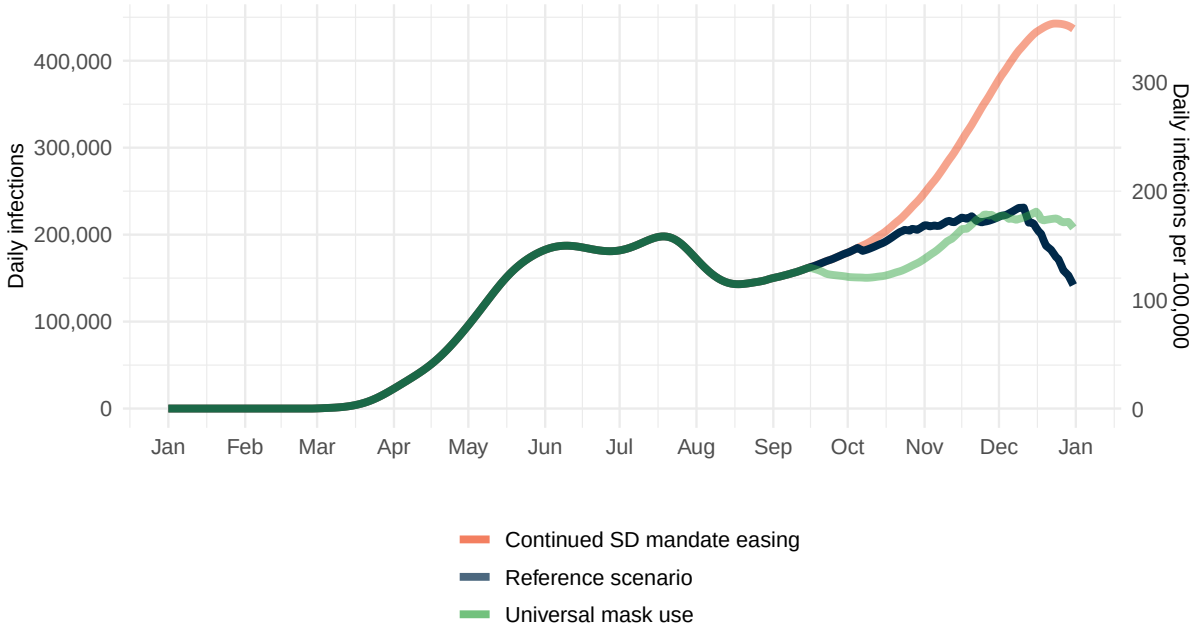


Fig 15. Month of assumed mandate re-implementation. (Month when daily death rate passes 8 per million, when reference scenario model assumes mandates will be re-imposed.)

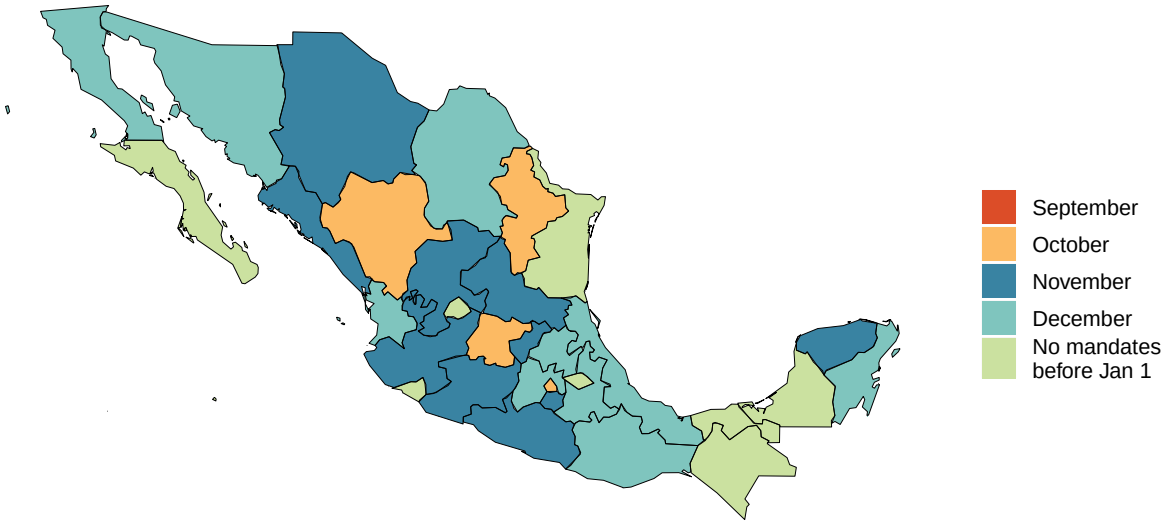


Figure 16. Forecasted percent infected with COVID-19 on January 01, 2021

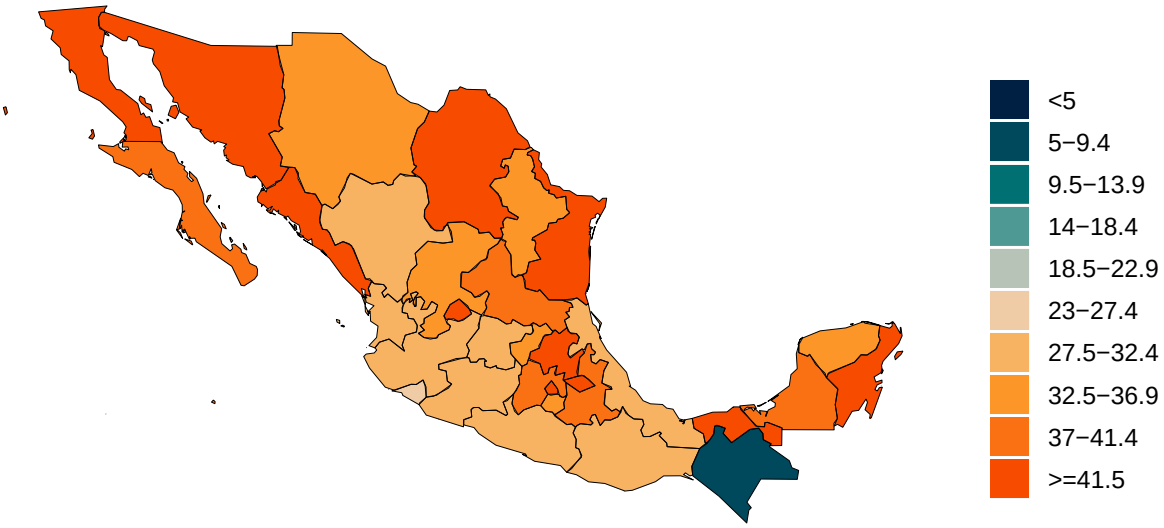


Figure 17. Daily COVID-19 deaths per million forecasted on January 01, 2021 in the reference scenario

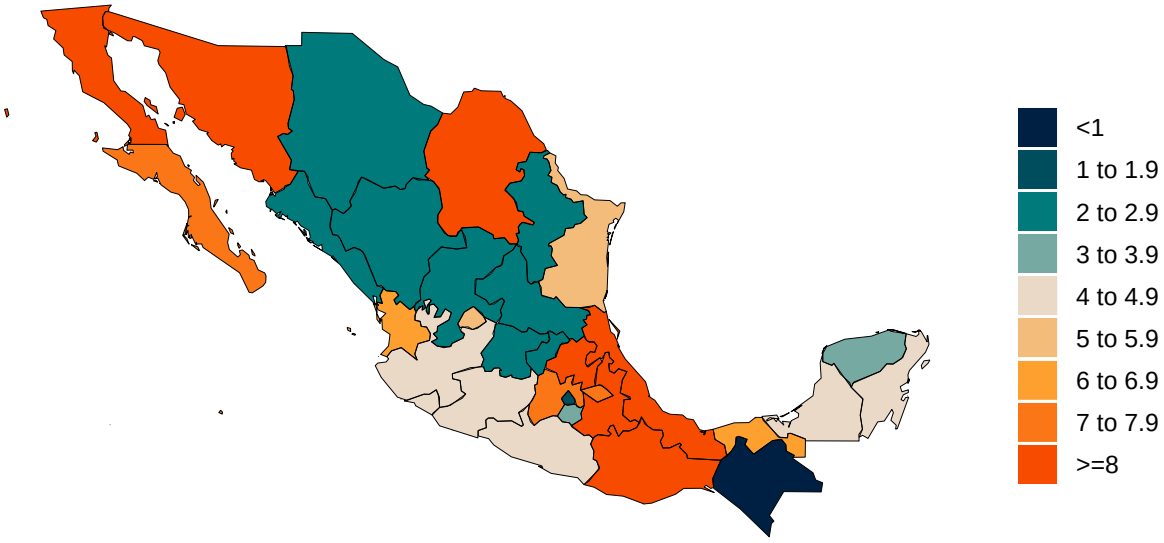


Table 3. Ranking of COVID-19 among the leading causes of mortality in the full year 2020. Deaths from COVID-19 are projections of cumulative deaths on Jan 1, 2021 from the reference scenario. Deaths from other causes are from the Global Burden of Disease study 2019 (rounded to the nearest 100).

Cause name	Annual deaths	Ranking
COVID-19	139,894	1
Ischemic heart disease	106,300	2
Diabetes mellitus	73,800	3
Chronic kidney disease	72,500	4
Cirrhosis and other chronic liver diseases	46,300	5
Stroke	37,900	6
Chronic obstructive pulmonary disease	32,800	7
Interpersonal violence	30,700	8
Alzheimer's disease and other dementias	23,700	9
Lower respiratory infections	22,600	10

Mask data source: Premise; Facebook Global symptom survey (This research is based on survey results from University of Maryland Social Data Science Center); Kaiser Family Foundation; YouGov COVID-19 Behaviour Tracker survey

A note of thanks:

We would like to extend a special thanks to the Pan American Health Organization (PAHO) for key data sources; our partners and collaborators in Argentina, Brazil, Bolivia, Chile, Colombia, Cuba, the Dominican Republic, Ecuador, Egypt, Honduras, Israel, Japan, Malaysia, Mexico, Moldova, Panama, Peru, the Philippines, Russia, Serbia, South Korea, Turkey, and Ukraine for their support and expert advice; and to the tireless data collection and collation efforts of individuals and institutions throughout the world.

In addition, we wish to express our gratitude for efforts to collect social distancing policy information in Latin America to University of Miami Institute for Advanced Study of the Americas (Felicia Knaul, Michael Touchton), with data published here: http://observcovid.miami.edu/; Fundación Mexicana para la Salud (Héctor Arreola-Ornelas) with support from the GDS Services International: Tómatelo a Pecho A.C.; and Centro de Investigaciones en Ciencias de la Salud, Universidad Anáhuac (Héctor Arreola-Ornelas); Lab on Research, Ethics, Aging and Community-Health at Tufts University (REACH Lab) and the University of Miami Institute for Advanced Study of the Americas (Thalia Porteny).

Further, IHME is grateful to the Microsoft AI for Health program for their support in hosting our COVID-19 data visualizations on the Azure Cloud. We would like to also extend a warm thank you to the many others who have made our COVID-19 estimation efforts possible.