Supplemental Material

Epidemiological characteristics of COVID-19 in Mexico and the potential impact of lifting confinement across regions

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Table S1. Fit parameters for the country, CMX and MEX as well as for some other states. Range for the reproductive number obtained from the re-sampling strategy. Parameter fitting is based on pandemic data from 15 March to 25 May 2020. States are identified by the three letter codes[32].

ID	β	η	$R_{0,min}$	R_0	$R_{0,max}$
TOT	1.48	0.55	2.4	2.7	3.6
CMX	2.76	1.06	2.3	2.6	3.0
MEX	2.38	0.91	2.3	2.6	3.0
JAL	0.24	0.05	4.3	4.8	5.6
GUA	0.36	0.09	3.6	4.0	4.6
VER	0.53	0.16	2.6	3.2	4.3
MIC	0.30	0.07	3.8	4.2	4.9
PUE	0.43	0.13	3.0	3.4	4.5
SON	0.36	0.08	3.5	4.4	5.9
HID	0.31	0.07	3.4	4.2	4.9
QUE	0.26	0.04	5.9	5.9	7.9
NLE	0.38	0.12	2.6	3.2	3.6
YUC	0.34	0.10	3.0	3.3	3.8
TAM	0.66	0.23	2.3	2.9	3.3
SIN	0.89	0.31	2.3	2.8	3.8
TLA	0.47	0.14	2.7	3.3	4.4
NAY	0.32	0.09	2.9	3.6	4.1
CAM	0.30	0.08	3.2	4.0	4.6
TAB	1.33	0.50	2.4	2.7	3.1

Table S2. Maximum of infected individuals and it corresponding date for the nominal fit and for the best deconfinement strategy. Number of UCI and intubation facilities required for the computed maximum, as well as the number of required hospital beds. Average percentages are obtained from the government daily reports database up to May 25, 2020. Number of available hospital beds is around 49,083 for the country. States are identified by the three letter codes

	Maximum of the nominal fit					Maximum of the best scenario					Average percentages		
ID	Max	Date	UCI	Int	Hosp	Max	Date	UCI	Int	Hosp	UCI	Int	Hosp
TOT	338,945	2020/10/20	14,198	14,082	129,591	513,814	2021/01/02	21,523	21,347	196,450	4.2	4.2	38
CMX	14,747	2020/08/29	481	660	5,035	99,913	2020/10/25	3,256	4,470	34,113	3.3	4.5	34
MEX	25,096	2020/10/13	831	1,281	12,497	188,575	2020/12/11	6,244	9,628	93,907	3.3	5.1	50
JAL	112,592	2020/12/13	2,783	2,562	28,417	102,147	2020/12/13	2,525	2,324	25,781	2.5	2.3	25
GUA	87,553	2020/11/04	5,171	3,730	20,767	79,996	2020/11/04	4,725	3,408	18,975	5.9	4.3	24
VER	74,397	2020/10/30	6,284	3,076	34,768	60,163	2020/10/30	5,082	2,487	28,116	8.4	4.1	47
MIC	64,103	2020/11/10	1,938	2,080	20,850	57,893	2020/11/15	1,751	1,878	18,830	3.0	3.2	33
PUE	56,419	2020/11/25	2,595	3,354	27,104	51,760	2020/11/23	2,380	3,077	24,866	4.6	5.9	48
SON	51,533	2020/10/02	1,482	837	15,822	45,364	2020/10/03	1,305	737	13,928	2.9	1.6	31
HID	41,914	2020/10/29	2,166	3,041	19,307	37,732	2020/10/31	1,949	2,737	17,381	5.2	7.3	46
QUE	39,429	2020/10/23	980	1,820	13,472	34,989	2020/10/22	869	1,615	11,955	2.5	4.6	34
NLE	32,521	2021/01/28	987	502	5,466	29,371	2021/01/27	891	454	4,937	3.0	1.5	17
YUC	16,049	2020/12/16	879	675	3,723	14,245	2020/12/15	781	599	3,304	5.5	4.2	23
TAM	16,019	2020/12/07	310	108	2,821	14,755	2020/12/10	285	99	2,598	1.9	0.7	18
SIN	12,573	2020/10/24	464	529	5,956	10,687	2020/10/18	395	449	5,063	3.7	4.2	47
TLA	12,307	2020/10/20	1,109	469	4,605	11,327	2020/10/27	1,021	432	4,238	9.0	3.8	37
NAY	12,048	2020/12/06	226	74	3,977	10,539	2020/12/12	197	65	3,479	1.9	0.6	33
CAM	11,736	2020/11/10	583	271	4,286	10,446	2020/11/16	519	242	3,815	5.0	2.3	37
TAB	5,182	2020/10/20	228	108	1,578	16,014	2021/01/15	705	334	4,878	4.4	2.1	30

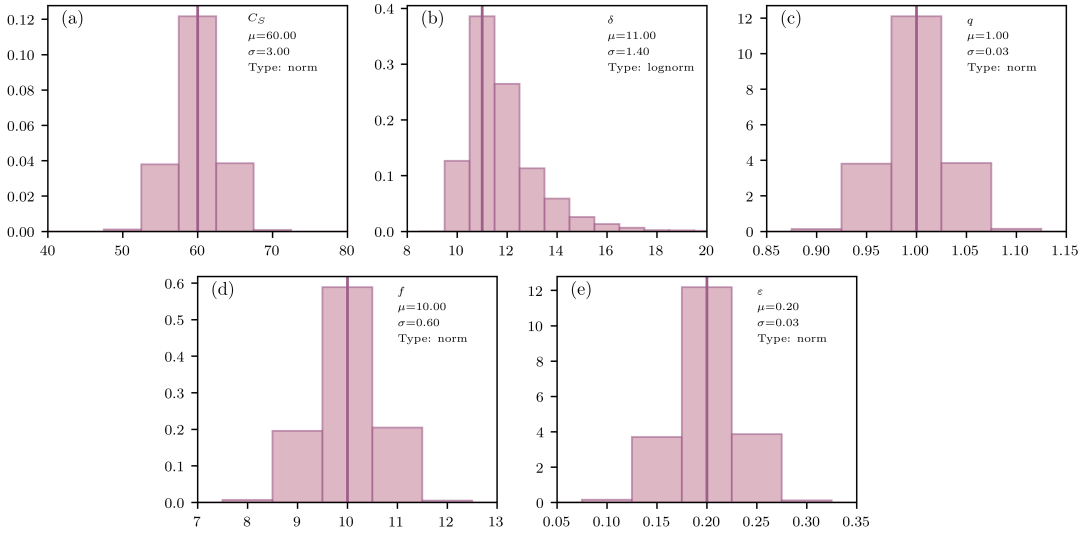

Figure S1. Statistical distributions used for re-sampling strategy. It is assumed a normal distribution with a mean as presented in Table 1, for exception of the parameter δ that assumes a log-normal distribution.

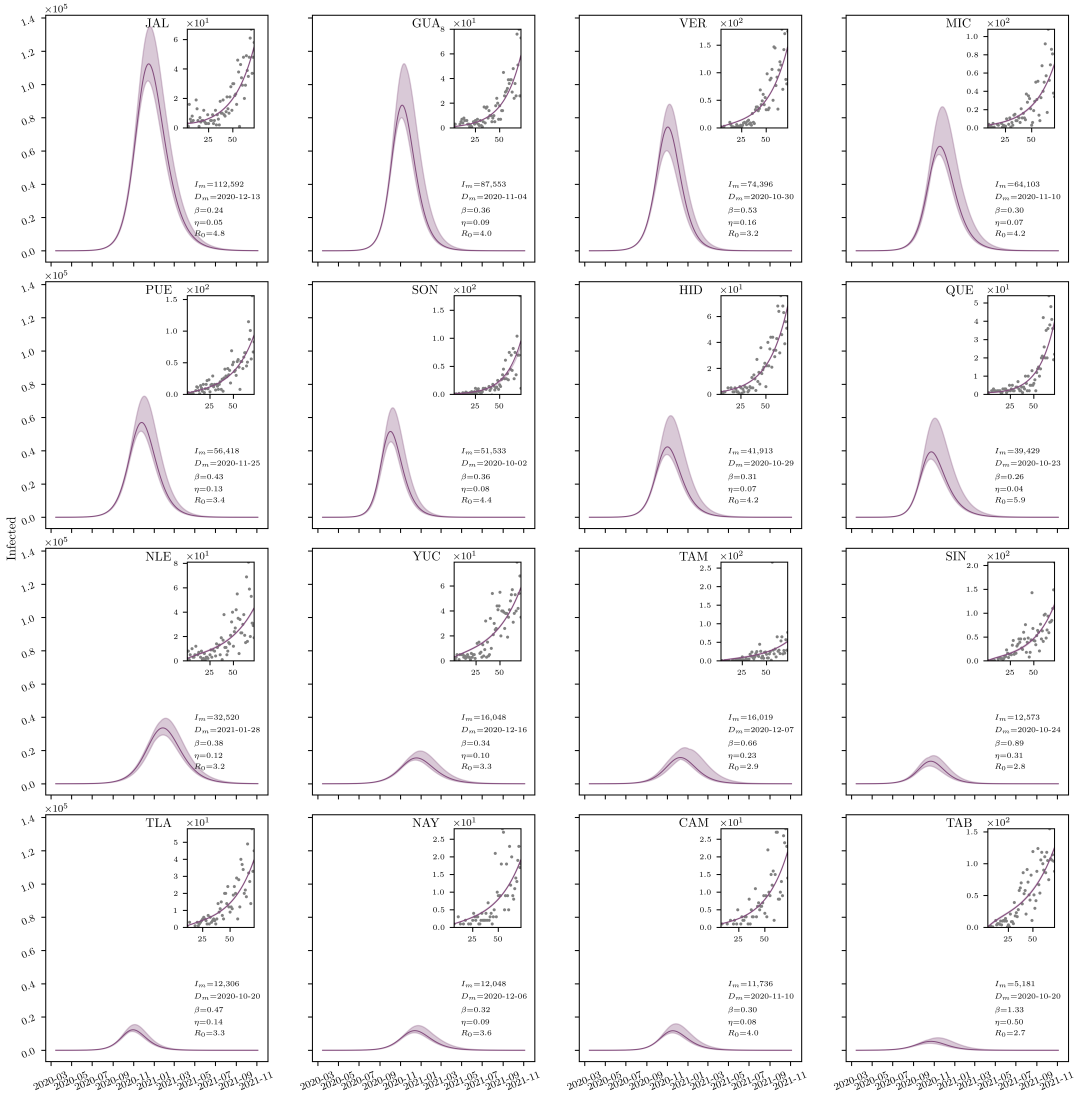

Figure S2. Scenario 1: Maintaining COVID-19 Lockdown for different regions in Mexico. This figure shows Mexican states with major infected individuals of COVID-19. Parameter fitting is based on pandemic data from 15 March to 25 May 2020. The continuous line represents the best fit while the shadow regions is the 95% CI based on the sampling procedure.

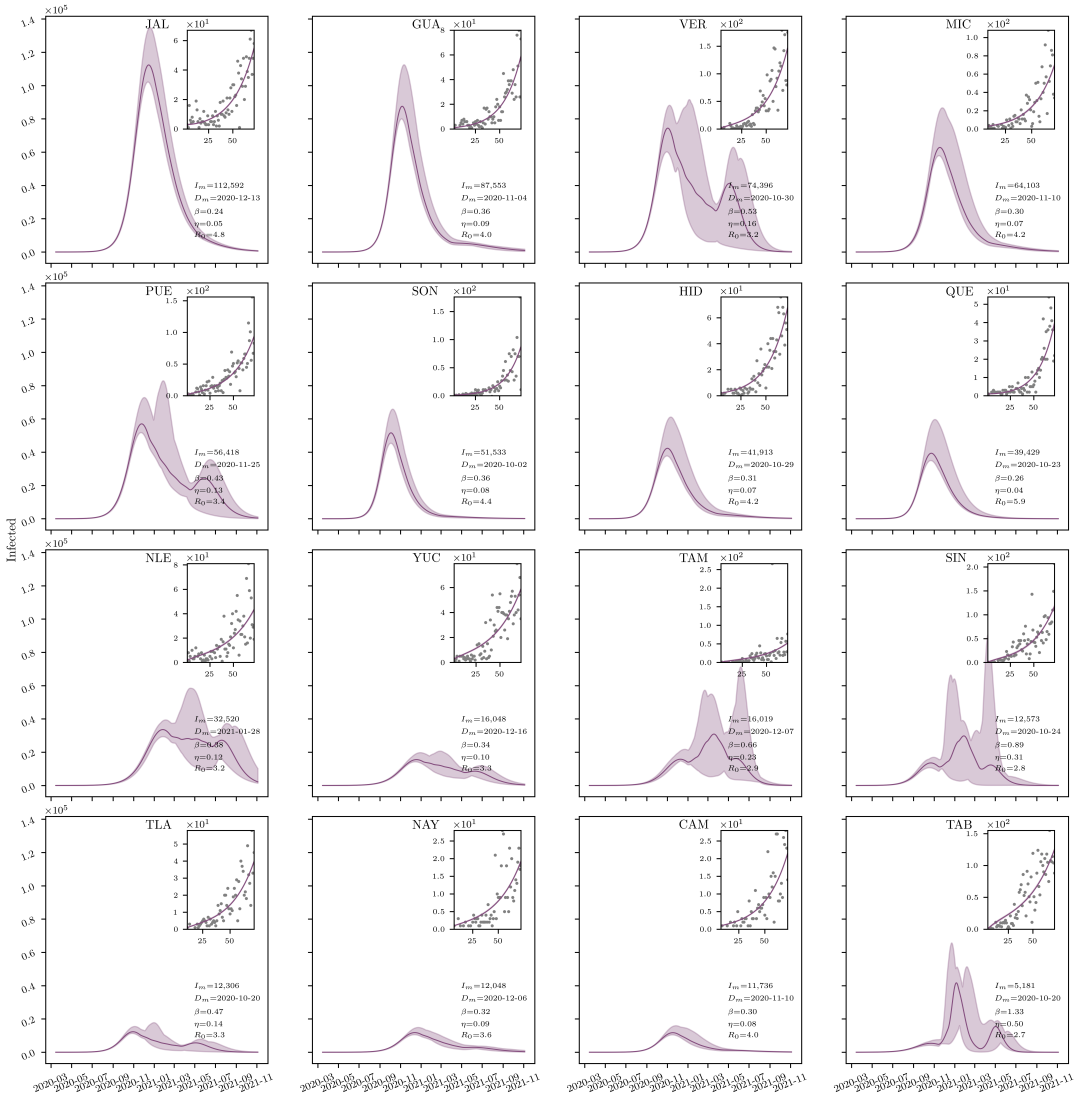

Figure S3. Scenario 3: Gradual lifting Confinement for different regions of Mexico on 1 June 2020. In this scenario, a fraction representing the workers that start the quarantine lifting in four steps (confinement percentage decreases of 27%/4=6.75% per month), while a fraction of the sub-population assuming scholar activities of school-age children (about 21.7%) start in the 5th month. The deconfinement month was set after the maximum infection peak for each state of Mexico.

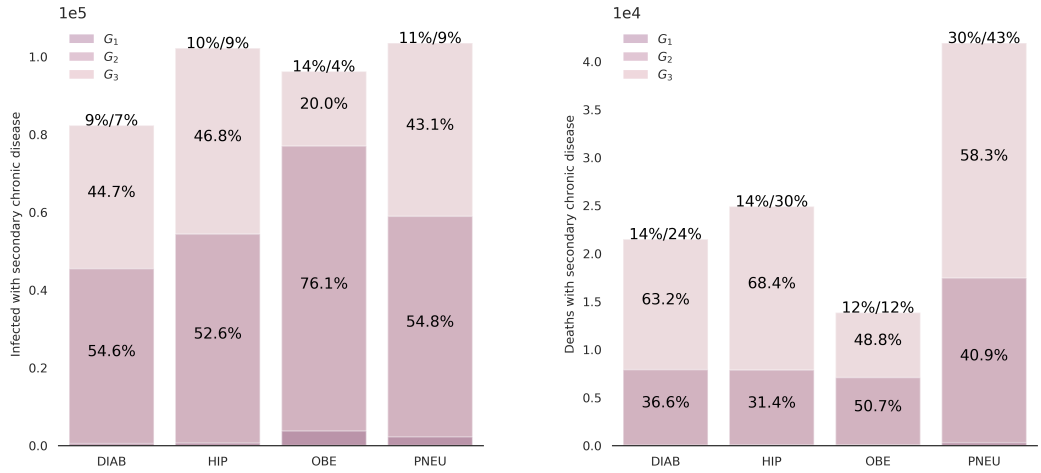

Figure S4. Infected individuals (left) and deaths (right) with chronic diseases for age groups. $G_1 : y < 25$ years; $G_2 : 25 \leqslant y < 60$; $G_3 : y \geqslant 60$. Percentages on the top of the histogram columns are the percentage of the infected individuals with the given condition referred to the total infected population for the G_2 and G_3 groups for the left plot and referred to total deaths in the right.

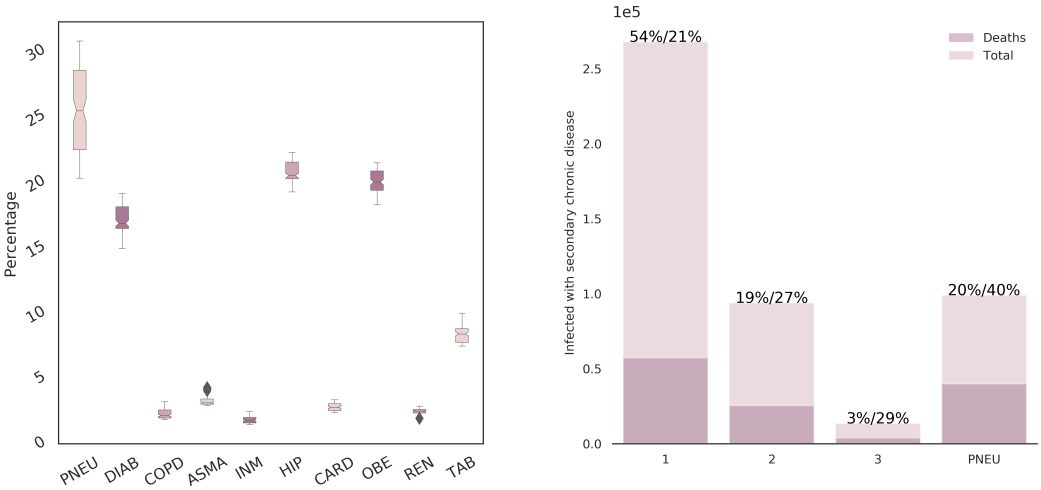

Figure S5. Reported data of most representative coexisting diseases. Data dispersion (left) shows the time percentage variability from April 12. Histogram in the right refers to the amount of individuals on May 25 having pneumonia (PNEU) or three of the chronic diseases with the higher incidence: diabetes, COPD and obesity. Labels 1, 2, and 3 represent the number of infected with one or the combination of 2 or 3 of the chronic diseases described above. Percentages on the top of the histogram columns are the percentage of the infected with the given condition referred to the total infected population and the mortality percentage for each category.

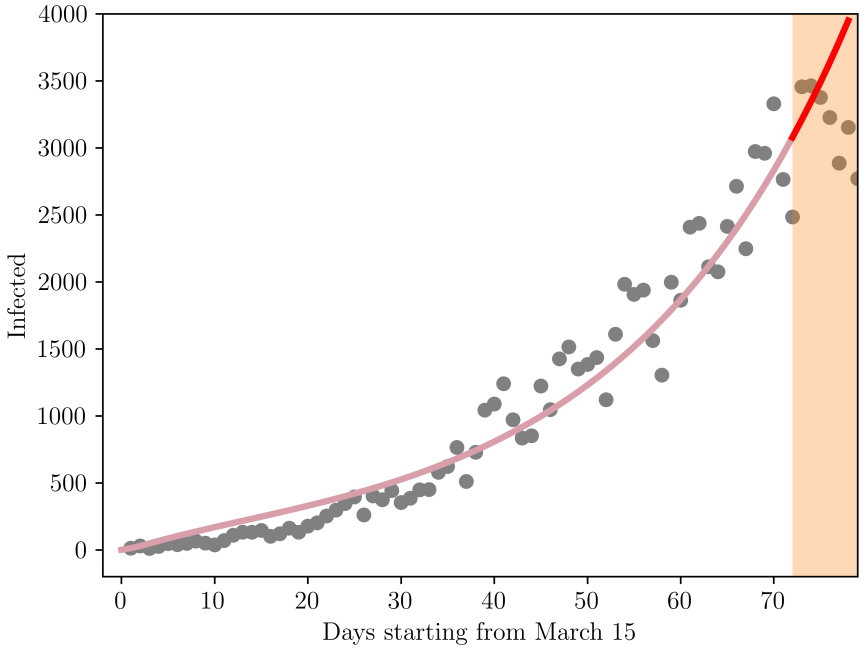

Figure S6. Model prediction up to June 1st. The light yellow region represents the extension of the model from May 25. Continuous magenta line is the best fit to the epidemiological data. Gray dots represent the infected cases. Continuous red line is model prediction.