Supplementary Materials

Appendix 1: Mathematical model

The CoMo (Covid19 International Modelling) SARS-CoV-2 model is an age-structured SEIRS model with infected compartments stratified by symptoms, severity and treatment seeking and access. The progression of individuals through the infection life cycle is represented by the diagram below.

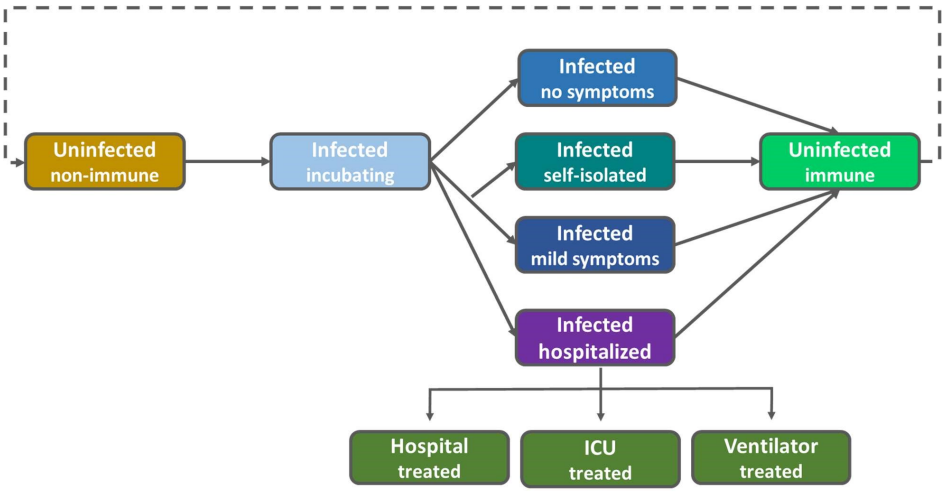

Figure S1: A diagram of the baseline model structure representing the unmitigated epidemic spread scenario. Source : Aguas R*, et al. BMJ Global Health* 2021; 5:e003126. doi: 10.1136

As individuals are infected, they transit through an incubation phase at the end of which they are fully infectious. At the end of this incubation period, individuals display very different symptomatology, with some never having any symptoms, while others require hospitalization. If a person is hospitalized, the model tracks their health care requirements (surge care bed, ICU bed, ventilator). Disease-induced mortality rates are heavily dependent on how severe the infection outcome is and whether individuals can receive the appropriate treatment. The model assumes that those who recover from infection will become immune. We allow for loss of immunity in the model but for the moment have set this parameter to be in the order of years.

The model interface can be found here: https://comomodel.net/ . The model interface uses publicly available country-specific data on cases and mortality for COVID-19[1] for visual calibration of model parameters to user-selected baseline scenarios. More elaborate calibration methods are under consideration but are not considered to be a priority since the system is unidentifiable and therefore calibration will be entirely dependent on user-selected baseline scenarios. The equations for the basic model structure follow (Equation 1).

$$\frac{dS}{dt} = -S \circ \Lambda + \omega R + A \cdot S - \mu \cdot S + bP$$
$$\frac{dE}{dt} = S \circ \Lambda - \gamma E + A \cdot E - \mu \cdot E$$
$$\frac{dI}{dt} = \gamma\,(1 - p_{clin})(1 - p_{ihr}) \cdot E - \nu_I I + A \cdot I - \mu \cdot I$$
$$\frac{dC}{dt} = \gamma\, p_{clin}(1 - p_{ihr}) \cdot E - \nu_I C + A \cdot C - \mu \cdot C$$
$$\frac{dR}{dt} = \nu_I(I + C) + A \cdot R - \omega R - \mu \cdot R + \left(1 - \delta_H\, p_{hfr}\right)\nu_H \cdot H + \left(1 - \delta_{H_c}\, p_{hfr}\right)\nu_H \cdot H + \left(1 - \delta_U\, p_{hfr}\right)\nu_U \cdot U + \left(1 - \delta_{U_c}\, p_{hfr}\right)\nu_U \cdot U + \left(1 - \delta_V\, p_{hfr}\right)\nu_V \cdot V + \left(1 - \delta_{V_c}\, p_{hfr}\right)\nu_V \cdot V$$
$$\frac{dH}{dt} = p_{ihr}(1 - p_U)(1 - p_{K_H})\gamma E - \nu_H H + A \cdot H - \mu \cdot H$$
$$\frac{dH_c}{dt} = p_{ihr}(1 - p_U)p_{K_H}\gamma E - \nu_H H_c + A \cdot H_c - \mu \cdot H_c$$
$$\frac{dU}{dt} = p_{ihr}p_U\left(1 - p_{K_U}\right)(1 - p_V)\gamma E - \nu_U U + A \cdot U - \mu \cdot U$$
$$\frac{dU_c}{dt} = p_{ihr}p_U p_{K_U}(1 - p_V)\gamma E - \nu_U U_c + A \cdot U_c - \mu \cdot U_c$$
$$\frac{dU_{cv}}{dt} = p_{ihr}p_U p_{K_U} p_V \gamma E - \nu_V U_{cv} + A \cdot U_{cv} - \mu \cdot U_{cv}$$
$$\frac{dV}{dt} = p_{ihr}p_U\left(1 - p_{K_U}\right)\left(1 - p_{K_V}\right)p_V \gamma E - \nu_V V + A \cdot V - \mu \cdot V$$
$$\frac{dV_c}{dt} = p_{ihr}p_U\left(1 - p_{K_U}\right)p_{K_V} p_V \gamma E - \nu_V V_c + A \cdot V_c - \mu \cdot V_c$$
$$P = (S + E + I + C + R + H + H_c + U + U_C + U_{Cv} + V + V_c)$$
$$s = 1 + a\cos\left(2\pi \frac{\left(t - \left(\frac{365.25\phi}{12}\right) + t_{in}\right)}{365.25}\right)$$
$$W = W_{home} + W_{work} + W_{school} + W_{other}$$
$$\Lambda = p\; s\; W\; \cdot \left(\frac{\rho E + I + C + \rho_s\; * (H + H_c + U + U_c + V + V_c)}{P}\right)$$
$$A = \begin{pmatrix} \begin{pmatrix} -1 & 0 \\ 1 & -1 \end{pmatrix} & \cdots & 0 \\ \vdots & \ddots \begin{pmatrix} -1 & 0 \\ 1 & -1 \end{pmatrix} \ddots & \vdots \\ 0 & \cdots & \begin{pmatrix} -1 & 0 \\ 1 & 0 \end{pmatrix} \end{pmatrix}$$
$$p_{K_H} = \begin{matrix} 0\; for\; H < K_H \\ 1\; for\; H \geq K_H \end{matrix}\Big\}$$
$$p_{K_U} = \begin{matrix} 0\; for\; U < K_U \\ 1\; for\; U \geq K_U \end{matrix}\Big\}$$
$$p_{K_V} = \begin{matrix} 0\; for\; V < K_V \\ 1\; for\; V \geq K_V \end{matrix}\Big\}$$

Equation 1

Non-pharmaceutical interventions

A series of non-pharmaceutical interventions were included in the model which can be switched on for specific periods of time, thus building a bespoke intervention package.

Self-Isolation if Symptomatic

This is the practice of individuals with either a confirmed case of Covid-19 or with Covid-19 symptoms isolating themselves at home for a period of 7 days. The parameters governing this intervention are:

- Start Date: the start date of the protocol
- Duration: the duration of the protocol
- Coverage: the percentage of the population who will be able to self-isolate if they have symptoms or are a confirmed case
- Adherence: the percentage of the designated isolation period that self-isolated individuals adhere to the intervention

Screening

This is a form of contact-tracing. Given enough testing capacity, it reflects how suspected contacts of confirmed cases are tested with a virological test. All individuals who test positive are then requested to self-isolate

- Start Date: the start date of additional screening
- Test Sensitivity: Probability that an infected person will test positive when screened.
- Suspected Contacts: number of people screened per reported case.
- Overdispersion: informs the probability of finding an infected person that is a known contact of a reported case, relative to random sampling (overdispersion = 1).
- Duration: duration of this additional protocol

Social Distancing

Also known as physical distancing, this refers to the measures taken to prevent the spread of a contagious disease by maintaining a specific physical distance between individuals and reducing the number of times individuals come into close contact with each other. The parameters governing this intervention are:

- Start Date: the start date of the protocol
- Duration: the duration of the protocol
- Coverage: the percentage of the population who reduce their societal contacts (excluding those at home, work and school)
- Adherence: the percentage of the time that those practicing social distancing adhere to social distancing measures

Handwashing

This indicates improvements in personal hygiene and reduction in risk behaviours (touching the face, nose or mouth), including the adoption of Personal Protection Equipment such as masks. The parameters governing this intervention are:

- Start Date: the start date of the protocol
- Duration: the duration of the protocol
- Efficacy: the effectiveness of personal hygiene measures in reducing the risk of infection per contact

Working at Home

This indicates the effect of having workers working from home. The parameters governing this intervention are:

- Start Date: the start date of the protocol
- Duration: the duration of the protocol
- Efficacy: the reduction in work related contacts
- Home contacts inflation: increased numbers of home contacts due to increased number of hours spent at home

School Closures

This indicates school closures and assumes that all schools in a country close at the same time. The parameters governing this intervention are:

- Start Date: the start date of the protocol
- Duration: the duration of the protocol
- Efficacy: defined as the reduction in contacts between school children when schools are closed
- Home contacts inflation: increased numbers of home contacts due to increased numbers of hours spent at home

Shielding the Elderly

This intervention is designed to isolate a proportion of the elderly population and reduce their overall contacts. The parameters governing this intervention are:

- Start Date: the start date of the protocol
- Duration: the duration of the protocol
- Coverage: the percentage of the elderly population who are shielded
- Efficacy: defined as the reduction in overall contacts of the shielded elderly population
- Minimum age for elderly cocoon: the minimum age cut-off defining which people should protect themselves

Travel Ban

This refers to a ban on international travel. The parameters governing this intervention are:

- Start Date: the start date of the protocol
- Duration: the duration of the protocol
- Efficacy: the reduction in imported cases per day (as a percentage)

Voluntary home quarantine

This indicates how many people will voluntarily quarantine themselves at home for a specified number of days if a person they live with tests positive for Covid-19. The parameters governing this intervention are:

- Start Date: the start date of the protocol
- Duration: the duration of the protocol
- Days in quarantine for an average person

- Coverage: The percentage of people voluntarily quarantining themselves given they live with a known infectious case.
- Rate: Speed at which people decide to quarantine themselves if they live with a known infectious case.
- Decrease in the number of other contacts when voluntarily quarantining: refers to decreased mean numbers of contacts outside of the home while quarantining
- Increase in the number of contacts at home when voluntarily quarantining: refers to increased numbers of home contacts due to increased time spent at home while quarantining

Lockdown

This refers to an emergency protocol that is categorized into three levels based on the efficacy or coverage of the various non-pharmaceutical interventions. The parameters governing this intervention are:

- Low-level lockdown (self-isolation 50%, social distancing 25%, cocoon 95%, hand-hygiene 5%)
    - Start Date: the start date of low-level lockdown protocols
    - Duration: the duration of low-level lockdown protocols

Mid-level lockdown (self-isolation 50%, social distancing 95%, school closure 85%, travel ban 95%, voluntary home quarantine 5%, working from home 50%, cocoon 95%, hand-hygiene 5%)

    - Start Date: the start date of mid-level lockdown protocols
    - Duration: the duration of mid-level lockdown protocols

- High-level lockdown (self-isolation 95%, social distancing 35%, school closure 85%, voluntary home quarantine 90%, working from home 75%, cocoon 95%, hand-hygiene 7.5%)
    - Start Date: the start date of high-level lockdown protocols
    - Duration: the duration of high-level lockdown protocols

Table of variables

The model variables are defined in Table S1 below.

Symbol	Definition
S	Susceptible
E	Infected and incubating
I	Infectious and asymptomatic following incubation
C	Infectious and mildly symptomatic following incubation
R	Recovered and immune
H	Severe infection: hospitalized
H_c	Severe infection: not hospitalized due to lack of capacity
U	Severe infection: hospitalized in ICU
U_c	Severe infection: hospitalized and requiring ICU but placed in surge ward
U_{cv}	Severe infection: hospitalized and requiring ventilator but placed in surge ward
V	Severe infection: hospitalized in ICU and on a ventilator
V_c	Severe infection: hospitalized in ICU requiring a ventilator but not on one

Table S1: A list of model variables and their definitions.

Table of parameters

Symbol	Definition	Value	Unit	Source
Demographics				
W_{home}	Country-specific age-dependent contact matrix describing the number of potentially infectious contacts at home per person per day	†	day^{-1}	[2]
W_{work}	Country-specific age-dependent contact matrix describing the number of potentially infectious contacts at work per person per day	†	day^{-1}	[2]
W_{school}	Country-specific age-dependent contact matrix describing the number of potentially infectious contacts at school per person per day	†	day^{-1}	[2]
W_{other}	Country-specific age-dependent contact matrix describing the number of potentially infectious societal contacts per person per day	†	day^{-1}	[2]
μ	1/Age-dependent non-Covid-19-related death rate	†	days	[3]
b	1/ Age-dependent fertility rate	†	days	[3]
α	Ageing rate between age categories	0.2	year^{-1}	
Natural history of infection				
p	Probability of infection given a single contact	†	NA	[4]
γ	1/duration of incubation period	3.5	days	[5-7]
ρ	Relative infectiousness of incubating phase	0.1	NA	‡
p_{clin}	Proportion of all infections that ever develop symptoms	0.55	NA	[8-10]
ν_I	1/duration of infectious phase post incubation	4.5	days	[5]
ρ_s	Relative proportion of contacts for hospitalised patients	0.15	NA	‡
ω	1/duration of immunity	150	years	‡
Seasonality				
a	Relative variation in viral transmissibility throughout the year (+- a proportion)	†	NA	-
ϕ	Month of peak in transmissibility	†	NA	-
Patient outcomes				
p_{ihr}	Probability of an infection being severe (requiring hospitalisation) by age	†	NA	[3, 11-14]
p_{hfr}	Probability of a severe/hospitalised infection being fatal by age	†	NA	[3, 11, 12, 14 15]
ν_H	1/Duration of hospitalised infection	†	days	[16]
ν_U	1/Duration of ICU infection	†	days	[17, 18]

ν_V	1/Duration of ventilated infection	†	days	5, 6, 15
δ_H	Maximum probability of death for a hospitalised infection	0.35		3, 16
δ_{Hc}	Maximum probability of death for an infection requiring hospitalisation that did not receive appropriate treatment	0.45	NA	19
δ_U	Maximum probability of death for a hospitalised infection requiring ICU admission	0.55	NA	19, 20
δ_{Uc}	Maximum probability of death for a hospitalised infection that would require ICU admission but was not admitted to the ICU	0.8	NA	19
δ_V	Maximum probability of death for a hospitalised infection requiring a ventilator	0.8	NA	19
δ_{Vc}	Maximum probability of death for a hospitalised infection that would require a ventilator but did not get one	0.95	NA	21
p_U	Probability of an infected patient needing ICU	0.5	NA	13, 21
p_V	Probability of an infected patient needing ICU and a ventilator	0.75	NA	21
K_H	Standard hospital bed capacity	†	NA	-
K_U	ICU bed capacity	†	NA	-
K_V	Ventilator capacity	†	NA	-

Table S2: A list of the default parameter values of the model. These are subject to change when the model is applied to a new setting and/or with new information about covid-19. We have provided references to demonstrate that the default values lie within plausible ranges. † Country specific value; ‡Assumed value (no reference found)

Appendix 2: Data and parameters for Senegal

Table S3: NPI measures in Senegal from March 2nd, 2020 to July 1st, 2021

Date	NPIs interventions
16/03/2020	Schools and universities closed
20/03/2020	International travel ban. Limited travel nationwide
24/03/2020	state of health emergency and curfew from 8pm to 6am
19/04/2020	Face masks are mandatory
11/05/2020	Relaxation of the state of health emergency, curfew from 9pm to 5am, mosques and churches reopened
04/06/2020	Curfew maintained from 11pm-5am. Lifting of the travel ban between regions
25/06/2020	Reopening of grades 10 and 13 subjects to national exams
12/11/2020	Schools and universities reopened
01/12/2020	Face masks are still mandatory
05/01/2021	Travel restriction in the capital Dakar and Thies (the second city), curfew extended from 9pm to 5am, Restrictions on public gatherings
23/02/2021	Start of the vaccination campaign
19/03/2021	End of the country's COVID-19 restrictions

The CoMo template containing data adapted to Senegalese context is provided as supplemental material 2.

Table S4: Full list of parameter values used. We denote by "†" country specific parameters based on data and "-" parameters based on assumptions

Sheet-Intervention	Parameter	Value	Unit	Source
Parameters	Number of exposed people at start date	2.0188478	Individuals	†Estimated
Parameters	Proportion of population with partial immunity at the start date	0		-
Parameters	Probability of infection given contact (0 to 0.2)	0.02416		†Estimated
Parameters	Percentage of all asymptomatic infections that are reported	0	%	-
Parameters	Percentage of all symptomatic infections that are reported	6	%	-
Parameters	Percentage of denied hospitalisations that are reported	90	%	†[22]
Parameters	Percentage of non-severe hospitalisations that are appropriately treated	90	%	†[22]
Parameters	Percentage of severe hospitalisations that are appropriately treated	90	%	†[22]
Parameters	Percentage of all asymptomatic infections in previously vaccinated people that are reported	0	%	-
Parameters	Percentage of all asymptomatic infections in previously vaccinated and exposed people that are reported	0	%	-
Parameters	Percentage of all asymptomatic infections in previously infected people that are reported	0	%	-
Parameters	Percentage of all symptomatic infections in previously vaccinated people that are reported	0	%	-
Parameters	Percentage of all symptomatic infections in previously vaccinated and exposed people that are reported	0	%	-
Parameters	Percentage of all symptomatic infections in previously infected people that are reported	0	%	-
Parameters	Percentage of all people dying outside the hospital with asymptomatic infections reported as covid-deaths	0	%	-
Parameters	Percentage of all people dying outside the hospital with symptomatic infections reported as covid-deaths	10	%	-
Parameters	Percentage of all people dying outside the hospital with severe infections reported as covid-deaths	10	%	†[22]
Parameters	Iterations (1 to 10,000)	1		-
Parameters	Noise (0.01 to 0.2)	0.01		-
Parameters	Confidence (5 to 25)	5	%	-
Parameters	Average sample size for seroprevalence	100		-
Country Area Param	Social Contacts Data	Senegal		†
Country Area Param	Mean Household size	8.7	Individuals	†[23]
Country Area Param	Mean number of infectious migrants per day	0	Individuals	-
Virus Param	Relative infectiousness of incubation phase	10	%	-
Virus Param	Average incubation period (1 to 7 days)	3.5	Days	-
Virus Param	Average duration of symptomatic infection period (1 to 7 days)	4.5	Days	-
Virus Param	Month of peak infectivity of the virus (1, 2, …, 12)	August		-
Virus Param	Annual variation in infectivity of the virus	0	%	-
Virus Param	Average duration of immunity (0.5 to 150)	150	Days	-
Virus Param	Probability upon infection of developing clinical symptoms	15	%	-
Virus Param	Probability upon hospitalisation of requiring ICU admission	25	%	-
Virus Param	Probability upon admission to the ICU of requiring a ventilator	25	%	-
Virus Param	Proportion of hospitalised patients needing O2	50	%	-

Virus Param	Probability upon infection of developing clinical symptoms if previously vaccinated	3.8	%	-
Virus Param	Probability upon infection of developing clinical symptoms if previously vaccinated and exposed	3.8	%	-
Virus Param	Probability upon infection of developing clinical symptoms if previously infected	15	%	-
Virus Param	Probability upon hospitalisation of requiring ICU admission if previously vaccinated	25	%	-
Virus Param	Probability upon hospitalisation of requiring ICU admission if previously vaccinated and exposed	25	%	-
Virus Param	Probability upon hospitalisation of requiring ICU admission if previously infected	25	%	-
Virus Param	Probability upon admission to the ICU of requiring a ventilator if previously vaccinated	25	%	-
Virus Param	Probability upon admission to the ICU of requiring a ventilator if previously vaccinated and exposed	25	%	-
Virus Param	Probability upon admission to the ICU of requiring a ventilator if previously infected	25	%	-
Virus Param	Probability of infection of people that have recovered from a previous infection	0	%	-
Virus Param	Change in probability of requiring hospitalisation if previously vaccinated	2.8	%	-
Virus Param	Change in probability of requiring hospitalisation if previously infected	2.8	%	-
Virus Param	Change in probability of requiring hospitalisation if previously infected and vaccinated	2.8	%	-
Virus Param	Days from seropositve to seronegative	100	Days	-
Hospitalisation Param	Maximum number of hospital surge beds	160000	Beds	-
Hospitalisation Param	Maximum number of ICU beds without ventilators	8000	Beds	-
Hospitalisation Param	Maximum number of ICU beds with ventilators	8000	Beds	-
Hospitalisation Param	Relative percentage of regular daily contacts when hospitalised:	15	%	-
Hospitalisation Param	Scaling factor for infection hospitalisation rate: (0.1 to 5)	1.248		-
Hospitalisation Param	Probability of dying when hospitalised (not req O2):	20	%	†22
Hospitalisation Param	Probability of dying when hospitalised if req O2:	20	%	†22
Hospitalisation Param	Probability of dying when denied hospitalisation (not req O2):	50	%	†22
Hospitalisation Param	Probability of dying when denied hospitalisation if req O2:	50	%	†22
Hospitalisation Param	Probability of dying when admitted to ICU (not req O2):	30	%	†22
Hospitalisation Param	Probability of dying when admitted to ICU if req O2:	55	%	†22
Hospitalisation Param	Probability of dying when admission to ICU denied (not req O2):	75	%	†22
Hospital Param	Probability of dying when admission to ICU denied if req O2:	75	%	†22
Hospital Param	Probability of dying when ventilated:	75	%	-
Hospital Param	Probability of dying when ventilator denied:	95	%	-
Hospitalisation Param	Probability of dying when ventilator required and not going to hospital:	95	%	-
Hospitalisation Param	Probability of dying when icu required (not O2) and not going to hospital:	90	%	-
Hospitalisation Param	Probability of dying when icu required (req O2) and not going to hospital:	90	%	-

Hospitalisation Param	Duration of hospitalised infection: (1 to 30)	12	Days	-
Hospitalisation Param	Duration of ICU infection: (1 to 30)	6	Days	-
Hospitalisation Param	Duration of ventilated infection: (1 to 30)	7	Days	-
Self-isolation if Symptomatic	Adherence:	100	%	-
(*Self-isolation) Screening	Overdispersion: (1, 2, 3, 4 or 5)	4	%	-
(*Self-isolation) Screening	Test Sensitivity:	80	%	-
(*Self-isolation) Household Isolation	Days in isolation for average person:	14	%	-
(*Self-isolation) Household Isolation	Days to implement maximum quarantine coverage: (1 to 5)	2	%	-
(*Self-isolation) Household Isolation	Decrease in the number of other contacts when quarantined:	20	%	-
(*Self-isolation) Household Isolation	Increase in the number of contacts at home when quarantined:	100	%	-
Social Distancing	Adherence:	100	%	-
Handwashing	Efficacy: (0-25%)	25	%	-
Mask Wearing	Efficacy: (0-35%)	35	%	-
Working at Home	Efficacy:	85	%	-
Working at Home	Home contacts inflation due to working from home:	10	%	-
School Closures	Home contacts inflation due to school closure:	20	%	-
Shielding the Elderly	Efficacy:	95	%	-
Shielding the Elderly	Minimum age for elderly shielding: (0 to 100)	70	Years	-
Vaccination	Time to reach target coverage (1 to 52)	4	Weeks	-
Vaccination	Duration of efficacious period	100	Years	-
Vaccination	Duration of efficacious period if previously infected	100	Years	-
Vaccination	Efficacy	20	%	-
Vaccination	Efficacy if previously infected	80	%	-
Mass Testing	Sensitivity	80	%	
Mass Testing	Isolation days	14	Days	
Dexamethasone	Relative risk of dying if needing O2 and taking Dex	82	%	-
Dexamethasone	Relative risk of dying if needing ventilation and taking Dex	64	%	-
Dexamethasone	Relative risk of dying if needing but not receiving O2 and taking Dex	82	%	-
Dexamethasone	Relative risk of dying if needing but not receiving ventilation and taking Dex	64	%	-
Dexamethasone	Change in ventilation requirement if given Dex	87	%	-
Cost values	Daily cost for standard bed	280	US$	†[24]
Cost values	Daily cost for intensive care bed	630	US$	†[24]
Cost values	Daily cost for ventilator bed	750	US$	†[24]
Cost values	Cost per vaccine dose	23	US$	-
AstraZeneca Vaccine	One dose of AstraZeneca protection against the Delta variant	30.7	%	†[25]
Astra Zeneca Vaccine	Two doses of AstraZeneca protection against the Delta variant	67.0	%	†[25]

Table S5: Experimental matrix

Age group (years old)		less than 30		30-40		40-50	50-60
Number of doses		1 dose	2 doses	1 dose	2 doses	2 doses	2 doses
Number of strategy	1	0	0.3608	0.1205	0.2607	0.1151	0.1429
	2	0.5	0.1804	0.0603	0.1303	0.0575	0.0714
	3	1	0	0	0	0	0
	4	0.3608	0	0.1205	0.2607	0.1151	0.1429
	5	0.1804	0.5	0.0603	0.1303	0.0575	0.0714
	6	0	1	0	0	0	0
	7	0.2909	0.2909	0	0.2102	0.0928	0.1152
	8	0.2473	0.2473	0.15	0.1787	0.0789	0.0979
	9	0.2036	0.2036	0.3	0.1471	0.0649	0.0806
	10	0.328	0.328	0.1095	0	0.1046	0.1299
	11	0.2296	0.2296	0.0767	0.3	0.0732	0.0909
	12	0.1312	0.1312	0.0438	0.6	0.0418	0.052
	13	0.2896	0.2896	0.0967	0.2093	0	0.1147
	14	0.2549	0.2549	0.0851	0.1842	0.12	0.1009
	15	0.2201	0.2201	0.0735	0.159	0.24	0.0872
	16	0.2963	0.2963	0.0989	0.214	0.0945	0
	17	0.274	0.274	0.0915	0.198	0.0874	0.075
	18	0.2518	0.2518	0.0841	0.1819	0.0803	0.15
	19	0.2651	0.2651	0.0886	0.1916	0.0846	0.105

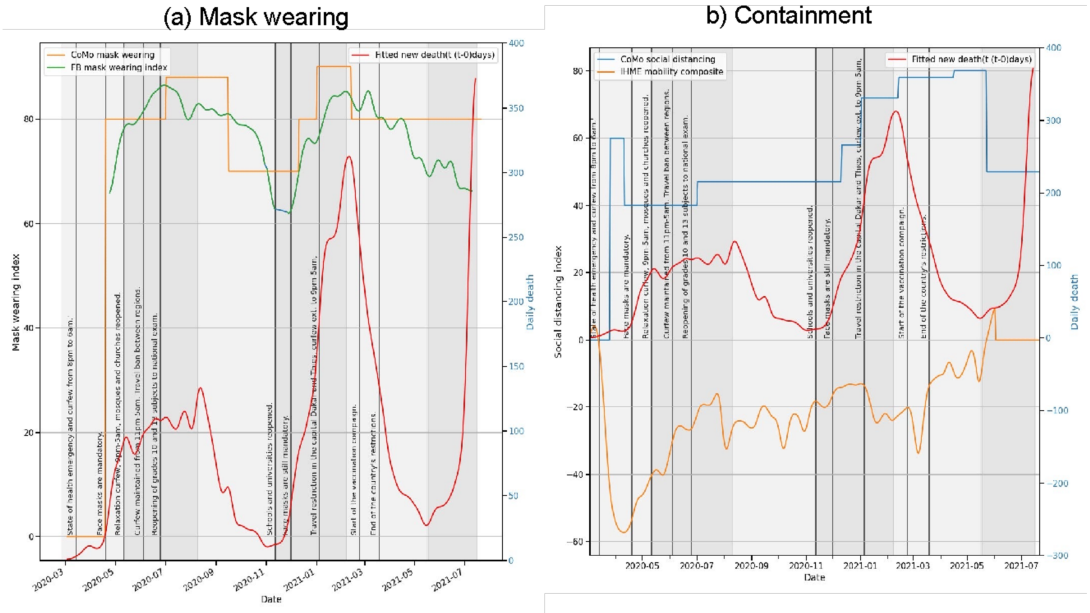

Figure S2: Facial mask wearing and containment parameter related to Facebook survey and Health metrics data

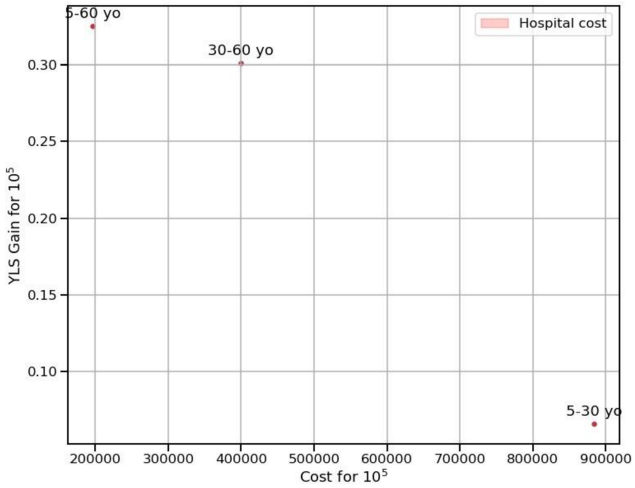

Figure S3: Cost-effectiveness analysis according to age group. Cost-effectiveness analysis for the three strategies for allocating the 6M doses, (strategy 1) we vaccinate the most vulnerable people other than ≤60: 70% the age group 50−60, (strategy 2) we vaccinate the most representative age groups in the population, corresponding to 50% the age group 5−30, (strategy. 3) we vaccinate 22% of the population of all age groups 5−60 . Cost is calculate for 'Only vaccination cost' and 'Only hospitalization cost'.

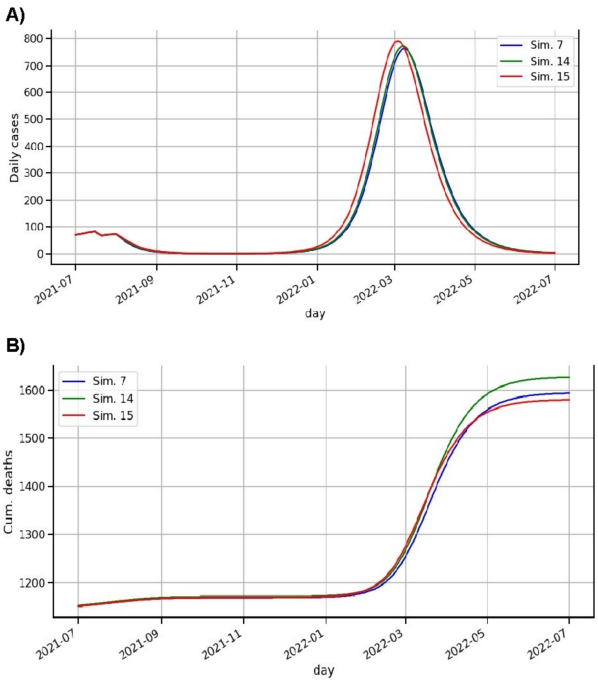

Figure S4: Different strategies comparison. Daily cases and cumulative deaths for different the vaccine for strategy 7, 14 and 15. We note that strategy 1 increase the daily cases (Figure S1.A) but decrease the death number (Figure S1.B)

References

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