CORONA CAPACITY

SMART PATTERN MATCHING AND MATHEMATICS GIVES YOU THE CAPACITY NEEDS FOR CORONA INFECTED PATIENTS, NOW AND IN THE NEAR FUTURE.





To obtain an account, please contact corona at simbox,ai



User Manual – application Corona Capacity ; version 11 April 2020

What has been added in this version 3 of the manual?

- In version 3 of the manual of the application Corona Capacity the new added functionality 'Capacity usage' is explained.
- ➤ The information about the new functionality can be found on page 27 and beyond (or by clicking on this link → go to page 27)

Our appologies if the manual is not completely clear. We are in a time rush to help as many hospitals as possible and to have the simulation model distributed as soon as possible.

What happens with the data ?

The data is only viewable for the user, and will not be used for any other reason. We will remove the data if the user requests it (each user can also always remove the data). If there is no request from the user to remove the data, then the data will be removed latest on 31 December 2020.

The data only consists of the posititive new cases per day as given in by the user.

If you want that the data is made available for research reasons, then we will only share it if you explicitly demand it.

The application is offered for free to anyone who wants to use it. Please do not sell it, or ask money for helping hospitals to use it. The purpose of the application is to support and help hospitals to deal with the surreal situation.

How to use the model ?

The model is aimed at giving more insights to the hospital. The model is NOT validated. The objective is to rapidly have a first outlook on what to expect and to make several simulations to improve current insights.

The calculations in the self-learning model are influenced each day by the new actual cases (new positives). Therefore the forecast will become more accurately after more data is known. It also detects to most likely scenario, but you should also run scenarios that are almost equally likely to a glance in what can possibly be expected.

If you don't have a lots of data yet (for example only 5 days), then your curve can still go anyway. We also are still learning and observing, and looking at the different curves: Is the South Korea curve rather flat because they had a quick and thorough lockdown?

All models are wrong, but some are useful.

We will update the model with information from hospitals, data scientists, field experts,... It is a pity that we (at this moment) don't see the real infection rate of the population. We can only guess it, and therefore only guess on what curve we are.

Important!

COI Use the webbrowser CHROME or SAFARI

s for Corona infected patients, now and in the near future.

Log in by using your username and password



Reaction times are dependent of the number of mails we receive, but we try to respond to your request as soon as possible.



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When you clicked here a popup appears where you can enter 3 dates To start the forecast of newly patient arrivals and the effect on the desired capacity, please click the "Save & Forecast" button first.

1. The first date is de first day that you received covid-19 positive cases at your hospital.

- Date 2 (may also be left empty if not applicable) – this is the first date that you received covid-19 patients from other hospitals
- Date 3 (may also be left empty if not applicable) – this is the first date that you have sent covid-19 patients to other hospitals

Dates 2 and 3 can also be filled in in a later stage (when they become applicable).

Change settings

First date with infected patients destined for your hospital:	6
20/03/2020	
First date with infected patients transferred from another hospital to your hospital:	6
23/03/2020	
First date with infected patients transferred from your hospital to another hospital:	6
25/03/2020	
	Cancel Save

sim box 🗠 Fe	forecast 🔒 So	cenarios 🗙	Paths	After entering the date(s) you see 3 rows of	? FAQ	 Disclaim
Date	# new cases destined for your hospital	# new patients IN from other hospitals	# patients OUT to other hospitals	dates from the entered date until 14 days into the future. Each day these rows are enlarged with one extra day.		
Fri 2020-03- 20 Sat 2020-03-	1			1. Row 1 – enter the new daily covid-19 positive		
21 Sun 2020- 03-22	2			hospital.		
Mon 2020- 03-23 Tue 2020-	3			another hospital on that day 3 Row 3 – enter the covid-19 patients transferred		
03-24 Wed 2020- 03-25	4			to another hospital on that day		
Thu 2020- 03-26						
Fri 2020-03- 27 Sat 2020-03- 28	·			Should I enter in row 1 the new daily arrived covid-19 positive cases, or the new on <u>admissioned</u> covid-19 cases ?	laily	
Sun 2020- 03-29 Mon 2020-				Both are possible, some hospitals use the application by entering the new daily are covid-19 positive cases (from which some are admissioned and some sent home ag	rived gain),	
			Save & Forecast	other hospitals enter only the admissioned covid-19 cases.		

Information The graph shows the actuals (blue line) and the arrivals according to the scaled scenario patterns based on the actuals (gray lines). The scaled selected scenario pattern Italy (green line) provides the forecast beyond the actuals.



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User Manual – application Corona Capacity



Actua

Extra explanation about using the function 'time shift in days'



Starting point

Your actuals are put on the graph where your first day is set on the first day of the curve (= first day of new daily cases)

Time shift in days ()	0
0 means that th your actuals m point of the cur	ne starting point of natch the starting rve of the scenario
The actual ne	w cases of your hospital

One of the curves of a scenario

Shift to the right

You can shift your actuals to the right of the curve (the curve of a scenario). When do you do that ?

For example: if you think that your actuals are not on the same moment as the curve. For example you are more in the peak of the curve then in the beginning. Then you can shift your curve.

Your actuals are moved to the right, or the curve is moved to the left

Shift to the left

Time shift in days 🚯

You can shift your actuals to the left of the curve (the curve of a scenario). When do you do that ? For example: if you think that your actuals are not on the same moment as the curve. For example you think that you are still further away from the peak then the curve of the scenario



Your actuals are moved to the left, or the curve is moved to the right

sim <mark>bo</mark>	🗙 🗠 Forecast	✿ Scenarios	aths .	Disclaimer	👤 test! 🚽
			Information Based on the actuals and the different shapes of the scenarios, the behavior of the actuals seems to correspond best with that of scenario WUHAN given the time shift actuals (blue line) and the arrivals according to the scaled scenario patterns based on the actuals (gray lines). The best scaled scenario pattern (green line) provides the forecast bey	of -3 days. The graph show ond the actuals.	s the
-	- St 6-6	oorona	Actuals and forecast of new arrivals		
S	at 2020-03-07	1	600		
S	un 2020-03-08	1	500		
N	1on 2020-03-09	2	300 × 100		
Т	ue 2020-03-10	2			
V	Ved 2020-03-11	20			
Т	hu 2020-03-12	3		2000 2000 2000 2000 2000 20	2020.04.23
F	ri 2020-03-13	5	Number of days since first day of infection		
S	at 2020-03-14	7		Opdate for	lecast
S	un 2020-03-15	4	(Re)calculate capacity		
N	1on 2020-03-16	5	To start the calculate calculate cape and the "(Re)calculate cape and the first. Always use that button to recalculate the capacity after changes have been made to	o the forecast.	
Т	ue 2020-03-17	9			
V	/ed 2020-03-18		The button (re)calculate capacity will show		
			the necessary capacity (necessary beds) per		
			department.		
			This is only shown if you filled in the paths		



Probability (%)

 \times Create / change path Create Path 8 Probability (in %): 20 8 Departments in path: Department A;10;10;10 Save Cancel Enter the expected % of Why do I need to enter the LOS 3 patients that will enter this times? path Because we are still improving Enter the department and ; and the LOS and ; and the application. the LOS and ; and the LOS (in the calculation this In one of the next versions the percentage will be taken from Example Department A;10;10;10 first number entered is the the new cases to enter this minimal LOS, the middle number path) is the modus of the LOS, and the This means that these patients go to department A last number is the maximum LOS. with an average LOS of 10 days

This way the calculation will take into account the variation in LOS

Probability (%)

sim box

Enter the expected % of patients that will enter this

(in the calculation this percentage will be taken from the new cases to enter this path)

Create / change path

Probability (in %):

5

Departments in path:

IC;14;14;14 Department A;10;10;10

> In this example a path is created with 2 departments. The patients go first to the IC with a LOS of 14 days, and then they go to Department A with a LOS of 10 days. Example

IC;14;14;14 Department A;10;10;10

The paths are made by entering one line per department.

The first line (in the example IC) is the first department they go to, the second line the second department they go to, and so on... Attention! The naming of the departments is uppercase sensitive. So the application regards 'Ward A' and 'ward A' as 2 different departments. So if you want to use the same department in multiple paths, then make sure the name is written the same.

Save

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a

+ Create Path

🚯 Disclaimer 🛛 👤 test! 👻



Name	Description		
ITALY	Scenario based on the curve of the actual positive new cases in Ita		
WUHAN	Scenario based on the curve of the actual positive new cases in W		
LOMBARDIA	Scenario based on the curve of the actual positive new cases in Lo	The scenario's are scaled	
SOUTH KOREA	Scenario based on the curve of the actual positive new cases in So		
GERMANY	Scenario based on the curve of the actual positive new cases in South Korea - 18 days in c	eters.info/coronavirus/country/germany/	+ Create scenario

Information The graph shows the scaled arrival pattern of the scenarios. It is scaled because absolute numbers are irrelevant, it is the shape of the pattern that matters. By doing so, the patterns can be compared with each other and the best fitting scenario can be chosen automatically based on the actuals.



+ Create scenario

Ignore	Name	Description
	ITALY	Scenario based on the curve of the actual positive new cases in Italy - 34 days in curve. source: https://www.worldometers.info/coronavirus/country/italy/
	WUHAN	Scenario based on the curve of the actual positive new cases in Wuhan. 45 days in curve. Source: https://ourworldindata.org/
	LOMBARDIA	Scenario based on the curve of the actual positive new cases in Lombardia. 34 days in curve. Source: https://graphics.reuters.com/HEALTH-CORONAVIRUS-ITALY/0100B5K6421/
•	SOUTH KOREA	Scenario based on the curve of the actual positive new cases in South Korea - 36 days in curve. source: https://www.worldometers.info/coronavirus/country/southkorea/
•	GERMANY	Scenario based on the curve of the actual positive new cases in Germany - 25 days in curve. source: https://www.worldometers.info/coronavirus/country/germany/
	FRANCE	Scenario based on the curve of the actual positive new cases in France - 28 days in curve. source: https://www.worldometers.info/coronavirus/country/france/
	US	Scenario based on the curve of the actual positive new cases in the US - 21 days in curve. source: https://www.worldometers.info/coronavirus/country/us/
	BELGIUM	Scenario based on the curve of the actual positive new cases in Belgium - 24 days in curve. source: https://www.worldometers.info/coronavirus/country/belgium/
	NETHERLANDS	sed on the curve of the actual positive new cases in the Netherlands - 26 days in curve. source: https://www.worldometers.info/coronavirus/country/netherlands/
V	BRAZIL	Scena ve of the actual positive new cases in Brazil - 22 days in curve. source: https://www.worldometers.info/coronavirus/country/brazil/

Save ignores

If you don't want to follow/see some of the scenarios, then you can check the 'ignore'-box of these scenarios. These scenarios are not shown in the 'Forecast'-part.

You can always uncheck these scenarios again .

Name	Description	
ITALY	Scenario based on the curve of the actual positive new cases in Italy - 27 days in curve. source: https://www.worldometers.info/coronavirus/co	
WUHAN	Scenario based on the curve of the actual positive new cases in Wuhan. 45 days in curve. Source: https://ourworldindata.org/	
LOMBARDIA	Scenario based on the curve of the actual positive new cases in Lombardia. 27 days in curve. Source: https://graphics.reuters.com/HEALTH-CORONAVIRUS-ITALY/0100B3K6421/	
SOUTH KOREA	Scenario based on the curve of the actual positive new cases in South Korea - 29 days in curve. source: https://www.worldometers.info/coronavirus/country/southkorea/	
GERMANY	Scenario based on the curve of the actual positive new cases in South Korea - 18 days in curve. source: https://www.worldometers.info/coronavirus/country/germany/	
	+	Create scenario

Information The graph shows the scaled arrival pattern of the scenarios. It is scaled because absolute numbers are irrelevant, it is the shape of the pattern that matters. By doing so, the patterns can be compared with each other and the best fitting scenario can be chosen automatically based on the actuals.



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		•	To start the forecast of newly patient arrivals and the effect on the desired capacity, please click the "Save & Forecast" button first.		
Dat	e	Actual # new patients with corona			
Sat	2020-03-07	1			
Sun	2020-03-08	1			
Mor	1 2020-03-09	2			
Tue	2020-03-10	2			
Wee	1 2020-03-11	20			
Thu	2020-03-12	3			
Fri 2	2020-03-13	5			
Sat	2020-03-14	7			
Sun	2020-03-15	4			
Mor	1 2020-03-16	5	Now click on 'Save & Forecast'		
Tue	2020-03-17	9			
Wee	1 2020-03-18	10			
		Save & Forecast			

Information The graph shows the actuals (blue line) and the arrivals according to the scaled scenario patterns based on the actuals (gray lines). The scaled selected scenario pattern Italy (green line) provides the forecast beyond the

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The new functionality has been added at the request of a number of hospitals to be able to follow the actual free bed capacity over a number of hospitals. The purpose is to share capacities if the capacity of one hospital becomes insufficient.

Therefore we created a function where a hospital can enter the occupied beds (per department, for example Intensive Care, or General ward), and can enter the total number of beds per department (reserved for COVID-19 patients).

sim <mark>box</mark> 🗠 Forecast 🏫 Scenarios 🛪 F	Paths 👖 Capacity usage			FAQ Sinclaim	er 🌣 Admin tasks 💄 admin 👻
Information This table provides an overview of	f all existing records in our syste	The records are used to generate reports for the total group co	onsisting of hospitals to which your hospital be	elongs to. Use the button 'Add record' to fill in the current situation.	Add record
Date time	Total	Used	Total	Used	
2020-04-11 09:34:56	20	15	10	5	2
	You	can go to the function 'Capacit on the button 'Capacity	cy usage' by clicking v Usage'		







Forecast

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Add record COHORT IC Date time Total Used Total Used 1 2020-04-11 09:44:17 20 18 10 7 20 16 1 10 4 2020-04-11 09:42:52 1 2020-04-11 09:34:56 20 15 10 5 The date and time stamps are generated automatically. The records entered are shown, wth the last updated record on top. Attention! If the date/time is not shown correctly, then that ? FAQ Disclaimer 👤 gwen 🗸 means that your time zone is not set correctly! You can change this in the settings (see also next page). Settings Sign off h lb. User Manual – application Corona Capacity

Information This table provides an overview of all existing records in our system. These records are used to generate reports for the total group consisting of hospitals to which your hospital belongs to. Use the button 'Add record' to fill in the current situation.



sim box 🛃 Forecast 🏫 Scenarios 🛪 Paths 📕 Capacity usage

Information This table provides an overview of all existing records in our system. These records are used to generate reports for the total group consisting of hospitals to which your hospital belongs to. Use the button 'Add record' to fill in the current situation.						
	COF	HORT		IC		
Date time	Total	Used	Total	Used		
2020-04-11 09:44:17	20	18	10	7	1	
2020-04-11 09:42:52	20	16	10	4		
2020-04-11 09:34:56	20	15	10	5	1	

You can always remove or change a record.

The date and time stamp will not change if you change the numbers in a record.

Using the function to have an overview over several hospitals

If you want to have an overview on the free bed capacity over several hospitals, then you require a specific login with which you can see the free bed capacity over the selected hospitals. You can ask for the login via <u>corona@simbox.ai</u> Attention! In order to provide that login we need the following information:

- 1. A (new) mail address which is not yet used in the application Corona Capacity
- 2. The list of hospitals (users in the application) which you want to see in the overview.

sim box 🛛 🗄 Capacity usage

Information This table shows the most recent capacity numbers for each of the monitored hospitals. Depicted are the number of available beds out of the total number of bed capacity.

Hospital name	Data datetime	COHORT	IC
hospital 1	2020-04-11 10:14:28	5 / 20	5 / 14
hospital 2	2020-04-11 10:13:17	8 / 30	11 / 22

Information This table shows the most recent capacity numbers for each of the monitored hospitals. Depicted are the number of available beds out of the total number of bed capacity.

Hospital name	Data datetime	COHORT	IC
hospital 1	2020-04-11 10:14:28	5 / 20	5 / 14
hospital 2	2020-04-11 10:13:17	8 / 30	11 / 22
The overview shows all hospitals that are linked to the regional account.	o For each hospital the is shown (this is the that has been ente hospital)	e latets record latest record ered by the).	verview shows the free bed aty per department (in bold , and the total bed capacity per department.
Very important! The names of the departments should be written the same in each hospital if you want them in the same column in the overview. For example: the application will regard IC and Intensive Care as 2 different departments.			

Therefore if you want to have them in the same column in the overview, then the names should be written the same by each hospital.