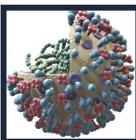


DEVELOPMENT OF AN IT TOOL TO ESTIMATE THE THERAPEUTIC NEEDS OF HOSPITALISED PATIENTS WITH COVID19 INFECTION BASED ON SIR EPIDEMIOLOGICAL MODEL

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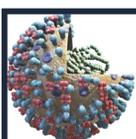
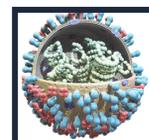


WHAT WAS DONE?

We created a tool to perform a timely estimation of the drug needs to treat the COVID-patients based on epidemiological forecasting.

The COVID 19 pandemic unprecedentedly challenged National Health Services to assure adequate patient care, despite a constantly escalating drugs demand. This complex situation requires appropriate planning to avoid misleading estimations, which would have consequences on patients and overall resources available.

WHY WAS IT DONE?



HOW WAS IT DONE?

1. The tool's epidemiological forecasting was based on a compartmental model in which the population is divided into three compartments (**Susceptible-Infected-Removed, SIR**), and transmission parameters are specified to define the rate at which persons move between stages.

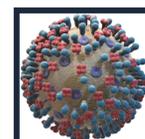
N = Total population



2. The drugs need for the forecasted patients was calculated according to a list of critical care drugs compiled consulting previous published scientific works, national and international guidelines.

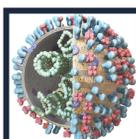
3. The list includes 51 drugs belonging to different therapeutic group, such as: antiarrhythmics, antibiotics, antipyretics, antivirals, heparins, IV-fluids, local anesthetics, neuromuscular blockade agents, sedative agents and vasopressors. For each drug it was estimated the percentage average ICU uptake for therapeutic group and active principle.

WHAT HAS BEEN ACHIEVED?



A tool consisting of an excel template, that, based on the information inserted, automatically calculate the number of patients classified by the intensity of care (hospitalized not-ICU, Hospitalized ICU, ventilated, intubated or with shock) and creates a table that includes, for each drug to be used, the following information: therapeutic group, active principle, dosage considered, pharmaceutical form, total dosage for patients considered and total quantity of unit doses for patients considered.

Sum of New hospitalized	Sum of New Hospitalized non-ICU	Sum of New ICU patients	Sum of Ventilated patients	Sum of New Intubated patients	Sum of New shock patients																			
33327	28313	5015	3510	2507	1755																			
Date																								
feb 2021																								
2020																								
2021																								
GEN	FEB	MAR	APR	MAG	GIU	LUG	AGO	SET	OTT	NOV	DIC	GEN	FEB	MAR	APR	MAG	GIU	LUG	AGO	SET	OTT	NOV	DIC	
Therapeutic group	Active principle	Dosage available on the market (considered)	Pharmaceutical form	Total amount (dosage) for the patients considered	Total amount (unit doses) for the patients considered																			
IV fluids	Kcl 80 Meq	40 meq	Injectable solution	4012000 meq	100300 vial																			
IV fluids	Magnesium sulfate	2000 mg	Injectable solution	200600000 mg	100300 vial																			
IV fluids	Sodium phosphate	15 mmol	Injectable solution	1504500 mmol	100300 vial																			
IV fluids	Calcium gluconate	1000 mg	Injectable solution	200600000 mg	200600 vial																			
Diuretics	Furosemide	250 mg	Injectable solution	6770250 mg	27081 vial																			
Antibiotics	Ceftriaxon (empirical)	1000 mg	Injectable solution	15045000 mg	15045 vial																			
Antibiotics	Ceftriaxon (target)	1000 mg	Injectable solution	3209600 mg	3210 vial																			



WHAT NEXT?

Our tool represents an opportunity for the immediate and efficient estimation of the drugs necessary to assist the COVID19 patients during emergency scenarios. It will be periodically updated as new evidences will be available.



