On Use and Misuse of Corona Mathematics

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My dear colleague from Australia. You ask how we in Denmark used mathematics in the first corona year. Thank you for that question.

As mathematicians, we both teach Jones' infection reproduction formula, and the logistic spread formula.

Jones' formula, as you know, says that the infection reproduction increases with the duration and density of crowds. It estimates that infection comes after 15 minutes within a meter. If you are closer, a quarter distance will 4-double the reproduction from 2.5 to 10. And 8 hours together will 32-double it to 80, which together with 25 cm distance will 128-double the infection pressure to 320 newly infected per infected.

However, where the distance can only be halved a few times, the duration can be doubled many times. Therefore, time infects much more than density, as was observed at a dental party in August, where 1 person infected 45, even though all orders for distance and deprivation were followed.

As of January 2020, therefore, there was a massive daily infection reproduction at the après ski sites, without affecting the active skiers. Who then carried the infection to at a football match in Milan on February 19, where half of the 80,000 spectators were inactive people from Bergamo, many of whom were medicated. The following week, Bergamo's hospitals and cemeteries were filled with sick and dead people due to the extreme reproduction of infection:

First 2 hours at a bar in Bergamo, then 1 hour on the train to Milan, then 2 hours at a bar in Milan, then 2 hours in a queue to get in and out of the stadium, then 2 hours like shouting herrings in a barrel, then 2 hours at a bar in Milan, then the 1 hour train home to Bergamo, then 2 hours at a bar in Bergamo. That is, about 14 hours at 25 cm distance, which gives an infection reproduction of 14 hours times 45 minutes times 4 for density times 2.5, i.e., 560. Taking into account low hygiene and lack of face masks, the figure is rather 1000 newly infected per infected. So, it only takes 40 skiers to infect everyone from Bergamo.

The incident led to the Bergamo hypothesis: Medicated people should avoid prolonged crowding while the active burn off the infection.

As to the logistical spread formula, we enjoy demonstrating it in our classes, since infection spreads like a rumor. At first everyone listens, but once 60% have heard it, no one wants to listen anymore. Then we have herd immunity. Similarly, with infection, in the beginning there are many to infect, but gradually there are fewer and fewer. Consequently, the growth is not exponential with a constant rate of growth, as in the case of interest rates in a bank. Instead, due to a limited population, the rate of growth will slow down and eventually become zero. The newly infected will therefore follow a hill curve with numbers that rise, peak and fall.

So, it is quite simple to establish a valid infection model using reliable data. The daily hospital admission rate increased in March by 20% daily. This percentage will then decrease evenly until herd immunity is reached. And a spreadsheet will show that it will take two months. And during this period, the medicated can then reduce their own infection reproduction by avoiding prolonged crowding.

If the infection is left to itself it will burn out as the flu does every year. But the government ignored the reliable hospitalization data and instead chose a shutdown based on three infection numbers, mainly from infected skiers from Austria. The infection was therefore allowed to survive and develop mutations in the prolonged crowding of the slum, first in minks, then in England, in South Africa and in Brazil.

For infection management, the government set up a group of experts to use infection numbers who are otherwise unreliable, as only those who want it are tested. Which symptom-free infection carriers obviously do not want.

The group chose a chain model: more reopening leads to more infected people, leading to more sick people, leading to more hospitalization, leading to more deaths. The population is seen as homogeneous, only divided by age over and under 60 years, but without taking into account the Bergamo hypothesis.

Consequently, the model's predictions were far from what was observed. Still, the experts defended their model with the George Box quote "All models are wrong, but some are useful". And their model was useful because it provides politicians with numbers. In doing so, they silence that, as does qualitative literature, also quantitative models come in two forms, fiction and fact, where, e.g., 2 kg at 3 \$/kg gives $2*3 = 6$ \$.

So, the experts do not want to learn from their invalid predictions. Despite Piaget's learning theory saying that learning takes place with inner schemas, which must be accommodated until they fit with the outside world.

Based on the observed Bergamo hypothesis, I therefore proposed changing the chain model to two models, one for the active ones, and one for the medicated.

For the active ones, more reopening will result in more infected, but not in more sicks, or more hospitalized, or more deaths.

For the medicated, more reopening will not lead to more infected people, and therefore not to more sicks, or more hospitalized, or more deaths. Provided, of course, that they reduce their contact to a maximum of 15 minutes in at least 1 meter distance, thereby avoiding prolonged crowding while the active ones burn off the infection in two months during full reopening, where only caregivers are tested. And where all injunctions are lifted so as not to delay the burning so much that a mutation can occur, which attacks also the active ones before the burning is completed.

Finally, since the effect of vaccines on immune people is not known, the active ones should not be vaccinated, as we risk filling the hospitals, not with corona patients, but with immunes who cannot tolerate the vaccine.

Unfortunately, there was no responsiveness to my information. I have made the YouTube video 'The Two Infection Formulas'. And written 80 letters to the editor and 16 extended feature articles sent to newspapers and authorities. And to the Danish Infection Institute, which is otherwise tasked with preventing and fighting infection. Six short letters were printed, including one on the Bergamo hypothesis.

Instead, the media relentlessly conveys the government's many irrelevant numbers.

First of all, the number of infected, which is not made more reliable by being indicated as a percentage of the number tested or of the number of residents in the area.

Next, the load on hospitals as the total number of beds occupied, but described with the word 'number of submitted', which can also mean the daily newcomers. Which is silenced, although these are only relevant numbers, since the ratio of two numbers four days apart indicates the infection reproduction. Unfortunately, this was renamed to the contact number, although it otherwise neatly illustrates the difference between reproduction above and below 100%, where infection is pumped into or out of the population.

The corona situation could have shown how the use of mathematics can solve problems. Instead, it has shown how abuse of mathematics can create serious social problems.

Jones' infection reproduction formula is silenced, and only crowding is warned, not duration.

The English mutation is presented as exponential growth with a constant growth rate, although this is impossible in a limited population, where the growth rate decreases steadily, i.e., logistically, and therefore results in the natural burning-out formula. Which, unfortunately, is silenced in favor of a useless chain model.

Media and experts confuse infection number and infection reproduction, i.e., absolute and relative numbers.

And both silence the only useful data, the daily admissions numbers. Which should be indicated by units to see if they confirm the Bergamo hypothesis.

If so, the experts' chain model could become realistic by dividing the population into unaffected active and affected medicated. And thus, recommend that the infection be burned with infection.
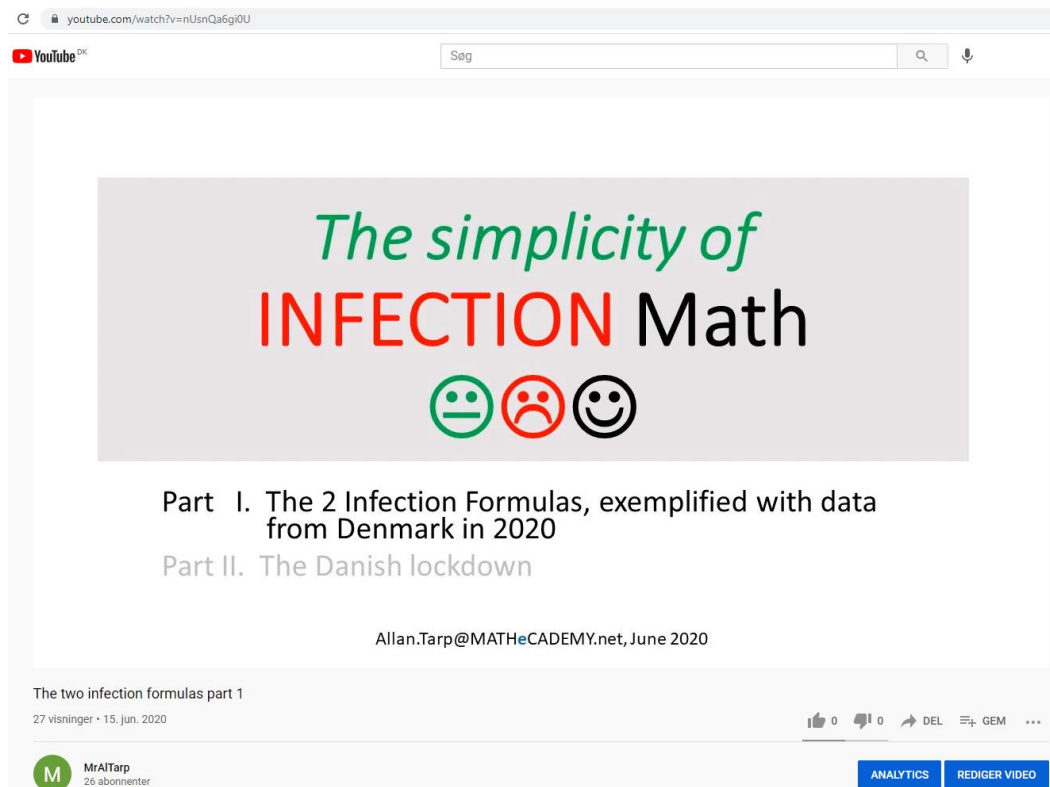
And better sooner than later before it's too late. That is, with the full reopening and cancellation of vaccines.

Logistic modelling at

http://mathecademy.net/corona-infection-model/

YouTube video 'The Two Infection Formulas'

https://www.youtube.com/watch?v=nUsnQa6gi0U