Pandemic Special

- *Grasp and Understand* -
Dangerous Mutation?

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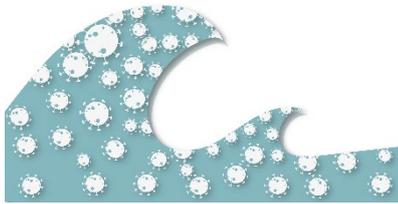
→ ## Higher mortality or higher spread, what is more dangerous?

*During a pandemic caused by a virus, mutations can occur. It's obvious, that a mutation spreading faster **and** being more deadly is bad news. Yet an important question arises: Which mutation causes more deaths? One with elevated mortality or spread?*

Infobox

Mortality

If a disease possesses a mortality rate of 5%, five out of 100 infected people will die as a consequence. If a mutation possesses a mortality rate elevated by 100 %, so ten out of 100 infected people will perish.

Spread

In the example, that if the original version of a pathogen leads to the infection two further people in the week after the infection of a single person the week prior, a mutated version with 100% higher spread of the pathogen will lead to four instead of two further infections.

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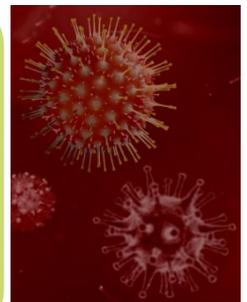
Grasp and Understand

The answer to this question is not obvious. To get a sense of the problem the proceeding is similar to the one in the Maths and Corona task 1. It is a good idea to play out several scenarios. Please print out the chess board three times. You will use the data provided in the Infobox, even though they differ from the recent developments of the pandemic.

Case 1: An infected individual reinfects two further individuals on average.

1) Calculate your numbers as in Sheet 1. Note the number of infections for 8 fields, start with one infected person.
2) Write the number of total infections under each field. One field is equal to one week.
3) Every 20th person infected with the virus dies. Divide 20 from the total number of infections, this will give you the number of deaths.

Now the new mutations enter your simulation. Use two different colors – one for every mutation.

Mutation 1: Higher Mortality; The number of deaths double. Label the corresponding values in your sheet.

Mutation 2: Higher Spread; Here you must repeat steps 1) to 3). This time four people get infected. Every 20th person infected with the virus dies.

Case 2: One infected person passes the virus one to one further person.

Fill out a new chess board printout. Proceed as with Case 1. The mutations here lead to the infection of two further people.

Case 3: Four infected individuals spread the virus to one additional person. Divide the number of new infections by four. Use a new chess board printout. Assume, that 1280 persons are infected at the beginning and proceed as in Case 1. The mutations lead to the infection of one individual by two infected people.

What's your conclusion?

Addition: Look up the real numbers for the spread and mortality of the corona virus and its mutations. Try to ascertain data for certain scenarios – you will encounter decimal numbers. You will see different numbers in different sources.

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