Final assignment

Part 1

There are respectively 1000, 2000 and 4000 pupils in three secondary schools in Amberhavn. The board of these three schools wants to give the pupils optimal protection against the flu. However, only a limited number of vaccines is available for the schools: 3000 in total. The board wonders how to best allocate the vaccines between the schools to have as few pupils as possible catch the flu.

This question is put to you, in your role as advisory committee. Research what the effects are of different allocations, and provide a well-founded advice based on this research. You can for example illustrate your findings with graphs and tables.

You can assume that within every school all the pupils come into contact with each other, but that there is no or negligible contact between pupils from different schools.

Part 2

In part 1 you researched how best to divide a limited number of vaccines among the pupils of different schools for a specific situation. The assignment considered pupils who have a lot of contact with other pupils in their own school and not a lot with pupils in other schools. You can also consider this generally as groups of people within a population who have a lot or very little contact with each other. In that case it is not the school board, but the health council who have to allocate a limited number of vaccines. Perhaps the number of vaccines will be smaller or larger (in relation) than in part 1. Or more groups can be defined. The situation becomes more complex and cannot be easily calculated any more.

In this last part of the assignment you will research the influence of this kind of factors on the best possible allocation of the available vaccines. Include your results in an advice for the health council for a general operational procedure in allocating vaccines to groups.

Tip: First vary only the number of vaccines available. For instance, research the situation with 1000, 2000 and 4000 vaccines (keeping the size of the groups the same as in part 1). Only then research what happens when you make other changes.

Appendix for assignment 5

Figure plotting indirect effect (fraction of the total population) against vaccination fraction f. The x-axis ranges from 0 to 1 labelled "vaccination fraction f". The y-axis ranges from 0,00 to 0,35 labelled "indirect effect (fraction of the total population)".