Assignment 5 – Modeling of infectious diseases

# Research

Virus chosen: A/H1N1 (2009, swine flu pandemic)

Population: Germany

Reliable sources:

* Robert Koch Institut (RKI) (https://www.rki.de/DE/Content/InfAZ/I/Influenza/Pandemie/Pandemie.html)
* Statista   
  (<https://de.statista.com/statistik/daten/studie/2861/umfrage/entwicklung-der-gesamtbevoelkerung-deutschlands/>)
* https://flexikon.doccheck.com/de/Influenza-A-(H1N1)?utm\_source=DocCheck&utm\_medium=DC%20Weiterfuehrende%20Inhalte&utm\_campaign=DC%20Weiterfuehrende%20Inhalte%20flexikon.doccheck.com

Time frame of outbreak: April 2009 – March 2010

Reported cases during the time frame: 220,000

Reported deaths during the time frame: 250

**Model:**

Compartments:

* Model for the first 274 days after the outbreak (beginning until the end of the year)
* N = Population of Germany 2009: 81.9 million

Factors that influence an outbreak:

* Infection rate: 0.3 - 0.7
* Incubation period: 1-4days
* Susceptibility: every member of the population
* Immunity: after infection
* Recovery: after 7 days

Interventions:

* Vaccination campaign (7.5% of the population was vaccinated)
* Quarantine of sick people or contact persons
* Obligation to report infections
* Closing of individual schools
* Experiments with the efficiency of masks
* Since only a small number of people got vaccinated and the other interventions were mostly abandoned by November 2009 only a small change in the infection rate is assumed (new infection rate: 0.28)

        - how did you define the intervention factors in the equations? what are the values based on?

    - determine which variables are available and can be used to model this event

    - What is R0? How is it different to Re? Note the answer down.

# Analysis:

With the help of intervention such as vaccination and quarantine the infection numbers were reduced. The intervention was effective