

Agent-based prediction of contagion matched with
web surface for government and businesses

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COVID Predictor

COVID Predictor

Challenge: Development of a web-based tool that predicts the epidemic progression within Switzerland

Why is this important?

An accurate model of the epidemic would help government and businesses to make informed decisions.

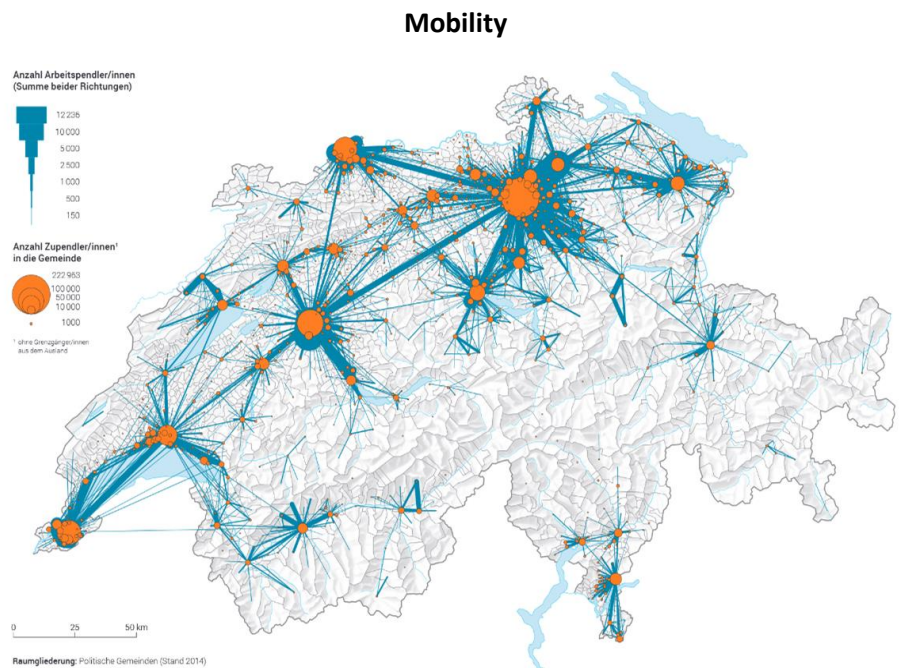
What is the Impact?

Informed decisions guarantee:

- Well being of citizens and employees
- Reduce impact on health system
- Implementation of necessary measures
- Minimization of economic impact

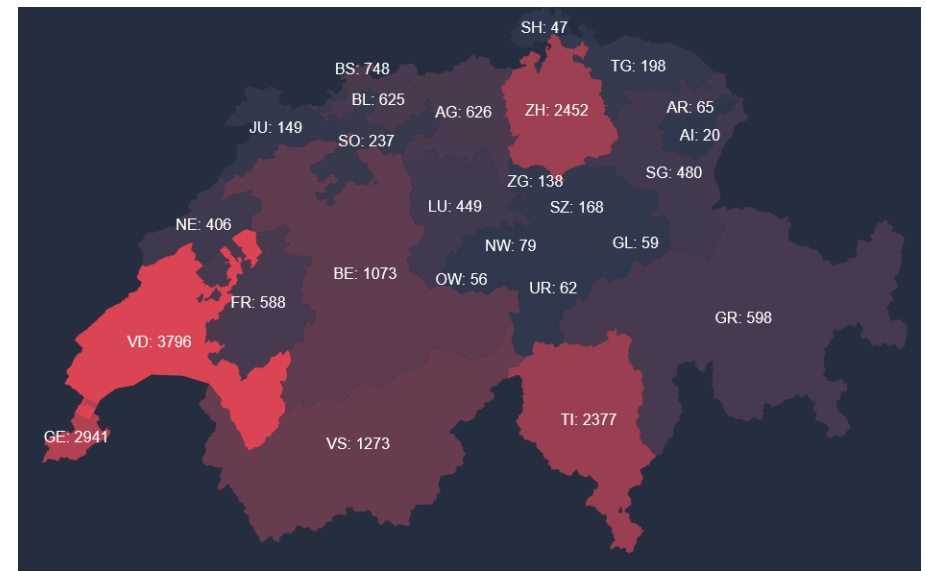
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Mobility of citizens is a major factor for disease spreading



Source: EDI, Eidgenössisches Departement des Innern, 2014

Infections 4.4.2020



Source: corona-data.ch

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Variables which affect infection:

- Population density
- People mobility
- Spreading rate
- Members per household / workspace
- Restrictions implemented by government
- Education and cultural background
- Access to health care
- ...

COVID Predictor

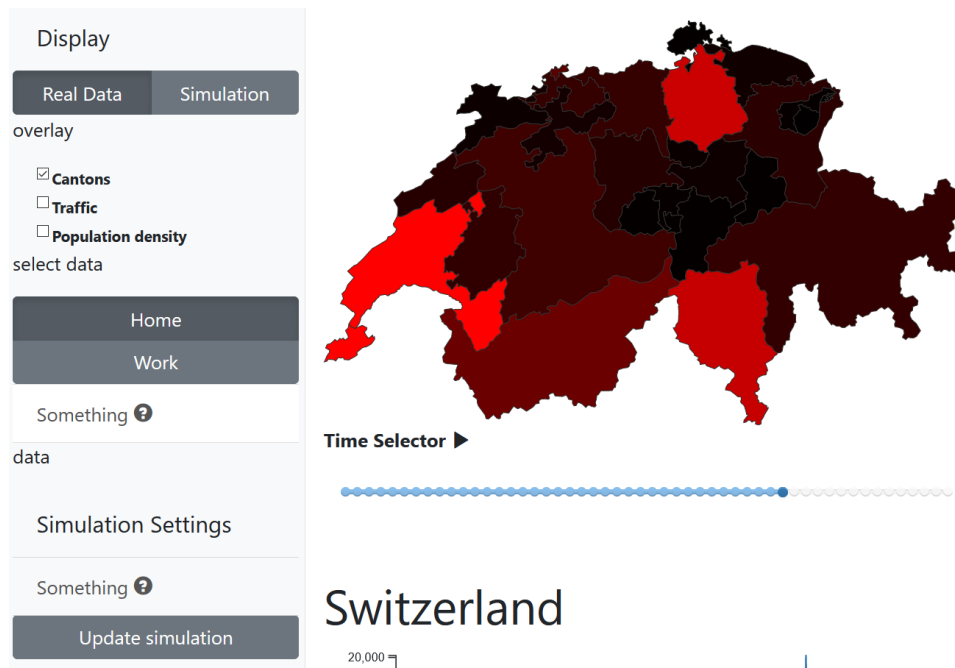
The mathematical model:

- Agent-based, stochastic epidemic simulator
- Agents are individuals in a closed population and interact with other agents
- Mobility is simulated with a transportation network to represent complexity involved in infectious diseases diffusion
- Prediction of three weeks time based on currently available data

This model was published by Ajelli, M., Gonçalves, B., Balcan, D. et al. *Comparing large-scale computational approaches to epidemic modeling: Agent-based versus structured metapopulation models*. BMC Infect Dis 10, 190 (2010).

COVID Predictor

The web design:



COVID Predictor

Future work:

Implementation of additional variables

- Governmental Restrictions
- Random social interaction
- Traffic and public transport
- Influx of people (airports/cross-border commuters)
- Influence of the education system
- Knowledge about the virus biology
- Weather