

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.

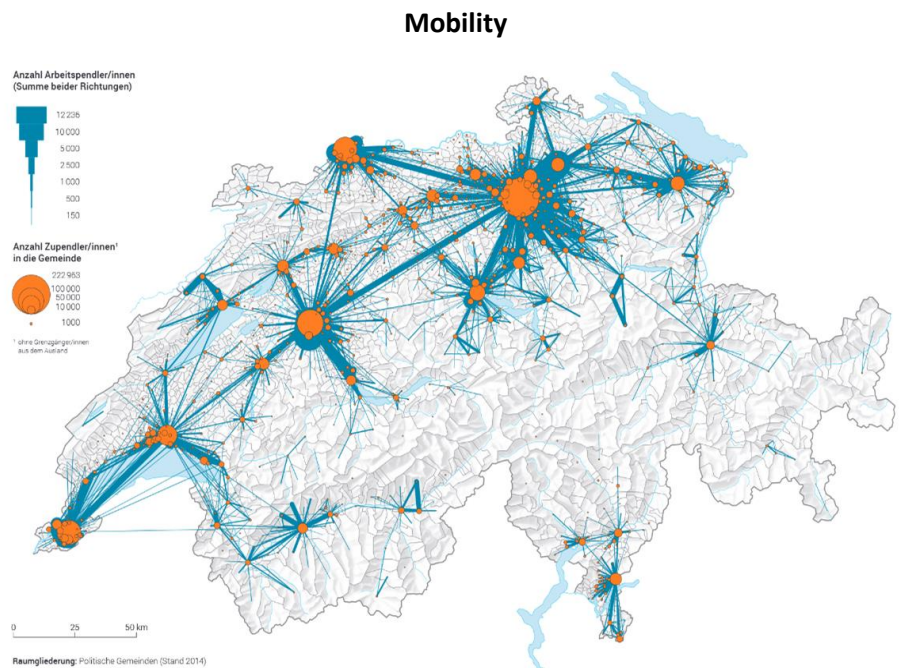
## **What is the Impact?**

Informed decisions guarantee:

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

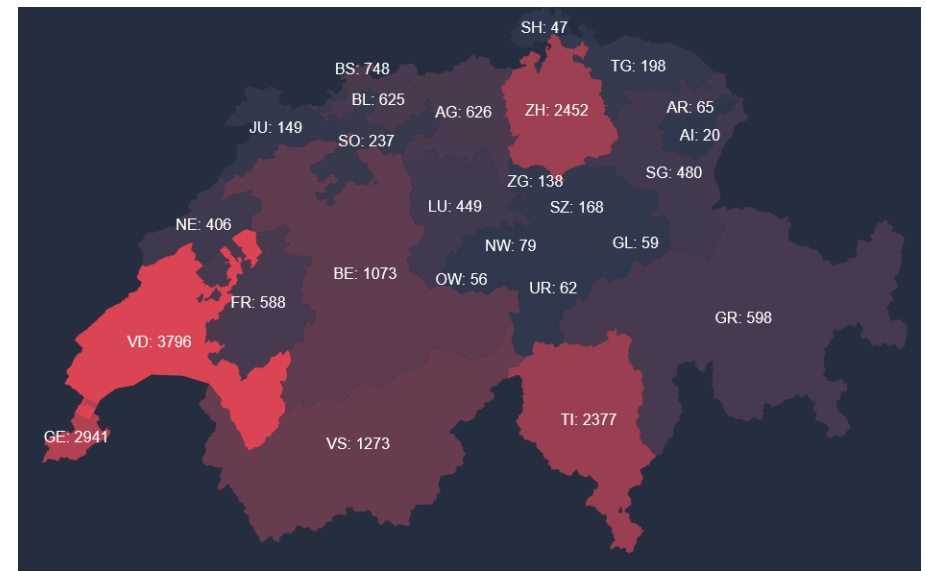
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Mobility of citizens is a major factor for disease spreading



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
- ...

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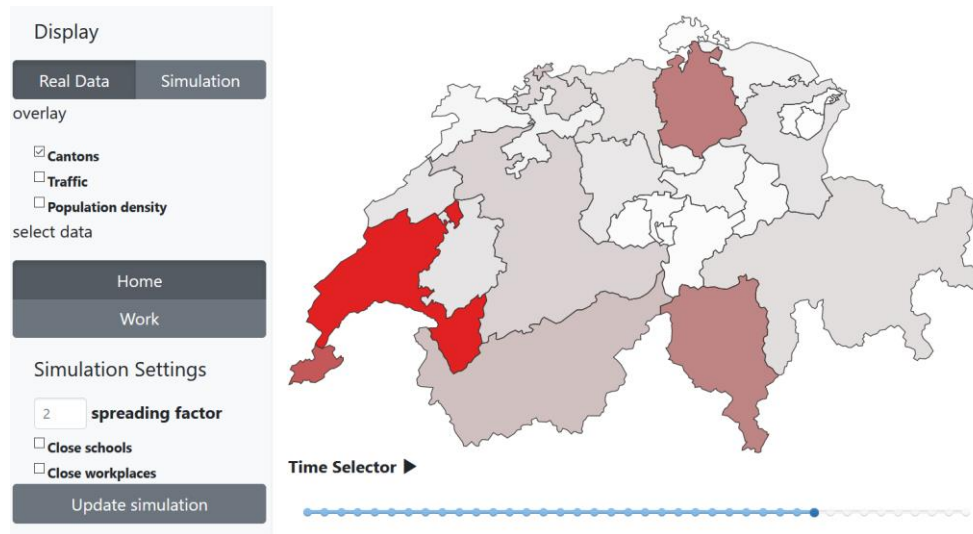
## The mathematical model:

- 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

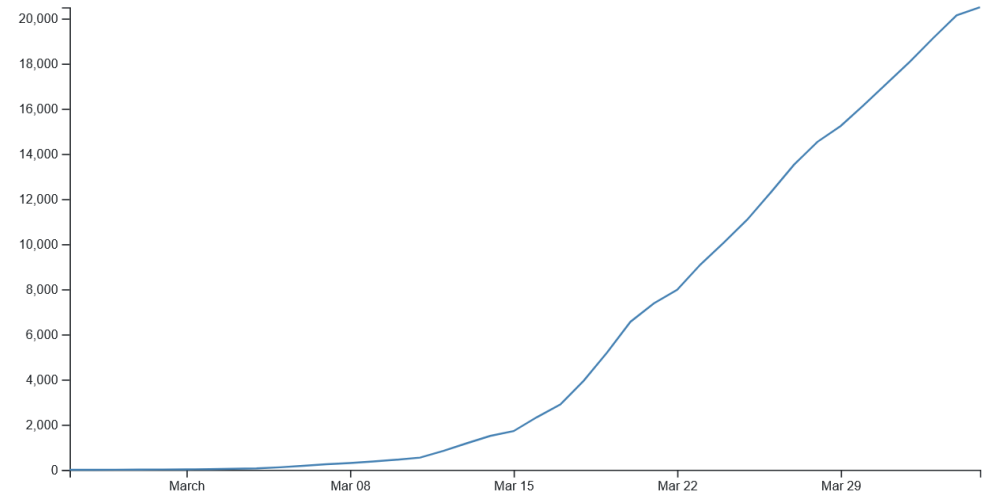
This model was published by Ajelli, M., Gonçalves, B., Balcan, D. et al. *Comparing large-scale computational approaches to epidemic modeling: Agent-based versus structured metapopulation models*. BMC Infect Dis 10, 190 (2010).

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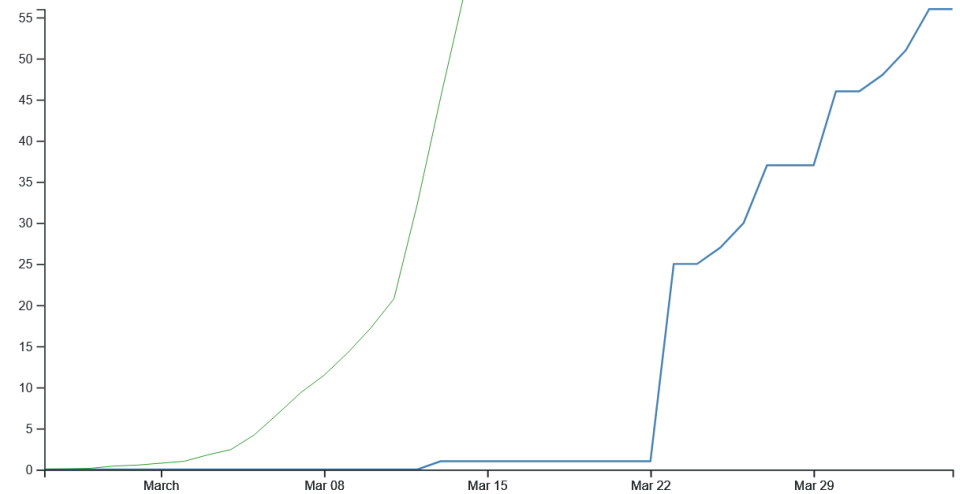
The web design:



Switzerland



Obwalden



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## 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