Eawag Seminar Invitation

Time is of the essence: containment of the SARS-CoV-2 epidemic in Switzerland from February to May 2020

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When **October 29, 16.00 – 17.00**

Where **Online via Zoom, contact seminars@eawag.ch for access details.**

Abstract
In late February and early March 2020, Switzerland experienced rapid growth of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections with 30,243 confirmed cases and 1,860 deaths as of 10 May 2020. The sequential introduction of non-pharmaceutical interventions (NPIs) resulted in successful containment of the epidemic. A better understanding of how the timing of implementing NPIs influences the dynamics and outcome of SARS-CoV-2 epidemics will be crucial for the management of a potential resurgence in Switzerland. We developed a dynamic transmission model that describes infection, hospitalization, recovery and death due to SARS-CoV-2 in Switzerland. Using a maximum likelihood framework, we fitted the model to aggregated daily numbers of hospitalized patients, ICU occupancy and death from 25 February to 10 May 2020. We estimated critical parameters of SARS-CoV-2 transmission in Switzerland and explored counterfactual scenarios of an earlier and later implementation of NPIs. We estimated the basic reproduction number $R0 = 2.61$ (95% compatibility interval, CI: 2.51-2.71) during the early exponential phase of the SARS-CoV-2 epidemic in Switzerland. After the implementation of NPIs, the effective reproduction number approached $Re = 0.64$ (95% CI: 0.61-0.66). Based on the observed doubling times of the epidemic before and after the implementation of NPIs, we estimated that one week of early exponential spread required 3.1 weeks (95% CI: 2.8-3.3 weeks) of 'lockdown' to reduce the number of infections to the same level. Introducing the same sequence of NPIs one week earlier or later would have resulted in substantially lower (399, 95% prediction interval, PI: 347-458) and higher (8,683, 95% PI: 8,038-9,453) numbers of deaths, respectively. The introduction of NPIs in March 2020 prevented thousands of SARS-CoV-2-related deaths in Switzerland. Early implementation of NPIs during SARS-CoV-2 outbreaks can reduce the number of deaths and the necessary duration of strict control measures considerably.