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COVIDStrategyCalculator: A standalone software to assess testing- and quarantine strategies

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Abstract: The working group on SARS-CoV-2 Diagnostics at Germany's Robert Koch-Institute has developed a software that enables public policy makers to assess different quarantine / testing strategies for their ability to reduce transmission. The tool is freely available* at GITHUB.

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A standalone software to assess testing- and quarantine strategies

The COVID-19 pandemic has disrupted society on a global scale, impacting not only human health, but also economies, educational systems, security and human rights. Because it affects poor and vulnerable people disproportionately, the pandemic worsens existing inequalities within and between countries. A curative treatment does not exist and vaccines will not be widely available in the near future. Therefore, the effective containment of SARS-CoV-2 epidemic spread is one of the most important objectives of our time.

Separating people who are, or who may be, SARS-CoV-2 infected, from others prevents transmission of the virus. This separation, termed isolation (people who are infected), or quarantine (people who may be infected) is key to successful containment of the pandemic. Its length (e.g. 14 days quarantine) covers the maximum time period of infectiousness. Quarantine / isolation may have adverse psychological effects and negative socio-economic impact, but simply shortening the duration would increase the risk of viral spread.

However, testing for SARS-CoV-2, if applied at the right point in time, can actually help to shorten quarantine duration without putting infection prevention at risk. Thus, combined quarantine / testing strategies can reduce the socio-economic burden of COVID-19 and generate greater public acceptance.

We have developed a software that enables public policy makers to assess different quarantine / testing strategies for their ability to reduce transmission. One example for questions that could be answered is: If quarantine for contact persons is shortened to 10 days and a test is performed during quarantine- will this increase or decrease the risk of COVID-19 spread? What is the optimal timing of the test? Will a second test decrease the risk further? The user has total flexibility in customizing testing strategies and setting model parameters. The software enables decision makers to tailor calculations specifically to their questions and perform an assessment 'on the fly', based on current evidence on infection dynamics. The COVID-19 Strategy Calculator (CSC) is a standalone GUI, which takes a situation sketch and a user-provided intervention strategy to estimate the risk reduction of the strategy. While the software evaluates quarantine, isolation and testing strategies entirely from the perspective of infection prevention, users can use the tool to compute variables for more general cost-benefit analysis that weigh infection prevention against socio-economic factors.

The tool is freely available under the GNU Lesser General Public License (LGPL) v3 from:

https://github.com/CovidStrategyCalculator/CovidStrategyCalculator

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