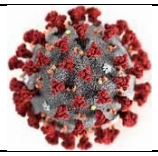
National COVID-19 Science Task Force (NCS-TF)



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Comment on planned updates :	

Strategy to control the epidemic of SARS-CoV-2 in Switzerland and protect lives and livelihoods

Summary of request/problem

Switzerland has made an enormous and successful effort to bring down the new confirmed SARS-CoV2 cases from more than 1000 to about 50 per day. What strategy should Switzerland now adopt to control the spread of the virus until a vaccine or effective treatment becomes available?

Executive summary

We present a strategy to control the epidemic while protecting lives and livelihoods, synthesizing insights from earlier Policy Briefs of the Task Force (link). This strategy is based on a comprehensive public health surveillance-response system. The goal of the strategy is to keep case numbers low at all times. This is the most effective, least disruptive and least costly way to maintain control of SARS-CoV-2 transmission. To keep case numbers low, we need to :

- Use a comprehensive and unified system to measure transmission and combine targeted and general measures within a national surveillance-response plan (complementing the existing Sentinella system).
- Intensify targeted measures (based on testing, contact tracing, isolating, quarantining and other means of targeted intervention) to achieve early detection and break transmission chains.
- Maintain general measures that have low to moderate costs for the society and economy (e.g. social distancing, hand and respiratory hygiene and masks). More disruptive measures (e.g. closure of schools, businesses and restaurants) should only be deployed if necessary.
- Tailor targeted and general measures to different geographic regions and strengthen public health surveillance to improve monitoring of the effects of the response on the epidemic.
- Coordinate cantonal, regional and international action plans across borders to prepare for the long-term changes needed to keep case numbers low.

This strategy requires the following actions:

- Access to testing must be greatly facilitated. Testing should be broadly available, easy to access, explicitly encouraged and paid for by the Confederation.
- The intensity of testing and the individuals that are mainly targeted for testing should be adapted to the regional settings.
- The system for contact tracing needs to be expanded to ensure a consistent and rapid response and to respond quickly if numbers of cases increase.
- All contacts require testing for SARS-CoV-2 infection, and quarantine or isolation. This applies to contacts identified by classical contact tracing and digital proximity tracing.
- People in isolation and quarantine must be afforded legal protection against job loss and social protection against income loss.
- A clear, timely, and persuasive communication of this strategy must be rolled out. The behavior of individuals is key in controlling the epidemic and protecting vulnerable people and the rights of individuals.

We argue that this strategy is the best option from all perspectives - health, economic and societal. We explain that it is important to invest considerable resources into identifying and interrupting individual transmission chains. We show

that such an investment is proportionate and necessary to prevent massive damage to the health of individuals, to society and to the economy. Lastly, we provide specific recommendations for how to implement this strategy.

Main text

Starting with the first confirmed case on February 25, 2020, Switzerland experienced an exponential increase in the number of infections with SARS-CoV-2 (link). In response, the Swiss government issued a number of measures to contain the spread of the epidemic, with a major set of measures being imposed in mid-March. The number of newly confirmed cases per day subsequently decreased from a maximum of about 1500 per day (March 27) to the current number of less than 50 per day (between May 9 and today, May 26; link). **This raises the question of what strategy Switzerland should now adopt to control the COVID-19 epidemic and preserve lives and livelihoods.**

There is a **clear and straightforward strategy to control the SARS-CoV-2 epidemic and minimize damage to the health of individuals, to society, and to the economy.** A basic tenet of this strategy is that exponential growth of SARS-CoV-2 epidemic in Switzerland must be prevented. An exponential spread can lead to a dramatic situation where high case numbers burden the society and make it very difficult and costly to regain control. This means that we need to prevent this and maintain the number of new infections per day below a threshold level. We need to be able to find a strategy that achieves this goal and can be maintained over an extended period of time, until a vaccine or effective treatment becomes available.

Importantly, it is more effective and less costly to control the epidemic at low rather than high daily case numbers (we discuss this further below). This means that we must capitalize on the low number of cases per day that we have achieved at present and invest substantial resources in maintaining this number low. As we will also discuss below, such an investment is **proportionate and necessary** to prevent massive damage to the health of individuals, to society, and to the economy.

In the following, **we support the main arguments** for this strategy in more detail. A key concept is the distinction between “general measures” and “targeted measures”. We use the term “general measures” for mechanisms of transmission control that affect all parts of the population. The term “targeted measures” is used for mechanisms of transmission control that are focused on individuals that are infected or have an elevated probability of being or becoming infected. Targeted measures include TITQ (testing, isolating, contact tracing and quarantining) as well as mechanisms for identifying infection hotspots (for example elderly homes) and preventing onward transmission.

1) We need to maintain a low number of cases. Maintaining a low number of cases has multiple important advantages (Policy Brief (PB) 11/05/2020, link). First, it preserves lives and prevents potentially debilitating disease. Second, when case numbers are low we can identify and interrupt individual transmission chains: as we discuss below, such targeted measures are, in general, much less costly than general measures. Third, these targeted measures are particularly effective and economical at low case numbers, as we will also discuss below. Fourth, low case numbers boost people's trust, which in turn supports an economic recovery because trust explains a significant part of an individual's investment and consumption decisions.

2) Surveillance with rapid detection and response are critical. The sooner an index case (i.e., an infected person) is detected, the more efficient is the reduction of further transmission of this individual and of all its contacts (PB 26/04/2020, link). Thus, testing should be broadly available, accessible easily and quickly, explicitly encouraged and paid for by the Confederation (PB 10/05/2020, link). All targeted measures depend on having a precise, rapid view of the emergence of new cases, and potentially of clusters of cases.

3) Targeted measures are, in general, less costly than general measures, especially when case numbers are low. Targeted measures only affect the subset of the population for which the risk of transmission is highest (PB 26/04/2020, link). When case numbers are low, only a small number of people are affected by these measures. Specifically, at low case numbers, one needs to trace contacts only for a small number of infected individuals, and send only a small number of people into quarantine. In contrast, general measures (such as closures of schools, businesses, or restaurants) not only affect the whole population but disrupt economic and societal activities to a much larger degree. Their costs for society and economy thus are considerably higher (PB 24/04/2020, link; PB 10/05/2020, link).

4) Targeted measures are more effective at low case numbers than at high case numbers. At low case numbers it is possible to invest more resources per case (e.g. trace contacts more rapidly, test asymptomatic in addition to symptomatic cases, provide better facilities and compensation for quarantine and isolation). These investments result in a greater reduction of transmission per case. Maintaining low case numbers thus allows to reduce transmission more effectively at lower total costs.

5) Investing heavily into targeted measures at low case numbers is a proportionate and necessary long-term strategy. When evaluating whether an investment into maintaining low case numbers is proportionate, we have to consider the consequences of failing to keep case numbers low, that is, the scenario where the number of new cases per day increases. As we described above, the effort and costs required to regain control of the epidemic increase dramatically once case numbers have increased to a high level (PB 11/05/2020, link). This means that a substantial investment into preventing this scenario is completely proportionate and cost-effective. The prevention of new cases should be the primary objective of a long-term strategy.

6) It is important that we make targeted measures as effective as possible. Given the importance and cost-effectiveness of targeted measures, it is imperative that we ensure they are used as effectively as possible. Specifically, we strongly recommend that classic contact tracing be complemented by digital proximity tracing (PB 26/04/2020, link). We recommend that contacts identified by proximity tracing (as well as by classical contact tracing, see below) are tested and advised to quarantine. This will allow evaluating the efficacy of digital proximity tracing and will ensure that digital contact tracing can make a contribution to transmission control.

7) Detection of new index cases is important and currently limiting. At low case numbers, every single case of infection that can be identified and every transmission that can be interrupted has a substantial effect on the control of the epidemic. For example, if there are 100 infected people in Switzerland, then identifying 50 of these and preventing all transmissions from them reduces the effective reproduction number R_e by 50%. One currently limiting step is the identification of infected people (so-called index cases). We strongly recommend that all contacts identified through classical contact tracing or digital proximity tracing be subject to testing for SARS-CoV-2 infection, in order to identify additional index cases. It is also likely that extensive testing in settings where many infections have been observed (for example health care settings) yields a substantial number of new index cases. Depending on prevalence, testing of contacts should be complemented by a Sentinella system that monitors transmission longitudinally in special groups such as schools, nursing homes, healthcare workers, service personnel and production settings (longitudinal monitoring means that the same individuals are tested repeatedly over time).

8) We need to complement targeted measures with low-cost general measures. Physical distancing and hygiene are key to any strategy to control SARS-CoV-2 (PB 11/4/2020, link). A third measure that can play an important role is the wearing of face masks (PB 20/04/2020, link). These measures have only moderate costs to society and the economy and are an essential complement to targeted measures.

9) We need legal and social protection for quarantined/isolated individuals to achieve the buy-in of the population. Getting tested and going into isolation or quarantine is first and foremost an altruistic act to protect others and offers limited benefits to the individual. As isolation and quarantine are a service to society it is therefore paramount to remove economic and legal costs and risks for taking these actions to the highest possible degree. Legal protection must exist against job loss for the duration of isolation and quarantine; social protection must exist against loss of income for the same period of time; those affected by the isolation and quarantine of others, for example when a parent or caregiver is isolated or quarantined, should be provided with alternative solutions (PB 09/05/2020, link).

10) Regional and national plans must be complemented by appropriate international coordination. SARS-CoV-2 does not know political borders. Switzerland is a small and internationally highly connected country, with substantial traffic across its borders, which is one reason for the rapid increase in case numbers early in the epidemic. Switzerland will benefit tremendously from low case numbers in other countries, especially neighboring countries. International coordination and cross-border control strategies that aim to keep case numbers low on both sides of a border must be developed and implemented.

11) Overall, it is essential to have a clear, evidence-based communication strategy, with specific messages targeted to each relevant segment and provided through channels they trust and use**.** Any strategy to control an epidemic is to a large degree based on actions taken by individuals and organizations (e.g. Swiss residents, tourists, employers, health and medical professionals, law enforcement personnel, school personnel). Clear communication should acknowledge the positive contribution of the population to the control of the epidemic to date, convey what actions are required from the population to preserve that success, and, importantly, outline explicitly the strategy of the Confederation to ensure continued success.

Unresolved issues

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References

Links to Policy Briefs are in the main text.

Appendices

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