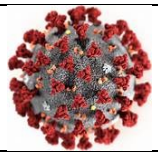
National COVID-19 Science Task Force (NCS-TF)



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Contact person: Monika.Buetler@unisg.ch (inputs by economics and other expert groups)	
Comment on planned updates :	

Title: Economic Considerations of Test-Isolate-Trace-Quarantine (TITQ)

Summary of request/problem : Financial and legal protections for affected individuals are necessary for a successful Test-Isolate-Trace-Quarantine (TITQ) strategy.

Executive summary:
Testing and quarantining both have private as well as social costs and benefits. This note explains these trade-offs and derives implications for (a) the mechanism to allocate the costs of testing, and (b) the provision of income for those confined to quarantine. As a unified TITQ strategy is in the public interest also for economic reasons, the federal government could act as a single payer. Moreoever, individuals confined to quarantine need to be financially and legally protected to strengthen compliance with the measures.

Testing

Note: Here we only consider diagnostic testing (such as RT-PCR, Thermo-Fisher-Scientific), but not serological tests.

At the moment (May 12) diagnostic testing in Switzerland is covered as follows (Eidgenössisches Departement des Innern EDI, Bundesamt für Gesundheit BAG, 2020):

- *health insurance:* if the outcome of the test is relevant for the medical treatment of an individual patient (ordered by a doctor). If the patient has not yet exceeded their annual deductible ('franchise'), then they have to cover the costs themselves.
- *accident insurance* for healthcare workers exposed to Sars-CoV-2 during work (if the probability that they were exposed is estimated to exceed 50%)
- *cantonal public purse*: if the outcome of a test is not necessarily relevant for the individual person, but is relevant from an epidemiological perspective (for example in the context of contact tracing). If persons with mild symptoms are tested (nor ordered by a doctor), this is done to curb the epidemic and to protect public health.
- *Individual out-of-pocket*: if a person wants to get tested for personal reasons (without being symptomatic or having been identified through contact tracing)

To assess the optimal allocation of the monetary cost of testing, both individual and societal costs and benefits have to be considered.

Testing has private benefits:

- Knowing that one is or is not infected. This benefit is limited, as it is short-lived, especially if negative (in which case the individual can still get infected).
- Providing a service to society can also be viewed as a private (psychological "warm glow") benefit (such as in blood donations) .

Testing has private costs:

- Net monetary costs of testing: These are the costs of the test plus medical consultation, minus the contribution of health/accidence insurance.[1]
- Non-monetary costs such as time spent testing, discomfort, hassle to get reimbursement (opportunity costs)

Testing has social benefits

- Identification of infected individuals allows for contact tracing and thus indirectly to limit spread of and containment of virus => positive externality of testing that is not fully taken into account by self-regarding individuals.
- Provides information about the spread of the virus in terms of location, socio-economic characteristics etc.
- A successful TITQ strategy reduces the needed severity of a lockdown. These benefits can be very large (cf. Policy Brief "Contact Tracing Costs").
- Systematic testing campaigns which are conducted in several cantons, such as targeting nursing homes (residents and employes), healthcare workers, medical consultations, some schools and some professional sectors, are of a broader interest, to help refine the testing/tracing/quaratining strategy at a national level, and identify potential hotspots.

Testing has social costs

- Monetary cost of testing borne by society.
- Congestion in case individuals without any exposure seek testing

Equity considerations

A uniform testing strategy imposes very different costs on the cantons. Cantons with a higher prevalence of the virus have to foot a much larger bill not only in the testing phase, but also in therapy. Moreover, the cantons that with a higher incidence of COVID19 cases may also incur higher economic losses (due to sick leave, quarantine, additional business closures). A decentralized allocation of costs increases the disparity between the cantons.

Information structure

- Asymmetric information (individual):
  Individuals who seek testing but are not a primary target of the testing strategy (symptoms, contacts, exposed workers), can easily pretend to have mild symptoms ("hypochondria"), so it is very difficult to differentiate between healthy and potentially sick individuals.

[1] Since Thursday April 30 the costs for RT-PCR tests have been reduced (from about 180.—Fr.) and fixed at 95.—Fr. for the test and, in addition, the costs of the medical consultation.

- Asymmetric Information (authorities):
  Authorities might want to test additional individuals in potential hotspots

To sum up, in a pandemic testing can thus not only be viewed as a stand-alone decision of the individual. The social benefits create a positive externality: The identification of infected individuals allows for contact tracing and thus indirectly to limit the spread of and enhance containment of the virus.

An optimal cost allocation mechanism between the individual and society depends on the relative magnitudes and interaction between private and social costs and benefits. Taking private and social costs and benefits into account, the allocation could be as follows:

- Costs borne by the Confederation in case of a nationally uniform testing strategy. This should be considered as covering the desired testing across the nation as well as systematic (local) testing campaigns that are of national interest.
  As the intensity of testing and thus the costs depend on the prevalence of infection, this would not necessarily imply uniform *per-capita* testing and associated expenditure across cantons.
- To the extent that COVID-19 testing can be considered as a preventive measure to control an epidemic outbreak rather than as a therapeutic intervention, there is a good case for the federal government covering the attendant costs.
- Cantons should be free to top up the federal testing budgets if they sought to carry out more tests.
- Under certain circumstances it might be beneficial to introduce non-monetary incentives for individuals, akin to incentives for blood donation (appeals to public-spiritedness, small meal, voucher; monetary rewards carry the danger to crowd out intrinsic motivation of individuals to provide a public good).
- In case of capacity constraints (number of tests, costs), priority should be given to:
  - people who have been referred to a testing facility by a medical professional
  - people who have been referred by a contact tracer
  - people in exposed jobs (nurses etc.)
  - vulnerable people (in terms of age and/or health status)
- Individuals should be allowed to test at their own costs as long as sufficient tests are available. Tests should be priced at producer cost, to avoid an incentive for diverting testing capacity to out-of-pocket payers.
- Co-payments in case of capacity constraints could potentially have unintended consequences: If individuals consider the fee as a price to get tested, they might even be more likely to ask for it because they feel they are entitled to it by paying a price (cf. also Gneezy, *et al.*, 2011).[2]

Quarantine

Clearly, a Test-Isolate-Trace-Quarantine (TITQ) strategy only works if individuals adhere to quarantining rules. For that, they should face the right incentives and must be financially

[2] Example of co-payments that have failed to deter demand: fees for emergency room visits in Germany, fines for late pick-up in day care centers (Gneezy and Rustichini, 2000), or monetary incentives to attend the gym (Acland and Levy, 2015).

and legally protected. Quarantine should be viewed as a civic obligation. The basic economic considerations outlined below apply to both traditional contact tracing as well as proximity tracing via smartphone app.

So far, the authorities have observed a strong, largely voluntary adherence to the measures imposed. However, this might be changing with the lifting of the lockdown and a perception that we have passed the peak of the crisis. It will become psychologically, socially and professionally costlier to be confined at home.

In traditional contact tracing an infected person lists all (potential) contacts in the last several days, and then these contacts are informed and, under certain conditions, ordered to quarantine by the contact tracing authority. In contrast, the proximity tracing app to be deployed operates on a purely voluntary base. With this app, an individual gets a notification if she/he has been within 2m of someone infected (and also using the app) for more than 15min during the contagious period. This notification consists of an automatic message prompt to contact the health authorities.

Economic requirements and constraints to implement a successful quarantine scheme

a) The scheme needs to protect people in quarantine legally and financially

b) It should provide for food and potentially shelter for those who cannot access these services

c) It should take into account the special situation of cross-border commuters and individuals without a work contract

d) It should distinguish between those who can work from home and those who cannot

e) Compensation payments should be conditional on compliance with the rules

Optimal financial compensation for those in quarantine

The optimal financial compensation scheme (continuation of wage payment, sick pay) for those confined to quarantine will differ depending on whether, for a given financial reward, the utility of working (U_w) is greater or lower than the utility of being quarantined (U_q).

- When U_w>U_q, ceteris paribus, socially optimal compensation is > 100%.
- When U_w<U_q, ceteris paribus, socially optimal compensation is < 100%.
- Assuming that pro-social motives correlate positively with (U_w - U_q), and/or assuming that U_w<U_q (people prefer quarantine to work) is a widespread phenomenon, a case for compensation ≤100% can be made.
- Even with compensation <100%, some workers with U_w<<U_q will seek ways to go into quarantine => potential for abuse, need for monitoring.
- Risk of “excess quarantining” is probably lower than risk of insufficient quarantining => In this case, the potential for abuse should not be decisive factor in the compensation; it may be better to err on the side of generosity (at least initially).

Allocation of costs for compensation scheme

Allocation of costs depends on whether quarantined individuals can continue working from home or not.

- In case work from home is possible, the employer incurs little or no loss and should bear continuation of payments.
- In case work from home is not feasible, continuation of payments also puts a burden on the firm and might lead to (implicit) pressure to avoid quarantine.[3]
  => In such cases, companies should receive wage replacement from the income compensation allowance in case of service (EO/APG Erwerbsersatzordnung). To avoid unjustified payments to firms for which home office is possible, such wage replacements must be justified.
- Self-employed individuals not only face a loss of income directly, but also some uncovered capital costs similar to the ones occurring to firms during a mandated lockdown. Compensation mechamisms such as the one provided during the lockdown could be thought of as complements. For quarantined self-employed or micro-business owners, however, the case for non-refundable compensation rather than refundable loans is even stronger than for lockdown-related income shortfalls.
- To incentivize adherence, adequate income support is also needed for individuals without employment and inadequate ressources.

Compliance, behavioral incentives and communication during the quarantine phase

As a general comment, both monetary and non-monetary incentives to comply with quarantine requirements need to to be considered. Especially during a pandemic, intrinsic motivation is an important component in maintaining quarantine efforts (see Meier, Gneezy and Rey-Biel (2011) for a review on the interplay between monetary and non-monetary incentives).

Financial protection during quarantine is obviously the most important incentive to comply. US evidence shows that the absence of continuation of wage payments can induce employees to continue working despite ill health (see also Pärli (2018)) – which is likely to have a negative impact on the course of a pandemic.

A second important factor is the monitoring of quarantined individuals during quarantine, not only for surveillance, but also to offer support and increase motivation of adherence to quarantine rules. In the canton of Zug, for example, quarantined people are called every day. Their experience shows that individuals do observe the quarantine.

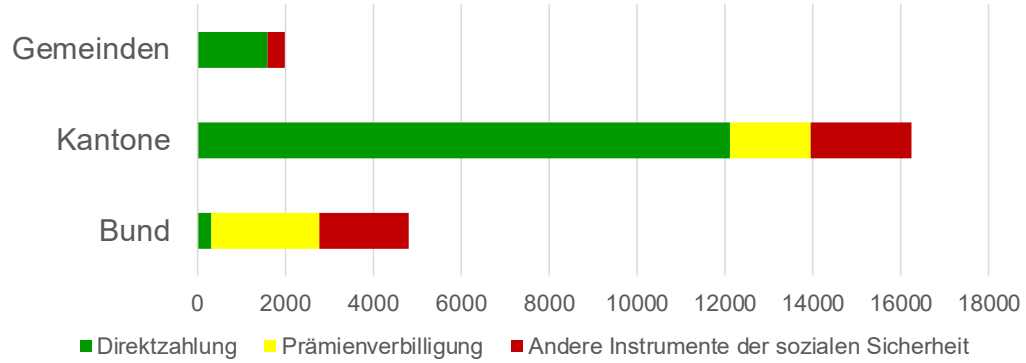
TTIQ requires a public awareness campaign. Employees should have the message reinforced directly from employers, so as to minimize psychological and material obstacles to observing quarantine recommendations.

[3] If several people in small companies are quarantined, then this can lead to substantial problems for these companies. One problem is financial – the company has to cover the salaries, with insurance only covering part of it. A second problem is operational – a substantial reduction in the work force of a company can put the company out of business – at least temporarily.

APPENDIX: Role of the Federal Government in public health expenditure

The share of the Federal Government in public health expenditure (direct payments) is usually very low – a mere 2.2% as of 2016. If one includes health insurance premium subsidies and the other instruments of social security, the share of the Federal Government increases to 21%.

	Direktzahlung		Prämienverbilligung		AHV/IV/UV/MV EL AHV-IV / Pflegehilfe	
	in CHF	in %	in CHF	in %	in CHF	in %
Bund	313	2.2%	2'480	58%	2'030	43.1%
Kantone	12'131	86.3%	1'830	42%	2'301	48.9%
Gemeinden	1'609	11.5%			378	8.0%
Total	**14'053**		**4'310**		**4'709**	



The division of public healthcare financing between the different layers of government (federal, cantonal and municipal) reflects the historical division of tasks and the limited responsibilities in the healthcare domain assigned to the federal government by the constitution. Since the introduction of the Health Insurance Law (KVG) and in particular in the last 10 years, the federal government has substantially increased its role in the field of health policy and health system leadership (e.g. through the health policy strategy Gesundheit2020 and the related national strategies with focus on NCD, palliative care, dementia, etc). This occurred without a substantial increase of the federal share in public healthcare spending.
It is undisputed, that the cantons should mainly be in charge of covering inpatient care, home care, nursing homes. One field of activity in which the federal layer keeps an important role is prevention, public health campaigns and disease control. For the field "Krankheitsbekämpfung, übrige", the share of the federal spending in total public spending corresponds to 63%.

Unresolved issues

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